
1938
2008
Onkološki inštitut
Ljubljana
70 let
Institute of Oncology
Ljubljana
70 years

Poročilo Report
1997 - 2008

CIP - Kataložni zapis o publikaciji
Narodna in univerzitetna knjižnica, Ljubljana

001.32 (497.4Ljubljana) : 616-006

ONKOLOŠKI inštitut (Ljubljana)
Onkološki inštitut Ljubljana = Institute of Oncology Ljubljana : 70 let = 70 years : 1938-2008 : poročilo = report : 1997-2008 / [urednik Marjetka Uršič Vrščaj ; angleški prevod Mojca Čakš ; fotografije Ljubo Bratina]. - Ljubljana : Onkološki inštitut, 2008

ISBN 978-961-6071-50-5
1. Uršič-Vrščaj, Marjetka
241744384

Izdal in založil
Publisher: **Onkološki inštitut Ljubljana**
Institute of Oncology Ljubljana

Urednik
Editor: **Marjetka Uršič Vrščaj**

Uredniški odbor
Editorial board: **Srdjan Novaković, Amela Duratović, Janez Žgajnar, Viljem Kovač**

Lektorica za slovenščino
Slovenian language editing: **Marta Anžlovar**

Angleški prevod
English translation: **Mojca Čakš**

Lektoriranje za angleščino
English language editing: **Amidas d.o.o.**

Fotografije
Photographs: **Ljubo Bratina**

Oblikovanje
Design: **Pristop d.o.o.**

Tisk
Printing: **Tiskarna Present d.o.o.**

Naklada
Edition: **2.000**

Častno pokroviteljstvo
Honorary patronage: dr. **Danilo Türk**, predsednik Republike Slovenije
President of the Republic of Slovenia

Vsebina

Contents

Ljubljana, 24. julij 2008

Spoštovani,

dr. ***Danilo Türk***
predsednik
Republike Slovenije

o bolezni neradi govorimo. Kadar smo zdravi, vsak dan uživamo, kot da bolezen ne bo nikoli sestavni del našega življenja. Tudi zato je toliko bolj stresno, ko se nas dotakne in se moramo z njo spoprijeti. V nas se naselijo strah, pesimizem, bolečina pred izgubo, zato je še kako pomembno, kdo nam stoji ob strani, kdo nas podpre na poti zdravljenja. Zaupanje v zdravnike, medicinske sestre in druge, s katerimi se srečujemo, ko prestopimo prag zdravstvene ustanove, je pomembno zagotovilo, da bo zdravljenje uspešnejše. Medsebojno zaupanje je tudi temelj uspešnega zdravljenja, pa tudi zaupanje v zdravstvene ustanove kot okolja, v katerem se določa in razrešuje naša usoda. Primerno je zato vprašanje, koliko in kaj smo skupaj z javnostjo storili, da bi to zaupanje krepili in s tem ustvarjali trdno podlago za učinkovito zdravljenje. Onkološki inštitut ima to izkušnjo, pa tudi izkušnjo 70-letne zgodovine, v kateri najdemo predane zdravstvene delavce, odlične znanstvenike, mednarodno uveljavljene raziskovalce in množico hvaležnih bolnikov, ki jim je inštitut povrnil zaupanje vase in bistveno pripomogel h kakovosti njihovega življenja.

Vsak organizem, vsaka ustanova se spopada z izzivi, vsakodnevnimi preizkušnjami, ki jih je treba znati upravljati, treba jih je premagati in iz bitke iziti boljši. Onkološki inštitut pri tem ni izjema. Je pa za Slovenke in Slovence pomemben temelj pri zdravljenju raka in hkrati dokaz, da je težave mogoče obvladovati. Dejstvo je, da smo spremljali mnogo različnih zgodb o težavah, pa tudi, da jih ne bi slišali in ne urejali, če pri tem zaposleni na Onkološkem inštitutu ne bi sodelovali. Dober tim odlikujejo povezanost, samokritika in pripravljenost biti boljši. Prepričan sem, da ste zaposleni na Onkološkem inštitutu to večkrat dokazali.

Posebej je treba pohvaliti slovensko onkologijo, ki je znala razpoznati partnerstvo nevladnih organizacij, ki se borijo za ozaveščanje in proti raku. To zagotovo prispeva h kakovosti oskrbe. Katera koli ustanova, še posebej zdravstvena, se mora povezovati s svojim okoljem in preverjati svojo usposobljenost skupaj s svojimi uporabniki. Nadvse dragocena je zato tradicija povezovanja s civilnodružbenimi organizacijami, v katerih se združujejo onkološki bolniki in ki s svojo dobronamernostjo sooblikujejo možnosti za njihovo zdravljenje. To sodelovanje je ena od pravic, ki spada med temeljne človekove pravice. Bolnik že dolgo ni več pasivni spremljevalec svoje usode, ampak pri svojem zdravljenju dejavno sodeluje.

Ko praznujemo, se ob spominu na prehojeno pot oziramo tudi v prihodnost. Onkološki inštitut je bil in bo tudi v prihodnje osrednja ustanova, ki je odgovorna za razvoj novih poti in znanja na področju onkologije. Poslanstvo Onkološkega inštituta je mnogotero. Ena od njegovih pomembnih nalog je tudi usposabljanje prihodnjih strokovnjakov s tega področja in pedagoško delo. Naloga nas vseh je, da zagotovimo te možnosti in ustvarimo primerno količino znanja in razvojnih zmogljivosti, ki bodo tej ustanovi omogočale uresničevanje njene osrednje vloge. Ker nas ni veliko, moramo skrbno ravnati z ambicioznimi človeškimi viri s tega področja in jim omogočiti, da bodo razvili svoje sposobnosti.

Izrekam vam priznanje za vaše zahtevno in odgovorno delo, ki ste ga opravili v ne najbolj prijaznem okolju. Nihče od nas si ne more predstavljati osebnega boja vsakega od vas, ko bolniku vlivate upanje, ga držite za roko in bodrite na zahtevni poti.

Srčno upam, da boste vztrajali na pravi poti in pri odgovornem delu.

Iz srca vam želim prijetno praznovanje in veliko razumevanja v vašem kolektivu.

Ljubljana, 24 July 2008

Dear Friends,

dr. ***Danilo Türk***
President of the
Republic of Slovenia

We are often reluctant to talk about disease. When we are healthy, it never occurs to us that disease could some day become an integral part of our lives. This helps explain why we are under such pressure when it finds us and when we are forced to confront it. All of a sudden, we are filled with anxiety, pessimism and fear of loss, which makes it all the more important to know who will be there for us, who will help us make it through the healing process. Being able to trust doctors, nurses and other health institution workers is an important measure of success in treatment. But good treatment is based not only on mutual confidence but also on the ability to rely on health institutions, the places where decisions are being made about our destiny. We should ask ourselves here how much and what exactly we have done, together with the public, to build on this trust and to create such an important basis for effective treatment. This is precisely what the Institute of Oncology has been doing, and it has been doing it for 70 years: throughout this period, there have been many dedicated health workers, excellent scientists, internationally acclaimed researchers and numerous grateful patients whom the Institute has helped regain their self-confidence and improve the quality of their lives.

Every organism, every institution is up against a multitude of challenges and everyday trials: an institution must be properly equipped if it is to manage and overcome them and emerge from the battle stronger than before. The Institute of Oncology is no exception. In the eyes of Slovenes, however, it also represents an important foundation for successful cancer treatment, proving that it is indeed possible to control problems. It is true that we have seen many different examples of such problems. But it is also true that we would never have heard about them or tried to solve them without the people who work for the Institute. A good team is about closeness, introspection and willingness to improve. I have no doubt that you have shown this in your work at the Institute on a great many occasions.

Slovenian oncology as a whole also deserves special mention for knowing how to embrace partnerships with non-governmental organisations that deal with awareness-raising about cancer. This surely helps to better the quality of treatment. Every institution, especially health institutions, must connect with its environment and monitor itself professionally together with its clients. We can therefore understand the value of the tradition of working with civil society organisations made up of oncology patients who are keen to be involved in defining the conditions of their treatment. Such cooperation is a fundamental human right. For quite some time now, the patient has no longer been a passive witness but rather an active participant in his or her healing process.

On this festive occasion, we not only look back at what we have achieved but also turn to the future. The Institute of Oncology was and will remain the central institution responsible for developing new methods and knowledge in oncology. Its mission encompasses a broad range of areas: one of its important roles, for example, is to train future experts and cover education in this field. The role we all have to play is to ensure the proper conditions for this, establish an appropriate knowledge pool and develop further means to enable the Institute to fulfil its basic function. Since we are a small nation, we have all the more reason to use our ambitious human resources with care, enabling all the people involved to fully unlock their potential.

Allow me to congratulate you on the formidable and responsible work you have accomplished under fairly difficult conditions. None of us can in fact imagine the personal endeavours each of you carries on when you bring hope to your patients, when you hold their hands and encourage them to push forward in their struggles.

I sincerely hope you will continue your work reasonably and responsibly.

Let me wish you a pleasant celebration and a great deal of understanding in your working environment.

mag. ***Aljoša Rojec****,*
univ. dipl. inž. el.,
generalni direktor

Vsaka častitljiva obletnica je trenutek, ko se ozremo v preteklost in obudimo spomine na uspehe in neuspehe, ki smo jim bili priča na prehojeni poti. Banovinski inštitut za raziskovanje in zdravljenje novotvorb, ustanovljen pred 2. svetovno vojno, 1. avgusta 1938, se je v sedmih desetletjih svojega obstoja predvsem zaradi poguma in širokosrčnosti zaposlenih, bolnikov ter vseh, ki ga nosijo v srcu, pa si tega včasih niti ne želijo glasno povedati, prelevil v sodoben, mednarodno priznan multidisciplinaren center za zdravljenje rakavih bolezni.

Zdi se, da je že obdobje, v katerem je bil ustanovljen Banovinski inštitut za raziskovanje in zdravljenje novotvorb, polno negotovosti, sprememb in seveda tudi iskric upanja, zaznamovalo kasnejše delovanje Onkološkega inštituta. Obstanek in razvoj Onkološkega inštituta sta bila velikokrat odvisna od srčnosti posameznikov, ki so pokazali svojo drznost in pogum prav v času, ko je bil Onkološki inštitut v najtežjih in najbolj brezupnih okoliščinah.

Plemenito poslanstvo, povezano z zdravljenjem in nego bolnikov, obolelih za rakom, in skrb za njihove svojce, spremlja Onkološki inštitut od samih začetkov njegovega delovanja. Širokosrčnost, velikodušnost in darežljivost so vedno bile in vedno bodo vrline negovalnega osebja in medicinskih sester, ki so pripravljene ob vsakem trenutku prisluhniti tudi osebnim željam in potrebam bolnikov ter njihovih svojcev, pri tem pa vedno izkazujejo visoko strokovnost. Želja zdravnikov in raziskovalcev po spoznavanju novega ter njihova iskrivost, ob veliki količini odrekanja, sta pripomogli, da so rezultati zdravljenja bolnikov na Onkološkem inštitutu primerljivi z rezultati zdravljenja v razvitih državah. Preudarnost, zmernost in strpnost, tako izrazite za vse nemedicinske službe, ki so ključno pripomogle k uspešnemu razvoju Onkološkega inštituta, so pomagale uravnotežiti vse želje in potrebe Onkološkega inštituta z zmožnostmi širšega okolja.

Vedno večja incidenca raka, povezana z vedno višjimi, pa vendar upravičenimi pričakovanji bolnikov in njihovih svojcev, pred institucije ter celotno družbo, ki se ukvarja z ozaveščanjem, preprečevanjem, in zdravljenjem raka, postavlja vedno zahtevnejše izzive. Učinkovit boj z rakom bo možen le ob zadostnih sredstvih, ki jih bodo za ta spopad od plačnikov zdravstvenih storitev prejemale inštitucije, kakršen je Onkološki inštitut.

Velik ugled v domači in mednarodni strokovni in laični javnosti ter neomajno zaupanje bolnikov in njihovih svojcev v Onkološki inštitut predstavljata zavezo za nadaljnji razvoj na strokovnem, raziskovalnem in pedagoškem področju ob zagotavljanju finančne vzdržnosti. Širše vodstvo inštituta in vsi zaposleni na inštitutu smo soočeni z visokimi in tudi upravičenimi pričakovanji bolnikov in celotne družbe. Ob zavedanju, da le spremembe vodijo k boljšim rezultatom, pa se bomo morali vsi zaposleni zavedati, da je Onkološki inštitut živ organizem, namenjen predvsem bolnikom, in zaradi tega podvržen občutljivim medčloveškim odnosom in hkrati vpet v širše družbeno okolje.

Naša želja je ostati vodilni zavod na področju onkologije v Sloveniji in se tudi v prihodnje uvrščati med vodilne onkološke centre v Evropi. S preselitvijo v nove prostore Onkološkega inštituta je bil narejen velik korak k izboljšanju bivanjskih razmer za naše bolnike, izboljšale so se delovne razmere za zaposlene, kar predstavlja trdne temelje, ki nam omogočajo doseganje naših ciljev in s tem izpolnjevanje pričakovanja bolnikov. Vizijo bomo lahko živeli le ob nenehnem izobraževanju in izpopolnjevanju, ki ni le temelj lastne prihodnosti, ampak zagotavlja tudi boljše rezultate zdravljenja in s tem

Aljoša Rojec*,*
M.Sc., B.Sc
Director General

Each commemoration of an important anniversary makes us look back and brings back memories of the successes and disappointments we have been through on the long road behind us. The Regional Institute for Research and Treatment of Neoplasms, founded on 1 August 1938, a few years before World War II, has in the seven decades of its existence grown into an advanced, internationally renowned multidisciplinary cancer center, largely owing to the bravery and whole-heartedness of the staff, patients and all others who have given their hearts to it, though they do not say so loudly.

It seems that the era when the Regional Institute for Research and Treatment of Neoplasms was established – an era in which uncertainty and transformations prevailed, and in which but tiny sparks of hope were flaring – deeply marked the further growth of the institute. The survival and progress of the institute were often left to a group of individuals whose loyalty and bravery rescued the institute in the hardest and most desperate times, when its autonomy was seriously at risk.

The noble mission to treat and care for cancer patients and to offer support to families of patients has been a close companion of the institute ever since its establishment. The nursing staff at the Institute of Oncology is known by and large for its virtues, such as open-heartedness, kindness, generosity, and readiness to listen to patients and to fulfill their personal wishes and needs, as well as those of their relatives. Besides that, the nursing services delivered to patients have always been of high quality. The ambition of the therapists and researchers to acquire new knowledge and their sharp intellect, along with their relentless abjuration of personal needs and interests, have contributed immensely to treatment results that are comparable to those in more developed countries. Prudence, modesty and patience, the qualities distinctively prevailing among the non-medical staff, whose contribution to the institute's successful development is also invaluable, have had a distinctive role in fine-tuning the wishes and needs of the institute to the potential of the wider environment.

The increasing incidence of cancer, along with the growing demands and greater expectations of cancer patients and their relatives, are posing new and more demanding challenges to the institute and to societies involved in promoting cancer awareness, prevention and treatment. The fight against cancer can only be successful if sufficient funds are provided by the agencies covering the cost of treatment services at institutions such as the Institute of Oncology Ljubljana.

The high reputation of the Institute of Oncology among the medical and lay public at the national and international level, as well as the great confidence of the patients and their families in the institution, represent a strong bond for the institute to ensure its further development in the areas of medicine, research and education – naturally, by respecting financial moderation. The management of the institute and its employees are facing high, yet justifiable expectations by the patients and society in general. In addition to being aware that only changes can lead to better results, the employees should also understand that the institute is a living organism, primarily intended for patients. Therefore, it is subject to the most sensitive interpersonal relations and, at the same time, also closely linked to the social environment.

Our wish is to remain the leading cancer center in Slovenia and to be ranked among the leading centers in Europe. A great step in improving the hospitalization conditions for patients and work conditions for personnel was made by moving into the new premises. Thus firm foundations have been

povezano zadovoljstvo bolnikov. Le z uvajanjem nenehnih pozitivnih sprememb na področju organizacije dela in s sprejemanjem teh sprememb s strani vseh zaposlenih pa bomo lahko pričakovanja svojih bolnikov in širše družbe tudi presegli.

Tako častitljiv jubilej, kot je sedemdesetletnica delovanja edinega terciarnega multidisciplinarnega onkološkega inštituta v Republiki Sloveniji, je tudi priložnost, da svoje misli usmerimo v prihodnost, pri tem pa se spomnimo dogodkov v preteklosti, ki naj nam bodo opomnik in vzpodbuda za delo v prihodnosti. V bližnji prihodnosti bo Onkološki inštitut soočen z drugo fazo gradnje novega Onkološkega inštituta. Dobrovernost zaposlenih in potrebe širšega družbenega okolja morajo biti zadosten motiv, da se ne bo ponovila zgodba iz prve faze gradnje novega Onkološkega inštituta.

Vsega se lahko bojimo od nekoga, ki se ne boji ničesar. Prav zato civilna družba in bolniki, združeni v mnogoterih združenjih bolnikov, zagotavljajo nenadomestljiv doprinos pri vzpodbujanju zavedanja širše družbe o problemih rakavih bolnikov. Pozitivno naravnan nadzor civilne družbe, širšega družbenega okolja in inštitucij, v katerih se zdravijo rakavi bolniki, pa predstavlja dodatno vzpodbudo pri nadaljnjem delu vsem zaposlenim na Onkološkem inštitutu.

Svetla prihodnost se vedno postavlja na ramenih preteklosti, zato smo vsi zaposleni upravičeno ponosni na svoje predhodnike in že zaradi svoje nravnosti zavezani, da nadaljujemo po začrtani poti – poti uspeha. Republika Slovenija premore le en sam Onkološki inštitut, zato je prav, da ga negujemo, razvijamo in spoštujemo.

Ljubljana, 20. junij 2008

established, which make our goals and the expectations of our patients attainable. Our vision for the future will come true by continuous training and improving our knowledge, which assures not only our own future, but also promises better treatment results and thereby also better satisfaction of our patients. Positive changes in the organization of work, which are embraced by the employees, will additionally help us to meet or even exceed the expectations of our patients and wider social circles.

This important commemoration of the 70th anniversary of the Institute of Oncology, of the only tertiary multidisciplinary cancer center in the Republic of Slovenia, is also an opportunity to look ahead and, at the same time, to bring to mind some past events that should serve us as a reminder and an inspiration for future work. In the near future, the Institute of Oncology will be faced with the second phase of construction of the new institute. The confidence of the employees and the needs of our society must be sufficient motivation to keep the history of the first phase of construction from repeating itself.

One should be afraid of those who have no fear. Therefore, the cooperation of civil society and patients, joined together in a number of patients' associations, is of invaluable importance in promoting cancer awareness among people by reminding them of cancer patients' struggles. Beneficial monitoring by civil society and wider social circles and by other cancer care institutions would be welcome, and would also be an added incentive to all the employees at the institute in their future work.

A bright future will always stand on the shoulders of the past. Everyone working at the institute is therefore justifiably proud of our brave ancestors, and is, on account of personal ethics, committed to follow this clearly defined path leading to success. There is only one Institute of Oncology in the Republic of Slovenia; it is therefore only proper to cultivate it, further develop it and respect it.

Ljubljana, 20 June 2008

Direktorji Onkološkega inštituta
Directors of the Institute of Oncology

Doc dr. **Josip Cholewa**
1938 - 1942

Prof. dr. **Leo Šavnik**
1942 - 1945; 1948 - 1963

Prof. dr. **Josip Hebein**
1945 - 1948

Prof. dr. **Božena Ravnihar**
1963 - 1982

Prof. dr. **Stojan Havliček**
1982

Prof. dr. **Stojan Plesničar**
1982 - 1986

Mag. dr. **Matjaž Zwitter**
1991 - 1995

Prof. dr. **Zvonimir Rudolf**
1986 - 1991; 1995 - 1999;
2003 - 2007

Doc. dr. **Albert Peter Fras**
2000 - 2003

Mag. **Aljoša Rojec**
2007 - 2008

Onkološki inštitut včeraj, danes, jutri

Onkološki inštitut Ljubljana danes, jutri

doc. dr.
Janez Žgajnar,
dr. med.,
strokovni direktor

Okviri delovanja Onkološkega inštituta (OI) so bili v najširšem pomenu postavljeni že takoj ob ustanovitvi, pred 70 leti, ko je bila sprejeta za tisti čas izjemna odločitev, da se ustanovi inštitucija, ki bi se poglobljeno ukvarjala z zdravljenjem raka. Rak je bil takrat redkejši kot danes, o njem se je malo govorilo, kadar pa se je, je bilo vedno v povezavi s smrtjo. Ustanovitelji inštituta so se zavedali, da se zdravljenje raka lahko izboljša samo, če se k raku pristopi usmerjeno, poglobljeno in multidisciplinarno. Zato so tudi ustanovili »inštitut za novotvorbe«. Pozneje so se formalni okviri delovanja OI le prilagajali njegovi dejanski vsebini, ne pa obratno.

Danes so usmeritve OI zapisane v aktu o ustanovitvi in v statutu:
»OI Ljubljana je celovit nacionalni onkološki center, ki opravlja naloge s področja preventive raka, zdravljenja, rehabilitacije in paliativne oskrbe bolnikov z rakom in skrbi za uravnotežen razvoj onkologije v državi.« (Temeljna določba, 1. člen, Statut OI)

»OI opravlja zdravstveno dejavnost na sekundarni in terciarni ravni ter raziskovalno in izobraževalno dejavnost.« (Temeljna določba, 3. člen, 1. odstavek, Statut OI).

Znotraj teh širokih okvirov seveda zlahka najdemo vsa področja današnjega delovanja OI. Prostor je tudi za vse tisto, kar še ni najbolje zastavljeno ali kar celo manjka. Ko si ogledujemo inštitucijo skozi čas, je še najlažje pogledati nazaj in z razdalje oceniti doseženo, zamujeno ali narobe napravljeno. Najbolj neprijetno je ocenjevati današnji čas: zaradi vsakodnevnih težav je težko videti gozd namesto dreves, pa tudi ogledalo si je neprijetno nastavljati. Vsekakor najtežje in najodgovornejše pa je pravilno gledati v prihodnost in jo, kar je še posebno pomembno, oblikovati.

OI je danes v slovenskem prostoru edinstvena ustanova. Je namreč edini celovit onkološki center v državi in ima posebno vlogo v razvoju onkologije za vso Slovenijo. Je sodobno zasnovan onkološki center, ki temelji na osnovnih načelih sodobnega zdravljenja raka, na multidisciplinarnosti in multiprofesionalnosti. Temu je prilagojena struktura (organigram); o vsaki enoti najdemo v tem zborniku zapise o dosežkih in smereh razvoja. Tudi ta struktura ni za vselej. O njeni začasnosti pričajo nekatere dejavnosti, ki so se razvile po uveljavitvi sedanjega organigrama, spreminjanje pa lahko pričakujemo tudi v prihodnje.

V tem kratkem poročilu nameravam z nekaj besedami opisati zdravstveno, raziskovalno in izobraževalno dejavnost OI, njegovo umeščenost v slovenski prostor danes in v prihodnje.

Za OI je bilo prelomno leto 2007. S preselitvijo sektorja operativnih strok, radiologije in nuklearne medicine v novo zgradbo se je končala dolgotrajna prva faza gradnje OI. S tem so se odprle povsem nove perspektive strokovnega razvoja. Ena od glavnih usmeritev v naslednjih letih je prav naloga, da te nove možnosti do konca izkoristimo. Ob tem pa ne smemo pozabiti, da nas čaka še druga faza gradnje, šele takrat bo namreč OI zaokrožen kot inštitucija, kot njegovo obliko vidimo danes.

V primarni preventivi bodo strokovnjaki OI tudi v prihodnje sodelovali v vseh programih v državi, ki so usmerjeni k doseganju zmanjšane obolevnosti za rakom (npr. zmanjševanje kajenja, promoviranje zdravega načina življenja). Še bolj neposredno vlogo pa OI igra v sekundarni preventivi, pri programih presejanja za tiste rake, pri katerih presejanje dokazano zmanjša umrljivost. Danes so taka pre-

Institute of Oncology Yesterday, Today and Tomorrow

Institute of Oncology Ljubljana Today and Tomorrow

Assist. Prof.
Janez Žgajnar,
MD, PhD,
Medical Director

The mission of the Institute of Oncology was broadly defined at its very foundation, 70 years ago, when a decision implying a most challenging vision for those times – that is, the decision to establish an institution that would be comprehensively dedicated to cancer treatment – was made. The disease, which was then less frequent than today and received little public attention, was, if ever mentioned, always associated with death. The founders of the institute were well aware that cancer treatment results might be improved if the approach to the disease would be uniformly, comprehensively and multidisciplinarily oriented towards a common goal. They therefore established an "institute for treatment of neoplasms". In the years to come, the formal operational scope of the institute became attuned to its true mission, and not the other way around.

Today, the mission is laid down in the founding act and statutes of the Institute of Oncology:
"The Institute of Oncology Ljubljana is a comprehensive national cancer center which carries out services required for cancer prevention and treatment, as well as rehabilitation and palliative care of cancer patients, and provides for the balanced national progress of oncology" (Statute, General Provisions, Article 1).

"The Institute of Oncology performs health care services at the secondary and tertiary level, as well as research and educational work" (Statute, General Provisions, Article 3, first paragraph).

Within this broad scope, it is not difficult to find all the present-day operational areas of the institute. Also within the same scope, there is room for areas of work that have not yet been duly worked out and for those which are still deficient.

Looking at the institute's growth over time, it is not hard to look backwards and judge from a distance what has been achieved, missed or improperly done. To be sure, it feels most uneasy to judge today's situation – due to the everyday problems, one fails to see the forest for the trees; and besides, to seek out what mirror can tell us is not too heartening either. It appears that looking ahead properly and, more importantly, making plans for the future, is by all means a most challenging and highly responsible commitment.

In the Slovenian national setting, the Institute of Oncology is a unique institution. It is the only comprehensive cancer center in the country, playing a specific role in the development of oncology in Slovenia. The Institute of Oncology is a cancer center conceptualized in up-to-date terms based on the guiding principles of oncology – multidisciplinarity and multiprofessionality. The organization of the institute (see the work organization chart) is attuned to this concept, and in this anthology information on the achievements and future prospects of each unit can be found. The chart as it is now has not been conceived once and for all; that it is provisional can be noted from the development of new areas of work that were initiated after the adoption of the present chart. We may thus expect that new changes will happen at the institute in the future.

In this report, I will make a brief summation of the medical, research and educational activities of the institute, as well as of the position that the institute holds and will hold in the future in the Slovenian national setting.

sejanja za raka maternične vratu (ZORA), raka dojk (DORA) in raka širokega črevesa (SVIT). Na OI se zavedamo, da je najsodobnejšim oblikam zdravljenja navkljub pomembno odkrivati predrakave spremembe ali zgodnje oblike raka, kajti to izboljša preživetje bolnikov. Dosledno bomo vztrajali pri najstrožjih merilih kakovosti teh programov, ker le taki zagotavljajo merljive uspehe.

Diagnostične dejavnosti OI vsekakor zagotavljajo vrhunsko raven obravnave bolnikov za lokalizacije, za katere so specializirane. Histopatogija in citopatologija sta referenčna slovenska centra za onkologijo, kar bomo zagotavljali tudi v prihodnje. Kadrovski problem je še posebno izrazit na oddelku za histopatologijo, saj narašča število pregledanih preparatov, preiskave tkiva pa so čedalje kompleksnejše. Oddelek za radiologijo je trenutno najsodobnejši državi. Nova oprema (CT, MRI) in digitalizacija oddelka ob selitvi v nove prostore odpirajo široke možnosti razvoja. (Pre)dolgo smo čakali, da lahko opravljamo sodobne slikovne preiskave, ki so ključne v obravnavi onkološkega bolnika. Tudi v prihodnje bomo skrbeli za sprotno posodabljanje slikovnih metod ter hkrati za uvajanje slikovno vodenih, minimalno invazivnih interventnih posegov. Z novo napravo PET CT smo v Sloveniji končno nadomestili zaostanek za svetom. V naslednjih letih jo nameravamo kar najbolje izkoristiti v dobro bolnikov iz vse Slovenije. OI bo tudi osrednja slovenska učna baza za nuklearne medicince. Nov in združen laboratorij zagotavlja raven preiskav, ki je v skladu s potrebami OI kot sekundarne in terciarne ustanove. Še naprej bo treba zagotavljati organizacijo dela, ki bo sledila organizaciji kliničnega dela OI.

Molekularna diagnostika je med mlajšimi oddelki OI, vendar se že lahko pohvali z nekaterimi odmevnimi dosežki. Če upoštevamo smer razvoja onkologije, ima pred seboj izjemen razvoj.

Zdravljenje raka na OI temelji, kot je bilo že večkrat povedano, na multidisciplinarnosti in multiprofesionalnosti. To zagotavljamo z obravnavo bolnikov v timih, v katerih sodelujejo strokovnjaki različnih profilov, ki se poglobljeno ukvarjajo s posamezno vrsto raka. Letos smo time reorganizirali, kar bo tudi v prihodnje sproten proces. Na tem mestu ne moremo mimo dela v konzilijih, na katerih člani timov skupaj določajo, kakšno bo zdravljenje bolnikov. V timih sodelujejo tudi številni strokovnjaki drugih inštitucij zunaj OI, ki enakopravno sodelujejo v delu konzilijev. Le tako delo omogoča strokovno najboljšo obravnavo bolnikov, zato se bomo zavzemali za pravično vrednotenje dela v konzilijih in s tem povezanih kadrovskih potreb.

Ko govorimo o OI danes, ne moremo mimo kratkega opisa kliničnih strok. Sektor operativnih strok je s selitvijo v nove prostore pridobil izjemne možnosti razvoja. Predvsem pomeni dokončno uveljavitev onkološke kirurgije kot sestavnega dela OI in še posebno kot nove stroke, ki se le počasi formalizira. Nove možnosti bomo morali izkoristiti. Strategija razvoja onkološke kirurgije na OI je usmeritev v zdravljenje istih lokalizacij kot doslej (rak dojk, melanom, sarkomi, rak ščitnice, rak danke) ter v abdominalno kirurgijo in ginekologijo. Načrtujemo tudi razvoj endoskopske kirurgije. Ob več operacijskih dvoranah nameravamo povečati tudi število rekonstruktivnih posegov. Že v bližnji prihodnosti bomo del operativnega programa preselili v dnevno bolnišnico. Tudi tako se bomo približevali smernicam iz razvitega sveta.

S selitvijo v nove prostore so se spremenili tudi pogoji dela za anesteziologijo, ki pokriva tri področja: anestezijo, intenzivno medicino in terapijo bolečine. Pridobili smo intenzivni oddelek, ki ima 12 postelj in omogoča najvišjo kategorizacijo zahtevnosti zdravljenja. V zadnjem času opažamo, da vedno

The year 2007 was a milestone in the development of the Institute of Oncology. The divisons of surgical oncology, radiology and nuclear medicine moved into a new building. Thus the first phase of construction of the new institute (which took too long) was completed and new prospects for technical development arose. In the years to come, one of the major aims is to take best advantage of new opportunities as they present themselves. However, we should keep in mind that the second phase of construction of the institute remains to be accomplished; on completion of the second phase, the Institute of Oncology will become a comprehensive institution as we envisage it today.

The institute will continue with its work in primary cancer prevention; the experts of the institute will be engaged in all national anti-cancer programs aimed at lowering the incidence of the disease (e.g. by reducing tobacco abuse and promoting healthy lifestyles). In secondary cancer prevention the role of the institute is of even greater importance, since it is involved in screening programs for the cancers for which there is evidence that screening can contribute to a decrease in the mortality rate. The screening programs that are already running cover cervical cancer (ZORA), breast cancer (DORA) and colorectal cancer (SVIT). The medical staff at the Institute of Oncology is well aware of how important the detection of premalignant changes or early stage cancer is for obtaining better survival, despite the use of the latest treatment methods. The staff is also determined to insist on the use of the strictest criteria for quality assurance of the screening programs, thereby also ensuring the quantification of results.

Diagnostics at the Institute of Oncology is specialized in providing high-quality services to cancer patients in the localization of tumors. The departments of histopathology and cytopathology are national reference centers for oncology in Slovenia, and their services in this role will be ensured in the future as well. Staff-related problems are a burning issue at the department of histopathology, due to the persistently growing number of samples and more complex procedures of tissue examination. The department of radiology is the most advanced diagnostic unit in the country. After moving the department into new premises, new devices (CT, MRI) and a digital system of operations opened widely new windows of opportunity for further progress. We have been waiting too long to be able to perform up-to-date image diagnostics, which is a crucial step in the comprehensive care of cancer patients. In the future, we will devote more attention to carefully upgrading the imaging methods and to introducing the use of image-guided minimally invasive intervention procedures. With the purchase of a new PET-CT device, Slovenia no longer lags behind other countries in the world. The new device will certainly be of great benefit to all patients in Slovenia. The Institute of Oncology will also serve as a national learning center for nuclear medicine in Slovenia. In the new laboratory, the quality assurance of all investigations meets the needs and standards of the institute as a secondary and tertiary health care institution in the country. The next step is to assure that the organization of work in the area of nuclear medicine will be attuned to the organization of clinical work in the institute. The department of molecular diagnostics is one of the newly established units whose work has already been crowned with some remarkable achievements. Considering the trends in the development of oncology, the best opportunities for progress are still ahead of it.

As has been frequently said, cancer treatment as carried out at the Institute of Oncology Ljubljana is based on multidisciplinarity. This approach to treatment has been ensured through the management of patients by multidisciplinary teams of experts specializing in the treatment of a particular cancer type. This year, a major reorganization of the teams was made at the institute, and in the future steps to reorganize the teams will be taken regularly. At this point, the work of advisory team meetings should not go

več bolnikov iz vseh sektorjev OI potrebuje intenzivno oskrbo, zato bo temu področju posvečena posebna pozornost.

Sektor radioterapije je v specifičnem položaju, ker je edini v Sloveniji. V zadnjih letih je z novo opremo v marsičem nadomestil zaostanek za najboljšimi, vendar še ne povsem. Sprejet je že načrt razvoja radioterapije v Sloveniji, ki predvideva še en center v Mariboru. Do tega, predvsem pa do popolne samostojnosti, je še dolga pot, zato bo v naslednjem obdobju OI še naprej ključen za razvoj radioterapije v državi. S ponudbo vseh sodobnih obsevalnih tehnik (3D-konformna RT, IMRT, IGRT, stereotaksija, TBI) želimo postati eden od vodilnih radioterapevtskih centrov v Evropi in vodilni center v osrednji/jugovzhodni Evropi.

Internistična onkologija, po nastanku najmlajša veja onkologije, se hitro razvija. Ob vse raznovrstnejšem in bolnikom prilagojenem zdravljenju se obseg dela iz številnih razlogov (naraščanje incidence raka, kroničen potek bolezni, nova zdravila itd.) vsako leto povečuje. Trenutne razmere na OI ne sledijo temu. V Sloveniji imamo le polovico potrebnih internistov onkologov in vsi so zaposleni na OI. V državi moramo to podhranjeno področje čim prej urediti, še posebno glede na pričakovano povečevanje števila novih bolnikov in novih zdravljenj. Da bi ohranili kakovost zdravljenja, je treba na OI zadržati uvajanje novih terapij, zahtevne terapije, klinično raziskovanje in zdravljenje redkih bolezni. Standardno sistemsko zdravljenje pri pogostejših rakih bo nujno prenesti v nekatere sekundarne bolnišnice, vendar le kadar za to obstajajo ustrezne razmere (izobraženi kadri itd.). V vseh sektorjih pa bomo vedno več zdravljenja opravljali ambulantno. Danes opravimo približno 400 ambulantnih pregledov na dan, kar je ob trenutnem kadrovskem položaju odločno preveč. V prihodnje želimo posvetiti več časa novim bolnikom in tistim na aktivnem zdravljenju. Zato lahko predvidevamo, da bomo bolnike po končanem zdravljenju v vedno večjem številu napotili k pooblaščenim zdravnikom. Tako bomo dosegli, da se bodo vrhunski strokovnjaki lahko bolje posvetili predvsem tistim, ki jih najbolj potrebujejo.

V tem kratkem pregledu ne moremo mimo onkološke zdravstvene nege, ki je v preteklosti dosegla visoko raven razvoja. Gre za specifično področje zdravstvene nege, ki »domuje« prav na OI. Ker pa se bolniki z rakom zdravijo tudi v drugih ustanovah v Sloveniji, je OI kot terciarni zavod dolžan usmerjati slovensko onkološko zdravstveno nego in biti referenčni center za to področje.

V zadnjem obdobju smo na OI uvedli kar nekaj novih dejavnosti, kot so paliativna oskrba, onkološko genetsko svetovanje in prehranska podpora. Zaradi razvoja stroke doma in po svetu lahko pričakujemo uvedbo novih dejavnosti. Čim prej je treba urediti celostno rehabilitacijo bolnika z rakom.

Spregledati ne smemo Registra raka RS, na katerega smo na OI upravičeno ponosni. Tudi v prihodnje bo deloval na OI, vsekakor pa bo nujen napredek v informacijski podpori v celotni Sloveniji, da bi zagotavljal hitro in natančno zbiranje podatkov.

Raziskovalna dejavnost je bila na OI od nekdaj zelo dobro razvita. Prav v zadnjem času smo v številu raziskav nekoliko zastali. Razlogi za to so zunanji (vedno več administrativnega dela), pa tudi naši, notranji. Preobremenjenost z rutinskim delom ne pušča mnogo časa za raziskovanje. Sprememba teh razmer mora biti ena od prioritet vodstva OI. Predvidevam, da bomo povečali število raziskav vseh

unnoticed. At these meetings the members of a team, working in concert, adopt a treatment plan for each patient. The teams also include experts from other health care institutions and not just from the Institute of Oncology, and they cooperate equally in the team's work. As this approach ensures the best and most proficient medical care for patients, we feel obliged to carry out a fair and equitable evaluation of this work to fulfill the human resources needs of this department.

Furthermore, in this brief review we should not overlook the importance of clinical services at the institute. The windows of opportunity for further progress opened widely for the Division of Surgical Oncology after its move to new premises. This was the final step in recognizing surgical oncology as a constituent part of the Institute of Oncology, and particularly as a new medical specialty that is gradually being formalized. We shall have to take maximum benefit from this new opportunity. The strategic plan for further developing surgical oncology at our institute involves treatment of the localizations that we have worked on thus far (breast cancer, melanoma and sarcoma, and thyroid and rectal cancers), as well as new localizations in abdominal and gynecological surgery. The plan also includes the commencement of endoscopic surgery. Several operating theaters will allow us to carry out more reconstructive surgeries. In the near future, part of the surgical program will be carried out in a day clinic. This will be one more step to bring us closer to the trends of the developed world. In the new premises, the work conditions for anesthesiologists have substantially improved. Anesthesiology at the Institute of Oncology covers the following three areas: anesthesiology, intensive care medicine and pain control therapy. The department has gained one more unit, an intensive care ward with a capacity of 12 beds, capable of providing the highest level of the most complex therapy procedures. Recently, the number of patients who are treated at other divisions of the institute and who require intensive care has been increasing; therefore, this issue needs further attention. The Division of Radiation Oncology holds a special position, because it is the only radiotherapy center in Slovenia. Only recently, after replacing the old technology with new irradiation machines, has the radiotherapy department almost, but not wholly, caught up with the treatment facilities of more developed countries. A strategic plan for further developing radiotherapy in Slovenia, which envisages the establishment of one more radiotherapy center in Maribor, has been adopted. Yet, there is a long way to go to see these plans come true and to become wholly independent; therefore, the Institute of Oncology will remain a center of vital importance for the development of radiotherapy in the country. With the capacity to provide treatment with the most up-to-date radiation techniques (3-D conformal radiotherapy, RT, IMRT, IGRT, stereotactic radiotherapy, TBI), we shall strive to become one of the leading radiotherapy centers in Europe and the leading center in Central and South Eastern Europe.

Medical oncology, the youngest among the oncology branches, is undergoing rapid development. Alongside the application of more versatile and individually adapted treatments, the extent of work is steadily increasing for a variety of other reasons, such as increasing incidence, the chronic course of the disease and new drugs available for use. Current conditions at the institute do not duly follow these trends. The number of medical oncologists in Slovenia hardly reaches half the potential number required for such a region, and all of them are working at the Institute of Oncology. So, it is inevitable that we should join our efforts to cover, as soon as possible, the medical staff shortage in this area before the expected trends in an increasing number of patients come true. In order to ensure the high quality of treatment, the Institute of Oncology should keep on introducing new therapies and more demanding therapies, carrying out clinical trials and treating rare diseases. Standard systemic treatment of common cancers should be transferred to those secondary health care institutions that meet the specific conditions for providing such

vrst: bazičnih, predkliničnih, translacijskih in kliničnih. OI je že tradicionalno močno vpet v mednarodno raziskovanje in tako bo tudi v prihodnje.

OI je tudi izobraževalna ustanova. Pričakujemo lahko, da bo še bolj sodeloval v izobraževanju kadrov vseh profilov. Pričakujemo lahko tudi goste iz tujine, ki bodo prihajali po znanje na OI. Ob tem pa ne smemo pozabiti dobre volje in naporov vseh zaposlenih, ki svoje znanje večinoma delijo brez formalnih nazivov ali sistematiziranih mest. Tem gre še posebna zahvala.

Največje bogastvo vsake dobre inštitucije, tudi OI, so ljudje. OI ima odlične strokovnjake in predane sodelavce vseh poklicev. Število zaposlenih se je skozi čas povečevalo in danes jih je čez 840. Tudi v prihodnje bomo še zaposlovali, čeprav se moramo zavedati, da že zaradi fizične omejenosti število zaposlenih ne bo bistveno večje. Zato bodo pomembnejši izbor dejavnosti, ki jih bo OI opravljal, ter izbira in zaposlovanje novih sodelavcev. OI je vrhunska terciarna ustanova in treba je zagotoviti take razmere, da bomo stremeli k zaposlovanju ljudi, ki se tega zavedajo, poleg tega pa imajo ambicije in voljo biti v svoji stroki enakovredni najboljšim v Evropi in svetu.

Demografske in epidemiološke smernice kažejo, da bo prav onkologija tista veja medicine, v katero bo treba usmerjati vedno več pozornosti, kadrov in denarja. Povsem razumljivo je, da zdravljenje vseh bolnikov z rakom ne bo nikoli potekalo na OI, saj tudi danes ne. Zato je v Sloveniji nujna delitev dela in izbira inštitucij, ki se bodo z rakom ukvarjale. Znano je, da zaostajamo pri preživetju predvsem pri pogostih rakih, ki se zdravijo razpršeno po državi, kar potrjuje raziskava EUROCARE 4. Zato je skrajni čas, da sprejmemo državni načrt nadzora raka; v času pisanja tega prispevka je v javni razpravi. Omenjeni načrt naj bi postavil dolgoročni okvir razvoja obravnave raka v Sloveniji. Bolniki imajo pravico do enako dobrega zdravljenja ne glede na to, kje vstopajo v zdravstveni sistem. In eden od pogojev je, da je že ob začetku zdravljenje določeno multidisciplinarno. Čeprav ima to načelo na OI večdesetletno tradicijo, to še vedno ni enako dosegljivo vsem prebivalcem Slovenije. Strokovnjaki OI ob današnjem številu ne zmorejo zagotavljati konziliarne dejavnosti za vso Slovenijo. Zato bo nujno izobraziti dodatne kadre v inštitucijah, ki bodo zdravile bolnike z rakom in ki bodo enakopravni člani timov skupaj s kolegi z OI. Konziliarno dejavnost bo treba priznati kot posebno dragoceno obliko sodelovanja in jo primerno ovrednotiti. Prepričan sem, da bomo v večji meri izkoristili tudi tehnološke možnosti, npr. telekonference. Kot zelo velika težava sta se v preteklosti izkazala pomanjkanje nadzora nad kakovostjo zdravljenja, ki ni in marsikje še vedno ne poteka skladno s strokovnimi smernicami. OI, razumljivo, nima pooblastil za ukrepanje v drugih ustanovah. Prava rešitev je zato delitev dela med manj ustanovami v Sloveniji kot danes, usmerjena onkološka izobrazba, multidisciplinarna in multiprofesionalna obravnava bolnika ter učinkovit nadzor. OI bo ohranil ključno vlogo pri razvoju onkologije v državi.

Ob koncu bi želel v nekaj stavkih povzeti, kako vidimo OI v prihodnosti. Najprej vsekakor kot gradbeno dokončano in sodobno opremljeno ustanovo. Ustanovo, kjer se izključno zdravijo redki raki, deloma tudi nekateri pogosti, kjer se intenzivno uvajajo nova zdravljenja in izvajajo najzahtevnejša. Kjer so raziskave, izobraževanje in publicistika sestavni del vsakodnevnega dela. Kot ustanovo, ki je tesno vpeta v mednarodne povezave in je tudi ključni igralec v razvoju onkologije v državi. Kot ustanovo, ki je odprta javnosti in civilni družbi. In ne nazadnje vidimo OI kot ustanovo, ki je do bolnika prijazna. OI naj postane eden najpomembnejših onkoloških centrov v tem delu Evrope.

treatment (properly educated staff, etc.). In all divisions of the institute, there is a tendency to perform the majority of treatment services in outpatient clinics. Today, about 400 patients are examined daily at outpatient clinics, which presents a serious overload for the present staff structure. Our plans are to pay greater attention to new patients and to those who are currently undergoing therapy. It can therefore be expected that, after therapy is completed, more patients will be referred to trained physicians outside the institute for follow-up. It will thus be possible to ensure that high-level experts dedicate all their attention and efforts primarily to those who truly need them.

In this brief overview, we should not overlook the role of oncology nursing care, which has reached an extraordinarily high level of quality in its development. This is a specific area of nursing “born and raised” in the Institute of Oncology. Since cancer patients also receive oncology nursing in other health care institutions in Slovenia, the Institute of Oncology, in its function as a tertiary health care institution, is responsible for overseeing the trends in oncology nursing in Slovenia and for discharging the duties of a reference center in this regard.

Most recently, the scope of operations at the institute has been expanded by delivering new services, such as palliative care, oncology genetic counseling and nutritional support. With the further development of oncology at home and abroad, more new services are expected to be introduced. One area that urgently needs to be organized is an integrated rehabilitation unit for cancer patients.

The Cancer Registry of Slovenia, of which we are justifiably proud, should also receive our special attention. It will continue to work within the operational scope of the Institute of Oncology; yet, more technically advanced information support should be provided to all regions in Slovenia in order to facilitate fast and accurate data gathering.

Research work at the Institute of Oncology has always progressed well; only recently has the institute begun to lag behind slightly in the number of open research studies. The reasons for this may be found in the broader setting (a growing amount of administrative work), as well as within ourselves. Overload with routine work does not leave much time for research. Therefore, improving work conditions in the domain of research should be one of the priorities of the management of the institute. In the future, the number of all types of research studies, including basic, pre-clinical, translational and clinical trials, is expected to grow. The participation of the Institute of Oncology Ljubljana in international research projects has been traditionally good and will be kept at this high level in the future as well.

The Institute of Oncology is also an important training institution. In the foreseeable future, the share of the Institute of Oncology in training all profiles of medical staff involved in cancer treatment will increase. Medical personnel from abroad are also welcome to expand their knowledge at our training programs. At the same time, we should not forget the good will and endeavors of all employees who have no formal titles or occupy a post with no categorization, but are nevertheless ready to share their knowledge with others. To them, special thanks are due.

The greatest wealth of any successful institution, and therefore also of the Institute of Oncology, is the people. The institute may be proud of its outstanding experts and dedicated workers of all professions. The number of employees has been increasing over time; presently the institute employs around 840

workers. The employment of new workers will continue to grow; however, it should be borne in mind that, due to physical limitations, further employment should not significantly exceed the present number. Therefore, a more important step will be to start selecting new services that the institute will perform in the future and appointing employees to perform these services. The Institute of Oncology Ljubljana is a top-level tertiary health care institution; we should therefore primarily aim to employ people who are aware of this important mission of the institute and who have the ambition and willpower to catch up with the best experts in Europe and the rest of the world.

Demographic and epidemiological trends show that oncology is a branch of medicine that will require greater attention, more cadre and more substantial funding. It is understandable that the Institute of Oncology will not, and already does not, provide treatment to all cancer patients in Slovenia. There is therefore an urgent need in this country to share the work with other health care institutions and to select those that will additionally specialize in cancer treatment. In Slovenia, the survival rate of patients with more frequent cancer types, who are treated in hospitals dispersed throughout the country, is lower compared to Western European countries; this was also confirmed by the EUROCARE-4 study. Thus, it is high time to adopt the national cancer control program that was submitted for public discussion at the same time as this report was being drafted. The primary aim of the program is to set up a long-term developmental framework for cancer management in Slovenia. Patients have the right to receive equal treatment irrespective of the region where they enter the health care system. One of the major conditions to be fulfilled is that, from its very beginning, treatment will approached in a multidisciplinary way. Though this approach has been followed at the Institute of Oncology for several decades, it is not accessible to all patients in Slovenia. Due to the growing number of cancer patients, the specialists in oncology from our institute cannot provide every part of the country with advisory services. The health care institutions that will perform cancer treatment will have to provide additional training to medical staff so that they will be equal partners in advisory teams with their colleagues from the Institute of Oncology. Participation in advisory team meetings will have to be considered a special and valuable form of cooperation, and evaluated accordingly. Regardless, I believe that in the near future we will have the possibility to avail ourselves of technological potential and to hold meetings as teleconferences. Not along ago, inadequate quality control of cancer treatment was a serious problem (which has not been completely solved), as the treatment guidelines were not always followed. The Institute of Oncology has no authorization to interfere in the work of other health care institutions. Therefore, the right solution would be to share the work among fewer Slovenian health care institutions than today, to provide specialized training in oncology, to ensure multidisciplinary and multiprofessional management of cancer patients, and to ensure effective supervision. In addition to all this, the Institute of Oncology Ljubljana should in the future also assume the key role in developing oncology in Slovenia.

Before closing, I wish to illustrate in a few words what our institute will look like in the future – hopefully, a completed building equipped with the most up-to-date technical installations; an institution that treats atypical cancers and, occasionally, also common cancer types; that is intensely involved in the application of the newest and most demanding treatment techniques; that performs research, teaching and publishing work as part of its routine work; that is closely connected with international organizations and, at the same time, a key moderator in the development of oncology in Slovenia; an institution that will be open to the public and civil society, and patient-friendly; and last but not least, an institution that will be one of the most eminent cancer centers in this part of Europe.

Onkološki inštitut včeraj, danes, jutri

Dosežki zadnjih desetih let

doc. dr.
Janez Žgajnar,
dr. med.,
strokovni direktor

Uvod

V zadnjem desetletju se je OI močno spremenil. Sproti se je prilagajal izzivom in zahtevam časa ter ves čas ohranjal stik z razvojem diagnostičnih in terapevtskih postopkov v svetu in ga hkrati sooblikoval. Izzivi, s katerimi se je soočal, so bili različni, v prvi vrsti epidemiološki.

Po podatkih Registra raka RS se je v letih od 1996 do 2005 incidenca raka v Sloveniji povečala za 40 % med moškimi in za 35 % med ženskami, umrljivost pa za 11 % pri moških in za 14 % pri ženskah (tabela 1). Več kot polovica povečanja incidence gre na račun staranja prebivalstva.

Tabela 1. Breme raka v Sloveniji 1996 in 2005 /
Table 1. Cancer burden in Slovenia in 1996 and 2005

	1996			2005		
	Skupaj Total	**Moški** Males	**Ženske** Females	**Skupaj** Total	**Moški** Males	**Ženske** Females
Incidenca / Incidence						
- število - number	7.780	3.883	3.897	10.720	5.455	5.265
- na 100.000 - per 100.000	392,5	404,3	381,4	535,7	556,6	515,6
- kumulativa* do 75. leta - cumulative* to 75 years of age	30,0	37,2	25,3	35,4	42,5	30,1
Umrljivost / Mortality						
- število - number	4.548	2.527	2.021	5119	2.814	2.305
- na 100.000 - per 100.000	229,4	263,1	197,8	255,8	287,1	225,7
Prevalenca / Prevalence						
- število - number	40.376	15.085	25.291	63.561	25.550	38.011

*kumulativna starostno standardizirana incidenčna stopnja je izračunana na 100 prebivalcev.
*Calculation of cumulative age-standardized incidence rate is made per 100 inhabitants.

Tako močan porast pojavnosti raka se je seveda odrazil tudi v obsegu dela OI, ki se je stalno povečeval (tabela 2). Pri razlagi trendov je treba upoštevati tudi spremenjene ekonomske razmere ter novosti v razvoju onkologije, zato so podatki pogosto težko primerljivi. V opazovanem obdobju so do leta 2004 strmo naraščali sprejemi v bolnišnično zdravljenje, od takrat pa so bolj ali manj na enaki ravni. Stalno pa raste število ambulantnih pregledov, kar je posledica vedno večjega prenašanja bolnišničnega zdravljenja v ambulantno obravnavo. To potrjuje tudi podatek o vedno krajši povprečni ležalni dobi, ki se je skrajšala za več kot dvakrat. Poleg vedno večjega prenosa zdravljenja v ambulante pa je na skrajševanje ležalne dobe vplivala tudi sprememba financiranja z uvedbo sistema skupin primerljivih primerov (SPP) leta 2003 in z opustitvijo obračuna po bolnišničnih oskrbnih dneh (BOD).

Institute of Oncology Yesterday, Today and Tomorrow

Results Achieved in the Last Decade

Assist. Prof.
Janez Žgajnar,
M.D., Ph.D.,
Medical Director

Introduction

In the last decade, many changes have been made at the Institute of Oncology Ljubljana. Throughout the decade, modifications were made in response to the challenges and requirements of that era, and the institute has steadily kept pace with – as well as taking an active part in – the advances in diagnostic and therapeutic techniques in the world. The challenges the institute has faced were most diverse.

Let us take a look at what they were in epidemiology. According to the data of the Cancer Registry of the Republic of Slovenia, cancer incidence in the years between 1996 and 2005 increased in men and women by 40% and 35%, respectively, whereas the mortality rate in men and women increased by 11% and 14%, respectively (Table 1). More than half of the incidence increase may be explained by the aging of the population.

Tabela 2. Statistični prikaz obsega dela v letih 1998-2007
Table 2. Statistical presentation of total work performed in the period 1998–2007

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**Povp. st. rasti** Average growth rate
Število sprejemov na OI Hospital admissions	9.751	7.103	10.100	10.991	11.450	12.571	13.309	14.179	13.863	13.448	3,64
Število bod Hospital inpatient days	98.568	100.327	94.255	83.726	81.365	75.424	71.869	68.000	66.377	63.240	-4,81
Vsi pregledi na OI Total no. of examinations	71.302	72.256	71.835	77.388	75.056	73.055	78.684	83.082	86.246	94.485	3,18
Od tega prvič na OI First examinations	7.551	7.103	7.521	7.409	6.570	5.809	6.417	6.385	6.229	6.682	-1,35
Povprečna ležalna doba Mean hospitalization time (in days)	10,1	14,1	9,3	7,6	7,1	6,0	5,4	4,8	4,8	4,7	-8,15

This increase in the incidence was, understandably, also reflected in the constantly increasing amount of work at the institute (Table 2). In explaining these trends, changes in the economic situation and new findings in the development of oncology should be taken into account; therefore, the data are often not easily comparable. In the observed period up to 2004, a steep growth of hospital admissions was recorded; from that point on, they settled down at a more or less stable level. On the other hand, outpatient clinic visits are steadily on the rise, which is primarily due to the increased transfer of hospital care to the outpatient clinic. This trend can also be confirmed by the data showing shorter mean hospitalization time, with a decrease that more than doubled. With the increasing transfer of treatment procedures to the outpatient clinic, and, accordingly, also shorter hospitalization times, the allocation of funds was changed by introducing a system of disease-related groups (DRG) in 2003 and abandoning the system of invoicing by hospital inpatient days.

Zmanjševanje števila evidentiranih prvih pregledov je nelogično in je posledica več dejavnikov: načrtno smo zmanjševali število pregledov bolnikov z benignimi boleznimi, konziliarni pregled ne šteje kot prvi pregled (vedno več bolnikov že na začetku pregledamo konziliarno), morebitna nova bolezen ali ponovitev bolezni pri istem bolniku ne šteje kot prvi pregled. Podatek o padcu števila prvih pregledov zato zavaja, saj smo v vsem tem obdobju pregledali 50 % vseh novih bolnikov z rakom v državi, ki jih je, kot že rečeno, vsako leto več.

Rasti obsega dela je sledilo tudi zaposlovanje (tabela 3).
Tako se je skupno število zaposlenih v tem povečalo kar za 23 %, od tega zdravnikov za 26 % in

Tabela 3. Zaposleni na OI 1997-2007
Table 3. Personnel at the Institute of Oncology in the period 1997–2007

Leto / Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Zdravniki Medical doctors	111	111	118	120	116	117	115	118	133	140
Sestre (DMS, VMS, ZT, SMS) Nurses (graduated, registered nurses, health care professionals, trained nurses)	225	228	239	234	241	242	257	264	273	279
Drugi Others	345	348	353	358	371	375	379	403	415	421
Skupaj **Total**	**681**	**687**	**710**	**712**	**728**	**734**	**751**	**785**	**821**	**840**

medicinskih sester za 23 %. Kljub temu število zdravnikov in medicinskih sester še vedno zaostaja za potrebami, zato bo ne glede na racionalizacijo dela potrebno dodatno zaposlovanje tudi v prihodnje. OI je večji, kot je bil, zdravljenje zahtevnejše, bivalne in delovne razmere ter standard oskrbe bolnikov pa boljši. Vse to zahteva tudi več kadra, in to bolje izobraženega.

Zaradi zahtev po drugačni organizaciji je bil januarja leta 2003 sprejet nov statut (revidiran 2006) ter februarja 2006 organigram OI. Že po nekaj letih lahko ugotavljamo, da bodo potrebne nekatere spremembe.

Ko pogledamo razvoj stroke v zadnjih desetih letih, lahko ugotavljamo osupljiv razvoj biotehnologije, ki je dodobra spremenila onkologijo. Pravzaprav smo sredi te revolucije. Še nikoli ni znanost skrivnosti raka odstirala s tako hitrostjo. Posamezne rake po njihovih bioloških značilnostih delimo na vedno več podskupin in ugotavljamo, da so v marsičem različne bolezni, ki zahtevajo tudi različno zdravljenje. Spoznanja se skozi translacijske raziskave zelo hitro prenašajo v diagnostične in terapevtske postopke. Tako so se v zadnjem desetletju pojavila tarčna zdravila, ki so izjemno uspešna pri nekaterih podvrstah posameznega raka. Razmah ob tem doživlja tudi molekularna diagnostika. Po drugi strani še vedno ostaja najuspešnejše posamezno zdravljenje pri solidnih tumorjih kirurško zdravljenje. To se je usmerilo predvsem v čim manj invazivne postopke, ki skrajšujejo čas zdravljenja in puščajo manj posledic. V radioterapiji so se razvile številne tehnike, ki omogočajo natančnejše obsevanje tarče z bolj homogenimi dozami in manj škode za zdrava tkiva. Vse našteto je povezano s številnimi

The lower number of registered first visits has no logical explanation; however, it could result from many factors: (i) we have been systematically downgrading the number of examinations of patients with benign diseases; (ii) the presentation of a patient to the multidisciplinary advisory team is not considered a first visit (increasingly, patients are being presented to advisory teams at the very beginning of treatment); (iii) any newly diagnosed disease or recurrence in a single patient is not considered a first visit. The data showing a decrease in the number of first visits is therefore misleading, because in the period in question, more than 50% of all patients newly diagnosed with cancer in Slovenia, whose percentage is steadily increasing, were examined at the institute.

Consequently, employment also increased in proportion to the increased volume of work (Table 3).

In this period, the total number of personnel increased by 23%, which includes an increase in the employment of medical doctors and nurses by 26% and 23%, respectively. Despite these numbers, the present personnel capacities hardly meet the hospital's needs; therefore, additional employment should be made possible, regardless of work rationalization measures. The Institute of Oncology has become bigger, treatment procedures have become more demanding, and habitation and work conditions as well as nursing standards have been improved. In view of the above, the need for more and better-trained personnel is increasing accordingly.

In January 2003, due to the need to restructure the institute, a new statute was adopted (amended in 2006); in February 2006, a work organization chart was introduced as well. Only a few years later, it is clear that further revisions are required.

Looking back, we can conclude that advancement in biotechnology has been astonishing, which has significantly influenced changes in oncology. We are, in fact, only halfway through these revolutionary changes. Never before has science been unveiling the mysteries of cancer at such a rate. Cancer types are being classified by their biological characteristics into more and more subgroups, and at the same time, it is becoming evident that they are diseases that differ from each other in many ways and therefore require different treatments. Through translational research, new findings are nowadays transferred in no time to diagnostic and therapeutic procedures. New target drugs, which are extremely efficient in certain subtypes of cancer, have made their breakthrough into clinical use in the same way. Advances in molecular diagnostics are also in full swing. On the other hand, in the treatment of individual solid tumors, surgery has not lost its primacy as the most effective method. Today, surgery is aimed at performing the least invasive procedures that require shorter healing and are least mutilating. In radiotherapy, several techniques have been developed that allow more accurate radiation of targets with homogenized doses, causing the least amount of damage to healthy tissue. The above advances have markedly influenced the innovations introduced to the Institute of Oncology in the last decade, which are presented in detail in the reports of each of the units of the institute. We shall present here only the cumulative tables illustrating the most significant results, such as initiating new areas of work, launching new equipment and moving into new, more suitable premises (Table 4).

Throughout the observed period, all innovation and program expansion was implemented within the adopted system of financing. From 2005 onward, applications for innovations and expansions of an operational scope were addressed to the Health Council at the Ministry of Health in Slovenia. We can

novostmi, ki smo jih v zadnjem desetletju vpeljali tudi na OI in so podrobneje opisane v poročilih posameznih oddelkov. Na tem mestu predstavljamo zbirno tabelo najpomembnejših dosežkov, novih dejavnosti, začetka uporabe nove opreme ali pa selitve v primerne prostore (tabela 4).

V vsem obdobju smo uvajali novosti in širitve programov v sistemu financiranja. Od leta 2005 smo novosti in širitve prijavljali na Zdravstveni svet pri MZ. Tako lahko prikažemo na novo plačane novosti od leta 2005 (tabela 5). Ob tem velja opozoriti, da smo s številnimi novostmi v omejenem obsegu začeli sami, brez urejenega plačevanja, ker so to zahtevale strokovne potrebe.

thus present the innovations that were subsidized from 2005 onward according to the new system of financing (Table 5). At this point, it should also be noted that many innovations (though within certain limits) were introduced on our own, without prior payment agreement, because the circumstances so required.

In the last decade, the costs of extremely expensive anticancer drugs have risen enormously; in 1998 they represented 19.4% of the total cost of health care disposable material, whereas in 2007 they were estimated at 53.21%.

Tabela 4. Zbirna tabela dosežkov v zadnjem desetletju
Table 4. Main achievements in the last decade

1999

Strokovni dosežki **Major achievements**	**Onkološka kirurgija** • Uvedba TME • Biopsija sentinel bezgavk pri raku dojk **Surgical oncology** • TME in clinical practice • Sentinel lymph node biopsy in breast cancer	**Anesteziologija in intenzivna terapija** • Uvedba laringeal.maske namesto intubacije pri krajših op. posegih od l. 97 stalni tečaji reanimacije za sestre in zdravnike OI **Anesthesiology & intensive therapy** • Use of laryngeal mask instead of intubation in shorter operations From 1997, regular refreshing courses on reanimation for nurses and medical doctors of the Institute	**Internistična onkologija** • Uvedba zdravil: taksotere, gemcitabin **Medical oncology** • Clinical use of taxotere and gemcitabine	**Radioterapija** • Uvedba stereotaktične radiokirurgije – obsevana prva bolnica **Radiotherapy** • Stereotactic radiosurgery in clinical practice – first applied on a patient	**Histopatologija** • Uvedena molekularna diagnostika limfomov **Histopathology** • Molecular diagnostics of lymphomas
	Citopatologija • Uvedba imunofenotipizacije na vzorcih limfomov **Citopathology** • Immunophenotyping of lymphoma samples	**Nuklearna medicina** • Začetek izvajanja limfoscintigrafije in lokalizacije varovalnih bezgavk pri raku dojke in melanomu **Nuclear medicine** • Lymphoscintigraphy and localization of sentinel lymph nodes in breast cancer and in melanomas	**Molekularna diagnostika** • Uvedba določanja mutacij pri bolnikih z dedno obliko raka dojke/jajčnikov **Molecular diagnostics** • Determination of mutations in patients with familial breast or ovarian cancer	**Lekarna** • Pričetek izdelave sterilnih epiduralnih in subarahnoidalnih raztopin. Vključitev farmacevta v klinične raziskave **Pharmacy** • Preparation of sterile epidural & arachnoideal suspensions	
Pomembna nova oprema **New equipment**	**Onkološka kirurgija** • Intraoperativna gama sonda **Surgical oncology** • Intraoperative gamma probe	**Anesteziologija in intenzivna terapija** • 1998 sobni laboratorij za plinsko analizo na int.odd.-bistv.izboljšal strok.delo **Anesthesiology & intensive therapy** • 1998 – mobile gas analyzer in intensive care unit	**Histopatologija** • Labolatorij za molekularno patologijo **Histopathology** • Laboratory for molecular pathology	**Citopatologija** • Pretočni citometer **Citopathology** • Flow cytometer	
Selitev iz/v / **Moving from/to**					
Nova dejavnost / **New health care service**					
Razno / **Other**					

2000

Strokovni dosežki **Major achievements**	**Onkološka kirurgija** • Biopsija sentinel bezgavk pri melanomu **Surgical oncology** • Biopsy of sentinel lymph nodes in melanoma	**Anesteziologija in intenzivna terapija** • Uvedba kont.s.c. infuzije preko elastomerov za hudo kronič. karcin. in nevropat. bolečino **Anesthesiology & intensive therapy** • Continuous s.c. infusion using elastomer in severe chronic carcinoma & neuropathic pain	**Internistična onkologija** • Uvedba zdravil: topotekan, irinotekan **Medical oncology** • Clinical use of topotecan, irinotecan	**Zdravstvena nega in oskrba** • Začetek sistematičnega spremljanja kakovosti dela zaposlenih v zdravstveni negi in oskrbi. **Nursing of & care for patients** • Systematic quality control of the performance of nursing staff	**Lekarna** • Pričetek izdelave protibolečinskih mešanic za posameznega bolnika v elastomerni črpalki • Specialist klinične farmacije prične sodelovati pri vizitah internističnega oddelka **Pharmacy** • Preparation of pain-releasing suspensions in elastomer pumps for individual patients • Specialist in clinical pharmacy joined the ward rounds at Dept. of Medical Oncology
Pomembna nova oprema / New equipment					
Selitev iz/v / Moving from/to					
Nova dejavnost / New health care service					
Razno **Other**	**Internistična onkologija** • Priznana samostojna specializacija iz internistične onkologije v RS **Medical oncology** • Specialization in medical oncology was approved as medical specialty in RS				

2001

Strokovni dosežki **Major achievements**	**Onkološka kirurgija** • ROLL • Organizacija onkološkega genetskega svetovanja pri raku dojk in jajčnikov **Surgical oncology** • ROLL • Genetic counseling in breast & ovarian cancer	**Anesteziologija in intenzivna terapij**a • Ukinitev dajanja humanih albuminov pri pooper. hipoalbuminemiji **Anesthesiology & intensive therapy** • Abandoning the therapy with human albumins in postoperative hypoalbuminemia	**Internistična onkologija** • Uvedba zdravil: kapecitabin, trastuzumab (metastatski rak dojk), rituksimab (širša uporaba, prva uporaba 1998), imatinib **Medical oncology** • Clinical use of capecitabine, trastuzumab (metastatic breast cancer), rituximab (wider use, first use in 1998), imanitib	**Histopatologija** • Uvedba fluorescenčna hibridizacija in situ (FISH) v diagnostiko **Histopathology** • Fluorescent in situ hybridization (FISH) applied in diagnostics
	Citopatologija • Uvedba intraoperativnega pregleda varovalne bezgavke **Citopathology** • Sentinel lymph node intraoperative examination			
Pomembna nova oprema **New equipment**	**Radioterapija** • Linearni pospeševalnik Linac 2100 C/D Varian (A4, zamenjava) **Radiotherapy** • Linear accelerator Linac 2100 C/D Varian (A4, replacement)	**Histopatologija** • Fluorescentni mikroskop • Laboratorij za FISH **Histopathology** • Fuorescence microscope • FISH laboratory	**Citopatologija** • Aparat za meritev DNA **Citopathology** • DNA assessment equipement	
Selitev iz/v / Moving from/to				
Nova dejavnost **New health care service**	Organizacija onkološkega genetskega svetovanje Oncological genetic counseling			
Razno / Other				

2002

Strokovni dosežki
Major achievements

Internistična onkologija
• Uvedba zdravil: temozolomid
Medical oncology
• Clinical use of temozolomide

Radioterapija
• Uvedba 3D konformne radioterapije in elektronskega portalnega slikanja, uvedba dozimetričnega protokola v skladu s priporočili Mednarodne agencije za atomsko energijo IAEA (International Atomic Energy Agency)
Radiotherapy
• 3D conformal radiotherapy & electron portal imaging; dosimetric protocol in line with IAEA (International Atomic Energy Agency) recommendations

Nuklearna medicina
• Uvedba rekombinantnega humanega TSH (rh TSH)
Nuclear medicine
• Radioiodine testing using recombinant human TSH (rh TSH)

Histopatologija
• Uvedba kromogene hibridizacije in situ (CISH) v diagnostiko
Histopathology
• Chromogene in situ hybridization (CISH) in diagnostics

Citopatologija
• Določanje hormonskih receptorjev na citoloških vzorcih karcinoma dojke
Cytopathology
• Determination of hormone receptors in FNAB breast cancer samples

Zdravstvena nega in oskrba
• Izdelava lastne specifične kategorizacije za paciente OI z dopolnitvijo z merili vseslovenske kategorizacije
Nursing of & care for patients
• Specific categorization of patients treated at the Institute of Oncology substantiated by the standards of general Slovenian categorization

Pomembna nova oprema
New equipment

Radioterapija
• CT za načrtovanje obsevanja Philips 8000 MX, 2001
• 3D-načrtovalni sistem XiO,Computerized Medical Systems, ZDA
• 3D dozimetrični sistem
Radiotherapy
• CT for irradiation treatment planning Philips 8000 MX, 2001
• 3D-planning system XiO,Computerized Medical Systems, USA
• 3D-dosimetric system

Citopatologija
• Aparat za imunocitokemično barvanje
Citopathology
• Immunocytochemical staining equipment

Molekularna diagnostika
• Podarjen nam je bil LightCycler 2.1.
Molecular diagnostics
• Donation of LightCycler 2.1.

Selitev iz/v
Moving from/to

Anesteziologija in intenzivna terapija
• 13. 12. vdor vode na int. odd. stavbe A
Anesthesiology & intensive therapy
• December 13, flood in Intensive Care Unit in Building A

Nova dejavnost / New health care service

Razno
Other

Histopatologija
• Zunanji alarmni sistem za javljanje napak delovanja ključnih aparatov (24-urna pripravljenost tehnikov)
Histopathology
• External alarm system, warning of failures in the functioning of vital medical apparatuses (24-hour availability of technicians on call)

Citopatologija
• 50. obletnica citologije na OI
Citopathology
• 50th anniversary of cytology at the Institute of Oncology Ljubljana

2003

Strokovni dosežki
Major achievements

Ginekološka onkologija
- Biopsija sentinel bezgavk pri raku vulve

Gynecological oncology
- Sentinel lymph node biopsy in vulvar cancer

Anesteziologija in intenzivna terapija
- Uvedba anest. ambulante – s tem evidentiranje predop. ocene vseh krg. bolnikov

Anesthesiology & intensive therapy
- Anesthesiology outpatient unit – preoperative evaluation of all patients eligible for surgery

Nuklearna medicina
- Izotopno vodene lokalizacije obščitničnih adenomov in drugih netipnih lezij na vratu
- Izotopno vodene lokalizacije netipnih lezij v črevesju
- Uvajanje nove fuzijske metode v program Medic view
- Posodabljanje protokola za izvajanje sekvenčne scintigrafije ledvic v programu Medic View

Nuclear medicine
- Isotope-guided localization of parathyroid adenomas and other nonpalpable lesions in the neck
- Isotope-guided localization of nonpalpable lesions in the colon
- New fusion method in the program Medic view
- Updated protocol for renal sequence scintigraphy in the program Medic View

Citopatologija
- Uvedba 4-parameterne meritve na pretočnem citometru

Citopathology
- 4-parameter measurements by flow cytometer

Zdravstvena nega in oskrba
- Uvedba sistema HACCP v centralno kuhinjo in v čajne kuhinje po oddelkih.
- Merjenje zadovoljstva pacientov s storitvami OI.

Nursing of & care for patients
- HACCP system introduced into the central hospital kitchen and kitchenettes at hospital wards
- Measuring satisfaction of patients with health services at the Institute of Oncology.

Internistična onkologija
- Uvedba zdravil: oksaliplatin, liposomalni doksorubicin

Medical oncology
- Clinical use of oxaliplatine and liposomal doxorubucin

Histopatologija
- Uvedba tehnike izdelave tkivnih mrež v raziskovalne namene
- Razširitev nabora preiskav, s katerimi sodelujemo v programu zunanje kontrole kakovosti imunohistokemije UK-NEQAS (ob ER in PR še Her-2)

Histopathology
- Technology of tissue nets used for research purposes
- Expansion of research scope with the studies included in the program of external quality control in immunohistochemistry UK-NEQAS (beside ER and PR also Her-2)

Pomembna nova oprema
New equipment

Radioterapija
- Brahiterapevtska naprava za naknadno polnjenje z viri Ir-192 Gammamed Plus, Varian (PDR način)

Radiotheapy
- Brachytherapy unit for implantng afterload Ir-192 sources – Gamma-med Plus, Varian (PDR method)

Histopatologija
- Oprema za izdelavo tkivnih mrež

Histopathology
- Technical equipement for tissue engineering

Selitev iz/v
Moving from/to

Onkološka kirurgija
- Najem operacijskih dvoran v KC

Surgical oncology
- Renting operational theaters in University Medical Center Ljubljana

Anesthesio-logy & intensive therapy
- 3. - 10. jan.: evakuacija int. odd. iz poplavljene stav. A v UKC

Anesthesiology & intensive therapy
- 3-10 January: evacuation of surgical ward from the flooded Building A to University Medical Centre Ljubljana

Nova dejavnost / New health care service

Razno / Other

2004

Strokovni dosežki
Major achievements

Onkološka kirurgija
- Izolirana ekstremitetna infuzija pri melanomu, Organizacija onkološkega genetskega svetovanja pri melanomu

Surgical oncology
- Isolated extremity infusion in melanoma Oncology genetic counseling in melanoma

Anesteziologija in intenzivna terapija
- Uvedba prehranske ocene in priprave kirurških bolnikov na op. poseg

Anesthesiology & intensive therapy
- Preoperative nutritional evaluation and preparation of patients eligible for surgery

Internistična onkologija
- Uvedba zdravil: cetuksimab, erlotinib

Medical oncology
- Clinical use of cetuximab and erlotinib

Oddelek za laboratorijske dejavnosti
- Reorganizacija laboratorijske dejavnosti; združitev treh laboratorijev v enoten Oddelek za laboratorijske dejavnosti

Department of laboratory diagnostics
- Reorganization of the department by merging 3 laboratories into the Department of Laboratory Diagnostics

Histopatologija
- uvedena uporaba tehnike izdelave tkivnih mrež v diagnostiko za določanje statusa Her-2

Histopathology
- Use of tissue net technology in the diagnostics for the determination of Her-2 status

Citopatologija
- Citološko –histološka korelacija tumorjev otroške dobe za 10 let

Citopathology
- Cyto- & histological correlation of childhood tumors for a 10-year period

Molekularna diagnostika
- Uvedba HRM1 metode

Molecular diagnostics
- HRM1 method

Zdravstvena nega in oskrba
- Uporaba novega terapevtskega lista (nadomestilo za temperaturne liste)
- Ocenjevanje in beleženje stopnje bolečine kot petega vitalnega znaka
- Priprava razširjenega programa Posvetovalnice za Onkološko zdravstveno nego

Nursing of & care for patients
- Use of a new therapy record of individual patients (in replacement to previous temperature recording chart)
- Evaluation and recording the grade of pain – a fifth vital sign
- Preparation of extended program on Oncology Nursing Counseling

Lekarna
- Prevzem izdelave protitumornih zdravil individualno na bolnika za stavbo H

Pharmacy
- Individual preparation of antitumor drugs for each separate patient in the Building H

Pomembna nova oprema
New equipment

Radioterapija
- Linearni pospeševalnik Elekta Synergy Platform (A3, zamenjava)

Radiotherapy
- Linear accelerator Elekta Synergy Platform (A3, replacement)

Histopatologija
- Rotacijski mikrofilmi

Histopathology
- Rotation microfilms

Selitev iz/v
Moving from/to

Internistična onkologija
- Selitev oddelkov BI in BII na HI (tedaj mešan oddelek za solidne tumorje in limfome, sedaj Oddelek za solidne tumorje) in delno CI (levo)

Medical oncology
- Moving the wards from BI and BII to H1 (at first intended to treatment of solid tumors and lymphomas, now exclusively of solid tumors) and C1 (left).

Lekarna
- Preselitev v nove prostore lekarne v stavbo H.

Pharmacy
- Moving into new premise in the Building H

Nova dejavnost / New health care service

Razno
Other

Citopatologija
- Organizacija 40. obletnice sekcije za citopatologijo

Citopathology
- Organization of 40th anniversary of cytology section

2005

Strokovni dosežki
Major achievements

Onkološka kirurgija
- Minimalno invazivna paratiroidektomija v regionalni anesteziji

Surgical oncology
- Minimally invasive parathyroidectomy under regional anesthesia

Anesteziologija in intenzivna terapija
- Uvedba hitrega pooperat. okrevanja po op. debel.črev.

Anesthesiology & intensive therapy
- Rapid postsurgical rehabilitation of patients surgically treated for colon cancer

Internistična onkologija
- Uvedba zdravil: trastuzumab (dopolnilno zdravljenje raka dojk), alemtuzumab, pemetreksed, bevacizumab

Medical oncology
- Clinical use of trastuzumab (adjuvant treatment of breast cancer), alemtuzumab, pemetrexed, bevacizumab

Oddelek za laboratorijske dejavnosti
- Vzpostavitev celovitega sistema zagotavljanja kakovosti; povezava lab.informacijskega sistema z integralnim bolnišničnim WebDoctor za elektronsko naročanje laboratorijskih preiskav in pošiljanje elektronskih izvidov

Department of laboratory diagnostics
- Establishment of an integral quality assurance system, with a link of laboratory info system to the integral hospital information system WebDoctor, allowing electronic requests of laboratory examinations and delivery of their results

Histopatologija
- Standardiziranje postopkov v histološki tehniki z avtomatskimi aparati
- Začetek standardiziranja in sledenja vseh postopkov z uvajanjem rednih zapisov v skladu s »Pravilnikom o delovanju medicinskih laboratorijev«
- Ureditev arhiva parafinksih blokov in histoloških preparatov

Histopathology
- Procedure standardization within the histology technique by using automated machines
- Beginning with standardization and monitoring of all procedures by regular recordings according to the Rules on Operation of Medical Laboratories
- Reorganization of the archives of paraffin blocks and histological slides

Molekularna diagnostika
- Začetek izvajanja limfomske diagnostike na Oddelku za molekularno diagnostiko
- Začetek izvajanja sekvenčnih analiz
- Uvedba spremljanja mutacij pri bolnikih z dedno obliko melanoma

Molecular diagnostics
- Initiation of lymphoma diagnostics by the department
- Initiation of sequence analyses by the department
- Follow-up of mutations in patients with familial melanoma

Zdravstvena nega in oskrba
- Vzpostavitev skupin za uvajanje izboljšav v zdravstveni negi in oskrbi pacienta za področje higiene, prehrane in posvetovalnice

Nursing of & care for patients
- Organization of groups in charge of improving nursing in the areas of hygiene, nutrition and counseling

Pomembna nova oprema
New equipment

Radiologija
- Mammotom

Radiology
- Mammotome

Eksperimentalna onkologija
- Oprema za nastanitev specifičnih patogenov prostih laboratorijskih malih živali

Experimental oncology
- New installation for keeping pathogen-free laboratory small animals

Oddelek za laboratorijske dejavnosti
- Na novo opremljen celoten laboratorij
- 2 hematološka analizatorja, Modularni biokemično-imunokemični analizator, sistem za elektroforezo, 4 centrifuge, 2 mikroskopa in druga analitska oprema.

Department of laboratory diagnostics
- Completely new laboratory equipment
- 2 hematology analyzers, modular biochemical & immunochemical analyzer, system for electrophoresis, 4 centrifuges, 2 microscopes and other analysis devices

Selitev iz/v
Moving from/to

Radioterapija
- Porušenje oddelka in selitev na nadomestne začasne lokacije. Dozidava dveh bunkerjev za dva dodatna megavoltna obsevalnika

Radiotherapy
- Before tearing down, a part of radiotherapy department moved to temporary location in order to build additional 2 bunkers for new megavolt irradiation devices at the original location

Histopatologija
- Selitev oddelka v nove prostore na D 02

Histopathology
- The department moved to new premises in the second floor of Building D (D02).

Citopatologija
- Selitev iz H1 v H2

Citopathology
- The department moved from H1 to H2.

Eksperimentalna onkologija
- Selitev v obnovljene prostore stavbe A I

Experimental oncology
- The department moved to reconstructed premises in the Building A (A/1).

Nova dejavnost
New health care service

Razno
Other

Ustanovitev oddelka za molekularno diagnostiko
Foundation of the department of molecular diagnostics

2006

Strokovni dosežki / Major achievements

Onkološka kirurgija
- Intraoperativni nevromonitoring pri operacijah ščitnice

Surgical oncology
- Intraoperative neuromonitoring in thyroid surgery

Internistična onkologija
- Uvedba zdravil: ibritumomab tiuksetan, sunitinib

Medical oncology
- Clinical use of ibritumomab tiuxetan, sunitinib

Radioterapija
- Uvedba in vivo dozimetričnih meritev in preverjanja obsevalnih doz na obsevalniku

Radiotherapy
- In vivo dosimetry measurements and control of radiation doses on radiation devices

Citopatologija
- Pričetek rednih 6 mesečnih tečajev za presejalce BMV

Citopathology
- Launching six-month courses in cervical cancer

Molekularna diagnostika
- Začetek presejanja genov soudeleženih pri HNPCC s HRM metodo: Presejanje genov MLH1 in MSH2.

Molecular diagnostics
- Initiation of screening for genes (MLH1 & MLH2), responsible for HNPCC, by using HRM method

Lekarna
- Spremljanje diferentnih zdravil individualno na bolnika, po zdravniku, diagnozi in odmerjanju

Pharmacy
- Follow-up of differential drugs, individually by the therapist, diagnose and dose

Pomembna nova oprema / New equipment

Onkološka kirurgija
- EMG za intraoperativni nevromonitoring
- Operativni mikroskop
- Endoskopski in laparoskopski stolp

Surgical oncology
- EMG for Intraoperative neuromonitoring
- Operative microscope
- Endoscopy & laparoscopy tower

Radiologija
- CT
- MR

Radiology
- CT
- MR

Radioterapija
- Linearni pospeševalnik Elekta Synergy Platform (A7, širitev zmogljivosti)
- Linearni pospeševalnik Clinac 2100 C/D Varian (A6, širitev zmogljivosti)
- Oprema za stereotaktično obsevanje BrainLab, ZDA

Radiotherapy
- Linear accelerator Elekta Synergy Platform (A7, extended potentials)
- Linear accelerator Clinac 2100 C/D Varian (A6, extended potentials)
- Installation for stereotactic irradiation BrainLab, USA

Selitev iz/v / Moving from/to

Oddelek za laboratorijske dejavnosti
- Preselitev oddelka iz stavbe A v D/4

Department of laboratory diagnostics
- The department moved from Building A to D/4

Nova dejavnost / New health care service

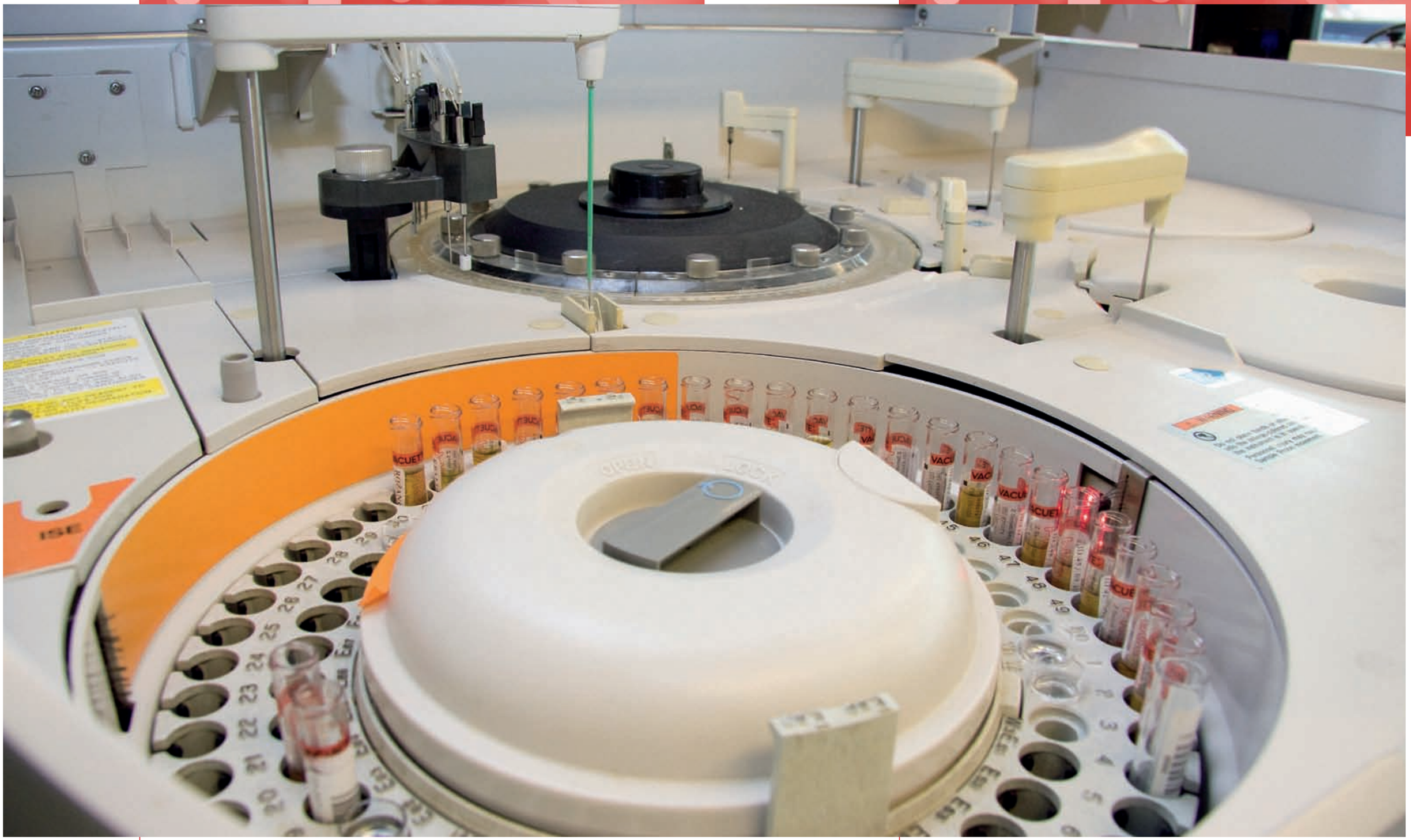
Oddelek za paliativo
Paliative care unitt

Prostovoljstvo na OI
Voluntary work at the Institute of Oncology

Razno / Other

Radioterapija
- Obisk inšpektorjev Mednarodne agencije za atomsko energijo IAEA (International Atomuic Energy Agency, 4.-8.12.2006) in evaluacija kadrovskih in strokovnih zmogljivosti ter kakovosti dela Sektorja za radioterapijo

Radioterapija
- Visit of IAEA supervisors (International Atomic Energy Agency) between 4 and 8 December, 2006 and evaluation of personnel and professional potential, as well as performance quality control at the Division of Radiotherapy



2007

Strokovni dosežki
Major achievements

Onkološka kirurgija
• Kirurgija jeter
• Intraoperativni UZ
• Organizacija onkološkega genetskega svetovanja pri dednem kolorektalnem raku
Surgical oncology
• Liver surgery
• Intraoperative US
• Oncology genetic counseling in familial colorectal cancer

Anesteziologija in intenzivna terapija
• Ultrazvočn preiskave srca intenzivnih in drugih bolnikov na OI
Anesthesiology & intensive therapy
• US examination of the heart of the patients at intensive care and at other wards of the Institute

Nuklearna medicina
• Začetek izvajanja pozitronske emisijske tomografije (PET/CT) z 18-F-FDG
Nuclear medicine
• Initiation of positron emission tomography (PET/CT) using 18-F-FDG

Radioterapija
• Ponovna uvedba stereotaktične radiokirurgije
Radiotherapy
• Reinitiation of stereotactic surgery

Internistična onkologija
Uvedba zdravil:, sorafenib
Medical oncology
Clinical use of sorafenib

Molekularna diagnostika
Začetek presejanja značilnih delov genov *BRCA1* in *BRCA2*: uvedba metode DGGE in MLPA
Molecular diagnostics
Screening for BRCA1 in BRCA2 genes and initiation of DGGE and MLPA methods

Pomembna nova oprema
New equipment

Onkološka kirurgija
• UZ za delo v operacijski
Surgical oncology
• US - intraoperative use

Anesteziologija in intenzivna terapija
• Prenosen aparat za UZ srca
Anesthesiology & intensive therapy
• High quality US device for heart sonography

Radioterapija
• Nov sistem za izdelavo individualnih zaščit in kompenzatorjev
• Brahiterapevtska naprava za naknadno polnjenje z viri Ir-192 GammaMed Plus, Varian (PDR način)
• Brahiterapevtska naprava za naknadno polnjenje z viri Ir-192 VariSource, Varian (HDR način)
Radiotherapy
• New system for providing individual protection compensators
• Brachytherapy afterload device with Ir-192 sources GammaMed Plus, Varian (PDR method)
• Brachytherapy afterload device with Ir-192 sources VariSource, Varian (HDR method)

Histopatologija
• Motoriziran fluorescenčni mikroskop in sistem za analizo slike
Histopathology
• Motorized fluorescence microscope and image analysis system

Nuklearna medicina
• V celoti opremljen nov laboratorij za pripravo in kontrolo kvalitete radiofarmakov
• Nov PET/CT skener
• 2 novi enodetektorski in ena nova dvodetektorska kamera gama
Nuclear medicine
• Newly equipped laboratory for preparation and quality control of radiopharmaceutics
• New PET/CT scanner
• 2 new single-detector and 1 double-detector gamma cameras

Citopatologija
• Nov pretočni citometer
Citopathology
• New flow cytometer

Molekularna diagnostika
• Nakup sekvenatorja in zmogljivega analizatorja za polimerazno verižno reakcijo v realnem času – LightCycler 480
Molecular diagnostics
• New sequenator and high-performance analyzer for real time PCR – LightCycler 480

Eksperimentalna onkologija
• Fluorescentni binokularni mikroskop z računalniško opremo za neinvazivno spremljanje fizioloških procesov v laboratorijskih malih živalih
Experimental oncology
• Computerized fluorescence binocular microscope for noninvasive following-up of physiology processes in laboratory small animals

Selitev iz/v
Moving from/to

Onkološka kirurgija
• Selitev iz stavbe A v novo zgradbo
Surgical oncology
• The department moved for Building A to new premises.

Anesteziologija in intenzivna terapija
• Selitev int. odd. iz UKC (po 5 letih v zasil. pogojih) v novo stavbo
Anesthesio-logy & intensive therapy
• After 5 years of hosting in rented provisional premises of the University Medical Centre, intensive care unit finally moved into new building.

Radiologija
• Selitev v stavbo H
Radiology
• The department moved into Building H.

Nuklearna medicina
• Selitev oddelka iz starih prostorov v prizidku stavbe A v nove prostore v 1. kleti stavbe E
Nuclear medicine
• The department moved from Building A to new premises in the basement of Building E

Nova dejavnost / New health care service

Razno / Other

Radioterapija
• Odobren IAEA TC projekt »Upgrading the Quality Assurance and Quality Control Programme in Radiotherapy, Stereotactic Radiosurgery and Nuclear Medicine in Slovenia – SLO 6003« (2007 – 2008).
Radiotherapy
• Approval of IAEA TC project »Upgrading the Quality Assurance and Quality Control Programme in Radiotherapy, Stereotactic Radiosurgery and Nuclear Medicine in Slovenia – SLO 6003« (2007 – 2008)

Internistična onkologija
• Prvi specialist internistične onkologije
Medical oncology
• First specialist in medical oncology completed the residency program.

2008

Strokovni dosežki
Major achievements

Onkološka kirurgija
• Laparoskopska kirurgija
Surgical oncology
• Laparoscopic surgery

Anesteziologija in intenzivna terapija
• Začeli s hemodinamskim monitoringom (Picco) pri najtežjih bolnikih na int. odd.
Anesthesiology & intensive therapy
• Initiation of hemodynamic monitoring (Picco) in patients at serious risk at intensive care unit.

Internistična onkologija
• Uvedba zdravil: lapatinib
Medical oncology
• Clinical use of lapatinib

Radioterapija
• Opustitev uporabe virov cezija Cs-137
• Uvedba CT/MRI podprtega 3D konformnega načrtovanja brahiterapevtskih posegov
Radiotherapy
• Abandoning the therapy with cesium Cs-137 sources
• Initiation of CT/MRI supported by 3D conformal planning of brachytherapy interventions

Histopatologija
• Uvajanje novega sistema za analizo slike v diagnostiko
Histopathology
• *New image analyzing system in* diagnostics

Molekularna diagnostika
• Začetek presejanja gena Tp53
Molecular diagnostics
• Initiation of screening for Tp53 gene

Lekarna
• Klinični farmacevt sodeluje pri izboru zdravil individualno na bolnikav sektorju onkološke kirurgije in radioterapije
Pharmacy
• Clinical pharmacist participates in individual drug preparation for each particular patient in surgical and radiotherapy wards

Eksperimentalna onkologija
• Elektrokemoterapija je odobrena kot nova zdravstvena dejavnost
Experimental oncology
• Electrochemotherapy is approved as an independent health care service

Pomembna nova oprema
New equipment

Radioterapija
• Rentgenska terapevtska naprava Gulmay D3300
• Linearni pospeševalnik Clinac 600 DBX Varian (A1, zamenjava)
Radiotherapy
• Rtg therapeutic device Gulmay D3300
• Linear accelerator Clinac 600 DBX Varian (A1, replacement)

Selitev iz/v
Moving from/to

Internistična onkologija
• Odprtje Oddelka za limfome in Enote za intenzivno internistično nego
Medical oncology
• Opening of the Department for Lymphoma Treatment and of Intensive care Unit

Nova dejavnost
New health care service

Klinična prehrana in dietoterapija
Clinical nutrition & dietotherapy

Program DORA
Program DORA

Razno
Other

Zdravstvena nega in oskrba
• Organizacija centralne enote za oskrbovalne dejavnosti.
Nursing of & care for patients
• Organization of central supply unit

V zadnjem desetletju so močno narasli tudi stroški dragih onkoloških zdravil: leta 1998 je njihova vrednost predstavljala 19,4 % stroškov zdravstvenega materiala, v letu 2007 pa že kar 53,21 %.

V zadnjem desetletju se je začelo tudi sistematično zbiranje in nadzor kakovosti dela z merjenjem nekaterih kazalcev, ki jih je določilo MZ. Zato je bila v letu 2006 nujna ustanovitev Pisarne za kakovost, ki bdi nad izvajanjem programov kakovosti na OI. Obravnava bolnikov na OI poteka, kot je bilo že večkrat poudarjeno, multidisciplinarno in multiprofesionalno. Time sestavljajo strokovnjaki različnih strok in profilov, obravnava bolnikov pa poteka v konzilijih. Najstarejši in največji tim na OI je mamarni, sicer pa je po zadnji reviziji iz leta 2008 na OI 11 timov (tabela 6).

In the recent 10-year period, performance quality control and quality assessment have been systematically initiated using some of the quality indicators determined by the Ministry of Health. In 2006, there was thus an urgent need to establish a Quality Control Office to supervise the implementation of quality control programs at the institute.

As already mentioned, a multidisciplinary and multiprofessional approach to the treatment of cancer patients has been adopted at the Institute of Oncology. For this reason, we have organized our work in teams consisting of experts having different areas of work and profiles. These multidisciplinary teams have regular consultation meetings, to which patients are invited for evaluation and decision-making on treatment. The oldest and largest is the breast multidisciplinary advisory team; presently, after the last revision in 2008, there are 11 multidisciplinary advisory teams at the institute (Table 6).

Število in sestava timov in konzilijev se spreminja in je rezultat sprotnih strokovnih potreb. V zadnjem času je tako nastal konzilij KRPAN, kjer obravnavamo netipne lezije dojk pred operacijo in po njej. Že ob nastanku je ustrezal potrebam za organizirano presejanje, zato ga ni bilo težko prilagoditi evropskim zahtevam. Znotraj timov nastajajo tudi smernice zdravljenja in klinične poti za posamezne bolezni (tabela 7).

Strokovno delo je v veliki meri določala prostorska stiska oziroma selitve v boljše prostore. Selitve posameznih oddelkov so naštete v tabeli 4. Prva faza gradnje OI se je začela leta 1996 in končala leta

Tabela 5. Financirani novi programi in širitve programov
Table 5. New subsidized programs and extension of programs

1998-2004	2005	2006	2007	2008
	Mamotom Mammotome	Določanje statusa HER v tumorju raka dojk HER determination in breast tumor	PET CT	DORA (izvajanje programa) DORA (program implementation)
	Streotaktično in intenzitetno modulirano obsevanje Stereotactic & intensity-modulated radiation	Vsadki za rekonstrukcijo dojk po odstranitvi dojke Implants for breast reconstruction after mastectomy		Klinična prehrana Clinical nutrition
	PDR in HDR obsevanje v brahiterapiji PDR & HDR irradiation in brachytherapy	Medicinska genetika v onkologiji Medical genetics in oncology		Onkološko genetsko svetovanje Oncological genetic counseling
	DORA (priprave) DORA (preparations)	DORA (priprave) DORA (preparations)		3D brahiradioterapija 3D brachyradiotherapy
	CT	LINAC 2x		Elektrokemoterapija Electrochemotherapy
	MR			
	LINAC No. 6			
Sistemsko zdravljenje: Novosti in širitve Systemic treatment: innovations &expansions	Sistemsko zdravljenje: Novosti in širitve Systemic treatment: innovations &expansions	Sistemsko zdravljenje: Novosti in širitve Systemic treatment: innovations &expansions	Sistemsko zdravljenje: Novosti in širitve Systemic treatment: innovations &expansions	Sistemsko zdravljenje: Novosti in širitve Systemic treatment: innovations &expansions

2007; še vedno čakamo na nadzidek TRT. Gradnja je torej trajala dolgo, posamezne stavbe pa smo naseljevali sproti, kot so bile zgrajene. Med pomembne strokovne dogodke lahko štejemo združitev in selitev biokemičnega laboratorija in tumorskih markerjev ter selitev ambulant z začasne lokacije v stavbi H nazaj v pritličje stavbe D leta 2007. Posebno pozornost zasluži stavba A, ki smo jo zadnjo izselili, čeprav je bila vedno najslabša in v preteklosti pravzaprav vedno prvi razlog za novogradnje. Prav sektor operativnih strok je delal v dobesedno nemogočih razmerah. Po zalitju operacijskih dvoran v stavbi A decembra 2002 smo gostovali v Kliničnem centru, bolnike pa smo vozili na operacije z reševalnimi vozili in nato nazaj. V letu 2007 smo končno v nove prostore preselili radiologijo, nu-

The number of multidisciplinary teams and, consequently, also their configuration varies depending on the on-the-spot need for specialists. For instance, this was also a reason for the recent establishment of the new advisory team "KRPAN" within the breast team, which treats non-palpable breast lesions prior to and after surgery. At its foundation, the team already met all the requirements for organized screening; therefore, it was not too demanding to harmonize it with European standards. Members of the multidisciplinary teams prepare treatment guidelines and a clinical path for each individual disease (Table 7).

Tabela 6. Multidiscplinarni timi OI leta 2008
Table 6. Multidisciplinary teams at the Institute of Oncology

	Type	Head
1	Ginekološki / Gynecology	Stržinar
2	Ščitnični / Thyroid	Pompe
3	Urogenitalni / Urogenital	Kragelj
4	Glava vrat / Head & neck	Lešničar
5	Limfomski / Lymphomas	Jezeršek-Novaković
6	Kožni tumorji / Skin tumors	Ocvirk
7	Prebavila / Gastrointestinal	Oblak
8	Torakalni / Thorax	Zwitter
9	Nevroonkološki / Neuro-oncology (CNS)	Smrdel
10	Sarkomski / Sarcomas	Eržen
11	Mamarni / Breast	Bilban Jakopin

Specialist work was greatly restricted by limited room capacities and by the delayed move into new or better premises. The moves of individual departments are presented in Table 4. The first phase of construction of the Institute of Oncology started in 1996 and was completed in 2007; in truth, we are still expecting a superstructure to be built above the basement where the teleradiotherapy unit is located. The construction lasted too long, and the new buildings were moved into gradually, as soon as each of the new buildings was ready for settlement. Building A deserves particular attention because it was the last one we could vacate, though it was in the worst condition and always a compelling argument for the construction of a new institute. The Division of Surgical Oncology had its premises in that building, where the working conditions were literally impossible. After December 2002, when the operation hall in Building A was flooded, the surgeons were operating as guests in the operating halls of the neighboring University Medical Centre – and, all these years, the patients were being transferred all the way to and from the site of the operation by ambulance. In 2007, we finally moved the departments of radiology and nuclear medicine and the Division of Surgical Oncology into new premises. Despite the multitude of deficiencies of the new construction, the working conditions are incomparably better than what we had before.

klearno medicino in sektor operativnih strok. Vsem nepopolnostim novogradnje navkljub so dosežene delovne razmere neprimerljivo boljše od prejšnjih.
Selitvam je sledila tudi nova oprema. Ni prostora, da bi opisovali vse, kar je bilo vloženega v posodobitev OI. Zato smo se omejili le na najpomembnejšo opremo, ki prikazana v tabeli 4.

Ta prispevek je le kratek povzetek najpomembnejših mejnikov OI v zadnjih desetih letih in uvod v podrobnejša poročila posameznih sektorjev in oddelkov ter skupnih dejavnosti. Iz predstavljenega lahko sklenemo, da je OI tudi v zadnjih 10 letih več kot dobro opravljal svoje poslanstvo in še enkrat potrdil, kako zelo prav so imeli naši predhodniki pred 70 leti, ko so naš inštitut ustanovili.

Tabela 7. Seznam objavljenih ali internih smernic, ki so jih oblikovali ali so sodelovali pri njihovem oblikovanju strokovnjaki z OI
Table 7. List of published and in-house guidelines prepared by members of the teams at the Institute of Oncology or in cooperation between our experts and teams outside the institute.

Leto	Tip raka / lokalizacija / obravnava	Tip
1998	Preventiva v osnovnem zdravstvu Prevention in primary care	priporočila za prakso recommendations
1999	Azbest Asbestos	državne smernice national guidelines
	Rak dojk – diagnoza in zdravljenje Breast cancer – diagnosis and treatment	priporočila recommendations
	Rak v predelu glave in vratu – diagnostika in zdravljenje Head & neck cancer – diagnostics and treatment	priporočila recommendations
2000	Presejanje raka v EU Cancer screening in EU	priporočila recommendations
	Predrakave spremembe materničnega vratu – odkrivanje, zdravljenje in nadzor Premaligant changes of the uterine cervix – detection, treatment and follow-up	priporočila recommendations
	Rak pljuč – ne-kirurško zdravljenje Lung cancer – non-surgical treatment	smernice guidelines
2001	Zdravljenje bolečine pri odraslem bolniku z rakom Pain control in adult cancer patients	priporočila recommendations
	Rak pljuč – internistična obdelava Lung cancer – treatment approach by medical oncologist	priporočila (interna) recommendations
	Ginekološki malignomi – 2. revidirana izdaja Gynecological malignancies – 2nd revised edition	doktrina guidelines
2002	Maligni melanom Malignant melanoma	priporočila recommendations

The new premises needed to be newly equipped. There is not space enough to describe in detail what investments were required to upgrade the equipment. We shall restrict ourselves to presenting just the most important innovations, which can be found in Table 4.

This is a brief summary of the most important milestones in the development of the Institute of Oncology Ljubljana in the last decade and, at the same time, an introduction to the detailed reports of each individual division and unit and the common services of the institute. From this brief overview we may conclude that, in these last ten years, the Institute of Oncology has been successfully implementing its mission and has more than once assured us how right our brave predecessors were when they founded our institute.

Leto	Tip raka / lokalizacija / obravnava	Tip
	Rak jajčnikov – kirurško zdravljenje Ovarian cancer – surgical treatment	smernice guidelines
	Febrilna nevtropenija Febrile neutropenia	smernice guidelines
	Rak požiralnika Esophageal cancer	smernice guidelines
	Ne-Hodgkinov limfom Non-Hodgkin's lymphoma	smernice guidelines
	Hodkinova bolezen Hodgkin's disease	smernice guidelines
2003	Slabost in bruhanje zaradi zdravljenja s citostatiki - preprečevanje in zdravljenje Nausea and vomiting due to therapy with cytostatics – prevention and treatment	priporočila recommendations
2004	Rak dojk Breast cancer	smernice guidelines
	Maligni melanom Malignant melanoma	smernice guidelines
	Pozicioniranje in kontrola kakovosti mamograma Positioning and quality control of mammograms	pravilnik in smernice regulations and guidelines
	Zgodnje odkrivanje raka Early cancer detection	smernice guidelines
2005	Rak materničnega vratu – presejanje žensk Cervical cancer – screening of female population	evropske smernice European guidelines

Leto	Tip raka / lokalizacija / obravnava	Tip
	Negovalne diagnoze Nursing diagnostics	teoretične smernice theoretical guidelines
	Rakasta kaheksija – presnovne spremembe Cachexia due to cancer – metabolic changes	smernice guidelines
2006	Rak pljuč - diagnostika in zdravljenje Lung cancer – treatment and diagnostics	smernice guidelines
	Nabava instrumentov in materialov za večkratno uporabo – standard EN ISO 17664 Purchase of disposable medical instruments and material – standard EN ISO 17664	priporočila recommendations
	Maligne kožne rane – oskrba Malignant injuries of the skin	priporočila recommendations
	Prehrana kritično bolnih odraslih bolnikov Nutrition of critically ill adults	slovenska priporočila National recommendations
2007	Prehrana bolnika z rakom Nutrition of cancer patients	priporočila recommendations
	Prehranska obravnava bolnikov s kronično rano Nutritional care for patients with chronic wound	priporočila recommendations
	Rak debelega črevesa – adjuvantno zdravljenje Colorectal cancer patients – adjuvant treatment	priporočila recommendations
	Napredovali rak debelega črevesa in danke – sistemsko zdravljenje Advanced colorectal cancer –systemic treatment	priporočila recommendations
	Napredovali rak trebušne slinavke – sistemsko zdravljenje Advanced pancreatic cancer – systemic treatment	priporočila recommendations
	Napredovali rak želodca – sistemsko zdravljenje Advanced stomach cancer – systemic treatment	priporočila recommendations
	Lokalno in/ali regionalno napredovali rak danke Locally or regionally advanced rectal cancer	priporočila recommendations
2008	Maligni limfom Malignant lymphoma	smernice guidelines
	Lokalna estrogenska terapija bolnic po zdravljenju raka Local estrogen therapy of female patients after completed cancer therapy	priporočila recommendations
	Zdravljenje kronične bolečine pri odraslem bolniku z rakom Treatment of chronic pain in adult cancer patients	priporočila (posodobljeno) recommendations (upgraded)

Rak v Sloveniji

Maja Primic-Žakelj in Vesna Zadnik

Breme raka opisujemo z osnovnimi kazalniki, kot so incidenca (število novih bolnikov), umrljivost (število umrlih), prevalenca (število vseh živih bolnikov z rakom na določen dan) in preživetje. Register raka za Slovenijo (Register) na Onkološkem inštitutu zbira podatke o incidenci raka že od leta 1950. Spremlja tudi preživetje in ocenjuje prevalenco. Podatki o umrljivosti se zbirajo na Inštitutu za varovanje zdravja RS.

Podobno kot v drugih evropskih državah je tudi v Sloveniji rak na drugem mestu med vzroki smrti. Ocenjena starostno standardizirana incidenčna stopnja raka pri obeh spolih je pri nas manjša od ocenjenega povprečja Evropske unije, umrljivost pri obeh spolih pa je nekoliko nad povprečjem. Leta 2005 je za rakom zbolelo 10.720 ljudi, 5.455 moških in 5.265 žensk. Od vseh 10.720 primerov jih je bilo 10.648 (99,3 %) registriranih po prijavnicah, ki jih v Register pošiljajo bolnišnice in druge zdravstvene ustanove, 72 (0,7 %) pa iz zdravniških poročil o vzroku smrti. Bolezen je bila mikroskopsko potrjena pri 10.024 primerih (93,5 %).

Trend starostno standardizirane incidenčne in umrljivostne stopnje raka v obdobju 1985–2005 prikazuje diagram 1. V zadnjih desetih letih se je incidenca raka v Sloveniji povečala za skoraj 40 %, umrljivost pa za nekaj več kot 10 %. Več kot polovica povečanja incidence gre na račun staranja prebivalstva. Vpliv staranja izključimo s starostno standardizacijo grobih stopenj. Medtem ko se starostno standardizirana incidenčna stopnja prav tako ves čas povečuje, pa se je umrljivostna stopnja začela v prvi polovici 90. let zmanjševati za nekaj več kot 1 % na leto. Zmanjševanje tveganja smrti za rakom ob večanju incidence kaže, da je zdravljenje uspešnejše in da vse več bolnikov ozdravi ali živi s to boleznijo, namesto da bi zaradi nje umrli.

Po podatkih Registra je mogoče predvideti, da bo od leta 2005 rojenih za rakom do 75. leta starosti zbolel skoraj vsak drugi moški in skoraj vsaka tretja ženska. Breme raka je odvisno od starosti. Od 10.720 ljudi, ki so za njim zboleli v Sloveniji leta 2005, je bilo manj kot 1 % mlajših od 19 let, skoraj 3 % bolnikov so bili stari 20–34 let, 10 % 35–49 let, 44 % 50–69 let, 43 % pa je bilo starih 70 let ali več. S staranjem prebivalstva je zato pričakovati, da se bo število novih primerov povečevalo, s tem pa se bo večala tudi obremenitev zdravstvene službe.

Prvih pet po številu novih primerov najpogostejših rakov (kože, debelega črevesa in danke, pljuč, dojke in prostate) dosega 50-odstotni delež vseh novih primerov rakave bolezni. Pri moških je bil leta 2005 najpogostejši rak prostate (15,7 % vseh rakov, ugotovljenih pri moških). Na prvem mestu je tako zamenjal pljučnega raka, ki je bil najpogostejši rak pri moških vse od leta 1967. Pri ženskah ostaja na prvem mestu rak dojk; incidenca te bolezni se še vedno povečuje. Pri obeh spolih se incidenca veča še pri raku debelega črevesa in danke, malignem melanomu in drugih kožnih rakih, trebušni slinavki in ne-Hodgkinovih limfomih. Pri moških se veča tudi incidenca raka mod, pri ženskah pa pljučnega raka in raka materničnega telesa. Incidenca raka materničnega vratu se od leta 1999 ne povečuje več.

Podatki o preživetju vseh bolnikov so kompleksna ocena bremena raka v opazovani populaciji. Zrcalijo uspešnost vseh programov onkološkega varstva, od množičnega presejanja in zgodnjega odkrivanja do zdravljenja, rehabilitacije in dolgoletnega spremljanja zdravstvenega stanja bolnikov. Petletno relativno preživetje slovenskih bolnikov z rakom se ves čas registracije raka pri obeh spolih izboljšuje. Razlike v preživetju med zbolelimi v obdobju 1991–1995 in zbolelimi v obdobju 2001–2005 prikazuje

Cancer in Slovenia

Maja Primic-Žakelj & Vesna Zadnik

Cancer burden estimates are obtained by using basic indicators, e.g. incidence (number of new cases), mortality (number of deaths), prevalence (number of cancer survivors on a particular day) and survival. Data on cancer incidence have been gathered by the Cancer Registry of Slovenia at the Institute of Oncology Ljubljana since 1950. The registry also follows up cancer survival and evaluates the prevalence, while data on the mortality are stored at the Institute of Public Health of the Republic of Slovenia.

In Slovenia, similarly as in other countries, cancer ranks second among the leading causes of death. The age-standardized incidence rate in Slovenia is lower for both sexes than the estimated average of the European Union, whereas the mortality rate is slightly higher than the estimated average. In 2005, 10,720 new cancer patients (5,455 men and 5,265 women) were registered. Out of the total of 10,720 cases, 10,648 (99.3%) were registered through the registration forms that hospitals and other health care institutions send to the registry, and 72 (0.7%) were registered from death certificates only. Cancer was microscopically confirmed in 10,024 cases (93.5%).

The trend of age-standardized incidence and mortality rates of cancer in the period 1985–2005 is presented in Figure 1. In the past 10 years, the cancer incidence rate in Slovenia has increased by 40%, while the mortality rate has risen by just over 10%. More than half of the increase in cancer incidence is due to the aging of the population. The population aging influence is excluded by standardizing crude mortality rates. While the age-standardized incidence rate is persistently increasing, the mortality rate started to decrease in the early 1990s by 1% per year. The reduced risk of cancer death with concurrently rising incidence is an indication that treatment is more successful and that an increasing number of cancer patients are cured or survive and live on with the disease instead of dying from it.

From the registry data it can be predicted that, from among those born in 2005, almost every second male and third female will contract cancer by the age of 75. Cancer burden depends on age. Out of 10,720 patients who were diagnosed with the disease in 2005, less than 1% were children younger than 19 years, almost 3% were 20–34 years of age, 10% were 39–49 years old, 44% were 50–69 years old, and 43% were 70 or more years of age. With an aging population, it can be expected that the number of new cases will grow, thereby also increasing the burden on the health care service.

The five most frequent cancers (skin, colorectal, lung, breast and prostate cancers) account for more than 50% of all newly diagnosed cancer cases. In 2005, prostate cancer was the most frequent in men (15.7% of all cancers diagnosed that year in men); it thus took over first place, which had been held up to that time by lung cancer, the most frequent cancer in men from 1967 onwards. In women, breast cancer still holds first place, and its incidence rate keeps rising. The incidence of colorectal cancer, malignant melanoma and other skin cancers, pancreatic cancer and non-Hodgkin's lymphoma is also increasing in both sexes. In men, the incidence of testicular cancer continues to increase, while in women, an increase in the incidence of lung cancer and uterine body carcinoma has been observed. Cervical cancer incidence has not been increasing.

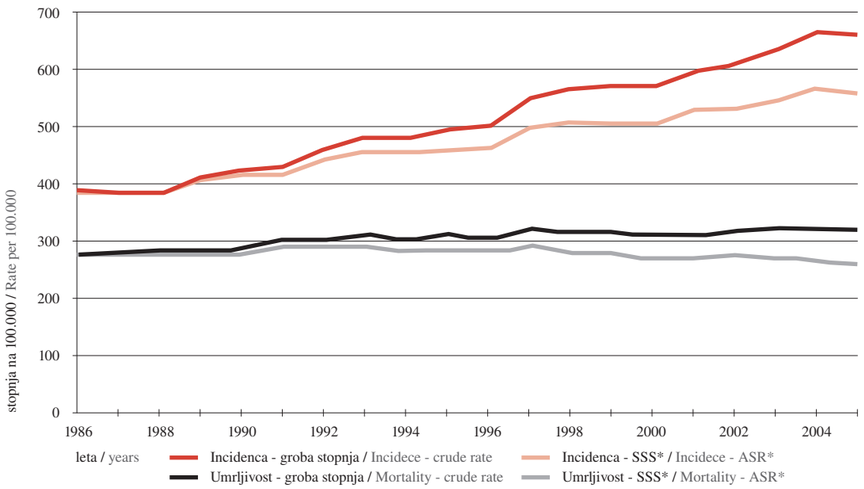
Data on the overall survival of all cancer patients are considered a complex measure of the cancer burden in the observed population. They reflect the efficiency of all cancer control programs, from mass screening programs and early cancer detection to treatment, rehabilitation and long-term post-

diagram 2. V zadnjem obdobju se je petletno relativno preživetje pri moških povzpelo na 51 %, pri ženskah pa znaša že 65 %. Tako veliko razliko v preživetju med spoloma pripisujemo različnim deležem posameznih rakavih bolezni glede na spol in starost. Ženske pogosteje zbolevajo za prognostično ugodnejšimi raki. V zadnjem obdobju se je preživetje vseh bolnikov z rakom izboljšalo predvsem na račun raka debelega črevesa in danke ter raka prostate pri moških, pri ženskah pa na račun raka dojke, debelega črevesa in maternicnega vratu.

V Sloveniji se bo breme raka prav gotovo povečevalo. Politične in ekonomske spremembe, ki smo jim bili priča v prejšnjem tisočletju, so vplivale na življenjski slog, izpostavljenost karcinogenom v delovnem in življenjskem okolju, pa tudi na organizacijo zdravstvenega varstva. Ker je latenčna doba pri raku večinoma daljša od 20 let, lahko pričakujemo, da se bodo posledice teh sprememb šele pokazale. Tudi če ostane raven nevarnostnih dejavnikov enaka kot danes, pa bo več onkoloških bolnikov, saj se rak pogosteje pojavlja pri starejših, številčnejša povojna generacija pa se bliža starosti, ko je tveganje zbolevanja za rakom največje.

Diagram 1. Grobe in starostno standardizirane incidenčne in umrljivostne stopnje raka, Slovenija 1986–2005.

Figure 1. Crude and age-standardized incidence and mortality rates of cancer in Slovenia in the period 1986–2005.



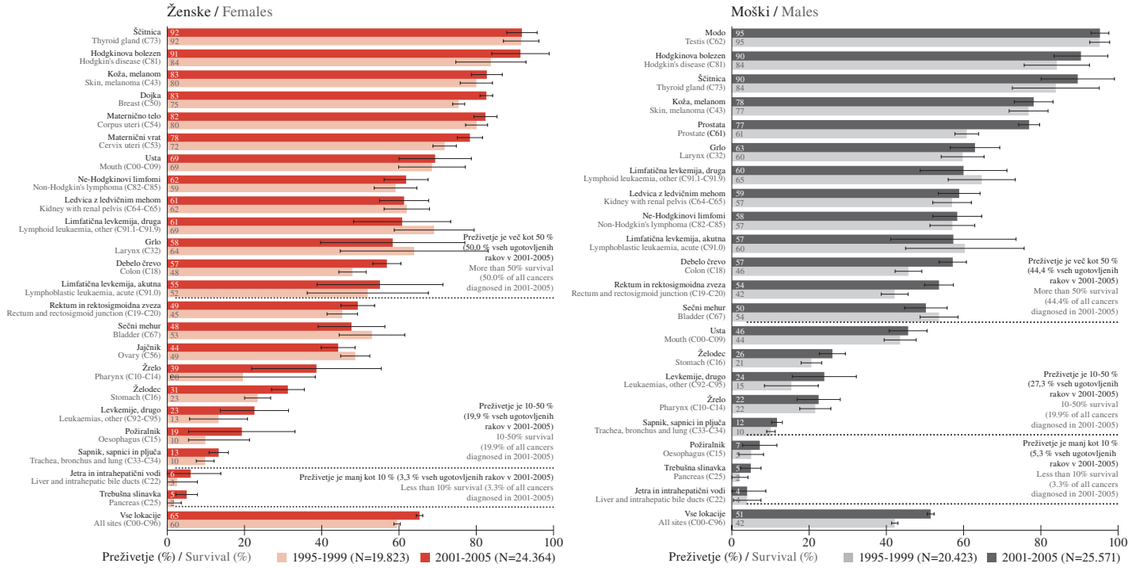
*SSS – starostno standardizirana incidenčna stopnja (standard: slovenska populacija 1986)
**ASR – age-standardized rate (standard: Slovenian population 1986)

treatment follow-up of patients. The five-year relative survival of Slovenian cancer patients has been constantly improving in both sexes from the very beginning of the registration practice. The survival rates of cancer patients diagnosed in the period 1991–1995 and in the period 2001–2005 are presented in Figure 2. In the most recent time period, the relative five-year survival rate in men reached 51%, whereas in women, by now it is 65%. Such a large difference in survival between the two sexes may be attributed to different percentages of particular cancer types depending upon the sex and age of patients. Women more frequently develop cancers with a more favorable prognosis. In the most recent period, the survival of all cancer patients has improved, which is mainly due to the successful treatment of colorectal and prostate cancer in men, and of breast, colon and cervical cancer in women.

In Slovenia, the cancer burden will definitely continue to grow. The political and economic changes we faced in the last millennium had an impact on lifestyle, exposure to carcinogens in the working and living environment, and the organization of the health care system. As the latency period in cancer is longer than 20 years, the consequences of these changes will continue to be seen in future years. Even though risk factors for cancer remain at the same level, the number of cancer patients will continue to grow because cancer usually develops among the elderly population, and the substantial postwar generation is nearing the age in which the risk of developing cancer is highest.

Diagram 2. Petletno relativno preživetje (s 95-odstotnim intervalom zaupanja) bolnikov, zbolelih za izbranimi raki v letih 1995–1999 in 2001–2005, prikazano po spolu.

Figure 2. Five-year relative survival (95% confidence interval) by age of patient contracting a particular cancer type in the periods 1995–1999 and 2001–2005.



Državni program obvladovanja raka v Republiki Sloveniji

Hotimir Lešničar

Kronologija nastajanja državnega programa

Zgodovina nastajanja Državnega programa obvladovanja raka (DPOR) sega v leto 1996, ko je v sodelovanju med Onkološkim inštitutom Ljubljana (OIL) in Ministrstvom za zdravje Republike Slovenije (MZ) nastal zapis posveta o tej temi. Do širše javne obravnave tega dokumenta ni prišlo, zaradi pomanjkanja politične volje je projekt zastal. Do ponovne obuditve ideje je prišlo po tem, ko je leta 2003 Slovenija postala podpisnica resolucije Sveta Evrope, ki je vse države članice zavezala k organiziranem boju proti raku. Osnutek slovenskega dokumenta je nastal decembra 2004, vendar so zanimanje zanj spodbudile šele priprave naše vlade na predsedovanje Evropski uniji. Slovenija je med svojim predsedovanjem problematiko obvladovanja raka namreč sprejela kot prioritetno temo zdravstvenega varstva. Širša skupina strokovnjakov iz epidemiologije in preventive, primarne, sekundarne in terciarne ravni onkološkega zdravstvenega varstva (OZV), paliativne oskrbe, pedagoškega in raziskovalnega dela je s predstavniki zdravstvene politike in civilne družbe pripravila izhodišča za pripravo DPOR. V navzočnosti treh predstavnikov SZO so bila ta izhodišča 9. novembra 2007 sprejeta na konferenci v Ljubljani. Januarja 2008 je MZ imenovalo osemčlanski odbor za pripravo DPOR. Delovno gradivo zapisa DPOR je bilo pripravljeno in julija 2008 poslano v javno obravnavo.

Zapis DPOR vsebinsko sledi besedilu resolucije 58. skupščine Svetovne zdravstvene organizacije (SZO), sprejetem 25. maja 2005. Resolucija vse države članice poziva k izboljšanju preventivnih ukrepov, izboljšanemu odkrivanju in zdravljenju ter boljši paliativni oskrbi bolnikov z rakom. Ker v Sloveniji v zdravljenje raka usmerjena inštitucija obstaja že od leta 1938, populacijski register od leta 1950, katedra za onkologijo in radioterapijo na Medicinski fakulteti Ljubljana in hkrati tudi enako imenovana podiplomska specializacija od leta 1956, po letu 2000 pa še specializacija iz internistične onkologije, se zdi, da so že naši predhodniki utrli pot, ki ji moramo le slediti. Žal nas je kopica dogodkov v zadnjem desetletju prepričala, da brez sprejetega in potrjenega DPOR zdravstvenega varstva na področju raka ne bo več možno zagotavljati niti v enakih okvirih kot doslej, kaj šele da bi ga izboljšali. Galopirajoča incidenca raka bo vse teže obvladljiva, saj nanjo vplivajo vse daljše preživetje, pomanjkljiva zakonodaja o škodljivih snoveh, slaba ozaveščenost in številne razvade. Dosedanji načini sekundarne preventive (npr. oportunistična presejanja z mamografijo) so se izkazali za malo uspešne. Zgodnje odkrivanje raka, v ozdravljivih stadijih, je slabo, saj ga (če ne štejemo nemelanomskega kožnega raka) kar 65 % odkrijemo, ko je že v napredovali fazi. Kakovosti preživetja, ki je odvisna od dobre in pravočasne diagnostike in ustreznega zdravljenja, pa (razen izjem) večinoma sploh še ne ugotavljamo. Postopki rehabilitacije dostikrat niso dovolj strokovno podprti, kar gre predvsem v škodo tistih ozdravljenih bolnikov, ki so po zdravljenju sposobni opravljati poklic. Pri organizaciji paliativne oskrbe pa smo verjetno na repu Evrope. Če k temu prištejemo še slabosti izobraževalnega sistema, medel odnos zdravstvene politike do raziskovalnega dela in senzacionalistično naravnane medije, ni čudno, da se ljudje zatekajo k alternativnim metodam zdravljenja. Ob neusklajenih stališčih zdravstvene politike in naraščajočih stroških zdravljenja vse večjo vlogo prevzema civilna družba, ki pa seveda ne more nadomestiti vloge strokovnega nadzora.

Vsebina zapisa DPOR

Temeljni smisel zapisa DPOR je prav gotovo zagotovitev **kontinuitete zdravstvene politike** za obvladovanje raka, saj mora biti dolgoročna. To pomeni izvajanje tistih načel, ki bodo prebivalcem in

National Cancer Control Program of the Republic of Slovenia

Hotimir Lešničar

Chronology of National Program Development

The beginning of the National Cancer Control Program dates back to the year 1996, when a memo was issued on the joint meeting held between the Institute of Oncology Ljubljana and the Ministry of Health of the Republic of Slovenia in reference to the subject. The document was not submitted for public discussion and, due to a lack of political will, work on the project was suspended. The idea was revived in 2003, after Slovenia became a signatory to the resolution of the Council of Europe binding all member states to adopt an action plan to combat cancer. A draft of the Slovenian document was prepared in December 2004, but it was given greater attention only when our government started preparations for the presidency of the EU. During its presidency, Slovenia laid particular emphasis on cancer control and adopted it as a priority issue in the domain of health care. An extended group of experts in cancer epidemiology and prevention, as well as experts at the primary, secondary and tertiary levels of cancer care, palliative care, and in education and research, prepared, in cooperation with representatives of health politics and civil society, the grounds for drawing up the National Cancer Control Program. These grounds were adopted at a meeting, also attended by three WHO representatives, held in Ljubljana, Slovenia, on November 9, 2007. In January 2008, the Ministry of Health appointed an eight-member committee to launch the National Cancer Control Program. Working documents on the National Cancer Control Program were drafted and submitted for public discussion in July 2008.

The wording of the memo on the National Cancer Control Program follows that of Resolution 58, adopted on May 25, 2005, by the WHO Assembly. This resolution calls for improving prevention measures, cancer detection, and treatment and palliative care. Given that a cancer center was founded in Slovenia already in 1938, the Cancer Registry has been in place since 1950, and the Chair for Radiotherapy and Oncology at the Ljubljana Faculty of Medicine and the related graduate residency study program have been accessible to medical students since 1956, and that, in 2000, medical oncology was also included in the residency study program, it is clear that our predecessors have paved the way and that we have but to follow it. Regrettably, a number of events in the last decade have convinced us that, without an approved and adopted document on the National Cancer Control Program, it will no longer be possible to ensure and even less to improve health care in oncology within the framework in place thus far. The galloping increase in cancer incidence, which can be attributed to the longer survival of the general population, will be hard to control if legislation concerning toxic substances is inadequate and if public awareness of cancer risk and health-threatening behaviors is low. So far, secondary prevention (e.g. opportunistic screening with mammography) has not been adequately effective. Early detection of cancer in its curable stages is poor, as 65% of cancer cases are detected in the advanced stage (with the exception of non-melanoma skin cancer), while no assessments of survivors' quality of life, which mainly depends on accurate and opportune diagnostics and appropriate treatment, have ever been made (with a few exceptions). Rehabilitation procedures are often carried out with insufficient professional support, which may put at a disadvantage particularly those cured patients who, after treatment, are fit to practice their profession. As for the organization of palliative care services, we are at the very tail end of the European Union countries. If, in addition to the above, we also consider the drawbacks of the educational system, the dim attitude of health policy towards research work and the sensation-oriented public media, it is not surprising that people are looking for alternative treatment methods. Due to the inconsistency of standpoints in health politics and rapidly growing treatment costs, the influence of civil society is growing stronger. Its support is important; however, it is obvious that it cannot replace expert control.

bolnikom zagotavljala uveljavljanje enakosti in dostopnosti. Seveda bo treba ta program dopolnjevati. Za zdaj je zastavljen do leta 2013. **Cilji DPOR** so predvsem: zmanjšanje incidence raka, zmanjšanje umrljivosti za rakom, boljša dostopnost do enakovredne obravnave in kakovostno preživetje bolnikov ter omogočanje paliativne oskrbe. Hkrati pa se program zavzema za enotnost pri **organizaciji, izvajanju** in **nadzoru** vseh dejavnosti, ki potekajo v zvezi z obvladovanjem raka v Sloveniji, po možnosti vključno z izobraževalno in raziskovalno dejavnostjo.

Vsebina DPOR je prilagojena slovenskim razmeram. Podane so glavne epidemiološke smernice, ki javnost morajo razburiti. Dejstvo, da bo v prihodnosti vsak tretji ali četrti prebivalec Slovenije zbolel za to ali ono obliko raka, je potrebno razmisleka. Danes za daljšo dobo uspemo pozdraviti približno vsakega drugega. Na število zbolelih in število ozdravljenih je v pozitivnem smislu mogoče bistveno vplivati. Seveda zato potrebujemo enaka strokovna izhodišča, organizacijo in izvedbo pa moramo prilagoditi potrebam in možnostim.

V **primarni preventivi raka** so v programu našteti vsi ukrepi, ki lahko privedejo do zmanjšanja pojavnosti raka. Kajenje, prehranske in pivske navade ter razvade v spolnosti, pa tudi okoljski in poklicni dejavniki, lahko poleg raka povzročijo tudi številne druge bolezni, zato so ukrepi zdravstvenega varstva hkrati z zakonskimi ukrepi našteti predvsem v že sprejeti Resoluciji zdravstvenega varstva Republike Slovenije, v DPOR pa so le povzeti. V **sekundarni preventivi raka** pa smo v zadnjih letih mukoma uspeli vzpostaviti vse tri državne programe zgodnjega odkrivanja (rak materničnega ustja, rak dojke, rak debelega črevesa in danke), ki pa morajo seveda potekati neprekinjeno, zato je treba zanje zagotoviti tudi enotnost izvajanja in kontinuiteto nadzora. Ker izvajanje preventivnih ukrepov ne spada v okvir onkološkega zdravstvenega varstva (OZV) v ožjem smislu, bo MZ moralo ustanoviti posebno inštitucijo, ki bo v povezavi z RR bdela nad izvajanjem vseh treh programov in skrbela za dolgoročni nadzor.

Koncentracija strokovnosti na **primarni ravni OZV** je zamišljena kot organizacija področnih **onkoloških ambulant**, v katerih delujejo na področju onkologije dodatno izobraženi specialisti in zdravstveni tehniki, ki z družinskimi zdravniki in specialističnimi ustanovami sodelujejo pri zgodnjem odkrivanju raka, pa tudi pri spremljanju bolnikov med zdravljenjem in po njem ter pri organizaciji paliativne oskrbe v domačem okolju. Pogoj za to je seveda vzpostavitev enotnega dokumentacijskega in informacijskega sistema.

Na **sekundarni ravni OZV** morajo bolnišnice, ki izvajajo onkološko dejavnost, zagotavljati **dostopno in strokovno primerljivo diagnostiko**, možnost **multidisciplinarne obravnave** pred prvim zdravljenjem, **najmanj 150 kirurških posegov na posamezno obliko raka na leto**, ki so opravljene v skladu s sprejetimi smernicami, strokovno neoporečno vodenje **standardnega sistemskega zdravljenja**, izvajanje **periodičnih ambulantnih pregledov po zdravljenju** in zagotavljanje **paliativne oskrbe neozdravljenih** bolnikov. DPOR torej vsebuje predlog koncentracije OZV na sekundarni ravni, ki bo bolnikom zagotavljala bolj strokovno in kakovostno obravnavo. Zato se tudi zavzema za gradnjo dodatnega obsevalnega oddelka v Mariboru in za vzpostavitev mreže sistemskega zdravljenja raka v tistih bolnišnicah, ki bodo izpolnjevale osnovne pogoje za izvajanje te dejavnosti. Prav tako je treba v skladu z začrtanimi načeli tudi na sekundarni ravni razvijati paliativno oskrbo. Strokovno podlago za izvajanje dajejo strokovne smernice za posamezne oblike raka, nadzor pa omogočata enotna dokumentacija in informacijski sistem.

Memo on National Cancer Control Program

The main purpose of the memo on the National Cancer Control Program is to provide for **continuity of health politics** in cancer control, which must remain a long-term commitment. This involves the implementation of principles ensuring the equality of the general population and patients in their access to health care services. To be sure, the program will have to be regularly amended. The present version is supposed to be in force until 2013. **The major goals** of the National Cancer Control Program are to reduce cancer incidence and the cancer death rate, to ensure equality of access to treatment potential and a high quality of life to cancer survivors, and to provide palliative care. Concurrently, the program aims to establish the concept of uniformity in organizing, performing and surveying all cancer control-related operations in Slovenia and, if feasible, also those related to education and research.

The content of the memo on the National Cancer Control Program is attuned to Slovenian conditions and discloses basic epidemiological trends that should alarm the public. The fact that every third or fourth inhabitant of Slovenia will contract one type of cancer or another needs to be considered. Today, long-term remission is obtained in every second cancer patient. It is possible to exert a positive influence on the incidence and cure rates. Therefore, there is an urgent need to establish uniform grounds, whereas organization and implementation should be adjusted to the needs and potential.

The program includes all measures at the **primary level of cancer prevention,** which, if properly followed, may reduce the cancer incidence rate. As abuse of tobacco, food and alcohol, together with environmental and occupational risks, may in addition to cancer cause other diseases as well, health care precautions and legislative provisions are included in the adopted Resolution on Health Care of the Republic of Slovenia; therefore, these are merely recapitulated in the National Cancer Control Program. At the **secondary level of cancer prevention,** we have managed, with great effort, to launch all three national programs for the early detection of cancer (cervical, breast and colorectal). Understandably, the three programs will carry on without interruption only if uniformity of implementation and continuity of control can be ensured. As carrying out prevention measures is not included in the strict sense in oncology health care, the Ministry of Health of the Republic of Slovenia will have to establish a specific body to monitor, jointly with the Cancer Registry, implementation of all three programs, and also to take long-term control over them.

The concentration of experts at the **primary level of cancer prevention** is conceived as an organization of regional **oncology clinics** run by physicians and health care technicians, specially trained in oncology, who would work together with family doctors and specialized health care institutions in early cancer detection and follow-up of cancer patients during and after treatment, as well as in organization of palliative care in the region. The precondition for this notion to be realized is the establishment of a uniform documentation and information system.

At the **secondary level of cancer care,** hospitals providing oncology treatment should make sure that **their diagnostics are professionally comparable and accessible**, that **multidisciplinary examination of patients** before primary treatment is enabled, that **at least 150 surgeries per specific type of cancer per year** are carried out according to the guidelines, that **standard systemic treatment** as

Zapis DPOR do leta 2013 ne predvideva prenosa **terciarne ravni OZV** iz sedanje koncentracije terciarnih ustanov v ljubljanski regiji. Pri dvomilijonskem prebivalstvu namreč za zdaj ni niti možno niti smiselno podvajati opreme in kadrov za izvajanje kombiniranih in najkompleksnejših posegov v diagnostiki in zdravljenju, za izvajanje raziskovalnega in pedagoškega dela ter za vodenje Registra raka (RR). Takšno je tudi mnenje mednarodnih svetovalcev SZO. Šele s koncentracijo OZV na sekundarni ravni bo namreč možen prenos tistih standardnih načinov zdravljenja, ki so terciarno raven doslej obremenjevali do te mere, da svojega poslanstva ni mogla izvajati v celoti. Čas pa bo pokazal, kako se bo razvijal zastavljeni onkološki center v Mariboru.

Izvajanje programa in nadzor

Izvedba DPOR je zastavljena na podlagi ocen dosedanjega stanja, na predlaganih strategijah ter sledenju merljivih ciljev in kazalcev. Cilji so izvedljivi ob **koncentraciji dejavnosti** in ob **strokovnem nadzoru**. Oboje omogočata le **enotna dokumentacija** in **enotni informacijski sistem**. Zato je treba **razširiti kapacitete Registra raka** (RR), da bo deloval kot centralna baza vseh (ne zgolj epidemioloških) podatkov, potrebnih za oceno učinkovitosti pri obvladovanju raka. V predlaganem programu izvedba enotne podatkovne baze na podlagi enotne dokumentacije in širitev RR predstavljajo dodaten (enkraten) strošek.

Nadzor izvajanja DPOR je glavni smisel tega programa. Zamišljen je po vzorcu številnih držav, ki imenujejo **nosilca programa** (s tajništvom) v okviru MZ in do deset strokovnjakov članov foruma, ki so dolžni vsako leto poročati o uspešnosti izvajanja programa. Svetovalci SZO povedo, da se programi brez takega nadzora izjalovijo. Pri snovanju DPOR so bili v Sloveniji vključeni tudi predstavniki bolnikov in civilne družbe. Ker je program nastajal v sodelovanju zdravstvene politike, izvajalcev in porabnikov, bo enako sodelovanje potrebno tudi pri izvajanju in nadzoru programa.

well as **regular follow-up examinations** after treatment are performed with irreproachable professional precision, and that **palliative care for incurable patients** is provided.

Hence, the National Cancer Control Program includes a proposal to concentrate oncology health care at the secondary level, thereby ensuring that patients will be given more professional and higher-quality treatment. In view of this, the program supports the idea of establishing an additional radiotherapy department at the Maribor Teaching Hospital and a network for systemic treatment of cancer in the hospitals that meet the criteria to perform oncology treatment. Furthermore, palliative care at the secondary level should be performed in compliance with the agreed principles. The treatment guidelines for individual cancer types should serve as a basis for the professional execution of treatment procedures, whereas monitoring will be ensured through the uniform documentation and information system.

The memo on the National Cancer Control Program does not envisage transferring the tertiary level of oncology health care outside the present tertiary institutions concentrated in the Ljubljana region. The reason lies in the decision that, for the time being, it is neither feasible nor sensible to double the equipment and staff capacity specializing in combined and highly complex diagnostic and treatment procedures, in research and educational work, and in cancer registry recording. This is also the view of international WHO advisers. With the concentration of oncology health care on the secondary level, it will be possible to transfer to the secondary level those standard treatment procedures which have so far been overloading the tertiary level institutions to the extent that they could not fully accomplish their mission. And only time will tell how the recently conceived cancer center in Maribor will grow.

Program Implementation and Monitoring

The concept of the National Cancer Control Program is based on evaluating the existing situation and proposed strategies, and on following up quantifiable targets and indicators. Targets are quantifiable by **concentration of operations** and by **qualified monitoring.** Both are feasible only through a **uniform documentation** and **information system**. For this purpose, the capacities of the Cancer Registry should be expanded so that it could serve as a central database for gathering and keeping all (not only epidemiological) data required to assess the efficiency of cancer control. The establishment of a standardized database using uniform documentation, as is proposed in the program, and the expansion of Cancer Registry operations will require additional (lump-sum) funding.

Monitoring the National Cancer Control Program implementation is the rationale for this program. Its conception followed the pattern of a number of countries, which appointed a principal investigator (and secretariat) within the Ministry of Health, along with about 10 experts – members of the forum who are obligated to report the results of program implementation once a year. WHO advisers explicitly told us that, without this monitoring, the programs usually fail. As the Slovenian program was conceived by joint cooperation between those involved in health care politics, medical experts and users, the same cooperating participants will also be required to implement and monitor the program.

Državni presejalni program za raka dojk DORA

***Mateja Krajc**,*
*v imenu organizacijske skupine programa DORA**

**Anže Droljc (Marand, d. o. o.), Snježana Frković Grazio (OIL), Kristijana Hertl (OIL), Maksimiljan Kadivec (OIL), Maja Mušič (OIL), Gorazd Noč (OIL), Karmen Peterlin (OIL), Jutta Pfeiffer (Screening Reference Team Germany – SRT), Maja Primic Žakelj (OIL), Firi Purić (OIL), Margrit Reichel (SRT), Cveto Šval (OIL), Lawrence von Karsa (International Agency for Cancer Research), Urban Zdešar (ZVD, d. d.), Janez Žgajnar (OIL)*

Konec marca 2008 so v okviru državnega presejalnega programa za raka dojk DORA prve ženske iz Mestne občine Ljubljana prejele vabilo na presejalno mamografijo v presejalni center na Onkološkem inštitutu Ljubljana (OIL). Dolgo pričakovan začetek presejalnega programa smo na OIL načrtovali več kot deset let, bolj intenzivno pa od leta 2004, ko je Zdravstveni svet sprejel in potrdil Predlog za uvajanje programa organiziranega presejanja za raka dojk v Sloveniji ter OIL poveril pripravo strokovnih in organizacijskih temeljev za državni program in za izvedbo projekta presejalnega programa. Program DORA je bil dokončno organizacijsko zastavljen s pomočjo evropske svetovalne skupine januarja 2007, Zdravstveni svet pa ga je potrdil marca 2007. S centralnim vodenjem, presejalno-diagnostičnima centroma v Ljubljani in Mariboru ter z mobilnimi presejalnimi enotami ne uvajamo le organizacijske spremembe, temveč tudi novo zdravstveno storitev – presejalno mamografijo in nove pogoje dela.

Spomnimo se, da presejanje pomeni iskanje predstopenj ali začetne bolezni med na videz zdravimi ljudmi s preprostimi preiskavami, ki izločijo tiste, ki imajo morda predinvazijsko ali zgodnjo invazijsko obliko raka, zaradi česar so pri njih potrebne nadaljnje diagnostične preiskave. Za iskanje raka dojk se kot presejalni test uporablja mamografija. Ključni elementi kakovostnega presejalnega programa za raka dojk so ustrezna izobraženost in strokovna usposobljenost multidisciplinarnega tima, ki sodeluje v presejanju in diagnostiki, predvsem radiologov in radioloških inženirjev, patologov, kirurgov, medicinskih sester in administrativnega osebja. Za mamografske naprave so predpisani kazalniki tehnične kakovosti, ki jih je treba preverjati vsak dan. Vse mamografske slike neodvisno odčitavata po dva radiologa; s tretjim, nadzornim, pa se na posebnem sestanku skupaj odločijo, kakšen naj bo postopek pri ženski, pri kateri sta prva dva odčitovalca zapisala različen izvid. Če je potrebna diagnostična obravnava, je vključen multidisciplinarni tim. Za program smo vzpostavili poseben informacijski sistem, aplikacijo DORA, ki omogoča redno spremljanje kazalcev kakovosti programa in nemoten potek dela. Ciljna populacija žensk, ki jo vabimo na presejalno mamografijo, je stara med 50 in 69 let. S posebnimi metodami promocije programa skušamo pri njih doseči ustrezno odzivnost. Merilo za učinkovitost presejanja je zmanjšanje umrljivosti med redno pregledovanimi ženskami, kar je tudi končni cilj programa DORA.

Glavne novosti in prednosti, ki jih med zdravstvene storitve prinaša presejalni program DORA, so (i) ločena obravnava simptomatskih in zdravih žensk, ki prihajajo na presejalno mamografijo, (ii) samostojno financiranje in uvedba plačevanja po številu opravljenih mamografij in odčitavanj ter (iii) uvedba mobilnih enot. Novost je tudi (iv) digitalna mamografija v presejanju in (v) centralizacija organizacije – osebje, stalno zaposleno v presejanju, je pod enotnim strokovnim in organizacijskim nadzorom, ter (vi) uvedba dnevnega preverjanja tehnične kakovosti digitalnih mamografskih naprav. Program DORA izpolnjuje vsa merila Evropskih smernic za zagotavljanje kakovosti presejanja za raka dojk, zato želi presejalno-diagnostični center na OIL pridobiti certifikat za evropski presejalni referenčni center, ki ga podeljuje EUREF (European Reference Organisation for Quality Assured Breast Screening and Diagnostic Services).

V letu 2007 je bil vzpostavljen prvi presejalni in diagnostični center na OIL, program pa je začel delovati v Mestni občini Ljubljana. Poteka tako, da ženska dobi tri tedne pred naročenim pregledom pisno vabilo. Ko pride na pregled, jo v presejalnem centru sprejme zdravstveni administrator, radiološki inženir pa opravi presejalno mamografijo. Mamografijo nato neodvisno odčitata dva radio-

National Breast Cancer Screening Program – DORA

***Mateja Krajc**,*
*(on behalf of the DORA organizing team)**

**Anže Droljc (Marand d.o.o.), Snježana Frković Grazio (OIL), Kristijana Hertl (OIL), Maksimiljan Kadivec (OIL), Maja Mušič (OIL), Gorazd Noč (OIL), Karmen Peterlin (OIL), Jutta Pfeiffer (Screening Reference Team Germany - SRT), Maja Primic –Žakelj (OIL), Firi Purić (OIL), Margrit Reichel, (SRT), Cveto Šval (OIL), Lawrence von Karsa, (International Agency for Cancer Research), Urban Zdešar (ZVD, d.d.), Janez Žgajnar (OIL)*

Toward the end of March 2008, women from the city of Ljubljana were the first to receive an invitation to attend a mammography screening test at the screening center of the Institute of Oncology Ljubljana. Long-standing expectations to launch a screening program for breast cancer have been, for some decades, slowly maturing at the Institute of Oncology, and more intensely only from 2004 onward, when the Health Council at the Ministry of Health of the Republic of Slovenia adopted and approved the Proposal for Introducing an Organized Breast Cancer Screening Program in Slovenia and authorized the Institute of Oncology Ljubljana to prepare the technical and organizational grounds for the national program and for implementation of the screening program. The final organizational concept for the DORA program was outlined in cooperation with a European advisory team in January 2007, and the Health Council approved it in March 2007. With the establishment of centrally guided screening and diagnostic centers in Ljubljana and Maribor, not only was an organizational change made, but also a new health service was introduced – screening mammography – and accordingly, new conditions of work have been adopted.

Briefly, screening is searching for pre-stages or early disease symptoms among the apparently healthy population, using simple test methods by which it is possible to select those who might have developed pre-invasive or early stage invasive cancer, thereby needing further diagnostic tests. The screening test used in early breast cancer detection is mammography. The key elements of a high-quality screening program include the appropriate education and professional qualification of a multidisciplinary team – primarily radiologists, radiological engineers, pathologists, surgeons, nurses and administrative staff – who are involved in cancer screening and diagnostics. The technical mammography equipment has to meet the standard technical quality indicators, which have to be checked daily. Mammograms are double-read by two independent radiologists; in case the findings of the two independent readers differ, they meet a third, supervising radiologist, and make a joint decision on what further procedure should be advised to the woman. If diagnostics is required, the multidisciplinary team is asked to join. A special information system – the DORA application, allowing regular follow-up of the program quality indicators and smooth work procedure – was elaborated for this program. The target female population invited to the screening mammography is aged between 50 and 69 years. With special program promotion methods, we try to attract as many women as possible to achieve an adequate response rate. One measure confirming screening efficiency is a reduced mortality rate among regularly examined women, which is also the ultimate goal of the DORA screening program.

The major innovations and benefits that have been brought to health services by the DORA screening program are: (i) separate treatment of symptomatic and healthy women who have attended the mammography screening test; (ii) independent funding and reimbursement of costs according to the number of performed mammographies and readings; and (iii) establishment of mobile mammography units. Other important innovations are: (iv) digital mammography in screening; (v) centralized processing – personnel fully employed by the screening program are under central uniform experts and managerial supervision; and (vi) regular daily technical quality control of digital mammographic devices. The DORA screening program meets all standards laid down in the European guidelines for quality assurance in breast cancer screening; therefore, the screening and diagnostic center at the Institute of Oncology Ljubljana endeavors to obtain the certificate of European reference screening center, which is awarded by the European Reference Organisation for Quality Assured Breast Cancer Screening and Diagnostic Services (EUREF).

loga. Če glede izvida ne soglašata ali če oba označita pozitiven izvid, se na tedenskih sestankih oba odčitovalca in odgovorni radiolog s konsenzom odločijo o nadaljnji obravnavi posamezne ženske. Odgovorni radiolog nato opravi nadaljnjo obravnavo, ki vključuje neinvazivno (povečava, kompresija, druge projekcije, ultrazvočni pregled) in/ali invazivno diagnostiko (debeloigelno biopsijo). Odgovorni radiolog mora biti izkušen v mamografskem odčitavanju in v vseh metodah nadaljnje diagnostike, za kar mora opraviti predpisani program usposabljanja. Radiolog odčitovalec mora na leto odčitati najmanj 5000 presejalnih mamografij. Nadaljnja obravnava v okviru programa DORA za zdaj poteka v presejalno-diagnostičnem centru na OIL, ko bo presejanje potekalo po vsej Sloveniji, pa bo imel to nalogo tudi center v Mariboru (UKC Maribor).
Osrednjo vlogo pri presejanju ima ženska. Kakršna koli komunikacija z njo poteka tako, da ne povzroča posredne ali neposredne škode. Pomembno je, da ženske seznanimo s koristmi in tveganji presejanja. Informacije, ki jih ženska prejme, so uravnotežene, iskrene, primerne, utemeljene na z dokazi podprti medicini, dosegljive, spoštljive in prirejene individualnim potrebam, kjer je to le mogoče. Ženske zato poleg vabila prejmejo tudi zgibanko, v kateri sta razložena potek in namen presejanja, na voljo pa je tudi telefonska številka, kamor lahko pokličejo za spremembo datuma pregleda ali za dodatna pojasnila.

Prva dva meseca presejanja je odziv vabljenih dober; presejalnega pregleda se v spomladanskem delu udeležilo 65,6 % od vseh naročenih žensk. Program je stekel brez večjih tehničnih ovir in je dobro pripravljen, kar je potrdila tudi evropska strokovna komisija, ki je pred začetkom preverila organiziranost programa pred presejalnim slikanjem prve ženske in med potekom dela.

In 2007, the first screening and diagnostic center was established at the Institute of Oncology Ljubljana, and implementation of the screening program was started in Ljubljana. In accordance with the adopted procedure, a woman receives an invitation to the mammography test three weeks before the date of the examination. Those who respond to the invitation are received and registered by a health administrative worker in the screening center, and a radiological engineer then performs screening mammography. The mammogram is read by two independent radiologists. If their findings are contradictory, inconsistent or positive for premalignant changes, a consensus on further treatment of each individual woman is reached at regular weekly meetings with the supervising radiologist. The radiologist responsible for a particular woman then carries out all further procedures, which include non-invasive diagnostic techniques (magnifying the mammogram, compression, other projections, US examination) and/or invasive techniques (core-needle biopsy). The radiologist responsible has to be highly skilled in reading mammograms, as well as in the use of all further diagnostic techniques; therefore, all radiologists have to pass an obligatory training program. A radiologist in charge of reading mammograms must read at least 5,000 mammograms per year. At present, all further screening procedures within the DORA screening program are performed in the screening and diagnostic center at the Institute of Oncology Ljubljana. As soon as the screening is expanded throughout the country, these tasks will also be delegated to the center in Maribor (University Medical Centre Maribor). In this screening program, major attention is focused on the woman. Whatever the communication with her, no harm should be done to her, either directly or indirectly. What is important is to explain to her what the benefits and risks of screening are. The information available to each woman is supposed be well-balanced, sincere, appropriate, evidence-based, accessible, polite, and, whenever required, attuned to her individual needs. Therefore, a flyer containing basic information on the course and aim of the screening, and a telephone number at which additional information may be obtained or the date of appointment changed, is attached to each invitation.

In the first two months, the response of women to the invitation was considerably positive; in spring this year, 65.6% of invited women attended the screening test. The program is running smoothly, without major technical complications. It is well-organized, which was also observed by the European expert commission that checked the organization of the program before the screening was launched and during the screening procedure.

Državni presejalni program za raka materničnega vratu ZORA

Maja Primic Žakelj, Marjetka Uršič Vrščaj, Ana Pogačnik*

** Programski svet DP ZORA: Marija Ilijaš Koželj, Nuša Konec Juričič, Blanka Mikl Mežnar, Andrej Možina, Ana Pogačnik, Maja Primic Žakelj, Alenka Repše Fokter, Vivijana Snoj, Margareta Strojan Fležar, Matka Teržan, Marjetka Uršič Vrščaj, Lucija Vrabič Dežman*

Rak materničnega vratu je ena od redkih rakavih bolezni, ki jo je mogoče preprečiti z odkrivanjem in zdravljenjem predrakavih sprememb. Preiskavo celic v brisu materničnega vratu sta že leta 1941 opisala Papanicolaou in Traut, zato se imenuje tudi test PAP. Preiskava se je v 50. letih prejšnjega stoletja začela uveljavljati kot presejalna za odkrivanje predrakavih sprememb pri na videz zdravih ženskah, bodisi kot sestavni del rednih ginekoloških pregledov (npr. v Sloveniji) ali kot del preventivnih programov, kjer bris lahko odvzame tudi drugo zdravstveno osebje, splošni zdravniki (npr. v Angliji) ali medicinske sestre (npr. na Finskem).

Spremljanje zbolevnosti in umrljivosti za rakom materničnega vratu v Evropi in drugod po svetu je pokazalo, da je uspešnost pri zmanjševanju bremena te bolezni različna. Odvisna je od tega, koliko žensk prihaja na redne preglede in kakšni so postopki za zagotavljanje kakovosti od odvzema brisa do njegovega pregleda, in od tega, kako obravnavajo ženske s predrakavimi spremembami. Primerjava incidence in umrljivosti med državami zahodne in vzhodne Evrope nakazuje, da so razlike predvsem posledica različnih organizacijskih pristopov do reševanja tega problema.

Presejanje je večplasten problem. Z javnozdravstvenega vidika se uspešnost lahko pokaže šele tedaj, ko je pregledanih vsaj 70 % žensk iz ciljne starostne skupine. Tako odzivnost pa dosežejo predvsem v organiziranih programih, ki jih podpira država in kjer ženskam pošiljajo pisna vabila na pregled brisa materničnega vratu. Enako pomembna je tudi kakovost dela prav vsakega člena v multidisciplinarnem timu, kjer sodelujejo ginekologi, medicinske sestre, presejalci, citopatologi, histopatologi, epidemiologi in administrativno osebje. Seveda je nujno, da so ženske s predrakavimi spremembami tudi pravilno zdravljene.

Čeprav so bili v Sloveniji že leta 1960 uvedeni preventivni ginekološki pregledi z odvzemom brisa materničnega vratu za odkrivanje predrakavih sprememb, (tj. oportunistično presejanje, neorganiziran program), ni kakovosti celotnega presejalnega postopka, od odvzema brisa do njegovega pregleda v laboratoriju, nihče sistematično spremljal, prav tako niso bila vzpostavljena merila, po katerih bi bilo mogoče spremljati kakovost presejalnih postopkov, diagnostična obravnava žensk pa je bila kljub strokovnim priporočilom neusklajena. Te pomanjkljivosti je bolj ali manj odsevala tudi incidenca raka materničnega vratu, ki jo od leta 1950 spremlja Register raka za Slovenijo. V Sloveniji so začeli uvajati redne preventivne ginekološke preglede in odvzeme brisa materničnega vratu na območju Ljubljane, Kranja in Maribora že pred letom 1960, po njem pa po vsej takratni republiki. Učinkovitost preventivnih pregledov se je pokazala z zmanjševanjem zbolevnosti in umrljivosti za rakom materničnega vratu. Po podatkih Registra se je letna incidenca manjšala od leta 1962 (34/100.000 žensk) do leta 1979, ko je bila najmanjša doslej (14/100.000 žensk). Od takrat do leta 1993 v grobi incidenci ni bilo pomembnejših sprememb, leta 1994 pa se je začela znova večati in je leta 1997 dosegla vrh (23,1/100.000, 241 novih primerov). Incidenca se je večala predvsem med ženskami, mlajšimi od 54 let.

Neučinkovitost dotedanjega sistema preventivnih ginekoloških pregledov naj bi izboljšal organiziran presejalni program, ki je po začetni pilotni fazi v ljubljanski in obalni zdravstveni regiji stekel na državni ravni leta 2003. Državni program ZORA (po črkah iz naslova programa – Zgodnje Odkrivanje predRAkavih sprememb materničnega vratu; poslej: DP ZORA) je bil vzpostavljen zato, da bi zmanjšali zbolevnost in umrljivost za rakom materničnega vratu v Sloveniji. Program ima za cilj povečati delež žensk v ciljni starostni skupini od 20 do 64 let, ki se udeležujejo rednih presejalnih pregledov

National Cervical Cancer Screening Program ZORA

Maja Primic Žakelj, Marjetka Uršič Vrščaj, Ana Pogačnik*

** Program Council of the NP ZORA: Marija Ilijaš Koželj, Nuša Konec Juričič, Blanka Mikl Mežnar, Andrej Možina, Ana Pogačnik, Maja Primic Žakelj, Alenka Repše Fokter, Vivijana Snoj, Margareta Strojan Fležar, Matka Teržan, Marjetka Uršič Vrščaj, Lucija Vrabič Dežman*

Cervical cancer is a rare malignant disease that can be prevented by detecting and treating premalignant changes. The analysis of cells in a cervical smear was described in detail in 1941 by Papanicolaou and Traut; it was therefore named after the two scientists as the PAP test. In the 1950s, this test started to be used as a screening method for the detection of premalignant changes in apparently healthy women. The PAP test was carried out as part of regular gynecological examinations (e.g. in Slovenia), or it was included in prevention programs; in the latter case, a smear sample might be collected by other medical staff or general practitioners (e.g. in the UK) or by nurses (Finland).

The follow-up of the incidence and mortality rates of cervical cancer in Europe and elsewhere in the world shows that the efficiency of the test in reducing the burden of this disease varies from country to country. It depends on the percentage of women who regularly see their gynecologist and on the quality assurance standards that are followed in handling the smears from their collection to examination, and also on the procedure that women undergo after the detection of premalignant changes. The comparison of incidence and mortality rates between the countries of Western and Eastern Europe has revealed that the differences between the two regions are mainly due to different organizational approaches to solving this problem.

Screening is a multifaceted problem. From the viewpoint of public health, its efficiency is noticeable only after at least 70% of women in the target age group have been tested. However, a response at that level can only be obtained in countries with well-organized screening programs that are supported by the state, and where women receive written invitations to attend a cervical smear test. At the same time, the quality standards of the work performed by each member of the multidisciplinary teams, which gather gynecologists, nurses, PAP screeners, cytopathologists, histopathologists, epidemiologists and administrative staff, are equally of paramount importance. Moreover, it is imperative that women with premalignant changes are properly treated.

Although preventive gynecological examinations that included cervical smear sample collection for detecting premalignant changes (i.e. opportunistic screening, unorganized screening program) were introduced in Slovenia in 1960, no systematic quality control of the entire screening procedure, from the collection of the smear to its examination, was provided; nor were there any standards that would serve as criteria for measuring the quality of screening procedures. The diagnostic management of women was not standardized, despite frequent professional advice. These shortfalls were obvious in the cervical cancer incidence rate followed by the Cancer Registry of Slovenia from 1950 onwards. In Slovenia, regular preventive gynecological examinations that also included the collection of a cervical smear were started in the regions of Ljubljana, Maribor and Kranj before 1960; after 1960, these preventive examinations were performed throughout the country within the boundaries of the then-Republic of Slovenia. The preventive examinations proved efficient, with a steady decline in the incidence of and mortality from cervical cancer. According to data from the Cancer Registry, the yearly incidence rate gradually decreased from 1962 (34/100,000 women) to 1979, when it reached its lowest level (14/100,000). From then until 1993, no significant changes were observed in the crude incidence of cervical cancer; but in 1994, it began to grow and reached its peak value in 1997 (23.1/100,000; 241 new cases). The incidence was primarily increasing among women below 54 years of age.

brisa materničnega vratu, na najmanj 70 %, tudi s pisnimi vabili tistim, ki se teh pregledov same ne udeležujejo. Za pošiljanje vabil ženskam, ki so si že izbrale svojega ginekologa (t. i. »opredeljenim ženskam«), a v določenem intervalu (3 leta) same ne pridejo na pregled, so zadolženi ginekologi, neopredeljenim pa jih pošilja Register ZORA. Ta deluje tudi kot varnostni mehanizem: vabila pošilja vsem ženskam ustrezne starosti, ki v štirih letih nimajo registriranega izvida. Ker mora vsak organizirani program stremeti tudi k vrhunski kakovosti vseh postopkov, so bile tudi za vse postopke DP ZORA izdelane smernice za zagotavljanje kakovosti. Poleg smernic so bile pripravljene tudi zakonske podlage, ki so jih potrdili ustrezni državni organi.

Pomemben dosežek programa je vzpostavitev centralnega informacijskega sistema (Registra ZORA) na Onkološkem inštitutu Ljubljana v službi Epidemiologija in register raka, v katerem se zbirajo vsi izvidi brisov materničnega vratu in izvidi patohistoloških preiskav iz vseh slovenskih laboratorijev za ginekološko citopatologijo. Skupaj s podatki Registra raka za Slovenijo omogoča spremljanje stopnje pregledanosti, presejalnega in morebitnih diagnostičnih postopkov. Predpogoj za ta sistem pa je bila prvič doslej standardizirana dejavnost laboratorijev za ginekološko citopatologijo, kar omogoča spremljanje dela laboratorijev. Do leta 2003, odkar spremljamo rezultate večine laboratorijev, take ocene sploh niso bile dosegljive. Sprememba terminologije citoloških sprememb leta 2006 naj bi dodatno prispevala k boljšemu ločevanju bolj od manj nevarnih sprememb v BMV. Eden od razlogov za razlike med laboratoriji je bil, da do leta 2006 v Sloveniji ni bilo organiziranega enotnega izobraževanja za presejalce. Spremembe v BMV so tako subtilne, da ni čudno, da jih laboratoriji ocenjujejo različno in po svojih merilih. V letu 2006 je bila na Onkološkem inštitutu Ljubljana s pomočjo kanadske učiteljice ustanovljena Šola za presejalce.

V dobrih treh letih po začetku organiziranega presejanja za odkrivanje RMV se je v ciljni skupini žensk, zajetih v program ZORA (od 20 do 64 let), povečala stopnja pregledanosti (delež žensk z najmanj enim izvidom BMV v zadnjih treh letih) na ciljno vrednost 70 %. Pregledanost je zadovoljiva le do 50. leta starosti, ko je ogroženost žensk največja, premajhna pa je pri starejših, med 50. in 64. letom. Več skrbi bo treba posvetiti tudi regijskim razlikam in povečati odziv tam, kjer je še vedno premajhen.

Podatki Registra raka za Slovenijo kažejo, da se incidenca RMV zmanjšuje; leta 2007 je bilo registriranih 160 novih primerov, kar je za 23 % manj kot leta 2003. Incidenca je manjša predvsem v najbolj ogroženi skupini žensk med 35. in 49. letom starosti, pri katerih je tudi največ patoloških izvidov BMV.

Odzivi žensk, ki jim je vse naše delo namenjeno, kažejo, da so program sprejele in da tudi bolj razumejo, zakaj jim brisa ni treba pregledovati vsako leto. Zadovoljne so s pisnimi vabili, le ponekod jih motijo dolge čakalne dobe. Vsaka njihova pisna ali telefonska pohvala pa je dobrodošla spodbuda za naše delo.

An organized screening program was launched at the state level in 2003 after a pilot phase in the Ljubljana and coastal regions, in order to improve the poor efficiency of the preventive gynecological examination system. The national program ZORA (an acronym of Slovenian terms for early detection of premalignant changes of the uterine cervix) was established to reduce the cervical cancer incidence and mortality rates in Slovenia. The program aims to increase the percentage of women in the age group from 20 to 64 years who are regularly attending cervical screening to at least 70% by sending written invitations to women who are not attending cervical screening tests. Sending invitations to women who have already registered with their gynecologist and have not come for a screening examination in three years is left to the gynecologist, while other women who have not registered with their gynecologist are invited by the ZORA registry. This registry also functions as a safety mechanism; it sends invitations to women in the target age group for whom no test results have been registered in the last four years. As each organized program aims to reach the highest quality for all its procedures, quality assurance guidelines for the implementation of all ZORA procedures have been elaborated. Besides the guidelines, the related legal basis has been approved and published by the appropriate national bodies.

An important achievement of the ZORA program is the establishment of a central information system at the Epidemiology and Cancer Registry of the Institute of Oncology Ljubljana, where all cervical smear test results and the related pathohistological findings from the laboratories for gynecological cytopathology throughout Slovenia are gathered. With access to this data from the Cancer Registry of Slovenia, the program enables monitoring of the extent of examinations performed thus far, as well as of screening and eventual diagnostic procedures. One prerequisite for establishing the central information system was to standardize operations in the gynecological cytopathology laboratories in the country, thus ensuring the monitoring of their work. Such monitoring of the test results of the majority of Slovenian laboratories has been possible only since 2003; before that date, no such estimates could be made. New terminology for cytological changes, adopted in 2006, has additionally contributed to better differentiation between changes in cervical smears that are seriously or less seriously at risk for developing cancer. One of the reasons for the discrepancies between the results obtained by different laboratories in Slovenia before 2006 was that there was no regular training established for screeners – they were trained at their workplace. The changes in cervical smears are so delicate that it is no wonder the laboratories used to describe them so differently and each of them according to its own standards. In 2006 a training course on cervical cancer screening, conducted by a Canadian teacher specializing in screening cytology, was held at the Institute of Oncology Ljubljana. It will become a standard training course for all new screeners.

In the more than three-year period since the launch of the organized cervical cancer screening program, the percentage of women with at least one cervical smear in the target age group (20–60 years) has reached the target level of 70%. However, this percentage, while considered satisfactory, has been reached only in women up to 50 years of age, for whom the risk of developing cancer is the highest. In the age group of 50–64 years, the percentage of examined women is still too low. More concern should be given to other differences among the regions and to increasing the response to invitations by the ZORA program in the districts where it is below the target level of 70%.

The data from the Cancer Registry of Slovenia show that cervical cancer incidence is gradually decreasing; in 2007, 160 new cases were registered, which is 23% lower than in 2003. The decrease in incidence was observed primarily in the age group of women 35–49 years old, who are at the highest risk for cervical cancer and in whom the highest percentage of pathologic cervical smears were found.

From the response of the women at whom the strategy of the whole program is aimed, it seems evident they have accepted the program and they understand why they do not need to have a smear tested every year. They also appreciate that written invitations are delivered to them; their only complaint is that the waiting time for a screening examination is sometimes too long. May we add that any comment in writing or by phone is welcome as an encouragement for our further work.

Svet Onkološkega inštituta Ljubljana

Svet OI je najvišji organ Onkološkega inštituta Ljubljana, ki nadzira in usmerja njegovo delovanje. Sestavljen je iz predstavnikov ustanovitelja (Vlada Republike Slovenije), zaposlenih na Onkološkem inštitutu, predstavnika Mestne občine Ljubljana in predstavnika zavarovancev, ki ga imenuje Zavod za zdravstveno zavarovanje Slovenije.

Council of the Institute of Oncology Ljubljana

The Council of the Institute of Oncology Ljubljana is the supreme organ that supervises and directs the activities of the institute. It consists of representatives of the founder of the institute (the Government of the Republic of Slovenia) and of the institute's employees, one representative of the City of Ljubljana and one representative delegated by the Health Insurance Institute of the Republic of Slovenia.

Člani, predstavniki ustanovitelja: Members of the Council, representatives of the founder of the Institute:	prof. dr. **Tadej Battelino**, dr. med., predsednik / MD, PhD, Chairman **Lucija Šikovec Ušaj**, univ. dipl. prav. / (Law) mag. **Ljudmila Ruparčič Oblak**, dr. med. / MD, MSc prof. dr. **Berta Jereb**, dr. med. / MD, PhD **Stojan Marjan Krebelj**, viš. upr. delav. / mag. **Tatjana Brinc**, univ. dipl. ekon. / MSc **Ana Polanc**, univ. dipl. ekon. / (Econ.) **Tatjana Drnovšek Zavšek**, univ. dipl. ekon. / (Econ.)
Člani, predstavniki Onkološkega inštituta: Members of the Council, representatives of the Institute's employees:	dr. **Erik Brecelj**, dr. med. / MD, PhD **Andreja Žagar**, viš. med. ses., dipl. ekon. / RN **Božidar Casar**, univ. dipl. fiz. / BSc (Physics) mag. **Jerica Češarek**, univ. dipl. soc. / MSc prof. dr. **Primož Strojan**, dr. med., podpredsednik / MD, PhD, Vice-Chairman
Članica, predstavnica Mestne občine Ljubljana: Member, representative of the City of Ljubljana:	mag. Nives Cesar / MSc
Član, predstavnik zavarovancev: Member, representative delegated by the Health Insurance Institute of the Republic of Slovenia:	Borut Miklavčič, univ. dipl. polit. / BSc (Polit.Sc.)

Razširjeni strokovni kolegij za onkologijo

Razširjeni strokovni kolegiji so najvišji strokovni organ na posameznem področju, ki usklajuje predloge klinik, strokovnih združenj in zbornic, visokošolskih zavodov, zdravstvenih zavodov ter posameznih strokovnjakov. Posamezni razširjeni strokovni kolegij je najvišje in avtonomno strokovno telo določene stroke. Pri svojih odločitvah je zavezano dosežkom znanosti, strokovno preverjenim metodam in razvoju stroke, pri čemer upošteva javni zdravstveni interes.

Strokovne predloge razširjenih strokovnih kolegijev, ki vplivajo na vsebino in obseg zdravstvenega varstva, s tem pa tudi na zdravstveno politiko in financiranje zdravstvenega varstva, obravnava in potrjuje Zdravstveni svet kot najvišji strokovni usklajevalni organ v zdravstvenem varstvu. Razširjeni strokovni kolegiji se oblikujejo na klinikah, inštitutih in drugih zdravstvenih zavodih. Na predlog klinik, strokovnih združenj in visokošolskih zavodov, ki izvajajo programe za zdravstvene delavce, jih določi minister za zdravje.

Slovenian Board for Oncology

The Slovenian Board for Oncology is the supreme medical body in oncology, which coordinates various proposals by clinics, medical associations and medical chambers, university institutions, health care institutes and individual experts. Every decision by the board should be made in compliance with scientific achievements, medically proven methods and advances in oncology, and should concurrently take into account public health interests. Should a decision by the Slovenian Board for Oncology have in any respect an impact on the program content and scope of health care, and thereby also on health care policy and funding, it shall be discussed and approved by the Health Council, the supreme organ accountable for professional coordination of operations in health care.

The foundation of the Slovenian Board for Oncology, which has its seat at the Institute of Oncology Ljubljana, was approved by the minister of health.

Na Onkološkem inštitutu je sedež Razširjenega strokovnega kolegija za onkologijo, ki ga sestavljajo v nadaljevanju navedeni člani:
The members of the Board are appointed by:

Člani, ki jih je imenoval Onkološki inštitut: Institute of Oncology Ljubljana:	prof. dr. **Branko Zakotnik**, dr. med. / MD, PhD prof. dr. **Matjaž Zwitter**, dr. med. / MD, PhD doc. dr. / Assist. Prof. **Marko Hočevar**, dr. med. (predsednik) / MD, PhD (Chairman)
Člani, ki jih je imenovala Zdravniška zbornica Slovenija: Medical Chamber of Slovenia:	doc. dr. / Assist. Prof. **Albert Peter Fras**, dr. med. / MD, PhD prim. dr. **Cvetka Bilban Jakopin**, dr. med. / MD, PhD doc. dr. / Assist. Prof. **Barbara Jezeršek Novakovič**, dr. med. / MD, PhD
Člani, ki jih je imenovalo Slovensko zdravniško društvo: Medical Association of Slovenia:	prof. dr. **Iztok Takač**, dr. med. / MD, PhD prof. dr. **Borut Štabuc**, dr. med. / MD, PhD prim. dr. **Miran Koželj**, dr. med. / MD, PhD

Strokovni svet

Strokovni svet OI je kolegijski strokovni organ, ki načrtuje, obravnava in usmerja strokovno dejavnost OI. Odloča o strokovnih vprašanjih v skladu s pooblastili, ki so določena v tem statutu, in v skladu z ekonomskimi možnostmi zavoda. Vodi ga strokovni direktor, člani pa so predstojniki sektorjev operativnih dejavnosti, radioterapije, internistične onkologije in predstavnik diagnostične dejavnosti.

Medical Board

The Medical Board of the Institute of Oncology is a collegiate body of experts that designs, discusses and directs the medical activities of the institute. The board makes decisions in compliance with the mandates laid down in the statute of the institute and with the economic potential of the institute. The board is presided over by the medical director. Members of the Medical Board of the Institute of Oncology are the heads of the divisions of surgical oncology, radiotherapy, medical oncology and diagnostics.

Strokovni svet Onkološkega inštituta predstavljajo:
Members of the Medical Board of the Institute of Oncology are:

doc. dr. / Assist. Prof. **Janez Žgajnar,** dr. med., / MD, PhD	strokovni direktor / Medical Director
doc. dr. / Assist. Prof. **Marko Hočevar,** dr. med. / MD, PhD	predstojnik sektorja operativnih dejavnosti / Head of the Division of Surgical Oncology
prof. dr. **Primož Strojan,** dr. med., / MD, PhD	predstojnik sektorja radioterapije / Head of the Division of Radiotherapy
doc. dr. / Assist. Prof. **Barbara Jezeršek Novaković,** dr. med. / MD, PhD	predstojnica sektorja internistične onkologije / Head of the Division of Medical Oncology
doc. dr. / Assist. Prof. **Živa Pohar Marinšek,** dr. med. / MD, PhD	predstavnica diagnostične dejavnosti / Representative of the Division of Diagnostics

Na seje strokovnega sveta so vabljeni generalni direktor, pomočnik strokovnega direktorja za raziskovanje in izobraževanje ter pomočnik strokovnega direktorja za zdravstveno nego – glavna medicinska sestra.

When invited, the director-general, assistant medical director for research and education, and assistant medical director for nursing (head nurse) may attend board meetings.

Raziskovalno-izobraževalni kolegij

Raziskovalno-izobraževalni kolegij (RIK) sestavljajo vsi zdravstveni delavci in sodelavci z doktoratom znanosti, visokošolski učitelji, predstojniki sektorjev, po potrebi tudi vodje oddelkov in enot, strokovni direktor OI in pomočnik strokovnega direktorja za zdravstveno nego – glavna medicinska sestra. RIK razpravlja o vprašanjih raziskovalnega in pedagoškega dela na OI, kadar njihov pomen presega redno obravnavo na strokovnem svetu OI. Sklicuje ga pomočnik strokovnega direktorja za raziskovanje in izobraževanje.

Board for Research and Education

The board consists of health professionals and professional associates with doctorates, university teachers, heads of divisions and, if necessary, heads of departments or units, the medical director, and the assistant medical director for nursing (head nurse). The Board for Research and Education discusses issues related to research and education in cases where particular issues outgrow the responsibilities of the Medical Board. Meetings of the Board for Research and Education are convened by the assistant medical director for research and education.

Člani RIK:
Members of the Board for Research and Education

red. prof. dr. / Prof. **Marija Auersperg,** dr. med. / MD, PhD
doc. dr. / Assist. Prof. **Nikola Bešić,** dr. med. / MD, PhD
prim. dr. **Cvetka Bilban-Jakopin**, dr. med. / MD, PhD
dr. **Simona Borštnar**, dr. med. / MD, PhD
doc. dr. / Assist. Prof. **Matej Bračko**, dr. med. / MD, PhD
dr. **Erik Brecelj**, dr. med. / MD, PhD
znan. svet. doc. dr. / Assist. Prof. **Maja Čemažar**, univ. dipl. biol. / MSc, PhD (Biol.); Research Adviser
red. prof. dr. / Prof. **Tanja Čufer**, dr. med. / MD, PhD
prim. doc. dr. / Assist. Prof. **Albert Peter Fras**, dr. med. / MD, PhD
dr. **Snježana Frković Grazio**, dr. med. / MD, PhD
dr. **Barbara Gazić**, dr. med. / MD, PhD
asist. dr. **Daša Grabec**, univ. dipl. fiz. / BSc, PhD (Physics)
dr. **Alenka Grošel**, univ. dipl. mikrobiol. / MSc, PhD (Microbiol.)
doc. dr. / Assist. Prof. **Marko Hočevar**, dr. med. / MD, PhD
dr. **Robert Hudej**, univ. dipl. fiz. / MSc, PhD (Physics)
dr. **Monika Jagodic**, dr. med. / MD, PhD
doc. dr. / Assist. Prof. **Barbara Jezeršek - Novaković**, dr. med. / MD, PhD
red. prof. dr. / Prof. **Berta Jereb**, dr. med. / MD, PhD
doc. dr. / Assist. Prof. **Veronika Kloboves - Prevodnik**, dr. med. / MD, PhD
dr. **Ira Koković**, univ. dipl. biol. / BSc, PhD (Biol.)
dr. **Borut Kragelj**, dr. med. / MD, PhD
dr. **Simona Kranjc**, univ. dipl. biol. / BSc, PhD (Biol.)
dr. **Janez Lamovec**, dr. med. / MD, PhD
dr. **Jaka Lavrenčak**, univ. dipl. biol. / BSc, PhD (Biol.)
doc. dr. / Assist. Prof. **Hotimir Lešničar**, dr. med. / MD, PhD

znan. svet. dr. **Srdjan Novaković**, univ. dipl. biol. / BSc, PhD (Biol.), Research Adviser
asist. dr. **Irena Oblak**, dr. med. / MD, PhD
dr. **Janja Ocvirk**, dr. med. / MD, PhD
dr. **Maja Podkrajšek**, dr. med. / MD, PhD
dr. **Ana Pogačnik**, dr. med. / MD, PhD
doc. dr. **Živa Pohar - Marinšek**, dr. med. / MD, PhD
izred. prof. dr. / Assoc. Prof. **Maja Primic - Žakelj**, dr. med. / MD, PhD
red. prof. dr. / Prof. **Zvonimir Rudolf**, dr. med. / MD, PhD
red. prof. dr. / Prof. **Gregor Serša**, univ. dipl. biol. / BSc, PhD (Biol.)
izred. prof. dr. / Assoc. Prof. **Marko Snoj**, dr. med. / MD, PhD
dr. **Vida Stegel**, univ. dipl. biol. / BSc, PhD (Biol.)
izred. prof. dr. / Assoc. Prof. **Primož Strojan**, dr. med. / MD, PhD
dr. **Breda Škrbinc**, dr. med. / MD, PhD
dr. **Erika Šoba Podobnik**, dr. med. / MD, PhD
izred. prof. dr. / Assoc. Prof. **Marjetka Uršič - Vrščaj**, dr. med. / MD, PhD
asist. dr. **Vaneja Velenik**, dr. med. / MD, PhD
izr. prof. dr. / Assoc. Prof. **Branko Zakotnik**, dr. med. / MD, PhD
izred. prof. dr. / Assoc. Prof. **Matjaž Zwitter**, dr. med. / MD, PhD
asist. dr. **Vesna Zadnik**, dr. med. / MD, PhD
asist. dr. **Lorna Zadravec Zaletel**, dr. med. / MD, PhD
dr. **Ivana Žagar**, dr. med. / MD, PhD
doc. dr. / Assist. Prof. **Janez Žgajnar**, dr. med. / MD, PhD

Vabljeni:
Invited Members:

Božo Casar, univ. dipl. fiz. / BSc (Physics)
asist. **Maja Marolt Mušič**, dr. med. / MD
asist. mag. **Ksenija Mahkovic - Hergouth**, dr. med. / MD, MSc
mag. **Barbara Možina**, dr. med. / MD, MSc
Matjaž Musek, univ. dipl. bibl. / BSc (Lib.Sc.)
Andreja Žagar, viš. med. ses., dipl. ekon. / RN, BSc, (Oec.)
Monika Sonc, mag. farm., spec. / BSc (Pharm)
Aleš Vakselj, dr. med. / MD
Barbara Vidergar - Kralj, dr. med. / MD
Zvezdana Snoj, dr. med. / MD
Aleksandra Oklješa Lukič, dipl. inž. rad. / BSc (Radiol.)
Edita Rotner, dipl. fiziot. / BSc (Physioth.)
asist. mag. **Tanja Roš Opaškar**, dr. med. / MD, MSc
prim. **Josipina Červek**, dr. med. / MD
asist. mag. **Primož Petrič**, dr. med. / MD, MSc
mag. **Nada Rotovnik Kozjek**, dr. med. / MD, MSc
asist. mag. **Tomaž Verk**, univ. dipl. fiz. / BSc, MSc (Physics)

Etična komisija

Etična komisija razpravlja in daje mnenje o etiki strokovnega in raziskovalnega dela na inštitutu. Posebej varuje pravice in interese bolnikov. Je samostojna v svojih odločitvah, vendar tesno povezana s Komisijo za medicinsko etiko pri Ministrstvu za zdravje.

Committee for Medical Ethics

The committee discusses and comments on the ethical issues of the medical and research work performed at the institute. It is particularly concerned with the protection of patients' rights and interests. The committee is an autonomous body, at liberty to make independent decisions, yet closely connected with the Medical Ethics Committee at the Ministry of Health of the Republic of Slovenia.

Člani:
Members:

prof. dr. / Prof. **Matjaž Zwitter**, dr. med., predsednik / MD, PhD, Chairman
Olga Cerar, dr. med. / MD
prim. **Matjaž Kaučič**, dr. med. / MD
znan. svet. dr. **Srdjan Novaković**, univ. dipl. biol. / DSc (Biol.), Research Adviser
Katarina Lokar, prof. zdrav. vzg. / BSc (Health Care)

Zunanji člani:
External members:

prof. dr. / Prof. **Tine Hribar**, univ. dipl. fil. / PhD (Phil.)
prof. dr. / Prof. **Ada Polajnar Pavčnik**, univ. dipl. prav. / PhD (Law)
prof. dr. / Prof. **Mirjana Ule Potrč**, univ. dipl. psih. / PhD (Psych.)
doc. dr. / Assist. Prof. **Anton Mlinar**, univ. dipl. teolog / PhD (Theol.)

Vodstvo inštituta / Boards of Directors

Onkološki inštitut Ljubljana/Institute of Oncology Ljubljana
Zaloška 2, SI – 1000 Ljubljana, Slovenija
Tel./Phone: +386 1 5879 110, Faks/Fax: +386 1 5879 400

Generalni direktor Director General	mag. **Aljoša Rojec**, univ. dipl. inž. el. (do 9. 7. 2008) M.Sc., B.Sc. (until July 9, 2008) v.d. generalnega direktorja / Acting Director-General **Ana Žličar**, univ. dipl. ekon. / B.Sc. (Oec.)
Strokovni direktor Medical Director	doc. dr. / Assist. prof. **Janez Žgajnar**, dr. med. / M.D., Ph.D.
Pomočnik strokovnega direktorja za raziskovanje in izobraževanje Assistant Medical Director for Research and Education	znan. svet. dr. / Research Full Professor **Srdjan Novaković**, Ph.D.
Pomočnica strokovnega direktorja za zdravstveno nego – glavna medicinska sestra Assistant Medical Director for Nursing – Head Nurse	**Andreja Žagar**, viš. med. ses., dipl. ekon. (do 30. 6. 2008) / RN, B.A. (Econ.) (until June 30, 2008) **Katarina Lokar**, prof. zdr. vzg. / RN, B.Sc. (Education.)

Upravna dejavnost OI je razdeljena na naslednje službe:
- finančna služba
- kadrovska služba
- plansko-analitska služba
- pravna služba
- služba javnih naročil
- služba za informatiko
- služba za odnose z javnostmi
- tehnično-vzdrževalna služba

Administrative services cover the following work domains:
- Accounting Department
- Personnel Department
- Department of Financial Planning and Analysis
- Legal Office
- Public Procurement Office
- Informatics Department
- Public Relations Service
- Technical Service and Maintenance

Upravne dejavnosti

Zdravstvena dejavnost kot javna služba v okviru javnega sektorja potrebuje za svoje delovanje poleg osnovne zdravstvene stroke tudi spremljajoče dejavnosti, ki s strokovno podporo na različnih področjih zagotavljajo nemoteno delo inštituta. Skrbijo za uravnoteženo in gospodarno delovanje inštituta v okviru danih oziroma obstoječih virov, skladno z zakonodajo in drugimi standardi.

Med najpomembnejšimi dosežki upravnih služb velja izpostaviti skokovit razvoj informatike, saj je v zadnjem desetletju naredila ogromen korak naprej. Tako danes že lahko govorimo o integralnem informacijskem sistemu, ki pokriva zdravstveni in poslovni del poslovanja inštituta. Zdravstveni informacijski sistem Webdoctor, ki se razvija v sodelovanju s podjetjem Marand, pokriva vse zdravstvene dejavnosti – registracijo bolnika, administracijo, ambulante, hospital, diagnostične enote, kirurgijo, radioterapijo, obračun storitev, SPP. Integralni informacijski sistem omogoča hitrejši in preglednejši dostop do poslovnih in zdravstvenih podatkov, kar zagotavlja učinkovitejše poslovanje inštituta na vseh ravneh. V skrbi za čim boljšo informiranost zaposlenih smo vzpostavili tudi intranetni portal, hkrati pa se prek moderno zasnovanega spletnega mesta odpiramo tudi navzven, strokovni in laični javnosti.

Administrative services

Health care is a service within the public sector; in carrying out its basic mission, it is dependent on associated services that provide professional and technical support in various areas, thus ensuring the smooth functioning of an institution. At the Institute of Oncology Ljubljana, administrative services are accountable for the balanced and rational operations of the institute within the framework of given or existing resources and in compliance with the adopted legislation and standards.

Among the achievements of the administrative service sector, particular attention should be paid to the astonishingly rapid progress of informatics at the institute in the last decade.
Today, we have an integrated information system that covers the medical and managerial work domains at the institute. The medical information system Web Doctor, developed in cooperation with the computer firm Marand, covers the needs of the medical care sector, so that the administrative services in the registration office, administration, outpatient clinic, hospital wards and the divisions of diagnostics, surgery, radiation and oncology, as well as health services invoicing and DRG, are all computer-operated. The integrated information system allows for faster and more transparent access to business and medical data, thereby ensuring more efficient management at all levels of the institute. In order to provide better information access to all employees, we have recently set up a modern intranet portal. At the same time, through our website, conceived in line with the most up-to-date recommendations, the Institute of Oncology has become accessible to wider medical circles as well as the lay population.

Onkološki inštitut Ljubljana v številkah

Delavci inštituta na dan 30. 6. 2008:
Employees at the Institute of Oncology Ljubljana on 30 June 2008:

Zdravniki / Physicians		135
Klinične službe / Clinical services	94	
Diagnostične službe / Diagnostic services	31	
Ostale dejavnosti / Other services	4	
Mladi raziskovalci / Junior research fellows	1	
Sekundariji / Interns	5	
Zdravstveni sodelavci z univerzitetno izobrazbo / Health care associates - university-grade	38	43
Mladi raziskovalci / Junior research fellows	5	
Medicinske sestre / Nursing staff		299
DMS/VMS / Nurses – university grade or college education	93	
SMS / Health care professionals and trained nurses	139	
Ostale dejavnosti / Other services		
DMS/VMS / Nurses – university grade or college education	31	
SMS / Health care professionals and trained nurses	36	
Ostali zdravstveni delavci in sodelavci / Other health care professionals or associates		169
Visoka izobrazba / Universitry grade	110	
Višja izobrazba / College education	14	
Srednja izobrazba / Secondary school	45	
Administrativni delavci v zdravstveni dejavnosti / Administrative staff in health care		56
Bolniške strežnice / Orderlies		69
V bolnišnični dejavnosti / Hospital services	61	
Ostale dejavnosti / Other services	8	
Delavci v servisni dejavnosti / Maintenance services employees		32
Delavci v upravi / Administration personnel		58
Skupaj / Total		**861**

Institute of Oncology Ljubljana in Figures

Delavci inštituta na dan 31. 12. 2004:
Employees at the Institute of Oncology Ljubljana on 31 December 2004:

Zdravniki / Physicians	100
Klinične službe / Clinical divisions	71
Diagnostične službe / Diagnostic divisions	25
Ostale dejavnosti / Other services	4
Drugi zdravstveni delavci in sodelavci / Other health care professionals and associates	205
Medicinske sestre / Nursing staff	279
Zdravstvena administracija / Administrative staff in health care	54
Bolniške strežnice in bolničarji / Orderlies	60
Delavci v servisnih in drugih dejavnostih / Maintenance services employees	49
Delavci v upravi / Administrative personnel	48
Skupaj / Total	**795**
Zdravniki sekundariji / Interns	5
Mladi raziskovalci / Junior research fellows	8
Zdravniki specializanti / Residents	32
Skupaj / Total	**45**
Skupaj vsi zaposleni / Grand total (all employees)	**840**

Onkološki inštitut Ljubljana v številkah
12. maj 2008

Število staležnih postelj – hospital / Hospital bed capacity at hospital wards

Oddelek / sektor Department / Division	Radioterapija Radiotherapy	Interna Medical Oncology	Op. dejavnosti Surgical Oncology	Paliativa Palliative Care	Skupaj Total
E 99 BRT	12				**12**
E 99 IZOTOPI (Isotopes)	3				**3**
E 2 krg.			24		**24**
E 3 (Int. nega) (Intensive Care)			13		**13**
E 4 krg. (Surgery)			22		**22**
D 1		31			**31**
H 1		46			**46**
H 2	56				**56**
C 1 desno (right wing)	17				**17**
C 2	28		7		**35**
C 2				6	**6**
Skupaj staležnih postelj (Total)	116	77	66	6	**265**

Institute of Oncology Ljubljana in Figures
12 May 2008

Dnevni hospital / Day hospital

Oddelek / sektor Department / Division	Radioterapija Radiotherapy	Interna Medical Oncology	Op. dejavnosti Surgical Oncology	Ambulantna kemoterapija Outpatient Clinic for ChT	Skupaj Total
C 1 levo (left wing)	10	12			**22**
H 1		9			**9**
E 1 krg. (surgery)			10		**10**
D 3 recovery (op. blok)			5		**5**
Cp				10	**10**
Skupaj dnevni hospital (Total)	10	21	15	10	**56**

Vse postelje Grand total	Radioterapija Radiotherapy	Interna Medical Oncology	Op. Dejavnosti Surgical Oncology	Ambulantna kemoterapija Outpatient Clinic for ChT	Paliativna oskrba Palliative care	Skupaj Total
	126	98	81	10	6	321

Polletni podatki na dan 30. 6. 2008
Six-month statement dated from 30 June 2008

Število ambulantnih pregledov / Total number of outpatient examinations	51.661
Prvi pregledi / First examinations	3.415
Ponovljeni pregledi / Follow-up examinations	48.248
Število hospitaliziranih bolnikov / Number of admissions	6.886
Število oskrbnih dni / Number of inpatient days	32.076
Povprečna ležalna doba / Hospitalization (days)	4,6 dni (days)


Miele

Onkološki inštitut včeraj, danes, jutri

Razmišljanje prof. Berte Jereb ob 70-letnici OI

Berta Jereb,
junij 2008

Organizatorji praznovanja 70-letnice Onkološkega inštituta so me povabili, da ob tem dogodku tudi jaz nekaj povem. To mi je predvsem v veselje, sodelovati pri obletnici ustanove kot jo poznam jaz, pa je tudi velika čast.

Na Onkološkem inštitutu sem bila zaposlena trikrat: od leta 1951 do 1961, od leta 1973 do 1975 in nato od leta 1984 do upokojitve leta 1990. Od takrat naprej sem nosilka raziskovalne naloge in še vedno reden »inventar« inštituta. V vmesnih obdobjih sem bila v širnem svetu, nikoli se nisem izneverila svojemu poklicu – onkologiji – in tudi v srcu sem ostala zvesta Onkološkemu inštitutu v Ljubljani. Razvoj in življenje na inštitutu sem doživela v treh različnih časovnih obdobjih z očmi, ki so videle vmes kar precej »velikega sveta«. V onkološki dejavnosti tistega sveta sem aktivno sodelovala, zato si bom dovolila nekaj svojih misli napisati.

Ker bodo o delu, o razvoju, o tehničnih napredkih in o pisanih objavah, v svetu in doma, verjetno še veliko napisali moji mlajši kolegi, bi vam rada povedala nekaj predvsem o ljudeh, s katerimi sem na Onkološkem inštitutu delala. Rada bi vam tudi opisala vzdušje med zaposlenimi na inštitutu, kakršno je bilo takrat. Zunanje okoliščine so se v teh obdobjih razlikovale in družbene spremembe so vplivale na ljudi, način dela in tudi na medsebojne odnose.

Danes se lahko le vprašamo, kaj bi bilo, če ne bi že takrat, leta 1938, izredni ljudje s pogledom v prihodnost in modrim načrtovanjem onkološke dejavnosti ustanovili tega inštituta. **»Z občudovanjem in spoštovanjem se moramo danes spominjati daljnovidnost in smelosti naših pionirjev, da so prav s tako obsežno zasnovo v skrajno skromnih razmerah začrtali naš inštitut. Marsikaj se danes zdi že samo po sebi umevno, vendar pa si zasnova in njena uresničitev nista lahko utirali poti niti ob ustanovitvi inštituta niti kasneje.«** Tako je napisala dr. Božena Ravnihar v knjižici, objavljeni ob 60-letnici inštituta. In prav to spoznanje in spoštovanje do pionirjev je bistveno, saj je v tem spoštovanju rasla odgovornost njihovih takratnih naslednikov, ki so s svojim vodstvom skrbeli za razvoj in ugled inštituta v svetu še v naslednjih desetletjih. Te besede ponavljam v upanju, da bo spoštovanje do preteklosti budilo odgovornost tudi v sedanjih in prihodnjih generacijah zdravnikov.

Tako se je začelo leta 1938.

V prvem nadstropju jugovzhodnega trakta šentpetrske vojašnice so preuredili nekaj prostorov, tako da so vanje lahko spravili 28 bolniških postelj, rentgenske aparate, operacijsko sobo in ambulanto; na podstrešju so bili laboratoriji za diagnostične preiskave in poskuse na živalih.

Oprema za zdravljenje z obsevanjem je bila skromna: majhna količina radija, en večji in dva manjša rentgenska aparata. Delati je začelo pet zdravnikov, vse osebje pa je takrat štelo 24 zdravstvenih in pomožnih delavcev. Uslužbenci, ki so bili na inštitutu že od začetka, so pripovedovali, kako so takrat vsi s strahom pričakovali, ali bodo bolniki prišli v inštitut ali ne, ali bo ideja posebnega zavoda za raka uspela ali ne. Takrat je beseda rak ljudem pomenila zanesljivo smrt.

Če se ozremo po svetu: kje so imeli takrat zavode, po vsebini in načrtovanem razvoju podobne slovenskemu? Tako v Evropi kot v ZDA so onkološke centre večinoma organizirali iz bolnišnic za rakave bolnike, ki so bile namenjene enemu do trem milijonom ljudi. Ponekod so se razvijali iz laboratorijev

Institute of Oncology Yesterday, Today and Tomorrow

Some Reminiscences and Views by Professor Berta Jereb on the Occasion of the 70th Anniversary of the Institute of Oncology

Berta Jereb,
June, 2008

The organizing committee for the celebration of the 70th anniversary of the Institute of Oncology Ljubljana has invited me, on the occasion of such a notable event, to present some of my views and experiences associated with this institution. It is my great pleasure to be among the invitees to the celebrations and a great honor to have the opportunity to present the institute as I know and remember it.

I was employed by the institute three times, in the periods 1951–1956, 1973–1975, and from 1984 until my retirement in 1990. Since my retirement, I have been principal investigator of a research project and, instead of leaving the institute, I have become a true part of the institute's "inventory". During my years of absence from the institute, I traveled through the wide world, but have never given up my profession – oncology – and I have in my heart remained faithful to the Institute of Oncology in Ljubljana. I witnessed the progress of and life at the institute in three different time intervals with eyes that had, in between, seen much of the "great world", and all the time I was deeply and actively involved in oncology there. May I therefore present some of my impressions about the institute as I remember it.

As I assume that my younger colleagues will present in detail the work, development, technical advances and publications in local and foreign medical reviews, I will first and foremost focus on the people I used to work with at the institute. I wish to tell you about the spirit that prevailed. In those times, the cultural and economic circumstances were different from ours today, and social changes had an impact on people, their approach to work and interpersonal relations.

Do we dare to guess what the situation would be today if a few brave men with a clear vision and wise strategy had not established this institute in 1938? **"It is with admiration and respect that we nowadays look upon the courageous visionaries who laid the foundations of our comprehensive institution, despite the extremely scarce means. While many of their achievements may be taken for granted now, it should be kept in mind that their conceptualization and implementation in practice were not always easy – neither at the time of the institute's foundation nor later on."** These are the words that Professor Božena Ravnihar wrote on the occasion of the 60th anniversary of the institute. And it is this recognition and respect for our pioneers that counts because, out of this respect, the responsibility of their disciples for furthering the progress and reputation of the institute arose. I am repeating these words by Professor Ravnihar in the hope that respect for the past will give rise to the same sense of responsibility in the present and future generations of oncologists.

It all started in 1938 …

Some rooms on the first floor of the south wing of the old "Šempeter barracks" were renovated so that they could accommodate 28 patients, X-ray equipment, an operating theater and outpatient clinic; the premises in the attic were readapted to the needs of diagnostic laboratories and animal experiments.

The irradiation equipment was quite modest: a bit of radium, one bigger and two smaller X-ray devices. The institute employed five medical doctors; the total number of personnel added up to 24 health professionals and other associates. The first employees, who worked at the institute from its very foundation, used to tell how anxious they were to know whether patients would start visiting the institute and whether the idea of a special institution for cancer treatment would take hold. In those times, cancer was taken as a death sentence by most people.

ali iz eksperimentalnih raziskovalnih inštitucij. Takšnih zavodov, kot je bil Onkološki inštitut, pa je bilo leta 1938 malo.

Slavni Paterson Institute for Cancer Research v Manchestru je bil ustanovljen leta 1932 z združitvijo bolnišnice Christie in inštituta Holtz Radium. Prvi predstojnik dr. Ralston Paterson ga je vodil do leta 1962 in mu dal ime.

Sloan-Kettering Cancer Center ima svoj začetek leta 1884 v newyorški bolnišnici za raka, leta 1940 so v New Yorku ustanovili Sloan-Kettering Institute za raziskave, Memorial Hospital so zgradili leta 1939, oba pa sta se šele leta 1960 združila v Sloan-Kettering Cancer Center, ki je danes največji onkološki center.

Radiumhemmet v Stockholmu so leta 1910 poimenovali zasebno hišo, v kateri so imeli 16 postelj za bolnice z rakom materničnega vratu, rentgenski aparat in 120 mg radija. Dr. Forssellu, ki je začel zdraviti raka materničnega vratu z radijem po zgledu francoskih zdravnikov, potem pa po lastni metodi, je prva sredstva zagotovila švedska kraljica Viktorija. Metoda se je kmalu pokazala prav tako uspešna kot radikalna operacija, ki jo je uvedel Wertheim. Dela so se lotili zagnano, prvi zdravniki niso prejemali plače. Leta 1937 je bil Radiumhemmet vključen v Karolinsko univerzo. Uspešna in slavna zgodba Radiumhemmeta je nastala z napori osebnosti (Forssell, Sievert, Heyman, Kottmeier, Santesson, Berven), ki so zapisane v zgodovino radioterapije in onkologije.

Predloge za organizacijo in načrtovanje onkoloških ustanov za regije so na Švedskem objavili leta 1974 in jih takole definirali:
• ustanoviti regionalne registre raka, izvajati statistiko in nadzor bolnikov z rakom,
• uvesti programe za zdravljenje raka,
• koordinirati sredstva za zdravljenje raka med bolnišnicami v regiji,
• svetovati in informirati zdravnike in druge zdravstvene delavce v območju,
• ustanoviti možnosti za usposabljanje in vzgojo zdravstvenega osebja vseh kategorij,
• vzpodbujati teoretične in klinične raziskave raka,
• nadzirati psihološke in socialne vidike onkologije,
• svetovati pri masovnih presejalnih programih,
• sodelovati pri obveščanju javnosti.

To organizacijsko shemo so na Švedskem v 70. in 80. letih uresničili tako, da so imele vse regije organizirane registre raka. Vse te naloge so bile že takrat vključene v razvojne dejavnosti Onkološkega inštituta. O tem pričajo objave ob proslavi njegove 25-letnice.

Ko sem bila leta 1951 sprejeta v službo, je bil inštitut že trdno ustanovljen in smernice njegovega razvoja začrtane. V prvih desetih letih so bili moji sodelavci tudi moji učitelji, ki so mi posredovali svoje znanje in istočasno so mi bili prijatelji. V veliki meri so oblikovali moj odnos do onkologije, do bolnikov, obolelih zaradi raka.

Bila sem prvi »mlajši zdravnik«, ki je dobil službo na Onkološkem inštitutu. V letu 1950 je bilo v Sloveniji 1670 novo ugotovljenih primerov raka, v letu 1960 pa že 3400; v tem letu je zaradi raka umrlo

Let us take a look around the world: Where in the world did, at that time, an institution with a similar concept and strategic plan exist? In Europe as well as in the United States, cancer centers emerged from hospitals for cancer patients that had the capacity to cover a population of 1–3 million. In some cases, they emerged from laboratories or experimental research institutes. In 1938, institutions like the Institute of Oncology Ljubljana were few.

The famous Paterson Institute for Cancer Research in Manchester, UK, was established in 1932 after the merger of Christie Hospital and Holtz Radium Institute. The first director, Professor Ralston Paterson, who gave his name to the institute, was its manager until 1962.

The beginnings of Sloan-Kettering Cancer Center date back to early 1884, to New York Cancer Hospital. In 1940, the Sloan-Kettering Institute for Cancer Research was established, whereas Memorial Hospital was built the year before, in 1939. Memorial Sloan-Kettering Cancer Center, the largest cancer center today, was established in 1960 by the merger of Memorial Hospital and the Sloan-Kettering Institute.

Radiumhemmet was the name given in 1910 to a private house in Stockholm, which had 16 beds for patients with cervical cancer, and only one X-ray machine and 120mg of radium. Queen Victoria of Sweden provided the first funds to Dr. Forssell, who started with the treatment of cervical cancer. At first he applied the method of French physicians; later on he introduced his own method, treatment with radium. His method proved to be as successful as radical surgery, known as Wertheim's operation. The staff worked with great enthusiasm – the physicians worked for free. In 1937, Radiumhemmet was attached to Karolinska University. The history of successes at Radiumhemmet is mainly due to the endeavors of six great gentlemen, Messrs. Forssell, Sievert, Heyman, Kottmeier, Santesson and Berven, pioneers in radiotherapy and oncology, whose names were entered into history.

In Sweden, proposals for organizing and setting up regional cancer centers were published in 1974 and ran as follows:
• to establish regional cancer registries, to provide statistics and monitoring of cancer patients;
• to introduce programs for cancer treatment;
• to coordinate the allocation of funds for cancer treatment among regional hospitals;
• to advise and inform medical doctors and health professionals in the region;
• to provide possibilities for training and education of health professionals at all levels;
• to encourage theoretical and clinical research on cancer;
• to follow up psychological and social aspects in oncology;
• to advise in the implementation of mass screening programs, and
• to participate in the promotion of public awareness of cancer.

This organizational chart was implemented in the years 1970–1980, so that by that time each region in Sweden had its own cancer registry. All the above tasks were already included in the development operations of our Institute of Oncology. The publications issued on the occasion of the 25th anniversary of the institute bear witness to this.

In 1951, when I started at the Institute of Oncology in Ljubljana, the institute was already a well-established organization with clear guidelines for future development. In the first 10 years, my

2270 oseb. Obolevnost za rakom se je pri nas v desetih letih torej podvojila**.** Dela je bilo ogromno, razmere za delo in za bolnike zelo revne. Prostori v šentpetrski vojašnici so bili natrpani, bolniki na tleh in na vozičkih po hodnikih. S strahom smo pričakovali vse večji naval bolnikov, saj zaradi prostorske stiske ne bi mogli več vsem omogočiti pravočasnega zdravljenja. V ambulanti je vsak dan na pregled čakalo 100 ali več bolnikov. Tudi bolniških postelj smo imeli blizu 100. Imeli smo dva rentgenska aparata za globinsko in dva za kontaktno obsevanje. Imeli smo radijske tube za površinsko in intrakavitarno zdravljenje, radijske igle za intersticijsko zdravljenje, vsega okrog pet gramov radija. Zdravnikov nas je bilo osem: dr. Serafin Vakselj, specialist rentgenolog, dr. Jože Žitnik, splošni kirurg, in dva ginekologa, predstojnik dr. Leo Šavnik in dr. Rado Poljanšek, ki sta operirala in dajala radij bolnicam z ginekološkim rakom. Radioterapijio je vodila dr. Božena Ravnihar, za specializacijo iz radioterapije sva bili določeni z dr. Danico Žitnik. Bila sem iz mlajše generacije, brez pravega znanja o raku, a z dobro voljo pomagati bolnikom po svoji najboljši moči. Takšno je bilo tudi splošno vzdušje na inštitutu, ki ga je s svojim zgledom vodil profesor Šavnik. Svoje delo smo opravljali z občutkom dolžnosti brez godrnjanja, brez zahtev po boljši plači, po plačanem dežurstvu. Verjamem, da nismo delali slabo. Verjamem, ker mi je to rekel bolnik, ki je zaradi pomanjkanja prostora in postelj ležal na golih tleh ob peči v sobi devet. Tolažila sem ga, da bom poskusila najti posteljo na kakšnem drugem oddelku takratnih kliničnih bolnišnic, pa je rekel: »Nikar, raje sem pri vas, tu ste dobri ljudje in tukaj me boste dobro zdravili.« Odnosi med zdravniki, sestrami, tehniki, med vsem osebjem so bili prijateljski. To so bila še vedno leta po vojni, ko smo bili hvaležni usodi, da smo preživeli, naša osebna pričakovanja so bila zato skromna. Cenili smo solidarnost in prijateljstvo, saj nam je to pomagalo preživeti. Zavedali smo se, da drug drugega potrebujemo, če hočemo uspeti. Čeprav so bili časi težki, revni in še vedno za marsikoga nevarni, je bilo naše prijateljstvo iskreno in skupni napori za zdravje naših težkih bolnikov izredni.

Predstojnika inštituta smo vsi spoštovali in ga imeli za zgled. Takole pove v tistem času o njem dr. Božena Ravnihar.

»Vsem so dobro poznane bedne razmere v našem inštitutu, ki izvirajo iz skrajne stiske s prostori. Znano je, kako malo udobnosti lahko nudimo našim bolnikom in kako naporno je delo osebja v takih pogojih. Da pa se bolniki kljub temu navežejo na našo ustanovo, da se radi, brez strahu in z zaupanjem zatekajo vanjo, da vlada med osebjem dobra volja, da brez pritiska in priganjanja s tolikšno požrtvovalnostjo premaguje vse težave in po najboljših močeh lajša bolnikom njihovo trpljenje, je temu brez dvoma vzrok tisto posebno prijetno in prisrčno človeško vzdušje, ki ga je ustvaril v inštitutu in ga vzdržuje profesor Šavnik prav s svojo osebnostjo.«

Leto 1955 je spomina vredno v razvoju radioterapije v Sloveniji, ker sva tedaj z dr. Danico Žitnik opravili specialistični izpit iz radioterapije in se je radioterapija tako uveljavila kot samostojna panoga medicine. Domišljam si, da sva bili tudi midve še pionirki. Kontaktne terapije z radijem, tako imenovane »brahiradioterapije«, sva se učili tako rekoč z golimi rokami. Povedali so nama, koliko je radija v kakšni tubi ali igli, polagali sva, zabadali, iz »Patersona« računali doze in se sproti učili. Načrt obsevanja z izodoznimi krivuljami smo takrat risali še z roko. Danes je marsikaj zelo drugače. Na voljo so naprave za določanje lege tumorja v globini, načrt za obsevanje izdela računalnik. Kar sva znali, sva se naučili iz knjig, od dr. Božene Ravnihar, ki se je učila in urila leto dni v Radiumhemmetu v Stockholmu, od dveh ginekologov in pa kirurga, ki je pogosto pomagal pri zapletenejših »aplikacijah«.

co-workers were not only my colleagues but also my teachers, who generously helped me with their knowledge and experience, and my good friends as well. They coached me through the period when I was developing my personal approach to oncology and to patients stricken with cancer.

I was the first “junior doctor” to get a job at the institute. In 1950, 1,670 new cancer cases were detected in Slovenia, and in 1960 there were 3,400. That year, 2,270 cancer deaths were registered. Hence, during that decade cancer incidence doubled. We were drowning in work. The working conditions and circumstances in which patients were taken care of were extremely poor. The premises of the old Šempeter barracks were crammed full; patients were lying on mattresses on the floor and on stretchers in the corridors. We were constantly under threat of an even stronger invasion of patients, who would not have received appropriate care because of the limited bed capacity. Every day, 100 patients or more were sitting in the waiting rooms of our outpatient clinic, and the bed capacity was nearly 100 beds. We had two X-ray devices for depth irradiation and two for contact irradiation, radium tubes for superficial and intracavitary treatment, radium needles for interstitial treatment, and 5g of radium altogether. Only eight physicians were employed, including: Serafin Vakselj, specialist in radiology; Jože Žitnik, specialist in surgery; and two gynecologists: Leo Šavnik, the director, and Rado Poljanšek, both specialized in surgical treatment and treatment with radium implantation of patients with gynecological cancer. Božena Ravnihar was head of radiotherapy, and Danica Žitnik and myself were residents in radiotherapy. I was one of the junior generation of doctors, with little knowledge of cancer, but with great will to help to the best of my abilities. This feeling prevailed in the general atmosphere at the institute under the management of Professor Šavnik, who acted as role model for the whole group. We worked with a strong sense of duty, without requiring better salaries or extra paid hours on duty. There is no doubt that we worked well. I believe it because a patient to whom we could offer, due to the lack of beds, only a place on the bare floor near the stove in room 9, said so. I tried to comfort him by promising to find him a free bed at some other department of the nearby clinical hospital, but he insisted on staying with us, saying: “Don’t, I’d rather stay with you, you’re good people, you’ll treat me well.” Relations between doctors, nurses, technicians and other staff were friendly. Those were the times after World War II when we were grateful to the destiny that had kept us alive, and our expectations were therefore truly modest. We cultivated solidarity and friendship, knowing that these values helped us to carry on. We were aware that we needed each other if we wanted to improve. Though times were hard and we were pitiably poor and the world outside our country considered to be dangerous, our friendship was sincere and honest, and all efforts for the health of our patients were unexpectedly exceptional.

We all had high respect for the director of the institute and followed him as our ideal companion. Professor Božena Ravnihar described those times with the following words:

“The miserable circumstances at the Institute of Oncology that arise from the dire need for more room are known to the wide public. What poor comfort we can provide for our patients and how hard the work is in such conditions is also generally known. However, to see that patients like our institute, that they readily – not with fear, but confidence – come to us, that goodwill prevails among the staff, who are coping with all troubles with sacrifice, and without pressure or coercion are trying to alleviate, to the best of their abilities, the pain and suffering of the patients – to witness all that, we could all agree that the extremely kind and caring ambiance that prevails at the institute arises from Professor Šavnik, who created it with his admirable and exceptional personality.”

Onkološki inštitut včeraj, danes, jutri

Pobudo za uvedbo radioterapije kot samostojne specialne medicinske stroke je dala dr. Božena Ravnihar. Takrat smo imeli v Sloveniji (tudi v večini drugih evropskih držav) le specializacijo iz radiologije, v kateri sta bili združeni diagnostika in terapija. Z Danico sva morali za domačo nalogo preštudirati knjigo Ralstona Patersona Zdravljenje malignih bolezni z radijem in rentgenskimi žarki (Treatment of malignant disease by radium and X-Rays), izdano v Londonu 1952, in Keppovo Grundlagen der Strahlenbehandlung (izdano v Stuttgartu 1951). Sama sem pred tem že prebrala knjigo Cancer, ki sta jo napisala Ackerman in del Regato (izdano v Londonu 1947). Knjiga je še vedno aktualna, tako kot stavek v uvodu: »Če vam bolnik umre, nikar ne recite, da je tako imel raka. Vprašajte se raje, kaj bi z naslednjim bolnikom naredili drugače, da bi ga ozdravili.« Ta stavek mi je ostal v spominu za vse življenje in naj bi bil vodilo pri delu vsakega zdravnika, ki zdravi bolnika z rakom.

Prav nič nismo pametnejši kot takrat, enako se lotevamo istih problemov, le da imamo na razpolago tehnične pripomočke, ki nam bistveno olajšujejo natančno opredelitev lege in velikosti tumorja v telesu, za določitev obsega predela, ki ga je treba zdraviti.

Vse te naprave so dragocene in drage, vendar ne morejo nadomestiti razmišljanja zdravnika, ki je včasih v množici podatkov v nevarnosti, da pozabi na bistveno – na ovrednotenje podatkov in celotno oceno bolnikovega stanja.

Ko sem po končanem stažu leta 1951 dobila službo na Onkološkem inštitutu, mi je prof. Leo Šavnik ob sprejemu rekel: »Zelo vas potrebujemo, veliko imamo dela za vas, pridite kar v ponedeljek.« Malo sem se ustrašila in rekla: »Gospod profesor, z mano si boste slabo pomagali, saj o raku ničesar ne vem.« Skromno mi je odgovoril: »Skupaj se bova učila, saj boste videli, kako malo vemo tudi mi.« Tako mi je vtisnil v zavest to, da vemo malo in da se moramo kolegi skupaj učiti. Največ smo se takrat naučili ob delu z bolniki. Vse bolnike z rakom smo redno kontrolirali na Onkološkem inštitutu. Redna kontrola bolnikov po končanem zdravljenju je bila potrebna predvsem zato, da smo jim lahko pomagali ob ponovnih pojavih bolezni. V zgodnjih letih nismo imeli kemoterapije, ki bi učinkovala povsod v telesu, kjer so rakaste celice. Periodično smo preiskovali bolnike, »lovili« bolezen in bili pri tem vedno korak za njo. Hkrati smo se učili razvoja bolezni, saj nekateri raki, ko se pozdravijo na prvotnem mestu, rajši zasevajo v kosti, drugi v pljuča. Vsega tega smo se učili sproti in porabili v korist pri zdravljenju bolnikov, ki so na novo prihajali. Danes za različne rake vemo, kje se po prvem zdravljenju lahko znova pojavijo. Tako jih »pričakamo« in jim to lahko preprečimo s sistemskim zdravljenjem. V zgodnjih 60. letih se je inštitut, še vedno v šentpetrski vojašnici, razširil tako, da je bilo postelj za 150 bolnikov, opremljen je bil z vso najpotrebnejšo opremo za sodobno zdravljenje raka; zaposlenih je bilo 27 zdravnikov in strokovnjakov drugih panog, število osebja pa se je povečalo na 185.

Leta 1975 sem se po 12 letih dela v Stockholmu in enoletnem obisku Sloan-Kettering Memorial Hospitala vrnila v Ljubljano. Dr. Ravniharjeva mi je ponudila službo strokovne direktorice. Božena je po smrti dr. Šavnika leta 1964 ostala sama. Čeprav po značaju zelo različni osebnosti, sta se odlično izpolnjevala pri njunem skupnem cilju in predanosti onkološkim bolnikom. Dr. Šavnik je zapustil veliko praznino, problemi onkologije so se večali, bolnikov je bilo vedno več, prav tako so se večale zahteve po prostorih in opremi. Tudi politika je bila v tistih letih bolj vplivna kot prva leta, ko so ugledni in vplivni ljudje menili, da je onkologija brezizgledna stroka revnih. Božena, zelo osamljena, se je počasi umikala. Nasledniki pa niso zmogli dosegati višine svojih predhodnikov.

Institute of Oncology Yesterday, Today and Tomorrow

The year, which should be considered a milestone in the history of radiotherapy in Slovenia, is 1955, because that year Danica Žitnik and myself passed the Board Exam for Radiotherapy – radiotherapy was thus approved as an independent medical specialty. I presume that we were pioneers. We were learning contact therapy with radium, the so-called “brachyradiotherapy” with bare hands. We were taught how much radium a tube or needle contained; we were implanting or inserting them, calculating doses from Paterson and improving our knowledge on the job. Irradiation treatment plans with isodose curves were at that time hand-drawn. Today, the situation is much different. In-depth tumor localization is performed by special localization devices, whereas the treatment planning is computerized. Whatever we knew, we learned from the literature, from Professor Božena Ravnihar, who spent a year at Radiumhemmet in Stockholm, from the two gynecologists and from the only surgeon, who often helped us when “applications” were too complicated.

Radiotherapy was approved as an independent medical specialty on the initiative of Professor Božena Ravnihar. Until then, only specialization in radiology, which covered diagnostics and therapy, could be obtained in Slovenia (and in the great majority of European countries). Danica and I were given a homework assignment: to read the books Treatment of Malignant Disease by Radium and X-Rays by Ralston Paterson, issued in London in 1952, and Grundlagen der Strahlenbehandlung by Kepp, issued in Stuttgart in 1951. Before that, I had already read Cancer by Ackerman and del Regato, issued in London in 1947. This book is still invaluable, as the sentence it starts with reads: “If your patient dies, don’t say: after all, he had cancer. Rather ask yourself what, with the next patient, you would do differently.” I will bear this sentence in my mind all my life, and it should be adopted as guiding principle by all therapists who treat cancer patients.

We are no wiser than we were in those times; we are approaching the same problems from the same point of view, except that we now have at our disposal devices that help us to determine the exact location and volume of a tumor and the size of the area that needs to be treated.

Though these devices are of invaluable assistance and most expensive, they cannot replace the wisdom of a therapist – who, however, overwhelmed by the multitude of data, may forget the essential things: assessment of data and overall evaluation of the patient’s condition.

Having completed my internship in 1951, I got a job at the Institute of Oncology. Upon receiving me, Professor Šavnik said: “We need you badly. We have a lot of work to do. Come on Monday.” Instantly, I got scared and replied: “Sir, I won’t be of much help to you, I don’t know anything about cancer.” His reply was unexpectedly modest: “We shall both learn together. You will be surprised to see how little we too know about cancer.” He thus made me aware that our knowledge about cancer on the whole was poor and that we had to join our forces to learn more about it. At that time, we gained most new knowledge from practice, through our contact with cancer patients. All cancer patients were regularly followed up at the Institute of Oncology. Regular follow-up of the patients after completed treatment was necessary mainly because we could more readily offer help to them in case of disease recurrence. In those early years chemotherapy, which would react systemically to the disease, i.e. to all parts of the body where cancer cells were present, was not yet widely used. We were periodically examining patients, trying to “catch” the disease, but we always found ourselves a step behind it. We were learning about the course of the disease by following up our patients, as some cancers, after the primary incidence is cured, tend to

Vedno več ozdravljenih

Kljub naraščajoči obolevnosti za rakom se je v Sloveniji umrljivost zaradi raka po letu 1985 zmanjšala za več kot 1 %. V letih 1992–1994 je bilo na leto v povprečju prijavljenih 7334 novih primerov, od teh umrlih 4454; od 10.226 na leto prijavljenih novih primerov raka v letih 2002–2004 jih je umrlo 5037.

Izrazito se je zmanjšala umrljivost otrok zaradi raka. Kljub naraščanju obolevnosti njihova umrljivost upada. Od povprečno 50 obolelih na leto jih preživi več kot 30 (diagram 1).

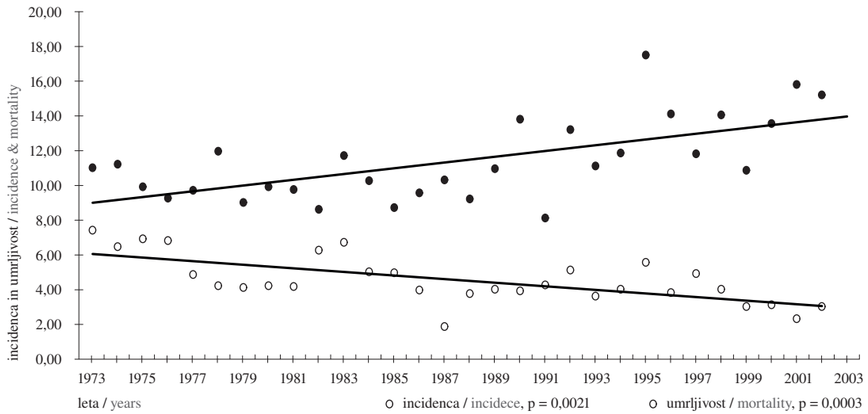


Diagram 1. Porast incidence in upad umrljivosti pri otrocih, starih od 0 do 15 let, v obdobju 1973 do 2004 (Register raka za Slovenijo, Onkološki inštitut Ljubljana).

Diagram 1. Increase of incidence and decline of mortality in children (0-15 years) with cancer in Slovenia. Provided by Cancer registry of Slovenie, Institute of Oconcology, Ljubljana.

Preživetje bolnikov z rakom se stalno izboljšuje zaradi zgodnejšega odkrivanja bolezni in izboljšanja zdravljenja, zlasti kemoterapije. Odraslih bolnikov pozdravimo že dobro polovico, otrok z rakom kar tri četrt.

Zadnja desetletja nismo več zadovoljni le s samim ozdravljenjem, ozdravljenemu želimo zagotoviti tudi najboljšo možno kakovost življenja. Zlasti je to pomembno za tiste mlade bolnike in otroke, ki imajo po ozdravljenju pred seboj še dolgo življenje. Od teh ozdravljenih smo se naučili tudi, kakšne so lahko posledice zdravljenja. S pomočjo izkušenj se poskušamo pri izbiri načina zdravljenja naslednjega bolnika izogniti posledicam. Zdravljenje se trudimo čim bolj »prikrojiti« vsakemu posameznemu bolniku. Temu cilju se bližamo počasi, a vztrajno. Splošno sprejeto mnenje je, da je otroke in mladostnike, ki so preživeli raka, treba spremljati do konca življenja in ugotavljati posledice zdravljenja njihove bolezni. Kadar je to možno, je treba opuščati za povzročanje posledic preveč škodljive načine zdravljenja in preživelim zagotavljati čim boljšo kakovost življenja. Na Onkološkem inštitutu imamo program vseživljenjskega sledenja preživelih od raka v otroštvu že od leta 1986. Za tak program imamo edinstvene razmere. Ker smo majhna država, ker imamo center za zdravljenje raka pri otrocih in predvsem ker imamo register raka, ki ga je že leta 1950 ustanovila dr. Božena Ravnihar, vemo za vse nekdanje bolnike in jih povabimo na kontrole. Včasih se zdi, da smo na začetku nove poti. Spet se sproti in s pregledi nekdanjih bolnikov učimo, kakšne posledice še več let po ozdravlje-

metastasize into the bones others to lung. We were acquiring all this knowledge through our work, and we used it for the benefit of the next patients. Today we know for various cancers where, after primary treatment, recurrence may develop, and we can wait there for it and prevent its further progression by systemic treatment. In the early sixties, the institute was still working in the old Šempeter barracks; however, it was expanded so that its capacity reached 150 beds. The institute had most therapeutic devices for carrying out up-to-date cancer treatment and employed 27 therapists and experts in treatment-related areas; the overall number of the staff thus increased to 158.

In 1975, after 12 years of work in Stockholm and one year at Sloan-Kettering Memorial Hospital, I returned to Ljubljana. Professor Ravnihar offered me the post of medical director of the institute. After the death of Professor Šavnik in 1964, Božena was left alone. Though they were two personalities with entirely different characters, they were a couple who agreed excellently in fulfilling their joint goals and in their mutual endeavors to help cancer patients. A great hole appeared; moreover, the problems in Slovenian oncology had started to pile up, and the number of cancer patients was rising. Thus the need for more working space and technical equipment were increasing accordingly. Politics then had a more influential role than in the first year after the war; distinguished and eminent personalities were convinced that oncology was a medical domain with no prospects, that it was to serve only the poor. Božena was a solitary light that was slowly fading away, while her successors could never reach the visionary goals of their forerunners.

An Increasing Cure Rate

Despite higher cancer incidence, the cancer-related death rate declined by more than 1% in 1985. In the years 1992–1994, roughly 7,334 new cancer cases were registered and 4,454 deaths reported per year, whereas in the years 2002–2004, 10,226 new cancer cases were registered and 5,037 deaths were reported per year. The death rate for childhood cancer significantly decreased and is still decreasing, despite higher incidence. Out of 50 children who are diagnosed with cancer per year, more than 30 survive.

The survival of cancer patients is improving from year to year, which is mainly due to earlier detection of the disease and advances in treatment approaches, in particular in chemotherapy. Today, almost half of adult patients and three quarters of children are successfully cured of cancer.

However, in recent decades we no longer consider a cure as a sufficient standard of success; rather, we try to assure the best possible quality of life to the patients who are cured. This is of vital importance, particularly for adolescents and children whose whole life lies ahead of them after the cancer is cured. And from these cured survivors, we have been learning about the late sequelae of cancer treatment. Following the experiences we have gained so far, we try to avoid the sequelae by selecting a more adequate treatment modality for the next patient. We always try to the best of our ability to adjust the treatment scheme to each individual patient. We are slowly yet surely approaching this goal. It has been generally agreed that adolescents and children who have survived cancer must be followed up for life in order to identify all sequelae of cancer treatment. Whenever possible, treatment methods that prove to be too toxic and bring about too many sequelae should be given up in order to assure a better quality of life to the survivors. At the Institute of Oncology, a program on lifelong follow-up of

nju lahko zapustita bolezen in njeno zdravljenje. Take nekdanje bolnike lahko opazujemo šele zadnja desetletja, prej so umirali, ker zanje nismo imeli uspešnih načinov zdravljenja. Zadnje desetletje v Sloveniji pozdravijo tri četrtine otrok z rakom. Tako kot pred desetletji pa ni nič lažje prodreti z novimi dognanji in spremeniti miselnosti ljudi, tudi zdravnikov. Tudi po mnogih desetletjih beseda rak v ljudeh še vedno vzbuja strah in za mnoge ozdravljene tudi sramoto.

Otroška onkologija je v marsičem utirala pot z novim načinom zdravljenja raka, pa tudi z rehabilitacijo po končanem zdravljenju. S preiskavami pri psihologih smo ugotovili, da imajo mnogi ozdravljeni od raka v otroštvu čustvene težave, ki jim otežujejo njihovo pot v življenju: pri učenju, pri zaposlovanju in zaradi njihovega nagnjenja k osami. Otroci, ozdravljeni od raka, imajo pred seboj še dolgo življenje. Leta 1992 je bil na 1000 oseb med 15. in 45. letom starosti en nekdanji bolnik z rakom. Leta 2000 bo to eden od 900 in leta 2010 bo verjetno že eden od 250 ljudi. Te številke povedo, kako pomembno je, da se ta posebna skupina ljudi s svojo edinstveno življenjsko izkušnjo aktivno vključuje v našo družbo. Zato skrbimo za ozaveščanje ljudi, njim pa pomagamo tako, da jih vabimo v skupine, kjer se z vrstniki z enako ali podobno izkušnjo lahko sproščeno pogovarjajo o svojih težavah in si najdejo trajne prijatelje. V ta namen smo leta 1996 ustanovili ustanovo Mali vitez, fundacijo za pomoč mladim, ozdravljenim od raka.

Vendar še vedno zaostajamo pri zgodnjem odkrivanju nekaterih oblik raka pri odraslih. V Sloveniji že delujejo programi za zgodnje odkrivanje raka na maternici, izpopolnjuje se program zgodnjega odkrivanja raka na dojki in uvaja se program odkrivanja zgodnjega raka na debelem črevesju. Težnja, izražena že pred desetletji, se počasi le uresničuje.

Leto 2008

To je za slovensko onkologijo pomembno leto. Z velikimi problemi in ob javnih razpravah kar po vsej Sloveniji so se bolniki letos iz šentpeterske vojašnice preselili v novo, sodobno stavbo Onkološkega inštituta, ki so jo gradili 10 let, in ima, žal, mnoge pomanjkljivosti. Med zaposlenimi na Onkološkem inštitutu je zaradi stresa in v veliki meri tudi zaradi pritiska medijev prišlo do raznih sporov. A upam, da se bo to umirilo, ko se bo razvijalo redno delo ob bolnikovi postelji. Ob tem ne morem pozabiti tistih novinarjev, ki so ob vseh težavah in problemih »sodobne zgradbe« vztrajno pisali in govorili o »konjušnici«, v kateri so še do pred kratkim bili oskrbovani slovenski bolniki z rakom. Saj vemo, da to nikoli ni bila konjušnica.

Gradnja novega inštituta je bila v načrtih vodstva že leta 1963 in dodeljena so bila sredstva za projektiranje nove stavbe na drugi strani Ljubljanice. To bi bilo po mnenju mnogih današnjih arhitektov, leta 2008, (45 let kasneje!) bolj človeško, saj bi imeli bolniki in medicinsko osebje pogled na Ljubljanico in bolnišnični park bi bil v večji meri ohranjen kot je danes. Žal se to ni zgodilo. Zgradili so nov klinični center, bolniki z rakom pa so morali počakati. Ker smo pravkar za onkologijo dogradili veliko, novo stavbo, ki se vsa sveti v steklu, bom navedla še nekaj stavkov, ki jih je zapisal leta 1946 Cutler, tudi pionir v onkologiji. V slovenščini se bi glasili nekako takole: **»Pri ustanavljanju onkološkega inštituta ali bolnišnice je najpomembnejši korak izbira zdravnikov. Pri tem se je treba zavedati, da je ta izbira edini pogoj za uspeh ali neuspeh projekta; niti stavba niti obseg opreme ne bosta odločilni dejavnik, ampak vzgoja, zasnova, znanje, izkušnje, vzdušje, fantazija in idealizem vodstva in**

successfully treated survivors of childhood cancer has been carried out since 1986. The conditions for carrying out such a program are ideal. As we are a small country, we have one center for childhood cancer treatment, and as we have a cancer registry, which was established in 1950 on the initiative of Professor Božena Ravnihar, we have at our disposal all data on former cancer patients and can therefore invite them for follow-up checks. Most developed countries cannot do it this way, since they still don't have a national cancer registry and cannot see all former cancer patients in one facility. They send out questionnaires. Our former patients are all seen by doctors, to the benefit of them and of the profession. It sometimes seems as if we are at the very beginning of a new path, and again we are faced with the challenge to learn more from practical experience by examining patients in order to see what the late effects of treatment are several years after the cancer is cured. Following up these patients is feasible only in recent decades, because earlier the patients with childhood cancer were dying. In the last decade, three quarters of all children affected with cancer were cured in Slovenia. However, today it is still no easier than it used to be to make a breakthrough with new ideas and to change the attitude of people or even doctors toward cancer. Though many years have elapsed, the term »cancer« still sounds ominous, whereas for many of those who have been cured of it, cancer is a social stigma.

Childhood oncology and rehabilitation after completed therapy have in many respects paved the way for new treatment modalities. Psychological studies made on patients cured of cancer in childhood revealed that they suffered from a number of emotional problems that made their life more difficult – for instance, they had learning difficulties or encountered problems in getting a job, which were mainly due to their inclination to isolation. Children who have been cured from cancer have just trodden the long life path ahead of them. In 1992, one per 1,000 adolescents aged between 14 and 15 years was cured of childhood cancer; in 2000, one out of every 900 adolescents aged between 14 and 15 years was cured of cancer, and in 2010, one of every 250 adolescents will be a cured cancer patient. These data show how important it is that this most specific group of people with their specific life experience is actively included in society. We are therefore doing our best to make people aware of the risk of social discrimination, and we are bringing together cured patients by inviting them to join groups in which they can more easily communicate with those who have undergone the same or similar experience, or in which they can find a friend. To this end, the Mali Vitez (Little Knight) foundation was established in 1996, intending to draw together and help young people being treated for cancer.

Despite our best endeavors, we are still lagging behind other countries in early detection of some cancers in adults. Some programs for early detection of cancer have already been launched in Slovenia; the screening program for early detection of cervical and breast cancer is already in full operation, whereas the screening program for colorectal cancer will be started in the near future.

The Year 2008

is a milestone in Slovenian Oncology. This is the year when the patients were moved, with great problems, pomp and endless public discussions, from the old Šempeter barracks to the new building of the Institute of Oncology. The construction of this building took 10 years; nonetheless, it still has numerous deficiencies. The employees at the institute underwent many stressful situations and much public media pressure, which caused quarrels among them. I sincerely hope that things will calm

njegovih sodelavcev. Rast in razvoj inštituta naj bosta odvisna in omejena samo od znanstvenih doprinosov in dosežkov.« Naši pionirji onkologije so se vsega tega očitno dobro zavedali.

Res je, da se je v slovenski onkologiji po prvih pionirskih dosežkih in neverjetnem vzponu in širitvi razvoj ustavil za več desetletij. Vzroki za to niso neznani. Težko je proces, ki vodi navzdol, ustaviti, še težje spet obrniti v napredek. A kaže, da bo šlo, kljub mnogim birokratskim oviram in pomanjkanju kadrov vsaj dveh generacij. Med mladimi onkologi je kar nekaj takih, ki jemljejo svoj poklic v onkologiji resno in zagnano, imajo fantazijo, in verjamem, da imajo ideale. Kar se mi zdi tudi zelo pomembno in daje upanje za uspešno prihodnost, je njihovo medsebojno prijateljstvo in spoštovanje, to, da se razumejo in si pomagajo. Danes imamo na razpolago nova spoznanja, visoko tehnologijo in mnoga učinkovita sredstva za zdravljenje raka. Zgodovina razvoja Onkološkega inštituta pa nas uči, da so za uspehe in razvoj najpomembnejši ljudje.

down when work beside the patients' beds again resumes its normal course. However, I cannot stop thinking about the journalists who were in addition to all the troubles and problems that the staff and patients were faced with in the completely new, "modern" building, over and over again writing and talking about "horse stables", in which, not long ago, all Slovenian cancer patients were cared for. To our knowledge, this building never was used as a horse stable.

The urgent need for a new Institute of Oncology is evidenced in the strategic plans prepared by the management of the institute in 1963. Funds were allocated and available for the design and construction of a new building across the river Ljubljanica. According to the view of many architects these days (45 years later!), that location would be much more humane and patient-friendly, as the patients and hospital staff would have a marvelous and relaxing view of the river and the hospital park would be preserved to a greater extent than it is now. Unfortunately, those dreams never came true. A new medical center was built instead, while cancer patients had to wait. As Slovenian oncology has just now moved to a big, new, modern building, all shiny and glossy with a glass façade, I will quote some sentences that Cutler, another distinguished pioneer in oncology, wrote in 1946: In establishing a cancer institute or hospital, the most important step is choosing the staff. "The staff of the institute must be chosen with the realization that upon this selection alone depends the success or failure of the project; that neither the building nor the size of the endowment but the background, training, experience, spirit, imagination and idealism of the leaders and their associates will be the determining factors. The growth of the institute must be controlled and limited solely by its scientific contributions and accomplishments". The early pioneers of oncology were deeply aware of these vital facts.

It is true that, after the initial achievements in oncology in Slovenia and an incredibly high rise and expansion, its further development was blocked for some decades. The reasons are not unknown. It is hard to stop a process heading downwards, even harder to turn it upwards again. It nevertheless seems the process will take the right direction, despite bureaucratic obstructions and the shortage of at least of two generations of specialized personnel. Among the junior generation of oncologists, many are highly motivated and committed to oncology, with vision, energy and high ideals. In my view, the prospects lie in their friendship. It is friendship, mutual assistance and respect that count and give hope for a successful future. Today, information on new achievements, high technology and a multitude of effective anti-cancer drugs is available. In the lessons learned from the history of the Institute of Oncology have taught us that the vital force of success and progress is human beings.

Strokovno delo

Epidemiologija in register raka

Vodja:
izr. prof. dr.
***Maja Primic-Žakelj**,*
dr. med.

Področje dejavnosti in pomen službe

Služba Epidemiologija in register raka je nastala leta 2003, ko je novi statut Onkološkega inštituta Ljubljana združil Register raka za Slovenijo (RRS) z Enoto za epidemiologijo v enotno službo. V njej so poleg državnega registra raka še Bolnišnični register Onkološkega inštituta (BROIL), oddelek za epidemiologijo ter presejalna enota z registrom organiziranega presejanja za raka materničnega vratu (ZORA) in za raka dojk (DORA).

RRS je eden najstarejših registrov raka v Evropi. Leta 1950 ga je ustanovila in do leta 1975 vodila pokojna profesorica dr. Božena Ravnihar. Njeno delo je prevzela profesorica dr. Vera Pompe Kirn, ki je do upokojitve leta 2003 skrbela za nadaljnje uveljavljanje RRS v domačem in mednarodnem merilu. Velik del podatkov RRS posreduje BROIL, ki omogoča podrobnejši pregled nad bolniki, zdravljenimi v naši ustanovi, ne glede na to, kje imajo stalno prebivališče. V zadnjem desetletju smo vzpostavili nov državni register za vodenje in spremljanje organiziranega presejalnega programa za raka materničnega vratu (ZORA), kjer se zbirajo citološki izvidi brisov materničnega vratu in histološki izvidi iz vse države. Od leta 2007 ustvarjamo informacijski sistem DORA, ki bo informacijska podpora organiziranemu presejalnemu programu za raka dojk.

Dejavnost oddelka za epidemiologijo skupaj z RRS in presejalnimi registri zagotavlja celovito obravnavo onkološke epidemiologije v Sloveniji. Strokovno obdelujemo rutinsko zbrane podatke in izdajamo letna poročila, opravljamo posebne raziskave na željo uporabnikov, s številnimi prispevki sodelujemo na strokovnih srečanjih, tudi z vabljenimi predavanji, doma in v tujini. S podatki se vključujemo v mednarodne podatkovne zbirke in mednarodne raziskave. Sodelujemo v Mednarodni in Evropski zvezi registrov raka ter na srečanjih teh zvez predstavljamo rezultate svojega dela. S poglobljenim proučevanjem zbranih podatkov spremljamo tudi uspešnost in učinkovitost programa obvladovanja raka ter opravljamo druge epidemiološke raziskave.

Služba je učna baza iz onkološke epidemiologije za študente do- in podiplomskega študija medicine ter drugih zdravstvenih šol. Podatki RRS pomagajo tudi drugim raziskovalcem za posebne raziskave, magistrske in doktorske naloge. Seznam pomembnejših del, objavljenih v zadnjih petih letih, objavljamo v rednih letnih poročilih RRS.

Strokovno sodelujemo tudi z nevladnimi organizacijami na področju preprečevanja raka, predvsem z Zvezo slovenskih društev za boj proti raku.

Dosežki v zadnjih desetih letih

Rednim letnim poročilom RRS v knjižni obliki od leta 2003 dodajamo spletno verzijo, tako da je poročilo dostopno čim širšemu krogu uporabnikov. Ker nas pri letu, na katero se poročilo nanaša, omejuje tehnologija zbiranja podatkov, v zadnjih letih poročilom dodajamo tudi ocenjeno incidenco za tekoče leto, v katerem smo poročilo izdali.

S podatki RRS, registra ZORA in posebej zbranimi podatki smo v zadnjem desetletju sodelovali v številnih mednarodnih podatkovnih zbirkah in projektih. Od podatkovnih zbirk velja omeniti pu-

Professional Work

Epidemiology and Cancer Registry

Head of the Unit:
Assoc. Prof.
***Maja Primic-Žakelj**,*
M.D., Ph.D.

Operational Scope and Mission of the Division

The Epidemiology and Cancer Registry was founded in 2003 when, according to the new statute of the Institute of Oncology, the Cancer Registry of the Republic of Slovenia and the epidemiology unit were merged together into one operational unit. The new division consists of the Cancer Registry of the Republic of Slovenia, the Hospital-Based Cancer Registry of the Institute of Oncology Ljubljana, the epidemiology unit, and screening units with the registries ZORA (cervical cancer screening program) and DORA (breast cancer screening program).

The Cancer Registry of Slovenia is one of the oldest population-based cancer registries in Europe. It was founded in 1950 at the Institute of Oncology in Ljubljana by the late Prof. Božena Ravnihar, who was at its head until 1975. This task was then entrusted to Prof. Vera Pompe-Kirn, who until her retirement in 2003 conducted the registry and further promoted its role at the national and international level. At least half of the data is supplied by the Hospital-Based Cancer Registry, which registers all data on patients who have been treated at our institution, regardless of their place of residence. In the most recent decade, a new national registry for implementation and monitoring of the organized cervical cancer screening program, known as ZORA, was established; the registry gathers smear test results and histology findings for the whole country. Since 2007, another information system called DORA, which will serve as informational support to the organized breast cancer screening program, has been under construction.

The epidemiology unit, together with the Cancer Registry of Slovenia and the screening registries, provides a comprehensive organization of cancer epidemiology in Slovenia. In the division, routinely gathered data are regularly processed and published in yearly reports; additionally, special studies are performed according to the requests of users, and members of the staff attend – often as invited lecturers – expert meetings at home and abroad, where they present papers. Our data are included in international databases and are often used in international studies. We also cooperate with the International Association of Cancer Registries and the European Network of Cancer Registries, and we regularly present the results of our work at the meetings of these unions. We monitor the success and efficiency of the National Cancer Control Program by in-depth analysis of the gathered data. We also carry out a number of other epidemiological studies.

Our services also serve as a learning base for undergraduate and graduate students who read epidemiology in oncology at the medical faculty and at other medical schools. Furthermore, the data stored in the Cancer Registry of Slovenia are available to investigators engaged in specific research studies, and to master's and doctoral candidates preparing their theses and dissertations. The list of the most eminent papers published in the last five years regularly appears in the registry's yearly reports.

In the domain of cancer prevention, our department also cooperates with non-governmental organizations, such as the Association of Slovenian Cancer Societies.

blikacijo Rak na petih kontinentih (Cancer Incidence in Five Continents), ki jo izdaja Mednarodna agencija za raziskovanje raka iz Lyona. V letu 2007 je izšel deveti zvezek, ki prikazuje podatke iz let 1998–2002, še pred tem pa je bila leta 2005 obnovljena celotna zbirka, s slovenskimi podatki od leta 1963. Priprava podatkov za ti dve zbirki je bila poseben izziv, saj je bilo treba podatke o mestu raka in histološki vrsti, kodirane po raznih klasifikacijah, ki so veljale v določenih časovnih obdobjih, prevesti v enoten sistem Mednarodne klasifikacije bolezni za onkologijo (3. izdaja). Kljub avtomatskim pretvornikom je bilo treba marsikaj pregledati, popraviti ali prešifrirati tudi ročno.

S podatki RRS sodeluje še v projektu ACCIS (Automated Childhood Cancer Information System), ki je namenjen raziskovanju raka pri otrocih. V podatkovni zbirki so podatki 80 populacijskih registrov raka, ki pokrivajo približno polovico otrok in četrtino adolescentov, ki živijo v 35 evropskih državah; zadnja analiza je bila objavljena konec leta 2004.

Leta 2003 je izšla druga samostojna publikacija o preživetju slovenskih bolnikov z rakom v letih 1983–1997. Te analize so prispevek k boljšemu vrednotenju uspešnosti celovitega boja proti raku v naši državi. Slovenski podatki so vključeni tudi v raziskave preživetja v Evropi (EUROCARE), izsledki četrte so bili objavljeni leta 2007. Leta 2008 pa je tudi s slovenskimi podatki izšla raziskava CONCORD, ki opisuje preživetje bolnikov z rakom v svetu. Sodelavci naše službe so bili ali so še vedno udeleženi še v drugih mednarodnih raziskavah oz. raziskovalnih skupinah, kot so npr. COS, EUROGAST, EUROPREVAL, EUROCHIP-II in III, EUROCAN+PLUS, EUNICE, EUROCOURSE, RARECARE, v raziskavi o drugih primarnih rakih v Evropi, v Mednarodni skupini o hormonskih dejavnikih in raku dojk (Collaborative Group on Hormonal Factors and Breast Cancer) in v skupini, ki pripravlja zemljevid raka na alpskem območju Evrope.

V zadnjih letih smo naredili velik napredek tudi pri proučevanju prostorske razporeditve raka v Sloveniji. V epidemiološko službo redno dobivamo poizvedbe o morebitnem povečanem tveganju raka na posameznih manjših slovenskih območjih. Na vsako tako vprašanje poskušamo odgovoriti primerno hitro in strokovno korektno. V veliko pomoč nam je uporaba novih statističnih metod in moderne programske opreme, vezane na GIS-tehnologijo. Specifične geografske epidemiološko-statistične študije sta vpeljali in jih pripravljata sodelavki Vesna Zadnik, specialistka javnega zdravja, ki je leta 2006 doktorirala iz prostorske analize, ter mlada raziskovalka, statističarka Tina Žagar, ki v svoji doktorski raziskavi razvija še nove pristope za prostorsko analizo podatkov registra raka.

Veliko priznanje za RRS je bilo imenovenje prof. dr. Vere Pompe Kirn, dr. med., za ambasadorko RS za znanost in za višjo svetnico. Gotovo je tudi njena dolgoletna dejavnost v Mednarodni zvezi registrov raka pripomogla k temu, da smo imeli leta 2007 čast z Mednarodno zvezo registrov raka organizirati svetovni kongres registrov raka v Cankarjevem domu v Ljubljani in hkrati z Evropsko zvezo registrov raka še tečaj o prostorski epidemiologiji.

Smer razvoja v prihodnosti

Vsa leta si v RRS, pa tudi v drugih registrih, prizadevamo izpopolnjevati kakovost in tehnologijo obdelave podatkov. Zadnjič je bila tehnologija RRS posodobljena leta 1999, že dve leti pričakujemo nadaljnjo posodobitev, predvsem pa uvedbo elektronske prijavnice raka in tehnološko bolj izpopol-

Major Achievements in the Last Decade

When the regular yearly report of the registry appears in print, an electronic version is also posted to the home page and is thus made accessible to a wider range of users. As technology limits us in gathering data for the year of publication, in the last few years we have added to each new report the predicted incidence for the year in which the report is published.

The data gathered by the Cancer Registry of Slovenia and by ZORA, as well as other specially collected data, are shared by numerous international databases and projects. Among the databases, »Cancer Incidence on Five Continents«, issued by the International Agency for Research on Cancer in Lyon, is worth mentioning. In 2007 the ninth volume, presenting data from 1998 to 2002, was issued. Prior to this edition, the entire collection was revised in 2005, so that data from Slovenia from the year 1963 were also included. The data processing for these two publications was particularly challenging because the data on cancer site and histology were coded using various classifications, such as were in force in the corresponding time periods; therefore, decoding and translation into the standardized system laid down by the International Classification of Diseases for Oncology, third edition, had to be carried out. Although an automatic data translation method was used, a great deal of the material had to be rechecked, corrected or recoded manually.

Our registry also supplies data to the project ACCIS (Automated Childhood Cancer Information System), intended for research studies on childhood cancer. The database contains data from 80 population-based cancer registries covering about half the children with cancer and a quarter of adolescents from 35 countries; the most recent analysis was published in 2004.

In 2003, another independent publication on cancer patients' survival in Slovenia between 1983 and 1997 was published. The aforementioned analyses are a valuable contribution to better evaluating the cancer control program in Slovenia. Data from the Slovenian Cancer Registry are also included in research studies on the survival rate in Europe (EUROCARE); the results of EUROCARE IV were published in 2007. In 2008 a CONCORD study, which is an overview of the global survival of cancer patients, was published. Members of our team were (and some still are) participating in several international research projects or groups, e.g. COS, EUROGAST, EUROPREVAL, EUROCHIP-II and III, EUROCAN+PLUS, EUNICE, EUROCOURSE and RARECARE, as well as in investigations on second primaries in Europe, in the Collaborative Group on Hormonal Factors and Breast Cancer, and in a group of investigators preparing a map of cancer in the Alpine region of Europe. Recently, major advances were achieved in investigating the spatial distribution of cancer in Slovenia. Our epidemiology unit is constantly receiving requests to research possible increases in cancer risks in some smaller regions of Slovenia. We make sure the answers to such requests are timely, professional and accurate. New statistical methods and the most recent software package based on GIS technology are of great help. Specific geographic and epidemiological studies have been initiated by our colleagues Vesna Zadnik, a specialist in public health, who in 2006 completed her doctorate in spatial analysis, and Tina Žagar, a resident in epidemiology and specialist in statistics, who in her doctoral dissertation is searching for and developing new approaches to the spatial analysis of data from the Cancer Registry.

njeno povezavo med bolnišničnim in državnim registrom. V zadnjih letih smo še izboljšali sodelovanje s Centralnim registrom prebivalstva (CRP), brez katerega ne bi mogli izračunavati preživetja bolnikov z rakom, prav tako pa ne voditi presejalnih programov. Pripravljamo elektronsko povezavo s CRP, kar bo naše podatke naredilo še ažurnejše. K večji kakovosti in popolnosti zajema informacij bo prispevalo poenotenje dokumentacije in elektronska obdelava podatkov oddelkov za patologijo, pa tudi celotnega popisa bolnika z rakom, kar je eden od ciljev Državnega programa obvladovanja raka, ki je trenutno v javni obravnavi.

An impressive recognition of the achievements of the Cancer Registry of Slovenia came in the form of Professor Vera Pompe-Kirn's nomination as ambassador of the Republic of Slovenia for science and senior counselor. Indisputably, her many years' activity in the International Association of Cancer Registries contributed to decision of its board to give us the honor of organizing in 2007, in cooperation with the IACR, the World Congress of Cancer Registries, and concurrently, in cooperation with European Association of Cancer Registries, a course on spatial epidemiology in Cankarjev Dom, a congress center in Ljubljana.

Future Goals and Guidelines

Over the years of its existence, the Cancer Registry of Slovenia, along with the other registries, has been striving to meet quality standards in data processing technology. The technology we use at present was last updated in 1999; for the last two years we have been hoping for further upgrades, in particular for an electronic cancer registration form and technologically more advanced connection between the hospital-based and state registries. In recent years, our cooperation with the Central Population Registry of the RS has improved. Without its cooperation, neither the survival rate of cancer patients could be calculated nor screening programs be implemented. Electronic communication with the Central Population Registry is being established. This will certainly help keep our data continually up-to-date. Higher quality and integrity of the information pack will be ensured by introducing uniform documentation and electronic data processing in the departments of pathology, as well as for the charts of cancer patients, which is one of the goals set by the National Cancer Control Program that has just been submitted for public discussion.

Strokovno delo

Diagnostične dejavnosti

Oddelek za laboratorijske dejavnosti

Vodja:
mag. ***Barbara Možina****,*
mag. farm., spec. med. biokem.

Pomen dejavnosti v sklopu multidisciplinarne onkološke obravnave

Oddelek za laboratorijske dejavnosti je samostojna organizacijska in strokovna enota v okviru Diagnostične dejavnosti. Nastal je z združitvijo in reorganizacijo treh laboratorijev: kliničnega, biokemičnega in dela laboratorija za tumorsko biologijo. Oddelek je začel delovati enovito, ko se je 4. decembra 2006 preselil v nove prostore v stavbo D.

Strokovna dejavnost laboratorija je laboratorijska diagnostika kliničnokemijskih preiskav krvi in drugega biološkega materiala za bolnike, ki se zdravijo na Onkološkem inštitutu, v manjši meri pa tudi za zunanje naročnike, za bolnišnice, zdravstvene domove in druge ustanove v Sloveniji.

Sodobna analitska oprema nam omogoča hitro in zanesljivo izvedbo širokega spektra preiskav. Za preiskovanje vzorcev uporabljamo le znanstveno preizkušene metode, ki so jih priznala mednarodna ali domača strokovna združenja ter razširjeni strokovni kolegiji. V laboratoriju razvite nove metode pred uporabo preverimo in dokumentiramo. Rutinsko opravljamo okoli 100 različnih preiskav elektrolitov, substratov, encimov, tumorskih označevalcev in ščitničnih hormonov ter hematološke in urinske preiskave, izvajamo koagulacijske in funkcijske teste ter elektroforezno ločevanje beljakovin; skupno naredimo več kot milijon preiskav na leto. V laboratorijski hematologiji celice analiziramo na najsodobnejših avtomatiziranih hematoloških sistemih. Pri morfoloških nepravilnostih celic krvne razmaze pregledamo pod svetlobnim mikroskopom. V naše delo spada tudi analiza kostnega mozga. Opravljamo osnovne (kvalitativne in kvantitativne) in specialne analize urina in blata. Določitev tumorskih označevalcev je v različnih kombinacijah namenjena predvsem spremljanju poteka in ustreznosti zdravljenja različnih rakavih obolenj. Specialne analize nekaterih uveljavljenih napovednih dejavnikov iz družine cisteinskih, serinskih in metalo proteinaz izvajamo v ekstraktih tumorskih tkiv z metodo ELISA (encimsko-imunski test na trdnem nosilcu).

Ključni dosežki enote v zadnjih desetih letih

Pri načrtovanju in oblikovanju laboratorijskega procesa smo v Oddelku za laboratorijske dejavnosti sledili strokovnim in tehničnim pogojem, določenih v Pravilniku o pogojih, ki jih morajo izpolnjevati laboratoriji za izvajanje preiskav v laboratorijski medicini, Ur. l. RS št. 64/2004. Sledili smo tudi standardu za medicinske laboratorije ISO 15189, »Medical laboratories – Particular requirements for quality and competence«.

V oddelku smo po reorganizaciji, združitvi in konsolidaciji izboljšali učinkovitost in kakovost laboratorijskega procesa ter skrajšali čas od naročila do laboratorijskega izvida. To smo dosegli z enotnim vodenjem oddelka, uvedbo enotnega laboratorijskega informacijskega sistema (L@bis), enotnim sprejemom biološkega materiala, zmanjšanjem količine odvzetega biološkega materiala bolnikov, zagotavljanjem laboratorijskih analiz iz primarnih vzorcev, skrajšanjem časa transporta biološkega materiala z uvedbo pnevmatske cevne pošte in z uvedbo enotnega standardiziranega laboratorijskega izvida. Z avtomatizacijo večine laboratorijskih procesov in usposabljanjem laboratorijskega osebja za delo na vseh deloviščih v laboratoriju smo pomembno prispevali k racionalizaciji dela. Povezava z integralnim bolnišničnim informacijskim sistemom WebDoctor omogoča elektronsko naročanje laboratorijskih preiskav in pošiljanje elektronskih izvidov naročnikom. Sistema L@bis in WebDoctor

Professional Work

Division of Diagnostics

Department of Laboratory Diagnostics

Head:
Barbara Možina*,*
MSc., EurClinChem

Work of the Laboratory in the Interest of Multidisciplinary Approach to Cancer Patient

The department of laboratory diagnostics is an independent specialized organizational unit within the Division of Diagnostics. It was established after merging and reorganizing three laboratories – the clinical, biochemical and part of the tumor biology laboratory. The department was formally founded in December 2006, after moving into new premises in Building D/4 (fourth floor).

The department specializes in laboratory diagnostics from clinicochemical analysis of blood and other biological material, collected mainly from patients who are treated at the Institute of Oncology; it also, though rarely, offers its services to clients outside the institute, to other hospitals, community health centers and other health care institutions around the country.

The latest laboratory equipment and analytical instruments allow us to perform a wide range of rapid and reliable analysis. The analysis of specimens is carried out using technically proven methods approved by international and national laboratory associations and by expanded professional boards. The methods developed by our laboratory are tested and documented prior to clinical use. The routine work of the laboratory includes around one hundred different analyses of electrolytes, substrates, enzymes, tumor markers, thyroid hormones, and hematology and urinary analysis; in addition, the laboratory also performs coagulation and functional tests, and electrophoretic separation of proteins. Altogether, the laboratory annually performs about one million analyses. The hematology laboratory uses the most advanced automated hematological systems for cell analysis. In case of irregularities in cell morphology, blood smears are additionally examined with a light microscope. Bone marrow analysis is also one of the work domains of the laboratory, as are basic (qualitative and quantitative) and special analyses of urine and feces. Tumor marker determination in different combinations is primarily intended to monitor the efficiency and adequacy of various cancer therapies. Special analyses of some of the confirmed prognostic factors from cysteine, serine and metalloprotease families are carried out in tumor tissue extracts by ELISA (enzyme-linked immunosorbent assay).

Major Achievements in the Last Decade

In planning and designing the laboratory procedures in our department, we followed all the professional and technical conditions laid down in the Rules on Conditions that Laboratories Must Fulfil to Perform Analyses in Laboratory Medicine (Official Gazette of the Republic of Slovenia, No. 64/2004). Moreover, ISO standard 15189 Medical Laboratories – Particular Requirements for Quality and Competence was also met.

After reorganizing, merging and consolidating the department, the efficiency and quality of our laboratory procedures were improved and the time from ordering an analysis to issuing its results was shortened. These improvements are the result of appointing uniform management of the department, initiating a standardized information system (L@bis) and biological material deliveries, reducing the amount of biological material delivered, ensuring laboratory analysis of primary samples, shortening the biological material delivery time by using a pneumatic air tube system, and introducing a standardized form for issuing laboratory test results. Another important contribution to rationalizing the work was computerizing the majority of laboratory processes, and training personnel who are

omogočata racionalno in zanesljivo izmenjavo podatkov med naročniki/uporabniki in izvajalci storitev ter zmanjšujeta možnost administrativnih napak.

Pri zagotavljanju kakovosti medicinski laboratorij sistematično izvaja vse dejavnosti, ki vodijo v izpolnjevanje zahtev za kakovost laboratorijskih rezultatov in zagotavljajo zaupanje v zanesljivost izvidov. Vzpostavili smo celovit sistem zagotavljanja kakovosti, ki vključuje načrtovanje in vodenje postopkov v vseh fazah laboratorijskega procesa (predanalitičnem, analitičnem in poanalitičnem). Za zagotavljanje kakovosti dela uporabljamo notranje in zunanje sisteme. Prve vodimo in analiziramo sami v laboratoriju, pri čemer uporabljamo komercialne materiale. Pri zunanjem preverjanju kakovosti rezultatov laboratorijskih preiskav smo vključeni v Slovensko nacionalno shemo za zunanjo oceno kakovosti (SNEQAS) in v mednarodno preverjanje INSTAND e. V. (Gesellschaft zur Förderung der Qualitätssicherung in medizinischen Laboratorien e. V.), RIQAS (Randox External Quality Assessment Scheme) in QCS (Quality Control Service Programme). Ti nam na podlagi rezultatov, ki ustrezajo njihovim merilom kakovosti, izdajo certifikate za opravljene preiskave ali pa podajo analizo rezultatov s komentarji o kakovosti opravljenih storitev.

Laboratorij sodeluje tudi pri raziskovalnem delu, tako pri projektih Javne agencije za raziskovalno dejavnost RS kot pri farmacevtskih raziskavah. Specifični strokovni delež s področja analitike prispevamo v raziskavah, ki potekajo pod okriljem EORTC (European Organisation for Research and Treatment of Cancer), pri izvedbi diplomskih, magistrskih in doktorskih nalog. Sodelujemo tudi z drugimi laboratoriji v državi. Aktivno se udeležujemo domačih in mednarodnih strokovnih srečanj in kongresov, rezultate svojega dela redno objavljamo v domači in tuji strokovni literaturi. V okviru Slovenskega združenja za klinično kemijo aktivno sodelujemo v organih združenja, pri pripravi strokovnih priporočil za svoje delo in pri strokovnem izpopolnjevanju laboratorijskih strokovnjakov. Sodelujemo tudi pri izobraževanju za laboratorijsko medicino, in sicer pri oblikovanju in izvajanju programa Srednje zdravstvene šole, smer laboratorijski tehnik. Praktično izvajamo programe pripravništva za vse ravni kadrov v biomedicinskih laboratorijih. Izpolnjujemo tudi pogoje za praktično izvajanje programa specializacije iz medicinske biokemije.

Cilji in smer razvoja

Strategijo strokovnega in poslovnega delovanja laboratorija smo usmerili v izgradnjo funkcionalne diagnostične enote, podprte z mednarodnimi strokovnimi smernicami. V laboratoriju nameravamo vpeljati sistem zagotavljanja kakovosti po standardu za medicinske laboratorije ISO 15189. Uvajamo nadzor nad posameznimi laboratorijskimi preiskavami, ki se izvajajo ob preiskovancu na bolnišničnih oddelkih Onkološkega inštituta.
Naš namen in cilji so spodbujati izobraževanje in znanstvenoraziskovalno delo ter prispevati h kakovosti dela v klinični kemiji in laboratorijski medicini ter k učinkovitemu razvoju in izboljšavam organizacijskega in strokovnega dela Oddelka za laboratorijske dejavnosti.

qualified to perform work tasks at any workplace in the laboratory. Electronic delivery of requests for laboratory analysis and dispatch of the results back to our in-house clients has become possible by linking the laboratory information system to the integrated hospital information system WebDoctor. Both systems, L@bis and WebDoctor, were introduced to facilitate a rational and reliable exchange of data between the customers/users and service providers, thereby also reducing the chances of administrative error.

The medical laboratory systematically performs all necessary tasks to assure the quality and reliability of laboratory test results. Overall quality is assured via a safety system, covering planning and execution of the procedures in all phases of laboratory work (pre-analytical, analytical and post-analytical). The laboratory uses internal and external quality assurance systems. The former are carried out by laboratory personnel using commercial products, and the latter are under the supervision of SNEQAS (Slovenian National External Quality Assessment Scheme), and of international agencies, such as INSTAND e.V. (Gesellschaft zur Förderung der Qualitätssicherung in medizinischen Laboratorien e.V.), RIQAS (Randox External Quality Assessment Scheme) and QCS (Quality Control Service Programme). If the results of the analyses performed by our laboratory meet the required standard, these agencies issue a certificate or make an evaluation of our results, which they deliver to us together with their comments on the quality of services performed.

Our laboratory is engaged in research work and participates in projects supported by the Slovenian Research Agency (ARRS) and in pharmaceutical trials. The laboratory offers significant analytical support to the investigators of our institute participating in trials under the patronage of EORTC (European Organisation for Research and Treatment of Cancer) and to candidates working on undergraduate or graduate theses. We cooperate with other laboratories in the country and participate in national and international expert meetings and congresses. The results of our work are being published in literature at home and abroad. As members of the Slovenian Association for Clinical Chemistry, we actively participate in the committees of the association, drawing up recommendations for laboratory work and expert training of laboratory staff. We are also included in an educational program of laboratory medicine, by assisting in the preparation and implementation of a training program for the Secondary School for Nursing – specialty laboratory technician. The laboratory also provides practical training for all levels of work at biomedical laboratories to apprentices, and meets all the requirements to train residents in medical biochemistry as well.

Future Prospects

The technical and business strategy of the laboratory has been aimed at establishing a functional diagnostic unit in accordance with international professional guidelines. Our plans are to set up a quality assurance system in compliance with the medical laboratory standard ISO 15189. Shortly, quality control of individual laboratory analyses performed in hospital wards at a patient's bed will also be introduced.

Our aim is to encourage further education and research work and to contribute significantly to a higher quality of work in clinical chemistry and laboratory medicine, as well as to the efficient progress and improvement of the organizational and laboratory work in our department.

Strokovno delo

Oddelek za molekularno diagnostiko

Vodja:
znan. svet.
dr. ***Srdjan Novaković***

Uvod

Po ocenah svetovno priznanih strokovnjakov je konec 20. stoletja zaznamoval napredek v medicini – konkretno, določitev človeškega genoma. Na podlagi poglobljenega znanja o genih je sledil bliskovit razvoj molekularne biologije v onkologiji, in sicer v dve temeljni smeri: 1) postopno uvajanje diagnostičnih metod na ravni genov – molekularna diagnostika in 2) postopno uvajanje novih načinov zdravljenja, prav tako na ravni genov. Metode v molekularni diagnostiki omogočajo natančno opredelitev sprememb (variacij, mutacij) na celični DNA in s tem natančnejšo opredelitev biologije rakave celice. Zato je postala molekularna diagnostika nepogrešljiva za zgodnje odkrivanje raka, za natančnejšo klasifikacijo ter za napoved razvoja bolezni in odgovora na zdravljenje. S temi metodami dobimo pomembno informacijo, ali je mutacija samo v tumorskih celicah (somatska mutacija) ali je tudi v vseh celicah v organizmu (germinalna mutacija). Nosilci germinalnih (dednih) mutacij zbolevajo za rakom približno 10–20 let prej kot posamezniki v splošni populaciji. Zato je prisotnost podedovanih mutacij smiselno določati in tako pravočasno predvideti ogroženost za nastanek raka pri preiskovani osebi ter pravilno in pravočasno ukrepati.

Programska usmeritev Oddelka za molekularno diagnostiko

Oddelek za molekularno diagnostiko smo ustanovili leta 2005. Zasnovali smo ga kot diagnostično-raziskovalni oddelek. To pomeni, da del programa vključuje uvajanje in izvedbo molekularnodiagnostičnih metod za potrebe Onkološkega inštituta in drugih ustanov zunaj inštituta. Drugi del programa predstavlja raziskovalno delo v molekularni in tumorski biologiji. Tudi ta del je namenjen potrebam Onkološkega inštituta, vendar je odprt za sodelovanje tudi z drugimi ustanovami v Sloveniji in tujini.

Pomembni strokovni dosežki

Kot najpomembnejši strokovni dosežek štejem, da nam je v pičlih dveh letih uspelo organizirati visoko tehnološko napreden oddelek, ki lahko izvaja različne zelo zahtevne preiskave iz molekularne diagnostike. V tem času smo uspeli zagotoviti stabilno financiranje programa s strani zdravstvene zavarovalnice. Diagnostično dejavnost oddelka lahko razdelimo v dva sklopa: določanje variacij pri družinah, obremenjenih z različnimi oblikami dednega raka, ter določanje variacij pri sporadičnih oblikah raka.

Določanje variacij pri dednih oblikah raka

V Oddelku za molekularno diagnostiko opravljamo diagnostične teste za potrebe genskega svetovanja pri raku dojke in jajčnikov, raku debelega črevesa in malignega melanoma. Poleg tega testiramo osebe, za katere obstaja sum, da imajo Li-Fraumeni sindrom. Za odkrivanje točkovnih mutacij ter manjših delecij in insercij uporabljamo metode DGGE (denaturacijska gradientna gelska elektroforeza, HRM (analiza na podlagi talitvene krivulje) in analizo nukleotidnega zaporedja (sekveniranje). Za odkrivanje večjih delecij in duplikacij pa uporabljamo metodo MLPA (metoda hkratnega pomnoževanja od ligacije odvisnih sond).

Professional Work

Department of Molecular Diagnostics

Head:
Research Full Professor
Srdjan Novaković*, Ph.D.*

Introduction

In the view of internationally renowned scientists, the end of the 20th century was particularly marked by advances in medical science – more precisely, in the identification of the human genome. Thorough and detailed knowledge about genes served as the basis for the development of molecular biology in oncology, which broke out like a flash of lightening and followed two basic principles: (1) initiating diagnostic methods based on genes – molecular diagnostics; and (2) initiating new treatment methods, also based on genes. Molecular biology methods allow an accurate definition of changes (variations, mutations) in cellular DNA, and thereby also an accurate definition of tumor cell biology. Therefore, molecular diagnostics has become indispensable in early cancer detection, accurate classification of the disease and its prognosis, and evaluation of response to treatment. The key information obtained by these methods is whether the mutation is present only in tumor cells (somatic mutation) or in the cells of the whole organism (germinal mutation). Germinal (hereditary) mutation carriers may contract cancer 10–20 years earlier than others in the general population. It is therefore sensible to find out whether hereditary mutations are present, and if so, to promptly evaluate the risk for developing cancer in the person under investigation and take appropriate preventive steps.

Program Orientation of the Department of Molecular Diagnostics

The department was established in 2005. It was conceived as a diagnostic and research unit, which means that part of its work plan includes introducing and applying molecular diagnostics in clinical practice for the needs of the Institute of Oncology, as well as of similar institutions outside the institute. The other part of its program is intended to study work in molecular and tumor biology, which is in line with the interest and needs of the institute, it is open to cooperation with other similar institutions in Slovenia and abroad.

Major Achievements

In the last two years of its existence, our major achievement is having become a technologically cutting-edge and well-organized unit, capable of performing highly demanding investigations in molecular diagnostics. In this short period, we managed to obtain steady funding from the Health Insurance Institute of Slovenia. The diagnostics performed by the department follows two main streams: identifying genetic variations in families with a burden of various familial cancers, and identifying genetic variations in sporadic cancers.

Identification of Variations in Familial Cancer

The department of molecular diagnostics performs diagnostic tests for the needs of genetic counseling in breast, ovarian and colon cancer, as well as in malignant melanoma. In addition, the department also performs testing of individuals suspected of having Li-Fraumeni syndrome. For the detection of point mutations, short deletions and insertions, the following methods are used: DGGE (denaturing gradient gel electrophoresis), HRM (high-resolution-melting analysis), and nucleotide sequence analysis (sequencing). For the detection of major deletions and duplications, MLPA (multiplex ligation-dependent probe amplification) is used.

Rak dojke in jajčnikov. Avtosomne dominantne mutacije, ki so najpogosteje povezane z rakom dojke in jajčnikov, so mutacije v supresorskih genih *BRCA1* in *BRCA2*. Zato je prvi korak pri testiranju določanje znanih mutacij v teh dveh genih. V primeru negativnega rezultata ob določitvi znanih mutacij in močne družinske obremenjenosti z rakom dojke ali jajčnikov opravljamo tudi presejanje omenjenih dveh genov.

Rak debelega črevesa. HNPCC, dedni nepolipozni rak debelega črevesa, predstavlja 3–5 % vseh črevesnih rakov. Ta oblika raka je najpogosteje povezana z mutacijami v genih *MLH1* in *MSH2*. Oba gena spadata v skupino genov, odgovornih za popravljanje napak na DNA, tj. med gene MMR (mismatch repair genes). Zato testiramo te gene s sekveniranjem v kombinaciji z metodami, ki omogočajo odkrivanje fragmentov različnih dolžin (krajše insercije in delecije) ter večjih delecij.

Maligni melanom. Dominantno podedovane mutacije pri bolnikih z malignim melanomom so opisane v dveh genih – *CDKN2A* in *CDK4*. Velikokrat je spremenjen tudi gen *MC1R* (prvenstveno polimorfizmi). Vse tri gene presejemo s HRM ali DGGE in sekveniramo.

Li-Fraumeni sindrom. To je dedni sindrom, ki povečuje predispozicijo za nastanek raka. Pri osebah s tem sindromom gre za mutacije v tumorskem supresorskem genu *Tp53*. Sindrom je povezan z nastankom različnih vrst raka (rak dojk, kosti, mehkih tkiv, ledvic, pljuč, rak na možganih …). Pri osebah, pri katerih sumimo, da gre za ta sindrom, presejamo gen *Tp53*.

Določanje variacij pri sporadičnih oblikah raka

Pri bolnikih z limfomi določamo klonalnost B- in T-limfocitov ter kromosomske translokacije. Klonalnost je diagnostično merilo za ločevanje neoplazije in reaktivnega procesa. Večina neoplastičnih procesov je monoklonalnih (izhajajo iz ene patološko spremenjene celice), reaktivne (benigne) limfoidne proliferacije pa so večinoma poliklonalne. Klonalnost limfoidnih proliferacij določamo po metodi klasične PCR, s katero določamo preurejen gen za težko verigo imunoglobulina (IgH), to so B-celični limfomi, ter preurejen gen za gama verigo receptorja T (TcRγ), kar so T-celični limfomi. S klasično PCR določamo kromosomsko translokacijo pri folikularnih limfomih t(14;18)(q32;q21) (bcl-2) in pri limfomu plaščnih celic t(11;14)(q13;q32) (bcl-1).

Raziskovanje

Naše raziskovalno delo je povezano z molekularno biologijo in tumorsko imunologijo. Na obeh področjih delo poteka v obliki domačih raziskovalnih projektov in sodelovanja v mednarodnih projektih. Pri tem moram poudariti sodelovanje v mednarodnem projektu za raziskovanje genskih sprememb pri malignemu melanomu ter sodelovanje na področju genskih sprememb raka dojke in debelega črevesa. Še posebno ponosni smo na svoje raziskovanje tumorske imunologije, ki je usmerjeno v pripravo in testiranje novih bioloških zdravljenj – predvsem tumorskih vakcin. Tekoče raziskave pokrivajo različno uporabo dendritskih celic in spremljanje mehanizmov, prek katerih ti pripravki sprožijo protitumorski imunski odgovor.

Breast and ovarian cancer. Autosomal dominant mutations, most frequently associated with breast and ovarian cancer, are mutations detected in *BRCA1* and *BRCA2* suppressor genes. Therefore, the first step to be taken in testing is to determine the known mutations in these two genes. If they test negative for the known mutations and if the burden with familial breast or ovarian cancer is evident, the screening test for the two genes is performed.

Colon cancer. HNPCC (hereditary nonpolyposis colorectal cancer) accounts for 3–5% of all colorectal cancers. This cancer is most frequently related to mutations in the *MLH1* and *MSH2* genes. Both genes belong to a group of genes responsible for repairing defects on DNA-MMR genes (mismatch repair genes). Testing for these genes is therefore performed by sequencing in combination with methods that allow the detection of fragments of various lengths (short insertions/deletions) and of large deletions.

Malignant melanoma. Germline mutations in patients with malignant melanoma are found in two genes – *CDKN2A* and *CDK4*. The *MC1R* gene is also frequently changed (primarily as polymorphism). All three genes are screened by using HRM and DGGE methods and sequencing.

Li-Fraumeni syndrome. Li-Fraumeni syndrome is a hereditary syndrome that greatly increases the susceptibility to cancer. In subjects with this syndrome, mutations in the tumor suppression gene *Tp53* are detected. The syndrome is associated with the risk of developing various cancers (breast cancer, bone and soft tissue sarcomas, brain tumors, renal or lung cancer, etc.). In persons suspected of this syndrome, the *Tp53* gene is screened for.

Identification of Variations in Sporadic Cancers

In lymphoma patients, the clonality of B and T lymphocytes and chromosome translocations are determined. Clonality is a diagnostic standard for differentiating between neoplasms and reactive processes. The majority of neoplasms are monoclonal (clones of a single pathologically changed cell), while reactive (benign) lymphoid proliferations are polyclonal. The determination of lymphoid proliferation clonality is performed using the standard PCR method, which allows determination of rearranged immunoglobulin heavy chain (IgH) genes (B-cell lymphomas) and rearranged T-cell-receptor gamma chain genes (T-cell lymphomas). The chromosome translocations t(14;18)(q32;q21) (bcl-2) and t(11;14)(q13;q32) (bcl-1) in follicular and mantle-cell lymphomas, respectively, are determined by standard PCR method.

Research

The research work of our department is aimed at molecular biology and tumor immunology. In both research domains, the work is carried out within the framework of national research projects or by cooperating in international research projects. At the level of international cooperation, particular attention should be given to the participation of the department in international research projects on gene mutations in melanoma and on breast and colon cancer. The colleagues of our department are particularly proud of their achievements in tumor immunology, the research domain investigating and testing new biological drugs – in particular, tumor vaccines. The investigations currently being car-

Razvoj

Naši načrti in naše želje so nadaljnje razvijanje molekularne diagnostike, ki bi bila čim bolj uporabna. V redno diagnostiko nameravamo uvesti predvsem določanje metilacijskega statusa za različne pomembne gene ter razširiti paleto genov, ki so soudeleženi pri nastanku raka in pri katerih določamo mutacije. Prav tako nameravamo začeti z določanjem mutacij v genih, ki so neposredno soudeleženi pri odgovoru na različna zdravila (primer K-Ras). V tumorski imunologiji načrtujemo nadaljevanje dela za pripravo tumorskih vakcin ter poglabljanje znanja o temeljnih protitumorskih imunoloških procesih v organizmu.

ried out deal with various applications of dendritic cells and monitoring the mechanisms that trigger anti-tumor immune response.

Future Prospects

Our plans and hopes for the future are to enhance further development of molecular diagnostics and to make it as useful as possible in the clinical setting. One of our hopes is to introduce the determination of the methylation status of certain genes, to expand the palette of genes which are held accountable for cancer development and whose mutations therefore need to be determined. Moreover, we also intend to initiate the determination of mutations in the genes directly involved in the response to different drugs (e.g. the *K-Ras* gene). In the domain of tumor immunology, our future plans are to continue our investigations on tumor vaccines and to further expand our knowledge about the basic anti-tumor immunological processes in living organisms.

Strokovno delo

Oddelek za nuklearno medicino

Vodja:
doc. dr. ***Ivana Žagar****,*
dr. med.

Oddelek za nuklearno medicino je odgovoren za izvajanje nuklearnomedicinskih diagnostičnih preiskav in za zdravljenje z radionuklidi ali radiofarmaki.

Diagnostične preiskave najpogosteje izvajamo za ugotavljanje ali opredelitev tumorjev, za ugotavljanje razširjenosti in ponovitve rakavih obolenj, zdravstvenih predpogojev za uvedbo ali nadaljevanje zdravljenja rakavih bolezni ter stranskih učinkov zdravljenja. Te preiskave so scintigrafije skeleta, ščitnice, obščitnic, scintigrafije telesa z 131-I, z 131-I MIBG ali 123-I MIBG, z 99m-Tc-MIBI, z 99m-Tc-DMSA, sekvenčne scintigrafije ledvic, perfuzijska scintigrafija pljuč, scintigrafije za opredelitev tumorjev v jetrih, scintimamografija, radionuklidna ventrikulografija in druge. Že več let odkrivamo tumorje z imunoscintigrafijo in receptorsko scintigrafijo. Pri bolnikih z diferenciranim rakom ščitnice smo leta 2002 uvedli tudi testiranje telesa z radiojodom ob uporabi rekombinantnega humanega TSH, kadar bolniki zaradi drugih bolezni niso sposobni prenašati dolgotrajne hipotireoze.

Pri svojem delu smo povezani z radiologi in kliničnimi zdravniki, kar močno poveča natančnost diagnoze.

Kot del multidisciplinarnega tima Onkološkega inštituta sodelujemo pri radionuklidno vodeni kirurgiji, ki se je v zadnjem času v onkologiji močno razmahnila. Od leta 1999 opravljamo limfoscintigrafije in lokalizacije varovalne bezgavke pri zgodnjem raku dojke in malignem melanomu. Od leta 2000 sodelujemo pri lokalizacijah netipnih lezij v dojkah z radiofarmakom, od leta 2003 pa pri lokalizaciji adenomov obščitnic in drugih netipnih lezij na vratu z radiofarmaki. Istega leta smo začeli izvajati limfoscintigrafijo in lokalizacijo varovalnih bezgavk tudi pri karcinomu vulve. V začetku leta 2003 smo zaradi vedno večjega števila indiciranih limfoscintigrafij in za potrebe radioizotopno vodene minimalno invazivne kirurgije s programom Medic View uvedli novo fuzijsko metodo, s katero smo izboljšali občutljivost preiskav in hkrati omogočili opravljanje preiskav na večjem številu kamer gama. Opisana programska nadgradnja predstavlja novost tudi v svetovnem merilu. Istega leta smo posodobili tudi protokol za izvajanje sekvenčne scintigrafije ledvic v programu Medic View.

Edini v Sloveniji zdravimo diferenciranega raka ščitnice z radiojodom in nekatere nevroendokrine tumorje z 131-I MIBG. Edini v Sloveniji (v sklopu mednarodne raziskovalne študije) smo se ukvarjali tudi z zdravljenjem mikrometastaz karcinoma ovarija po peritoneju s pomočjo z 90-Y označenih protiteles. Skupaj s timom za zdravljenje limfomov študijsko uvajamo zdravljenje nekaterih limfomov z 90-Y označenimi odgovarjajočimi protitelesi.

Od leta 2004 smo vključeni v mednarodno multicentrično študijo zdravljenja napredovalega raka ščitnice ob rekombinantnem humanem TSH, od leta 2006 pa v primerih, ko je to indicirano, ob rekombinantnem humanem TSH opravljamo tudi ablacijo z radiojodom. V letu 2005 smo sodelovali tudi pri izdelavi evropskih smernic za odkrivanje in zdravljenje diferenciranega raka ščitnice.
Na oddelku za nuklearno medicino nas je trenutno zaposlenih 18, in sicer 3 zdravnice (dve specialistki nuklearne medicine in ena specialistka interne medicine), en magister farmacije, en specialist biokemije, sedem inženirjev radiologije, en inženir elektrotehnike, en višji zdravstveni tehnik, dve administratorki in dve strežnici.

Professional Work

Department of Nuclear Medicine

Head:
Assist. Prof.
Ivana Žagar*, M.D., Ph.D.*

The department of nuclear medicine is in charge of nuclear medical diagnostics and of treatment with radionuclides and radiopharmaceuticals.

Diagnostic examinations are carried out with the aim of identifying or evaluating tumors, their spread or recurrence, the health preconditions for starting or continuing cancer therapies, and the toxic effects of cancer therapies. The examinations performed at our department for the purposes of nuclear medical diagnostics are: bone scintigraphy, scintigraphy of thyroid and parathyroid tissue, whole body scintigraphy using 131-I, 131-I MIBG or 123-IMIBG, 99m-Tc-MIBI, 99m-Tc-DMSA, dynamic renal scintigraphy with 99mTc-MAG3, perfusion scintigraphy of the lung, scintigraphy for the evaluation of liver tumors, scintimammography, radionuclide ventriculography and others. For several years, we have been using immunoscintigraphy and receptor scintigraphy for the detection of tumors. In 2002, we started with recombinant human TSH-aided radioiodine testing in patients with differentiated thyroid carcinoma, in whom endogenous TSH stimulation was not an option due to the patient's poor physical condition during the hypothyroid state or due to the disease progression during L-thyroxine withdrawal. Close cooperation by our specialists with radiologists and clinical specialists contributes significantly to the accuracy of diagnosis.

Our specialists are members of several multidisciplinary teams at the institute. In this function, they contribute to minimally invasive radionuclide-guided surgery, which has been recently used extensively in the following domains: since 1999, lymphoscintigraphy and localization of sentinel lymph nodes have been applied in breast carcinoma and melanoma; localization of nonpalpable lesions in the breast (since 2000), and localization of parathyroid adenomas (since 2003) and other nonpalpable lesions in the neck have been performed using dedicated radiopharmaceuticals and a gamma probe. The same year, lymphoscintigraphy of sentinel lymph nodes was initiated in the management of vulvar carcinoma. At the beginning of 2003, the MedicView program, together with a new fusion method, were introduced due to the growing number of lymphoscintographies and growing needs for radioisotope-guided minimally invasive surgery. This innovation helped to improve the sensitivity of examinations and also allowed us to carry out these examinations on more gamma cameras at the same time; moreover, this upgrade was also a worldwide innovation. That same year, the protocol for dynamic renal scintigraphy with 99mTc-MAG3 was upgraded in the MedicView program.

The department of nuclear medicine is the only center in Slovenia to treat differentiated thyroid carcinoma with radioiodine 131-I and certain neuroendocrine tumors with 131-I-MIBG. Moreover, the department is also the only one in the country to treat (within an international research study) micrometastases of ovarian carcinoma invading the peritoneum, using 90-Y labeled antibodies. The department of nuclear medicine, hand-in-hand with the lymphoma team, experimentally initiated the treatment of some lymphomas with specific 90-Y labeled antibodies.

Since 2004, our specialists have been participating in an international multicentric research study on recombinant human TSH-aided radioiodine treatment of advanced thyroid carcinoma. From 2006 onwards, we have been performing recombinant human TSH-aided radioiodine ablation of thyroid remnants in patients in whom, for various reasons, hypothyroidism following total thyroidectomy is not an option. In 2005, our experts contributed actively to the elaboration of European guidelines for the detection and treatment of differentiated thyroid carcinoma.

Strokovno delo

Na oddelku izobražujemo študente Medicinske fakultete in Visoke šole za zdravstvo, specializante nuklearne medicine in radioterapije. Od leta 2008 imamo na oddelku spet enega visokošolskega učitelja.

Od 1. oktobra 2008 Oddelek za nuklearno medicino deluje v novih prostorih v kleti stavbe E na Onkološkem inštitutu. Dobili smo tudi novo opremo: v celoti je opremljen nov laboratorij za pripravo in nadzor kakovosti radiofarmakov, imamo dve novi enodetektorski in eno dvodetektorsko kamero gama.

Nuklearna medicina v onkologiji je v svetu že zelo usmerjena v zgodnje odkrivanje tumorjev in razširjenosti maligne bolezni, učinkovitosti njenega zdravljenja in načrtovanje radioterapije s pozitronsko izsevno tomografijo (PET). Že pred selitvijo v nove prostore smo 5. septembra 2007 edini v Sloveniji začeli z novo dejavnostjo – PET/CT. Za zdaj uporabljamo s fluorom-18 (pozitronski sevalec) označeno deoksiglukozo (18-F-FDG). Preiskavo uporabljamo predvsem pri bolnikih z rakom pljuč, debelega črevesa in rektuma, malignega melanoma, limfoma, z rakom glave in vratu, dojke, požiralnika in ščitnice. PET/CT za bolnike v Sloveniji pomeni zgodnejšo in natančnejšo oceno razširjenosti bolezni, zgodnejše in natančnejše ugotavljanje ponovitve ali razširitve bolezni, zgodnje ugotavljanje učinkovitosti zdravljenja ter natančnejše določanje obsevalnih polj.

Professional Work

The department has 18 employees: three specialists (two in nuclear medicine and one in internal medicine), one master of pharmacy, one specialist in biochemistry, seven radiological engineers, one engineer in electrotechnics, one health technician, two administrative workers and two orderlies.
The department is open to practical training of students from the Faculty of Medicine and the College of Health Studies, as well as residents in nuclear medicine and radiotherapy. In 2008, one of our specialists was appointed a university lecturer.

Since October 1, 2007, the department has been working in new premises with completely new technical equipment in the basement of Building E of the Institute of Oncology (a newly equipped laboratory for preparation and quality control of radiopharmaceuticals, two single-detector gamma cameras and one double-detector gamma camera).

In oncology worldwide, nuclear medicine is aimed at the early detection of tumors and disease spread, at the evaluation of treatment efficiency, and at treatment planning in radiotherapy using positron emission tomography (PET). Not long before moving into the new premises, on September 5, 2007, we were the first in the country to introduce a new technique – PET/CT. Currently, we use fluor-18 labeled deoxyglucose (18-F-FDG). The technique is primarily used in patients with lung cancer or colorectal cancer, with malignant melanoma or lymphoma, or with head and neck, breast, esophageal or thyroid cancer. The PET/CT diagnostic imaging technique is a great benefit for Slovenian patients – it allows earlier and more accurate evaluation of disease spread, earlier and more accurate detection of disease recurrence or spread, instantaneous evaluation of treatment efficiency, and more accurate determination of radiation fields.

Strokovno delo

Oddelek za radiologijo

Vodja:
***Maja Mušič**, dr. med.*

Radiologija je v zadnjem obdobju z razvojem računalniške tehnologije doživela izjemen napredek. Novejše slikovne metode (CT in magnetna resonanca) so omogočile natančnejši pogled v človeško telo – s tem pa hitrejše in natančnejše odkrivanje rakavih in tudi drugih bolezni, njihovih začetkov in ponovitev.

Radiolog je pri obravnavi onkoloških bolnikov enakopraven član multidisciplinarnega tima. Njegova vloga je pomembna pri odkrivanju bolezni, načrtovanju obsega operativnih posegov, načrtovanju zdravljenja in sledenju bolnikov, pa tudi pri odkrivanju zapletov zdravljenja in bolezni.

Zlasti pomembna je njegova vloga pri odkrivanju netipnih tumorjev dojke. Z odkrivanjem majhnih, netipnih tumorjev se namreč izrazito zmanjša umrljivost za to boleznijo.

Oddelek za radiologijo se je iz oddelka za rentgensko in UZ-diagnostiko, ki je deloval v stavbi A v nemogočih razmerah, razvil v sodoben oddelek, z najsodobnejšo opremo, ki je lahko vzor oddelkom v regiji. S selitvijo v stavbo D smo v septembru 2007 dobili popolnoma digitalen oddelek, brez filmov. Z novo, digitalno tehnologijo se je izboljšala kakovost slik in zmanjšala obremenjenost preiskovancev z ionizirajočim sevanjem.

Z novim oddelkom smo dobili napravo za magnetno resonanco (1.5 T), 16-rezinski računalniški tomograf, digitalni rentgenski aparat za slikanje pljuč in skeleta, digitalni mamografski aparat in štiri sodobne ultrazvočne aparate.

Leta 2006 nam je Europa Donna podarila napravo za vakuumsko biopsijo dojk, na kateri se uspešno opravlja diagnostika netipnih sprememb v dojkah. Opravljenih je bilo že približno 1000 biopsij. S to metodo smo občutno zmanjšali število diagnostičnih operacij.

Radiologi aktivno sodelujemo na interdisciplinarnih konzilijih in pri pripravi smernic za obravnavo bolnikov z malignimi boleznimi (mehkotkivni in možganski tumorji). Uvedli smo nov pred- in pooperativni konzilij za dojke, v katerem sodelujejo kirurg, patolog in radiolog. Skupaj pregledajo izvide bolnic, ki so bile operirane po lokalizaciji sprememb v dojkah pod rentgensko ali UZ-kontrolo, in rezultate vseh punkcij, ki so bile opravljene pod rentgensko kontrolo.

Na oddelku je zaposlenih 12 radiologov. Število vseh opravljenih preiskav vsako leto narašča, delno na račun večje incidence bolezni, delno na račun daljšega preživetja naših bolnikov. V zadnjih desetih letih sta doktorirala dva radiologa, dr. Kocijančič in dr. Podkrajškova, dva radiologa sta pridobila naziv magister znanosti, in sicer dr. Hertl in dr. Kadivec.

V zadnjih desetih letih smo za slovenske radiologe organizirali štiri mamografske šole z mednarodno udeležbo (1998, 1999, 2000, 2004). Aktivno smo sodelovali tudi na vseh slovenskih radioloških kongresih.

Zadnjih pet let se na oddelku izvaja diagnostika z računalniško tomografijo; sprva z napravo v lasti radioterapije, zadnji dve leti in pol pa na 16-rezinski CT-napravi.

Professional Work

Department of Radiology

Head:
***Maja Mušič**, M.D.*

In recent years, radiology has witnessed great advances mainly due to the development of computer technology. The most advanced imaging techniques (computed tomography and magnetic resonance) provide more precise insight into the human body and thereby also more accurate detection of malignant and other diseases, their early stages or recurrences.

The radiologist is an equal member of the multidisciplinary team responsible for cancer patient treatment. He or she plays a key role in detecting cancer, planning the extent of surgical intervention, planning treatment and post-treatment follow-up of patients, and detecting treatment- and disease-related complications.

The role of the radiologist is particularly important in detecting nonpalpable lesions of the breast, since the detection of small, nonpalpable tumors significantly reduces the breast cancer mortality rate.

From the department of radiology and ultrasonography diagnostics that existed in the old premises of Building A and worked under impossible conditions, a modern department of radiology has emerged, equipped with the most advanced technical facilities; as such, it is considered the standard of perfection by similar departments in the region. In September 2007, the department moved into the reconstructed Building D, into premises with a digitally operated system – no films at all. The new technology has improved image quality and reduced the risk of ionizing radiation.

The new department is equipped with a new device for magnetic resonance imaging (1.5 T), a 16-slice computed tomography device, a digital X-ray for lung and whole body imaging, digital mammography and four modern US devices.

In 2006, the non-governmental organization Europa Donna donated a vacuum-assisted breast biopsy apparatus used to diagnose nonpalpable changes in the breast. Around 1,000 examinations have already been performed. This method has markedly reduced the number of diagnostic surgeries.

Radiologists in our department are members of interdisciplinary advisory teams and regularly attend their meetings; they also participate in drawing up treatment guidelines for cancer patients (soft tissue and brain tumors). Another important achievement of our department is the establishment of a pre- and post-operative breast advisory team, which consists of a surgeon, pathologist and radiologist. The team reviews the charts of patients operated on for changes in the breast by using X-ray or US-guided techniques.

The department employs 12 radiologists. The number of examinations is steadily increasing, partly on account of higher cancer incidence and partly on account of the longer survival of cancer patients.

In the last 10 years, two radiologists in our department obtained doctorates (I. Kocijančič and M. Podkrajšek), and two obtained master's degrees (K. Hertl and M. Kadivec).

In this period, we organized four international training courses on breast imaging diagnostics (1998, 1999, 2000 and 2004).

Diagnostika z magnetno resonanco je postala izjemno pomembna metoda pri zamejitveni diagnostiki bolezni, pri določanju stadija in načrtovanju zdravljenja (maternični vrat, rektum, dojka). Pomembna sta postala diagnostika sprememb v jetrih in uvajanje specifičnih jetrnih kontrastov za načrtovanje jetrnih resekcij.

V sodelovanju z radioterapijo se je uspešno implementirala metoda za kontrolo položaja aplikatorjev za brahiterapijo pod magnetno resonanco (rak materničnega vratu in prostate). Doza na oboleli del se poveča, zmanjša pa se doza na zdrave predele.

Z oktobrom 2007 smo na oddelku uvedli dežurno službo radioloških inženirjev in pripravljenost zdravnikov. Tako smo omogočili hitrejšo diagnostiko za nujne bolnike in pomoč kolegom klinikom na intenzivnem oddelku in drugih bolnišničnih oddelkih.

V letošnjem letu uvajamo novo metodo punkcije dojk pod magnetno resonanco. S to metodo bomo izboljšali diagnostiko netipnih sprememb v dojkah, zlasti pri ženskah, pri katerih so najdene spremembe vidne samo pri preiskavi z magnetno resonanco. Uvajamo tudi perkutano radiofrekvenčno ablacijo sprememb v jetrih, pozneje tudi v dojkah.

The department can also be proud of the high active participation of our colleagues in all radiology congresses in Slovenia.

In the last five years, the department has been routinely performing computed tomography for diagnostic purposes (at first with the CT device in the department of radiotherapy, and in the last two and a half years, with the 16-slice computed tomography device).

Diagnostics using magnetic resonance is a most helpful method for staging the disease – determining the disease stage and planning treatment (uterine cervix, rectum, breast, etc.) Equally important is the diagnostics of liver changes – application of different liver contrasts for liver resection planning.

In cooperation with the department of radiotherapy, a method of MRI-guided positioning of brachytherapy applicators, used in the treatment of cervical and prostate cancer, was developed – the dose to the tissue affected with malignant disease is increased, whereas the dose to the healthy tissue is reduced.

Since October 2007, the services of a radiological engineer on duty and a radiologist on call have been available. This service was introduced in order to ensure faster diagnostics in urgent cases and immediate assistance to clinical doctors in the intensive care unit and other hospital wards.

This year, a new method of magnetic resonance-guided biopsy for suspicious breast lesions was introduced. This method will certainly improve the diagnostics of nonpalpable changes in breast tissue, particularly in women in whom the changes were seen only by using the magnetic resonance imaging technique.

In the near future, the department will start performing percutaneous radiofrequency ablation of liver lesions, and later on, also of breast lesions.

Strokovno delo

Oddelek za citopatologijo

Vodja:
doc. dr.
Živa Pohar-Marinšek,
dr. med.

Pomen Oddelka za citopatologijo

Citopatologija je diagnostična metoda, s katero skušamo opredeliti naravo bolezni z mikroskopskim pregledom celičnega vzorca iz obolelega tkiva. Na Onkološkem inštitutu citopatologijo uporabljamo že 56 let, od leta 1952. V začetnih osmih letih je bila v rabi le eksfoliativna citopatologija (pregled brisov maternične vratu in telesnih tekočin ter izločkov), od leta 1960 pa se je uveljavila tudi aspiracijska biopsija s tanko iglo (ABTI). V letu 1984 je število ABTI preseglo 8000 vzorcev in v zadnjih 22 letih niha okoli števila 9000, kar nas uvršča med največje citopatološke laboratorije v Evropi. Približno polovico vseh vzorcev odvzamemo citopatologi sami iz tipljivih sprememb, preostale večinoma odvzamejo rentgenologi, slikovno vodeno iz netipljivih sprememb. Naš oddelek je diagnostični citopatološki servis za Onkološki inštitut, za velik del Kliničnega centra v Ljubljani ter za splošne zdravnike in druge specialiste na širšem območju Ljubljane. Pogosto pridejo na odvzem vzorca tudi bolniki iz drugih krajev Slovenije. Z leti smo mikroskopskemu pregledu vzorca začeli dodajati različne pomožne metode, kot so citokemija, imunocitokemija, pretočna citometrija in analiza DNA. Zato je danes citopatologija uporabna metoda v preventivi rakavih obolenj, pri postavljanju diagnoze raka, pri odločanju o izbiri vrste zdravljenja ter pri sledenju poteka zdravljenja in poteka bolezni.

Pomembni dosežki v zadnjih desetih letih

V preventivni dejavnosti smo trenutno precej bolj aktivni kot pred desetimi leti, saj se je število brisov materničnega vratu (BMV) v zadnjih treh letih povečalo za 340 %. Vzrok za to je organizirani presejalni program ZORA, ki nadzira kakovost laboratorijev za pregled BMV in je v letu 2005 dosegel, da se je zmanjšalo število laboratorijev, ki sodelujejo v programu, z 19 na 10.

V diagnostični dejavnosti smo dosegli naslednje uspehe:

a. V drugi polovici leta 2001 smo v rutinsko diagnostiko uvedli medoperativni pregled odtisov varovalne bezgavke pri bolnicah z rakom dojke. Število pregledanih bezgavk je v prvih dveh letih tako raslo, da smo leta 2003 pregledali kar 674 varovalnih bezgavk. Zaradi vse pogostejše uporabe ultrazvočno vodene ABTI netipljivih pazdušnih bezgavk pogosto dokažemo metastatsko bolezen že pred operacijo in tako odpade potreba po medoperativnem pregledu varovalne bezgavke. V letu 2007 se je zato število citoloških pregledov varovalne bezgavke zmanjšalo na 311.
b. Leta 2002 smo z ročnega imunocitokemičnega barvanja prešli na avtomatsko. Tak način omogoča natančnejše reakcije, ker zmanjšuje možnost napak. Istega leta smo po dvoletnem testiranju na celicah tkivne kulture in operativnih vzorcev raka dojke v rutinsko diagnostiko uvedli tudi imunocitokemično določanje hormonskih receptorjev na celičnih vzorcih. Določanje prisotnosti hormonskih receptorjev na celičnih vzorcih je uporabno za načrtovanje hormonskega zdravljenja pri bolnicah z rakom dojke, ki niso operirane, za določanje prisotnosti receptorjev v zasevkih in kot pomoč pri opredeljevanju izvora raka pri metastatski bolezni.
c. Večparametrni pretočni citometer imamo na oddelku za citopatologijo od leta 1998 in ga uporabljamo kot pomoč pri diagnostiki limfomov. V prvih sedmih letih smo postopoma modificirali protokole za izvajanje meritev in tako izboljšali občutljivost metode.
d. V letu 2007 smo začeli z odvzemom celičnega vzorca za določanje Her-2 z metodo fluorescentne hibridizacije in situ (FISH). Na našem oddelku pripravimo vzorce, FISH pa izvedejo na Oddelku za patologijo.

Professional Work

Department of Cytopathology

Head:
Assist. Prof.
Živa Pohar-Marinšek,
M.D., Ph.D.

Role of the Department of Cytopathology

Cytopathology is a diagnostic method, which is used to identify the type of disease by microscopic examination of a cell sample from the affected tissue. Cytopathology has been available at the Institute of Oncology Ljubljana since 1952, i.e. for 56 years. In its initial eight years, only exfoliative cytopathology (examination of cervical smears, bodily fluids and excrement) was performed. In 1960, fine-needle aspiration biopsy (FNAB) was introduced. In 1984, the examined FNAB cases exceeded 8,000, and in the last 22 years, this number has reached about 9,000 cases examined per year, which ranks us among the largest cytopathology laboratories in Europe. Half of the biopsies are collected by our cytopathologists from palpable lesions; the other half of the biopsies mostly from nonpalpable lesions are collected by radiologists using image-guided biopsy techniques. Our department provides its diagnostic cytopathology services to our mother institution – the Institute of Oncology Ljubljana – as well as to the University Medical Centre Ljubljana, and to general practitioners and other specialists in the Ljubljana region. Often, patients from other regions of Slovenia are referred to our laboratory for FNAB. Over the years, other ancillary techniques have been introduced, such as cytochemistry, immunocytochemistry, flow cytometry and DNA analysis. Therefore, cytopathology has become a useful method for preventing and diagnosing cancer, selecting treatment modality and following up the treatment and course of the disease.

Major Achievements in the Last Decade

In cancer prevention, the department of cytopathology is far more active than it was 10 years ago. In the last three years, the examination of cervical smears increased by 340%. The reason for this huge increase is due to the increased activity of the National Cervical Cancer Screening Program, which introduced quality control for cervical smear tests. The result of such quality control was a reduction in the number of laboratories participating in the program from 19 to 10 in the year 2005.

Recent Achievements in Diagnostics:

a. In the second half of 2001, intraoperative sentinel lymph node examination by imprint cytology in breast cancer patients was added to routine diagnostic procedures. During the first two years, the number of sentinel lymph node imprints examined has been rising rapidly, and in the year 2003, 674 imprints were examined. With the use of US-guided FNAB of nonpalpable axillary lymph nodes, many metastases are confirmed prior to surgery, thus eliminating the need for intraoperative sentinel lymph node biopsy. In 2007, the number of cytologic examinations of sentinel lymph nodes therefore dropped to 311.
b. In 2002, manual immunocytochemical staining was replaced by an automated technique. The new technique allows for more accurate reactions, because there are fewer chances for mistakes. The same year, our routine diagnostics was also enriched by immunocytochemical determination of hormone receptors in cell samples from breast cancer. The technique was introduced after a two-year period of sustained testing on cells from tissue cultures and surgical biopsies. The new diagnostic method is useful in hormone treatment planning for breast cancer patients who are not surgically treated; it is also used to evaluate the presence of receptors in metastases and is a helpful tool in detecting the primary cancer origin in metastatic disease.

Citopatologi smo že vsa leta dejavni tudi v raziskovanju. Sodelovali smo v programskih skupinah in v raziskovalnih projektih, ki smo jih tudi sami vodili. Teme naših raziskovanj so bile imunofenotipizacija limfomov ter citodiagnostika raka dojke, ščitnice, pljuč, sarkomov in tumorjev v otroštvu. Izsledke svojih raziskav smo objavili v člankih. Kot enega pomembnejših naj omenimo pregledni članek o težavah diagnosticiranja tumorjev otroške dobe, ki je letos januarja izšel v reviji Cytopathology.

Naš ključni dosežek v izobraževanju je organizacija in vodenje šole za presejalce BMV. Pooblastilo za organizacijo šole, ki je obvezna za presejalce BMV, nam je podelilo Ministrstvo za zdravje leta 2005. Izobraževanje traja šest mesecev in smo ga do sedaj izpeljali že dvakrat.

Med pomembne dosežke citopatologov spadajo še organizacija 50. obletnice Oddelka za citopatologijo leta 2002, organizacija 40. obletnice Sekcije za citopatologijo SZD leta 2004 ter Goldblattova nagrada za leto 2005, ki jo je prejela prof. dr. Marija Us Krašovec, dr. med., prva vodja Oddelka za citopatologijo na Onkološkem inštitutu. Goldblattovo nagrado za izjemne dosežke in prispevke k razvoju citopatologije vsako leto podeljuje Mednarodna akademija za citologijo.

Smer razvoja v prihodnosti

V citopatologiji se vedno bolj uveljavlja uporaba molekularnih tehnik kot dopolnilna metoda morfološkemu pregledu. Menimo, da bo kmalu postala tako nepogrešljiva, kot je trenutno imunocitokemija. Zato si bomo prizadevali za uvedbo metode FISH na celičnih vzorcih za testiranje prisotnosti nekaterih genetskih napak pri tumorjih v otroštvu in pri nekaterih sarkomih.
Možnost razvoja vidimo tudi v pretočni citometriji. Skušali bomo uvesti šestparametrne meritve, ki v primerjavi s štiriparametrnimi, ki jih uporabljamo sedaj, omogočajo določanje večjega števila antigenov na eni celici in s tem boljše opredeljevanje limfomov.
Pri bolnikih z limfomom nameravamo uvesti tudi imunofenotipizacijo kostnega mozga in periferne krvi ter določanje minimalne rezidualne bolezni s pretočnim citometrom iz vzorcev bolnikov z limfomom in nekaterimi tumorji v otroštvu.

c. The multiparameter flow cytometer has been in operation since 1988 and is used as an aid in lymphoma diagnostics. During the first seven years of its operation, we modified measuring protocols in a step-wise method, which contributed to improving the sensitivity of the method.
d. In 2007, the department started collecting cell samples for Her-2 determination by fluorescent in situ hybridization (FISH). FNAB and sample preparation are carried out by the department of cytology, while FISH is performed by the department of pathology.

Cytopathologists have been active in the field of research ever since the existence of the department of cytopathology. We have participated in program teams and research projects, in which many of our colleagues were principal investigators. The domains we have focused on in our research are: immunophenotyping of lymphomas, and cytodiagnostics of breast, thyroid and lung cancer, as well as of sarcomas and childhood tumors. The results of our research studies have been published in numerous scientific journals. Among the most important publications, a review article on the difficulties in diagnosing small round-cell tumors in childhood from fine-needle aspiration cytology samples, published this year in the January issue of Cytopathology, deserves special attention.

Our most important contribution to educational programs is the training course on cervical cancer screening, organized and carried out by our department. The authorization for the organization of the training course was granted by the Ministry of Health of the Republic of Slovenia in 2005. This six-month training course, which is obligatory for all cytotechnologists involved in cervical cancer screening, has so far been completed twice.

On the list of our major achievements, the most outstanding events are the 50th anniversary of the department of cytopathology in 2002, the 40th anniversary of the Cytopathology Society of the Slovenian Medical Association in 2004, and the 2005 Goldblatt Medal, awarded to Prof. Marija Us-Krašovec in recognition of her merits and outstanding achievements in cytology.

Future Prospects

In cytopathology, the use of molecular techniques as ancillary methods to morphologic examination is steadily growing. We believe that they will soon become as indispensable as immunocytochemistry. Therefore, we will try to introduce testing for specific translocations on cell samples from certain childhood tumors and sarcomas using FISH.

We see an opportunity for further improvement also in flow cytometry. Our plan is to perform six-parameter measurements, which, in comparison to the four-parameter measurements that are currently in use, allow us to determine a larger number of antigens in a single cell and can thereby contribute to the better evaluation of lymphomas.

We are also planning to introduce into our routine work the immunophenotyping of bone marrow and peripheral blood in lymphoma patients, and the evaluation of minimal residual disease with flow cytometer from samples of lymphomas and childhood tumors.


OLYMPUS
JAPAN
10X/20

Strokovno delo

Oddelek za patologijo

Vodja:
dr. **Snježana Frković-Grazio**, *dr. med.*

Pri multidisciplinarni obravnavi bolnika z rakom je histopatološka diagnoza ključna, saj na njej temelji odločitev o najprimernejšem načinu zdravljenja. Patolog z mikroskopskim pregledom tkivnih vzorcev – pogosto pa tudi z uporabo dodatnih metod – opredeli naravo in histološki tip tumorja, glede na tip tumorja pa tudi vrsto morfoloških in bioloških značilnosti, ki napovedujejo potek bolezni in odziv tumorja na določeno vrsto zdravljenja. Pri kirurški odstranitvi tumorja patolog poleg tega določi stopnjo razširjenosti bolezni, oceni, ali je tumor odstranjen v celoti, in v primerih, ko je kirurški poseg sledil predoperativnemu zdravljenju z radio- in/ali kemoterapijo, oceni odgovor tumorja na zdravljenje.

Oddelek za patologijo Onkološkega inštituta opravlja histopatološke preiskave za potrebe OI in številnih drugih zdravstvenih ustanov v Sloveniji. Na našem oddelku pregledamo večino limfomov, tumorjev mehkih tkiv in kosti ter tumorjev dojk in ščitnice, ki jih odkrijejo v Sloveniji, smo pa tudi edini oddelek, ki opravlja histopatološko preiskavo kostnega mozga. Opisana področja (kirurška patologija dojke, ščitnice, mehkih tkiv in kosti ter hematopatologija) so naša osnovna strokovna usmeritev – zanje opravljamo tudi konzultacijske storitve za vse druge zdravstvene zavode v Sloveniji in tudi za zdravstvene zavode in posameznike iz tujine.

Strokovno, izobraževalno in raziskovalno delo v zadnjem desetletju

Obseg dela se na Oddelku za patologijo OI se v zadnjem desetletju konstantno povečuje. S spreminjajočim se pristopom k diagnostiki in zdravljenju onkoloških bolnikov (vse večji delež minimalno invazivnih diagnostičnih posegov, kot so debeloigelne biopsije, in konzervirajočih posegov, pogostejša uporaba neoadjuvantnega zdravljenja, uvedba bioloških zdravil) je postalo delo patologa še pomembnejše, hkrati pa tudi obsežnejše in strokovno zahtevnejše. V tem času smo začeli opravljati histološke preiskave v sklopu novih postopkov, kot so mamotomske igelne biopsije dojke, ekscizije netipnih lezij dojke in biopsije varovalnih bezgavk. Zaradi natančnejše določitve tipa tumorja in določitve bioloških označevalcev v tumorju se je izrazito povečalo število imunohistokemičnih (IHK) preiskav, razširil pa se je tudi njihov spekter. Iz istih razlogov smo v rutinsko delo pri diagnostiki malignih limfomov, sarkomov in karcinomov dojke uvedli uporabo fluorescenčne hibridizacije in situ (FISH).

Zaradi racionalizacije stroškov in optimizacije rezultatov IHK in FISH smo – najprej v raziskovalno, pozneje pa tudi v rutinsko delo – uvedli tehnologijo tkivnih mikromrež, v zadnjem letu pa na to področje uvajamo uporabo najsodobnejšega avtomatskega sistema za analizo slike, ki omogoča kvantifikacijo biomarkerjev v mikroskopskih preparatih tkivnih rezin in tkivnih mrež. Financiran je bil iz raziskovalnih in donatorskih sredstev. V sklopu našega oddelka je sprva deloval tudi laboratorij za molekularno patologijo, v katerem smo uvedli rutinsko opravljanje molekularne diagnostike malignih limfomov, od leta 2003 pa se ta del diagnostike opravlja v sklopu novega enotnega oddelka za molekularno diagnostiko OI.

V sodobni medicinski laboratorijski praksi je ključno spoštovanje načel dobre laboratorijske prakse. Od leta 2004, ko je v veljavo stopil Pravilnik o delovanju medicinskih laboratorijev, smo začeli sistematično usklajevati delovanje svojega oddelka s tem pravilnikom in drugimi mednarodnimi standardi kakovosti. Oddelek že vrsto let redno sodeluje v zunanji kontroli kakovosti imunohistokemičnega barvanja in FISH v sklopu britanske nacionalne sheme (NEQAS). Naši rezultati so zmeraj ustrezali

Professional Work

Department of Pathology

Head:
***Snježana Frković-Grazio**, M.D., Ph.D.*

In a multidisciplinary approach to cancer patients, histopathological diagnosis is of prime importance because it serves as the basis for making decisions on the most appropriate treatment. A pathologist, using a microscope and often also additional methods for examining tissue samples, determines the nature of the tumor and its histological type, and in regard to the histological type, also its various morphological and biological characteristics, which are predictive for the course of the disease and tumor response to the selected treatment. After the tumor has been surgically removed, the pathologist determines the disease stage and assesses whether the tumor was removed completely, or in cases in which the patient was preoperatively treated with radio- and/or chemotherapy, evaluates the response to the therapy. The department of pathology at the Institute of Oncology Ljubljana performs histopathological examination for the needs of the institute and also of other health care institutions in Slovenia. The majority of lymphomas, soft tissue and bone tumors, and breast and thyroid carcinomas that are detected in Slovenian patients are examined by the pathologists at our department, which is also the only center in Slovenia performing histopathological examination of bone marrow. The above domains (surgical pathology of the breast, thyroid, soft tissue and bone and hematopathology) are the basic areas of expertise, in which we also offer consultancy service to other health institutions in the country and abroad.

Expert, educational and research work in the last decade

The scope of work at our department has been constantly increasing over the last decade. With changes in the approach to diagnostics and treatment of cancer patients (ever-increasing percentage of minimally invasive diagnostic examinations, such as core-needle biopsies, organ-sparing procedures, more frequent applications of neoadjuvant therapies, new biological drugs), the work of a pathologist has gained importance and, at the same time, has increased immensely and become professionally more demanding. Histological examinations of core-needle biopsies and excisions of nonpalpable lesions of the breast, as well as sentinel lymph node biopsies nowadays represent a considerable proportion of the pathologist's workload. Due to the growing need for more accurate determination of tumor type and biological tumor markers, the number of immunohistochemical examinations has increased remarkably and their specter extended accordingly. For the same reasons, the fluorescent in situ hybridization (FISH) method has become part of our routine work in the diagnostics of lymphomas, soft tissue and breast tumors. In view of rationalizing costs and optimizing results obtained by immunohistochemistry and FISH, tissue microarray technology has been introduced into experimental and routine work; this year, the new technology is being upgraded with an advanced automated image-analyzing system, which allows the quantification of biomarkers. The upgrade was financially supported by research funds and donations. Within the pathology department, laboratory for molecular pathology that routinely performed molecular diagnostics of malignant lymphomas was set up. From 2003 this laboratory became an integral part of the newly established department of molecular diagnostics of the Institute of Oncology Ljubljana.

In today's medical laboratory practice, it is of vital importance to follow the principles of good laboratory practice. Since 2004, when the Slovenian Regulations on Operation of Medical Laboratories were issued, we have started to systematically harmonize our working procedures with the adopted rules and with international quality standards. Our department has been participating for several years in external quality control of immunohistochemical stainings and FISH with the UK National

visokemu standardu v imunohistokemiji, tudi rezultati naše preiskave FISH so ocenjeni kot zanesljivi in primerni za uporabo v diagnostiki.

Dodaten prispevek k izboljšanju in spremljanju kakovosti diagnostičnega dela predstavlja – poleg vsakodnevnih sestankov za diskusijskim mikroskopom – ponovno pregledovanje vseh primerov igelnih biopsij in ekscizij netipnih lezij dojke, ki so predstavljeni na tedenskem multidisciplinarnem sestanku patologov, kirurgov in radiologov. Podoben postopek poteka tudi pri biopsijah kostnega mozga v primerih, ki so predstavljeni na klinično-patoloških sestankih Hematološke klinike Kliničnega centra.

Pomemben segment dejavnosti oddelka predstavljata raziskovalno in izobraževalno delo. V preteklem desetletju so zdravniki oddelka vodili in uspešno končali štiri raziskovalne projekte. Sodelovali so tudi v številnih drugih državnih in mednarodnih raziskovalnih projektih ter v mednarodnih kliničnih raziskavah, v katerih postaja vloga patologov vse pomembnejša. Od leta 2004 so raziskovalci oddelka vključeni v raziskovalni program Lastnosti malignih tumorjev, pomembne za diagnozo ter napoved poteka bolezni in izida zdravljenja, ki ga vodi dr. M. Bračko in v katerem sodelujejo tudi raziskovalci z Oddelka za citopatologijo OI in Kliničnega oddelka za hematologijo UKC Ljubljana. Dr. J. Lamovec je bil l. 2007 izvoljen za izrednega člana Slovenske akademije znanosti in umetnosti. Na oddelku poteka izobraževanje v sklopu specializacije iz anatomske patologije in citopatologije, kjer so zdravniki oddelka glavni in neposredni mentorji. Oddelek že več kot 25 let organizira redne slide seminarje, ki predstavljajo pomembno obliko kontinuiranega podiplomskega izobraževanja slovenskih patologov, udeležujejo pa se jih tudi kolegi iz tujine.

Cilji in smeri razvoja

Tudi v prihodnje bomo skušali ohraniti visoko raven strokovnega dela v onkološki patologiji, slediti razvoju novih metodologij in sodobnim strokovnim smernicam ter jih implementirati v lastno delo. V laboratoriju nameravamo vpeljati sistem zagotavljanja kakovosti po standardu za medicinske laboratorije ISO 15189. Še naprej bomo skrbeli za strokovno izobraževanje specializantov in specialistov patologije ter se še širše vključevali v raziskovalno delo v sklopu lastnih in mednarodnih študij.

External Quality Assessment Scheme (NEQAS). The results obtained in our laboratory have always met high immunohistochemical standards, and our FISH results have also been evaluated as reliable and suitable for diagnostic purposes. Another contribution to the improvement and quality control of our diagnostic work is – apart from daily meetings at the discussion microscope – the review of all core-needle biopsies and excisions of nonpalpable breast lesions, which are presented at regular weekly meetings of the multidisciplinary team, consisting of pathologists, surgeons and radiologists. A similar procedure was adopted also for bone marrow biopsies that are presented at the multidisciplinary meetings at the department of haematology of the University Medical Centre Ljubljana.

Education and research are important segments in the operational scope of the department. In the last decade, members of the department have conducted and successfully completed four research projects, and participated in several national and international projects and clinical trials, in which the role of pathologists is increasingly more important. Since 2004, the research investigators from our department have been collaborating with investigators from the department of cytology of the Institute of Oncology Ljubljana and from the department of haematology of the University Medical Centre Ljubljana in the research program »Characteristics of Malignant Neoplasms Important for Diagnosis, Prognosis and Treatment Outcome«, lead by dr. M. Bračko. In 2007, dr. J. Lamovec was appointed an associate member of the Slovenian Academy of Sciences and Arts. The educational program at the department of pathology includes a residency training program in pathology; medical doctors at the department act as principal mentors and supervisors. For more than 25 years, the department has organized regular slide seminars, which are an important form of continuing postgraduate education for Slovenian pathologists, as well as for our colleagues from abroad.

Future Prospects

We will do our best in the future as well to keep our work in oncological pathology at the highest professional level, to follow advances in methodology and the most recent professional guidelines, and to incorporate them into our work. Our plans are to set up a quality assurance system in compliance with the medical laboratory standard ISO 15189. We will also carry on with providing further training to residents and specialists in pathology, and we will more intensively engage in research at the national and international level.

Strokovno delo

Sektor operativnih strok

Predstojnik:
doc. dr.
***Marko Hočevar**,*
dr. med.

Kirurgija predstavlja najstarejši in še vedno najuspešnejši način zdravljenja solidnih tumorjev. Tudi danes, v dobi stereotaktičnega obsevanja in tarčnih bioloških zdravil, je prispevek kirurgije k ozdravitvi rakavih bolnikov največji od vseh znanih načinov zdravljenja raka. Vendar se vloga kirurgije spreminja, predvsem zaradi razvoja bazične znanosti, ki je v tem času omogočil povsem drugačen pogled na biologijo tumorjev. Danes vemo vedno več o osnovnih mehanizmih iniciacije, promocije in progresije tumorjev. To znanje nam vedno bolj pomaga pri vseh vidikih obravnave bolnikov z rakom in celo pri še zdravih ljudeh, pri katerih je verjetnost nastanka raka povečana.

Onkološki kirurg je enakopraven član multidisciplinarnega tima, kjer s strokovnjaki komplementarnih strok (z diagnostikom, radioterapevtom, internistom onkologom) sodeluje pri vseh vidikih obravnave rakavih bolnikov – pri preventivi, diagnostiki, zdravljenju, sledenju in paliaciji. Za kirurga je zato izredno pomembno osnovno znanje onkologije, saj mu omogoča dodatno kognitivno komponento njegovega dela – presojo o tem, kdaj operirati in zakaj. Tehnični vidiki kirurškega znanja – kako operirati – so samo dopolnitev optimalnega načrtovanja in načina kirurškega zdravljenja.

Ob tem pri kirurškem zdravljenju raka naletimo na splošen problem specializiranosti in subspecializiranosti medicine. V zadnjih desetletjih 20. stoletja se je zaradi čedalje obsežnejšega znanja medicina specializirala na različna ožja področja. Temu je sledila tudi kirurgija, ki se je specializirala po različnih organskih sistemih. »Organski« specialisti se danes ukvarjajo z benigno in z maligno patologijo znotraj posamičnih organskih sistemov. Zanimivo pa je, da se je že zelo zgodaj po pojavu »anatomske« specializacije kirurgije pokazalo, da imajo različni specialisti veliko skupnega, ko pride do kirurškega zdravljenja malignih tumorjev. Osnovni biološki in kirurški principi so enaki ne glede na anatomski predel ali organski sistem, v katerem je vzniknil rak. Tako se kirurško zdravljenje raka požiralnika ali raka prostate v osnovnih kirurških principih praktično ne razlikuje. Zaradi teh spoznanj je bilo leta 1981 v Ženevi ustanovljeno Evropsko združenje onkoloških kirurgov (ESSO). Med ustanovnimi člani smo bili tudi slovenski onkološki kirurgi. To združuje povezuje številne kirurge, ki se v svoji praksi večinoma ukvarjajo z rakavimi bolniki. Namen združenja je poudarjati pomen onkološke kirurgije v zdravljenju vseh vrst solidnega raka. Poznavanje osnovnih bazičnih principov, raziskovanje in kirurške tehnike so skupne vsem onkološkim kirurgom ne glede na anatomsko vrsto tumorjev, s katerimi se ukvarjajo. Znotraj onkološke kirurgije so se tako po različnih anatomskih področjih prenesle iste kirurške tehnike. Primer je izolirana ekstremitetna perfuzija pri melanomu, ki se je pozneje z nekaj modifikacijami prenesla v jetrno kirurgijo (izolirana perfuzija jeter) in ginekologijo (hipertermična perfuzija trebuha pri raku jajčnikov).

Po vzoru drugih evropskih specializacij ima tudi ESSO od leta 2002 svoj evropski izpit znotraj EBSQ (European Board of Surgical Qualification). Izpit poteka vsako leto ob kongresu ESSO ali ECCO (European CanCer Organisation). Med prvimi šestimi kandidati, ki so omenjeni izpit opravili v letu 2002 v Lillu v Franciji, sta bila tudi dva slovenska onkološka kirurga (Ibrahim Edhemović in Marko Hočevar). Ta izpit je pozneje opravil tudi Nikola Bešić. ESSO je v letu 2006 objavil priporočila in program za enotno evropsko specializacijo onkološke kirurgije. Pri pisanju programa specializacije, ki je objavljen na spletni strani ESSO in v časopisu Surgical Oncology, je sodeloval tudi Marko Hočevar.

Tako kot ostale komplementarne terapevtske stroke v onkologiji tudi onkološka kirurgija postaja vse bolj »tarčno« usmerjena in tako ob manjši invazivnosti dosega enake ali dostikrat celo boljše rezultate

Professional Work

Division of Surgery

Head:
Assist. Prof.
***Marko Hočevar**,*
M.D., Ph.D.

Surgery is one of the main treatments for cancer. It is also the oldest and most successful treatment for solid tumors. Even today, in the era of stereotactic radiotherapy and target biological drugs, surgery is the most effective of all cancer treatment modalities; hence, of all treatment modalities, its contribution to the cure of cancer patients is the highest. On the other hand, the role of surgery varies and depends primarily on progress achieved in the basic sciences, which has significantly altered perspectives on tumor biology. We now have a much broader knowledge of the principal mechanisms of tumor initiation, promotion and progress. And this knowledge is gradually and extensively being applied in all aspects of managing both cancer patients and healthy subjects who are at a higher risk of developing cancer.

Today, the surgical oncologist is a member of a multidisciplinary oncology team, in which he or she plays an equal part with experts of complimentary medical professions, e.g. diagnosticians, radiotherapists and medical oncologists. The surgical oncologist is involved in all stages of care for cancer patients – that is, in cancer prevention, diagnostics, treatment, follow-up and palliation. It is therefore of major importance that the surgical oncologist is acquainted with the basics of oncology, which open another dimension to his work – the assessment of when and why to act. The technical dimension of surgical work – how to act – is merely a supplement to optimal treatment planning and to the selection of the most suitable surgical treatment technique.

One global challenge we are facing in the surgical treatment of cancer is specialization and subspecialization in medicine. In the last decades of the 20th century, the process of breaking medical science into different subspecialties started, due to the increasing corpus of medical knowledge. The same trend was observed in surgery, which was divided by different organ systems into appropriate subspecialties. Today, specialists in “organ” surgery are dealing with the benign as well as malignant pathology of their specialty. It is interesting, however, that at the very beginning of the process of categorizing surgery into “anatomical” specialties, it was obvious that the specialists in different anatomical surgery specialties had much in common when faced with surgical treatment of malignant tumors. The basic principles – as much biological as surgical ones – are the same, regardless of the anatomical area or organ system in which the cancer has arisen. So, in terms of basic surgical principles, the surgical treatment of esophageal cancer does not differ from the surgical treatment of prostate cancer. This new evidence proved decisive for setting up an organization that would unite surgeons who were treating predominantly cancer patients. So, in 1981, ESSO (European Society of Surgical Oncology) was founded in Geneva, Switzerland. Among the founding members of ESSO were surgeons from Slovenia. The main objective of the new organization was to put emphasis on the importance of surgery in treating all types of solid tumors. Basic principles, i.e. research and surgical techniques, are common to all surgical oncologists, regardless of their anatomical specialty. Hence, the same surgical techniques were adopted by the various anatomical specialties within the domain of surgical oncology. Isolated extremity perfusion in the management of melanoma can serve as an illustrative case. Following some modifications, this technique has been transferred to liver surgery (isolated perfusion of the liver) and gynecology (hyperthermic abdominal perfusion in the treatment of ovarian cancer).

Following the practices of other unified European specializations, ESSO in 2002 launched its first examination session in surgical oncology, conducted under the supervision of the ESSO Examination Board. This examination, the European Board of Surgical Qualification, is regularly organized once a

zdravljenja. V zadnjih 15 letih smo tako priča uvedbi številnih manj invazivnih metod v kirurgijo raka. Laparaskopska kirurgija raka prebavil je danes pri nekaterih indikacijah enako uspešna kot klasična kirurgija, vendar je travma za organizem manjša, zato se rane hitreje celijo in tudi rehabilitacija bolnikov je hitrejša.

Izotopno vodena kirurgija je močno spremenila kirurško zdravljenje raka dojk, melanoma in vulve. Biopsija bezgavke sentinel (prve drenažne bezgavke) je pri omenjenih vrstah raka v celoti izpodrinila klasične odstranitve bezgavk, ki so bile zelo mutilirajoče, saj so bile največkrat samo diagnostične operacije, ki naj bi natančno zamejile bolezen. Izotopno vodena kirurgija se uveljavlja tudi pri kirurgiji raka debelega črevesa, tumorjev glave in vratu ter endokrinih tumorjih.

Tudi kadar nismo dobili novih manj invazivnih metod, je postala kirurgija manj mutilirajoča in je povzročala bistveno manj neželenih posledic. Najlepši primer je totalna mezorektalna ekscizija (TME) pri raku danke. TME upošteva osnovne onkološke kirurške principe (resekcija v bloku znotraj anatomskega predela in pri tem doseže večjo radikalnost, hkrati pa ohrani vse bistvene vitalne strukture in funkcije. Bolniki imajo po taki operaciji bistveno manj lokalnih recidivov ter ohranjeno kontinuiteto prebavil, urinsko kontinenco in spolne funkcije.

Na Onkološkem inštitutu je prišlo v zadnjih 10 letih do organizacijskih sprememb, ki so v letu 2002 privedle do nastanka enotnega sektorja operativnih strok, ki združuje tri med seboj tesno povezane oddelke:
• Oddelek za onkološko kirurgijo,
• Oddelek za onkološko ginekologijo,
• Oddelek za anesteziologijo in intenzivno terapijo.
Sektor ima skupnega predstojnika, vsak oddelek pa ima svojega vodjo.

V zadnjih 10 letih smo v sektorju operativnih strok opažali stalen, približno 5-odstoten letni porast števila operacij. Za to sta dva razloga:
• stalen porast incidence raka,
• uvedba novih metod v kirurško zdravljenje nekaterih vrst raka, zaradi česar je prišlo do postopnega koncentriranja bolnikov v omejeno število centrov.

Prostorske možnosti za povečan obseg dela so bile na stari lokaciji sektorja operativnih strok v stavbi A zelo omejene in so preprečevale normalen razvoj dejavnosti. To se je še dodatno zaostrilo po poplavi konec leta 2002, ki je dokončno onemogočila operativno delo v stavbi A. Sledilo je zelo težavno obdobje gostovanja v UKC Ljubljana in v Kirurškem sanatoriju Rožna dolina. V najetih operacijskih dvoranah smo operirali bolnike, ki so bili sicer še naprej hospitalizirani v nemogočih razmerah v stavbi A. Na operacijo smo jih prepeljali iz stavbe A in po njej smo jih spet odpeljali tja. Kljub temu smo še naprej vsako leto povečevali število operacij – in kljub zelo improviziranim razmeram v tem času nismo imeli nobenega hujšega zapleta. Dokončanje novogradnje se je iz meseca v mesec in iz leta v leto izmikalo. Kljub vsemu smo ga v letu 2007 le dočakali. Spomladi 2007 smo v nove prostore najprej preselili dnevno bolnišnico in začeli uporabljati dve novi operacijski dvorani. Oktobra 2007 smo dokončno zapustili stavbo A. Tako so onkološki bolniki in zaposleni le dobili človeka vredne prostore.

year, on the occasion of the ESSO or ECCO (European Cancer Organisation) yearly congress. Among the first six candidates to pass this examination in 2002 in Lille, France, were two Slovenian surgical oncologists, Ibrahim Edhemović and Marko Hočevar. The following year, one more Slovenian surgeon applied for and passed the EBSQ examination (Nikola Bešić). In 2006, ESSO published recommendations and a core curriculum for a unified European specialization program in surgical oncology. One member of the team who designed and wrote the specialization program, which was posted on the ESSO website and published in the medical journal Surgical Oncology, was our Slovenian colleague, Marko Hočevar.

Surgical oncology, as with other complementary cancer treatments, is developing into a target treatment, which is less aggressive and achieves results equal to (or occasionally even better than) standard treatment. In the past 15 years, we have thus witnessed an expansive use of less aggressive surgical methods in cancer surgery. Considering certain indications, laparoscopic resection of gastrointestinal tumors, which is less traumatic for the organism and thereby also allows for more rapid curing and rehabilitation of patients, may often be as successful as standard surgery.

Major changes have been observed in the treatment of breast and vulvar cancer and of melanoma after the introduction of radioisotope-guided surgery. In these three cancer types, the sentinel lymph node biopsy has completely banished the traditional lymph node dissection, which was a mutilating surgical procedure, although its principal task was merely diagnostic, aiming to accurately assess the disease stage. Radioisotope-guided surgery has also been successfully introduced in surgery of the colon, head and neck, and endocrine tumors.

Surgery has become less mutilating, with fewer undesired adverse effects, even in cases where less aggressive surgical methods are not available. The most illustrative example is total mesorectal excision (TME) in the treatment of rectal cancer. TME simply allows for the basic principles of oncological surgery, i.e. en-block resection within an anatomical compartment, thus achieving a more enhanced radicality and, concurrently, sparing all vital structures and functions. Patients who have undergone TME have considerably fewer local recurrences, while the continuity of the gastrointestinal tract, urine continence and normal sexual function are usually preserved.

In the last decade, several organizational changes have been made at the Institute of Oncology Ljubljana; as a result of this reorganization, the Division of Surgery was established in 2002, joining three interrelated departments:
• department of surgical oncology
• department of gynecological oncology
• department of anesthesiology and intensive care

Each of the three departments is managed by the head of the department, while the whole division is under the control of a joint head of the division.

In the Division of Surgery, a steady 5% increase in the number of operations performed per year has been observed over the last decade. This increase can be attributed to the following two causes:
• a steady increase of cancer incidence; and

V zadnjih 10 letih je prišlo v sektorju operativnih strok do številnih in odmevnih dosežkov na različnih področjih. Strokovno izstopajo uvedbe številnih novih kirurških metod zdravljenja. Vse so v duhu doslednega upoštevanja osnovnih onkoloških kirurških principov in vse manjše nepotrebne invazivnosti.

Pri bolnikih/bolnicah z rakom dojk, vulve in z melanomom se je uveljavila biopsija bezgavk sentinel. S to minimalno invazivno metodo individualno natančno ugotovimo stadij bolezni brez nepotrebne mutilacije.

Kot prva bolnišnica v Sloveniji smo pri bolnikih z rakom danke uvedli totalno mezorektalno ekscizijo (TME) in s tem dosegli najmanjši odstotek lokalnih recidivov, hkrati pa največji odstotek kontinuitetnih operacij.

Pri bolnikih z metastatskim melanomom, omejenim na okončine, smo uvedli izolirano ekstremitetno infuzijo in se s tem izognili nepotrebnim amputacijam.

Ena od osnovnih novih tehnik v onkologiji je postala »izotopno« vodena kirurgija, ki smo jo uvedli pri operaciji raka dojk, črevesja in tumorjev obščitnic.

V letu 2007 smo po prihodu prof. Gadžijeva uvedli tudi kirurgijo jeter in uporabo intraoperativnega UZ.

Z zamudo glede na ostale slovenske bolnišnice smo po selitvi v nove prostore začeli tudi z uvajanjem laparaskopske kirurgije in opravili smo prve preventivne ovariektomije pri nosilkah genov BRCA, resekcije sigmoidnega črevesja in adrenalektomije.

Kot prva bolnišnica v Sloveniji smo pri operacijah ščitnice začeli uporabljati intraoperativni monitoring povratnega laringealnega živca.

V letu 2000 smo kot del skupine za onkološko genetsko svetovanje začeli s svetovanjem in genetskim testiranjem bolnikov z dednim rakom. Najprej je bila ta dejavnost usmerjena samo na bolnike z dednim medularnim rakom ščitnice, pozneje pa še na bolnike z rakom dojk, črevesja in z melanomom. Ker je dobro podporno zdravljenje bistven del obravnave onkoloških bolnikov, smo po letu 2002 začeli s predoperativno prehransko podporo (zdravljenjem) pri bolnikih, pri katerih je načrtovan večji operativni poseg.

Pri operiranih bolnikih in pri bolnikih v enoti intenzivne terapije smo uvedli uporabo bronhoskopije in UZ srca.

Pri bolnikih s tumorji obščitnic smo uvedli minimalno invazivne operacije v regionalni anesteziji.
Tvorno smo sodelovali pri organizaciji paliativnega tima in oddelka na Onkološkem inštitutu.
Strokovnjaki operativnega sektorja so sodelovali pri nastanku smernic za zdravljenje večine tumorjev (sarkomov, raka ščitnice, melanoma, raka dojk, prebavil). Smernice pripomorejo k enotni obravnavi bolnikov z rakom in predstavljajo prvi korak pri nastajanju kliničnih poti za posamične tumorske lokalizacije.

• application of new methods in the surgical treatment of some cancer types, as a result of which, patients with these specific cancers are gradually being concentrated only in specialized cancer centers.

The space capacities that were available to the surgical staff in the old premises of the Institute of Oncology (Building A) were too poor to allow an increased amount of work or normal progression of activities. The circumstances were further exacerbated after the flood at the end of 2002. From then on, surgery could no longer be performed in the old building. The period that followed was truly difficult. Our surgical staff performed operations in hired operating theatres of the University Medical Centre and the Rožna Dolina Surgical Sanatorium. The patients who were hospitalized in the almost unbearable conditions of the old Building A were, after the operation, transported back to Building A. In spite of most unkind working conditions, the number of operations was steadily growing every year, and despite constant improvisation at work, no serious complications developed after surgery. The construction of the new building was delayed from month to month and then from year to year … and so on, until 2007, when it was completed. In spring 2007, the Division of Surgery started to move into the new premises. First, the day hospital was moved and operations started to be performed in two operating theatres. In October 2007, the surgical team definitively left the premises in the old Building A and moved to the patient- and staff-friendly premises of the new building.

In addition to numerous changes in the recent decade, this period has been distinctly marked by abundant and most valuable achievements. The most important are undoubtedly those obtained in the area of surgery – e.g. a number of new treatment methods applied in surgery, designed and developed in consistency with basic surgical principles and the requirements for minimal unnecessary invasiveness.

A new method successfully being applied in the treatment of patients with breast and vulvar cancer or melanoma is sentinel lymph node biopsy (SNLB). This is a minimally invasive surgical method that is used to accurately determine the disease stage without causing any unnecessary mutilation.

Our institute was the first in the country to start using total mesorectal excision (TME) in the treatment of patients with rectal cancer, thereby achieving the lowest percentage of local recurrences and the highest percentage of continuity of operations.

Isolated extremity infusion is another new method being applied in the treatment of patients with metastatic melanoma on the extremities. With the use of this new method, unnecessary amputation of the extremity can be avoided.

One of the treatment methods of fundamental importance in surgical oncology is radioisotope-guided surgery, applied in the surgical treatment of breast, colon and parathyroid tumors.

In 2007, after Professor Gadžijev joined our surgical team, surgery for liver cancer using intraoperative ultrasonography was introduced at our institute.

In comparison with other Slovenian hospitals, our institute introduced the use of laparoscopic surgery only after the surgical staff was moved to the new building and new operating theaters, where the first

Strokovnjaki operativnega sektorja so sodelovali tudi pri organiziranju presejalnih programov za raka materničnega vratu (ZORA) in dojk (DORA).

V zadnjih 10 letih smo dobili šest novih doktorjev znanosti (Bešić, Hočevar, Žgajnar, Brecelj, Ečimović, Stopar) in štiri nove magistre znanosti (Hergouth, Lahajnar, Bergant, Eržen)

Dobili smo tri nove docente (Bešić, Hočevar, Žgajnar), novo izredno profesorico (Vrščaj), bili smo tudi mentorji trem novim doktorjem znanosti in štirim novim magistrom znanosti.

V raziskovanju smo bili v sektorju operativnih strok v zadnjih 10 letih zelo aktivni. Imeli smo osem nosilcev raziskovalnih projektov in/ali programov (Auersperg, Lindtner, Vrščaj, Snoj, Kozjek, Bešić, Žgajnar, Hočevar). Temu je sledila tudi bogata publicistična dejavnost s številnimi članki v domačih in tujih strokovnih revijah.

V prihodnje nameravamo uvesti regionalno hipertermično perfuzijo po totalni peritonektomiji pri bolnikih, ki imajo lokoregionalno napredovalega raka kolorektuma, jajčnikov in mezoteliomom. Pri teh bolnikih lahko z omenjeno metodo pri ustrezno izbrani indikaciji dosežemo popolno ozdravitev v 30 %.

Postopno nameravamo razširiti indikacije za laparaskopsko operiranje bolnikov s kolorektalnim rakom, nekaterih zasevkov jeter, tumorjev suprarenalk. Dodatno želimo uvesti laparaskopski pristop tudi pri manj zahtevnih (brez predhodne kemoterapije) retroperitonealnih limfadenektomijah.

Velika naloga je posodobitev smernic zdravljenja različnih vrst raka in na tej podlagi postavitev kliničnih poti za vso državo. Vzpostaviti moramo tudi vse potrebne mehanizme kontrole kakovosti našega dela, saj brez tega ni in ne bo optimalnih rezultatov zdravljenja.

V naslednjih letih pričakujemo nadaljnje koncentriranje nekaterih lokalizacij na Onkološkem inštitutu kot enem izmed terciarnih centrov, saj je to skladno s smernicami Nacionalnega načrta obvladovanja raka. Za sektor operativnih dejavnosti pomeni to dodatne strokovne in organizacijske izzive, ki jim bomo kos samo s skupnim in enotnim pristopom vseh zaposlenih. Za bolnike pa to pomeni upanje, da bodo v domačem okolju zdravljeni primerljivo z ostalim razvitim svetom.

preventive ovariectomies in BRCA gene carriers, resections of the sigmoid colon and adrenalectomies have already been performed.

Our institute was also the first in Slovenia to use intraoperative monitoring of the recurrent laryngeal nerve in thyroid surgery.

In the year 2000, doctors in the surgical oncology division, as members of a group for oncology genetic counseling, started counseling and genetic testing of patients with familial cancer. At first, counseling and testing was limited to patients with familial medullary carcinoma of the thyroid; later on, it was expanded to patients with breast and colon cancer and to those with melanoma.

As appropriate supportive therapy has always been an essential constituent part of the management of cancer patients, preoperative nutrition support is now provided particularly to patients for whom an extensive surgical intervention has been indicated.

Bronchoscopy and echocardiography are now regularly used in postoperative and intensive care of patients.

Patients with parathyroid tumors are treated under regional anesthesia with minimally invasive surgical methods.

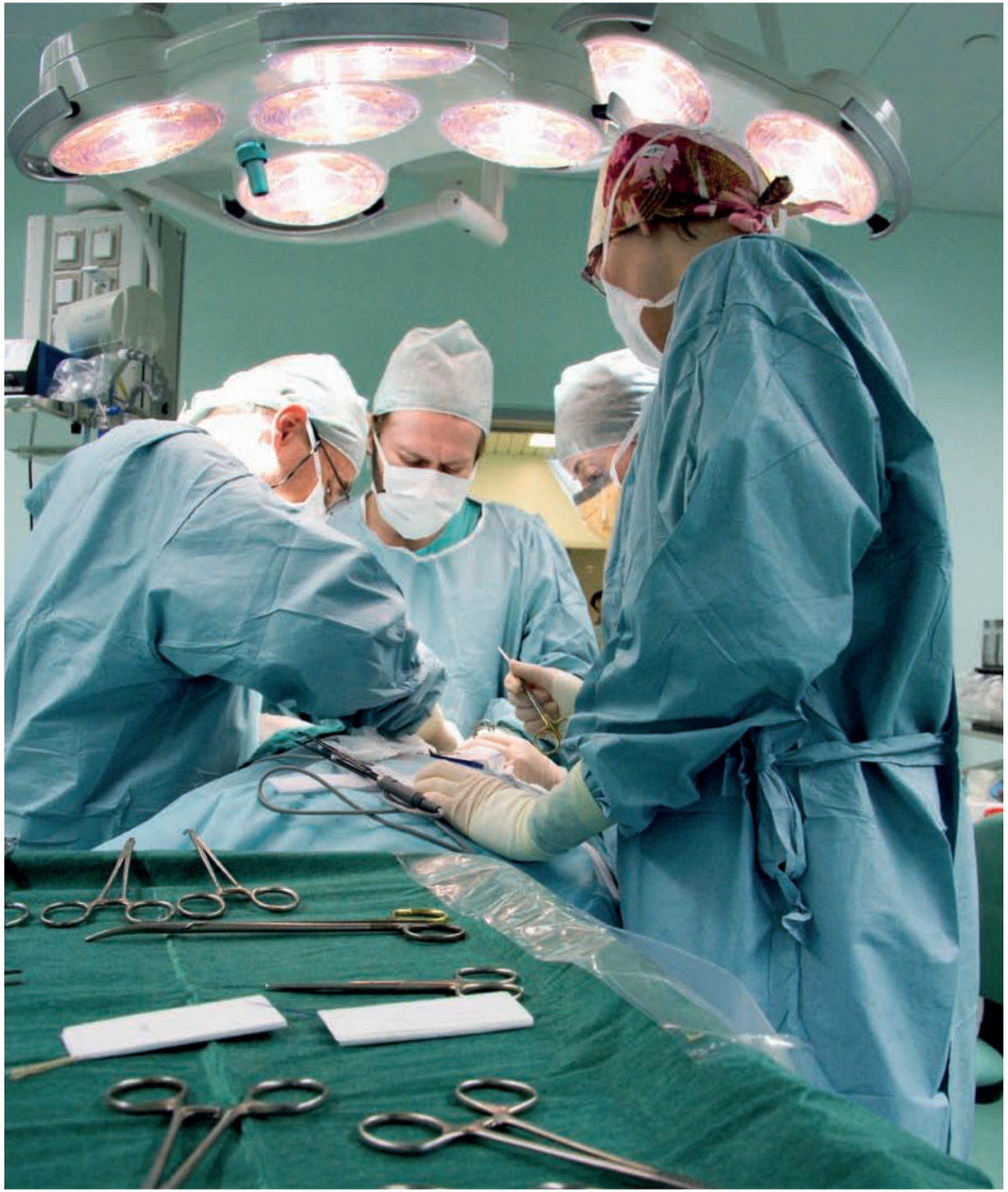
The staff of the Division of Surgery participated in founding and organizing a palliative care team and unit at the Institute of Oncology.

The experts of the Division of Surgery were actively involved in designing and developing treatment guidelines for the majority of tumors (sarcoma, thyroid cancer, melanoma, breast cancer, gastrointestinal tumors). Such guidelines are indispensable for providing uniform care to cancer patients, and are therefore the first step in making clinical paths for managing specific tumor localizations.

The experts of the Division of Surgery also cooperated in the organization and establishment of screening programs for cervical (ZORA) and breast (DORA) cancers.

In the last 10 years, six of our colleagues obtained doctorates (Bešić, Hočevar, Žgajnar, Brecelj, Ečimović, Stopar), and four obtained master's degrees (Hergouth, Lahajnar, Bergant, Eržen). Three of our colleagues were appointed to the post of assistant professor (Bešić, Hočevar, Žgajnar), and one was promoted to associate professor (Vrščaj). Members of our staff were mentors to three new candidates for doctorates and four candidates for master's degrees.

Our colleagues in the Division of Surgery have also been very productive in the last 10-year period in the research domain. Eight of them were principle investigators for a research project or program (Auersperg, Lindtner, Vrščaj, Snoj, Kozjek, Bešić, Žgajnar, Hočevar). Their productive research work and publishing creativity has been certified by numerous scientific papers published in local and international medical and other scientific journals.



The goals we have set for the future include developing new techniques, such as regional hyperthermic perfusion after total peritonectomy in patients with locoregionally advanced colorectal or ovarian carcinoma or mesothelioma. With this technique, a complete cure could be obtained in 30% of patients with the aforementioned tumors, if the appropriate indication is selected.

We also plan to expand the indications for laparoscopic surgical treatment of patients with colorectal cancer, liver metastases and suprarenal tumors. We intend to use laparoscopic access also in less demanding lymphadenectomies (without preoperative chemotherapy).

Another important task we will be faced with is updating the guidelines for the treatment of different types of cancer and preparing clinical paths valid for the whole country. At the same time, mechanisms of quality control for our work also need to be established, or else we will not be able to obtain optimal treatment results.

In the coming years, we can expect further concentrations of certain cancer localizations at the Institute of Oncology Ljubljana (one of the tertiary centers). This will be in accordance with the National Cancer Control Plan. The Division of Surgery will thus be faced with additional professional and organizational challenges, which we will be able to overcome only with the joint forces of all our staff. This will raise the confidence of our patients that the treatment they receive will be as effective as that of patients in the developed world.

Strokovno delo

Sektor radioterapije

Predstojnik:
prof. dr.
***Primož Strojan**,*
dr. med.

Uvod

Radioterapija je eden izmed treh temeljnih onkoloških terapevtskih načinov. Njen nesluteni razmah so omogočili tehnološki napredek, radiobiološka spoznanja in klinične izkušnje, ki so se nakopičili v sto in nekaj letih po odkritju rentgenskih žarkov. Sektor radioterapije Onkološkega inštituta v Ljubljani je trenutno edini oddelek v Sloveniji, ki je opremljen z napravami in sistemi za načrtovanje, izvajanje in nadzor kakovosti obsevanja z ionizirajočim sevanjem. Tu so zbrani tudi vsi strokovni kadri, potrebni za izvajanje obsevalne dejavnosti.

Pomen radioterapije v sklopu multidisciplinarnega onkološkega zdravljenja

Z radioterapijo kot enim izmed treh ključnih terapevtskih načinov naj bi bila zdravljena polovica ali celo večji delež vseh bolnikov, ki zbolijo za rakom. Obsevanje vstopa v program zdravljenja posameznega bolnika na začetku, po opravljenih diagnostičnih preiskavah, ali pozneje med boleznijo, ob njeni ponovitvi ali razširitvi v druge dele telesa. Nastopa lahko kot samostojno zdravljenje, pogosteje pa je skupaj s kirurgijo oziroma sistemskim zdravljenjem del terapevtskega programa. Ob dejstvu, da je med ozdravljenimi bolniki kar 40 % takih, ki so bili zdravljeni z obsevanjem (bodisi kot edinim terapevtskim načinom ali v kombinaciji z drugimi), in da na radioterapijo odpade manj kot 6 % vseh stroškov, namenjenih zdravljenju raka (podatek velja za Švedsko), predstavlja obsevanje stroškovno daleč najučinkovitejše zdravljenja raka.

Ker se zavedamo, da je optimalno zdravljenje rezultat presoje številnih dejavnikov, ki opredeljujejo bolezen pri posamezniku, zdravniki radioterapevti aktivno sodelujemo s strokovnjaki drugih strok s področja diagnostike in klinične onkologije v multidisciplinarnih konzilijih na Onkološkem inštitutu, v univerzitetnih kliničnih bolnišnicah v Ljubljani in Mariboru ter v bolnišnici Golnik. Kot konziliarni onkologi redno obiskujemo nekatere splošne bolnišnice po Sloveniji, kjer s svojim znanjem in izkušnjami prispevamo k čim bolj kakovostni in celostni onkološki obravnavi bolnikov in izobraževanju strokovnjakov.

Razvoj radioterapevtske dejavnosti v Sloveniji

V slovenskem prostoru ima radioterapija zavidljivo tradicijo. Njeno vijugasto, a uspešno pot je leta 1902 z nakupom radijevega aplikatorja za zdravljenje kožnih tumorjev v predelu oči zastavil dr. Emil Bock, predstojnik oftalmološkega oddelka Splošne bolnišnice v Ljubljani. To se je zgodilo le sedem let po odkritju rentgenskih žarkov (W. C. Röntgen, 1895) in le tri leta po prvem znanem poročilu o uspešni ozdravitvi raka, bazalnoceličnega karcinoma kože nosu z žarki X (T. Stenbeck, 1899). Začetek teleradioterapevtske dejavnosti sega v leto 1923, ko je bil v okviru Splošne bolnišnice v Ljubljani ustanovljen Rentgenski zavod. Takrat je pod vodstvom dr. Alojzija Kunsta zavod uspel pridobiti prvo terapevtsko rentgensko napravo, t. i. »rentgenoterapija« pa je postala del dejavnosti sicer v diagnostiko usmerjenega oddelka. V naslednjih letih so podobne naprave začele delovati tudi v Mariboru in Brežicah. Z ustanovitvijo Banovinskega zavoda za zdravljenje in raziskovanje novotvorb leta 1938 v Ljubljani pod vodstvom doc. dr. Josipa Cholewe pa se je začela radioterapevtska dejavnost koncentrirati in razvijati na enem samem mestu. To je omogočilo usmerjen razvoj dejavnosti in predvsem optimalen izkoristek zmogljivosti. Ta zasnova se je ohranila tudi po 2. svetovni vojni oziroma tudi po letu

Professional Work

Division of Radiotherapy

Head of the Division:
Assist. Prof.
***Primož Strojan**,*
M.D., Ph.D.

Introduction

Radiotherapy is one of the three basic treatment modalities in oncology. Its unforeseen expansion was a logical consequence of the intense technological progress, new evidence in radiobiology and clinical experience that were excessively proliferating during the hundred and some years after the discovery of X-rays. At the moment, the Division of Radiotherapy at the Institute of Oncology Ljubljana is the only center in Slovenia equipped with the facilities and systems to plan, carry out and ensure the quality of treatment with ionizing radiation. Moreover, at the institute experts from all domains of radiotherapy are brought together, with the ability to carry out irradiation treatments according to modern standards.

Role of radiotherapy within the multidisciplinary organization of oncology

Half or even more of patients affected with cancer should be treated with radiotherapy, i.e. with one of the three basic treatment modalities in oncology. Radiotherapy is included in the treatment program at the beginning, immediately after the diagnostic tests, or in later phases, during the course of the disease, or when it has recurred or metastasized in other parts of the body. It may be applied as an autonomous therapy; more frequently, though, it is part of a therapeutic program also comprising surgery and systemic treatment. Given that 40% of all cured cancer patients have been treated with radiotherapy (applied as the sole therapy or in combination with others) and that the treatment costs of radiotherapy account for less than 6% of all costs planned for the management of a cancer (data provided by Sweden), radiotherapy is by far the most cost-effective cancer treatment.

Being aware that optimal treatment results can be obtained only by careful consideration of numerous factors determining the disease in each individual patient, radiation oncologists are working hand-in-hand with experts from other fields of oncology, e.g. diagnostics and clinical oncology. They are also members of multidisciplinary advisory teams in oncology that are convened at the Institute of Oncology Ljubljana, both university medical centers in Ljubljana and Maribor, and at the University Clinic of Respiratory and Allergic Diseases Golnik. Radiation oncologists are regularly visiting general hospitals in Slovenia as consultants in oncology, helping and contributing with their rich knowledge and experience to more effective and comprehensive care for patients in local hospitals, as well as to specialized training for their experts.

History of radiotherapy in Slovenia

In Slovenia, radiotherapy has an auspicious tradition. Though it has taken a zigzag course, it has been successful overall since 1902, when Dr. Emil Bock, head of the Ophthalmology Clinic of the General Hospital in Ljubljana, bought a radium applicator for treating skin tumors in the eye region. This purchase was carried out only seven years after the discovery of X-rays (W.C. Roentgen, 1895) and three years after the first documented report about a cured cancer case – a basal cell carcinoma of the skin on the nose treated with X-rays (T. Stenbeck, 1899). The first ventures in teleradiotherapy in Slovenia reportedly took place in 1923, when the Roentgen Institute was established within the former General Hospital in Ljubljana. The institute, then headed by Dr. Alojzij Kunst, the founder and director of the institute, purchased the first therapeutic X-ray device, and the so-called “roentgenotherapy” thus

1946, ko je bil ustanovljen ljubljanski Onkološki inštitut, kot ga poznamo danes – celovit nacionalni multidisciplinarni center, ki opravlja naloge, povezane s preventivo raka, zdravljenjem, rehabilitacijo in paliativno oskrbo bolnikov z rakom, ter skrbi za uravnotežen razvoj onkologije v državi. Le poenoteno prizadevanje različnih strokovnjakov za radioterapijo in stekanje finančnih virov, namenjenih obsevalni dejavnosti za celotno Slovenijo, na eno samo mesto razloži dejstvo, da smo v Sloveniji kljub precejšnjemu pomanjkanju denarja oziroma obsevalnih zmogljivosti dobili prvi megavoltni obsevalnik betatron že leta 1955, torej le tri oziroma dve leti za tem, ko je taka naprava začela delovati v Zürichu, Parizu in Oslu, telekobalt pa 11 let (leta 1962) po prvi inštalaciji v Kanadi. S petletnim zamikom (leta 1978) je na inštitutu začel delovati prvi dvoenergijski linearni pospeševalnik, prvi računalniško krmiljeni linearni pospeševalnik pa je bil kupljen le tri leta (leta 1988) po prihodu teh naprav na trg.

V organizacijskem pogledu je radioterapevtska dejavnost od ustanovitve Banovinskega zavoda za zdravljenje novotvorb ves čas delovala kot samostojna enota znotraj večdisciplinarne ustanove. Že leta 1947 je bila kot rezultat vizionarskih prizadevanj prof. dr. Božene Ravnihar v okviru ljubljanske Medicinske fakultete ustanovljena Katedra za onkologijo in radioterapijo. Prav tako gnana z entuziazmom in napori prof. Ravniharjeve, je bila v Sloveniji že zelo zgodaj prepoznana potreba po oblikovanju profila medicinskega strokovnjaka, ki bo nosilec specifičnega znanja in veščin s področja obsevalne dejavnosti. Tako je bila že leta 1955 specializacija iz radioterapije (z onkologijo) ločena od specializacije iz radiologije, v okviru katere so se do takrat izobraževali zdravniki, ki so pozneje delali v radioterapiji.

Manj uspešni so bili v svojih prizadevanjih po priznanju specifičnosti svoje dejavnosti kolegi medicinski fiziki: formalno potrditev svoje strokovne usmeritve »medicinska fizika« so uspeli doseči šele v zadnjem obdobju. Prav tako zaostajajo za načrti prizadevanja za formalno šolanje iz medicinske fizike: to naj bi v Sloveniji steklo v okviru podiplomskega programa na Fakulteti za fiziko in matematiko Univerze v Ljubljani v enem od prihodnjih študijskih semestrov.

Sektor radioterapije danes

Danes je v Sektorju radioterapije na Onkološkem inštitutu v Ljubljani zaposlenih 119 strokovnjakov za obsevalne dejavnosti. Sektor je razdeljen v štiri organizacijske enote: Oddelek za teleradioterapijo, Oddelek za brahiradioterapijo, Oddelek za radiofiziko in enoto Klinični oddelki sektorja (bolnišnični del s 111 bolniškimi posteljami in dnevna bolnišnica z 10 posteljami). Na dveh terapevtskih in kliničnih oddelkih dela 23 specialistov radioterapevtov (in 15 specializantov), ki so razdeljeni v šest timov, znotraj katerih se obravnavajo posamezne vrste raka. Takšna ureditev z ustrezno bolnišnično podporo omogoča zdravljenje vseh vrst raka, vključno s tumorji pri otrocih, in aplikacijo sistemskega zdravljenja med obsevanjem (sočasna ali konkomitantna radiokemoterapija) vedno, kadar je indicirana. Pri pljučnem raku je v rokah zdravnikov radioterapevtov vse sistemsko zdravljenje, razen redkih primerov sistemskega zdravljenja drugega reda, ki ga aplicirajo internisti onkologi. Z obsevalnimi napravami, ki obratujejo v dveh izmenah (delovni čas od 7.00 do 19.00), upravlja 61 radioloških inženirjev, 11 medicinskih fizikov in 7 dozimetristov pa je odgovornih za načrtovanje obsevanj v teleradioterapiji in brahiradioterapiji, za pripravo obsevalnih naprav in načrtovalnih sistemov za klinično uporabo, za zagotavljanje in preverjanje kakovosti dozimetričnih in žarkovnih lastnosti obsevalnih naprav in spremljajočih sistemov ter izvedenega obsevanja. Medicinski fiziki imajo tudi ključno

became one of the fields of work of this unit, which was mainly diagnostics-oriented. In the following years, similar devices were also introduced in the hospitals in Maribor and Brežice. After the establishment of the Regional Institute for Research and Treatment of Neoplasms in 1938 in Ljubljana, under the directorship of Assist. Prof. Josip Cholewa, all radiotherapeutic activities were concentrated at one location. It was thus possible to further develop radiotherapeutic activities under supervision and control, and to make optimal use of the available equipment. The same concept was kept after the year 1946, when the Institute of Oncology Ljubljana was established in the form and function as we know it today – a comprehensive national multidisciplinary center in charge of prevention and treatment of cancer, rehabilitation and palliative care of cancer patients, and the steady progress of oncology in the country. With the joint endeavors of various experts in radiotherapy and the funds intended for radiotherapy for the whole territory of Slovenia concentrated in one particular place, it was possible, despite a limited budget and lack of irradiation potential, to get the first megavoltage irradiation device in Slovenia, a 31 MeV Betatron, already in 1955 – that is, only three years after the same device was launched in Zürich, and two years after Paris and Oslo. A telecobalt unit was purchased in 1962, eleven years after the first unit was installed in Canada. With five years' delay, in 1978 a dual X-ray dual modality linear accelerator was supplied, while the first digitally controlled linear accelerator was purchased in 1988, just three years after these devices appeared on the market.

From the organizational point of view, radiotherapy has been functioning as an autonomous unit within a multidisciplinary institution since the establishment of the Regional Institute for Research and Treatment of Neoplasms. As a result of the farsighted endeavors of Prof. Božena Ravnihar, the long-standing director of the Institute of Oncology, the Chair for Oncology and Radiotherapy was founded within the Faculty of Medicine of the University of Ljubljana in 1947. Driven by the boundless enthusiasm and relentless efforts of Professor Ravnihar, an urgent need was acknowledged in Slovenia to formulate a medical specialist profile with specific knowledge and proficiency in radiotherapy operations. So, by the year 1955, radiotherapy, together with oncology, was officially recognized as a special branch of medicine – apart from roentgen diagnostics, with which it had been joined previously.

Less fortunate in their endeavors to obtain approval for their work specialty were our colleagues, medical physicists. The professional degree in medical physics was formally approved only recently, whereas preparations for formal training in medical physics have been delayed. It is expected that a graduate training course will soon be launched at the Faculty of Mathematics and Physics at the University of Ljubljana.

Division of Radiotherapy today

The Division of Radiotherapy employs 119 experts in various domains of radiotherapy. The division is further divided into four organizational units: the Departments of Teleradiotherapy, Brachyradiotherapy and Radiophysics, and the Radiotherapy Wards with 111 hospital beds and 10 beds at the day clinic. Two therapeutic departments and clinical wards are managed by 23 radiation oncologists (and 15 residents in radiotherapy). They are divided into six teams, each of them in charge of particular cancer localizations. Such work organization, supported by appropriate hospital back-up, allows treatment of any type of cancer, including pediatric tumors and, whenever indicated, also the application of chemotherapy during irradiation (concomitant radiochemotherapy). In the case of treatment of lung

vlogo pri uvajanju novih obsevalnih tehnik. Tehnično pomoč zagotavljata dva inženirja, vzdrževalca obsevalnih naprav.

Strojni park teleterapevtskih naprav, na katerih je izvedena večina obsevanj, sestavljajo tri naprave za pripravo bolnikov na obsevanje – simulatorji (dva konvencionalna in en CT), ena rentgenska terapevtska naprava in sedem megavoltnih obsevalnikov (en telekobalt in šest linearnih pospeševalnikov). Izmed slednjih sta dva monoenergijski napravi in štirje dvoenergijske naprave z možnostjo tvorbe fotonskih in elektronskih žarkovnih snopov. Pet pospeševalnikov je opremljenih z večlistnim kolimatorskim sistemom (MLC, angl. Multi Leaf Colomator) in z elektronskim sistemom za slikanje obsevalnih polj (EPID, angl. Electronic Portal Imaging Device). Za potrebe načrtovanja obsevanja so na voljo trije računalniški sistemi (za t. i. dvodimenzionalno in tridimenzionalno načrtovanje ter posebej za načrtovanje stereotaktičnega obsevanja) skupaj z osmimi delovnimi postajami, za potrebe vrisovanja tarčnih volumnov, ki ga opravljajo zdravniki, pa še pet dodatnih delovnih postaj. CT-simulator, novejših pet obsevalnikov in računalniški sistem za 3D-načrtovanje obsevanja so med seboj povezani s sodobnim mrežnim sistemom, ki omogoča hiter in varen prenos digitalnih podatkov med naštetimi tremi segmenti radioterapevtskega procesa.

Arzenal brahiterapevtskih naprav sestavljajo tri naprave za naknadno polnjenje z iridijevimi viri ionizirajočega sevanja, dva računalniška sistema za načrtovanje obsevanja in diagnostično rentgensko (C-lok) ter ultrazvočna naprava za preverjanje lege vstavljenih vodil. Letni delež brahiterapevtskih posegov v skupnem številu obsevanj je 5-odstoten.

S sedanjo organizacijo in opremljenostjo Sektorja radioterapije je bilo v letu 2007 izvedenih 5051 obsevanj (teleterapija – 4781, brahiterapija – 270) pri 3947 bolnikih; delež obsevanih bolnikov z rakom v Sloveniji je torej 36,82-odstoten (v izračunu je upoštevana incidenca raka v Sloveniji za leto 2005). Število frakcij obsevanja je bilo 76.659, pri čemer je bilo z manj kot desetimi frakcijami obsevanih 41 % bolnikov, z 10 do 24 frakcijami 27 % bolnikov in s 25 ali več frakcijami 32 % bolnikov. Delež obsevanj s paliativnim oziroma kurativnim namenom je bil 33-odstoten oziroma 67-odstoten. Čakalna doba za obsevanje na telekobaltu je bila v povprečju tri tedne (večinoma paliativna obsevanja), na linearnih pospeševalnikih pa pet tednov. Z brahiterapijo so bili zdravljeni bolniki z različnimi ginekološkimi in urološkimi tumorji, tumorji anusa, danke, očesa in žrela.

Ključni dosežki zadnjih desetih let

Dolgi tradiciji radioterapevtske dejavnosti v Sloveniji primerni so tudi dosežki sektorja v izobraževanju in raziskovalni dejavnosti. Ves čas od ustanovitve Katedre za onkologijo in radioterapijo leta 1947 smo zdravniki radioterapevti aktivno vključeni v dodiplomsko izobraževanje za študente medicine; klinične vaje na Onkološkem inštitutu študentje že vrsto let ocenjujejo kot ene najbolje organiziranih in vsebinsko najbogatejših. V zadnjem času nekateri kolegi sodelujejo tudi pri organizaciji in izvedbi dodiplomskega pouka onkologije na novoustanovljeni Medicinski fakulteti v Mariboru. Trenutno je med 23 specialisti radioterapevti na Katedri za onkologijo in radioterapijo habilitiranih 11 kolegov: dva izredna profesorja, dva docenta in osem asistentov; med naštetimi je devet doktorjev znanosti, osem magistrov znanosti, štirim zdravnikom je bil podeljen primarijat. V skupini 11 medicinskih fizikov sta dva doktorja znanosti in dva magistra znanosti.

cancer patients, radiation oncologists also provide systemic treatment, with the exception of a few rare cases of second-line systemic treatment, which is usually applied by medical oncologists. Irradiation devices, which are in service in two shifts per day, from 7.00 a.m. to 7.00 p.m., are operated and maintained by 61 radiation therapists, while 11 medical physicists and 7 dosimetrists are in charge of planning treatment in teleradiotherapy and brachyradiotherapy, preparing irradiation devices, planning systems for clinical use, and monitoring and ensuring the quality of the dosimetric and beam properties of irradiation machines and accompanying systems, as well as of the performed irradiation session. Medical physicists also have a key role in introducing new irradiation techniques into practice. Technical support is provided by two engineers, who maintain the irradiation devices.

The existing arsenal of teleradiotherapy facilities, with which the majority of treatment sessions are performed, comprises three units to prepare patients for irradiation – simulators (two conventional and one CT), one X-ray therapeutic unit, and seven megavoltage irradiation devices – one telecobalt unit and six linear accelerators, of which two are single X-ray unimodal units and four are dual X-ray units having the capacity to generate photon and electron beams. Five linear accelerators are equipped with a multileaf collimator system (MLC) and electronic portal imaging device (EPID). For planning purposes, three computer systems (for two- and three-dimensional [2D, 3D] planning and for planning stereotactic treatments) with eight work stations are available, with an additional five work stations for the radiation oncologists to mark target volumes. The CT simulator, five new treatment units and computer systems for three-dimensional and stereotactic planning are interconnected via a modern network system, which allows for rapid and safe transfer of digital data among the three segments of the radiotherapeutic procedure.

The arsenal of brachyradiotherapy devices consists of three afterloading devices using iridium wires as sources of ionizing irradiation, two computer systems for treatment planning, a diagnostic X-ray (C-arm) and an ultrasound device to control the position of implanted guides. Of the total number of all irradiation sessions performed per year, the percentage of brachytherapy sessions is 5%.

Under the present workflow organization and with the existing equipment of the Division of Radiotherapy, 5,051 irradiation sessions (teleradiotherapy 4,781, brachyradiotherapy 270) were performed on 3,947 patients in 2007; thus, the percentage of cancer patients treated in Slovenia with irradiation is 36.82% (this calculation was made by taking into account the data on cancer incidence in 2005). The total number of irradiation fractions was 76,658, with 41%, 27% and 32% of patients receiving fewer than 10, 10–24, and more than 25 fractions, respectively. The percentage of irradiation sessions with palliative and curative intent was 33% and 67%, respectively. Waiting time for irradiation with the telecobalt unit was three weeks on average (mainly irradiation with palliative intent), whereas for irradiation with linear accelerators, it was five weeks. Brachyradiotherapy was performed in patients with various gynecological, urologic and anorectal tumors, tumors of the eye, and pharyngeal tumors.

Major achievements in the last decade

The achievements of the Division of Radiotherapy in education and research in the last ten years have not lagged behind the long radiotherapy tradition in Slovenia. From the foundation of the Chair for Oncology and Radiotherapy in 1947, radiation oncologists have been involved in the undergraduate

Na podiplomski ravni zdravniki radioterapevti in kolegi medicinski fiziki sodelujemo kot kompetentni mentorji v petletnem programu specialističnega izobraževanja Zdravniške zbornice Slovenije iz radioterapije in onkologije, ki je v celoti usklajen s priporočili Evropskega združenja za radioterapijo ESTRO (angl. European Society for Therapeutic Radiology and Oncology). Enako velja za program specializacije iz medicinske fizike, ki je prav tako usklajen z usmeritvami in potrjen na Svetu Evropske federacije organizacij za medicinsko fiziko EFOMP (angl. European Federation of Organizations for Medical Physics). Tako uspešno skrbimo za primerno izobrazbeno raven prihodnjih sodelavcev. Nič manj pa ni pomembno sodelovanje strokovnjakov Sektorja radioterapije z različnimi združenji bolnikov in ostalo laično javnostjo. S predavanji, pisnim gradivom in drugimi oblikami nastopov v javnosti skrbimo za boljšo seznanjenost ljudi s preventivo in možnostmi zdravljenja ter rehabilitacije po agresivnem onkološkem zdravljenju.

Raziskovalne aktivnosti so tesno prepletene z vsakodnevnim strokovnim delom, saj je v zasnovi Onkološkega inštituta kot terciarne zdravstvene ustanove raziskovanje obvezen del vsakodnevnih dejavnosti. Najpomembnejši dogodek zadnjih desetih let, ki je ustvaril ustrezne razmere za razvoj drugih aktivnosti, ključnega pomena za strokovno in raziskovalno delovanje samega sektorja in slovenske radioterapije nasploh, je bila temeljita obnova, posodobitev in razširitev obsevalnih zmogljivosti sektorja.

Na Oddelku za teleradioterapijo smo v tem obdobju dobili pet novih, sodobnih megavoltnih obsevalnikov (trije izmed njih so zamenjali stare in izrabljene naprave) ter povečali zmogljivosti s petih na sedem naprav. V ta namen sta bila leta 2005 objektu TRT dozidana dva nova »bunkerja« za obsevalnika. Ob tem je bil porušen večinski del logističnih prostorov sektorja, aktivnosti, ki so se tam odvijale, pa premeščene v preostanek že pred tem pretesnega in prostorsko neustreznega objekta. Nadalje je bila z novo napravo zamenjana terapevtska rentgenska naprava, izključno za potrebe priprave bolnikov na obsevanje kupljen nov CT-aparat (oziroma simulator), računalniški sistem za 3D-načrtovanje obsevanj ter oprema za stereotaktično radiokirurgijo in radioterapijo. Z naštetimi pridobitvami so bile ustvarjene razmere za korenito spremembo načina dela: preproste, na 2D-načrtovanju temelječe obsevalne tehnike je v celoti izpodrinilo mnogo kompleksnejše, natančnejše in časovno bistveno zamudnejše konformalno 3D-obsevanje. Obsevalno ponudbo smo dopolnili z uvedbo obsevanja celotnega telesa (TBI, angl. Total Body Irradiation) in stereotaktične radiokirurgije (SRS, angl. Stereotactic Radiosurgery) v rutinsko klinično delo ter jo kakovostno nadgradili z uvedbo dozimetrije s polprevodniškimi diodami in vivo na vseh novejših obsevalnikih z ustrezno opremo.

V segmentu brahiradioterapije je obnova in razširitev obsevalnih zmogljivosti sovpadala z gradnjo popolnoma novih prostorov oddelka, ki se je 1. oktobra 2007 iz pritličja stavbe A preselil v neposredno bližino teleterapevtskega dela sektorja v kleti stavbe E. Dostop do CT- in MR-naprav Oddelka za radiologijo je tudi na tem področju omogočil prehod na sodobno in varnejše 3D-načrtovanje obsevanj. Popolnoma je bila opuščena uporaba cezijevih izvirov (Cs-137), ki so jih nadomestili iz zaščitniškega gledišča prijaznejši iridijevi izviri (Ir-192). Še vedno pa ostajajo v uporabi stroncijevi aplikatorji (Sr-90). Sedanje zmogljivosti dopuščajo pomembno povečanje (za okoli 80 %) deleža z brahiterapijo zdravljenih bolnikov in uvedbo t. i. obsevanja z visoko hitrostjo doze (HDR, angl. High Dose Rate). Oboje dovoljuje vključevanje novih indikacij v klinično delo (tumorji glave in vratu, bronhialnega sistema, požiralnika, dojk) in s tem pomembno razširitev brahiterapevtske ponudbe v slovenskem prostoru.

training of medical students; practical clinical tutorials organized at the Institute of Oncology have long been highly appreciated and considered as well-coordinated and with a rich scope of content. Recently, our colleagues have been assisting in setting up and implementing the undergraduate curriculum in oncology at the newly founded Faculty of Medicine in Maribor. Out of 23 radiation oncologists, 12 have been appointed at the Chair for Oncology and Radiotherapy: two associate professors, two assistant professors and eight teaching assistants. Among our colleagues, nine are doctors of science, eight are masters of science, and four were promoted to primarius. In the team of medical physicists, two are doctors of science and two are masters of science.

Radiation oncologists and medical physicists from our division participate as mentors in the five-year graduate training program for residents in radiotherapy. The program, which is designed in line with the recommendations of the European Society for Therapeutic Radiology and Oncology (ESTRO), is organized by the Medical Chamber of Slovenia. The curriculum of the graduate specialist training course for medical physicists is also prepared in compliance with European guidelines and approved by the European Federation of Organizations for Medical Physics (EFOMP). We believe that we have taken the right steps for the successful and proper upbringing of future colleagues.

The cooperation of the experts of our division with different cancer patients' associations and the lay community is of no less importance than the professional and scientific achievements of our division. Our colleagues devote special attention to keeping the public well-informed on cancer prevention, treatment options and rehabilitation after aggressive cancer treatment, by delivering lectures, publishing papers on cancer and other forms of public appearance.

Research activities are closely interlinked with the everyday routine work; at our institute, which is a tertiary health care institution, research is, at any rate, an obligatory part of its activities. The event of foremost significance in the last 10 years, which created favorable conditions for the development of other activities of vital importance for operative and research work in the Division of Radiotherapy and for the general progress of radiotherapy in Slovenia, was the renewal, upgrading and expansion of the irradiation potentials in the division.

The great profit of the last 10-year period in the Department of Teleradiotherapy consists of five new, modern megavoltage irradiation units (three of the new ones replaced old, completely burnt-out units); the irradiation facilities of the department have thus increased from five to seven units. In 2005, two new concrete bunkers were built for the safe storage of the new radiation units. Therefore, the major part of the existing logistical premises of the Department of Teleradiotherapy had to be removed, and alternate premises were provided for the staff and work that used to be performed there in the remaining part of the old building, which was too small and spatially inappropriate even before the reconstruction. Furthermore, the old therapeutic X-ray device was also replaced by a new one, and a new CT device (simulator) with a 3D computer-aided treatment planning system and all necessary equipment for stereotactic radiosurgery and radiotherapy was also installed. With the upgraded facilities, it was possible to radically change the methods of work: the conventional 2D planning radiation techniques were completely replaced by more complex, accurate and essentially more time-consuming 3D conformal radiation techniques. The irradiation services were additionally extended by including total body irradiation (TBI) and stereotactic radiosurgery/radiotherapy into routine clinical work, and

S prehodom na 3D-načrtovanje obsevanja in uvedbo potrebnih nadzornih algoritmov in mehanizmov v radioterapevtskih postopkih je sektor znova stopil ob bok sodobnim radioterapevtskim oddelkom drugod po razvitem svetu. Ustvarjeno je ustrezno izhodišče za uvedbo nekaterih naprednih radioterapevtskih tehnik, katerih implementacijo v klinično delo načrtujemo – ob nakupu ustrezne dodatne opreme – že v bližnji prihodnosti: intenziteto modulirajoče obsevanje (IMRT, angl. Intensitiy Moduleted Radiotherapy – konec leta 2008) in slikovno vodeno obsevanje (IGRT, angl. Image Guided Radiotherapy). Z doseženim kakovostnim preskokom so tudi v Sloveniji prišle do izraza številne prednosti sodobnega zdravljenja z obsevanjem oziroma njegovih kombinacij z drugimi terapevtskimi načini, predvsem sistemskim zdravljenjem, tako z vidika učinkovitosti kot tudi varnosti.

V zadnjem desetletju je bila v sodelovanju z drugimi sektorji naše ustanove izvedena vrsta kliničnih raziskav, ki so prek publikacij v uglednih tujih strokovnih časopisih našle potrditev tudi v tujini. Na tem mestu je treba izpostaviti izvirno zasnovane raziskave raka pljuč in mezotelioma z implementacijo nizkodozne kemoterapije z gemcitabinom; predoperativno radiokemoterapijo raka debelega črevesa in danke s kapecitabinom, samim ali v kombinaciji s cetuksimabom; konkomitantno radiokemoterapijo neoperabilnega in operabilnega raka glave in vratu z mitomicinom C in bleomicinom oziroma cisplatinom; zdravljenje raka sečnega mehurja s sočasnim obsevanjem in vinblastinom; raziskave slikovnega prikaza in dozimetrije na 3D-načelu izvajane brahiterapije raka materničnega vratu in prostate. Zdravniki in drugi strokovnjaki sektorja radioterapije so sodelovali v številnih akademskih mednarodnih kliničnih raziskavah raka pljuč, glave in vratu, dojk in limfomov, ki so potekale pod okriljem Evropske organizacije za raziskovanje in zdravljenje raka EORTC (angl. European Organizaion for Research and Treatment of Cancer) in Centralnoevropske kooperativne skupine za onkologijo CECOG (angl. Central European Cooperative Oncology Group). Visoka strokovnost kolegov medicinskih fizikov in njihovo sodelovanje z Mednarodno agencijo za atomsko energijo IAEA (angl. International Atomic Energy Agency) na področju dozimetrije v radioterapiji sta bili nadgrajeni z izdelavo univerzalnih mednarodnih standardov in priporočil, obveznih za vse, ki delajo na tem področju. Poleg omenjenega so medicinski fiziki sodelovali v več mednarodnih projektih iz dozimetrije ter zagotavljanja in preverjanja kakovosti v radioterapiji. Večkrat jim je IAEA zaupala izobraževanje kolegov iz tujine.

Cilji in smeri razvoja v prihodnosti

Cilj Sektorja radioterapije za prihodnost je jasen: postati vodilni regionalni radioterapevtski center, ki bo po kakovosti storitev in opremljenosti primerljiv z najpomembnejšimi tovrstnimi oddelki v Evropi in drugod po razvitem svetu. Čeprav so trenutna izhodišča obetavna, pa je treba za dosego tega cilja storiti še veliko.

Projekcija razvoja radioterapije v slovenskem prostoru s konkretnimi načrti za prihodnost je bila leta 2005 izdelana v okviru elaborata Ocena potreb po radioterapevtskih zmogljivostih do leta 2010 in akcijski načrt za njihovo uresničitev. Elaborat je bil obravnavan in potrjen na sestanku Sekcije za radioterapijo pri Slovenskem zdravniškem društvu in na sestanku Razširjenega strokovnega kolegija za onkologijo pri Ministrstvu za zdravje Republike Slovenije. Ugotovitve in sklepi v njem predstavljajo temeljna izhodišča za načrtovanje razvoja radioterapevtske dejavnosti v državi.

were also efficiently upgraded by implementing semiconductor diodes in *in vivo* dosimetry applied in all new and appropriately equipped radiation units.

In the Department of Brachyradiotherapy, the upgrading and extension of radiation capacities coincided with the construction of completely new premises. On October 1, 2007, the whole department was thus moved from the old Building A to the new location in the basement of the new Building E, in close proximity to the Department of Teleradiotherapy. Moreover, access to CT and MRI devices at the Department of Radiology facilitated implementation of more sophisticated and safer 3D treatment planning of brachytherapy applications. Obsolete cesium (Cs-137) sources were compensated for with iridium (Ir-90) sources that are, from the safety point of view, more friendly to work with, whereas strontium (Sr-90) applicators are still in use. The existing capacities allow a significant increase, by around 80%, in the number of brachytherapy applications, as well as the introduction of high-dose rate (HDR) brachytherapy. As a result, new indications (head and neck, bronchial, esophageal and breast tumors) may now be included in clinical work, which is an important extension of brachytherapy services currently available to Slovenian patients.

With the switch to 3D treatment planning and implementation of necessary control algorithms and mechanisms in radiotherapy procedures, the Division of Radiotherapy of the Institute of Oncology Ljubljana again stands firmly side by side with radiotherapy departments in the developed world. Thus, appropriate grounds have been provided for introducing advanced radiotherapy techniques. Their application in clinical routine work will be possible in the near future with the purchase of appropriate equipment: intensity-modulated radiotherapy (IMRT; by the end of 2008) and image-guided radiotherapy (IGRT). With these achievements, numerous benefits of using the most up-to-date irradiation techniques and their combinations with other cancer treatment modalities, particularly with systemic treatment, have been especially noted in terms of efficiency as well as safety.

In the last decade, we carried out a series of clinical studies in cooperation with other divisions of our institute. Through the reports and scientific papers on these studies published in eminent foreign medical journals, our research work also found affirmation abroad. Special attention should be paid to the studies originally conceived and carried out by our experts. These are the research studies on lung cancer and mesotheliomas treated with low-dose chemotherapy with gemcitabine; preoperative radiochemotherapy with capecitabine alone or in combination with cetuximab in the treatment of colorectal cancer; concomitant radiochemotherapy with mitomycine C, bleomycine or cisplatin in the treatment of inoperable and operable head and neck cancer; treatment of bladder cancer with concomitant radiotherapy and vinblastine; and imaging and dosimetry in 3D brachytherapy of cervical and prostate cancer. Radiation oncologists and other specialists in radiotherapy have participated in numerous international academic clinical research studies of lung, head and neck and breast cancer, and lymphomas, which were carried out under the patronage of the European Organisation for Research and Treatment of Cancer (EORTC) and the Central European Cooperative Oncology Group (CECOG). The top-level expertise of our medical physicists and their cooperation with the International Atomic Energy Agency (IAEA) have resulted in the elaboration of universal international standards and recommendations that are mandatory for all work in this domain. Moreover, our medical physicists also cooperated in several international projects on dosimetry and on quality assurance and quality control in radiotherapy. They were also given the privilege by IAEA to organize on-the-job trainings for their colleagues from abroad.

Da bi skrajšali čakanje bolnikov na obsevanje, dosegli priporočeni delež bolnikov z rakom, ki se med svojo boleznijo zdravijo (tudi) z obsevanjem, in razbremenili trenutno delujoče naprave, bo treba povečati število megavoltnih obsevalnih naprav (in pripadajočih sistemov za načrtovanje in nadzor kakovosti obsevanj) na 12. V omenjenem elaboratu so v okviru posodobitve in razširitve strojnega parka radioterapije predvidene naslednje aktivnosti:

- Dokončanje obnove in razširitve radioterapevtskega centra na Onkološkem inštitutu v Ljubljani s skupaj osmimi delujočimi megavoltnimi obsevalniki. Ta trenutek se megavoltni obsevalniki nahajajo v sedmih izmed osmih razpoložljivih »bunkerjev«: prostora je torej še za en obsevalnik. Poleg tega je za normalno delovanje sektorja nujno treba zgraditi logistične prostore, ki so bili leta 2005 ob dograditvi dveh novih »bunkerjev« v večjem delu porušeni.
- Gradnja enega ali dveh t. i. satelitskih radioterapevtskih centrov zunaj Onkološkega inštituta s skupaj štirimi megavoltnimi obsevalniki. Kot prva možnost se sama po sebi ponuja gradnja takega centra v Mariboru. Poleg že naštetih sta pomembnejša razloga za takšno odločitev še: 1) ponuditi bolnikom iz severovzhodnega dela Slovenije udobnejše zdravljenje z občutno krajšimi vsakodnevnimi prevozi na obsevanje oziroma hospitalizacijo bližje domu; 2) organizacija visokošolskega študijskega programa medicine v okviru Medicinske fakultete Univerze v Mariboru.

Ob tem pa ne smemo pozabiti, da je vsako povečanje obsevalnih zmogljivosti nad obstoječimi nujno prej uskladiti s kadrovskimi zmogljivostmi. Te so že ta trenutek krepko izpod mednarodno priporočenih standardov: za uskladitev trenutnega stanja v Sektorju radioterapije s priporočili bi bilo ob sedanjem obsegu dela treba povečati število zdravnikov specialistov s 23 na 45, medicinskih fizikov in dozimetristov z 18 na 25, podvojiti bi bilo treba število inženirjev vzdrževalcev obsevalnih naprav na štiri. To potrjujejo tudi ugotovitve inšpektorjev Mednarodne agencije za atomsko energijo IAEA, ki so v decembru 2006 obiskali sektor in preverili njegovo organiziranost, strokovnost ter primerljivost z mednarodnimi priporočili in standardi, tudi kadrovskimi. Ker je v slovenskem prostoru število zdravnikov in fizikov, kandidatov za specializacijo, omejeno, bo v prihodnje nujno pritegniti že oblikovane specialiste iz tujine v še večjem številu kot do sedaj.

Ker sta tehnologija in kakovost storitev izjemno soodvisni (bolj kot na večini drugih področij medicine) in ker je radioterapevtska oprema draga, je treba za nemoten razvoj obsevalne dejavnosti in s tem za povečanje dostopnosti bolnikov do zdravljenja z obsevanjem izvajalcem te dejavnosti zagotoviti stabilen finančni vir. V ta namen je bila na Onkološkem inštitutu že izdelana objektivna finančna ocena kakovostno različnih radioterapevtskih storitev, ki v izračunu upošteva realne stroške amortizacije in vzdrževanja naprav ter stroške potrebnih kadrov. Že v najbližji prihodnosti pa je treba doseči, da se bodo storitve radioterapevtske dejavnosti obračunavale ločeno od sedanjega sistema SPP (skupine primerljivih primerov). V nasprotnem primeru naj bi se radioterapevtske storitve za ambulantno in za bolnišnično obravnavane bolnike vodile kot samostojne postavke.

Sklep

Ta trenutek je Sektor radioterapije s svojimi strokovnjaki in opremo edini oddelek v državi, kamor prihajajo bolniki, ki potrebujejo tako zdravljenje. Trdim, da se te odgovornosti zavedamo v polni meri, prav tako kot so se je naši predhodniki v preteklih desetletjih. Od tod tudi zavidljiva tradicija in kakovostna raven, ki smo jo dosegli navkljub številnim težavam, zapletom in predvsem pomanjkanju

Future goals and guidelines

The future goals of the Division of Radiotherapy are evident: to develop into the leading regional radiotherapy center, which will be comparable in the quality of its services and technical facilities with the most prominent radiotherapy centers in Europe and elsewhere in the developed world. Though these goals currently seem promising, there is still so much to be done to meet them.

The vision for further development of radiotherapy in Slovenia with concrete future plans was elaborated in 2005 within the document “Estimation of Radiotherapy Capacity Requirements until 2010 and Action Plan for Their Implementation”. The project was considered and adopted at the meeting of radiotherapy section of the Slovenian Medical Association and at the meeting of the Medical Council for Oncology at the Ministry of Health of the Republic of Slovenia. The statements and conclusions from this document serve as fundamental premises for the further development of radiotherapy in Slovenia.

In view of cutting down the waiting time, providing radiotherapy services to the cancer patients who, according to recommendations, need to be treated with irradiation during the course of their disease, and disburdening the existing overloaded radiation facilities, it is necessary to increase the number of megavoltage treatment units (and of compulsory treatment planning and quality control systems) to 12 units. In the above project, the following goals are set within the plans to update and extend the existing stock of radiation facilities:

- to finish the reconstruction and extension of the radiotherapy center at the Institute of Oncology Ljubljana, reaching a total number of eight megavoltage units. At the moment, seven megavoltage units are located in eight available bunkers, so there is room for another unit. Moreover, for normal functioning of the division, the construction of new rooms for logistical operations is indispensable, as a great part of the building used for this purpose was destroyed in 2005 when two new bunkers were raised;
- to build one or two satellite radiotherapy centers outside the Institute of Oncology, with a capacity of altogether four megavoltage units. Among the options under consideration is the establishment of such a center in Maribor. In addition to the already listed reasons, the following two should not be disregarded: (i) to offer patients from the northeastern part of Slovenia a more comfortable time during treatment, with shorter transfers to daily therapy sessions or hospitalization closer to their home; and (ii) the recently organized university study program for medicine within the Faculty of Medicine in Maribor.

However, it should not go unnoticed that any upgrade of existing irradiation potential should be, prior to its implementation, attuned to the availability of staff potential, which currently does not meet the internationally recommended standards. To bring the existing staff potential in the Division of Radiotherapy at the Institute of Oncology into line with international recommendations, the number of radiation oncologists, medical physicists and dosimetrists, and engineers maintaining the radiotherapy facilities should be increased from 23 to 45, from 18 to 25, and from 2 to 4, respectively. The same was recommended by the IAEA inspectors who visited our division in December 2006 and checked its organization, professional competence and comparability (including human resources) with international recommendations and standards. Due to the meager stock of medical doctors and physicists in Slovenia, it seems unavoidable for us to invite more competent specialists in radiotherapy from abroad.

finančnih sredstev. V potrditev naj navedem del zapisa iz zaključne ocene in priporočil že omenjenega inšpekcijskega ogleda našega sektorja, ki so ga pripravili strokovnjaki Mednarodne agencije za atomsko energijo IAEA decembra 2006: »Oprema, kupljena v zadnjih petih letih, je izkoriščena optimalno. Ob tem pa bo treba zagotoviti ekonomski program kontinuirane implementacije nove opreme, vzdrževanja, servisiranja in nadgrajevanja sedanjih zmogljivosti. Čeprav je strokovnost zaposlenih (zdravnikov radioterapevtov, medicinskih fizikov in radioloških inženirjev) na ravni kompetentnosti, predstavlja glavno oviro, ki bi lahko onemogočila uvedbo visokokakovostnih radioterapevtskih storitev v državi, resna kadrovska podhranjenost zdravnikov radioterapevtov in fizikov ...« Le če se zavedamo pomanjkljivosti in jih sproti odpravljamo, bomo izvajalci dejavnosti lahko jamčili, da bo radioterapija v Sloveniji opravljala svoje poslanstvo v okviru multidisciplinarnega in kombiniranega onkološkega zdravljenja. Predvsem v korist in zadovoljstvo slovenskih bolnikov.

Due to the extremely strong interdependence, much stronger than in other branches of medicine, between technology and quality of services, and due to the high cost of radiotherapy facilities, the providers of radiotherapy services are fully committed to securing stable financial resources that would allow for the steady development of radiotherapy and thereby also increase the availability of its services to patients. An impartial financial evaluation of qualitatively different radiotherapy services, taking into account the rational cost of equipment depreciation and maintenance, and the staff involved, has already been made at the institute. However, proper steps should be made in the near future to ensure that radiotherapy services are accounted for separately from the existing system of diagnosis-related groups (DRG). Radiotherapy services should be, within outpatient as well as inpatient care of patients, considered an independent service.

Conclusion

Today, the Division of Radiotherapy at the Institute of Oncology Ljubljana, with its specialists and facilities, is the only radiotherapy center in the country offering irradiation treatment services to all Slovenian patients who need them. We are fully aware of this responsibility, as much as our predecessors were in the past. This is where this enviable tradition and high level of services achieved, despite innumerable problems, complications and shortage of funds, comes from. May I, in order to endorse the above statement, present to you a fragment of the final report on the assessment and recommendations made by the IAEA supervisors in December 2006: “The equipment purchased by the department during the last five years is optimally utilized. However, a prospective economic program of continuous equipment implementation, maintenance, service and tool upgrades needs to be developed. Although the actual professional staff (radiation oncologists, physicists, radiographers) represents a high level of competence, the major problem is that radiation oncologists and physicists are seriously understaffed, and this may jeopardize the implementation of high-quality radiotherapy services for the whole country.”

Being mindful of these deficiencies and immediately making them up will assure that all those involved in radiotherapy in Slovenia will fulfill the mission of radiotherapy within multidisciplinary and combined cancer treatment – first and foremost to the benefit and satisfaction of cancer patients in Slovenia.

Sektor internistične onkologije

Predstojnica: doc. dr. ***Barbara Jezeršek-Novaković****, dr. med.*

Področje in pomen dejavnosti

Internistična onkologija je samostojna stroka, ki se je razvila iz interne medicine in je danes v onkologiji nepogrešljiv del multidisciplinarne oskrbe bolnika z rakom. Zaradi svoje specifičnosti in zahtevanega znanja iz interne medicine in iz onkologije, zlasti sistemskega zdravljenja raka, je kot samostojna specializacija priznana v ZDA in številnih evropskih državah. Od leta 2000 je samostojna specializacija tudi v Sloveniji.

Glavna dejavnost internistične onkologije oziroma specialistov internistov onkologov je sistemsko zdravljenje raka. Sistemsko zdravljenje v onkologiji pomeni uporabo učinkovin, ki naj bi delovale na vse rakaste celice v telesu (neposredno ali posredno). Nepogrešljivo je pri zdravljenju rakaste bolezni, in sicer kot dopolnilno zdravljenje po lokalnem zdravljenju in ko se bolezen razširi po organizmu. Delovanje sistemskih zdravil je usmerjeno v preprečevanje delitve rakastih celic, preprečevanje njihovega prodiranja v druga tkiva in preprečevanje zasevanja. Sistemsko zdravljenje obsega zdravljenje s klasičnimi kemoterapevtiki, hormonsko zdravljenje in zdravljenje z biološkimi zdravili (tarčnimi zdravili in imunomodulatorji). Poleg specifičnega sistemskega zdravljenja internistična onkologija vključuje tudi podporno zdravljenje neželenih učinkov zdravljenja ter paliativno zdravljenje, lajšanje simptomov bolezni, ki je zlasti pomembno v času, ko je specifično zdravljenje izčrpano, in v času umiranja.

Za pravilno predpisovanje in vodenje sistemskega zdravljenja raka je potrebno znanje iz interne medicine in onkologije, poleg tega pa tudi poznavanje farmakoterapije, predvsem interakcij specifičnih zdravil za raka z drugimi zdravili, neželenih učinkov ter njihovo preprečevanje in zdravljenje. Ob hitrem razvoju tarčnih zdravil je pomembno tudi poznavanje molekularne biologije in njenih dosežkov. Za pravilno načrtovanje sistemskega zdravljenja in ustrezno celostno oskrbo bolnika z rakom je pomembno sodelovanje internistov onkologov s patologi in molekularnimi biologi, pa tudi s strokovnjaki za radiologijo, radioterapijo in kirurgijo, zdravstveno nego in farmacijo.

Sodelovanje v kliničnih raziskavah iz internistične onkologije je izjemno pomembno, saj se prek vodenja in sodelovanja v kliničnih raziskavah sodeluje pri razvoju novih načinov zdravljenja, nove oblike zdravljenja se varno uvajajo v standardno klinično prakso, bolnikom pa omogoči hiter dostop do učinkovitih novih vrst zdravljenja.

Specifični profili, ki so potrebni za strokovno izvajanje sistemskega zdravljenja raka, so internisti onkologi, medicinske sestre, specializirane za delo na oddelkih/enotah za internistično onkologijo, ter farmacevti in farmacevtski tehniki. Po mednarodnih merilih je internist onkolog zdravnik, ki ima specializacijo iz internistične onkologije, in/ali specialist internist, ki 80 % svojega delovnega časa izvaja sistemsko zdravljenje bolnikov z rakom. Internisti, ki izvajajo zdravljenje bolnikov z rakom v polnem delovnem času, so v Sloveniji za zdaj zaposleni na edinem vseobsegajočem onkološkem terciarnem centru – na Onkološkem inštitutu Ljubljana – v Sektorju internistične onkologije (17). Izvajajo večino sistemskega zdravljenja solidnih tumorjev in limfomov odraslih bolnikov v Sloveniji, razen sistemskega zdravljenja raka pljuč, ki ga večinoma še vedno izvajajo specialisti radioterapevti onkologi in pulmologi. Zdravljenje akutnih levkemij, kroničnih mieloproliferativnih obolenj in plazmocitomov v Sloveniji vodijo in izvajajo internisti hematologi, zdravljenje otroških tumorjev pa pediatri onkologi.

Division of Medical Oncology

Head: Assist. Prof. ***Barbara Jezeršek-Novaković****, M.D., Ph.D.*

Field of work and its significance

Medical oncology is an independent medical specialty that developed from internal medicine and is today an indispensible part of multidisciplinary care for a cancer patient. Due to its specificity and knowledge, required as much from internal medicine as from oncology, and in particular from systemic treatment, medical oncology has been approved as an independent medical specialty in the United States and in several European countries. In 2000, it was also approved in Slovenia.

The major task of medical oncology and of specialists in medical oncology is the systemic treatment of cancer. In oncology, systemic treatment uses agents that affect (directly or indirectly) all cancer cells everywhere in the body. Systemic treatment is of key importance in cancer treatment and is applied either as adjuvant treatment after local therapy or when the disease has spread to other parts of the body. The principle of treatment with systemic agents is to inhibit the division of cancer cells, their invasion of other tissue and metastasis. Systemic treatment comprises treatment with standard chemotherapeutics, hormonal therapies and treatment with biological agents (target drugs and immunomodulators). In addition to specific systemic treatment, medical oncology and its specialists also manage treatment toxicities and palliative care applied to relieve disease symptoms, which should be considered particularly after all resources of specific treatment have been used and in cases of slow and painful dying.

Proper indication and management of systemic treatment is only possible with thorough knowledge of internal medicine and oncology, and also of pharmacotherapy, in particular interactions between specific cancer agents and other drugs, toxic effects, and their prevention and treatment. Such an accelerated advancement in the development of target drugs also requires knowledge of molecular biology and of its scientific achievements. Proper planning of systemic treatment and comprehensive care for a cancer patient entails cooperation by medical oncologists with pathologists and molecular biologists, as well as with radiologists, radiotherapists, surgeons, nurses and pharmacists.

Cooperation in clinical research studies is of paramount importance for our team of medical oncologists. By conducting or participating in clinical studies, our colleagues have the opportunity to be directly involved in the development of new treatment techniques and their application in standard clinical practice; at the same time, this is a good opportunity for patients, who can more rapidly get access to new treatment techniques.

Specific profiles of health care workers that are required to properly apply systemic therapy to cancer patients are: medical oncologists, nurses specializing in the care of patients in medical oncology wards, pharmacists and pharmacy technicians. According to international criteria, a medical oncologist is a medical doctor who has completed his/her residency and passed the board exam in medical oncology, and/or a specialist in internal medicine who devotes 80% of his/her working hours to the systemic treatment of cancer patients. Only the specialists in internal medicine (17) who are employed at the Division of Medical Oncology of the Institute of Oncology Ljubljana, a comprehensive tertiary cancer center in Slovenia, are fully engaged (100% of their working hours) in cancer treatment. They carry out the majority of systemic treatment of solid tumors and lymphomas in adult cancer patients, except the systemic treatment of lung cancer, which remains the domain of specialists in radiation

Ključni dosežki v zadnjih desetih letih – v strokovnem in raziskovalnem delu, v izobraževanju, mednarodno pomembnih publikacijah ali priznanjih

Prek sodelovanja v kliničnih raziskavah smo preizkušali nove učinkovine za sistemsko zdravljenje raka – predvsem iz skupine tarčnih zdravil – trastuzumab, bevacizumab, cetuksimab, rituksimab, imatinib, sunitinib, sorafenib, lapatinib, erlotinib, gefitinib, pa tudi novejše klasične kemoterapevtike, kot so docetaksel, pemetreksed, liposomalni doksorubicin, gemcitabin in 5-fluorouracil v dolgotrajni infuziji. Večino navedenih učinkovin smo uspešno vpeljali v rutinsko zdravljenje bolnikov z različnimi vrstami raka. Prek vlog na Zdravstvenem svetu smo redno uvajali vsa nova sistemska zdravljenja, ki so temeljila na izsledkih mednarodnih kliničnih raziskav.

Leta 1998 smo uvedli nov profil raziskovalne medicinske sestre, kar je močno izboljšalo kakovost klinično-raziskovalnega dela na inštitutu. Raziskovalna sestra je najprej delala v Sektorju za internistično onkologijo, s širjenjem dela, zaposlitvijo in izobrazbo še novih raziskovalnih sester pa je bila ustanovljena Enota za klinične raziskave. Od 1998 do 2008 smo kot raziskovalci sodelovali v 50 mednarodnih kliničnih raziskavah, nosilci raziskave pa smo bili pri 40 od teh raziskav. Največji delež raziskav je potekal v okviru akademskih multinacionalnih raziskav, v sklopu EORTC (European Organisation for Research and Treatment of Cancer) in IBCS (International Breast Cancer Study Group). Kot partnerji smo sodelovali tudi v dveh projektih 6. okvirnega evropskega programa, projektu STREP »DNA METHYLATION« ter programu Network of excellence »TRANSBIG; MINDACT«. Bili smo nosilci (ali nosilci na Onkološkem inštitutu) 10 projektov ARRS in enega programa ARRS. Podrobnosti o raziskovalnem delu so navedene v prispevku Raziskovanje in izobraževanje.

Internisti onkologi smo v zadnjih 10 letih sodelovali na številnih mednarodnih in domačih strokovnih sestankih in tako širili znanje iz internistične onkologije. Sodelovali smo pri postavitvi strokovnega časopisa Onkologija, ki v slovenskem jeziku seznanja vse kolege zdravnike s strokovnimi novostmi v onkologiji. V tem času delamo kot uredniki, recenzenti, predvsem pa kot pisci številnih raziskovalnih in strokovnih prispevkov v mednarodnih in domačih znanstvenih in strokovnih revijah. Sodelovali smo tudi kot avtorji ali uredniki 9 strokovnih knjižnih publikacij in 15 knjižic, namenjenih bolnikom in širši javnosti. Aktivno delujemo pri organizaciji in izvedbi vsakoletnih Onkoloških vikendov. V Ljubljani smo v sodelovanju z evropskim združenjem za internistično onkologijo (ESMO – European Society of Medical Oncology) organizirali dve uspešni mednarodni šoli: Citostatska zdravila – delovanje in sopojavi (Cystostatic agents – activity and toxicity) ter Dobra klinična praksa (Good clinical practice). Aktivno smo sodelovali tudi pri organizaciji rednih kongresov CEOC (Central European Oncology Congress), ki od leta 1998 vsaki dve leti potekajo v Opatiji in pri organizaciji kongresov EBCC (European Breast Cancer Conference). Leta 2008 je prof. dr. Tanja Čufer v sklopu evropskega projekta FACT, ki je potekal v okviru predsedovanja Republike Slovenije Evropski uniji, sodelovala pri nastanku knjige in smernic za raziskovanje v Evropski uniji. Izr. prof. dr. Branko Zakotnik pa je leta 2007 na pobudo UEMS (European Union of Medical Specialists) Evropski komisiji predstavil pomen specializacije iz internistične onkologije.

V izobraževanju je pomemben dosežek, da je bila leta 2000 interna onkologija uvedena kot samostojna specializacija. Pomembna je tudi vzpostavitev rednega letnega izobraževanja, Dnevov internistične onkologije; potekajo od leta 2005. Trenutno je v procesu izobraževanja 12 specializantov iz

oncology and pulmologists. In Slovenia, acute leukemias, chronic myeloproliferative disorders and plasmacytomas are primarily treated by hematologists, whereas the treatment of childhood tumors is entrusted to pediatric oncologists.

Major achievements in the last decade in medical and research work and education, and major internationally distinguished medical publications and awards

In the field of medical work, significant achievements were made through the cooperation of our experts in clinical research trials on new agents for systemic treatment, in particular on target drugs, such as trastuzumab, bevacizumab, cetuximab, rituximab, imatinib, sunitinib, lapatinib, erlotinib and gefitinib, and also on the most recent standard chemotherapeutics, such as docetaxel, pemetrexed, liposomal doxorubicin, gemcitabine and 5-fluorouracil in long infusions. The majority of these agents were introduced in routine clinical use for the treatment of different cancers. Through regular applications addressed to the Health Council at the Ministry of Health of the Republic of Slovenia, we gained approval for the clinical use of new systemic treatment regimes validated by international clinical trials.

In 1998, the post of research nurse was created. With the new work force, the quality of clinical research work improved significantly. At first, the research nurse was engaged only by the Division of Medical Oncology; later on, the extension of our work domains required new forces and the training of new research nurses, which led to the establishment of a new unit at the institute – the unit for clinical research. In the 10-year period from 1998 to 2008, members of our team participated as investigators in 50 international clinical trials, and in 40 of them, they were appointed principal investigators. The majority of these trials were performed within the framework of academic multinational research studies under the patronage of the European Organisation for Research and Treatment of Cancer (EORTC) and the International Breast Cancer Study Group (IBCS). We also participated in two projects of the Sixth Framework Programme, the STREP project “DNA METHYLATION” and the Network of Excellence program “TRANSBIG; MINDACT”. Our colleagues were also principal investigators in ten national research projects funded by ARRS (Research Agency of the Republic of Slovenia), and in one program funded by the same agency. Details on the contribution of our team to research are given in the chapter on research and education.

In the last decade, the medical oncologists of our division attended several international and local medical expert meetings, which were excellent opportunities to expand their knowledge and proficiency in medical oncology. Our colleagues were also among the founding editors of the medical journal Onkologija, published in Slovene and intended for our colleagues in wider medical circles, informing them of recent achievements and new evidence in oncology. Currently, members of our team have been appointed as editors in some medical journals; first of all, though, we are all proficient and creative writers of research and scientific papers, which are published in international and local medical journals. We were also invited to cooperate as authors or editors in the publication of 9 books on oncology and 15 booklets intended for cancer patients and the lay community. Every year, we participate in the organization of traditional weekend meetings on oncology. In cooperation with the European Society of Medical Oncology (ESMO), in Ljubljana we organized two successful international courses on “Cytostatic Agent Activity and Toxicity” and “Good Clinical Practice”. We are also included in the organizational bodies of regular meetings of the Central European Oncology

internistične onkologije. Zanje imamo organizirane redne journal klube. V Sektorju za internistično onkologijo deluje en redni profesor, en izredni profesor, en docent in dva asistenta. Veliko naporov vlagamo v stalno izobraževanje vseh internistov onkologov in za sproten prenos novega znanja iz tujine. Trenutno sta na organiziranem izobraževanju v priznanih onkoloških centrih dva naša kolega, da bi prenesli znanje, pa smo bili v zadnjih letih številni internisti onkologi na krajših obiskih tujih inštitucij. Pomembno je, da smo uvedli dodatno štirimesečno izobraževanje za interniste drugih slovenskih bolnišnic, kjer bodo izvajali standardno sistemsko zdravljenje. Ta program je uspešno opravilo že pet internistov.

Cilji oz. smer razvoja v prihodnosti

Obseg in pomen dela v internistični onkologiji sta v zadnjem desetletju močno narasla, na leto se za kar 10 % poveča število novih uvedb zdravljenja in število zdravljenj. To je delno posledica naraščanja incidence raka zaradi daljše življenjske dobe prebivalstva in večjega deleža obolelih za rakom v starosti, predvsem pa kroničnega poteka številnih rakov ter uvedbe novih vrst učinkovitega sistemskega zdravljenja v zdravljenje praktično vseh rakov. Za dobro obvladovanje bolezni postaja internist onkolog nepogrešljiv pri zdravljenju večine bolnikov z rakom. Internistična onkologija in individualno sistemsko zdravljenje, ki temelji na poznavanju molekularne biologije raka, bo tako v naslednjih letih temeljno zdravljenje raka, zato se bodo potrebe po sistemskem zdravljenju in s tem potrebe po internistih onkologih strmo večale.

Povsod po svetu in tudi v Sloveniji že danes primanjkuje ustrezno izobraženih zdravnikov za sistemsko zdravljenje raka, zlasti internistov onkologov. Na Onkološkem inštitutu Ljubljana jih trenutno dela 17, po priporočilih ESMO in ASCO (American Society of Clinical Oncology) pa bi jih moralo v Sloveniji delati najmanj 36. Za celostno strokovno in enovito obravnavo za vse prebivalce Slovenije je zato treba zagotoviti dovolj specifičnih profilov, ki bodo usposobljeni za strokovno izvajanje sistemskega zdravljenja raka. V ta namen je treba zagotoviti razpise specializacij in zaposlovanje internistov onkologov po sprejeti mreži na Zdravniški zbornici Slovenije za interniste onkologe (36 specialistov do 2015). V pripravi je že nova, še razširjena mreža internistov onkologov. Vzporedno mora potekati usposabljanje in zaposlovanje medicinskih sester in farmacevtov, da bo sistemsko zdravljenje raka potekalo nemoteno. Pomembni sta tudi ohranitev dodiplomskega in specialističnega izobraževanja ter kontinuirano postspecialistično izobraževanje iz internistične onkologije in nadzor nad njim.

Predvidevamo, da se bo v prihodnje povečal obseg standardnega sistemskega zdravljenja pogostih rakov (dojka, prebavila, pljuča) v okviru sekundarne ravni z ustanovitvijo enot internistične onkologije v okviru internističnih oddelkov bolnišnic, ki bodo strokovno tesno sodelovale s Sektorjem internistične onkologije na Onkološkem inštitutu Ljubljana. Glede na mednarodna priporočila in dosedanje rezultate pa bo ostalo uvajanje zdravljenja z novimi diferentnimi zdravili za specifično zdravljenje raka in zdravljenje redkih rakov izključno na vseobsegajočem onkološkem centru, Onkološkem inštitutu Ljubljana v Sektorju internistične onkologije. Povečali bomo tudi obseg kliničnega raziskovalnega dela, ki je glavna domena terciarnega vseobsegujočega onkološkega centra. Načrtujemo še ustanovitev enote za klinične raziskave na Onkološkem inštitutu Ljubljana v okviru Sektorja za internistično onkologijo in s tem izvajanje kliničnih raziskav 1. in 2. faze, kar bo bolnikom omogočilo dostop do novih vrst zdravljenja.

Congress (CEOG), which since 1998 have been held every two years in Opatija (Croatia), and of the European Breast Cancer Conference (EBCC). In 2008, Prof. Tanja Čufer was invited to be a co-author of a book and research guidelines in the European Union within the European project “FACT”, which was carried out during the Slovenian Presidency of the European Union. On the initiative of the European Union of Medical Specialists (UEMS) in 2007, Prof. Branko Zakotnik gave a speech in which he explained the role and significance of medical oncology as a medical specialty.

In the field of education, one important achievement is that medical oncology was approved as an autonomous medical specialty in 2000. Another important achievement is the regular yearly training course for medical oncologists, known as “Days reserved for medical oncology”, which has been held from 2005 onwards. Currently, 12 members of our team are residents in medical oncology. They regularly meet at so-called “journal clubs”. Among the members of our staff, one is a full professor, one is an associate professor, one is an assistant professor and two are teaching assistants. We are putting much of our efforts towards maintaining continuity in the training of medical oncologists and in ensuring a rapid transfer of new evidence in oncology from the international setting to our country. Presently, two of our colleagues are attending on-the-job training courses in two highly renowned and internationally recognized cancer centers; the visits of our colleagues to similar institutions abroad have always been planned with a view to more rapidly transfer new knowledge and skills. A four-month additional training was also prepared for specialists in internal medicine in other Slovenian hospitals, where standard systemic treatment will soon be initiated. Five candidates have already successfully passed this training.

Future goals and guidelines

In the last ten years, the extent and significance of medical oncology’s contribution to cancer treatment has increased considerably: a 10% yearly increase was observed in the number of newly applied treatments and in the total number of treatment sessions. This may be a consequence of the increased cancer incidence due to the longer survival of the population and the higher percentage of cancer patients among the elderly, and particularly due to the chronic nature of several cancer types and the application of new systemic treatment methods in the treatment of practically all cancer types. In order to be able to keep the disease under control, the medical oncologist is indispensible in the treatment process of most cancers. Medical oncology and individual systemic treatment, both based on knowledge of the molecular biology of cancer, will prove to be an essential treatment modality in the coming years. Therefore, it may be expected that the need for systemic treatment, and thereby also for medical oncologists, will rise steeply.

At this very moment, there is already a considerable lack of medical doctors, and in particular of medical oncologists suitably trained in systemic cancer treatment. The Institute of Oncology Ljubljana currently employs 17 medical oncologists; according to ESMO and ASCO (American Society of Clinical Oncology) recommendations, Slovenia should have at least 36 medical oncologists. To assure the complex and integrated management of cancer patients in Slovenia, we would need to provide a sufficient number of specific job profiles specialized in performing systemic treatment of cancer. Free posts in specialist training courses for residents in medical oncology and free posts for the employment of medical oncologists according to the network adopted by the Medical Chamber of Slovenia

Smernice so podlaga za izvajanje zdravljenja in temeljijo na medicini, podprti z dokazi. Smernice za sistemsko zdravljenje raka morajo biti integralni del celostnih smernic za zdravljenje posameznih rakov. Njihova izdelava in posodabljanje v okviru smernic diagnostike in zdravljenja posameznih rakov je tako prednostna naloga internističnih kolegijev terciarnih ustanov. Isto velja tudi za izobraževanje in izdelavo smernic za podporno zdravljenje in sledenje rakavih bolnikov ter za paliativno oskrbo, kar pa se bo pozneje izvajalo na primarni ravni.

V naslednjih letih bomo še naprej zagotavljali sprotno uvajanje novih sistemskih zdravil za raka pod skrbnim strokovnim nadzorom specialistov internistov onkologov terciarnega centra. Podali smo že pobudo za ustanovitev RSK za sistemsko zdravljenje raka. Za smotrno in varno uvajanje novih sistemskih zdravil za raka v državi in za strokovni nadzor nad tem je ustanovitev takega kolegija nujna. Na državni ravni je treba pripraviti sistemska merila za finančno kritje zdravljenja z novimi zdravili, ne da bi po registraciji zdravila v državi prihajalo do daljših odlogov, kar bi moralo biti enotno za parenteralna in peroralna zdravila. Zavod za zdravstveno zavarovanje Slovenije pa mora zagotoviti centralizirano in pregledno sledenje porabe zdravil po posameznih bolnišnicah v Sloveniji in primerno razporeditev finančnih sredstev.

(36 specialists by 2015) should be advertised. A new extended network for medical oncologists is now in preparation. Concurrently, training and employment of nurses and pharmacists in performing systemic treatment of cancer should also take place. At the same time, it is important to continue with undergraduate and residency training programs, as well as with post-specialization training in medical oncology.

In the future, we will extend the scope of standard systemic treatment of the most frequent cancers (breast, gastrointestinal and lung) outside the existing boundaries by founding medical oncology departments at the secondary level within the units of internal medicine of Slovenian hospitals. These will work in mutual professional cooperation with the Division of Medical Oncology of the Institute of Oncology. According to the international recommendations and following the research results obtained thus far, the application of treatment with new drugs for the specific treatment of cancer and treatment of rare cancer types will continue to be performed exclusively by the Division of Medical Oncology of the Institute of Oncology Ljubljana, the comprehensive cancer center in Slovenia. The scope of clinical research work, which is the principal task of a tertiary comprehensive center for oncology, will also be extended. Our plans include the establishment of a new unit for clinical research within our division. With extended research potential, we will also be able to carry out phase I and phase II clinical studies, and thereby to provide our patients with access to new treatment techniques as well.

Treatment guidelines, which serve as the basis for carrying out any treatment, are founded on evidence-based medicine. Guidelines for systemic cancer treatment must be an integral part of all-inclusive guidelines for the treatment of specific cancer types. Formulation and updating of guidelines for systemic treatment within the guidelines for diagnostics and for the treatment of specific cancer types should be a high-priority task of boards for internal medicine at tertiary health care institutions. The same priority should be given to elaborating training and guidelines for supportive treatment, follow-up and palliative care of patients, which will then be put into practice at the primary level.

In the coming years, we will be making sure that new agents used in the systemic treatment of cancer will be steadily supplied, and that their use in clinical practice will be under careful control of the specialists in medical oncology of the tertiary cancer center. We have already suggested that an enlarged medical board for the systemic treatment of cancer should be established. We believe that such a medical board is indispensible. Furthermore, at the state level, systemic criteria should be worked out to immediately fund treatment with new agents without long delays after a drug's registration. These criteria should be uniform for the whole state and applicable to the drugs administered both parenterally and perorally. A centralized and transparent system to monitor the use of drugs in Slovenian hospitals, and thereby also to appropriately distribute funds among the hospitals, should be provided by the Health Insurance Institute of Slovenia.

Vodja:
prim. ***Jožica Červek****, dr. med.*

Palitivna oskrba

OI je center za celostno obravnavo bolnikov z rakom in zagotavlja vse možne oblike zdravljenja. Po strokovni usposobljenosti ima raven tercialne ustanove.

Paliativna oskrba (PO) je sestavni del celostne oskrbe. Namenjena je bolnikom z neozdravljivim rakom. PO blaži in obvladuje telesne simptome napredovale bolezni, lajša psihične, socialne in duhovne težave. Namen PO je vzdrževanje optimalne kakovosti življenja in pomoč svojcem.

PO na OI se izvaja na:
• bolniških oddelkih (osnovna PO),
• ambulantah in posvetovalnicah (osnovna PO) ter
• oddelku za akutno paliativno oskrbo (specialistična PO).

V primerjavi z osnovno PO, je ta oddelek namenjen strokovno zahtevnejši, specialistični PO. Namenjen je bolnikom s težje obvladljivimi simptomi. Ta oddelek je tudi učna baza za izobraževanje osebja, zaposlenega na OI in v drugih zdravstvenih ustanovah. Namenjen je opravljanju kliničnih raziskav iz PO. Program vključuje tudi sodelovanje in pomoč drugim izvajalcem v Sloveniji z namenom zagotavljanja in razvoja PO v vseh predelih države.

Celostno PO zagotavlja multiprofesionalen tim, v katerega so vključeni strokovnjaki različnih enot:
• kirurgije, radioterapije in internistične onkologije,
• zdravstvene nege
• ambulanta za zdravljenje bolečine,
• oddelek za psihoonkologijo,
• zdravstveno-socialno svetovanje,
• duhovna podpora,
• enota za klinično prehrano in dietoterapijo,
• fizioterapija,
• lekarna, s kliničnim farmacevtom,
• prostovoljci.

Z izdelavo in uporabo kliničnih poti ter smernic, je PO standardizirana na tem oddelku in zagotavlja strokovno kakovost.

Tim za PO in koordinator za PO skrbi za nepretrgano PO tudi po odpustu preko mreže povezav: patronažna služba, družinski zdravnik, socialna služba, hospic in ambulante za obravnavo bolečine v regionalnih bolnišnicah.

S postavitvijo mreže paliativne oskrbe v Sloveniji, dodatno kadrovsko zasedbo in izobrazbo s področja paliativne oskrbe predstavlja OI referenčni center za PO bolnikov z rakom v Sloveniji.

Head:
Jožica Červek*, M.D.*

Palliative care

Palliative care is an integral part of comprehensive medical care for patients. It is mainly intended for the treatment of patients with incurable cancer. Palliative care alleviates and reduces the physical symptoms of advanced disease, and releases psychological, social and mental distress. It is aimed at maintaining optimal quality of life and offering support to the patient's family. Palliative care at the Institute of Oncology is provided to patients:
• at hospital wards (primary palliative care);
• in outpatient and consultation clinics (primary palliative care); and
• at the hospital ward for acute palliative care (specialized palliative care).

In contrast to primary palliative care, the ward for acute palliative care performs medically more demanding and specialized care for patents with symptoms than cannot be easily managed. This ward also serves as a learning base for training personnel employed at the Institute of Oncology and other health care institutions. It is also used as a setting for performing palliative care clinical trials. Furthermore, its operational scope covers cooperation with and support to other palliative caretakers in the country, with the aim to provide and further develop palliative care in all regions of the country.

Comprehensive palliative care at the Institute of Oncology is performed by a multiprofessional team that includes experts from different units of the institute, including:
• surgery, radiotherapy and medical oncology;
• pain control unit;
• psycho-oncology unit;
• health & social care counseling;
• spiritual support;
• clinical nutritional support and dietotherapy;
• physiotherapy;
• pharmacy (with clinical pharmacist included); and
• volunteers.

With the elaboration and practical application of clinical paths and guidelines, palliative care has been standardized, thereby assuring the highest professional quality of services.

The palliative care team and coordinator are in charge of seeing to it, via a network of connections such as community nursing services, family doctors, social care services, hospice and pain control clinics in regional hospitals, that palliative care is not interrupted after the patient is discharged from the hospital.

The present staff structure of the unit and its potential for clinical trials and training are the mainstays that allow for the Institute of Oncology to be acknowledged as a reference center for the palliative care of cancer patients.

Vodja:
mag. ***Nada Kozjek-Rotovnik****, dr. med.*

Klinična prehrana in dietoterapija na Onkološkem inštitutu

Uvedba klinične prehrane in ustanovitev Enote za klinično prehrano na Onkološkem Inštitutu v Ljubljani v letu 2008 je nov korak k še učinkovitejšemu in kakovostnejšemu zdravljenju bolnikov z rakom.

Na OI je glede na rezultate naših raziskav prehransko ogroženih okoli 83 % hospitaliziranih bolnikov, individualno prehransko obravnavo pa potrebuje 45 % bolnikov.

Klinična prehrana bolnikov se izvaja v Enoti za klinično prehrano. Delo poteka multidisciplinarno in interdisciplinarno. Bolnikom zagotavlja njihovim presnovnim potrebam prilagojeno prehransko podporo in presnovne ukrepe. Delo oddelka je večnivojsko in obsega:

- ugotavljanje bolnikovega prehranskega statusa in prehranskih navad, določanje prehranskih potreb in pripravo načrta prehranske obravnave, potrebne za vzdrževanje, okrevanje in izboljšanje zdravja (prehranska podpora in terapija);
- prehransko terapijo in druge presnovne ukrepe zaradi priprave na zdravljenje ali zdravljenje zapletov med zdravljenjem, ki so povezani z napredovalimi katabolnimi stanji in zahtevajo hospitalizacijo;
- prehransko svetovanje in vzgojo kot sestavni del preventivnega in kurativnega zdravljenja;
- prehranske terapije na oddelkih, kjer se bolniki primarno zdravijo v obliki konzultanske službe, v ambulanti za klinično prehrano in v posvetovalnici za prehrano; v ambulanti za klinično prehrano vodimo tudi umetno prehrano bolnikov na domu;
- sodelovanje z drugimi zdravstvenimi ustanovami in ustanovami, kjer se nadaljuje prehranska obravnava bolnikov z rakom (na primer domovi za ostarele) ter sodelovanje pri pripravi protokolov in priporočil za prehransko terapijo;

Na oddelku so zaposleni zdravnik specialist, trije dietetiki in diplomirana medicinska sestra. Pri izvajanju prehranske terapije sodelujemo z lečečim zdravnikom in drugimi člani zdravstvenega tima.

Vodja:
doc. dr.
Marko Hočevar*,*
dr. med.

Onkološko genetsko svetovanje

Skupina za genetsko svetovanje deluje na Onkološkem inštitutu Ljubljana od leta 2001. Sestavljena je multidisciplinarno, vključuje tudi psihologa in diplomirano medicinsko sestro.

V tem času je s kontinuiranim delom opravila pionirsko delo v razvoju obravnave dednega raka v Sloveniji. Poleg svetovanja je opravila tudi testiranje na mutacije, kadar je bilo to indicirano. Testiranja so sprva delali v tujini, vedno več pa tudi na oddelku za molekularno biologijo. Člani so svoje dosedanje izsledke večkrat predstavili javnosti v prispevkih, predavanjih ali člankih. Skupina ima tudi mednarodne povezave in sodeluje v več mednarodnih projektih.

Doslej smo opravljali genetsko svetovanje za dednega raka dojk in jajčnikov, malignega melanoma ter medularnega raka ščitnice. V naslednjem obdobju želimo delo razširiti, najprej na dednega raka širokega črevesa, pospešiti sodelovanje z drugimi inštitucijami in mednarodno sodelovanje. Še bolj nameravamo utrditi onkološko genetsko svetovanje kot integralni del obravnave raka v Sloveniji, kar bo tudi skladno z nastajajočim državnim programom nadzora raka. Od leta 2008 je Onkološko genetsko svetovanje financirano kot redna dejavnost OI.

Head:
Nada Kozjek-Rotovnik*,*
M.D., M.Sc.

Clinical nutrition and dietotherapy

Clinical nutrition therapy and the establishment of the clinical nutrition unit at the Institute of Oncology Ljubljana in 2008 was a new step towards more effective and higher-quality treatment of cancer patients.

According to our research results, 83% of patients hospitalized at the Institute of Oncology Ljubljana are at nutritional risk, whereas 45% of them need individual nutritional treatment.

Clinical nutrition of patients is carried out by the clinical nutrition unit. Work in the unit is organized according to the principles of multidisciplinarity and interdisciplinarity, thus providing patients with nutritional support and interventions to improve their metabolism, which are adjusted to the patient's metabolic needs. The services of the unit are performed on a multilevel basis and include:

- identification of the nutritional status and habits of a patient, determination of his/her nutritional needs, and formulation of a plan for nutritional treatment ensuring the maintenance of physical condition, recovery and improvement of health by applying nutritional support and therapy;
- nutritional therapy and other interventions required before the beginning of therapy or by treatment complications associated with an advanced catabolic stage requiring hospitalization;
- nutritional counseling and education as a part of preventive and curative treatment;
- nutritional therapy as a counseling service at hospital wards where patients are receiving primary treatment, in nutritional clinics, and in nutritional counseling offices; the nutritional clinic is in charge of distributing artificial sustenance to patients in home care.

The unit cooperates with other health care institutions in Slovenia, particularly with those that provide further nutritional treatment to cancer patients (e.g. nursing homes for the elderly). It also participated in designing protocols and recommendations for the nutritional treatment of patients.

The unit employs a specialist in nutritional treatment, three dietitians and a graduated nurse. Nutritional therapy is carried out in cooperation with the attending oncologist and with other members of the team.

Head:
Assist. Prof.
Marko Hočevar*,*
M.D., Ph.D.

Oncological genetic counseling

The genetic counseling team has been providing its services at the Institute of Oncology since 2001. This is a multidisciplinary team, consisting of experts from different specialties, including a psychologist and a graduated nurse. From its beginning to the present time, the team has done pioneering work in the management of familial cancer in Slovenia. In addition to counseling, the team carries out mutation testing whenever it is indicated. At first these tests were made in laboratories abroad, but increasingly, more tests are being performed by the laboratory in our department of molecular biology. The team members have presented their achievements in a number of research papers, lectures and articles, and have established international relations and even joined several international research projects. So far, genetic counseling has been successfully implemented for the following familial cancers: breast and ovarian cancers, malignant melanoma and medullary thyroid cancer. In the near future, genetic counseling services will be expanded to include familial colon cancer. Future

Vodja:
*dr. **Zvezdana Snoj**, dr. med.*

Člani skupine za Onkološko genetsko svetovanje so:
Nikola Bešić, Kristijana Hertl, Marko Hočevar, Cvetka Jakopin, Mateja Krajc, Srdjan Novaković, Andreja Škufca, Vida Stegel, Aleš Vakselj, Alenka Vrečar, Janez Žgajnar.

Psihoonkologija

Začetki psihoonkologije segajo v drugo polovico prejšnjega stoletja, ko se je stigma, povezana z diagnozo in prognozo raka zmanjšala do te mere, da je postalo sprejemljivo odkrito govoriti o raku, ne da bi diagnoza in prognoza bolniku ostali prikriti. Takrat se je tudi prvič pokazala možnost raziskati bolnikove stiske, občutja in doživljanja v zvezi z maligno boleznijo. Kmalu za tem je tudi na Onkološkem inštitutu dozorela potreba po uvajanju psihiatrične obravnave bolnikov z rakom in po nastanku psihoonkološke dejavnosti v naših prostorih.

V današnjem času se še vedno srečujemo z neko drugo stigmo, ki je bila prav tako prisotna skozi stoletja in je prispevala k poznemu zanimanju za psihološko dimenzijo raka: gre za negativna stališča do duševne bolezni in do duševne stiske bolnikov, celo takrat, ko se pojavi v kontekstu resne telesne bolezni. Prav ta stigma in predsodki do duševne bolezni, ki nas še vedno spremljajo, so bili močna ovira na poti k integraciji psihosocialnega področja v celostno obravnavo raka, k prepoznavanju bolnikov z duševno stisko, pri bolnikih pa na poti k sprejemanju ustrezne strokovne pomoči.

Danes, na začetku tretjega tisočletja, ko je psihonkologija ena od mlajših subspecializacij v onkologiji in je tudi ena od najbolj definiranih subspecializacij v konzultantsko-liaison psihiatriji, pričakujemo, da bo dala dober zgled o pomenu multidisciplinarnega pristopa v obravnavi raka.

Na Oddelku za psihoonkologijo danes skrbimo za celostno obravnavo bolnikov in njihovih svojcev, ki sledi najsodobnejšim smernicam psihiatrične stroke v psihofarmakološki in psihoterapevtski obravnavi. Skrbimo tudi za izobraževanje strokovnjakov, ki se ukvarjajo z zdravljenjem raka, in se ukvarjamo z znanstvenoraziskovalnim in pedagoškim delom.

Tudi v naslednjem obdobju želimo prispevati k izboljšanju celostne obravnave bolnikov z rakom, utemeljeni na znanstvenih raziskavah, ki so podlaga za intervencije in zmanjšujejo ovire za psihiatrično obravnavo bolnikov z rakom in njihovo psihosocialno oskrbo.

V tem kontekstu smo v zadnjih treh letih prvič v slovenskem prostoru izvedli raziskavo, ki je razkrila pogostnost nekaterih najpogostejših duševnih motenj pri bolnikih z rakom. Klinikom onkologom bo lahko pomagala k boljši prepoznavnosti duševnih motenj pri njihovih bolnikih in s tem tudi k izboljšanju celostne, multidisciplinarne obravnave bolnikov z rakom.

Head:
***Zvezdana Snoj**, M.D., Ph.D*

plans include enhancing cooperation at the national and international level, and strengthening the role of oncology genetic counseling as an integral part of cancer control in Slovenia, which is in line with the emerging National Cancer Control Program. From 2008 onwards, genetic counseling has been registered and financed as one of the regular activities of the Institute of Oncology.

The members of the genetic counseling team are: Nikola Bešić, Kristijana Hertl, Marko Hočevar, Cvetka Jakopin, Mateja Krajc, Srdjan Novaković, Andreja Skufca, Vida Stegel, Aleš Vakselj, Alenka Vrečar and Janez Žgajnar.

Psycho-oncology

The beginnings of psycho-oncology at the Institute of Oncology date back to the second half of the 20th century, when the centuries-long stigma attached to cancer diagnosis and prognosis was overcome to the degree that conversation with the patient could be open, without concealing the truth about the diagnosis and prognosis of the disease. Only then was it possible to start exploring the distress, feelings and experiences associated with malignant disease. Shortly afterwards, a need arose at the Institute of Oncology to render psychological support to cancer patients and to provide them with psycho-oncology services within the institute.

Today we are still facing the stigma that has been present throughout the centuries, thus hindering the growth of interest in the psychological dimension of cancer. This represents a negative attitude towards mental illness and mental distress, even in cases associated with serious physical disease. And this stigma, together with the prejudices against mental illness that are still deeply rooted in ourselves, is a serious obstacle in our endeavors to integrate a psychosocial approach to the disease into comprehensive cancer care, and to recognize patients' suffering in order to provide them with proper psychological support.

At this point, at the threshold of the third millennium, psycho-oncology is entering an important phase in its development: as one of the youngest subspecialties in oncology and one of the best defined subspecialties in consultancy-liaison psychiatry, it will, in our opinion, become a valuable example of a wide-open multidisciplinary approach to cancer care. The work of the department of psycho-oncology aims at comprehensive care of cancer patients and their relatives. It follows the latest guidelines adopted in psychiatry, as much in medicamentous therapy as in psychotherapy. It provides training to specialists in cancer treatment and enhances scientific research work and education.

In the years to come, we will continue to contribute to the improvement of comprehensive care for cancer patients, founded on scientific research that paves the way for medical interventions and breaks down barriers in providing psychological treatment and psychosocial care to cancer patients.
Within this context, we carried out an investigation – the first of its kind in Slovenia – which revealed the prevalence of the most frequent psychological disorders in cancer patients in the last three years. This study will be of great help to clinical oncologists in recognizing these disorders in their patients, and thereby also in improving the comprehensive and multidisciplinary approach to cancer patients.
The study is just a single step in the process, which was initiated with the aim of strengthening interaction among members of the multidisciplinary teams involved in treating cancer patients and the role of psychiatry in this process.

Vodja:
asist. mag.
***Tanja Roš - Opaškar**,*
dr. med.

Naša študija je le en od korakov v procesu, s katerim smo želeli okrepiti povezavo med člani multidisciplinarnega tima, ki obravnavajo bolnike z rakom, in predstaviti pomembnost vloge, ki jo pri tem lahko ima psihiatrična stroka.

V naslednjem obdobju pričakujemo, da bo Oddelek za psihoonkologijo kot edini tovrstni oddelek v Sloveniji imel ustrezne možnosti za razvoj, saj število bolnikov, ki potrebujejo psihoonkološko obravnavo, močno narašča. Oddelek za psihoonkologijo je namreč že zdavnaj presegel okvire, v katerih je nekoč bil postavljen.

Nevroonkologija

Začetki sistematične nevroonkološke dejavnosti na OI segajo v leto 1995, ko je inštitut dobil prvega specialista nevrologa, ki je polni delovni čas obravnaval nevrološke probleme pri bolnikih z rakom. Sicer ima nevroonkologija v svetu, posebno v ZDA, nekaj manj v zahodni Evropi, že večdesetletno tradicijo.

Nevroonkologija obravnava nevrološke zaplete pri bolnikih z rakom, povezane z lokalizacijo in širjenjem maligne bolezni, kot so kompresija hrbtenjače ali caudae equinae, možganske metastaze, karcinoza mening in druge, toksične učinke specifičnega onkološkega zdravljenja – predvsem nevrotoksičnih citostatikov, redkeje obsevanja – na periferno in/ali osrednje živčevje ter nevrološke zaplete po operaciji tumorja in nevrološke zaplete po kombiniranju naštetih vrst zdravljenja.

Obravnava nevrološka obolenja, ki so posledica oddaljenih učinkov raka na živčevje v obliki sicer redkih, t. i. paraneoplastičnih nevroloških bolezni.

Nevrolog je pomemben del obravnave bolnikov s primarnimi možganskimi tumorji, tako pri oceni, opredelitvi in spremljanju nevrološke okvare kot tudi pri ustreznem zdravljenju obtumorskega edema, nadzoru epileptičnih napadov, opredeljevanju in zdravljenju delirantnih motenj ter drugih nevroloških zapletov oziroma simptomov in znakov.

Nevroonkologija obravnava tudi bolečinske sindrome pri bolnikih z rakom, jih opredeljuje in zdravi.

Vsi nevrološki problemi pri bolnikih z rakom niso povezani z rakom ali zdravljenjem raka, ampak gre lahko za koincidenco z drugimi nevrološkimi obolenji.

Nevroonkolog sodeluje v multidisciplinarnem timu, ki obravnava bolnike z nevropatsko bolečino, in na nevrokirurškoonkološkem konziliju. Sodeluje v pedagoškem procesu za nevroonkologijo, predvsem izobražuje specializante nevrologije in nevrokirurgije, obdobno pa tudi študente medicine v okviru vaj iz onkologije in nevrologije.

Od leta 2002 skupaj z Nevrološko kliniko UKC sodelujemo v Evropski mednarodni multicentrični raziskavi redkih paraneoplastičnih nevroloških obolenj, letos pa bomo začeli sodelovati v raziskavi perifernih polinevropatij kot posledici učinkov nevrotoksičnih citostatikov.
Za zagotovitev optimalne obravnave oz. zdravljenja večine nevrookoloških bolnikov je potrebno sodelovanje nevrologa/nevroonkologa.

Head:
***Tanja Roš-Opaškar**,*
M.D., M.Sc.

Looking ahead, we expect that the department of psycho-oncology, as the only institution of its kind in Slovenia, will have appropriate opportunities for further growth and expansion, in particular for the sake and benefit of the growing number of cancer patients who are in need of psychological support.

The department of psycho-oncology has long ago outgrown the framework within which it was established.

Neuro-oncology

The pioneering period of systematic neuro-oncology at the Institute of Oncology goes back to the year 1995, when the institute employed its first specialist in neuro-oncology, a full-time member of the medical staff who was in charge of treating neurological disorders in cancer patients. Throughout the world, particularly in the United States and less so in Western Europe, neuro-oncology has a several-decades-long tradition.

Neuro-oncology deals with neurological complications in cancer patients arising from tumor location and its further metastasis, such as compression of the spinal cord or cauda equinae syndrome, brain metastases, meningeal carcinosis and others; and from the toxic effects of specific oncology therapy on the peripheral and/or central nervous system, in particular of neurotoxic cytostatics and, less frequently, of radiotherapy; and from post-surgical neurological complications or neurological complications occurring after a combination of the above treatments.

Neuro-oncology treats neurological disorders arising from distant effects of the disease on the nervous system, which are known as paraneoplastic neurological diseases.

The neurologist has a decisive role in the management of patients with primary brain tumors, i.e. in clinical assessment, diagnostics and treatment of a neurological injury, as well as in the treatment of paratumor edematous tissue, management of epileptic seizures, and diagnostics and treatment of deliriant disorders and other neurological complications, symptoms or syndromes.

Neuro-oncology also deals with pain syndromes in cancer patients, including staging and treatment.

The neuro-oncologist cooperates with the multidisciplinary team concerned with treating neuropathic pain, and with the neurosurgery and oncology advisory team. The neuro-oncologist is also engaged in teaching programs in neuro-oncology intended particularly for residents in neurology and neurosurgery, and, for interim periods, also for medical students attending the regular practical training program in oncology and neurology.

Since 2002, the neuro-oncologist of our institute has participated, together with the department of neurology of the University Medical Centre Ljubljana, in a European international multicentric research project on rare paraneoplastic neurological disorders; this year, we have also joined a research study on peripheral neuropathies as a sequel to treatment with neurotoxic cytostatics.

In order to ensure optimal care and treatment for cancer patients with neurological disorders, the cooperation of neurologists and neuro-oncologists is indispensable.

Vodja:
***Edita Rotner**,*
dipl. fiziot.

Fizioterapija

Fizioterapevtska služba je bila v zdravljenje onkološkega bolnika vključena v 60. letih prejšnjega stoletja.

Fizikalna terapija in rehabilitacija sta sestavni del zdravljenja onkološkega bolnika, ki s pomočjo metod gibalne terapije in fizikalnih energij vzdržuje, vzpostavlja ali izboljšuje njegove psihofizične sposobnosti in zmogljivosti. Cilji fizioterapije izhajajo iz posledic bolezni, pri čemer se upošteva prognoza bolezni. Fizioterapevt mora sproti in skrbno ocenjevati bolnikovo stanje in mu prilagajati fizioterapevtski program.

Oddelki, kjer smo vključeni v zdravljenje, so naslednji:
• ambulanta fizioterapije,
• sektor operativnih strok,
• sektor internistične onkologije,
• sektor radioterapije,
• paliativni oddelek.

V ambulanti fizioterapije izvajamo rehabilitacijo bolnic po operaciji dojke in po obravnavamo limfedem.

V sektorju operativnih strok, vključno z intenzivnim oddelkom, je poudarjena zgodnja mobilizacija bolnika in respiratorna terapija.

Na drugih oddelkih obravnavamo bolnike, pri katerih je zaradi zdravljenja ali napredovanja rakave bolezni zmanjšana aktivnost oz. kakovost življenja.

Pri obravnavi upoštevamo smernice, ki jih zahteva klinična slika, vendar je treba prav pri obravnavi onkoloških bolnikov cilj in način mnogokrat prilagajati poteku bolezni.

S svojim znanjem in fizioterapevtskimi metodami omogočamo, da bolnik čim dlje ohranja aktivnost, samostojnost in kakovost življenja.

Za dosego cilja pa je bistveno aktivno sodelovanje bolnika, drugih zdravstvenih delavcev v timu in ne nazadnje tudi bolnikovih svojcev.

Vodja:
***Jadranka Vučko**,*
viš. uprav. del.

Zdravstvena administracija

Naša enota podpira večino vseh administrativnih potreb OI. Sem ne spadajo le administrativni delavci diagnostičnih enot in nekaterih oddelkov. Naš oddelek zaposluje predvsem zdravstvene administratorje, ki so razporejeni v naslednje pododdelke:

Strojepisnice
Zaposleni v strojepisnicah zagotavljajo sprotno zapisovanje opažanj pri bolnikih, ki jih narekujejo zdravniki (pregledi, sprejemi, odpusti, izvidi). Delajo na vseh bolnišničnih oddelkih in v večini ambulant.

Head:
Edita Rotner

Physiotherapy

Physiotherapy became a part of oncology care for cancer patients in the 1960s.

Physical therapy and rehabilitation is a constituent part of the process of treating cancer patients; it maintains, restores and improves the psychophysical condition and performance of cancer patients by using motion therapy methods and physical energy techniques. The aims of physiotherapy are defined by the sequels of the disease and by allowing for the disease prognosis; physiotherapy closely intertwines with other treatment processes. All throughout treatment, the physiotherapist should be carefully assessing the patient's condition and modifying the physiotherapy program to it.

With regard to typical work settings, the areas of treatment in which physiotherapy is required are the following:
• outpatient physiotherapy service;
• Division of Surgical Oncology;
• Division of Medical Oncology;
• Division of Radiotherapy;
• palliative care unit.

The outpatient physiotherapy service performs rehabilitation in patients after breast surgery and treats lymphedemas.

In the Division of Surgical Oncology, including the intensive care unit, physiotherapy primarily aims at providing early mobilization to patients and performing respiratory therapy.

At other units, physiotherapy services are provided to patients whose activity or quality of life has deteriorated due to toxic treatment effects or advanced disease.

In the management of patients, we follow those guidelines that appear to be appropriate in the given situation with regard to the clinical assessment of the patient's condition; however, physiotherapy treatment aims and techniques applied to cancer patients often require modifications attuned to the specificities of the course of the disease.

The members of our team help patients maintain their physical activity, independence and quality of life with the acquired knowledge, skills and physiotherapy techniques.
In order to fulfill our mission, it is of vital importance that active cooperation is established between patients, members of the team and other health professionals.

Head:
***Jadranka Vučko**,*
senior administrative worker

Health care administration

Health care administration is the unit where the majority of the administrative requirements of the medical sector of the institute are fulfilled. The unit not only encompasses the administrative staff of the diagnostic departments, but also many others. The unit employs mainly administrative workers, who are assigned to the following subunits:

Ambulantni in hospitalni obračun
Obe obračunski službi skrbita za obračunavanje bolnišničnih in ambulantnih storitev.

Arhiv popisov
Popisi bolezni se hranijo v skupnem arhivu, kjer velja knjižnični način dela. Arhiv ločimo na živi in mrtvi del. Že ime pove, da v živem arhivu hranimo zdravstveno dokumentacijo živih bolnikov, v mrtvem arhivu pa umrlih bolnikov. Dokumentacija umrlih bolnikov služi predvsem znanstveno-raziskovalnemu delu naših zdravnikov in drugih zdravstvenih delavcev in sodelavcev.

Sprejemna pisarna
Je enotna za ves inštitut in sprejema bolnike v ambulantni del in bolnišnični del. Sprejema tudi bolnike za Center za bolezni dojk in diagnostične enote inštituta.

Oddelek kljub omejenemu zaposlovanju tekoče opravlja vse naloge za potrebe OI. Delavci se za svoje delo usposabljajo precej časa, saj administrativnega kadra s predznanjem medicine na trgu delovne sile ni in ga moramo usposobiti sami.

Vodja:
mag. ***Klelija Štrancar****,*
univ. dipl. teol.

Prostovoljno delo na OI

Prostovoljstvo je organizirana oblika pomoči – bolnikom, njihovim svojcem in prijateljem. Na OI poteka od leta 2006.

Prostovoljstvo je oblika pomoči, za katero se človek odloči po svoji presoji in ji posveti del svojega prostega časa. Prostovoljec na OI je lahko vsak, ki se za to odloči in izpolnjuje zahteve, zapisane v Pravilih prostovoljnega dela na Onkološkem inštitutu Ljubljana. Namen prostovoljnega dela je izboljšati kakovost življenja bolnikov med bivanjem v bolnišnici, posredno pa tudi njihovim svojcem. Je tudi pomoč zaposlenim. Prostovoljci s svojo prisotnostjo in delom, ki obsega druženje, spremljanje na preiskave, neformalne pogovore, drobno praktično pomoč, razvedrilo idr., pomembno prispevajo k humanizaciji zdravstvene ustanove.

V sodelovanju z društvi onkoloških bolnikov, pa tudi z drugimi organizacijami in posamezniki postaja prostovoljno delo dragocen prispevek k celostni oskrbi bolnikov na OI.

Typing pool
The staff of the typing pool is responsible for instantly providing written records on patients, as dictated by physicians upon the patient's visit to the outpatient clinic, admission to or discharge from the hospital, or by the patient's test results. Their workplaces are located at all hospital wards and in the majority of outpatient consulting rooms.

Health services invoicing
This subunit is in charge of invoicing the services performed by the inpatient and outpatient clinics.

Patients' charts archives
Patients' charts are stored in archives operated according to a library storage system. It is divided into "alive" and "dead" sections. As is evident from the name, the "alive" archives store documentation on patients who are still alive, while the "dead" archives contain the documentation of those deceased.

Reception office
The institute has a central reception office that registers the patients referred to outpatient clinics and those who are admitted to the hospital, as well as the patients referred to the Breast Disease Center.

Despite restricted employment of new workers, the unit keeps up with the current work requirements. The staff must undergo specific training for this work because, in the human resources market, administrative personnel with any knowledge of medical care are not available; we thus have to train our staff ourselves.

Head:
Klelija Štrancar*,*
B.Sc., M.Sc.

Voluntary services unit

Volunteering is an organized service offering aid to patients, their relatives and friends. This service has been running at the Institute of Oncology since 2006.

Volunteering is a job that each individual decides for at his/her own discretion and devotes to it part of his/her leisure time, apart from his/her regular job or other commitments.

Everyone who has decided to volunteer and who complies with the requirements laid down in the Regulations for Volunteering Service at the Institute of Oncology Ljubljana can apply for this job. The aim of this service is to improve the quality of life of the patients during their stay in the hospital and, ultimately, also of their relatives, and to be of help to the hospital staff as well. Volunteers, just by being present and active, keep the patients company or accompany them to various examinations, involve them in informal conversation, help them with small errands, and try to relax them. Their help is an invaluable contribution to the humanization of this health care institution.

Volunteers, jointly with cancer patients' associations and other societies, as well as individuals, also considerably contribute to comprehensive cancer care at the Institute of Oncology Ljubljana.

Dejavnost zdravstvene nege in oskrbe bolnika

Pomočnica strokovnega direktorja za področje zdravstvene nege in oskrbe – glavna medicinska sestra:
***Katarina Lokar**, prof. zdr. vzg.*

Področje in pomen dejavnosti v sklopu multidisciplinarne onkološke obravnave

Zdravstvena nega (ZN) je samostojno strokovno in organizacijsko področje, ki je z drugimi zdravstvenimi dejavnostmi na Onkološkem inštitutu Ljubljana (OI) vključeno v celovito obravnavo bolnika z rakom. Izvajalci zdravstvene nege so diplomirane medicinske sestre (višje medicinske sestre) in tehniki zdravstvene nege (zdravstveni tehniki, srednje medicinske sestre). Dejavnost zdravstvene nege in oskrbe zaposluje 279 medicinskih sester ter 60 bolniških strežnic in bolničarjev.

Z vidika razvoja stroke, organizacije, razvoja kadrov in ekonomske učinkovitosti to dejavnost vodi pomočnik strokovnega direktorja za zdravstveno nego in oskrbo (PSD-ZN), ki hkrati zagotavlja, da sta ZN in oskrba vključeni v strokovno in poslovno politiko delovanja OI. PSD-ZN vodi tudi strokovno-posvetovalni organ, Kolegij zdravstvene nege. Ta kolegij razpravlja o strokovnih, organizacijskih in kadrovskih zadevah v zdravstveni negi in oskrbi. Sestavljajo ga vodilne medicinske sestre oddelkov in enot ter posameznih strokovnih področij.

Primarna naloga naše dejavnosti sta neposredna zdravstvena nega in oskrba bolnika. Nosilka onkološke zdravstvene nege je diplomirana medicinska sestra. Zaposleni v zdravstveni negi smo vključeni v preventivo raka, zgodnje odkrivanje raka, njegovo diagnostiko in zdravljenje, zagotavljanje informacij, izobraževanje in svetovanje ter v psihološko podporo, rehabilitacijo, paliativno oskrbo in raziskovanje. Cilji zdravstvene nege so predvsem zagotoviti strokovnost, kontinuiteto, učinkovitost, racionalnost, kakovost in primerljivost onkološke zdravstvene nege tako v strokovnem kot v organizacijskem smislu doma in v svetu ter pri tem izkazovati spoštovanje do vsakega zaposlenega in njegovega dela. Ob tem želimo zagotavljati spoštovanje bolnika kot celovite osebnosti, mu pomagati pri vseh tistih aktivnostih, ki pripomorejo k ohranitvi ali vrnitvi zdravja ali pri mirni smrti ter sodelovati pri uresničevanju diagnostično-terapevtskega programa, katerega pobudnik je zdravnik. Dejavnost zdravstvene nege in oskrbe zajema tudi pedagoško in raziskovalno dejavnost v zdravstveni negi.

Ključni dosežki v zadnjih desetih letih

V dejavnosti zdravstvene nege in oskrbe smo v zadnjih desetih letih dosegli številne dosežke v organizaciji dejavnosti, strokovnem delu, raziskovalnem delu in izobraževanju.

Izdelali smo 100 standardov, navodil in priporočil za delo v zdravstveni negi in oskrbi, ki jih revidiramo na dve do štiri leta. Standardizacija procesov dela je ključnega pomena za poenotenje dela v zdravstveni negi in oskrbi ter je pogoj za spremljanje kakovosti dela. Standardi, navodila in priporočila so tudi izobraževalno gradivo za vse novo sprejete zaposlene.

V okviru delovne skupine za dokumentiranje v zdravstveni negi smo razvili nov terapevtski list, ki vsem zdravstvenim delavcem na OI omogoča kakovostnejše dokumentiranje informacij o bolniku. Terapevtski list je bil testiran in postopoma uveden na vse bolnišnične oddelke. Dokumentiranje je pri zagotavljanju kakovostne oskrbe bolnikov ključno, saj gre za komunikacijsko metodo, ki vse zdravstvene delavce stalno informira o tem, kakšno zdravstveno oskrbo je bolnik prejel, in jasno opredeli vse pomembne informacije o njem. Z uvedbo novega terapevtskega lista pa smo dosegli še en zelo pomemben dosežek, začeli smo namreč z ocenjevanjem in zapisovanjem stopnje bolečine kot petega vitalnega znaka.

Division of Nursing of and Care for Patients

Assistant Medical Director for Nursing – Head Nurse:
***Katarina Lokar**, RN, B.Sc. (education)*

Domain of nursing within a multidisciplinary approach to cancer care

Nursing is a specialized and independent organizational discipline that is, together with other divisions of the Institute of Oncology, involved in the comprehensive care of cancer patients. Nursing is provided by registered and assistant nurses. The Division of Nursing employs 279 registered and assistant nurses and 60 attendants and nursing orderlies.

It is headed by the assistant medical director for nursing, who is responsible for overseeing the development, organization and economic efficiency of nursing, and for sustaining the position of nursing and care as a constituent part of the medical and administrative policies of the Institute of Oncology. In addition, the assistant medical director for nursing also chairs the Nursing Board, a nursing advisory board at the institute that deals with technical and organizational matters, as well as with human resources management in nursing and care for patients. The members of the board are charge nurses of wards, departments and units.

The work of a nurse is focused primarily on nursing and care for patients. A nurse in oncology nursing is engaged in cancer prevention, early cancer detection, diagnostics and treatment, and is also in charge of providing information about nursing care to patients, educating and advising them, and offering psychological support, rehabilitation and palliative care; he or she is at the same time involved in research work. The Division of Nursing aims to ensure the proficiency, continuity, efficiency, economy, quality, and comparability of its services regarding performance and organization with the nursing services and organization in other Slovenian hospitals and worldwide. It also aims to develop and maintain high respect for all employees and their work, as well as for each individual patient, respecting him/her as an integrated personality, supporting him/her in activities that help to restore and maintain his/her health, offering support to the patient and family members in the terminal phase of disease, and carrying out the therapeutic program prescribed by the therapist. Besides nursing and care for cancer patients, the nurses at the Division of Nursing at the Institute of Oncology are also active in the field of education and training, as well as research.

Major achievements in the last decade

In the last 10 years, several important achievements have been made by our division in the domains of work organization, nursing care, research and education.

We have developed around one hundred standards, guidelines and recommendations for nursing, which we revise and update every two or four years. Standardization is one of the key conditions for quality control of performance in nursing. Thus standards, guidelines and recommendations are obligatory reading material, which is provided to all newly employed nurses upon taking up the post.

The working group responsible for providing documentation on nursing services to patients, which was established within the Division of Nursing at the Institute of Oncology Ljubljana, developed a patient therapy record which allows better data gathering about the patient. The therapy record was tested and then introduced into all clinical wards. Documentation is of vital importance in patient care in order to be able to provide high-quality services to patients. This is a means of communication to

Od leta 2002 smo aktivni člani operativne skupine Kolegija za poenotenje slovenske kategorizacije zahtevnosti bolnišnične zdravstvene nege. Izdelali smo lastno specifično kategorizacijo za svoje bolnike, ki smo jo dopolnili z merili vseslovenske kategorizacije, s čimer smo dosegli primerljivost zahtevnosti onkološke zdravstvene nege. S kategorizacijo zahtevnosti bolnišnične zdravstvene nege ocenjujemo bolnikove potrebe glede na zahtevnost zdravstvene nege; tako lahko prikažemo obremenjenost zaposlenih in izračun potrebe po kadrih v dejavnosti in na posameznih bolnišničnih oddelkih.

Vodstvo zdravstvene nege se zaveda pomena kakovosti in varnosti pri oskrbi bolnikov in se zavzema za neprestano spremljanje in izboljševanje procesov za zagotavljanje zdravstvene oskrbe, ki bo zadovoljila potrebe bolnikov in drugih. Kakovost dela zaposlenih v zdravstveni negi in oskrbi sistematično spremljamo že od leta 2000. Kakovost klinične prakse zdravstvene nege spremljamo s strokovnimi nadzori, ki ga opravljajo vodilne medicinske sestre oddelkov, 1-krat na leto pa tudi vodstvo dejavnosti. Izhodišče metodologije so standardi, navodila in priporočila zdravstvene nege ter sklepi Kolegija za zdravstveno nego in Strokovnega sveta OI. Za izvajanje strokovnih nadzorov smo do danes izdelali 18 kazalnikov kakovosti:

(1) kategorizacija zdravstvene nege,
(2) preprečevanje razjede zaradi pritiska,
(3) oskrba okužene rane,
(4) oskrba kronične rane,
(5) oskrba akutne operativne rane, ki se celi per primam,
(6) vstavitev in oskrba i.v. kanile,
(7) rokovanje in oskrba venske valvule,
(8) sistem delitve peroralne terapije ali peroralnih zdravil,
(9) priprava citostatskih zdravil,
(10) aplikacija citostatskih zdravil,
(11) pripravljenost prevezovalnega vozička,
(12) urejenost medicinske sestre,
(13) zaprt sistem odvzema venozne krvi,
(14) delitev hrane,
(15) priprava inštrumentov in medicinskih pripomočkov pred oddajo v centralno sterilizacijo,
(16) ločevanje odpadkov,
(17) preprečevanje bolnišničnih okužb,
(18) urejenost mape z zbirko standardov, navodil in priporočil zdravstvene nege.

Glede varnosti bolnikov redno spremljamo kazalnike kakovosti za estravazacijo citostatikov, padce bolnikov in pojav razjed zaradi pritiska, intenzivno sodelujemo pri spremljanju in preprečevanju bolnišničnih okužb, poskusno pa smo začeli uvajati še pogovore o varnosti oz. varnostne vizite vodstva ZN. Poleg tega smo spremljali tudi zadovoljstvo bolnikov s kakovostjo informiranja in komuniciranja ter njihove izkušnje s prehrano in hotelskimi storitvami. Aktivno smo sodelovali pri pripravi vloge za poslovno odličnost. Na področju kakovosti smo v letu 2005 vzpostavili skupine za uvajanje izboljšav v zdravstveni negi in oskrbi bolnika, in sicer tim za bolnišnično higieno, prehranski tim in tim za vzpostavitev multidisciplinarnega dela v zdravstveni negi v Posvetovalnici za zdravstveno nego.

inform all health care professionals about the type of care a patient has received and about relevant data on the patient him-/herself. The application of the therapy record is one more achievement in our endeavors to provide high-quality nursing – in other words, we started recording and assessing the grade of pain as a fifth vital sign.

Since 2002, we have been members of the working group “Board for Uniform Categorization of Nursing Complexity in Slovenian Hospitals”. Our participation in this board has resulted in the elaboration of a specific categorization of oncology nursing, supplemented by the measures of general Slovenian categorization; the complexity of oncology nursing has thus become comparable. The categorization of hospital nursing complexity is applied as a means of evaluating patients’ needs for nursing; from the obtained results, the workload of nurses can be calculated, and thereby also the need of hospital wards to employ new cadre.

The management of the division is well aware of how important it is to assure quality and safety in nursing, and is working ceaselessly on quality control and improvement of work processes, thus assuring high-quality nursing in order to meet the needs of patients and others. At the Institute of Oncology Ljubljana, quality control in nursing and care for patients has been systematically carried out since 2000. Quality control of performance in nursing is supervised by charge nurses and, once a year, also by the management of the division. The methodology is based on nursing standards, guidelines and recommendations, and on the resolutions of the Nursing Board and Medical Board of the institute. In order to facilitate this task, 18 quality control indicators have been elaborated so far:

(1) categorization of nursing
(2) pressure ulcer prevention
(3) infected wound care
(4) chronic wound care
(5) acute surgical wound care, healed per primam
(6) intravenous catheter insertion and nursing
(7) handling with and care for implanted vascular access port
(8) per os therapy distribution system
(9) preparation of cytostatic therapy
(10) application of cytostatic therapy
(11) properly set up wound management cart
(12) professional image of nurses
(13) closed venous blood collection system
(14) food distribution system
(15) management of medical instruments and devices prior to central sterilization procedure
(16) waste separation
(17) hospital acquired infection control
(18) order in the files containing collections of nursing standards, guidelines and recommendations

The safety of patients is assured by using quality control indicators for extravasation of cytostatics, accidental falls of patients and incidence of pressure ulcers; we also participate in the control and prevention of hospital-acquired infections. Recently, we have experimentally initiated safety rounds at the hospital wards by the management of the nursing division. Our team also made an evaluation of

Na OI že od leta 1998 deluje Posvetovalnica za onkološko zdravstveno nego. Osnova za njeno odprtje je bila vizija razvoja stroke zdravstvene nege, ki med drugim zagovarja, da mora biti medicinska sestra tudi v vlogi zdravstvenega vzgojitelja. Zaradi hitro spreminjajočega se sistema zdravstvene obravnave bolnikov se je v zadnjih letih ležalna doba bistveno skrajšala in vedno več onkoloških bolnikov se zdravi ambulantno ali v dnevni bolnišnici. Medicinske sestre se zavedamo, da lahko v doseganju cilja hitre obravnave prihaja do pomanjkljivega informiranja bolnikov o bolezni in neželenih učinkih zdravljenja. Neželene učinke lahko z zdravstveno vzgojo, s svetovanjem in učenjem bolnikov o njihovi vlogi pri obvladovanju neželenih učinkov zdravljenja in bolezni preprečimo ali omilimo, s tem pa pomembno vplivamo na potek obravnave in na kakovost bolnikovega življenja med boleznijo in zdravljenjem. Da bi tudi bolnikom, ki se zdravijo ambulantno, omogočili kakovostno, kontinuirano zdravstveno nego, smo v letu 2004 v dvanajstčlanski delovni skupni medicinskih sester izdelali Plan razširjenega programa Posvetovalnice za onkološko zdravstveno nego. Razširjeni program poleg že dveh delujočih – zdravstveno vzgojo pri negi stome in inkontinence ter prehransko zdravstveno vzgojo – vključuje še naslednje vrste zdravstvene vzgoje: pri zdravstveno-socialni obravnavi bolnikov; protibolečinsko; pri sistemskem zdravljenju raka; pri zdravljenju z radioterapijo; pri kirurškem zdravljenju; pri obvladovanju okužb; pri paliativni zdravstveni negi in oskrbi; pri samopregledovanju dojk. Za posamezna zdravstvenovzgojna področja smo že izdelali standardne učne vsebine, ki omogočajo poenotenje procesa zdravstvenovzgojnega dela izvajalcev in s katerimi lahko zagotavljamo kakovost svojega dela. V obravnavi bolnikov smo se odločili za multidisciplinarni pristop, ki upošteva povezovanje medicinskih sester z zdravstvenimi sodelavci znotraj in zunaj OI. Poleg individualne smo v načrtu opredelili tudi skupinsko zdravstvenovzgojno obravnavo bolnikov. Da bi ugotovili njihove želje in potrebe po zdravstveni vzgoji, njihove dosedanje izkušnje in mnenje o informiranju, smo aprila leta 2005 izvedli raziskavo. V istem letu smo uspešno poskusno v prakso vpeljali skupinske delavnice, in sicer Svetovanje o splošnih načelih prehrane pacienta z rakom, Svetovanje pri zdravljenju raka dojke z obsevanjem, Svetovanje pri zdravljenju raka glave in vratu z obsevanjem, Svetovanje pri zdravljenju raka črevesja z obsevanjem, Svetovanje pri pripravi pacientov na operacijo črevesne stome, Svetovanje pri zdravljenju s citostatiki, Svetovanje pri zdravljenju s Xelodo®, Svetovanje svojcem pacientov v paliativni obravnavi.

Razvoj stroke zdravstvene nege na OI je v veliki meri odvisen od raziskovalnega dela v onkološki ZN ter v menedžmentu v ZN in zdravstvu. Raziskovanje poteka v obliki aplikativnih raziskav menedžmenta, stroke in spremljanja kakovosti dela z vidika uporabnika storitev. Opravili smo naslednje aplikativne raziskave:

- Kaj menijo medicinske sestre in zdravniki o uspešnosti informiranja bolnikov na OI,
- Znanje in stališča medicinskih sester in zdravstvenih tehnikov o dokumentiranju ZN,
- Ocena internih izobraževanj,
- Presečna študija testne kategorizacije bolnišnične zdravstvene nege,
- Znanje in stališča pacientov o prehrani,
- Presečna študija prehranskega screeninga vseh hospitaliziranih pacientov,
- Ocena pacientovega zadovoljstva s prehrano OI in Kliničnega centra,
- Potrebe po hostel obravnavi na OI,
- Potrebe po paliativni oskrbi v radioterapiji,
- Presečna študija bolečine,
- Presečna študija ugotavljanja dejavnikov tveganja za razjedo zaradi pritiska.

patient satisfaction with the quality of information and communication services provided, as well as with board and lodgings. We participated in preparing an application for a business excellence prize. In 2005, working teams in charge of improvements in nursing and care for patients were established for the following domains: hospital hygiene, hospital nutrition, and maintenance of a multidisciplinary relationship between tasks in oncology nursing and consultancy services.

The oncology nursing consultancy service was established at the Institute of Oncology Ljubljana in 1998. Its establishment was sparked by one idea for the future development of nursing – that this profession should also involve consultancy, and that a nurse should assume the role of a health care consultant. Due to rapidly changing systems of managing patients, hospitalization has been radically shortened and the number of oncology patients who are being treated in outpatient or day clinics is steadily increasing. Nurses are very much aware that, in their endeavors to achieve the goals set by faster management procedures, patients may receive insufficient information about the disease or undesired treatment effects. Undesired treatment effects can be prevented or relieved by counseling, advising and informing the patients how to manage the toxic effects of treatment and the disease itself; thus, significant improvement may be obtained in the management procedure and quality of life of patients all through the course of the disease and treatment. In order to provide high-quality and continuous nursing to our outpatients, a 12-member team was entrusted with the task of elaborating the Plan for Extended Oncology Nursing Consultancy Service, which was completed in 2004. In addition to educating patients about stoma and incontinence care and nutrition, the extended program also provides information about medicosocial management of patients, pain control, systemic cancer treatment, radiotherapy, surgical treatment, infection control, palliative care and breast self-examination. For each of the above areas, a standard teaching curriculum was designed, yielding a uniform educational process and ensuring quality in nursing. The management of our patients is based on a multidisciplinary approach, allowing joint and cooperative work by our nurses with the health care professionals inside and outside the institute. Besides informing and educating individual patients, the education of patients at a group level was also conceived. In order to find out what the true wishes and needs of our patients are to receive education on health care, as well as their experiences and opinions on the accessibility of information, a survey was carried out in April 2005. That same year, experimental group workshops were organized. At these workshops, patients were given instructions and counseling on general nutritional standards for cancer patients, radiotherapy in the treatment of breast cancer, head and neck cancer treatment with radiotherapy, colon cancer treatment with radiotherapy, preparation of patients for stoma surgery, treatment with cytostatics and treatment with Xeloda®; instructions were also given to the relatives of patients receiving palliative care.

Further development of nursing at the Institute of Oncology Ljubljana depends to a great extent on research in the field of nursing, as well as on management in nursing and health care. Research is conducted through applied investigations of management and quality control in nursing, from the viewpoint of nursing service users. The applied investigations that have already been carried out are as follows:

- What is the opinion of nurses and medical doctors about the accessibility of information to patients admitted to the institute?
- Knowledge and attitudes of nurses and assistant nurses regarding the documentation of nursing care?

V letu 2007 smo na Onkološkem inštitutu v sodelovanju s Sekcijo medicinskih sester in zdravstvenih tehnikov v onkologiji nadaljevali z raziskovalno nalogo Zaščita medicinskih sester pri ravnanju s citostatiki, ki je bila osnovana in že izvedena v letih 1996 in 1997 in je do leta 2008 veljala za edini vir podatkov o stanju varnega dela s citostatiki v Sloveniji. Raziskavi področja dela s citostatiki smo dodali tudi področje ravnanja z biološkimi zdravili, ki so v zadnjem desetletju postala pomemben del sistemskega zdravljenja raka. Na podlagi zbranih podatkov in analize stanja smo ugotovili, da moramo izdelati skupna strokovna priporočila, enotne standarde, podati nacionalne smernice za ekstravazacijo, poenotiti negovalno dokumentacijo za bolnike, ki se zdravijo sistemsko, in zanje izdelati dostopno gradivo. Oblikovali smo projektne skupine, v katere smo vključili vse zdravstvene zavode, ki izvajajo sistemsko zdravljenje bolnikov z rakom, za končno dosego in uresničitev ciljev, ki smo si jih postavili. Poleg navedenega sodelujemo tudi pri izvajanju kliničnih raziskav. Primarna naloga tima raziskovalnih medicinskih sester enote za klinične raziskave je sodelovanje v mednarodnih in internih kliničnih raziskavah.

Aktivni smo tudi pri pedagoško-izobraževalnem delu. Redno organiziramo pripravništvo za poklicne skupine tehnikov zdravstvene nege in diplomirane medicinske sestre. Organiziramo praktične vaje za dijake srednjih zdravstvenih šol in vodimo vaje za študente zdravstvene nege visokih zdravstvenih šol. Imamo štiri habilitirane predavatelje za zdravstveno nego, ki učijo na visokostrokovnih programih ZN. Dvakrat na mesec organiziramo interno izobraževanje o različnih temah z domačimi in gostujočimi predavatelji. Redno organiziramo obnovitvene tečaje temeljnih postopkov oživljanja. Kot slovenski referenčni center za onkološko zdravstveno nego smo dolžni širiti znanje tudi na medicinske sestre drugih zdravstvenih zavodov, zato smo organizirali več izobraževanj in učnih delavnic, nekatere smo zaradi zanimanja ponavljali tudi trikrat na leto. Za zunanje udeležence smo organizirali naslednja izobraževanja:
• Zdravstvena nega in obvladovanje bolečine,
• Standardni postopki medicinskih sester v zvezi z venskim podkožnim prekatom,
• Kaj mora medicinska sestra vedeti o sistemski terapiji.

V povezavi z Evropsko zvezo medicinskih sester (EONS) smo organizirali dve izobraževanji za zaposlene in zunanje medicinske sestre, in sicer projekt TITAN (namenjeno izboljšanju preprečevanja, odkrivanja in obravnave bolnikov z anemijo, nevtropenijo in trombocitopenijo) in projekt TARGET (o tarčnih zdravilih). Zaposleni v zdravstveni negi svoje znanje intenzivno obnavljamo in aktivno širimo (velikokrat na povabilo) na seminarjih, kongresih in konferencah v Sloveniji in v tujini.

Od leta 1998 smo pripravili več publikacij za bolnike. V okviru OI smo izdali knjižice Kemoterapija in vi (1998), Prehrana in vi (1999), Kako premagati izgubo las (2000), v letu 2006 pa tudi zloženke Obvladujte svojo utrujenost, Nizko število belih krvnih celic/levkopenija, Nizko število rdečih krvnih celic in znižana vrednost hemoglobina/slabokrvnost. V letu 2007 smo sodelovali pri pripravi knjižice Napotki za premagovanje neželenih učinkov sistemskega zdravljenja: kaj morate vedeti, v letu 2008 pa pri strokovnem pregledu priročnika za medicinske sestre Ne-Hodgkinov limfom: priročnik za samoizobraževanje medicinskih sester.

V letu 2003 smo uvedli sistem HACCP v centralno kuhinjo in v čajne kuhinje po oddelkih; opravljamo letne nadzore in izobraževanje delavcev, ki prihajajo v stik z živili. V letu 2008 pa smo orga-

• Evaluation of in-house training events?
• Cross-sectional study on categorization of nursing complexity in hospital wards
• Knowledge and attitudes of patients about nutrition
• Cross-sectional study on nutritional screening of all hospitalized patients
• Evaluation of patient satisfaction with daily meals prepared at the Institute of Oncology Ljubljana or at the University Medical Centre Ljubljana
• Needs for hostel care at the Institute of Oncology Ljubljana
• Needs for palliative care in radiotherapy
• Cross-sectional study of pain
• Cross-sectional study of risk factors for pressure ulcer incidence

In 2007, the research study “Protection of Nurses in Handling Cytotoxic Drugs”, initiated in 1996–97, was continued in cooperation with the oncology nurses section. Until 2008, this study was considered the only data source in Slovenia on the safe handling of cytotoxic drugs; it was then extended to the handling of biological drugs, which have become an important treatment of choice in the systemic treatment of cancer over the last decade. On the basis of the gathered data and overall analysis of the situation, it was concluded that there was a need to elaborate general expert recommendations, uniform standards, national guidelines for extravasation and a uniform documentation system on nursing care for patients undergoing systemic treatment, and to provide instruction booklets accessible to all patients under systemic treatment. In order to fulfill the set goals, project teams including all health centers specializing in systemic treatment of cancer were founded. Furthermore, we are also actively involved in clinical trials. The primary task of research nurses in the clinical trials unit is to cooperate in international and in-house clinical trials.

The staff of our division is also engaged in teaching and training activities. We regularly organize internship training programs for assistant nurses and registered nurses, as well as clinical work for the students of secondary schools of nursing and nursing colleges. Four nurses from our team have been appointed teachers of nursing; they lecture in specialized nursing programs at the university level. In-house training courses on various subjects conducted by local or visiting lecturers are held twice a month. We regularly organize refresher courses on the necessary steps to take in resuscitation. As a reference center for oncology nursing in Slovenia, we are obliged to expand and transfer our knowledge and experience in oncology nursing to the nurses working at other health centers in Slovenia; we have therefore prepared several training courses and workshops. Due to the great interest in this type of training, several courses have been repeated even three times in one year. The following courses were organized for participants from other health care institutions:
• Nursing and pain control;
• Standard nursing care procedures for implanted vascular access port;
• Basics of systemic treatment for nurses.

Two training events, the first known as TITAN (for better prevention, detection and treatment of patients with anemia, neutropenia and thrombocytopenia) and the second as TARGET (for better knowledge of target drugs) were organized in cooperation with the European Oncology Nursing Society (EONS) for in-house nurses and nurses working elsewhere. Nursing sector personnel are also mindful of their responsibility to further expand and refresh their knowledge and experience

nizirali centralno enoto za oskrbovalne dejavnosti. Sodelovali smo pri pripravi strokovnih meril za javna naročila. Za nami je tudi organizacija in selitev v nove prostore OI.

V dejavnosti zdravstvene nege in oskrbe smo se aktivno vključili še v organizacijo in zagon onkološkega genetskega svetovanja za dednega raka dojk, jajčnikov in širokega črevesa ter paliativne oskrbe bolnikov. Za ta področja smo medicinske sestre izobrazili v tujini.

Od leta 2000 vsako leto organiziramo praznovanje 12. maja, mednarodnega praznika medicinskih sester. Ob tem dnevu podelimo priznanja zaposlenim v zdravstveni negi, ki jih predlagajo njihovi sodelavci, izbere pa za to imenovana komisija. Od leta 2003 ob tej priložnosti organiziramo dneve odprtih vrat za javnost, bolnike in zaposlene, kjer predstavimo svoje delo in dosežke preteklega leta.

Vodimo Sekcijo medicinskih sester in zdravstvenih tehnikov v onkologiji pri Zbornici – Zvezi, prek katere smo včlanjeni v EONS. V EONS-u imamo člana v posvetovalnem organu.

Smer razvoja v prihodnosti

V preteklosti je bila – in do neke mere še vedno je – zdravstvena nega orientirana kirurško, radioterapevtsko, internistično in paliativno. Vendar smo se začeli odmikati od biomedicinskega pristopa proti holistični ZN, zato danes in v prihodnosti postaja naša dejavnost usmerjena v bolnika, ki je v središču obravnave, v partnerstvo z bolniki in njihovo aktivno udeležbo pri zdravstveni oskrbi, v timsko delo, v integracijo vseh profesionalnih področij, v na dokazih temelječo prakso zdravstvene nege, v multiprofesionalni pristop k zdravstveni oskrbi, k razvoju vodij ZN, k profesionalnemu razvoju medicinskih sester, k podiplomskemu izobraževanju v ZN in k razvoju novih vlog medicinskih sester (npr. medicinska sestra za zdravstveno nego dojk), ki jih prinašajo potrebe bolnikov ter razvoj onkologije in novih tehnologij.

by attending seminars (very often at the invitation of the organizers), congresses and conferences in Slovenia and abroad.

Since 1998, several informative publications have been issued for patients on topics of interest to them, e.g. chemotherapy (1998), nutrition (1999) and alopecia (2000). In 2006, instructive leaflets explaining fatigue, low number of leukocytes (leucopenia), low number of erythrocytes, and low hemoglobin count (anemia) were published. In 2007, our team participated in the preparation of one more informative booklet on undesired toxic effects of systemic treatment, and in 2008 a handbook on non-Hodgkin's lymphoma, intended for the self-education of nurses, was entrusted to us for expert revision before printing.

In 2003, Hazard Analysis Critical Control Point (HACCP) principles were introduced in the central kitchen and kitchenettes in hospital wards. Employees who deal with food must undergo yearly supervision and training. In 2008, a central supply unit was established. Members of our team participated in outlining technical criteria for public tenders. The same year, our move to the premises of the newly constructed building was successfully completed.

We also played an important part in preparing and initiating the palliative care unit and genetic counseling in the management of hereditary breast, ovarian and colon cancer. The nurses who were appointed to perform these new functions had been trained abroad.

Every year since 2000, the Institute of Oncology has commemorated May 12 as International Nurses Day. On that day in May, employees in the nursing division of our institute who have been nominated by their colleagues and selected by a special board are given awards for their exceptional achievements. Since 2003, this day has been celebrated as an open-door forum for nurses to present their work and achievements of the past year to visitors, patients and employees of the institute.

We are leading the oncology nurses section at the Nursing Chamber of Slovenia – Nurses' Association of Slovenia. Our section is a member of the European Oncology Nursing Society (EONS), and a member of the institute represents Slovenia in the Advisory Council of EONS.

Future goals and guidelines

In the past, oncology nursing was systematized by oncology specialties into surgical, radiotherapy, medical oncology and palliative nursing care. This systemization still seems to be in force; however, in preference for holistic nursing, we are less and less satisfied with this biomedical approach to nursing care. Today, nursing seeks to be focused primarily on the patient, the mainstay of its mission – on the partnership with the patient and his or her active participation in nursing and care processes, on teamwork and integration of all professional areas, on evidence-based nursing practice, on a multidisciplinary approach to health care, on the formation of qualified nursing team leaders, on the professional growth of nurses, encouraging them to complete graduate studies, and on the development of new roles for breast care nurses as required by the needs of patients, advances in oncology and new technologies.


Dräger

Strokovno delo

Lekarniška dejavnost

Vodja:
***Monika Sonc**,*
mag. farm. spec.

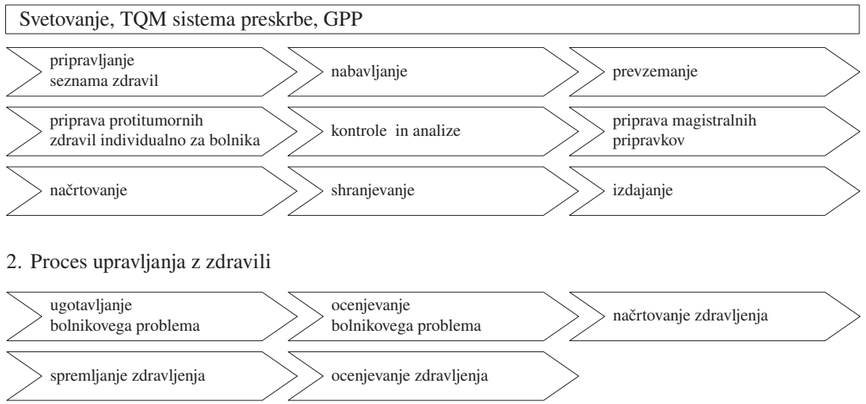
Lekarniška dejavnost v bolnišnicah je eno izmed ključnih področij delovanja farmacevta v okvirju sistema zdravstvenega varstva. Uravnava jo Zakon o lekarniški dejavnosti (Ur. l. RS 9/92), bolnišnične lekarne pa so po Zakonu o zdravstveni dejavnosti (Ur. l. RS 9/92) sestavni del vsake bolnišnice.

Cilji bolnišnične lekarne so:
1. zagotavljati kakovostna, učinkovita in neškodljiva zdravila, zdravilne pripravke ter medicinske pripomočke,
2. zagotavljati kakovostno, učinkovito in neškodljivo zdravljenje z zdravili in medicinskimi pripomočki.

Za izvajanje predpisanih ciljev bolnišnični farmacevti opravljajo naloge v okviru naslednjih procesov dela:
a) preskrba z zdravili in medicinskimi pripomočki,
b) upravljanje z zdravili in medicinskimi pripomočki.

Pri svojem delu morajo zagotavljati preglednost in sledljivost ter vse dejavnosti podpreti s TQM (Total Quality Management) in GPP (Good Pharmacy Practice).

Lekarniška dejavnost se v bolnišnici izvaja na dveh ravneh:
1. Proces preskrbe z zdravili in medicinskimi pripomočki



2. Proces upravljanja z zdravili

Dosežki lekarne na Onkološkem inštitutu

Lekarna je posebno pozornost na strokovnem področju v tem obdobju namenila teoretični pripravi na zahtevno nalogo, ki jo čaka v prihodnosti, to je na organizacijo priprave protitumornih zdravil individualno za bolnike. S tem bi bili pripravki tudi na Onkološkem inštitutu v Ljubljani v skladu s predpisi Evropske skupnosti. Pripravo protitumornih zdravil je lekarna prevzela na dislocirani enoti in čaka na adaptacijo enote za aseptično delo.

Professional Work

Pharmacy

Head:
***Monika Sonc**,*
M.Sc. (Pharm.),
specialist in clinical pharmacy

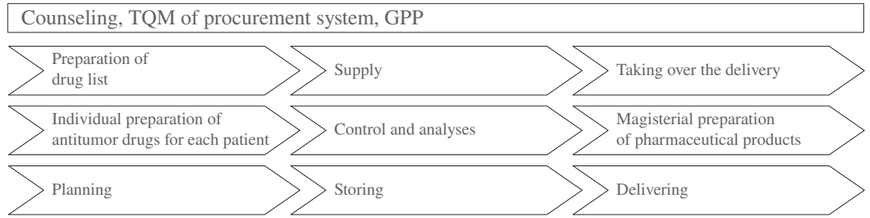
Hospital pharmacy practice is one of the key work domains of a pharmacist within the health care system. It is standardized by the Pharmacies Act (Official Gazette of the Republic of Slovenia, No. 9/92). According to the Health Services Act (Official Gazette of the RS, No. 9/92), hospital pharmacies are a constituent part of each hospital.

The aims of a hospital pharmacy are:
(1) to ensure high-quality, effective and non-hazardous drugs, therapeutic products and medical devices;
(2)to ensure high-quality, effective and non-hazardous therapy with drugs and medical devices.

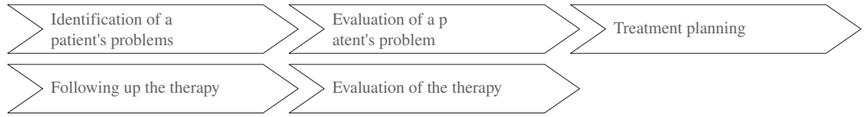
Hospital pharmacists implement the above aims by performing tasks within the framework of the following work processes:
(1)supplying drugs and medical devices, and
(2)managing drugs and medical devices.

The pharmacists must assure the transparency and traceability of drugs and strictly follow the principles of total quality management (TQM) and good pharmacy practices (GPP).

In hospitals, pharmacy practice is carried out at two levels:
1. Supplying drugs and medical devices
2. Management of drugs and medical devices



2. Management of drugs and medical devices



Major achievements of the pharmacy at the Institute of Oncology

In the last decade, the major concern in the professional area of pharmacy personnel was to gain knowledge on the theoretical principles of the serious task they are faced with – namely, the management of antitumor drug preparation for each individual patient. The preparation of pharmaceutical products at the Institute of Oncology Ljubljana would thus meet the standards of the European Community. Antitumor drug preparation is now being performed in a discrete unit that needs further adaptation to ensure aseptic work conditions.

Strokovno delo

V bolnišnicah po svetu se vse bolj uveljavlja profil kliničnega farmacevta. Ena od magister farmacije je v letu 1997 končala specializacijo iz klinične farmacije in s tem razširila obseg strokovnega dela. Klinični farmacevt je vključen v individualni sistem odmerjanja, kar zmanjšuje možnost napak in omogoča boljšo oskrbo bolnika (pacient care). Prizadeva si za racionalizacijo porabe zdravil na OI, kar pomeni, da lekarna nadzoruje tudi vzdrževanje optimalnih zalog zdravil na oddelkih in njihovo pravilno hranjenje. Razmišljamo o vgradnji distribuirnega stroja, ki bi omogočal deljenje zdravil individualno za bolnika, kar bi pomenilo, da bi zdravilu lahko sledili od lekarne do bolnika.

Klinični farmacevt sodeluje pri vizitah na vseh oddelkih OI. S pridobljenim znanjem je usposobljen svetovati oziroma priskrbeti informacije, povezane s farmakoterapijo in farmakokinetiko, vključno z interakcijami med zdravili, neželenimi učinki, inkompatibilnostmi i.v. mešanic in podobnim.. Vključeni smo v klinične raziskave. Tako sta pri vsakem bolniku zagotovljeni učinkovitost in varna uporaba novega zdravila. Klinični farmacevt pri vsakem bolniku spremlja tudi neželene učinke zdravil in jih primerja z neželenimi učinki pri že ustaljenih shemah zdravljenja.

Ena izmed magister je začela tudi z izobraževanjem pripravnikov farmacevtov in specialistov klinične farmacije. Prejela je Minerikovo priznanje za prispevek k razvoju slovenske farmacije v letu 2001. Magistri so aktivni člani ISOPP (Mednarodna organizacija farmacevtov v onkološki praksi), Evropskega združenja kliničnih farmacevtov (ESCP), Slovenskega farmacevtskega društva in Lekarniške zbornice.

Cilji oz. smer razvoja lekarne

Lekarniško dejavnost v bolnišnicah izvajajo farmacevti v okviru interdisciplinarne skupine, da bi tako izboljšali kakovost zdravstvenih storitev in zmanjšali stroške. Farmacevti sodelujejo pri načrtovanju in izvajanju zdravljenja z zdravili, pri čemer upoštevajo farmakokinetične in farmakodinamske ter farmakoekonomske vidike, saj se tako lahko izboljšajo klinični, humanistični in ekonomski izidi zdravljenja z zdravili. Tak pristop farmacevta konceptualno postavlja v vlogo zdravstvenega delavca, ki ni zadolžen samo za preskrbo z zdravili, ampak tudi za načrtovanje in spremljanje zdravljenja z zdravili (za upravljanje z zdravili).

Pred uvedbo predloženega modela delovanja lekarniške dejavnosti v bolnišnici je treba definirati:
- organiziranost lekarniške dejavnosti,
- standarde za kadre,
- standarde za opremo, prostore in dokumentacijo,
- standarde za vrednotenje dela z zdravili,
- standarde za strokovno-poslovne podatke v zdravstvu,
- standarde za strokovno-poslovne procese.

Uvajanje sistema upravljanja z zdravili bo potekalo postopno. Najprej pa bo treba vzbuditi zaupanje izvajalcev v učinkovitost in kakovost sistema in tako zagotoviti njihovo sodelovanje.

Professional Work

In hospitals throughout the world, the new profile of clinical pharmacist is gaining recognition. In 1997, one of our masters in pharmacy completed a residency program in clinical pharmacy and thus expanded the scope of clinical work in our pharmacy. A clinical pharmacist is qualified to enter into an individuated system of dose preparation, which considerably reduces the possibility of committing errors and thereby also ensures better care to patients. The pharmacy is in charge of rationalizing drug consumption at the institute, which means the pharmacy has control over minimum stocks of drugs and their proper storage at the hospital wards. Our plans are also to install a drug distribution device that mechanically distributes drugs to each individual patient and, at the same time, allows better traceability of a drug from the pharmacy to the patient.

The clinical pharmacist attends ward rounds. The acquired knowledge and skills make him competent to give advice and to provide information from pharmacotherapy and pharmacokinetics, including data on drug interactions, side effects of drugs, incompatibility of intravenous mixtures, etc. Our pharmacists participate in clinical trials, which is one more way to ensure the efficient, safe consumption of new drugs in each individual patient. The clinical pharmacist follows up side effects of drugs in each patient and compares them with those of standard treatment schedules.

One of the members of our pharmacy personnel is in charge of carrying out educational programs; she conducts training programs for apprentice pharmacists and for residents in clinical pharmacy. In 2001, she was awarded the Minerik Prize in recognition of her contributions to the development of Slovenian pharmacy. The pharmacists of our department are members of the International Society of Oncology Pharmacy Practices (ISOPP), the European Society of Clinical Pharmacists, the Slovenian Pharmaceutical Society and the Slovenian Chamber of Pharmacy.

Future Prospects

Hospital pharmacy practice is carried out by pharmacists within a multidisciplinary group, with the aim to increase the quality of health services and to reduce treatment costs. The pharmacists assist in treatment planning and in treatment with drugs, and are therefore responsible for seeing that pharmacokinetic, pharmacodynamic and pharmacoeconomic concepts are being followed, thereby assuring better clinical and more humane and economical outcomes of treatment. This approach to treatment puts the pharmacist into the position of a health care worker, who is not only in charge of providing drugs, but also takes an active part in planning and following up treatment (drug management).
Before applying the proposed model of hospital pharmacy practice to clinical practice, the following issues need to be defined:
- structure of pharmacy services;
- personnel standards;
- equipment, premises and documentation standards;
- standards for work evaluation of handling drugs;
- standards for professional and business data processing in health care; and
- standards for professional and business procedures.

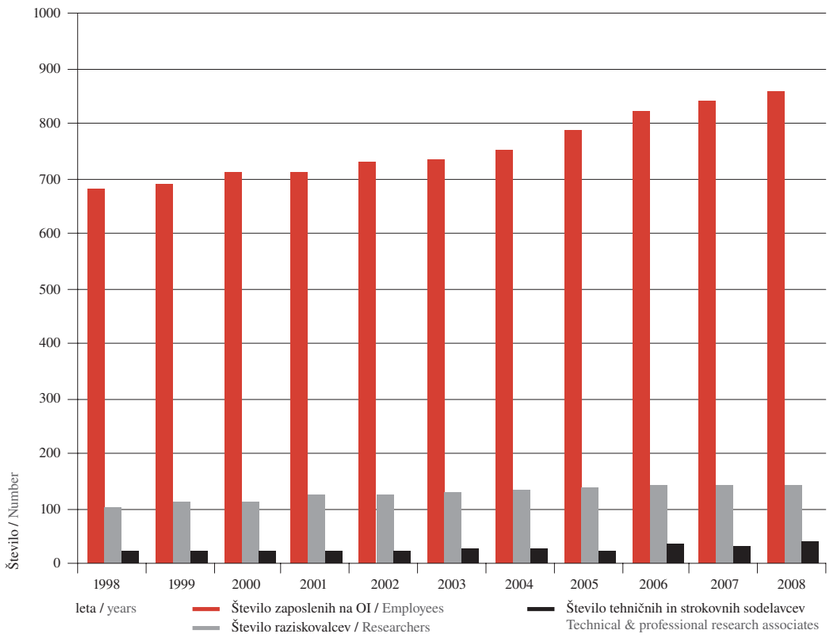
The system of drug management will be introduced gradually. As a first step, we should win the confidence of those involved in the system regarding the efficiency and quality of the system, and enhance their cooperation.

Raziskovanje in izobraževanje

Pomočnik strokovnega direktorja za raziskovanje in izobraževanje:
znan. svet.
dr. ***Srdjan Novaković***

Onkološki inštitut Ljubljana je zasnovan kot vseobsegajoči javni zavod za odkrivanje, zdravljenje in raziskovanje raka. Kot vodilna ustanova v državi skrbi za uravnotežen in pravilen razvoj onkološke zdravstvene dejavnosti v Sloveniji. Zato imata izobraževanje in raziskovanje na OI poseben pomen, saj sta temeljni obliki aktivnosti, ki omogočata pridobivanje in širjenje znanja. Raziskovanje in izobraževanje na OI Ljubljana se izvaja v vseh organizacijskih strukturah ustanove. V letu 2008 je bilo (po podatkih Sicrisa) registriranih 142 raziskovalcev ter 40 strokovnih in tehničnih sodelavcev (Slika1).

Slika 1. Število vseh zaposlenih na OI, raziskovalcev ter tehničnih in strokovnih sodelavcev 1998–2008/
Figure 1. Number of all employees, researchers and technical & professional research associates at the Institute of Oncology 1998-2008



V obdobju 1998–2008 smo rezultate raziskovalnega in strokovnega dela predstavili v 221 samostojnih publikacijah, 869 znanstvenih ali strokovnih člankih in 940 poljudnih člankih. V istem obdobju smo imeli 1626 aktivnih predstavitev svojega dela – 774 referatov oz. predavanj z objavo in 852 povzetkov krajših ustnih predstavitev ali plakatov. Del našega raziskovalno-izobraževalnega dela je tudi vzgoja novih kadrov. Mentorji ali somentorji za doktorate in magisterije smo bili 75-krat. Strokovnjaki z našega inštituta so tudi člani uredniških odborov ter recenzenti v številnih mednarodnih in domačih strokovnih in znanstvenih revijah (Slika 2).

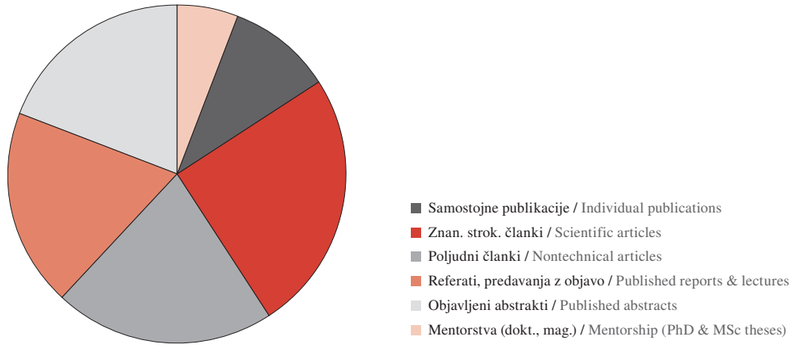
Research and Education

Research Full Professor
Srdjan Novaković*, Ph.D.*
Assistant Medical Director for Research and Education

The Institute of Oncology Ljubljana is conceived as a comprehensive public institution for detection, treatment and research of cancer. As the leading institution in this domain in the country, it ensures balanced and proper development of oncology health services in Slovenia. This is why research and education need to hold a special position at the institute – because they enhance both knowledge acquisition and expansion. Research and education are being implemented in all organizational units of the institute. In 2008, 142 researchers and 40 experts and technical research associates were registered with SICRIS (Slovenian Current Research Information System) (Figure 2).

In the last decade, from 1998 to 2008, the results of our research and expert work were presented in 221 publications, 869 scientific and medical papers, and 940 non-technical articles. In the observed period, 1,626 presentations were given by our colleagues at various scientific events – 774 reports and lectures, which were also published in scientific literature, and 852 abstracts of oral presentations and posters. Apart from research work, education is also one of the regular duties of the institute. Our colleagues were mentors or co-mentors to 75 doctoral and master's candidates. Specialists from our institute are also members of editorial boards and reviewers of numerous international and national medical and scientific journals (Figure 2).

Slika 2. Rezultati znanstveno-raziskovalnega dela v obdobju 1998-2008
Figure 2. Results of scientific and research work 1998-2008



Vizija

Združiti izsledke temeljnih, aplikativnih in kliničnih raziskav za čim uspešnejše obvladovanje raka.
Koncept raziskovalne dejavnosti OI je pripravljen tako, da v največji možni meri pokriva vsa pomembna področja v onkologiji: 1) nastanek raka – kancerogenezo, 2) biologijo raka – rast in značilnosti tumorjev, 3) epidemiologijo raka, 4) prilagoditvene mehanizme organizma, ki je zbolel za rakom, in prilagoditvene mehanizme rakastih celic – predvsem tumorska imunologija, 5) odkrivanje in klasifikacijo raka, 6) zdravljenje raka in 7) ugotavljanje zgodnjih in kasnih posledic zdravljenja.

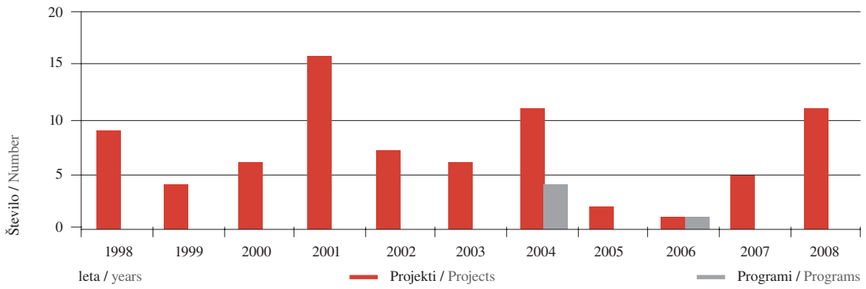
Namen

Prenos znanja z večnivojskega raziskovalnega področja v klinično prakso.

Vrste raziskav in financiranje

Raziskave na OI lahko opredelimo kot bazične, predklinične in klinične. Klinične raziskave se delijo še na diagnostične, epidemiološke in klasične klinične raziskave za vrednotenje delovanja novih zdravil in načinov zdravljenja. Glede na strukturo zaposlenih na OI in tradicijo raziskovanja po posameznih področjih prevladujejo klinične in epidemiološke študije. Raziskovalno delo poteka v okviru raziskovalnih projektov (domačih in tujih), programov in v okviru kliničnih študij. Financira se iz sredstev, pridobljenih na domačih javnih razpisih (ARRS), mednarodnih razpisih, iz sredstev Ministrstva za zdravje, namenjenih delovanju terciarnih ustanov, ter iz sredstev, ki so namenjena za klinične študije. V obdobju 1998–2008 smo na domačih razpisih pridobili 78 raziskovalnih projektov, 4 raziskovalne in 1 infrastrukturni program. V istem obdobju smo sodelovali tudi v 11 mednarodnih in 7 bilateralnih projektih. Prav tako se je v tem obdobju začelo 71 različnih kliničnih študij (Slika 3, Slika 4). Seznami domačih, evropskih, ter bilateralnih projektov, programov in kliničnih raziskav so navedeni na koncu poglavja o raziskovanju: *Seznam projektov 1998–2008, Seznam programov 1998-2008, Klinične raziskave 1998–2008, Evropski projekti, kjer Onkološki inštitut Ljubljana nastopa kot partner 1998–2008, Mednarodni bilateralni projekti 1998–2008.*

Slika 3. Projekti in programi 1998–2008 / Figure 3. Projects and programs 1998-2008



Vision

Our primary objective is to draw together the results of basic, applicative and clinical trials in order to apply them to obtain the most efficient control over cancer possible.
The concept of research work at the Institute of Oncology Ljubljana is designed to cover all important oncology domains: (1) cancerogenesis; (2) cancer biology – tumor growth and its characteristics; (3) cancer epidemiology; (4) adaptation mechanisms of organisms that have contracted cancer and adjustable mechanisms of cancer cells – in particular tumor immunology; (5) cancer detection and classification; (6) cancer treatment; and (7) determination of early and late sequels of cancer therapies.

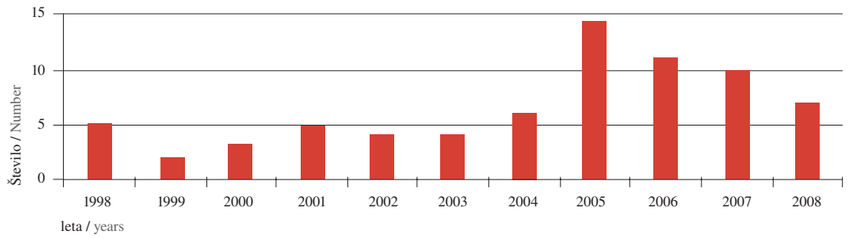
Aim

Our common aim is to translate knowledge from the multilevel research domain into clinical practice.

Types of research and funding

The research studies performed at the Institute of Oncology are categorized as basic, preclinical and clinical trials. Clinical trials are further classified into diagnostic, epidemiological and classical clinical trials; the latter are carried out with the aim of evaluating the effectiveness of new drugs or treatment methods. Considering the structure of the personnel employed at the Institute of Oncology and research tradition, clinical and epidemiological studies prevail. Research work is carried out within a framework of research projects (national and international), research programs and clinical trials. The funding comes from means obtained through local public tenders (ARRS – Research Agency of Slovenia), international public tenders, and from means granted by the Ministry of Health and intended for the operational costs of tertiary institutions, as well as from those intended for clinical trials. In the 10-year period of 1998–2008, we received funding for 78 research projects, 4 research programs and 1 infrastructural program through national public tenders. In the same period, we cooperated in 11 international and 7 bilateral projects, and initiated 71 clinical trials (Figure 3, Figure 4). The lists of Slovenian, European and bilateral projects, programs and clinical studies are given at the end of the section "Research": *List of Projects 1998–2008, Research Programs 1998–2008, Clinical Trials 1998–2008, European Projects in Which the Institute of Oncology Ljubljana Cooperates as a Co-Investigator 1998–2008, International Bilateral Projects 1998–2008.*

Slika 4. Klinične raziskave na OI 1998–2008 / Figure 4. Clinical trials at the Institute of Oncology 1998-2008



Sodelovanje pri raziskavah

Razlikujemo raziskovalno delo, ki se izvaja izključno znotraj OI, in raziskovalno delo, ki se izvaja v sodelovanju z različnimi slovenskimi in mednarodnimi ustanovami.

Slovenski partnerji za sodelovanje so visokošolske organizacije, raziskovalni inštituti, bolnišnice in farmacevtska industrija. Od visokošolskih organizacij sodelujemo z vsemi tremi univerzami – z Univerzo v Ljubljani (Medicinska fakulteta, Fakulteta za farmacijo, Fakulteta za šport, Biotehniška fakulteta, Fakulteta za veterino, Fakulteta za elektrotehniko, Visoka šola za zdravstvo), Univerzo v Mariboru (Medicinska fakulteta) ter Univerzo na Primorskem (Visoka šola za zdravstvo Izola). Med večjimi raziskovalnimi inštituti lahko naštejemo sodelovanje z Inštitutom Jožef Stefan, Kemijskim inštitutom in Nacionalnim inštitutom za biologijo. Izrednega pomena je sodelovanje z različnimi bolnišnicami po državi, kot so Univerzitetni klinični center Ljubljana, Univerzitetni klinični center Maribor in tudi z drugimi.

Mednarodno sodelovanje OI v raziskovanju poteka prek vključevanja v mednarodne (multicentrične) študije, sodelovanja v bilateralnih projektih ali neposrednega sodelovanja z različnimi priznanimi mednarodnimi centri za zdravljenje in raziskovanje raka ter z mednarodnimi farmacevtskimi družbami.

Da je raziskovanje v onkologiji (in s tem tudi na OI) kakovostno, potrjujejo tudi podatki o vplivnosti onkologije v medicini. Tako se raziskave iz onkologije uvrščajo v vrh razpredelnice po številu objav, po številu citatov in tudi po kakovosti revij, kjer so bile objavljene (Tabela 1).

Vplivnost objav, vezanih na raziskave v onkologiji, se v Sloveniji samo še povečuje, kar je razvidno iz tabel o vplivnosti področij v medicini v krajših časovnih obdobjih. Tako so se objave iz onkologije v zadnjem obdobju, za katerega je mogoče dobiti podatke (2003–2006), uvrstile v vrh objav v medicini (Tabela 2, Tabela 3, Tabela 4).

Tabela 1. Vplivnost področij v medicini (Slovenija 1981–2006)
Table 1. Impact of medical specialties (Slovenia 1981-2006)

Rang Rank	Področje Medical specialty	Št. citatov No. of citations	Št. objav No. of publications	RIF*
1	Raziskave v medicini, splošne teme / Medical Research, General Topics	4.119	121	34,04
2	Revmatologija / Rheumatology	1.413	49	28,84
3	Onkologija / Oncology	3.398	177	19,20
4	Onkogeneza in raziskave o raku / Oncogenesis and Cancer Research	3.837	246	15,60
5	Endokrinologija, metabolizem in prehrana / Endocrinology, Metabolism and Nutrition	473	32	14,78
6	Splošna in interna medicina / General and Internal Medicine	3.889	267	14,57
7	Raziskave v medicini –organi in sistemi / Medical Research, Organs and Systems	3.339	250	13,36
8	Klinična imunologija in nalezljive bolezni / Clinical Immunology and Infectious Disease	1.621	129	12,57
9	Dermatologija / Dermatology	275	24	11,46
10	Gastroenterologija in hepatologija / Gastroenterology and Hepatology	508	50	10,16
11	Raziskave bolezni srca in ožilja ter hematološke raziskave / Cardiovascular and Hematology Research	1.179	121	9,74
12	Urologija in nefrologija / Urology and Nephrology	692	79	8,76
13	Kardiovaskularni in respiratorni sistem / Cardiovascular and Respiratory Systems	1.306	162	8,06
14	Klinična psihologija in psihiatrija / Clinical Psychology and Psychiatry	152	19	8,00
15	Nevrologija / Neurology	875	113	7,74
16	Pediatrija / Pediatrics	553	73	7,58
17	Radiologija, nuklearna medicina in slikovna diagnostika / Radiology, Nuclear Medicine and Imaging	685	91	7,53
18	Hematologija / Hematology	413	56	7,38
19	Okoljska medicina in javno zdravstvo / Environmental Medicine and Public Health	253	36	7,03
20	Raziskovanje v laboratorijski medicini in medicinski tehnologiji / Research / Laboratory Medicine and Medical Technology	1.503	222	6,77
21	Anestezija in intenzivna nega / Anesthesia and Intensive Care	350	56	6,25
22	Farmakologija in toksikologija / Pharmacology and Toxicology	1.927	328	5,88
23	Dentalna medicina ter ustna kirurgija v medicini / Dentistry/Oral Surgery and Medicine	238	43	5,53
24	Raziskovanje v medicini, diagnostiki in zdravljenju / Medical Research, Diagnosis and Treatment	1.285	240	5,35
25	Reprodukcijska medicina / Reproductive Medicine	749	151	4,96
26	Kirurgija / Surgery	512	119	4,30
27	Zdravstveno varstvo in njegove usluge / Health Care Sciences and Services	62	15	4,13
28	Ortopedija, rehabilitacija in medicina športa / Orthopedics, Rehabilitation and Sports Medicine	347	99	3,51
29	Oftalmologija / Ophthalmology	156	51	3,06
30	Otorinolaringologija / Otolaryngology	108	44	2,45

* Relativni faktor vpliva / Relative Impact Factor

Tabela 2. Relativni pomen področja v primerjavi z ostalimi medicinskimi področji v obdobju 1993-1997
Table 2. Relative impact of an individual medical specialty in comparison to others in the period of 1993-1997

Rang Rank	Področje Medical Specialty	Št. citatov No. of Citations	Št. objav No.of Publications	RIF*
1	Splošna in interna medicina / General and Internal Medicine	124	19	6,53
2	Klinična psihologija in psihiatrija / Clinical Psychology and Psychiatry	15	3	5,00
3	Raziskave v medicini – splošne teme / Medical Research, General Topics	141	30	4,70
4	Endokrinologija, metabolizem in prehrana / Endocrinology, Metabolism and Nutrition	12	3	4,00
5	Klinična imunologija in nalezljive bolezni / Clinical Immunology and Infectious Disease	112	31	3,61
6	Onkologija / Oncology	84	24	3,50
7	Onkogeneza in raziskave raka / Oncogenesis and Cancer Research	179	57	3,14
8	Hematologija / Hematology	20	7	2,86

*Relativni faktor vpliva / Relative Impact Factor

Tabela 3. Relativni pomen področja v primerjavi z ostalimi medicinskimi področji v obdobju 1998-2002
Table 3. Relative impact of an individual medical specialty in comparison to others in the period of 1998-2002

Rang Rank	Področje Medical Specialty	Št. citatov No. of Citations	Št. objav No. of Publications	RIF*
1	Raziskave v medicini – splošne teme / Medical Research, General Topics	621	39	15,92
2	Revmatologija / Rheumatology	295	21	14,05
3	Onkologija / Oncology	680	77	8,83
4	Endokrinologija, metabolizem in prehrana / Endocrinology, Metabolism and Nutrition	119	14	8,50
5	Onkogeneza in raziskave raka / Oncogenesis and Cancer Research	633	104	6,09
6	Klinična imunologija in nalezljive bolezni / Clinical Immunology and Infectious Disease	246	41	6,00
7	Raziskave v medicini – organi in sistemi / Medical Research, Organs and Systems	606	102	5,94
8	Hematologija / Hematology	50	9	5,56

*Relativni faktor vpliva / Relative Impact Factor

Cooperation in Research Studies

We distinguish between the research work performed exclusively at the Institute of Oncology Ljubljana and the research work performed in cooperation with various Slovenian and international institutions.

Cooperating partners in Slovenia are university organizations, research institutes, hospitals and the pharmaceutical industry. Among the universities with which we cooperate are all three Slovenian universities – the University of Ljubljana (Faculty of Medicine, Faculty of Pharmacy, Faculty of Sport, University College of Health Care), University of Maribor (Faculty of Medicine), and University of Primorska (University College of Health Care). The major research institutes we cooperate with are the Jožef Stefan Institute, the Institute of Chemistry and the National Institute of Biology. Cooperating partners of special importance are various Slovenian hospitals, e.g. University Medical Centre Ljubljana and Maribor Teaching Hospital.

In international research cooperation, the Institute of Oncology Ljubljana participates in international (multicentric) studies and bilateral projects, and is directly involved in research studies performed jointly with various eminent international cancer centers and international pharmaceutical companies.

The fact that the research in oncology (including research by the Institute of Oncology) meets high standards of quality can be verified by the data on the impact of oncology in medical science. Reports on oncology research rank among the very top of published medical papers by number of publications, number of citations and quality of journals in which they appear (Table 1).

In Slovenia, the impact of publications resulting from research in oncology is gradually increasing, which can be seen from the tables on the impact of individual medical specialties in shorter time intervals. In the most recent period for which data were available (2003–2006), the publications on oncology ranked at the top of all medical science publications (Table 2, Table 3, Table 4).

By comparing our research output (evidenced by various publications) with the output of neighboring countries, we are at the same rank as Italy and Austria. However, all three countries lag behind the United Kingdom (U.K.), which is reputed to be among the European countries with the highest relative impact factor (RIF) (Table 5).

Tabela 4. Relativni pomen področja v primerjavi z ostalimi medicinskimi področji v obdobju 2003-2006
Table 4. Relative impact of an individual medical specialty in comparison to others in the period of 2003-2006

Rang Rank	Področje Medical Specialty	Št. citatov No. of Citations	Št. objav No.of Publications	RIF*
1	Onkologija / Oncology	1,016	90	11,29
2	Onkogeneza in raziskave raka / Oncogenesis and Cancer Research	1.184	108	10,96
3	Dermatologija / Dermatology	125	12	10,42
4	Raziskave v medicini – splošne teme / Medical Research, General Topics	572	59	9,69
5	Revmatologija / Rheumatology	122	22	5,55
6	Klinična psihologija in psihiatrija / Clinical Psychology and Psychiatry	60	11	5,45
7	Raziskave v medicini – organi in sistemi / Medical Research, Organs and Systems	554	102	5,43
8	Hematologija / Hematology	232	43	5,40

*Relativni faktor vpliva / Relative Impact Factor

Primerjava naše raziskovalne dejavnosti (izkazane z različnimi objavami) z rezultati sosednjih držav jasno kaže, da smo enakovredni z Italijo in Avstrijo. Vsi skupaj pa zaostajamo za Veliko Britanijo, ki je navedena kot ena od evropskih držav z najvišjim relativnim faktorjem vpliva (RIF) (Tabela 5).

Tabela 5. Primerjalna analiza raziskovalno-publicistične dejavnosti s sosednjimi državami in Veliko Britanijo (1981-2006)
Table 5. Comparative analysis of research output with neighboring countries and U.K. (1981-2006)

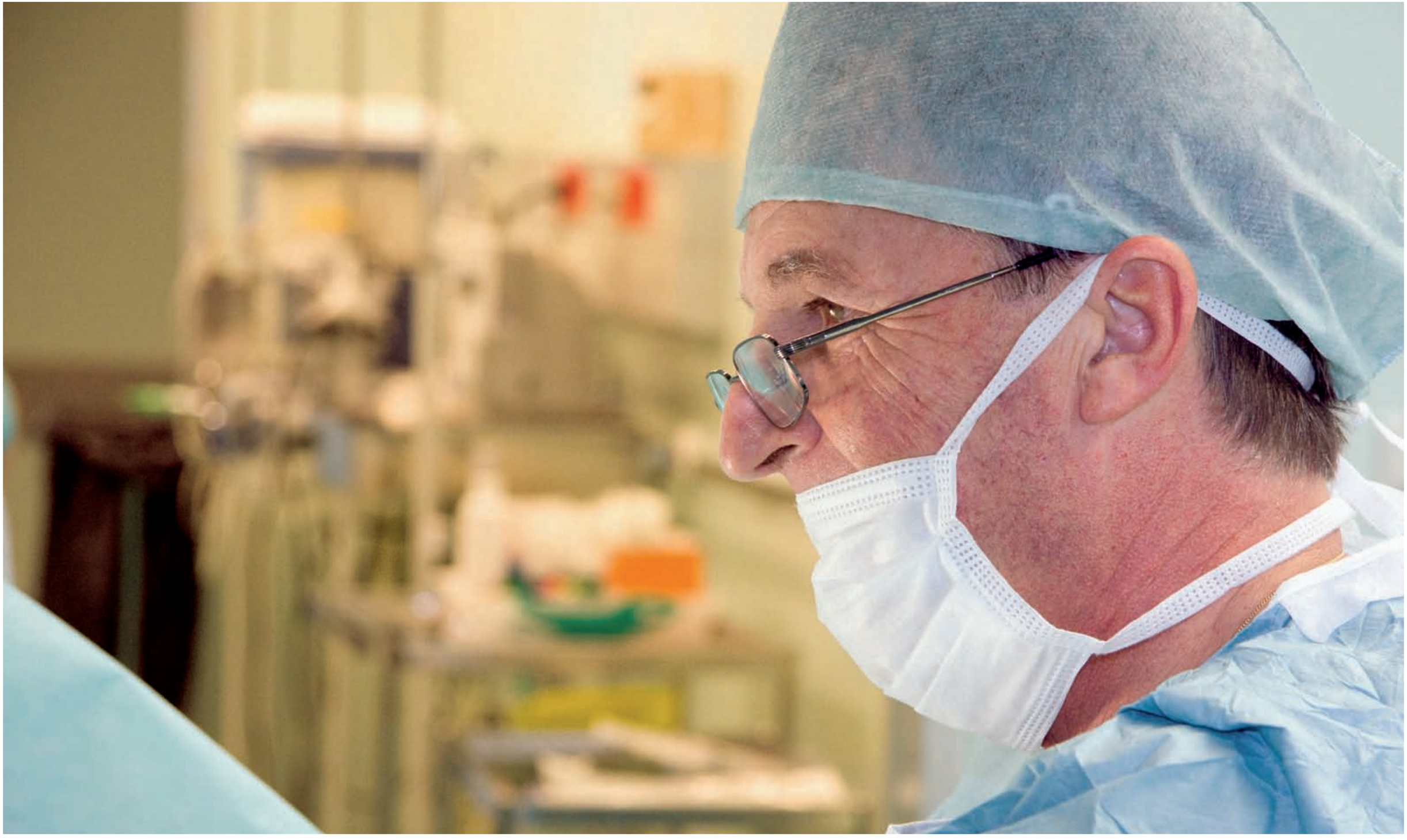
Klinična onkologija / Clinical Oncology

Rang Rank	Država Country	Št. citatov No. of Citations	Št. objav No. of Publications	RIF*
1	Velika Britanija / U.K.	409.039	15.583	26,25
2	Italija / Italy	232.224	11.456	20,27
3	Avstrija / Austria	36.828	1.910	19,28
4	Slovenija / Slovenia	3.398	177	19,20
5	Madžarska / Hungary	7.047	477	14,77
6	Hrvaška / Croatia	597	74	8,07

Predklinična onkologija / Preclinical Oncology

Rang Rank	Država Country	Št. citatov No. of Citations	Št. objav No. of Publications	RIF*
1	Velika Britanija / U.K.	658.400	21.258	30,97
2	Avstrija / Austria	59.528	2.704	22,01
3	Italija / Italy	348.728	18.079	19,29
4	Slovenija / Slovenia	3.837	246	15,60
5	Madžarska / Hungary	11.893	913	13,03
6	Hrvaška / Croatia	1.883	219	8,60

*Relativni faktor vpliva / Relative Impact Factor



Seznam projektov 1998–2008
List of Projects 1998-2008

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
1998			
J1-0640 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Serumske vrednosti cisteinskih proteinaz katepsinov B, H in L in njihovih inhibitorjev stefinov in cistatinov kot pokazateljev diagnoze Serum values of cisteine proteases of B,H, and L cathepsins and their stefin and cathepsin inhibitors as diagnostic indicators	**Kos, Janko** **Štabuc, Borut**	1. 7. 1998– 30. 6. 2001
J3-0097	Okužbe z virusi papiloma pri intraepitelijskem raku materničnega vratu Papillomavirus infections in intraepithelial cervical cancer	**Uršič Vrščaj, Marjetka**	1. 7. 1998– 30. 6. 2001
J3-0428 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Genetski dejavniki pri ženski neplodnosti Genetic factors of infertility in females	**Geršak, Ksenija** **Us Krašovec, Marija**	1. 7. 1998– 30. 6. 2001
J3-0146	Zdravljenje malignih solidnih tumorjev z interferonom alfa Treatment of malignant solid tumors with interferon alpha	**Štabuc, Borut**	1. 7. 1998– 30. 6. 2001
J3-0123	Protitelesa proti proteinu p53 in p53 v serumu bolnikov z malignimi tumorji Protein p53 antibodies and p53 serum values in patients with malignant tumors	**Rudolf, Zvonimir**	1. 7. 1998– 30. 6. 2001
J3-0143	Raziskave zdravljenja pljučnega raka: etična in klinična razpotja Research of lung cancer treatment: at a crossroads of medical ethics and clinical approaches	**Zwitter, Matjaž**	1. 7. 1998– 30. 6. 2001
L1-0469 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Optimizacija za terapijo potencialnih analogov MDP in TNF Optimization of MDP and TNF analogues having therapeutic potential	**Štalc, Anton** **Novaković, Srdjan**	1. 7. 1998– 30. 6. 2000
L3-0362 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Vzroki ustaljene incidence invazivnega raka MV v Sloveniji Causes of constant inicidence of invasive cervical cancer in Slovenia	**Rakar, Stelio** **Primic-Žakelj, Maja**	1. 7. 1998– 30. 6. 2000
L3-9202	Dodatno sistemsko zdravljenje bolnic z rakom dojk stadijev I in II Adjuvant systemic therapy in operable breast cancer patients	**Lindtner, Jurij**	1. 11. 1998– 31. 12. 1999

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
1999			
J3-1220	Napovedna vrednost oksigeniranosti tumorjev pri izbranih bolnikih z malignomom glave in vratu Predictive value of tumor oxygenation in selected patients with head & neck malignancies	**Lešničar, Hotimir**	1. 1. 1999– 30. 6. 2001
L3-1259	Modulacija imunskega odziva pri bolnikih z malignim melanomom rezistentnim na kemoterapijo Modulation of immune response of patients with chemotherapy-resistant malignant melanoma	**Štabuc, Borut**	1. 1. 1999– 30. 6. 2001
L3-1192	PovejMi: telemedicinska pomoč bolnicam z rakom dojke PovejMi (TellMe): telemedicinal support to breast cancer patients	**Babič, Ankica**	1. 1. 1999– 30. 6. 2001
L3-1008 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Razpoznavanje pljučnih okužb pri jatrogeno imunosuprimiranih bolnikih Recognizing lung infections in patients with iatrogenic immunosuppression	**Skralovnik-Štern, Aleksandra** **Vovk, Marjeta**	1. 1. 1999– 30. 6. 2001
2000			
J3-2049	Uporaba elektroporacij v genski terapiji Electroporation for gene therapy	**Čemažar, Maja**	1. 1. 2000– 30. 6. 2002
J3-2165	Napovedni pomen proteinov uPA sistema in katepsinov za preživetje in odgovor na sistemsko zdravljenje bolnic z rakom dojk Predictive value of uPA protein system and of cathepsins for the survival and response to treatment of breast cancer patients	**Čufer, Tanja**	1. 1. 2000– 30. 6. 2002
J3-2411	Histološki in imunohistokemični napovedni dejavniki pri karcinomu dojke v stadiju I Histological and immunohistochemical prognostic factors in stage I breast carcinoma	**Bračko, Matej**	1. 1. 2000– 30. 6. 2002
J3-2450 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Biološke značilnosti raka glave in vratu in uspeh zdravljenja Biological characteristics of head & neck carcinomas and treatment efficiency	**Šmid, Alojz** **Lešničar, Hotimir**	1. 1. 2000– 30. 6. 2002
L3-2061	Psihosocialni vplivi raka dojke na družinsko življenje The psychosocial impact of breast cancer on family life	**Primic-Žakelj, Maja**	1. 1. 2000– 30. 6. 2002
L3-2161	Varovalna bezgavka Sentinel node	**Snoj, Marko**	1. 1. 2000– 30. 6. 2002

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
2001			
J3-3010	Neoperabilni karcinom glave in vratu: Poskus izboljšanja zdravljenja in analiza nekaterih bioloških značilnosti Inoperable carcinoma of the head and neck: an attempt to improve treatment results and analysis of some biological characteristics	**Strojan, Primož**	1. 7. 2001– 30. 6. 2004
J3-3021	Problemi kombiniranega zdravljenja pljučnega raka Multimodality treatment for lung cancer	**Zwitter, Matjaž**	1. 7. 2001– 30. 6. 2004
J3-3026	Pomen citomorfologije, meritev DNA, Ki 67 in apoptoze za načrtovanje in ocenjevanje učinka kemoterapije pri raku ščitnice Role of cytomorphology, DNA measurements, Ki 67 and apoptosis in evaluating the efficiency of chemotherapy in thyroid cancer	**Pogačnik, Ana**	1. 7. 2001– 30. 6. 2004
J3-3076 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Vpliv elementarnega živega srebra na peroksidacijo lipidov in funkcijsko sposobnost posameznih tarčnih organov pri prebivalcih mesta Idrija Lipid peroxidation and functional damage in target tissues and organs in citizens of Idrija and mercury miners exposed to the elemental mercury	**Osredkar, Joško** **Pompe Kirn, Vera**	1. 7. 2001– 30. 6. 2004
J3-3101	Pomen DNA ploidije in jedrnih značilk nedrobnoceličnega pljučnega raka Quantitative image analysis of non-small cell lung cancer: estimation of biological potential and treatment planning based on DNA ploidy and nuclear texture features	**Strojan Fležar, Margareta**	1. 7. 2001– 30. 6. 2004
J3-3104	Diagnostika in terapija netipnega raka dojk Diagnostics and therapy of the nonpalpable breast cancer	**Lindtner, Jurij**	1. 7. 2001– 30. 6. 2004
J3-3303 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Kirurgija raka prebavil Colorectal cancer surgery	**Repše, Stanislav** **Lamovec, Janez** **Bračko, Matej**	1. 7. 2001– 30. 6. 2004
J3-3395 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Genetski dejavniki pri ženski neplodnosti 2 Genetic causes of female infertility 2	**Geršak, Ksenija** **Pogačnik, Ana**	1. 7. 2001– 30. 6. 2004
J3-3460	Genetske in radioizotopne metode v diagnostiki in terapiji raka ščitnice Genetic and radioisotopic methods in diagnosis and therapy of thyroid carcinoma	**Bešić, Nikola**	1. 7. 2001– 30. 6. 2004
J3-3464	Pomen tirozinazne RT-PCR pri zamejitvi bolezni bolnikov z malignim melanomom Role of tyrosinase RT-PCR in staging of patients with malignant melanoma	**Hočevar, Marko**	1. 7. 2001– 30. 6. 2004

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
J3-3489	Nove biomedicinske aplikacije elektroporacije New biomedical applications of electroporation	**Serša, Gregor**	1. 7. 2001– 30. 6. 2004
J3-3495	Vloga imunofenotipizacije s pretočnim citometrom v diagnozi, prognozi in zdravljenju ne-Hodgkinovih limfomov Flow cytometric immunophenotyping in diagnosis, prognosis and treatment of non-Hodgkin's lymphomas	**Kloboves-Prevodnik, Veronika**	1. 7. 2001– 30. 6. 2004
J3-3497	Filodni tumor dojke. Histološke, citološke, imunohistokemijske in jedrne značilnosti pri napovedi biološkega poteka Phyllodes tumor of the breast. Histological, cytological, immunohistochemical and nuclear texture features in prediction of its biological behavior	**Lamovec, Janez**	1. 7. 2001– 30. 6. 2004
J3-3501	Priprava tumorskih vakcin Creation of tumor vaccines	**Novaković, Srdjan**	1. 7. 2001– 30. 6. 2004
J3-3506	Pomen visokorizičnih humanih virusov papiloma pri odkrivanju raka materničnega vratu The role of high risk human papilloma viruses in the detection of cervical cancer	**Uršič Vrščaj, Marjetka**	1. 7. 2001– 30. 6. 2004
L3-3375	Uvedba tridimenzionalnega načrtovanja radioterapije v Sloveniji Introduction of three dimensional radiotherapy treatment planning in Slovenia	**Lešničar, Hotimir**	1. 7. 2001– 30. 6. 2004
2002			
J3-4176	Predklinične raziskave elektrogenske terapije v onkologiji Preclinical research on electrogene therapy in oncology	**Čemažar, Maja**	1. 7. 2002– 30. 6. 2005
J3-4178	Pomen okultnih metastaz v pazdušnih bezgavkah pri zgodnjem karcinomu dojke Significance of occult axillary lymph node metastasis in early breast carcinoma	**Bračko, Matej**	1. 7. 2002– 30. 6. 2005
J3-4203	Adjuvantno zdravljenje bolnikov z malignim melanomom stadij IIB,C z interferonom alfa-2A Adjuvant treatment of stage IIB,C malignat melanoma patients with inteferon alfa-2a	**Rudolf, Zvonimir**	1. 7. 2002– 30. 6. 2005
J3-4207	Ocena učinkovitosti presejanja za raka materničnega vratu v Sloveniji; študija primerov s kontrolami Estimation of the efficacy of cervical cancer screening in Slovenia; a case-control study	**Primic-Žakelj, Maja**	1. 7. 2002– 30. 6. 2005
J3-4291	Napovedni pomen proteinov uPA sistema za odgovor na sistemsko zdravljenje in za lokalno ponovitev bolezni pri bolnicah z rakom dojk Prognostic value of uPA-system proteins for loco-regional recurrence and predictive value for response to systemic treatment in breast cancer	**Čufer, Tanja**	1. 7. 2002– 30. 6. 2005

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
J3-4308 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Napovedni pomen katepsinov in stefinov pri napredovanem karcinomu glave in vratu zdravljenem s konkomitantno radiokemoterapijo Predictive value of cathepsins and stefins in advanced head & neck carcinoma treated with concomitant chemoradiotherapy	**Šmid, Alojz** **Strojan, Primož**	1. 7. 2002– 30. 6. 2005
L3-4278	Po odstranitvi varovalne bezgavke: Obsevanje ali kirurgija After mapping of the axilla: radiotherapy or surgery	**Snoj, Marko**	1. 7. 2002– 30. 6. 2005
2003			
J3-5296	Model umetnih nevronskih mrež (artificial neural networks - ANN) - pomoč pri izbiri dopolnilnega zdravljenja pri bolnicah z rakom dojke Model of artificial neural networks (ANN) - help for clinicians in selecting adjuvant treatment in breast cancer patients	**Zakotnik, Branko**	1. 1. 2003– 31. 12. 2005
J3-5299	Vpliv novih metod patologije in klinike na rezultate zdravljenja bolnikov s tumorji EWing/PNET Effects of new methods in pathology and clinical management on treatment results in patients with EWing/PNET	**Pohar - Marinšek, Živa**	1. 1. 2003– 31. 12. 2005
J3-5325 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Kasne posledice na ledvicah po zdravljenju raka pri otrocih Late sequels of childhood cancer therapies on the kidney	**Kveder, Rado** **Jereb, Berta**	1. 1. 2003– 30. 6. 2005
L3-5234	Genotoksični vpliv zdravljenja na somatske celice bolnikov s tumorjem moda in pozne posledice Genotoxic and late effect of treatment on somatic cells of patients with testicular tumor	**Bilban-Jakopin, Cvetka**	1. 1. 2003– 31. 12. 2005
L3-5012 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Molekularno genetske predispozicije za nastanek nekaterih vrst raka Molecular genetic predisposition for development of some cancers	**Ravnik-Glavač, Metka** **Hočevar, Marko**	1. 1. 2003– 31. 12. 2005
L3-5074 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Zgodnje odkrivanje raka na pljučih in dejavniki tveganja za nastanek in progres bolezni Early detection of lung cancer and risk factors for development and progress of disease	**Terčelj-Zorman, Marjeta** **Zwitter, Matjaž**	1. 1. 2003– 31. 12. 2005
2004			
J3-6260	Vpliv infuzij nizkih odmerkov citostatikov na tumorske celice in pretok krvi v tumorjih Effect of infusions of cytostatics in low doses on tumor cells and blood flow in tumors	**Auersperg, Marija**	1. 2. 2004– 30. 1. 2007

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
J3-6363	Priprava tumorskih vakcin: hibridomi in gensko spremenjene vakcine Tumor vaccines: hybridomas and genetically modified vaccines	**Novaković, Srdjan**	1. 7. 2004– 30. 6. 2007
J3-6389 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Kirurgija raka prebavil Colorectal cancer surgery	**Repše, Stanislav** **Bračko, Matej**	1. 7. 2004– 30. 6. 2007
J3-6044	Nove poti zdravljenja pljučnega raka New approaches in the tratment of lung cancer	**Zwitter, Matjaž**	1. 7. 2004– 30. 6. 2007
J3-6063	Rak materničnega vratu pri ženskah z rednimi ginekološkimi pregledi - zagotavljanje in nadziranje kakovosti presejanja Cervical cancer in women with regular gynecological examinations-quality assurance in and control of cervical cancer screening	**Uršič Vrščaj, Marjetka**	1. 7. 2004– 30. 6. 2007
J3-6083	Dedni melanom pri Slovencih Herediary melanoma in Slovenian population	**Hočevar, Marko**	1. 7. 2004– 30. 6. 2007
J3-6092	Genetske in radioizotopne metode v diagnostiki in terapiji raka ščitnice Genetic and radiosotopic methods in diagnosis and therapy of thyroid carcinoma	**Bešić, Nikola**	1. 7. 2004– 30. 6. 2007
L3-6039	Kasne posledice zdravljenja raka pri otrocih in mladih odraslih Late effects of treatment of cancer in children and young adults	**Jereb, Berta**	1. 2. 2004– 30. 1. 2007
L3-6059	Prospektivna randomizirana klinična raziskava faze ll: 5-FU/LV in Irinotekan v primerjavi s kombinacijo Kapecitabin in Irinotekan v prvem zdravljenju metastatske bolezni pri bolnikih s karcinomom debelega črevesa in danke Prospective randomized clinical trial phase ll: 5-FU/LV and Irinotecan versus combination Capecitabin and Irinotecan in patients with metastatic colorectal cancer as first line treatment	**Ocvirk, Janja**	1. 2. 2004– 30. 1. 2007
L3-6068	Primerjava potekov bolezni bolnic z mikrometastazo v prvi bezgavki, ki so prestale disekcijo pazduhe, s poteki onih, ki so bile zgolj opazovane A randomized trial of axillary dissection versus no axillary dissection for patients with clinically node negative breast cancer and micrometastaseses in the sentinel node (IBCSG 23-01)	**Lindtner, Jurij**	1. 7. 2004– 30. 6. 2007
Z3-6144	Raziskava možnosti uporabe parafina za filtrski kompenzator v megavoltni radioterapiji The investigation of the optional paraffin wax as a filter compensator in megavoltage external beam radiotherapy	**Strojan, Primož**	1. 2. 2004– 30. 1. 2006

Šifra projekta Project Code	Naslov Title	Nosilec / Principal Investigator Nosilec na OI / Principal Investigator at the Institute	Trajanje Duration
2005			
J3-7044	Zdravljenje malignih tumorjev z elektrogensko terapijo Treatment of malignant tumours with electrogene therapy	**Čemažar, Maja**	1. 9. 2005– 31. 8. 2008
J3-7488	Dedni rak dojk in jajčnikov v Sloveniji Hereditary breast and ovarian cancer in Slovenia	**Žgajnar, Janez**	1. 9. 2005– 31. 8. 2008
2006			
M1-0153 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Biološka dozimetrija na osnovi magnetno resonančnih metod Biological dosimetry using magnetic resonance methods	**Šentjurc, Marjeta** **Casar, Božidar**	1. 6. 2006– 30. 11. 2008
2007			
J3-9161 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Plodnost po zdravljenju raka mod Fertility after testicular cancer treatment	**Zorn, Branko** **Matos, Erika**	1. 1. 2007– 31. 12. 2009
J3-9580	Razvoj celičnih biosenzorskih sistemov za določevanje učinkov ionizirajočega sevanja in kemičnih karcinogenov Development of cell biosensor systems for determination the effect of ionising radiation and of chemical carcinogens	**Serša, Gregor**	1. 1. 2007– 31. 12. 2009
L2-9212 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Preverjanje položaja radioaktivnih izvirov med obsevanjem tumorjev v brahi terapiji Verification of radioactive sources positioninig during brachytherapy	**Kramberger, Gregor** **Burger, Janez**	1. 1. 2007– 31. 12. 2009
L3-9346	Analiza kasnih posledic zdravljenja raka pri otrocih in mladih odraslih Analysis of late effects after treatment of cancer in children and young adults	**Jereb, Berta**	1. 7. 2007– 30. 6. 2010
V3-0371	Znanstveno raziskovalni zavodi na področju biomedicinskih znanosti - izsledki biomedicinskih raziskav in učinkovita oblika organiziranosti Scientific research institutions involved in biomedical sciences: biomedical research results and successful organizational layout	**Zalar, Bojan** **Serša, Gregor**	1. 1. 2007– 30. 9. 2008
2008			
J3-0020 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Tridimenzionalna analiza obraza pri slovenskih otrocih v obdobju rasti in razvoja Three-dimensional analysis of face in children in growing-up and adolescence period	**Ovsenik, Maja** **Marolt Musič, Maja**	1. 2. 2008– 30. 1. 2011
J3-0465	Imunomodulacija s tumorskimi vakcinami pripravljenimi iz celih tumorskih celic in CpG ODN Editing of immunosurveillance with the whole cell tumor vaccines and CpG ODN	**Novaković, Srdjan**	1. 2. 2008– 30. 1. 2011
J3-0480	Genetika dednega melanoma Genetics of hereditary melanoma	**Hočevar, Marko**	1. 2. 2008– 30. 1. 2011
J3-0485	Uporaba antiangiogene siRNA za zdravljenje malignih melanomov Antiangiogenic siRNA for the treatment of advanced malignant melanoma	**Čemažar, Maja**	1. 2. 2008– 30. 1. 2011
J3-0570	Genetske in radioizotopne metode v diagnostiki in terapiji raka ščitnice Genetic and radioisotopic methods in diagnostics and therapy of thyroid carcinoma	**Bešić, Nikola**	1. 2. 2008– 30. 1. 2011
L3-0494	Metoda za večmodalno primerjalno analizo 3D volumnov na osnovi CT/MR slik Method for multimodal comparative analysis of 3D volumes, based on CT/MR images	**Hudej, Robert**	1. 2. 2008– 30. 1. 2011
L3-0113 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Razvoj in validacija kliničnih orodij temelječih na mednarodni klasifikaciji funkcioniranja, zmanjšanja zmožnosti in zdravja (mkf) Development and evaluation of clinical tools according to international classification of functioning, limited capabilities and health	**Burger, Helena** **Bešić, Nikola**	1. 2. 2008– 30. 1. 2011
L3-0431 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Genetika raka dojk in hormonsko nadomestno zdravljenje Genetics of breast cancer and hormone replacement therapy	**Geršak, Ksenija** **Novaković, Srdjan**	1. 2. 2008– 30. 1. 2011
L3-0449	Nove poti zdravljenja pljučnega raka II New approaches in the treatment of lung cancer II	**Zwitter, Matjaž**	1. 2. 2008– 30. 1. 2011
J1-0200 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Sinteza novih rutenijevih spojin in njihova možna uporaba pri tumorski elektrokemoterapiji Synthesis of novel ruthenium compounds and their potential use in electrochemotherapy of tumors	**Turel, Iztok** **Serša, Gregor**	1. 2. 2008– 30. 1. 2011
J3-0124 (OI kot sodelujoča RO) (Institute of Oncology as Research Partner)	Vpliv rekombinantnega humanega eritropoetina na izražanje genov in prenos signala pri raku na dojkah The role of recombinant human erythropoetin on gene expression and signal transduction in breast cancer	**Debeljak, Nataša** **Borštnar, Simona**	1. 2. 2008– 30. 1. 2011

Seznam programov 1998-2008
Research Programs 1998-2008

Šifra programa Program Code	Naslov Title	Nosilec Principal Investigator	Trajanje Duration
P3-0003	Razvoj in ovrednotenje novih terapij za zdravljenje malignih tumorjev Development and evaluation of new approaches to cancer treatment	**Serša, Gregor**	1. 7. 2004– 31. 12. 2008
P3-0289	Značilnosti malignih neoplazem, pomembnih za diagnozo ter napoved poteka bolezni in izida zdravljenja Characteristics of malignant neoplasms important for diagnosis, prognosis and treatment outcome	**Bračko, Matej**	1. 7. 2004– 31. 12. 2008
P3-0307	Rak glave in vratu - analiza bioloških značilnosti in poskus izboljšanja zdravljenja Cancer of the head and neck - analysis of biological characteristics and an attempt to improve treatment results	**Strojan, Primož**	1. 7. 2004– 31. 12. 2008
P3-0321	Napovedni dejavniki in zdravljenja bolnikov z rakom dojk in drugimi raki Prognostic and predictive factors for response to treatment of breast cancer and other solid tumors	**Čufer, Tanja**	1. 7. 2004– 31. 12. 2008
IP-0302	Infrastrukturni program – Doživljenjsko spremljanje preživelih od raka v otroštvu in mladosti in translacijske raziskave Lifelong follow-up of survivors of childhood and adolescent cancer and related translational trials	**Zadravec Zaletel, Lorna**	1. 7. 2006– 31. 12. 2008

Klinične raziskave 1998–2008
Clinical Trials 1998-2008

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
1998		
EORTC 10951	Hormonska terapija prvega reda z eksemestanom ali tamoksifenom pri postmenopavzalnih bolnicah z rakom dojk – randomizirana klinična raziskava, faza II. Randomized phase II study in first-line hormonal treatment for metastatic breast cancer with exemestane or tamoxifen in postmenopausal patients	**Čufer, Tanja**
EORTC 10972	Kemoterapija prvega reda z epirubicinom, ciklofosfamidom in trajno infuzijo 5-fluorouracila pri bolnicah z lokalno napredovalim rakom dojk – faza I A phase I study with epirubicin, cyclophosphamide and continous infusion 5-fluorouracil in patients with advanced breast cancer	**Čufer, Tanja**
Protocol ID M39999	Zdravljenje nizko malignih folikularnih limfomov z Mab Thero Treatment of follicular lymphomas of moderate malignancy with Mab Thera	**Čufer, Tanja**
EORTC 10975	Zdravljenje bolnic z rakom dojk rezistentnim na antracikline s trajno infuzijo 5-fluorouracila in gemcitabina – faza I, raziskava A phase I study of continuous infusion 5-fluorouracil (5-FU-CIVI) in combination with gemcitabine (GEM) in patients with anthracycline-refractory breast cancer	**Čufer, Tanja**
EORTC 10961	Zdravljenje prvega reda bolnic z napredovalim rakom dojk z doksorubicinom in taksolom: randomizirana raziskava primerjave s standardnim zdravljenjem z doksorubicinom in ciklofosfamidom Doxorubicin/Taxol combination as first-line chemotherapy in advanced breast cancer: a randomized study versus standard doxorubicin/ cyclophosphamide combination regimen	**Čufer, Tanja**
1999		
EORTC 20982, Trial H9	EORTC protokol H9 za prospektivno študijo – Hodgkinova bolezen, stadij I in II Prospective controlled trial in clinical stages I-II supradiaphragmatic Hodgkin`s disease. Evaluation of treatment efficacy, (long-term) toxicity and quality of life in two different prognostic subgroups	**Tomšič Demšar, Radka**
96-OEXE 031-C/13/96	Dopolnilno zdravljenje s tamoksifenom ali eksemestanom pri bolnicah z rakom dojk, ki so že dve leti prejemale tamoksifen Randomised double-blind trial in postmenopausal women with primary breast cancer who have received Adjuvant Tamoxifen for 2-3 years, comparing subsequent Adjuvant Exemestane treatment with further Tamoxifen	**Červek, Jožica**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
2000		
NSGO OC 9804, EORTC 55981, NCIC CTG OV14	Randomizirana raziskava o kombiniranem zdravljenju s paklitakselom, epirubicinom in karboplatinom, v primerjavi s paklitakselom in karboplatinom, pri bolnicah z napredovalim rakom jajčnikov A randomized trial of Paclitaxel/Epirubicin/Carbo-platin Combination (TEC) versus Paclitaxel/Carbo-platin (TC) in the treatment of women with advanced ovarian cancer	**Cerar, Olga**
B.I.G. 2 - 2098	Učinkovitost dopolnilnega zdravljenja raka dojk z docetakselom in doksorubicinom istočasno ali zaporedoma, kateremu sledi kemoterapevtska kombinacija CMF, v primerjavi z učinkovitostjo zdravljenja samo z doksorubicinom ali kombinacijo doksorubicina in ciklofosfamida, katerima ponovno sledi kemoterapevtska kombinacija CMF – večcentrična raziskava III. faze An intergroup phase III trial to evaluate the activity of Docetaxel, given either sequentially or in combination with Doxorubicin, followed by CMF, in comparison to Doxorubicin alone or in combination with Cyclophosphamide, followed by CMF, in the adjuvant treatment of node-positive breast cancer patients	**Čufer, Tanja**
TOPDOC	Zdravljenje peritonealne bolezni pri raku jajčnikov (multicentrična raziskava o učinku intraperitonealno uporabljenega 90Y-Teragina na intraperitonealno bolezen pri bolnicah z rakom jajčnikov) Treatment of peritoneal disease in ovarian cancer (A multicentre study investigating the effect of intraperitoneally administered 90Y-Theragyn on intraperitoneal disease in ovarian cancer patients)	**Stržinar, Vida**
2001		
EORTC 20981	Randomizirana klinična raziskava III. faze za zdravljenje ponovitve folikularnih Nehodgkinovih limfomov Chimeric anti-CD 20 monoclonal antibody (Mabthera) in remission induction and maintenance treatment of relapsed follicular non-Hodgkin`s lymphoma: a phase III randomised clinical trial	**Tomšič Demšar, Radka**
IBCSG 18-98 (BIG 1-98)	Učinkovitost dopolnilnega zdravljenja raka dojke z letrozolom pri pomenopavznih bolnicah s hormonsko odvisnimi tumorji (pozitivni estrogenski in/ali progesteronski receptorji) – večcentrična raziskava III. faze A phase III study to evaluate letrozol as adjuvant therapy for postmenopausal women with receptor (ER and/or PR) positive tumors	**Pajk, Bojana**
AMAROS EORTC 10981	Varovalna bezgavka / AMAROS, EORTC, št. 10981 After mapping of the axilla: radiotherapy or surgery?	**Snoj, Marko**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
EORTC 10994 BIG 00-01	Prva, prospektivna, večcentrična raziskava o napovedni vrednosti p53, določenega s funkcionalnim testom na glivah za odgovor na kemoterapijo z ali brez taksanov pri bolnicah z lokalno napredovalim/vnetnim rakom dojke ali pa večjim, operabilnim rakom dojke First prospective intergroup translational research trial assessing the potential predictive value of p53 using a functional assay in yeast in patients with locally advanced/inflammatory or large operable breast cancer prospectively randomised to a taxane versus a non taxane regimen	**Čufer, Tanja**
SMART	Multicentrična randomizirana raziskava o preživetju po zdravljenju z radioimunimi monoklonalnimi protitelesi: mednarodna raziskava pri bolnicah z rakom jajčnikov z uporabo HMFG 1 protiteles, označenih z 90 itriumom Multicentre randomised survival study of monoclonal antibody radioimmunotherapy: a multinational study in patients with ovarian carcinoma using the HMFG 1 antibody labeled with 90 Yttrium	**Stržinar, Vida**
2002		
BCIRG 005 (TAX GMA 301)	Multicentrična randomizirana raziskava faze III, za ugotavljanje učinkovitosti docetaksela v kombinaciji z doksorubicinom in ciklofosfamidom (TAC) v primerjavi z učinkovitostjo doksorubicina in ciklofosfamida, ki jima sledi docetaksel (AC›T), v dopolnilnem zdravljenju operabilnega raka dojk HER2NEU negativnih bolnic s pozitivnimi pazdušnimi bezgavkami TAX GMA 301(BCIRG 005) A multicenter phase III randomized trial comparing docetaxel in combination with doxorubicin and cyclophosphamide (TAC) versus doxorubicin and cyclophosphamide followed by docetaxel (AC→ T) as adjuvant treatment of operable breast cancer HER 2NEU negative patients with positive axillary lymph nodes	**Čufer, Tanja**
BCIRG 006 (TAX GMA 302)	Multicentrična randomizirana raziskava III. faze, za primerjavo doksorubicina in ciklofosfamida, ki jima sledi docetaksel (AC→ T) z doksorubicinom in ciklofosfamidom, ki jima sledita docetaksel in trastuzumab (AC›TH), ter z docetakselom, platinovo soljo in trastuzumabom (TCH) v adjuvantnem zdravljenju bolnic s pozitivnimi bezgavkami in visoko ogroženih bolnic z negativnimi bezgavkami z operabilnim rakom dojk, ki ima izražen HER2NEU (BCIRG 006) Multicenter phase III randomized trial comparing doxorubicin and cyclophosphamide followed by docetaxel (AC→ T) with doxorubicin and cyclophosphamide followed by docetaxel and trastuzumab (AC→ TH) and with docetaxel, platinum salt and trastuzumab (TCH) in the treatment of node-positive and high risk node-negative adjuvant patients with operable breast cancer containing the HER 2NEU alteration	**Čufer, Tanja**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
EORTC Trial 18991 (Final ver. 8.2.2000)	Klinična raziskava III. faze: zdravljenje s PEG-Intronom A v primerjavi z opazovanjem pri bolnikih z melanomom s stadijem III po operativni odstranitvi področnih bezgavk PEG-Intron versus observation after regional lymph node dissection in AJCC stage III (TxN1- 2M0) melanoma patients: a randomized phase III trial	**Ocvirk, Janja**
PNS-EURONETWORK QLG1-CT-2002-01756	Paraneoplastični nevrološki sindromi (PNS). Klinične in laboratorijske značilnosti Paraneoplastic neurological syndromes (PNS). Clinical and laboratory aspects	**Roš Opaškar, Tanja**
2003		
EORTC 10001-160010	Randomizirana raziskava II.–III. faze za oceno učinkovitosti kapecitabina in vinorelbina pri bolnicah predhodno zdravljenih z antraciklini in taksani A randomised phase II – III trial evaluating the efficacy of capecitabine and vinorelbine in anthracycline- and taxane-pretreated metastatic breast cancer	**Čufer, Tanja**
P3-0003	Razvoj in ovrednotenje novih terapij za zdravljenje malignih tumorjev Development and evaluation of new approaches to cancer treatment and evaluation of new approaches to cancer treatment	**Serša, Gregor**
1839IL/0503 SIGN	Odprta randomizirana klinična študija II. faze ZD1839 in docetaksela kot zdravljenja drugega reda za bolnike z napredovalim nedrobnoceličnim karcinomom pljuč v stadiju IIIB ali IV A phase II, open-label, randomised, parallel group, non-comparative study of ZD1839 (Iressa) and docetaxel (Taxotere) as second-line therapy in subjects with advanced (stage IIIb or IV) non-small cell lung cancer	**Zwitter, Matjaž**
/	Gemcitabin v podaljšani infuziji v kombinaciji s cisplatinom za bolnike z napredovalim rakom pljuč in mezoteliomom Prolonged infusion of Gemcitabine combined with cisplatin for treatement of patients with advanced lung cancer and mesothelioma	**Zwitter, Matjaž**
2004		
L3-6059 GIT – FOLFIRI - XELIRI	Prospektivna randomizirana klinična raziskava faze II: 5-FU/LV in Irinotekan v primerjavi s kombinacijo Kapecitabin in Irinotekan v prvem zdravljenju metastatske bolezni pri bolnikih s karcinomom debelega črevesa in danke Prospective randomized clinical trial phase II: 5-FU/LV and Irinotecan versus combination capecitabine and Irinotecan in patients with metastatic colorectal cancer as first-line treatment	**Ocvirk, Janja**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
EORTC 10021	Randomizirana, dvojno slepa, kontrolirana s placebom, multicentrična IDBBC raziskava faze II, ki primerja kombinacijo anastrazola (Arimidexa) z ZD1839 (Iresso) ali s placebom pri bolnicah z metastatskim rakom dojke An EORTC randomized, double blind, placebo-controlled, phase II multicenter trial of Anastrozole (Arimidex) in combination with ZD 1839 (Iressa) or placebo in patients with advanced breast cancer	**Čufer, Tanja**
CECOG/GIST 1.2.001	Odprta raziskava z imatinibom (Glivec) pri bolnikih z neoperabilnimi ali metastatskimi malignimi gastrointestinalnimi stromalnimi tumorji, ki izražajo c-kit Open-label trial of Glivec in patients with unresectable or metastatic malignant gastrointestinal stromal tumors expressing c-kit	**Zakotnik, Branko**
PREHRANA	Priprava programa in formalnih postopkov za prehransko oskrbo in podporo podhranjenih bolnikov A program and formal procedures outline for nutritional management and support of undernourished patients	**Rotovnik Kozjek, Nada**
ZEVALIN-YTRACIS	Učinkovitost radioimunoterapije z Yttrium 90 Ibritumomab Tiuxetanom (ZevalinTM) pri starejših bolnikih z drugo ponovitvijo indolentnih CG20 pozitivnih Nehodgkinovih limfomov Efficiency of radioimmunotherapy with Yttrium 90 Ibritumomab Tiuxetan (ZevalinTM) in elderly patients with the second recurrence of indolent CG20-positive non-Hodgkin's lymphomas	**Jezeršek Novaković, Barbara**
/	Kemoradioterapija invazivnih prehodnoceličnih karcinomov sečnega mehurja z gemcitabinom Concurrent chemoradiotherapy with gemcitabine in invasive transitional-cell bladder carcinoma	**Kragelj, Borut**
2005		
ESOPE (QLRT-2001-02003)	Standardizacija postopkov za zdravljenje z elektrokemoterapijo in elektrogensko terapijo European standard operating procedures of electrochemotherapy and electrogene therapy	**Serša, Gregor**
First BEAT MO 18024 AVASTIN	Bevacizumab in kemoterapija kot prva linija zdravljenja metastatskega raka debelega črevesa in danke First-line Bevacizumab and chemotherapy in metastatic cancer of the colon or rectum first BEAT (Bevacizumab Expanded Access Trial)	**Ocvirk, Janja**
EORTC 18032 Protocol PO3267	Podaljšan načrt, naraščajoči odmerki temozolomida proti dacarbazinu pri stadiju IV metastatskega melanoma: randomizirana raziskava na III. stopnji EORTC Melanoma Group Extended schedule, escalated dose of Temozolomide versus Dacarbazine in stage IV metastatic melanoma: a randomized phase III study of the EORTC melanoma group	**Ocvirk, Janja**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
Protocol NO 16967 FOLFOX-XELOX	Odprto, randomizirano klinično preskušanje III. faze, kapecitabin peroralno, intermitentno v kombinaciji z oksaliplatinom intravenozno (Q3W) ("XELOX") v primerjavi z bolus in kontinuirano infuzijo fluorouracil/i.v. levkovorin z oksaliplatinom intravenozno (Q2W) ("FOLFOX") pri bolnikih z metastatskim rakom debelega črevesa, ki so predhodno prejeli kot prvo linijo zdravljenja CPT-11 v kombinaciji s 5-FU/LV An open-label randomized phase III study of intermittent oral Capecitabine in combination with intravenous Oxaliplatin versus bolus and continuous infusion of Fluorouracil/Intravenous Leucovorin with intravenous Oxaliplatin as treatment for patients with metastatic colorectal cancer who have received prior treatment with CPT-11 in combination with 5-FU/LV as first-line therapy	**Ocvirk, Janja**
INTEREST 1839IL/0721	Randomizirana, odprta, mednarodna raziskava III. faze v več centrih, dveh vzporednih skupin, ki prejemajo ZD1839 (IRESSA®) ali docetaksel (TAXOTERE®), pri bolnikih z lokalno napredovalim ali metastatskim nedrobnoceličnim pljučnim rakom, ki so predhodno že prejemali kemoterapijo na osnovi platine, pa se je bolezen ponovila A Randomized, open-label, parallel group, international, multicenter, phase III study of oral ZD1839 (IRESSA®) versus intravenous Docetaxel (TAXOTERE®) in patients with locally advanced or metastatic recurrent non-small cell lung cancer who have previously received Platinum-based chemotherapy	**Zwitter, Matjaž**
EORTC 10002	Anketa mednarodne skupine za raka dojk o pogledih bolnic z rakom dojk, mlajših od 35 let, na nevarnost pojava neplodnosti zaradi dopolnilnega zdravljenja (verzija 3.2) A survey of the Breast International Group (B.I.G) to assess the attitude of patients aged less than 35 years, with early breast cancer, toward the risk of loss of fertility related to adjuvant therapies.	**Čufer, Tanja**
TRUST MO 18109	Program razširjene dostopnosti zdravila TARCEVA (ERLOTINIB) pri bolnikih z napredovalim nedrobnoceličnim rakom pljuč (NSCLC) stadija IIIB/IV A program for wider access to the target drug TARCEVA (ERLOTINIB) to the patients with invasive, stage IIIB/IV non-small cell lung cancer (NSCLC)	**Smrdel, Uroš**
/	Problemi kombiniranega zdravljenja: Napredovali rak pljuč pri bolnikih v stanju zmogljivosti WHO2: primerjava dveh shem zdravljenja v randomizirani klinični študiji II. faze Randomised phase II clinical trial comparing two schedules of chemotherapy for patients in poor performance status (WHO 2) with advanced non-small cell lung cancer	**Zwitter, Matjaž**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
CECOG-ERBITUX CECOG/CORE 1.2.001	Randomizirana klinična raziskava faze II. ocenjevanja učinkovitosti in varnosti dveh shem prvega zdravljenja metastatskega kolorektalnega raka: FOLFOX6 + cetuksimab proti FOLFIRI + cetuksimab A randomized, open-label phase II study evaluating the efficacy and safety of FOLFOX6+Cetuximab versus FOLFIRI+Cetuximab as first-line therapy in patients with metastatic colorectal cancer - CECOG/CORE.1.2.001	**Ocvirk, Janja**
/	Adjuvantno zdravljenje bolnikov z malignim melanomom stadij IIB, C z Interferonom alfa – 2A 3x6 mio I.E. Adjuvant treatment of stage IIB,C malignant melanoma patients with inteferon alfa-2A 3x6 mio I.E.	**Rudolf, Zvonimir**
/	Randomizirana klinična študija II. faze: Gemcitabin v kratki ali dolgi infuziji, cisplatin in obsevanje pri inoperabilnem nemetastatskem nedrobnoceličnem pljučnem raku Randomised phase II clinical trial: gemcitabine in brief or long infusion, cisplatin and irradiation for inoperable non-metastatic non-small cell lung cancer	**Zwitter, Matjaž**
IMEX 1839IL/0704	Randomizirana, primerjalna, stratificirana raziskava III. faze v več mednarodnih centrih z vzporednimi skupinami, ki prejemajo 250 mg ali 500 mg ZD1839 (IRESSA®) ali metotreksat pri bolnikih s ploščatoceličnim rakom glave in vratu, ki so predhodno že bili zdravljeni Prospective, randomized, multicentric phase III study comparing 250 mg or 500 mg of ZD1839 (IRESSA®) with metothrexate in previously treated patients with squamous cell carcinoma of the head and neck	**Zakotnik, Branko**
/	Kronična bolečina in druge kasne posledice po operaciji raka dojk pri bolnicah z biopsijo prve bezgavke in bolnicah z odstranjenimi bezgavkami v pazduhi Chronic pain and other late sequences after the operation of breast cancer among the patients with sentinel lymph node biopsy and axillary lymph node dissection at the Institute of Oncology Ljubljana.	**Lahajnar, Slavica**
	Navzočnost in klinični pomen telomerazne RNA v plazmi bolnic z operabilnim rakom dojk v poteku zdravljenja Presence and clinical impact of telomerase RNA in the plasma of patients treated for operable breast cancer	**Žgajnar, Janez**
2006		
GBG26 MO17038	Multicentrično, randomizirano, primerjalno klinično preskušanje faze III med zdravljenjem s kapecitabinom ter zdravljenjem s kapecitabinom v kombinaciji s trastuzumabom pri bolnicah s HER2 pozitivnim metastatskim rakom dojk in napredovanjem bolezni po predhodnem zdravljenju s trastuzumabom A multicenter randomized phase III study to compare capecitabine alone or in combination with trastuzumab in patients with HER2 positive metastatic breast cancer and progression after previous treatment with trastuzumab	**Čufer, Tanja**

Raziskovanje in izobraževanje

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
EPOTILON	Prospektivna multicentrična randomizirana odprta študija vzporednih skupin II faze za raziskavo učinkovitosti, varnosti in prenašanja 2 odmerkov ZK 219477 (16 in 12 mg/m² telesne površine) pri bolnicah z metastatskim rakom na dojki Prospective, multicenter, randomized, parallel-group, open-label phase II study to investigate the efficacy, safety and tolerability of 2 doses of ZK 219477 (16 and 12 mg/m² body surface area) in patients with metastatic breast cancer	**Čufer, Tanja**
IBCSG 25-02 TEXT	Faza III, klinična raziskava, ki preučuje vlogo eksemestana in GnRH analoga kot dopolnilnega zdravljenja za predmenopavzne ženske s hormonsko odvisnim rakom dojke A phase III trial evaluating the role of Exemestane plus GnRH analogue as adjuvant therapy for premenopausal women with endocrine responsive breast cancer	**Pajk, Bojana**
št. protokola A6181037 SUTENT	Zdravljenje s SU011248 za bolnike z metastatičnim rakom ledvic, neodzivnim za citokine, ki niso primerni za sodelovanje v drugih protokolih s SU011248 in jim utegne zdravljenje s SU011248 koristiti A SU011248 treatment protocol for patients with cytokine-refractory metastatic renal cell carcinoma who are ineligible for participation in other SU011248 protocols and may derive benefit from treatment with SU011248	**Škrbinc, Breda**
Protokol BO18192A (SATURN)	Multicentrično, dvojno slepo, randomizirano klinično preskušanje faze III z namenom ocene učinkovitosti zdravila Tarceva ali placeba po končanih 4 ciklih kemoterapije na osnovi platine pri bolnikih s histološko potrjenim, napredovalim ali ponavljajočim se (stadij IIIB in neprimerni za kombinirano terapijo) ali metastatskim (stadij IV) nedrobnoceličnim rakom pljuč (NSCLC), pri katerih ni prišlo do napredovanja bolezni ali do nesprejemljive toksičnosti med kemoterapijo A multicentre, double-blind randomised, phase III study to evaluate the efficacy of Tarceva or placebo following 4 cycles of platinum-based chemotherapy in patients with histologically documented advanced or recurrent (stage IIIB and not amenable for combined modality treatment) or metastatic (stage IV) non-small cell lung cancer (NSCLC) who have not experienced disease progression or unacceptable toxicity during chemotherapy	**Zwitter, Matjaž**

Research and Education

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
Protokol BO18602-B (TITAN)	Multicentrično, odprto, randomizirano klinično preskušanje faze III z namenom ocene učinkovitosti zdravila Tarceva™ ali primerjalnih zdravil Alimta® (pemetreksed), oziroma Taxotere® (docetaksel) pri bolnikih s histološko potrjenim napredovalim ali ponavljajočim se (stadij IIIb in neprimerni za kombinirano zdravljenje) ali metastatskim (stadij IV) nedrobnoceličnim rakom pljuč, pri katerih je prišlo do napredovanja bolezni v obdobju kemoterapije na osnovi platine A multicentre, open-label, randomized phase III study to evaluate the efficacy of Tarcewa™ or comparator Alimta® (pemetrexed) or Taxotere® (docetaxel) in patients with histologically documented, advanced or recurrent (stage IIIB and not amenable for combined modality treatment) or metastatic (stage IV) non-small cell lung cancer who have experienced disease progressin during platinum-based chemotherapy.	**Zwitter, Matjaž**
MAXIMA MO19872	Klinično preskušanje faze IIIb vzdrževalnega zdravljenja z MabThero® (rituksimabom) pri bolnikih s folikularnim Nehodgkinovim limfomom, ki so bili odzivni na indukcijsko zdravljenje A phase IIIb study of MabThera® (rituximab) maintenance therapy in patients with follicular non-Hodgkin's lymphoma who have responded to induction therapy	**Jezeršek Novaković, Barbara**
IBCS 32-05 (CASA)	Klinična raziskava dopolnilne kemoterapije pri starejših ženskah. Faza III, klinična raziskava, ki preučuje vlogo zdravljenja z dopolnilnim pegiliranim liposomalnim doksorubicinom (PLD, Caelyx®, Doxil®) pri ženskah, starih 66 let ali več, s hormonsko neodvisnim rakom dojke, ki NISO primerne za zdravljenje s »standardno kemoterapevtsko shemo« Chemotherapy adjuvant study for women at advanced age. Phase III trial evaluating the role of adjuvant pegylated Liposomal Doxorubicin (PLD, Caelyx®, Doxil®) for women (age 66 years or older) with endocrine nonresponsive breast cancer who are NOT suitable for being offered a »standard chemotherapy regimen«	**Pajk, Bojana**
EPO-SLO-13	Spremljanje učinkovitosti in varnosti zdravljenja anemije z enkrat tedenskim odmerkom zdravila Eprex v pogojih vsakdanje klinične prakse pri bolnikih z limfoproliferativnimi boleznimi in solidnimi tumorji v času kemoterapije Monitoring the efficiency and safety of anemia treatment with a weekly dose of Eprex as a routine clinical practice in patients with lymphoproliferative diseases and solid tumors	**Velenik, Vaneja**
MO19390 SAIL	Odprta raziskava zdravila bevacizumab (Avastin) v kombinaciji s kemoterapijo na osnovi platine, kot zdravljenje prvega reda bolnikov z napredovalim ali ponavljajočim se neskvamoznim nedrobnoceličnim rakom pljuč Open-label trial of bevacizumab (Avastin) combined with platinum based chemotherapy as first-line treatment in patients with advanced or recurrent nonsquamous non-small cell lung cancer	**Zwitter, Matjaž**
	Uporabnost proizvoda Breast Care v diagnostiki raka dojk Applicability of Breast Care products in breast cancer diagnostics	**Žgajnar, Janez**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
2007		
(protokol št. MO19391) ATHENA	Odprta študija bevacizumaba (Avastin®) in monoterapije s taksanom ali kombinacije v 1. liniji zdravljenja bolnikov z lokalno recidivnim ali metastatskim rakom dojk Open-label study of bevacizumab (AVASTIN) plus taxane monotherapy or in combination for the first-line treatment of patients with locally recurrent or metastatic breast cancer.	**Borštnar, Simona**
NHL-13 (št. protokola ML18223)	Multicentrična, randomizirana raziskava faze III za primerjavo vzdrževalnega zdravljenja z Rituximabom in samega opazovanja pri bolnikih z agresivnim limfomom celice B A multicentre, randomized phase III study of Rituximab as maintenance treatment versus observation alone in patients with aggressive B-cell lymphoma: NHL-13	**Jezeršek Novaković, Barbara**
(protokol M017092) QUASAR 2	Multicentrična mednarodna raziskava kapecitabina + bevacizumaba v adjuvantnem zdravljenju raka na debelem črevesu Multicentre international study of capecitabine + bevacizumab as adjuvant treatment of colorectal cancer	**Ocvirk, Janja**
(AVEX MO19286)	Randomizirano, odprto klinično preskušanje faze III za oceno učinkovitosti in varnosti bevacizumaba v kombinaciji s kapecitabinom v prvi liniji zdravljenja starejših bolnikov z metastatskim rakom debelega črevesa in danke AVEX Avastin in Elderly with Xeloda A randomized, open-label Phase III study to assess efficacy and safety of bevacizumab in combination with capecitabine as first-line treatment for elderly patients with metastatic colorectal cancer (PROTOCOL MO19286) (AVEX) / EUDRACT # 2006-003293-10)	**Ocvirk, Janja**
(Protocol CECOG/ CORE.1.2.002)	Randomizirana odprta raziskava faze II ocenjevanja učinkovitosti in varnosti dveh shem prvega zdravljenja metastatskega kolorektalnega raka z nemutiranim genom K- ras: FOLFOX4 +cetuksimab enkrat na teden in FOLFOX4+ cetuksimab enkrat na 14 dni A randomized, open-label phase II study evaluating the efficacy and safety of FOLFOX4 + weekly Cetuximab versus FOLFOX4+ bi-weekly Cetuximab as first-line therapy in patients with metastatic colorectal cancer EudraCT number 2006-006941-15	**Ocvirk, Janja**
/	Odprta raziskava razširjene dostopnosti zdravljenja z lapatinibom in kapecitabinom pri osebah s preveliko ekspresijo gena ErbB2 in lokalno napredovalim ali metastatskim rakom dojke An open-label expanded access study of Lapatinib and Capecitabine therapy in subjects with ErbB2 overexpressing locally advanced or metastatic breast cancer (EGF103659 2006-002080-93)	**Borštnar, Simona**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
EMR 62202-688	Cetuksimab (Erbitux®), capecitabine (Xeloda®) in obsevanje v preoperativnem zdravljenju bolnikov z lokalno napredovalim resektabilnim rakom danke Cetuximab (Erbitux), Capecitabine and radiotherapy in neoadjuvant treatment of patients with locally advanced resectable rectal cancer: a Phase II Pilot Study (XERT)	**Velenik, Vaneja**
/	Kakovost življenja bolnikov z lokalno napredovalim resektabilnim rakom danke Quality of life after combined modality treatment in patients with resectable rectal cancer	**Velenik, Vaneja**
/	Prospektivno spremljanje intenzitete odmerka pri bolnikih na mielosupresivnem zdravljenju s srednjim ali visokim tveganjem razvoja febrilne nevtropenije pri bolnikih z zgodnjim rakom dojk in limfomi A prospective dose intensity evaluation program in patients receiving myelosuppressive chemotherapy with moderate or high risk of febrile neutropenia (FN) for early breast cancer and lymphoma	**Čufer, Tanja,** **Jezeršek Novaković, Barbara**
J3-01245	Vpliv rekombinantnega humanega eritropoetina na izražanje genov in prenos signala pri raku na dojkah The role of recombinant human erythropoietin on gene expression and signal transduction in breast cancer	**Borštnar, Simona**
2008		
Study No. BIG2-06/N06D/EGF106708	ALTTO – študija optimizacije adjuvantnega zdravljenja z lapatinibom in/ali trastuzumabom; randomizirana, multicentrična, odprta faza III, klinična raziskava dopolnilnega zdravljenja z lapatinibom, trastuzumabom, njunega zaporedja in kombinacije pri bolnikih s HER2/ErbB2 pozitivnim primarnim rakom dojke A randomized, multi-centre, open label, phase III study of adjuvant lapatinib, trastuzumab, their sequence and their combination in patients with HER2/Erb2 positive primary breast cancer - ALTTO (Adjuvant Lapatinib and/or Trastuzumab Treatment Optimisation) study	**Matos, Erika**
MINDACT	Z mikromrežno analizo se pri bolezni z negativnimi bezgavkami (po novem z 1-3 pozitivnimi) lahko izognemo kemoterapiji (Microarray in node-negative disease may avoid chemotherapy): a prospective, randomized study comparing the 70-gene signature with the common clinical-pathological criteria in selecting patients for adjuvant chemotherapy in node-negative breast cancer	**Čufer, Tanja**
Erbitux EMR 62202-717 (št. EudraCT: 2007-000401-29)	Indukcijska kemoterapija, ki ji sledi kemoradioterapija s cetuksimabom in cisplatinom pri neoperabilnem ploščatoceličnem karcinomu glave in vratu Induction chemotherapy followed by chemoradiation with cetuximab and cisplatin for inoperable squamous-cell carcinoma of the head and neck	**Strojan, Primož**

Šifra raziskave Study code	Naslov raziskave Title	Nosilec Principal Investigator at the Institute
J3-0570	Uspešnost ablacije ostanka ščitnice po totalni ali skoraj totalni tiroidektomiji pri bolnikih s karcinomom ščitnice glede na velikost odmerka radiojoda (RAZISKOVALNI PROJEKT: Genetske in radioizotopne metode v diagnostiki in terapiji raka ščitnice) Efficacy of radioiodine ablation of thyroid remnant after total thyroidectomy in patients with TC with regard to the dose of radioiodine	**Bešić, Nikola**
Protokol št. 042-00	Uporaba zdravila vorinostat (MK-0683) za zdravljenje bolnikov z napredovalim kožnim T-celičnim limfomom (CTCL) Compassionate use of Vorinostat (MK-0683) for the treatment of patients with advanced cutaneous T-cell lymphoma	**Tomšič Demšar, Radka**
	Prehranska vizita (v slovenskih bolnišnicah) Nutrition day in Slovenian hospitals	**Rotovnik Kozjek, Nada**
EORTC 08072	Mednarodna klinična študija CONVERT: Klinična študija III. faze z naključnim izborom med dvakratdnevnim ali enkratdnevnim obsevanjem, oboje s sočasno kemoterapijo s cisplatinom in etoposidom pri bolnikih z omejeno razširjenostjo drobnoceličnega pljučnega raka International clinical study CONVERT - a phase III randomised controlled trial of concurrent once-daily versus twice-daily radiotherapy and chemotherapy for limited stage small cell lung cancer	**Zwitter, Matjaž**

EORTC – European Organization for Research and Treatment of Cancer (www.eortc.be); IBCSG – International Breast Cancer Study Group (www.ibcsg.org); CECOG – Central European Cooperative Oncology Group (www.cecog.org); BCIRG – Breast Cancer International Research Group (www.bcirg.org);

Evropski projekti, kjer Onkološki inštitut Ljubljana nastopa kot partner 1998–2008
European Projects in Which Institute of Oncology Ljubljana Cooperates as Co-Investigator 1998-2008

COS	Case-Only Study on the interaction of diet and genetic predisposition in the occurrence of breast cancer in young women	**Maja Primic Žakelj**
FACT	Fighting Aganst Cancer Today	**Maja Primic Žakelj**
RERECARE	Suverlliance of rare tumours in Europe	**Maja Primic Žakelj**
EUROCAN+PLUS	Priority 1: Life Science, Genomics and Biotechnology for Health Action line: Applications-oriented genomic approaches to medical knowledge	**Maja Primic Žakelj**
ESOPE	European Standard Operating Procedures of Electrochemoterpy and Electrogenetherapy	**Gregor Serša**
CLINIPORATOR	A new adaptive generator for DNA electrotransfer in vivo for gene therapy	**Gregor Serša**
ANGIOSKIN	DNA electrotransfer of plasmids coding for antiangiogenic factors as a proof of principle of non-viral gene therapy for the treatment of skin disease	**Gregor Serša**
CONTICANET	CONective TIssue CAncers NETwork to integrate European Experience in Adult and Children	**Zvonimir Rudolf**
GENOMEL	Genetic and environmental determinants of melanoma: translation into behavioural change	**Marko Hočevar**
DNA METHYLATION	Epigenetic profiling of breast cancer: prognostic and therapeutic applications / Podprojekt EPIGENOMICS	**Tanja Čufer**
TRANSBIG	Translating molecular knowledge into early breast cancer management, building on the BIG (Breast International Group) network for improved treatment tailoring	**Tanja Čufer**

Mednarodni bilateralni projekti 1998–2008
International Bilateral Projects 1998-2008

Francosko-slovensko znanstveno sodelovanje
Franco-English Scientific Cooperation

New theoretical models of cell and tissue electropermeabilization, their experimental validation and technological applications (PICS)	**Gregor Serša**
Evaluation of electrical parameters for effective electrochemotherapy and electrogene therapy, and design of electrochemotherapy in the clinics (BI-FR/04-005)	**Gregor Serša**
The electroporation induced generation of reactive oxygen species (BI-FR/08-09-PROTEUS-005)	**Gregor Serša**

Sodelovanje med Slovenijo ter Veliko Britanijo in Severno Irsko
Cooperation: Slovenia - Great Britain and Northern Ireland

Therapeutic targeting of tumor vasculature with antiangiogenic gene therapy (BI-GB/06-003)	**Maja Čemažar**
Effect of electrochemotherapy with cisplatin or bleomycin on morphology and function of primary endothelial cells (BI-GB/07-002)	**Maja Čemažar**

Sodelovanje med Slovenijo in Ciprom
Cooperation: Slovenia - Ciper

Development and introduction of new techniques for testing for BRCA 1 and 2 mutations in hereditary breast and ovarian cancer patients from Slovenia and Cyprus (BI-CY/06-07-005)	**Srdjan Novaković**
Study of the hereditary colon cancer syndromes in Cyprus and Slovenia (BI-CY/08-09-006)	**Srdjan Novaković**

Vizija

Širjenje znanja o raku kot o bolezni, ki jo lahko obvladamo in ki ne pomeni nujno vnaprej izgubljene bitke.

Namen

Nenehno izobraževanje strokovnega kadra, ki se ukvarja z onkologijo na OI in v drugih zdravstvenih ustanovah po Sloveniji.
Ozaveščanje in izobraževanje laične javnosti o naravi bolezni, načinih prevencije, zgodnje samodiagnostike in pravilnega ukrepanja ob postavitvi suma, da gre za bolezen.

Iz vizije in namena je razvidno, da je izobraževalna dejavnost OI opredeljena kot stalen proces, ki je neločljivo povezan s strokovnim in raziskovalnim delom. Kot osrednja državna ustanova za zdravljenje in raziskovanje raka imamo tudi obveznost (zapisano v statutu OI), da na tem zahtevnem področju opravljamo izobraževalno delo. Razdelimo ga lahko na dve veliki kategoriji: izobraževanje strokovnega kadra ter ozaveščanje in izobraževanje laične javnosti.

Izobraževanje strokovnega kadra

Kadar govorimo o izobraževanju strokovnega kadra, govorimo o izobraževanju v sklopu pedagoških dejavnosti – namenjeno je predvsem študentom na do- in podiplomskem študiju – ter o izobraževanju že formiranih strokovnjakov.
Pedagoško delo s študenti poteka v obliki predavanj in vaj ter mentorstev pri diplomah. Na podiplomskih študijih poleg predavanj in praktičnega pouka vključuje tudi mentorsko delo za specializante, magisterande in doktorande. Pedagoško delo naših zaposlenih je neločljivo povezano z delovanjem Katedre za onkologijo in radioterapijo Medicinske fakultete v Ljubljani, Univerze v Ljubljani. Katedra ima svoj sedež na OI in jo tradicionalno vodijo učitelji, ki prihajajo z OI (več o katedri v posebnem poglavju). Učitelji, ki prihajajo z OI, so različnih profilov (zdravniki, diplomirane medicinske sestre, zdravstveni sodelavci) in so vse bolj prisotni tudi pri izvajanju pedagoških procesov na drugih fakultetah Univerze v Ljubljani (Fakulteta za farmacijo, Fakulteta za šport, Biotehniška fakulteta, Fakulteta za veterino, Visoka šola za zdravstvo), Univerze v Mariboru (Medicinska fakulteta), Univerze na Primorskem (Visoka šola za zdravstvo Izola), Univerze v Novi Gorici (Fakulteta za znanosti o okolju), Visokošolskega središča Novo mesto (Visoka šola za zdravstvo) ter Visoke šole za zdravstveno nego Jesenice.

Izobraževanje strokovnjakov, ki se profesionalno ukvarjajo z onkologijo na OI ali v drugih zdravstvenih ustanovah po Sloveniji, poteka prek organizacije različnih strokovnih predavanj, seminarjev, izobraževalnih dnevov, šol in tečajev. Skozi te oblike izobraževanja se predstavljajo novosti, študije in nova doktrinarna stališča. Večina teh dogodkov je zaokroženih tudi z izdajo monografij, ki povzemajo predstavljeno tematiko. Zgoščen pregled teh izobraževalnih aktivnosti na OI pokaže, da v izobraževanju nastopamo v dvojni vlogi, in sicer kot učitelji in mentorji ter kot tisti, ki se izobražujejo. V obdobju 1998–2008 smo bili mentorji/somentorji za doktorate ali magisterije kar 75-krat in velika večina doktorjev in magistrov znanosti je zaposlenih na OI (34 doktorjev in 30 magistrov). Pomembna

Vision

We aim to raise awareness of cancer as a controllable disease, claiming that fighting against cancer is not necessarily fighting a losing battle.

Aims

Continuous education of expert staff involved in oncology at the Institute of Oncology Ljubljana and at other health institutions in the country;
Raising awareness and education of the lay population about the nature of the disease, its prevention, early self-detection of cancer, and which steps should be taken if the disease is suspected.

From the vision and set aims, it is evident that education at the Institute of Oncology Ljubljana is an ongoing process, inseparable from clinical and research work. As the central national institution responsible for cancer treatment, we are committed (as laid down in the statute) to implementing educational tasks in the field of oncology. Education at the Institute of Oncology takes place at two different levels: educating specialists in oncology, and promoting awareness of and education on cancer among the lay population.

Education of professionals in oncology

The education of professionals in oncology covers training programs for undergraduate and post graduate students, as well as additional training of already accredited professionals in oncology.

Training programs for undergraduates are conducted in the form of lectures, practicums and mentorship to degree candidates. Training programs for post graduates include, in addition to lectures and practicums, also mentorship to residents and master's and doctoral degree candidates. Educational work at the Institute of Oncology is performed under the aegis of the Chair for Oncology and Radiotherapy of the Faculty of Medicine, University of Ljubljana. The Chair for Oncology and Radiotherapy has its seat at the Institute of Oncology and is regularly chaired by university professors employed by the institute (for more information, see the section on the Chair of Oncology and Radiotherapy). University professors who perform this function in addition to their regular work at the Institute of Oncology have various professional profiles (medical doctors, graduate nurses, health care associates); they are also involved in the training programs of other faculties at the University of Ljubljana (Faculty of Pharmacy, Faculty of Sport, Biotechnical Faculty, Veterinary Faculty, University College of Health Care), at the University of Maribor (Faculty of Medicine), University of Primorska (College of Health Care Isola), University of Nova Gorica (School of Environmental Sciences), University and Research Center Novo Mesto (College of Health Care) and College of Nursing Jesenice.

sta tudi podatka, da je med njimi 34 mladih raziskovalcev in da je za njihovo izobraževanje skrbelo, ali še skrbi, 39 mentorjev z OI.

Sodelovanje OI z drugimi inštitucijami po svetu, ki se ukvarjajo z rakom, je zelo pomembno tudi v izobraževanju. V ta namen nas je v obdobju 1998–2008 obiskalo in predstavilo svoje delo v obliki predavanj 54 priznanih strokovnjakov. Naše mednarodno sodelovanje smo krepili tudi tako, da smo se izobraževali v različnih centrih zunaj Slovenije. Triindvajset strokovnjakov z OI se je izpopolnjevalo več kot mesec dni v tujih onkoloških centrih. Mednarodno sodelovanje se odraža tudi pri pripravi mednarodnih šol in kongresov. V preteklem desetletnem obdobju smo bili organizatorji/soorganizatorji 33 mednarodnih šol.

Pomemben del izobraževalnega procesa je pisanje in izdaja knjig, ki so namenjene strokovnjakom in tudi laični javnosti. Onkološki inštitut je kot založnik v preteklem desetletju izdal 67 knjig. Poleg tega so strokovnjaki z OI izdali 33 knjig v sodelovanju z različnimi društvi ter 13 knjig, katerih izdajo so omogočile različne farmacevtske družbe. Večina knjig predstavlja aktualen pogled na odkrivanje in zdravljenje določene vrste raka. Letne publikacije Registra raka za Slovenijo pa zajemajo statistično obdelane podatke o vseh vrstah raka in njihovi incidenci po različnih parametrih (spol, starost, regije ...).

Seznami predavateljev na OI, mentorjev in somentorjev za doktorande in magistrande, mladih raziskovalcev in njihovih mentorjev, vabljenih tujih predavateljev, mednarodnih šol, ki so jih organizirali strokovnjaki z OI, ter publikacije avtorjev z OI, so navedeni na koncu poglavja o izobraževanju: *Seznam predavateljev na OI v obdobju 1998–2008, Mentorji/somentorji za doktorande in magistrande 1998–2008, Mladi raziskovalci in njihovi mentorji 1998–2008, Vabljeni predavatelji iz tujine 1998–2008, Mednarodne šole 1998–2008, Publikacije avtorjev z OI, kjer je OI tudi izdajatelj, Publikacije avtorjev z OI, ki so bile izdane v sodelovanju z društvi, Publikacije avtorjev z OI, katerih izdajo so omogočile farmacevtske družbe.*

Ozaveščanje in izobraževanje laične javnosti

V zadnjih desetih letih je razvoj informacijske tehnologije omogočil razmah pretoka informacij in s tem naredil marsikatero informacijo, ki se nanaša na raka kot bolezen, dostopno širši javnosti. V povprečju so bolniki precej bolje informirani o postopkih odkrivanja oz. diagnostike in tudi o načinih zdravljenja raka kot pred desetletjem. To se po eni strani odraža v večji skrbi za preventivne ukrepe in bolj zdravo življenje (gibanje, zdrava prehrana, samopregledovanje ...) in po drugi strani v vse večjih zahtevah po dodatnih specifičnih informacijah od lečečih zdravnikov. S tem se je zahtevnost in pomembnost ozaveščanja/izobraževanja laične javnosti samo še povečala. Zato je naloga strokovnjakov z OI, da pri ozaveščanju/izobraževanju javnosti pravilno interpretirajo informacije, s katerimi bolniki ali javnost razpolagajo, da pojasnijo možnosti, s katerimi razpolagamo, in da jih pravilno usmerjajo pri dodatnih aktivnostih, vezanih na preventivo, diagnostiko ali zdravljenje raka.

Ozaveščanje/izobraževanje laične javnosti poteka na različne načine – od javnih nastopov (RTV, tisk, javna predavanja), priprave informacij na naših spletnih straneh, tiskanja informativnih knjižic in zloženk, tiskanja plakatov do neposrednih pogovorov z bolniki ali njihovimi svojci. V letu 2008 smo s Kancerološko sekcijo pripravili delovni vikend, ki je bil namenjen srečanju predstavnikov društev

Further training of specialists who are professionally involved in oncology at the institute or at other health care institutions in Slovenia is provided through organized lectures, seminars, weekend seminars in oncology, training courses and tutorials. These training events are an opportunity to present innovations, studies and new viewpoints, and are usually concluded by issuing proceedings of the meetings, summarizing the topics discussed. A detailed review of the involvement of the Institute of Oncology in the area of education shows that the experts of our institute appear in both roles – as teachers and mentors, and as participants in training programs. In the period 1998–2008, our colleagues were mentors and/or co-mentors to 75 doctoral and master's degree candidates; the great majority of them (34 doctors and 30 masters of science) are now employed by the institute. According to the current statistics, there are 34 residents at the institute, whose residency training program is conducted under the tutorial of 39 mentors, all employed by the institute.

In the area of education, the cooperation of the Institute of Oncology with similar cancer institutions throughout the world is also of great importance. In the last decade, we have hosted 54 internationally renowned cancer experts, who delivered lectures at the institute. Attending on-the-job trainings at various cancer centers outside the country has further reinforced our international cooperation. Altogether 23 experts have spent more than a month at such training to improve their knowledge and skills. The 33 international courses organized jointly with our partners from abroad serve as evidence of our strong international ties.

Publication of literature intended for medical circles and the lay population plays an important part in the educational process. In the last decade, 67 publications have been edited by the Institute of Oncology itself and 33 in cooperation with various societies, while 13 were sponsored by various pharmaceutical companies. The majority of these publications deal with the most recent approaches to the detection and treatment of individual cancer types, whereas the annual publications by the Cancer Registry of Slovenia provide statistically processed data of all cancer types and their incidence by taking account of different parameters (sex, age, region, etc.). The lists of faculty members, mentors and co-mentors, young researchers, invited speakers, international training courses and various monographs are given at the end of the section "Education": *Faculty Members 1998–2008, Mentors and Co-Mentors to Doctoral and Master's Degree Candidates 1998–2008, Young Researchers and their Mentors 1998–2008, Invited Speakers from Abroad 1998–2008, International Training Courses 1998–2008, Publications edited by the Institute of Oncology and by authors from the Institute of Oncology, Publications by authors from the Institute of Oncology edited in cooperation between the Institute of Oncology and various societies, Publications by authors from the Institute of Oncology sponsored by pharmaceutical companies.*

Promoting awareness and education of the lay population

In the last 10 years, the progress in information technology has greatly increased information flow, thereby assuring better access to information about cancer for the wider public. On average, patients are better informed about cancer detection and diagnostic procedures, as well as about cancer treatment methods, than they were 10 years ago. This results in greater attention to cancer prevention measures (physical activity, healthy diet, self-examination, etc.) on the one hand, while on the other, there is greater demand by patients for additional specific information from their therapists, which,

onkoloških bolnikov in zdravnikov. Namen sestanka je bil dodatno informirati javnost o delu OI in uvajanju novih načinov zdravljenja, hkrati pa dobiti povratno informacijo o tem, kaj onkološki bolniki pogrešajo pri skupnem sodelovanju. Kot je že bilo navedeno, se aktivno sodelovanje strokovnjakov z OI z društvi odraža tudi v skupnih projektih, kot je izdaja posebnih knjižic, ki so namenjene predvsem obveščanju bolnikov in druge laične javnosti. Kratek povzetek aktivnostih strokovnjakov z OI na področju obveščanja/izobraževanja laične javnosti je več kot 100 javnih nastopov, 940 poljudnih člankov, 33 informativnih knjižic in 2 delovna sestanka.

accordingly, has increased the complexity and significance of making people aware of and educated about cancer risks. Therefore, an important task of the specialists in oncology at the Institute of Oncology Ljubljana is to provide correct interpretation of all information accessible to patients and the general public, to present clearly the limitations of available treatment methods, and to advise what additional steps should be taken in cancer prevention, diagnostics and treatment.

There are different ways to raise public awareness and knowledge of cancer risks, e.g. public appearances (TV programs, press, public lectures), information on websites, issuing informative printed matter and flyers, printing posters, and open talks with patients and their relatives. In 2008 the Institute of Oncology, in cooperation with the cancerology section of the Slovenian Medical Society, organized a weekend meeting that gathered representatives of cancer patients' associations and medical doctors. The aim of this meeting was to present the Institute of Oncology and its work to the public, to inform them of new treatment methods, and to get feedback from them on which issues had been overlooked in the years of this joint cooperation. As has already been mentioned, the active cooperation of the institute and its employees with cancer patients' associations is implemented through joint projects, such as the publication of informative printed material intended mainly for patients and the general public. A brief review of the activities of the institute's employees in the area of informing and educating the lay population shows that 100 public appearances and 2 workshops were organized, and 940 articles for the lay population and 33 informative brochures were published.

Seznam predavateljev na OI v obdobju 1998–2008
Faculty Members 1998-2008

Redni profesorji **Full Professors**	dr. **Tanja Čufer**, dr. med. dr. **Zvonimir Rudolf**, dr. med. dr. **Gregor Serša**, univ. dipl. biol. dr. **Marija Auersperg**, dr. med. (upokojena / retired) dr. **Marjan Budihna**, dr. med. (upokojen / retired) dr. **Rastko Golouh**, dr. med. (upokojen / retired) dr. **Berta Jereb**, dr. med. (upokojena / retired) dr. **Stojan Plesničar**, dr. med. (upokojen / retired) dr. **Vera Pompe Kirn**, dr. med. (upokojena / retired) dr. **Marija Us-Krašovec**, dr. med. (upokojena / retired)
Znanstveni svetniki **Research Full Professors**	dr. **Maja Čemažar**, univ. dipl. biol. dr. **Srdjan Novaković**, univ. dipl. biol.
Izredni profesorji **Associate Professors**	dr. **Lidija Kompan**, dr. med. dr. **Maja Primic-Žakelj**, dr. med. dr. **Marko Snoj**, dr. med. dr. **Primož Strojan**, dr. med. dr. **Marjetka Uršič-Vrščaj**, dr. med. dr. **Branko Zakotnik**, dr.med. dr. **Matjaž Zwitter**, dr. med. dr. **Jurij Lindtner**, dr. med. (upokojen / retired)
Docenti **Assistant Professors**	dr. **Nikola Bešić**, dr. med. dr. **Matej Bračko**, dr. med. dr. **Albert Peter Fras**, dr. med. dr. **Marko Hočevar**, dr. med. dr. **Barbara Jezeršek Novaković**, dr. med. dr. **Veronika Kloboves-Prevodnik**, dr. med. dr. **Hotimir Lešničar,** dr. med. dr. **Živa Pohar-Marinšek**, dr. med. dr. **Ivana Žagar**, dr. med. dr. **Janez Žgajnar**, dr. med.
Znanstvena sodelavka **Senior Research Associate**	dr. **Ana Pogačnik**, dr. med.

Asistenti **Teaching Assistants**	**Franc Anderluh**, dr. med. mag. **Ibrahim Edhemović**, dr. med. mag. **Kristijana Hertl**, dr. med. dr. **Borut Kragelj**, dr. med. dr. **Ksenija Mahkovic Hergouth**, dr. med. mag. **Erika Matos**, dr. med. **Maja Marolt Musič**, dr. med. dr. **Irena Oblak**, dr. med. mag. **Bojana Pajk**, dr. med. mag. **Primož Petrič**, dr. med. mag. **Maja Podkrajšek**, dr. med. mag. **Martina Reberšek**, dr. med. dr. **Vaneja Velenik**, dr. med. mag. **Tomaž Verk**, univ. dipl. fiz. dr. **Vesna Zadnik**, dr. med. dr. **Lorna Zadravec Zaletel**, dr. med. mag. **Helena Barbara Zobec Logar**, dr. med.
Ostali predavatelji **Other Lecturers**	**Marjana Bernot**, dipl. m. s., univ. dipl. org. mag. **Slavica Lahajnar**, dr. med. **Gordana Lokajner**, dipl. m. s., univ. dipl. org. **Katarina Lokar**, viš. med. ses., prof. zdr. vzg. **Tjaša Pečnik Vavpotič**, viš. med. ses., prof. zdr. vzg. mag. **Nada Rotovnik-Kozjek**, dr. med. **Monika Sonc**, mag. farm. **Katja Škalič**, dipl. inž. rad. **Slavko Škalič**, ing. rad.

Mentorji/somentorji za doktorande in magistrande 1998–2008
Mentors and Co-Mentors to Doctor's and Master's Degree Candidates 1998 – 2008

Doktorand, magistrand Candidate	**Mentor** Mentor	**Somentor** Co-Mentor	**Naslov naloge** Title of thesis	**Vrsta** PhD or MSc thesis	**Leto** Year
Čemažar, Maja	**Serša, Gregor**	**Miklavčič, Damijan**	Protitumorsko delovanje elektrokemoterapije s cisplatinom na eksperimentalnih tumorskih modelih *in vitro* in *in vivo*	doktorat PhD thesis	1998
Lavrenčak, Jaka	**Us-Krašovec, Marija**		Pomen svetlih področij v celičnih jedrih	doktorat PhD thesis	1998
Rode, Mirela	**Šmid, Alojz**	**Budihna, Marjan Gašperšič, Dominik**	Vloga sline pri preprečevanju intraoralnih komplikacij po obsevanju	doktorat PhD thesis	1998
Jarm, Tomaž	**Miklavčič, Damijan**	**Serša, Gregor**	Vpliv elektroterapije na parametre prekrvitve in oksigenacije tumorjev	doktorat PhD thesis	1998
Strojan, Primož	**Rudolf, Zvonimir**	**Budihna, Marjan**	Napovedni pomen katepsinov in njihovih endogenih inhibitorjev pri bolnikih s karcinomi glave in vratu	doktorat PhD thesis	1998
Volk, Neva	**Pompe-Kirn, Vera**		Napovedni dejavniki preživetja bolnikov z želodčnim rakom v Sloveniji	doktorat PhD thesis	1998
Jarm, Tomaž	**Miklavčič, Damijan**	**Serša, Gregor**	Vpliv elektroterapije na parametre prekrvitve in oksigenacije tumorjev	doktorat PhD thesis	1999
Lebar-Maček, Alenka	**Miklavčič, Damijan**	**Serša, Gregor**	Vpliv električnih parametrov na elektroporacijo plazmaleme v *in vitro* pogojih	doktorat PhD thesis	1999
Macedoni-Lukšič, Marta	**Jereb, Berta**		Kasne nevrološke posledice pri otrocih, zdravljenih zaradi možganskega tumorja	doktorat PhD thesis	1999
Zakotnik, Branko	**Budihna, Marjan**	**Šmid, Alojz**	Zdravljenje neoperabilnih karcinomov glave in vratu z obsevanjem in hkratno kemoterapijo	doktorat PhD thesis	1999
Bilban-Jakopin, Cvetka	**Rudolf, Zvonimir**		Ugotavljanje kromosomskih sprememb somatskih celic po obsevanju z ionizirajočimi žarki in zdravljenju s citostatiki pri bolnikih s tumorjem moda in malignim limfomom	doktorat PhD thesis	2000
Fležar, Margareta	**Us-Krašovec, Marija**		Jedrne značilke seroznih tumorjev jajčnika	doktorat PhD thesis	2000
Hočevar, Marko	**Auersperg, Marija**		Uporabnost koncentracije tiroglobulina v serumu za diferencialno diagnostiko benignih in malignih folikularnih tumorjev ščitnice	doktorat PhD thesis	2000
Ivanuša, Teodora	**Jevtič, Vladimir**	**Serša, Gregor**	Makromolekularna kontrastna sredstva pri slikanju z magnetno resonanco in merjenje pretoka krvi v SA-1 tumorjih miši	doktorat PhD thesis	2000
Ocvirk, Janja	**Rudolf, Zvonimir**	**Štabuc, Borut**	Topni receptorji TNF pri rakavih bolnikih	doktorat PhD thesis	2000
Tomšič, Matija	**Rozman, Blaž**	**Primic-Žakelj, Maja**	Prevalenca Sjögrenovega sindroma v Sloveniji	doktorat PhD thesis	2000
Škrbinc, Breda	**Us-Krašovec, Marija**	**Čufer, Tanja**	Napovedni dejavniki raka dojke stadijev I do II	doktorat PhD thesis	2001
Pohar-Marinšek, Živa	**Us-Krašovec, Marija**		Pomen svetlobno-mikroskopskih in slikovno-citometričnih celičnih značilnosti rabdomiosarkoma za klasifikacijo	doktorat PhD thesis	2001
Jezeršek Novaković, Barbara	**Rudolf, Zvonimir**		Protein p53 in njegova protitelesa v serumu bolnikov z Ne-Hodgkinovimi limfomi	doktorat PhD thesis	2001
Frković-Grazio, Snježana	**Golouh, Rastko**		Morfološke in imunohistokemične lastnosti karcinoma dojke v stadiju T1NOMO pri napovedovanju bolezni	doktorat PhD thesis	2002
Kragelj, Borut	**Čufer, Tanja**		Kemoradioterapija invazivnih karcinomov sečnega mehurja	doktorat PhD thesis	2003
Borštnar, Simona	**Čufer, Tanja**		Napovedni pomen urokinaznega aktivatorja plazminogena, njegovih inhibitorjev in receptorja pri raku dojke	doktorat PhD thesis	2003
Čegovnik, Urška	**Novaković, Srdjan**		Priprava ekspresijskih kaset za prehodno tvorbo citokinov in rastnih faktorjev v sesalskih celicah	doktorat PhD thesis	2003

Doktorand, magistrand Candidate	Mentor Mentor	Somentor Co-Mentor	Naslov naloge Title of thesis	Vrsta PhD or MSc thesis	Leto Year
Kranjc, Simona	**Serša, Gregor**		Vpliv elektroporacije na radiosenzibilizirajoči učinek bleomicina in cisplatina pri sarkomskih celicah in tumorjih LPB	doktorat PhD thesis	2003
Ećimović, Patricija	**Pompe-Kirn, Vera**		Drugi primarni raki pri bolnikih s kadilskimi raki v Sloveniji v obdobju 1961–2000 ter njihov vpliv na preživetje	doktorat PhD thesis	2004
Kocijančič, Igor	**Rudolf, Zvonimir**	**Čufer, Tanja**	Možnosti ultrazvočnega prikaza fiziološke plevralne tekočine in napovedni dejavniki za opredelitev malih plevralnih izlivov	doktorat PhD thesis	2004
Žgajnar, Janez	**Bešić, Nikola**		Racionalno kirurško zdravljenje zgodnjega raka dojk	doktorat PhD thesis	2004
Bilalović, Nurija	**Selak, Ivan**	**Golouh, Rastko**	Uloga PU.1 transkriptivnog faktora, u folikularnom limfomu	doktorat PhD thesis	2004
Petkovšek, Marko	**Nastran, Janez**	**Serša, Gregor**	Visokodinamični pulzni napetostni vir za *in vivo* elektropermeabilizacijo	doktorat PhD thesis	2004
Koković, Ira	**Golouh, Rastko**	**Komel, Radovan**	Napovedna vrednost himeričnih transkriptov SYT-SSX iz parafinskih vzorcev sinovijskega sarkoma	doktorat PhD thesis	2005
Jagodic, Monika	**Serša, Gregor**	**Čufer, Tanja**	Napovedna vrednost katepsinov D in L pri raku dojk	doktorat PhD thesis	2005
Šoba, Erika	**Budihna, Marjan**	**Šmid, Alojz**	Nekateri klinični in biološki napovedni dejavniki pri bolnikih z neoperabilnim karcinomom ustnega žrela, zdravljenih s sočasno radiokemoterapijo	doktorat PhD thesis	2005
Grošel, Alenka	**Čemažar, Maja**	**Serša, Gregor**	Vpliv kombinacije elektrogenske terapije s p53 in elektrokemoterapije s cisplatinom na humane karcinomske celične linije in mišje sarkome	doktorat PhD thesis	2005
Zadravec-Zaletel, Lorna	**Jereb, Berta**		Dejavniki tveganja za hipogonadizem po zdravljenju raka v otroštvu	doktorat PhD thesis	2006
Zadnik, Vesna	**Primic-Žakelj, Maja**	**Ferligoj, Anuška**	Geografska analiza vpliva socialno-ekonomskih dejavnikov na incidenco raka v Sloveniji v obdobju 1995–2002	doktorat PhD thesis	2006
Eržen, Janez	**Fležar, Margareta**	**Rott, Tomaž**	Jedrne značilke pri nedrobnoceličnem pljučnem raku	doktorat PhD thesis	2006

Doktorand, magistrand Candidate	Mentor Mentor	Somentor Co-Mentor	Naslov naloge Title of thesis	Vrsta PhD or MSc thesis	Leto Year
Gazić, Barbara	**Pohar-Marinšek, Živa**		Napovedni pomen citometrične meritve DNA v vzorcu aspiracijske biopsije raka dojke	doktorat PhD thesis	2006
Stegel, Vida	**Novaković, Srdjan**		Priprava in uporaba tumorskih cepiv iz mononuklearnih celic na eksperimentalnih tumorskih modelih	doktorat PhD thesis	2006
Brecelj, Erik	**Bračko, Matej**	**Pogačnik, Ana**	Prognostični pomen klinično-patoloških značilnosti, izražanje E-kadherina, DNA ploidije in proliferacijske aktivnosti pri folikularnem karcinomu ščitnice	doktorat PhD thesis	2006
Vudrag, Marko	**Katz, Sidney A.**	**Primic-Žakelj Maja**	Investigation of possible health effects resulting from reconfiguration of the Mrzlek water supply	doktorat PhD thesis	2006
Velenik, Vaneja	**Zakotnik, Branko**		Kapecitabin kot senzibilizator pri predoperativnem obsevanju bolnikov z lokalno napredovalim resektabilnim rakom danke	doktorat PhD thesis	2007
Oblak, Irena	**Strojan, Primož**	**Šmid, Alojz**	Napovedna vrednost katepsinov B in L ter stefinov A in B pri bolnikih z neoperabilnim karcinomom ustnega dela žrela, ki so bili zdravljeni s sočasno radiokemoterapijo	doktorat PhD thesis	2007
Drev, Primož	**Golouh, Rastko**	**Čufer, Tanja**	Pomen onkogenov HER1 in HER2 v primarnem tumorju za hormonsko zdravljenje bolnic z metastatskim karcinomom dojke	doktorat PhD thesis	2007
Podkrajšek, Maja	**Hočevar, Marko**		Ultrazvočna preiskava pazduhe pri zamejitvi bolezni bolnic z rakom dojk	doktorat PhD thesis	2007
Stopar, Tatjana	**Novak-Jankovič, Vesna**	**Hočevar, Marko**	Uporaba levobupivakaina za blok vratnega pleteža pri minimalno invazivni paratiroidektomiji: primerjava anestetičnih in farmakokinetičnih (toksičnih) učinkov med površinskim in kombiniranim blokom	doktorat PhD thesis	2007
Borštnar, Simona	**Čufer, Tanja**		Določanje urokinaznega sistema pri raku dojk	magisterij MSc thesis	1998

Doktorand, magistrand Candidate	Mentor Mentor	Somentor Co-Mentor	Naslov naloge Title of thesis	Vrsta PhD or MSc thesis	Leto Year
Bubnič, Bernarda	**Us-Krašovec, Marija**	**Žargi, Miha**	Strukturne značilnosti jeder sluznice glasilk in raka grla v slikovnem citometru	magisterij MSc thesis	1998
Furlani, Tatjana	**Pompe-Kirn, Vera**		Zbolevnost za rakom v obdobju 1965–1994 in ocena izbranih dejavnikov tveganja v občini Kočevje v primerjavi s Slovenijo	magisterij MSc thesis	1998
Srebotnik-Kirbiš, Irena	**Us-Krašovec, Marija**		Imunokemično odkrivanje antigena PCNA in Ki-67 na celičnih vzorcih raka dojke	magisterij MSc thesis	1998
Brecelj, Erik	**Auersperg, Marija**	**Pogačnik, Ana**	DNA ploidija in proliferacijska aktivnost pri karcinomih ščitnice v Sloveniji	magisterij MSc thesis	1999
Jagodic, Monika	**Čufer, Tanja**		Peroralno zdravljenje z etopozidom pri bolnicah z razsejanim rakom dojk	magisterij MSc thesis	1999
Pajk, Bojana	**Us-Krašovec, Marija**	**Čufer, Tanja**	Napovedna vrednost DNA ploidije pri starejših bolnicah z rakom dojke, zdravljenih s tamoksifenom	magisterij MSc thesis	1999
Tomšič, Radka	**Jereb, Berta**		Prognostički čimbenici u bolesnika sa ekstranodalnim ne-Hodgkinovim limfomom glave i vrata stadija I i II	magisterij MSc thesis	1999
Lestan, Alenka	**Primic-Žakelj, Maja**		Učestalost raka u djelatnika izloženih ionizirajućem zračenju i kemoterapeuticema	magisterij MSc thesis	1999
Čegovnik, Urška	**Novaković, Srdjan**		Priprava ekspresijske kasete z genom hTNFα za prehodno izražanje v sesalskih celicah	magisterij MSc thesis	2000
Dremelj, Marta	**Jereb, Berta**		Pozne posledice na ledvicah po zdravljenju nefroblastoma v otroštvu: analiza poznih posledic zdravljenja raka pri otrocih	magisterij MSc thesis	2000
Oblak, Irena	**Budihna, Marjan**		Vpliv koncentracije hemoglobina v krvi na izvid zdravljenja neoperabilnih karcinomov ustnega žrela	magisterij MSc thesis	2000
Ećimović, Patricija	**Pompe-Kirn, Vera**		Pojav drugih primarnih rakov pri bolnikih z rakom grla v Sloveniji v obdobju 1961–1996 primer območne karcinogeneze	magisterij MSc thesis	2001

Doktorand, magistrand Candidate	Mentor Mentor	Somentor Co-Mentor	Naslov naloge Title of thesis	Vrsta PhD or MSc thesis	Leto Year
Karner, Katarina Barbara	**Lešničar, Hotimir**		Učinek električnih impulzov in pregrevanja na krvni pretok in rast mišjega tumorja *in vivo*	magisterij MSc thesis	2001
Kranjc, Simona	**Serša, Gregor**		Vpliv elektroporacije na učinek kombiniranega zdravljenja eksperimentalnih tumorjev s cisplatinom in obsevanjem	magisterij MSc thesis	2001
Edhemović, Ibrahim	**Snoj, Marko**	**Golouh, Rastko**	Aktivnost fosfolipaze A2 v tumorjih širokega črevesa in danke	magisterij MSc thesis	2002
Kocijančič, Ksenija	**Zwitter, Matjaž**		Pomen ultrazvočno vodene tankoigelne biopsije povečanih nadledvičnih žlez pri bolnikih s pljučnim rakom	magisterij MSc thesis	2002
Gazić, Barbara	**Us-Krašovec, Marija**	**Geršak, Ksenija**	Uporabnost celic granuloze za normiranje citometričnih meritev	magisterij MSc thesis	2002
Cvelbar, Mirjam	**Uršič-Vrščaj, Marjetka**	**Rakar, Stelio**	Dejavniki tveganja in napovedni dejavniki pri bolnicah z dvojnim primarnim rakom: epitelnim rakom jajčnika in rakom dojke	magisterij MSc thesis	2003
Reberšek, Martina	**Čufer, Tanja**		Elektrokemoterapija raka dojk	magisterij MSc thesis	2003
Benedičič Pilih, Ana	**Pompe-Kirn, Vera**		Trend incidence in preživetja bolnikov s kožnim malignim melanomom v Sloveniji v obdobju 1980–1999 glede na izbrane napovedne dejavnike preživetja	magisterij MSc thesis	2003
Grošel, Alenka	**Serša, Gregor**	**Čemažar, Maja**	Vpliv elektrogenske terapije s p53 v kombinaciji s cisplatinom na preživetje humanih celičnih linij raka prostate in raka debelega črevesa *in vitro*	magisterij MSc thesis	2003
Matos, Erika	**Čufer, Tanja**		Vpliv inhibitorjev urokinaznega aktivatorja plazminogena na učinkovitost hormonskega ali citostatskega zdravljenja raka dojke	magisterij MSc thesis	2003
Hertl, Kristijana	**Primic-Žakelj, Maja**		Analiza kakovosti mamografskega presejanja v Zdravstvenem domu Domžale v obdobju1998–2002	magisterij MSc thesis	2004

Doktorand, magistrand Candidate	Mentor Mentor	Somentor Co-Mentor	Naslov naloge Title of thesis	Vrsta PhD or MSc thesis	Leto Year
Šeruga, Boštjan	**Zakotnik, Branko**		Zdravljenje raka požiralnika s preoperativno kemoradioterapijo	magisterij MSc thesis	2004
Petrič, Primož	**Strojan, Primož**		Rezultati zdravljenja karcinoma ustne votline z radikalnim ali pooperativnim obsevanjem na Onkološkem inštitutu v Ljubljani	magisterij MSc thesis	2005
Norčič, Gregor	**Repše, Stanislav**	**Pompe-Kirn, Vera**	Vpliv stadija bolezni ob pričetku zdravljenja na preživetje bolnikov z rakom debelega črevesa in danke v Sloveniji	magisterij MSc thesis	2005
Južnič Šetina, Tanja	**Čufer, Tanja**		Karcinom dojke pri moškem	magisterij MSc thesis	2006
Smrdel, Uroš	**Zwitter, Matjaž**		Problemi radikalnega zdravljenja pljučnega raka z obsevanjem: homogenost doze	magisterij MSc thesis	2006
Kadivec, Maksimiljan	**Lešničar, Hotimir**	**Jevtič, Vladimir**	Ultrazvočna diagnostika žilnih sprememb po kombiniranem zdravljenju karcinomov glave in vratu	magisterij MSc thesis	2006
Lahajnar, Slavica	**Primic-Žakelj, Maja**		Kronična bolečina in druge kasne posledice po operaciji raka dojk pri bolnicah z biopsijo prve bezgavke in bolnicah z odstranjenimi bezgavkami v pazduhi	magisterij MSc thesis	2007

Mladi raziskovalci in njihovi mentorji 1998–2008
Young Researchers and their Mentors 1998-2008

Mladi raziskovalec Young researcher	Mentor Mentor
Simona Borštnar	Zvonimir Rudolf, Tanja Čufer
Erik Brecelj	Marija Auersperg, Nikola Bešić
Petra Cerkovnik	Srdjan Novaković
Urška Čegovnik	Srdjan Novaković
Maja Čemažar	Gregor Serša
Marta Dremelj	Berta Jereb, Marjan Budihna
Primož Drev	Rastko Golouh
Patricija Ećimović	Vera Pompe Kirn
Barbara Gazić	Veronika Kloboves Prevodnik, Marija Us-Krašovec
Nebojša Glumac	Marko Snoj
Cvetka Grašič Kuhar	Branko Zakotnik
Alenka Grošel	Gregor Serša
Zvezdana Hlebanja	Zvonimir Rudolf
Monika Jagodic	Tanja Čufer
Barbara Jezeršek Novaković	Zvonimir Rudolf
Urška Kamenšek	Gregor Serša
Katarina Barbara Karner	Marjan Budihna, Hotimir Lešničar
Simona Kranjc	Gregor Serša
Jaka Lavrenčak	Marija Us Krašovec
Suzana Mesojednik	Gregor Serša
Janja Ocvirk	Zvonimir Rudolf
Aleksander Pečnik	Marija Auersperg
Andraž Perhavec	Janez Žgajnar
Barbara Perić	Marko Hočevar
Gašper Pilko	Nikola Bešić
Vida Stegel	Srdjan Novaković
Margareta Strojan Fležar	Marija Us-Krašovec
Primož Strojan	Zvonimir Rudolf
Breda Škrbinc	Marija Us Krašovec
Gregor Tevž	Maja Čemažar
Neva Volk	Vera Pompe Kirn
Lorna Zadravec Zaletel	Berta Jereb
Tina Žagar	Maja Primic Žakelj
Janez Žgajnar	Jurij Lindtner

Vabljeni predavatelji iz tujine 1998–2008
Invited Speakers from Abroad 1998-2008

1998		
Paul Keall	USA	Current and future trends in radiotherapy
Robert J. Beck	USA	Decision making and clinical outcomes research
1999		
Tillman Pearce	France	Eloxatin in colorectal cancer in future directions
Mark Jaroszeski	USA	Electrochemotherapy for the treatment of cutaneous tumors
H. Boko	Croatia	Introduction into telemedicine
A. Dzubur	Croatia	Practial implementation of telemedicine networks
Andrej Trampuž	Switzerland	Problem of multiresistant bacteria in hospitals
2000		
Sergio Pecorelli	Italy	Overview of ovarian cancer treatment in 2000
Robert S. Lavey	USA	Impact of hb and tumor oxygenation on efficacy of radiation and chemotherapy
Thomas Spitzer	USA	New developments in stem cell transplantation
Niklas Zojer	Austria	Erythropoietin in the treatment of cancer related anemia
Gabriela V. Kornek	Austria	Rationale for erythropoietin therapy in cancer patients
Paul Keall	USA	Precision radiotherapy: from imaging to intensity modulated delivery
Mateja Krajc	Belgium	Analysis brca-1 and brca-2 gene mutation in the families with high breast or ovarian cancer incidence –belgium model
Lois Jones	Australia	Radiobiological optimisation for radiotherapy
Maja Osmak	Croatia	Resistance to chemotherapy: from basic research to clinical application
2001		
Andrej Trampuž	Switzerland	Rational use of antibiotics for empirical purposes
Peter Vaupel	Germany	Oxygen status of malignant tumors: pathomechanisms of hypoxla and significance for tumor therapy
Jurgen Dunst	Germany	Prognostic significance of anemia in radiotherapy and radiochemotherapy

Michael G. Ormerod	U.K.	The advantages and disadvantages of using flow cytometry to measure prognostic factors in fnas from breast cancer
Zabagno	Italy	Sentinel lymph node and treatment of the axilla
Haralabos Koussis	Italy	Our chemotherapy program for breast cancer.
Gillian Thomas	Canada	Hemoglobin and hypoxia: its impact on tumour growth and response to therapy
2002		
Werner Schmidt	Austria	Digital radiotherapy: 6 years of experience, benefits and new treatment modalities
Andrea Decensi	Italy	Latest developments in breast cancer chemoprevention
Gianni Sava	Italy	Metastasis inhibition by ruthenium complexes
Giuliana Decorti	Italy	Multidrug resistance proteins. Role in cancer resistance and physiological functions.
Wouter W.A. Zuurmond	The Netherlands	Treatment of severe malignant and nonmalignant pain
Wolfgang Haedicke	Austria	Differentially expressed genes in human liver cancer: new candidate targets for diagnostics and therapeutics
Walley J. Temple	Canada	Innovations in challenging sarcoma
2003		
Marie-Pierre Rols	France	What can electric field make for you? Electropermeabilization: a physical method for the transfer of therapeutical molecules into cells
Jeffrey Tobias	U.K.	1. Hormone therapy in post menopausal breast cancer. An update of data from the atac study. 2. Research governance in oncology - what does the cancer clinician need to know
Robert Jeraj	Usa	Image guided radiotherapy
Malcolm Hayes	Canada	Breast cancer in british columbia - experience with the screening mammography program and the role of the pathologist in determining treatment selection
Jasenka Matisic	Canada	Screening for cervical cancer in british columbia

2004		
Juergen Dunst	Germany	A ten-year long use of epoetin alpha (eprex-a) is a step forward in support therapies
Ian F. Tannock	Canada	Introducing new systemic treatments in oncology: the canadian experience
Adriano Bompiani	Italy	Genetic testing and human rights watch – outlining european legislation
Muriel Golzio	France	Electric-field-mediated gene delivery: from in vitro to in vivo understandings
Valley John Temple	Canada	Treatment of colorectal cancer recurrence

2005		
Roland Herzog	Germany	Medical application of laser
Ervin B. Podgoršak	Canada	Radiosurgery: theory and practice
Werner Scheithauer	Austria	Antiangiogenic target treatment of solid tumors.
Lucile Blaise	France	Presentation of french breast prostheses “serena”
Hilary Calvert	U.K.	New drugs and designer drugs in ovarian and breast cancer
Mark Verrill	U.K.	Use of taxol in a weekly regimen

2006		
Chryso Kanthou	U.K.	Tumour cell-endothelial interactions: signal pathways and therapeutic targets
Gunther Stegel	Austria	Advancing the management of chemotherapy-induced anaemia and neutropenia in oncology
Haim Manor	Israel	Mechanism of telomere extension by telomerase
Norman Jaffe	USA	High dose methotrexate in osteosarcoma. An odyssey of rejection and acceptance

2007		
Eberhard Neumann	Germany	Digression on the biophysics of clinical electroporation therapies
Robert Jeraj	USA	Early evaluation of anticancer therapy efficiency by using pet imaging devices
Ian F. Tannock	Canada	Reading the literature with a critical eye

2008		
Pankaj Chaturvedi	India	Head and neck oncology scenario in india with an emphasis on oral cancers

Mednarodne šole 1998–2008
International Training Courses 1998 – 2008

1998
Advances in cancer detection and treatement
Seminar on cell cultures: handling and trends

1999
The 14th International meeting of Adriatic society of Pathology
ESMO in EONS: Cytostatic agents – delivery and toxicity
Science Writing in Biomedicine
The Second International Training Course on Breast Cancer Imaging

2000
ESO Advanced Course on Ethics in Oncology
2nd International Symposium on Organ Sparing Treatment in Oncology
Science Writing in Biomedicine
International Conference on Bioelectromagnetism
Research Meeting on Advances in Cancer Radiotherapy

2001
International Training Course on Breast Cancer Diagnostics “Breast Imaging Quality Control”

2002
2nd Conference on Experimental Tumour Biology
Workshop “EFOMP Medical Physics Short Course” and the meeting of The European Federation of Organisations for Medical Physics (EFOMP)
EORTC Lymphoma Group
ESMO Course on Good Clincal Practices
EORTC Lymphoma Group Meeting
Principles and Practice of Cancer Registration, Surveillance and Control

2003
EUSOMA, ESO and ESSO Improving Clinical Skills in Early Breast Cancer Treatment

2004

3rd Conference on Experimental and Translational Oncology

ESTRO Modern Brachytherapy Techniques

The Fourth International Course on Breast Imaging Diagnostics

2005

Adriatic Society of Pathology - 19th International Meeting

EORTC BCG, 2005 Annual Meeting

Electroporation based Technologies and Treatments

2006

4th Conference on Experimental and Translational Oncology

ESTRO Teaching Course on Basic Clinical Radiobiology

2007

11th Mediterranean Conference on Medical and Biological Engineering and Computing, MEDICON 2007

3rd Postgraduate course and scientific workshop: Electroporation based technologies and treatments

29th Annual Meeting of the International Association of Cancer Registries

GEC-ESTRO 3D GynBrachytherapy Network – Workshop on Treatment Planning

2008

5th Conference on Experimental and Translational Oncology

Publikacije avtorjev z OI, kjer je OI tudi izdajatelj
Publications Edited by the Institute of Oncology and by the Authors from the Institute Of Oncology

Naslov Title	**Leto** Year	**ISBN**
Bibliografija delavcev Onkološkega inštituta = Bibliography of the staff of the Institute of Oncology Ljubljana : 1993-1997 / uredila Kiauta Dušica	1998	961-6071-21-1
Etična razpotja v klinični medicini : program tečaja, prispevki in delovno gradivo / uredila Zwitter Matjaž, Ećimović Patricija	1998	961-6071-19-X
Incidenca raka v Sloveniji 1995 / uredila Pompe Kirn Vera	1998	-
Incidenca raka v Sloveniji 1996 / uredil Golouh Rastko	1998	-
Kemoterapija in vi / Velepič Marina, Skela Savič Brigita	1998	-
Looking back – moving forward. Abstract book. Reach to recovery international conference, Ljubljana 1998	1998	-
Megace oralna suspenzija megestrol acetate ; 40 mg/ml, stekleničke 240 ml / Štabuc Borut	1998	-
Onkološki inštitut Ljubljana : 60 let : 1938-1997. Poročilo 1993-1997 / urednik Zvonimir Rudolf	1998	961-6071-20-3
Rak dojke / uredili Snoj Marko et al.	1998	961-6071-18-1
Rak pri otrocih : zbornik. 13. onkološki vikend, Postojna 1998 / uredila Jereb Berta	1998	-
Seminar on cell cultures : handling and trends : book of abstracts	1998	-
Zaščita medicinskih sester pri rokovanju s citostatiki / Bobnar Albina et al.	1998	
Prehrana in vi / Drolc Helena	1999	961-6071-22-X
Seminar in učna delavnica o centralnih venskih katetrih s podkožnim prekatom : Delovno gradivo / urednik Pompe Franc	1999	961-6071-23-8
Rak pri otrocih : zbornik. 13. onkološki vikend, Postojna 1998. 1. ponatis / uredila Jereb Berta	1999	961-90324-7-0
Book of abstracts. Research meeting on advances in cancer therapy, Ljubljana 2000 / Editors Casar Božidar, Jeraj Robert	2000	961-6071-27-0
Incidenca raka v Sloveniji 1997 / uredili Pompe Kirn Vera et al.	2000	
Pregled pomembnejših tumorskih označevalcev v klinični onkologiji / Novaković Srdjan	2000	961-6071-26-2
Priročnik iz onkološke zdravstvene nege in onkologije / uredili Velepič Marina et al.	2000	961-6071-29-7
Smernice za nekirurško zdravljenje bolnikov z rakom pljuč / Zwitter Matjaž, Kovač Vilijem, Plaper Vernik Marija	2000	-
Bolezni dojke [Elektronski vir] / Babič Ankica et al.	2001	-
Incidenca raka v Sloveniji 1998 / uredili Pompe Kirn Vera et al.	2001	
Doktrini zdravljenja bolnikov z malignimi limfomi in bolnic z rakom rodil : zbornik. 16. onkološki vikend, Laško 2002 / uredili Lindtner Jurij et al.	2002	961-6377-06-X
Dolžnosti in pravice v zvezi z zdravjem – pravice bolnikov z rakom. 10. Seminar »In memoriam dr. Dušana Reje, Ljubljana 2002 / uredili Štabuc Borut et al.	2002	961-6377-04-3
Incidenca raka v Sloveniji 1999 / uredili Pompe Kirn Vera et al.	2002	-
Role and status of medical physicists, diagnostics & nuclear medicine, new developments in teletherapy : [course book] / uredili Casar Božidar, Schmidt Werner, Zdešar Urban	2002	961-6071-30-0

Naslov Title	**Leto** Year	**ISBN**
Sprejem in bivanje na Onkološkem inštitutu v Ljubljani / Velepič Marina, Čufer Tanja	2002	-
An update of diagnostic approach to malignant lymphomas : proceedings. XXXIII. Memorial meeting for Professor Janez Plečnik with international participation, Ljubljana 2002 / Editors Bračko Matej et al.	2002	961-6071-31-9
Incidenca raka v Sloveniji 2000 / uredili Pompe Kirn Vera et al.	2003	-
Informacije za bolnike o preiskavah v nuklearni medicini	2003	961-6071-32-7
Navodila za izvajanje programa ZORA. Državni program Zgodnjega Odkrivanja predRAkavih sprememb materničnega vratu (ZORA) / Uršič Vrščaj Marjetka et al.	2003	-
Preživetje bolnikov z rakom v Sloveniji : 1983-1997 / uredili Pompe Kirn Vera et al.	2003	961-6071-33-5
Rak prebavil. 11. Seminar "In memoriam dr. Dušana Reje, Ljubljana 2003 / uredili Štabuc Borut et al.	2003	961-6377-09-4
Zbrana dela / Vodovnik Lojze, uredili Miklavčič Damijan et al.	2003	961-6371-55-X
Incidenca raka v Sloveniji 2001 / uredili Primic Žakelj Maja et al.	2004	-
Novosti v onkologiji in smernice za obravnavo bolnic z rakom dojk in bolnikov z malignim melanomom : zbornik. 17. onkološki vikend, Laško 2004 / uredili Bešić Nikola et al.	2004	961-6377-12-4
Poročilo o poteku državnega programa ZORA v letih 2003 in 2004 / Pogačnik Ana et al., uredila Kirar Fazarinc Irena	2004	961-6071-35-1
Smernice zdravljenja raka dojk / Bilban Jakopin Cvetka et al.	2004	961-6071-34-3
Book of abstracts. 20th International meeting of the Adriatic Society of Pathology, Strunjan 2005 / Editor Bračko Matej	2005	-
Incidenca raka v Sloveniji 2002 / uredili Primic Žakelj Maja et al.	2005	-
Navodila za odvzem brisa materničnega vratu in za izvajanje programa ZORA. 4. prenovljena izd. / Kirar Fazarinc Irena et al.	2005	961-6071-38-6
Navodila za poenotenje izvidov brisov materničnega vratu / Pogačnik Ana et al.	2005	961-6071-37-8
Paliativna oskrba bolnikov z rakom : zbornik. 18. onkološki vikend, Laško 2005 / uredili Novaković Srdjan et al.	2005	961-6377-14-0
Pomen kliničnih raziskav za bolnike z rakom : priročnik za bolnike z rakom / uredili Žgajnar Janez et al.	2005	961-6071-36-X
Geni in rak : zbornik. 19. onkološki vikend, Laško 2006 / uredili Žgajnar Janez et al.	2006	961-6377-17-5
Incidenca raka v Sloveniji 2003 / uredila Primic Žakelj Maja	2006	-
Nevtropenična dieta : navodila za bolnike / Mlakar Mastnak Denis	2006	-
Nizko število belih krvnih celic – levkopenija : navodila za bolnike / Pečan Salokar Tjaša	2006	-
Nizko število krvnih ploščic - trombocitopenija : navodila za bolnike / Koren Peter	2006	-
Nizko število rdečih krvnih celic in znižana vrednost hemoglobina – slabokrvnost (anemija) : navodila za bolnike / Zajc Metka	2006	-
Obvladujte svojo utrujenost / Mlakar Mastnak Denis	2006	-
Pojavljanje raka v občini Brežice v primerjavi z ostalo Slovenijo : geografska analiza incidence raka v občini Brežice na podlagi podatkov Registra raka za Slovenijo : zaključno poročilo / Zadnik Vesna, Žagar Tina, Primic Žakelj Maja	2006	-
Rak dojke : kaj morate vedeti. 2. dopolnjena izd. / Borštnar Simona et al.	2006	961-6071-39-4

Publikacije avtorjev z OI, ki so bile izdane v sodelovanju z društvi
Publications by the authors from the Institute of Oncology edited in cooperation of the Institute of Oncology with various societies

Naslov Title	**Leto** Year	**ISBN**
Rak želodca. Kaj morate vedeti o bolezni / Anderluh Franc et al.	2006	961-6071-41-6
Smernice za diagnostiko in zdravljenje bolnikov z rakom pljuč / Antonič Jože et al. ; urednik Zwitter Matjaž	2006	-
At the crossroad of tradition and new technologies in cancer registration ; The role of cancer registries in cancer control : programme and book of abstracts. 29th annual meeting of International Association of Cancer Registries, Ljubljana 2007 / editors Primic Žakelj Maja, Žagar Tina, Zadnik Vesna	2007	978-961-6071-42-0
Incidenca raka v Sloveniji 2004 / uredila Primic Žakelj Maja	2007	-
Napotki za premagovanje neželenih učinkov sistemskega zdravljenja raka : kaj morate vedeti? / Borštnar Simona et al.	2007	978-961-6071-40-6
Rehabilitacija po zdravljenju raka : zbornik. 20. onkološki vikend, Laško 2007 / uredili Grabljevec Klemen et al.	2007	978-961-6377-19-5
Sistemsko zdravljenje raka. Dan internistične onkologije, Ljubljana 2007	2007	-
Učna delavnica iz ginekološke citopatologije, predavalnica Splošne bolnišnice Celje, 2007 / Nieminen Pekka, Repše Fokter Alenka, Kloboves Prevodnik Veronika	2007	978-961-6071-43-7
Pogosta vprašanja v paliativni oskrbi / uredili Benedik Jernej et al.	2008	978-961-6071-45-1
Poročilo o rezultatih državnega programa ZORA v letih 2006 in 2007 / Primic Žakelj Maja, Pogačnik Ana, Uršič Vrščaj Marjetka	2008	978-961-6071-48-2
Rak debelega črevesa in danke : kaj morate vedeti o bolezni / Anderluh Franc et al., uredila Ocvirk Janja	2008	978-961-6071-47-5
Rak požiralnika : kaj morate vedeti o bolezni? / Anderluh Franc et al.	2008	978-961-6071-44-4
Zdravila za uporabo v paliativni medicini / Červek Jožica et al.	2008	978-961-6071-46-8
Bolniki in strokovnjaki – skupaj uspešnejši pri premagovanju raka : zbornik. 21. Onkološki vikend, Laško 2008 / urednik Borštnar Simona	2008	978-961-6377-21-8

Naslov Title	**Leto** Year	**ISBN**
Pljučni rak ; Rak ščitnice. 14. onkološki vikend, Laško 1998 / uredili Lindtner Jurij et al.	1998	-
Šola mamografske diagnostike = Breast imaging course / uredili Rener Miljeva, Vargazon Tomaž, Kadivec Maksimiljan	1998	-
Kolikor znaš, toliko veljaš – tudi na področju zdravja : 15 najpogostejših rakov / Lukič Franc, Pompe Kirn Vera, Primic Žakelj Maja	1999	961-90324-5-4
Družinski zdravnik in rak : zbornik. 15. onkološki vikend, Ljubljana 2000 / uredili Lindtner Jurij et al.	2000	961-6377-00-0
Napredovali rak – dodajmo življenje dnevom. 27. strokovni seminar iz onkologije in onkološke zdravstvene nege, Radenci 2000 / uredile Velepič Marina, Skela Savič Brigita, Červek Jožica	2000	-
Priporočila za odkrivanje, zdravljenje in nadzor bolnic s predrakavimi spremembami materničnega vratu / Uršič Vrščaj Marjetka et al.	2000	961-6185-02-0
Rak rodil : vodnik za bolnice na poti okrevanja / Uršič Vrščaj Marjetka, Vegelj Pirc Marija	2000	961-90822-1-4
Ginekološki malignomi. Doktrina zdravljenja ginekoloških malignomov na Onkološkem inštitutu in Univerzitetni ginekološki kliniki / Stržinar Vida et al.	2001	961-6377-03-5
Hormonsko zdravljenje raka dojke : informativna knjižica za bolnice / uredila Vegelj Pirc Marija	2001	961-90822-3-0
Mamografija : metoda za zgodnje odkrivanje raka dojke / Jančar Breda, Vegelj Pirc Marija	2001	961-90822-2-2
Slikanje dojke in kontrola kakovosti / uredili Rener Miljeva et al.	2001	-
Urgentna stanja v onkologiji in hormonsko zdravljenje raka dojk. 28. strokovni seminar iz onkologije in onkološke zdravstvene nege, Radenci 2001 / uredile Bobnar Albina et al.	2001	-
Ginekološki malignomi. Doktrina zdravljenja ginekoloških malignomov na Onkološkem inštitutu in Univerzitetni ginekološki kliniki. 3. revidirana izd. / Stržinar Vida et al.	2002	961-6377-05-1
Navodila za poenotenje izvidov brisov materničnega vratu in vzpostavitev informacijskega sistema ginekološke citopatologije / Pogačnik Ana et al.	2002	961-6185-03-9
Razvoj onkologije in onkološke zdravstvene nege ; Kakovost v zdravstveni negi. 29. strokovni seminar iz onkologije in onkološke zdravstvene nege, Ljubljana 2002 / uredila Skela Savič Brigita	2002	-
Pomen kakovosti v sterilizaciji. Sterilizacija, srce bolnišnice : zbornik predavanj, Terme Čatež 2003 / uredila Žagar Andreja	2003	-
Starost in rak. 30. strokovni seminar iz onkologije in onkološke zdravstvene nege, Ljubljana 2003 / uredila Skela Savič Brigita	2003	-
Gibanje je življenje / Rotovnik Kozjek Nada	2004	961-6170-87-2
Rak na modih : vodnik za bolnike na poti okrevanja / Stanovnik Marjeta, Vegelj Pirc Marija	2004	961-90822-4-9
Rak rodil : vodnik za bolnice na poti okrevanja / Uršič Vrščaj Marjetka, Vegelj Pirc Marija	2004	961-90822-1-4
Ukrepajmo danes, da bomo živeli jutri. 31. strokovni seminar iz onkologije in onkološke zdravstvene nege, Moravske Toplice 2004 / uredile Skela Savič Brigita, Logonder Mira, Lokar Katarina	2004	961-6424-13-0
Maligni limfomi : vodnik za bolnike/ce na poti okrevanja / Jezeršek Novaković Barbara, uredila Vegelj Pirc Marija	2005	961-90822-6-5

Naslov Title	Leto Year	ISBN
Sodobni trendi v onkologiji in onkološki zdravstveni negi. 32. strokovni seminar iz onkologije in onkološke zdravstvene nege, Rogla 2005 / uredile Logonder Mira, Skela Savič Brigita, Lokar Katarina	2005	961-6424-27-0
Standardi v procesiranju materiala. Sterilizacija, srce bolnišnice : zbornik predavanj, Terme Radenci 2005 / uredila Žagar Andreja	2005	961-6424-20-3
Kirurško zdravljenje raka dojke in rekonstrukcija dojke : informativna knjižica za bolnice / Kaučič Matjaž, uredila Vegelj Pirc Marija	2006	961-90822-9-X
Med bolnišnico in domom : izziv medicinski sestri za kontinuirano onkološko zdravstveno nego, standardi zdravstvene nege Onkološkega inštituta Ljubljana. 33. strokovni seminar iz onkologije in onkološke zdravstvene nege, Rogla 2006 / uredile Logonder Mira, Lokar Katarina, Skela Savič Brigita	2006	978-961-6424-43-1
Obvladujmo spremembe. Sterilizacija, srce bolnišnice : zbornik predavanj, Rogaška Slatina 2006 / uredila Žagar Andreja	2006	961-6424-40-8
Biološka zdravila za zdravljenje raka : nov način sistemskega zdravljenja, novo upanje za bolnike / Čufer Tanja, uredila Vegelj Pirc Marija	2007	-
Rak na modih : vodnik za bolnike na poti okrevanja. Prenovljena in dopolnjena izd. / Stanovnik Marjeta, Vegelj Pirc Marija	2007	978-961-6658-00-3
Šola o melanomu / uredili Ocvirk Janja, Snoj Marko, Strojan Primož	2007	-
Ženske, moški in rak. 34. strokovni seminar iz onkologije in onkološke zdravstvene nege, Zreče 2007 / uredile Mlakar Mastnak Denis, Lokar Katarina	2007	978-961-6424-53-0
Varni in ekonomični postopki dela v sterilizaciji. Sterilizacija, srce bolnišnice : zbornik predavanj, Laško 2008 / uredili Žagar Andreja, Istenič Irena	2008	978-961-6424-71-4
Varnost bolnikov in osebja v onkologiji in onkološki zdravstveni negi. 35. strokovni seminar iz onkologije in onkološke zdravstvene nege, Rogla 2008 / uredile Mlakar Mastnak Denis, Lokar Katarina	2008	978-961-6424-68-4

Publikacije avtorjev z OI, katerih izdajo so omogočile farmacevtske družbe
Publications by the authors from the Institute of Oncology edited in cooperation of the Institute of Oncology with various pharmacevtical companies

Naslov Title	Leto Year	ISBN
Priporočila za zdravljenje bolečine pri odraslem bolniku z rakom / Lahajnar Čavlovič Slavica et al.	2001	-
Rak dojke : kaj morate vedeti / Borštnar Simona et al.	2004	961-238-329-4
Melanom : informacije o bolezni in zdravljenju / Ocvirk Janja, Hočevar Marko	2005	961-91297-1-7
Obvladovanje neželenih učinkov zdravljenja malignega melanoma z zdravilom Intron A / Ocvirk Janja	2005	-
Rak debelega črevesa in danke : kaj morate vedeti o bolezni / Ocvirk Janja, Vegelj Pirc Marija	2005	961-91295-1-2
Xeloda, kapecitabin : bolnikov dnevnik / Ocvirk Janja	2005	961-91295-2-0
Bolnikov vodnik za razumevanje možganskega tumorja in možganskih zasevkov / Smrdel Uroš et al.	2006	-
Le ovinek na poti življenja : [knjižica za pomoč bolnikom z rakom in njihovim svojcem] / Zakotnik Branko, uredili Červek Jožica et al.	2006	961-91470-1-4
Xeloda, kapecitabin med obsevanjem : bolnikov dnevnik / Ocvirk Janja et al.	2006	961-91295-3-9
Depresija pri bolnikih z rakom / Snoj Zvezdana	2008	978-961-6374-45-3
Melanom : informacije o bolezni in zdravljenju / Ocvirk Janja et al.	2008	978-961-91297-6-0
Ne-Hodgkinov limfom : priročnik za samoizobraževanje medicinskih sester / Vodušek Ana Lina	2008	978-961-91295-9-3
Tarčno zdravljenje raka na pljučih in trebušni slinavki : brošura in dnevnik za bolnike / Ocvirk Janja, Smrdel Uroš	2008	-

Raziskovanje in izobraževanje

Oddelek za eksperimentalno onkologijo

Vodja:
prof. dr. ***Gregor Serša****,*
univ. dipl. biol.

Odkrivanje novih in izboljševanje že uveljavljenih pristopov zdravljenja raka je prvi pogoj za napredek v onkologiji. Boj proti raku se začne v laboratoriju s preučevanjem mehanizmov nastanka in razvoja raka. Radovednost in ustvarjalni zagon raziskovalcev sta ključnega pomena pri zasnovi raziskav, vztrajnost in pogum pa pri translaciji zdravljenja raka iz laboratorijev v kliniko. Povezava raziskovalne dejavnosti in klinične onkologije je na Onkološkem inštitutu zagotovljena z Oddelkom za eksperimentalno onkologijo. Namen tega oddelka je razvijanje novih pristopov zdravljenja ter njihovo uvajanje v klinično testiranje in klinično prakso v onkologiji, torej tako imenovane translacijske raziskave.

Znanstvenoraziskovalno delo je v zadnjih 15 letih vpeto predvsem v biomedicinske aplikacije elektroporacije. To je fizikalni pristop, kjer z aplikacijo električnih pulzov na celice ali tumor začasno destabiliziramo celično membrano. S tem omogočimo, da v celice vstopijo molekule, ki drugače sploh ne bi ali pa bi težko vstopale vanje. Ta metoda je že dolgo znana pri delu s celičnimi kulturami, nekoliko drugačni električni parametri pa omogočajo tudi pristop in vivo, in sicer za dostavljanje nekaterih citostatikov, kot sta bleomicin in cisplatin, ali gole molekule DNK v celice ali tkiva. Zdravljenje z uporabo elektroporacije, s katerim povečamo učinek citotoksičnih zdravil, kot sta bleomicin in cisplatin, se imenuje elektrokemoterapija, če vnašamo DNA, pa elektrogenska terapija.

Bili smo pionirji elektrokemoterapije, ki se je začela razvijati pred 15 leti. Elektrokemoterapija s citostatikom cisplatinom je povsem rezultat našega razvoja. Elektrokemoterapija s cisplatinom ali bleomicinom je po uspešnih predkliničnih in kliničnih raziskavah ter po pripravljeni standardizaciji protokola zdravljenja, ki je bil pripravljen v okviru evropskega projekta ESOPE, postaja standardno, zato se lahko izvaja v vseh kliničnih ustanovah. Izvedbo omogoča generator električnih pulzov CLINIPORATOR, ki je plod evropskega konzorcija partnerjev, v katerem smo sodelovali tudi mi. V prihodnosti želimo elektrokemoterapijo klinično preizkusiti tudi za zdravljenje tumorjev na notranjih organih. Poleg tega smo to zdravljenje uvedli v veterinarsko medicino, kjer uspešno zdravijo različne primarne tumorje psov, mačk in konjev.

Elektrogensko zdravljenje uporablja podoben princip kot elektrokemoterapija. Z uporabo nekoliko drugačnih električnih pulzov dostavljamo v celice DNA molekule brez virusnih vektorjev, ki lahko povzročajo neželene stranske učinke. Na predklinični ravni razvijamo in optimiziramo parametre, ki so pomembni za uspešno transfekcijo, predvsem v tumorjih, da bi tako dosegli čim večji odstotek transfeciranih celic. Dobra transfekcija je pomembna za učinkovito izražanje terapevtskih genov in protitumorski učinek izraženih produktov. Terapevtski geni, ki jih uporabljamo v predkliničnih raziskavah, učinkujejo proti tumorjem na različne načine. Bodisi nadomestijo okvarjene gene, značilne za tumorske celice, bodisi stimulirajo imunski sistem, da se učinkoviteje bori proti tumorskim celicam, ali pa z mehanizmom utišanja preprečijo izražanje genov, ki so odgovorni za napredovanje maligne bolezni. V prihodnosti želimo izsledke predkliničnih raziskav elektrogenske terapije preizkusiti tudi v kliničnih raziskavah.

Razvoj obsevalnega zdravljenja, ki je eno od standardnih oblik zdravljenja raka, v zadnjem času vključuje tudi kombinacije obsevanja s spremljajočim lokalnim ali sistemskim zdravljenjem. Eden od načinov, kako povečati učinkovitost radioterapije, je radiosenzibilizacija tumorjev s kemoterapevtiki, kot sta bleomicin in cisplatin. Naše prve predklinične raziskave kombinacije elektrokemoterapije

Research and Education

Department of Experimental Oncology

Head:
Prof. ***Gregor Serša****,*
Ph.D. (Biol.)

The prerequisite that assures progress in oncology is to develop new treatment modalities and to improve those that have long been in use. The fight against cancer starts in the laboratory with the study of the mechanisms of cancer development and progression. Curiosity and research enthusiasm in investigators are of major importance in research, whereas persistence and courage are decisive in translating cancer treatment from the laboratory to the clinical setting. At the Institute of Oncology, the interrelationship between research and clinical oncology is provided by the department of experimental oncology. The main objective of the department is to develop new treatment approaches and their testing and application in the clinical setting, which, in fact, is the objective of translational research.

In the last 15 years, scientific research at the department has been focused mainly on the biomedical application of electroporation. Electroporation is a biophysical method used to temporarily disturb the cell membrane by applying electric pulses to cells, thus allowing molecules like DNA, which would not be able to or could hardly enter the cell, to pass into the cell through the cell membrane. This method has long been practiced in cell cultures, while slightly modified electrical parameters allow its application also in vivo, in particular for delivering certain cytostatics, like bleomycine and cisplatin, or naked DNA molecules into cells or tissue. Treatment with electroporation, which increases the effect of cytotoxic drugs like bleomycine and cisplatin, is termed electrochemotherapy; if naked DNA molecules are delivered, the treatment is termed electrogene therapy.

Fifteen years ago, when electrochemotherapy was initiated, we were pioneers in the research area. Electrochemotherapy with cisplatin is entirely the result of our research and development. After preclinical and clinical studies and standardization of treatment protocols designed and created within the European project ESOPE, treatment with electrochemotherapy is gradually being applied as a standard treatment method in clinical practice. Electrochemotherapy is carried out by a generator of electric pulses – the CLINIPORATOR, the result of joint research efforts by a European consortium of experts, with which our team partnered. In the future, we plan to test the use of electrochemotherapy in the treatment of tumors in internal organs. Furthermore, electrochemotherapy has also been introduced in veterinary medicine in the treatment of different primary tumors in dogs, cats and horses.

Electrogene therapy is performed on the same principle as electrochemotherapy, except that the electric pulses are modified so that naked DNA molecules, without virus vectors which can cause undesired side effects, are delivered into cells. In the preclinical phase, we developed and optimized the parameters that are vital for efficient transfection, particularly in tumors in which as high as possible percentage of transfected cells is desirable. Good transfection is important in order to obtain effective therapeutic gene expression and a high antitumor effect of the expressed products. Therapeutic genes applied in preclinical research have a different antitumor effect. They may replace the defective genes that are typical for tumor cells, or they may stimulate the immune system to fight more aggressively against tumor cells; or, with a silencing mechanism, they may even inhibit expression of the genes responsible for disease progression.

Treatment with irradiation, one of the standard cancer treatments, has recently been extended and also includes combinations of irradiation with concomitant local or systemic treatment. One of the

z obsevanjem so pokazale radiosenzibilizirajoč učinek cisplatina in bleomicina. Sinergističen radiosenzibilizirajoč učinek se je pokazal tudi pri kombinaciji elektrogenske terapije, ki stimulira imunski sistem in obsevanja. V nadaljnjih predkliničnih raziskavah je treba potrditi izreden protitumorski učinek kombiniranega zdravljenja še z uporabo frakcioniranega obsevanja, ki se uporablja v kliniki.

Delavci Oddelka za eksperimentalno onkologijo se vključujemo v pedagoške procese na dodiplomskem in podiplomskem študiju. Na dodiplomskem študiju smo aktivni na Zdravstveni fakulteti Univerze v Ljubljani, Visoki šoli za zdravstvo Izola Univerze na Primorskem in na Fakulteti za znanosti o okolju Univerze v Novi Gorici, na podiplomskem študiju pa pri študiju biomedicine, biotehnike in medicinske fizike Univerze v Ljubljani.

Doc. dr. Maja Čemažar je leta 2007 prejela državno Zoisovo priznanje za pomembne dosežke v eksperimentalni onkologiji. Njeno znanstvenoraziskovalno delo zajema biomedicinske aplikacije elektroporacije, predvsem genske terapije raka in elektrokemoterapije. Njena izvirna dosežka v zadnjih sedmih letih sta na dveh področjih, in sicer v elektrogenski terapiji raka in pri uvedbi elektrokemoterapije v veterinarsko medicino.

Dosedanje in prihodnje delo Oddelka za eksperimentalno onkologijo je bilo in bo usmerjeno v izvajanje translacijskih raziskav v onkologiji. Glavna področja dela bodo:
- razvijanje biomedicinskih aplikacij elektroporacije, predvsem v elektrokemoterapiji in elektrogenski terapiji,
- uvajanje nanotehnologije z magnetnimi nanodelci kot dostavnega sistema za gensko terapijo,
- razvijanje novih kombinacij radioterapije z gensko terapijo,
- raziskave o učinkih različnih terapevtskih pristopov na prekrvitev tumorjev in uporaba žilno razdiralnih in antiangiogenih terapij pri zdravljenju tumorjev.

Iz eksperimentalne onkologije so bile v domačih in mednarodno pomembnih strokovnih revijah objavljene številne publikacije. Podrobnejši podatki so dostopni tudi na spletni strani Onkološkega inštituta in v sistemu COBBIS.

methods to increase the efficiency of radiotherapy is to radiosensitize tumors with chemotherapeutics, such as bleomycine and cisplatin. In our initial preclinical research on the combined treatment of electrochemotherapy with radiation, a radiosensitizing effect for these two drugs was observed. A synergic radiosensitizing effect was also observed in the concomitant treatment of electrogene therapy, stimulating the immune system, and irradiation. In further preclinical studies, we shall investigate the antitumor effect of combined treatment when applying fractionated radiotherapy, which is used in clinical practice.

The staff of the department of experimental oncology is included in the pedagogic process at the undergraduate and graduate level of university studies. At the undergraduate level, our colleagues are teachers at the University College of Health Studies of the University of Ljubljana, the University College of Health Studies in Isola at the University of Primorska, and the School of Environmental Sciences of Nova Gorica Polytechnic, whereas graduate courses are given to students of biomedicine, biotechnics and medical physics at the University of Ljubljana.

In 2007, Assist. Prof. Maja Čemažar, Ph.D. (Biol.) received the 2006 Zois Award for her outstanding achievements in experimental oncology. Her scientific work covers biomedical applications of electroporation in two particular areas, electrogene therapy in cancer treatment and electrochemotherapy in veterinary medicine.

The work of the department of experimental oncology has been and will further be focused on translational research in oncology. The major areas of work will be:
- further development of biomedical applications of electroporation, particularly in electrochemotherapy and electrogene therapy;
- application of nanotechnology with magnetic nanoparticles as drug delivery systems in gene therapy;
- development of new combinations of radiotherapy and gene therapy; and
- research on different treatment approaches to blood perfusion in tumors, and application of antivascular and antiangiogenic therapies in cancer treatment.

Numerous scientific papers on experimental oncology have been published by members of the research team in local and internationally recognized medical journals. Details about these publications can be accessed on the website of the Institute of Oncology in the shared cataloguing system COBISS.

Vodja:
***Matjaž Musek**,*
univ. dipl. bibl.

Strokovna knjižnica za onkologijo se po Unescovi klasifikaciji uvršča med specialne knjižnice. Je osrednja onkološka knjižnica in specializiran informacijski center za onkologijo. Vključena je v sistem znanstveno-tehnološkega informiranja v Sloveniji, v vzajemni katalog slovenskih knjižnic (COBIB) ter v druge zbirke in servise sistema COBISS (Kooperativni online bibliografski sistem in servisi).

Ustanovljena je bila že na začetku razvoja Onkološkega inštituta, v zgodnjih 50. letih, kot izraz potreb multidisciplinarne usmerjenosti inštituta. Danes predstavlja osrednjo informativno točko za onkološko literaturo in informacije v Sloveniji, močno pa je povezana tudi s sorodnimi centri v Evropi in drugod po svetu. V zadnjih desetih letih je sledila razvoju informacijske tehnologije in njenih storitev, tako da sedaj že polovico potreb po informacijah in strokovni literaturi zadovoljuje v elektronski obliki iz e-virov in svetovnega spleta. Kot članica različnih konzorcijskih povezav slovenskih knjižnic je v zadnjih letih pridobila dostope do vseh pomembnejših agregatnih servisov elektronskih revij in knjig ter drugih infomacijskih virov. Tako lahko mirno zapišemo, da knjižnica danes lahko najde in dostavi katero koli informacijo, ki jo potrebujejo strokovnjaki OI pri svojem kliničnem, znanstvenem, pedagoškem ali upravno-tehničnem delu. V tem času je tudi avtomatizirala svoje celotno poslovanje, v zadnjem letu pa prehaja na nov sistem avtomatizacije, ki bo uporabnikom omogočil še boljši in učinkovitejši dostop do virov v lastni knjižnici in širše, neposredno na njihovem delovnem mestu. Pri tem pa knjižnica ne zanemarja pomembnih osebnih stikov s svojimi uporabniki (koordinacija nabave informacijskih virov, izobraževanje uporabnikov pri uporabi teh virov itn.), ki jih v prihodnje namerava še krepiti in obogatiti z drugimi oblikami povezovanja in sodelovanja.

Knjižnica še naprej redno vodi bibliografijo inštituta in vseh zaposlenih, ta baza pa je sedaj postala del širše zasnovanega sistema znanstveno-tehničnih bibliografskih in faktografskih informacij (SICRIS), ki so eden od temeljev merjenja in določanja znanstvene uspešnosti v državi. Knjižnica zato ne izdaja več redne desetletne bibliografije v knjižni obliki, temveč vsem zaposlenim omogoča neposreden dostop v bazo, kjer si sami lahko izpišejo bibliografijo za poljubno obdobje.

Strokovna knjižnica za onkologijo je, čeprav je bila ustanovljena za potrebe inštituta, aktiven partner v povezavah z drugimi knjižnicami v državi, saj je njena zbirka literature in virov informacij v veliki meri unikatna in zato pomembna za ves medicinski krog v Sloveniji. Akitvno se povezuje tudi s partnerskimi knjižnicami drugod po svetu, posebno v sistemu medbibliotečne izposoje. Knjižnica redno sodeluje na srečanjih in koordinaciji knjižnic biomedicinskega kroga v Sloveniji, vodja knjižnice je član pogajalske skupine konzorcija slovenskih knjižnic za pogajanja s ponudniki elektronskih zbirk in revij, je član strokovnih teles na Agenciji za raziskovalno dejavnost, zaposleni v knjižnici so člani Zveze bibliotekarskih društev Slovenije (ZBDS), kjer se dejavno vključujejo v delo zveze in njene Sekcije za specialne/visokošolske knjižnice, vodja knjižnice pa je tudi predstavnik slovenskih medicinskih knjižničarjev v svetu Evropskega združenja medicinskih bibliotekarjev EAHIL (European Association for Health Information & Libraries).

Head:
***Matjaž Musek**, B.Sc.*
(Lib.Sc.)

According to UNESCO classification, the library at the Institute of Oncology Ljubljana is a special library. It is the main library and specialized information center for oncology in Slovenia. The library is an integral part of the system of scientific and technical information in Slovenia and of the Cooperative Online Bibliographic Catalogue of Slovenian libraries (COBIB) and other databases and services of the COBISS system (Cooperative Online Bibliographic System & Services).

The library has existed since the very beginning of the Institute of Oncology. Its foundation dates back to the early 1950s, when it was set up in response to the need for a multidisciplinary approach to cancer treatment by the institute. Today, it represents a focal point for oncology information and literature available in Slovenia, and is closely connected with similar centers in Europe and worldwide. In the past decade, the library has been catching up with the rapid progress in information technology and services, and consequently now has the capacity to meet electronically half of its users' needs for information and medical literature by employing its own electronic collections on the Internet. As a member of various consortia of Slovenian libraries, the library has access to all important aggregators of electronic journals and books and other information sources. We can thus easily say that the library can provide any information that the medical professionals of our institute might seek in their clinical, scientific, educational, managerial or technical assignments. In the meantime, all library operations have been automated. This year, a new automated system with better and more efficient access to library information resources will be installed, allowing users direct access to these information resources from their own workstations. The library staff, however, do not neglect interpersonal relations; they maintain good contact with their users (coordinating new information resource acquisitions, advising on how to use the various information resources, etc.), and plans are underway to further intensify such cooperation.

In the meantime, the library continues with its regular updates of the bibliography of the institute and its employees; hence, this database has now become an integral part of a wider system of scientific and technical bibliographic and factographic information (SICRIS Slovenian Current Research Information System), which serves as basis for measuring and evaluating scientific competence in the country. For that reason, the library no longer issues a bibliography in a publication covering the last ten years, but rather provides direct access to the database, from which every employee can make a printout of the selected period by him- or herself.

Though the special library for oncology was established for the needs of the institute, it is an active partner in associations with other libraries in the country, as the collection of literary information resources in our library is unique and therefore of great importance for the wider medical circles in Slovenia. The library has also entered into partnership with similar libraries elsewhere in the world, particularly within the interlibrary loan system. The members of the library staff regularly attend conferences and coordination meetings of biomedical libraries in Slovenia. The head librarian is a member of the negotiating group of the Consortium of Slovenian Libraries, which is authorized to conduct negotiations with suppliers of electronic collections and journals, and is a member of advisory bodies of the Slovenian Research Agency. The library staff takes part in the Union of Associations of Slovene Librarians. Members actively participate in the work of the union, as well as of the section of special/university libraries, while the head librarian has been delegated to the Council of the European Association for Health Information and Libraries as the representative of Slovenian medical librarians.

Katedra za onkologijo in radioterapijo Medicinske fakultete Univerze v Ljubljani

Predstojnik:
prof. dr. ***Zvonimir Rudolf****,*
dr. med.

Asistenti:
prof. dr. ***Tanja Čufer****,*
dr. med.
doc. dr. ***Hotimir Lešničar****, dr. med.*
prof. dr. ***Primož Strojan****, dr. med.*

Pedagoška sestra:
Gordana Lokajner*,*
DMS, univ. dipl. org.

Katedra za onkologijo in radioterapijo je bila ustanovljena decembra 1947. Že naslednje leto je ljubljanska Medicinska fakulteta sprejela v svoj program onkologijo in radioterapijo kot poseben predmet. V tistem času so le redkokje poučevali onkologijo in radioterapijo kot poseben predmet, še danes so v Evropi tudi medicinske fakultete, ki tega nimajo. Tako je bila Katedra za onkologijo in radioterapijo ena izmed prvih v Evropi in tudi drugod po svetu.

Prvi predstojnik Katedre za onkologijo in radioterapijo je bil prof. dr. Leo Šavnik (1947–1963), za njim pa prof. dr. Božena Ravnihar (1963–1984) in prof. dr. Stojan Plesničar (1984–1995).
Katedra za onkologijo je kot klinična katedra že od ustanovitve umeščena na Onkološki inštitut Ljubljana, ki je tako tudi baza za pedagoško in raziskovalno dejavnost v onkologiji.

Pouk onkologije poteka v 5. letniku študija medicine in dentalne medicine, vendar mu je kljub obsežnosti problematike žal namenjenih premalo ur. Temu primerna je tudi zasedba katedre. V zadnjem obdobju smo sicer povečali število asistentskih mest (z dveh na tri), glede na pomembnost in delež patologije pa jih bo v naslednjih letih treba povečati. Pouk onkologije in radioterapije zato bogatimo z izbranimi multidisciplinarnimi predavanji habilitiranih učiteljev, ki so zaposleni na Onkološkem inštitutu. Študenti se seznanijo z nastankom, epidemiologijo, zgodnjim odkrivanjem ter diagnostiko in zdravljenjem rakavih bolezni. Spoznajo splošne onkološke principe, multidisciplinarni način obravnave bolnikov, usmerjeno onkološko anamnezo, opredelitev stanja zmogljivosti, metode diagnostike in zdravljenja.

Večino fonda predavanj namenjamo aktivnemu sodelovanju študentov v okviru seminarjev, ki jih pripravijo študenti sami ob pomoči moderatorjev s katedre.
V poletnem semestru s pomočjo habilitiranih asistentov in učiteljev ter izkušenih sodelavcev specialistov Onkološkega inštituta Ljubljana organiziramo zelo uspešne klinične vaje.

Chair for Oncology and Radiotherapy of the Faculty of Medicine, University of Ljubljana

Chairman:
Prof. ***Zvonimir Rudolf****, M.D., Ph.D.*

Faculty:
Prof. ***Tanja Čufer****, M.D., Ph.D.*
Assist.
Prof. ***Hotimir Lešničar****, M.D., Ph.D.*
Prof. ***Primož Strojan****, M.D., Ph.D.*

Teaching nurse:
Gordana Lokajner*, B.Sc. (Org.), graduated nurse*

The Chair of Oncology and Radiotherapy was established in December 1947. The following year, the Faculty of Medicine included oncology and radiotherapy in its curriculum as a separate subject. In those times, oncology and radiotherapy were not taught as a separate subject. Even today, in many European countries, medical school curricula do not include oncology and radiotherapy. So, our Chair of Oncology and Radiotherapy, under the aegis of the Faculty of Medicine, University of Ljubljana, was among the first in Europe and worldwide.

The first chairman was Prof. Leo Šavnik (1947–1963); he was succeeded by Prof. Božena Ravnihar (1963–1984) and Prof. Stojan Plesničar (1984–1995). Ever since its establishment, the Chair of Oncology has been located at the Institute of Oncology, which has throughout this period served as a basis for further educational and research work in oncology.

According to the curriculum of medical studies and dentistry, the subject “Oncology and Radiotherapy” is offered in the fifth year. Regrettably, considering the complexity of the subject, the number of hours dedicated to it is not sufficient; neither is the faculty of the chair. Recently the number of faculty members was increased from two to three. However, in view of the growing importance of the subject, and of pathology within it, more university teachers will be needed in the following five years. We are also further expanding the program of oncology and radiotherapy with multidisciplinary lectures given by habilitated lecturers employed by the Institute of Oncology. The students are thus given the opportunity to learn about cancer origins, epidemiology, early detection, and a multidisciplinary approach to cancer patient treatment that is primarily aimed at cancer history, performance status evaluation, and diagnostics and treatment methods.

The majority of the available teaching hours are intended to enhance active participation by students in seminal work, prepared by students under the tutelage of faculty moderators. For a six-month period the faculty members, in cooperation with habilitated teaching assistants and university teachers, as well as highly experienced specialists from the Institute of Oncology, also conduct a practical clinical training program for students, which appears to be very successful.

Sodelovanje s civilno družbo – prostovoljci in društvena dejavnost

*Koordinatorica prostovoljnega dela na OI je mag. **Klelija Štrancar***

Prostovoljno delo na Onkološkem inštitutu Ljubljana

Delo prostovoljcev je v razvitem svetu uveljavljena oblika dela v bolnišnicah, ker izboljšuje kakovost življenja bolnikov, zmanjšuje prezgodnje izgorevanje bolnišničnega osebja in prispeva k boljšemu poznavanju problematike okolja, s katero se srečujejo bolnišnice. Tudi na OI Ljubljana poteka prostovoljno delo zaradi enakih razlogov. Poleg visoke strokovne zdravstvene plati, ki jo omogoča sodobna medicina, prostovoljci bolnikom in bolnicam na OI kažejo tudi drugo plat – dajejo neformalno psiho-socialno podporo vsem tistim, ki si jo želijo in potrebujejo.

Prostovoljci, ki se želijo vključiti v to obliko dejavnosti na OI Ljubljana, morajo skozi nekaj izobraževanj, splošnih in usmerjenih, ki jih usposobijo za delo na našem inštitutu. Poleg tega morajo izpolniti potrebne obrazce ter podpisati Dogovor o izvajanju prostovoljstva na OI, ki jih zavezuje k izpolnjevanju predpisanih Pravil prostovoljnega dela na OI. Tako OI skupaj s prostovoljci zagotavlja visoko kakovost pomoči, ki jo potrebujejo bolniki in njihovi svojci.

Pomoč prostovoljcev je namenjena predvsem informiranju in druženju, po potrebi pa tudi spremljanju bolnikov na preiskave. Prostovoljci vsak dan obiskujejo bolnike in jim podarjajo del svojega prostega časa. Druženje poteka v obliki neformalnih pogovorov, igranja družabnih iger, izdelovanja raznih izdelkov, spoznavanja drugih krajev sveta prek potopisov ali spretnosti žive besede. Prostovoljci bolnikom omogočajo srečanja v kapelici, s pesmijo, branjem Svetega pisma, poglabljanjem in raznimi sprostitvenimi vajami. Bolnike spremljajo na sprehode in so jim na voljo za druge oblike druženja. V glavni avli Onkološkega inštituta skrbijo za prijazen sprejem bolnikov, ki prihajajo na ambulantne preglede, in njihovih spremljevalcev. Vse to je del prispevka prostovoljnega dela v skrbi za kakovostnejše preživljanje časa v bolnišnici.

Prostovoljci ne opravljajo del, ki so v opisu delovnih nalog zdravstvenih delavcev, in ne dajejo mnenj, ki spadajo v medicinsko področje. Vodijo pa dnevnik o svojem delu in pomembna opažanja posredujejo zdravstvenemu osebju.

Društva in skupine za samopomoč

Na OI Ljubljana že vrsto let delujejo skupine za samopomoč ter številna društva s področja onkologije. Te organizacije so pomembno pripomogle ne samo k psiho-socialni pomoči bolnikom, ampak tudi k dopolnitvi zdravstvenega sistema ter predvsem k ozaveščanju širše javnosti o raku. Na OI smo jim vedno znali prisluhniti in za uspešno sodelovanje s civilno družbo si bomo v dobro bolnikov prizadevali tudi v prihodnje. Hvala vsem društvom in posameznikom, ki pri teh rešitvah aktivno sodelujete.

Cooperation with Civil Society – Assistance of Volunteers and Non-governmental Organizations

*The voluntary services coordinator at the Institute of Oncology Ljubljana is **Klelija Štrancer**, M.Sc.*

Voluntary services at the Institute of Oncology

Voluntary services in hospitals are generally recognized as one of the hospital's areas of work; they help to improve the quality of life of patients, to protect hospital staff from burnout, and to expose to a wider public the problems that hospitals are faced with. Voluntary services at the Institute of Oncology Ljubljana have been initiated for these same reasons. Besides the most professional medical services that current medical science can provide, patients treated at the institute may also benefit from services offered by volunteers, who provide psychosocial support to the patients who need or ask for help of this kind.

Volunteers who wish to join voluntary services at the Institute of Oncology Ljubljana have to undergo obligatory trainings, both general and specialized, in which they acquire qualifications and skills for this work at our institute. In addition, they have to fill in registration forms and sign a volunteer services agreement, by which they are committed to follow the Rules on Voluntary Services at the Institute of Oncology Ljubljana. These requirements need to be fulfilled in order to assure high-quality support to patients and their relatives.

The support by volunteers is primarily aimed at providing information to patients and keeping them company or accompanying them to various examinations. Volunteers visit our patients regularly; every day, they spend some of their spare time with them, involving them in informal conversation, playing games, creating small pieces of art, and getting to know new places through travelogues or personal sharing. Volunteers also accompany them to gatherings in the chapel, where they try to relax them by singing, reading from the Bible, meditating and performing exercises to release their tension. They accompany them for walks and invite them to join in other forms of informal gathering. In the main reception hall of the Institute of Oncology, volunteers see to it that patients and their accompanying persons are warmly welcomed. The work of volunteers is an invaluable contribution to our joint endeavors to improve the quality of life of the patients during their stay in the hospital.

Volunteers, however, do not perform any of the tasks of health professionals employed by the institute and are not allowed to give any opinion related to medical or health care. They keep a diary of their work and report the observations they consider important to the medical staff of the hospital.

Cancer societies and self-help groups

Cancer societies and self-help groups have been working for several years at the Institute of Oncology. These organizations have significantly contributed to the general health care system, in particular in endeavors to make the public aware of cancer risks. The Institute of Oncology Ljubljana has always been open-handed with these organizations and will continue to support this successful cooperation with civil society. The institute wishes to thank all the societies, groups and individuals who so generously offer this kind of support.

Sodelovanje s civilno družbo – prostovoljci in društvena dejavnost

Društvo bolnikov z limfomom
predsednik Blaž Kondža
Vodnikovo naselje 1, 1000 Ljubljana
www.limfom.si

Društvo laringektomiranih Slovenije
predsednik Ivan Košak
Parmova 53, 1000 Ljubljana

Društvo onkoloških bolnikov s programom Pot k okrevanju – organizirana samopomoč bolnikov z rakom
predsednica prim. Marija Vegelj Pirc, dr. med.
Poljanska cesta 14, 1000 Ljubljana
www.onkologija.org

Europa Donna – slovensko združenje za boj proti raku dojk
predsednica prim. Mojca Senčar, dr. med.
Zaloška cesta 5, 1000 Ljubljana
www.europadonna-zdruzenje.si

Invalidsko društvo ILCO Ljubljana
predsednik Franc Rems
Parmova 53, 1000 Ljubljana
www.ilco-si.org

Ljubljansko društvo za boj proti raku
predsednica Vesna Sgerm Robič, dr. med.
Zaloška cesta 2, 1000 Ljubljana
www.rak-lj.si

Slovensko društvo Hospic
predsednica Tatjana Žargi
Dolenjska cesta 22, 1000 Ljubljana
www.drustvo-hospic.si

Slovensko združenje bolnikov z limfomom in levkemijo, L&L
predsednica Kristina Modic
Povšetova 37, 1000 Ljubljana

Ustanova Mali vitez
predsednica prof. dr. Berta Jereb, dr. med.
Zarnikova 3, 1000 Ljubljana
www.ustanova-malivitez.si

Združenje za boj proti raku debelega črevesa in danke – Europacolon Slovenija
predsednica Ivka Glas
Povšetova 37, 1000 Ljubljana

Zveza slovenskih društev za boj proti raku
predsednik prof. dr. Borut Štabuc, dr. med.
Zaloška cesta 2, 1000 Ljubljana
www.protiraku.si

Cooperation with Civil Society – Assistance of Volunteers and Non-governmental Organizations

Društvo bolnikov z limfomom (Lymphoma Patients Association)
President: Blaž Kondža
Vodnikovo naselje 1, 1000 Ljubljana
www.limfom.si

Društvo laringektomiranih Slovenije (Laryngectomy Patients Association)
President: Ivan Košak
Parmova 53, 1000 Ljubljana

Društvo onkoloških bolnikov s programom Pot k okrevanju – organizirana samopomoč bolnikov z rakom (Cancer Patients Association and its „Reach to Recovery“ program – cancer support group)
President: Marija Vegelj Pirc, M.D.
Poljanska cesta 14, 1000 Ljubljana
www.onkologija.org

Europa Donna – slovensko združenje za boj proti raku dojk (Europa Donna – Slovenian Breast Cancer Coalition)
President: Mojca Senčar, M.D.
Zaloška cesta 5, 1000 Ljubljana
www.europadonna-zdruzenje.si

Invalidsko društvo ILCO Ljubljana (Association of Disabled Persons – ILCO Ljubljana)
President: Franc Rems
Parmova 53, 1000 Ljubljana
www.ilco-si.org

Ljubljansko društvo za boj proti raku (Ljubljana Cancer Society)
President: Vesna Sgerm Robič, M.D.
Zaloška cesta 2, 1000 Ljubljana
www.rak-lj.si

Slovensko društvo Hospic (Slovenian Hospice Association)
President: Tatjana Žargi
Dolenjska c. 22, 1000 Ljubljana
www.drustvo-hospic.si

Slovensko združenje bolnikov z limfomom in levkemijo, L&L (Lymphoma & Leukemia Patients Association of Slovenia)
President: Kristina Modic
Povšetova 37, 1000 Ljubljana

Ustanova Mali Vitez (Little Knight Foundation)
President: Prof. Berta Jereb, M.D., Ph.D.
Zarnikova 3, 1000 Ljubljana
www.ustanova-malivitez.si

Združenje za boj proti raku debelega črevesa in danke - Europacolon Slovenija (Colorectal Patients Association – Europacolon Slovenia)
President: Ivka Glas
Povšetova 37, 1000 Ljubljana

Zveza slovenskih društev za boj proti raku (Association of Slovenian Cancer Societies)
President: Prof. Borut Štabuc, M.D., Ph.D.
Zaloška cesta 2, 1000 Ljubljana
www.protiraku.si


HANAUPORT

Zahvala

Marjetka Uršič Vrščaj
v imenu uredniškega odbora

Iskreno se zahvaljujemo vsem, ki so sodelovali pri zbiranju podatkov za zbornik, oblikovanju besedila in pripravi strokovnih ilustracij.

Prav tako se zahvaljujemo vsem sodelavcem Onkološkega inštituta, ki so s svojim delom pripomogli k učinkovitemu delovanju in ugledu inštituta, v zadnjih desetih letih in pred tem. Brez njihovega vsakodnevnega dela teh objavljenih podatkov ne bi bilo!

In ne nazadnje hvala vsem, ki so nam omogočili izdajo tega poročila in obeležitev 70-letnice našega inštituta.

Acknowledgement

Marjetka Uršič Vrščaj
(on behalf of the Editorial Board)

We greatly acknowledge the help of all who were involved in creating this almanac. Particular gratitude goes to our colleagues for gathering heaps of data and preparing illustrations, and to the authors for producing their written contributions.

We are most thankful to all the employees of the Institute of Oncology Ljubljana, who have, in the last decade and even much earlier than that, contributed with their assiduous work to the successful growth of the institute and its repute at the national and international level. Such success would have never been acclaimed, had it not been achieved through the relentless everyday efforts of the employees!

We also owe a debt of gratitude to our partners who assisted us in publishing this almanac and in organizing a commemoration of the 70th anniversary of the Institute of Oncology Ljubljana.

Thanks to all of them!

Seznam uslužbencev Onkološkega inštituta Ljubljana

Stanje zaposlenih na dan 30. junij 2008

(brez akademskih nazivov, ki so že navedeni drugje)

0.1. Generalni direktor	
Belak Aleša	Delavec brez poklica
Benedik-Senčar Alenka	Univerzitetni diplomirani pravnik
Čotar Uroš	Univerzitetni diplomirani fizik
Juvančič Veselka	Delavec brez poklica
Kocmur Jovanka	Delavec brez poklica
Krevs Cvetko	Delavec brez poklica
Miljković Branko	Vodogradbenik
Mag. **Rojec Aljoša**	Univerzitetni diplomirani inženir elektrotehnike
Dr. **Rudolf Zvonimir**	Doktor medicine
Smole Tatjana	Delavec brez poklica
Teršek Ana	Gimnazijski maturant
Tušek Tomaž	Strojni tehnik
0.2. Strokovni direktor	
Handukić Helena	Poslovni sekretar
Hotujec Simona	Diplomirani organizator- menedžer
Dr. **Novaković Srdjan**	Univerzitetni diplomirani biolog
Dr. **Žgajnar Janez**	Doktor medicine
I. Zdravstvena dejavnost	
1.0. Diagnostična dejavnost	
1.1. Oddelek za radiologijo	
Bačkonja Sanja	Diplomirani inženir radiologije
Bezjak Mihael	Diplomirani inženir radiologije
Breznik Silva	Doktor medicine
Čavlek Mihael	Doktor medicine
Čebulj Katja	Diplomirani inženir radiologije
Dimitrić Sandra	Upravni tehnik
Eržen Jakšič Romana	Doktor medicine
Frece Nina	Upravni tehnik
Fujan Maja	Radiološki inženir
Grobler Boris	Diplomirani inženir radiologije
Haclar Brigita	Diplomirani inženir radiologije
Mag. **Hertl Kristijana**	Doktor medicine
Hudales Brigita	Diplomirani inženir radiologije
Jereb Simona	Doktor medicine
Jokan Elizabeta	Diplomirani inženir radiologije
Mag. **Kadivec Maksimiljan**	Doktor medicine
Kokot Andreja	Diplomirani inženir radiologije
Kompare Urška	Diplomirani inženir radiologije
Korat Sebastijan	Diplomirani inženir radiologije

List of Employees of the Institute of Oncology Ljubljana

Employees on 30 june 2008

(with no academic titles, since they are already given elsewhere)

Korošec Gregor	Diplomirani inženir radiologije
Kovačič Anita	Diplomirani inženir radiologije
Kropivnik Mateja	Doktor medicine
Krznar Darja	Poslovni sekretar
Kučera Špela	Zdravstveni tehnik
Lekše Barbara	Diplomirana medicinska sestra
Lovrič Dimitrij	Doktor medicine
Marolt Mušič Maja	Doktor medicine
Miljković Ana	Diplomirani inženir radiologije
Možina Eva	Doktor medicine
Peterlin Karmen	Diplomirani inženir radiologije
Dr. **Podkrajšek Maja**	Doktor medicine
Podobnik Gašper	Diplomirani inženir radiologije
Rataj Alenka	Diplomirani inženir radiologije
Rener Miljeva	Doktor medicine
Rusjan Patricija	Diplomirani inženir radiologije
Stanković Aleksander	Diplomirani inženir radiologije
Strnad Simona	Diplomirani inženir radiologije
Šijanec Nežka	Zdravstveni tehnik
Vargazon Tomaž	Doktor medicine
Winkler David	Diplomirani inženir radiologije
Zdešar Mirjana	Zdravstveni tehnik
Zebič-Šinkovec Marta	Doktor medicine
1.2. Oddelek za nuklearno medicino	
Antonić Milka	Ekonomski tehnik
Bijelac Milica	Delavec brez poklica
Bogovič David	Diplomirani inženir radiologije
Dražumerič Samo	Diplomirani inženir radiologije
Horvat Rika	Doktor medicine
Hudomalj Boštjan	Magister farmacije / Diplomirani organizator - menedžer
Kovačič Mateja	Radiološki inženir
Krajnc Dragica	Delavec brez poklica
Malenšek Marjeta	Diplomirani inženir kemijske tehnologije
Muftić Elvisa	Diplomirani inženir radiologije
Sabo Krunoslav	Diplomirani zdravstvenik
Schwarzbartl Pevec Andreja Antonija	Doktor medicine
Škalič Katja	Diplomirani inženir radiologije
Škalič Slavko	Radiološki inženir
Večko Miroslava	Diplomirani inženir radiologije
Videgar Kralj Barbara	Doktor medicine
Vidmar Stanislav	Inženir elektrotehnike

Zogović Radmila	Delavec brez poklica
Dr. **Žagar Ivana**	Doktor medicine

1.3. Oddelek za citologijo

Bajec Nadežda	Ekonomski tehnik
Butara Polonca	Inženir farmacije / Univerzitetni diplomirani organizator
Grčar Kuzmanov Biljana	Doktor medicine
Gril Vesna	Laboratorijski tehnik
Halilović Sanita	Lesarski tehnik
Horvat Barbara	Upravni tehnik
Janež Milanka	Upravni tehnik
Jezeršek Sandra	Doktor medicine
Kavčič Tanja	Upravni tehnik
Dr. **Kloboves-Prevodnik Veronika**	Doktor medicine
Klopčič Ulrika	Doktor medicine
Laknar Simona	Laboratorijski tehnik
Dr. **Lavrenčak Jaka**	Univerzitetni diplomirani biolog
Matić Marijana	Laboratorijski tehnik
Mitić Dijana	Univerzitetni diplomirani mikrobiolog
Dr. **Nolde Nataša**	Univerzitetni diplomirani biolog
Petelin Milena	Laboratorijski tehnik
Dr. **Pogačnik Ana**	Doktor medicine
Dr. **Pohar-Marinšek Živa**	Doktor medicine
Salobir Lidija	Univerzitetni diplomirani mikrobiolog
Šturbej Brigita	Kemijski tehnik
Uhan Kastelic Simona	Dipl.Inženir laboratorijske biomedicine
Zalar Janja	Univerzitetni diplomirani biolog

1.4. Oddelek za patologijo

Dr. **Bračko Matej**	Doktor medicine
Brna Jana	Kemijski tehnik
Čaušević Jasmina	Laboratorijski tehnik
Djukić Slobodanka	Delavec brez poklica
Dr. **Drev Primož**	Doktor veterinarske medicine
Flek Marko	Diplomirani inženir kemijske tehnologije
Dr. **Frković Grazio Snježana**	Doktor medicine
Gašljević Gorana	Doktor medicine
Dr. **Gazić Barbara**	Doktor medicine
Hitij Sonja	Laboratorijski tehnik
Ivanuša Ivan	Laboratorijski tehnik
Jančar Janez	Doktor medicine
Kernjak Slak Mateja	Diplomirana inženirka laboratorijske biomedicine

Kozina Nataša	Laboratorijski tehnik
Dr. **Lamovec Janez Zdravko**	Doktor medicine
Limback Stokin Clara	Doktor medicine
Maričić Milanka	Ekonomski tehnik
Maričić Štefica	Delavec brez poklica
Milovanović Dragana	Laboratorijski tehnik
Ota Maja	Univerzitetni diplomirani biolog
Pečnik Aleksandra	Laboratorijski tehnik
Raković Danilka	Laboratorijski tehnik
Rupnik Barbara	Komercialni tehnik
Stokić Maja	Ekonomski tehnik
Suljić Sabina	Diplomirani inženir kemijske tehnologije
Šarić Sabina	Poslovni sekretar
Šinkovec Nada	Kemijski tehnik
Teraš Urška	Univerzitetni diplomirani biolog
Trškan Ines	Laboratorijski tehnik
Zidar Andreja	Doktor medicine

1.5. Oddelek laboratorijske dejavnosti

Artnik Slavka	Laboratorijski tehnik
Čibej-Avbelj Miranda	Laboratorijski tehnik
Čoroli Vera	Profesor biologije
Čuk-Pašanku Valentina	Univerzitetni diplomirani inženir farmacije
Dolničar Petra	Diplomirana inženirka laboratorijske biomedicine
Fogec Tatjana	Laboratorijski tehnik
Gantar Jana	Kemijski tehnik
Dr. **Grošel Alenka**	Univerzitetni diplomirani mikrobiolog
Kosmač Breda	Kemijski tehnik
Kovač Karmen	Kemijski tehnik
Lavrih Alenka	Inženir farmacije
Miočinović Janja	Kemijski tehnik
Mag. **Možina Barbara**	Univerzitetni diplomirani inženir farmacije specialist / Specialist medicinske biokemije
Novak Zdenka	Diplomirana inženirka laboratorijske biomedicine
Novakovič Nataša	Laboratorijski tehnik
Nunčič Polonca	Laboratorijski tehnik
Pangršič Zvonka	Gimnazijski maturant
Podergajs Pirc Marija	Laboratorijski tehnik
Slabič-Vidmar Jelena	Laboratorijski tehnik
Smerkol Sylte Anne Katrine	Inženir farmacije
Svetic Branka	Univerzitetni diplomirani inženir kemijske tehnologije / Specialist medicinske biokemije

Vrčon Anka	Kemijski tehnik
Vukšinič Irena	Laboratorijski tehnik
Zalar Marija	Kemijski tehnik
Založnik Katja	Diplomirani inženir laboratorijske biomedicine

1.7. Oddelek za molekularno diagnostiko	
Cerkovnik Petra	Univerzitetni diplomirani biolog
Dr. **Koković Ira**	Univerzitetni diplomirani biolog
Ličar Alenka	Univerzitetni diplomirani biolog
Dr. **Stegel Vida**	Univerzitetni diplomirani biolog
Tekavčič Elizabeta	Profesor biologije
Traven Simona	Laboratorijski tehnik
Zajc Karmen	Laboratorijski tehnik

2.0. Sektor operativnih dejavnosti	
Čarman Mojca	Doktor medicine
Gašperin Mojca	Doktor medicine
Jeglič Goran	Doktor medicine
Kerin Povšič Milena	Doktor medicine
Dr. **Kompan Lidija**	Doktor medicine
Novak Supe Barbka	Doktor medicine
Mag. **Rotovnik Kozjek Nada**	Doktor medicine
Stražišar Branka	Doktor medicine
Voje Minca	Doktor medicine
Mag. **Lahajnar-Čavlovič Slavica**	Doktor medicine
Mag. **Mahkovic - Hergouth Ksenija**	Doktor medicine
Deleva Anžič Tankica	Doktor medicine
Markelj Špela	Doktor medicine
Pahole Goličnik Jana	Doktor medicine
Perhavec Andraž	Doktor medicine
Grosek Jan	Doktor medicine
Mihalič Rene	Doktor medicine
Mulh Robert	Doktor medicine
Sever Primož	Doktor medicine
Dr. **Brecelj Erik**	Doktor medicine
Novak Marko	Doktor medicine
Mag. **Bergant Damijan**	Doktor medicine
Dr. **Bešič Nikola**	Doktor medicine
Mag. **Edhemović Ibrahim**	Doktor medicine
Mag. **Eržen Darja**	Doktor medicine
Kaučič Matjaž	Doktor medicine
Pompe Franc	Doktor medicine

Šušteršič Matjaž	Doktor medicine
Dr. **Snoj Marko**	Doktor medicine
Hočevar Marko	Doktor medicine
Gadžijev Eldar	Doktor medicine
Šalamun Vesna	Doktor medicine
Djurišić Astrid	Doktor medicine
Mag. **Baškovič Milan**	Doktor medicine
Bebar Sonja	Doktor medicine
Mag. **Stržinar Vida**	Doktor medicine
Dr. **Uršič Vrščaj Marjetka**	Doktor medicine
Vakselj Aleš	Doktor medicine

3.0. Sektor radioterapije	
Albreht Mateja	Diplomirani inženir radiologije
Anderluh Franc	Doktor medicine
Babič Petra	Diplomirani inženir radiologije
Dr. **Bilban-Jakopin Cvetka**	Doktor medicine
Bizjak Matošec Nataša	Radiološki inženir
Mag. **Burger Janez**	Profesor fizike
But Hadžić Jasna	Doktor medicine
Casar Božidar	Univerzitetni diplomirani fizik
Čakš Bogomir	Diplomirani inženir radiologije
Čarman Janka	Doktor medicine
Čemažar Urška	Diplomirani inženir radiologije
Črnak Andreja	Radiološki inženir
Čuk Nevenka	Univerzitetni diplomirani inženir farmacije specialist
Mag. **Dremelj Marta**	Doktor medicine
Dr. **Fras Albert Peter**	Doktor medicine
Gačnik Uroš	Diplomirani inženir radiologije
Giovani Urban	Diplomirani inženir radiologije
Gojkovič Horvat Andreja	Doktor medicine
Gorič Sabina	Diplomirani inženir radiologije
Dr. **Grabec Daša**	Univerzitetni diplomirani fizik
Gruden Simona	Radiološki inženir
Gugić Kevo Jasenka	Doktor medicine
Hace Dunja	Diplomirani inženir radiologije
Hafnar Darja	Diplomirani inženir radiologije
Hanuna Omar	Radiološki inženir
Hlupič Srečko	Diplomirani inženir radiologije
Horvat Tomaž	Diplomirani inženir radiologije
Hübscher Karmen	Diplomirani inženir radiologije
Hudej Rihard	Univerzitetni diplomirani fizik

Dr. **Hudej Robert**	Univerzitetni diplomirani fizik
Iglič Andreja	Radiološki inženir
Ikić Vojislav	Radiološki inženir
Mag. **Jančar Boris**	Doktor medicine
Jelovčan Marjeta	Diplomirani inženir radiologije
Jeraj Matjaž	Diplomirani inženir radiologije
Mag. **Karner Katarina Barbara**	Doktor medicine
Kavšek Šket Metka	Radiološki inženir
Kjuder Igor	Radiološki inženir
Kolar Matjaž	Radiološki inženir
Koroša Polonca	Diplomirani inženir radiologije
Kos Franc	Diplomirani inženir radiologije
Kos Gregor	Doktor medicine
Kotar Nika	Diplomirani inženir radiologije
Mag. **Kovač Viljem**	Doktor medicine
Kračun Marko	Diplomirani inženir radiologije
Dr. **Kragelj Borut**	Doktor medicine
Krašovec Bogdana	Diplomirani inženir radiologije
Kuduzović Emir	Diplomirani inženir radiologije
Kumar Dušan	Radiološki inženir
Legen Tadeja	Diplomirani inženir radiologije
Dr. **Lešničar Hotimir**	Doktor medicine
Ljubijankić Roman	Diplomirani inženir radiologije
Majdič Elga	Doktor medicine
Marolt Jerneja	Diplomirani inženir radiologije
Marolt Primož	Diplomirani inženir radiologije
Melgaard Elizabeth Mary Joan	Diplomirani inženir radiologije
Miklavčič Janez Anže	Diplomirani inženir radiologije
Miklavž Mojca	Diplomirani inženir radiologije / Univerzitetni diplomirani organizator
Mlekuž Matevž	Diplomirani inženir radiologije
Ninković Zdenka	Radiološki inženir
Nosan Irena	Diplomirani inženir radiologije
Novak Gregor	Diplomirani inženir radiologije
Oblak Barbara	Diplomirani inženir radiologije
Dr. **Oblak Irena**	Doktor medicine
Oklješa Lukič Aleksandra	Diplomirani inženir radiologije
Palamar Esma	Diplomirani inženir radiologije
Paulin Košir Marija Snežna	Doktor medicine
Pernek Tatjana	Diplomirani inženir radiologije
Petković Saša	Diplomirani inženir radiologije
Mag. **Petrič Primož**	Doktor medicine

Pičman Franc	Elektrotehnik
Pikec Mojca	Diplomirani inženir radiologije
Počič Slavka	Diplomirani inženir radiologije
Pogačnik Elizabeta	Diplomirani inženir radiologije
Posl Aleš	Diplomirani inženir radiologije
Prek Erika	Diplomirani inženir radiologije
Prusnik Mojca	Diplomirani inženir radiologije
Rajer Mirjana	Doktor medicine
Rajšter Franjo	Diplomirani inženir radiologije
Mag. **Robar Vlado**	Univerzitetni diplomirani fizik
Robnik Matevž	Diplomirani inženir radiologije
Saje Klavdija	Diplomirani inženir radiologije
Sekereš Boris	Radiološki inženir
Sgerm-Robič Vesna	Doktor medicine
Simšič Marija Majda	Diplomirani inženir radiologije
Skoblar Vidmar Marija	Doktor medicine
Mag. **Smrdel Uroš**	Doktor medicine
Mag. **Stanič Karmen**	Doktor medicine
Stražišar Boštjan	Diplomirani inženir radiologije
Dr. **Strojan Primož**	Doktor medicine
Strojnik Andrej	Univerzitetni diplomirani fizik
Šanjić Suzana	Diplomirani inženir radiologije
Šarvari Attila	Univerzitetni diplomirani fizik
Šegedin Barbara	Doktor medicine
Šešek Manja	Doktor medicine
Šljivić Željko	Diplomirani inženir radiologije
Dr. **Šoba-Podobnik Erika**	Doktor medicine
Mag. **Tomšič Demšar Radka**	Doktor medicine
Trojar Mateja	Diplomirani inženir radiologije
Turk Maruša	Diplomirani inženir radiologije
Vavtar Alenka	Diplomirani inženir radiologije
Dr. **Velenik Vaneja**	Doktor medicine
Mag. **Verk Tomaž**	Univerzitetni diplomirani fizik
Vodopivec Katja	Diplomirani inženir radiologije
Vodušek Ana Lina	Doktor medicine
Vojvodić Ilija	Univerzitetni diplomirani inženir elektrotehnike za telekomunikacije
Vrankar Martina	Doktor medicine
Dr. **Zadravec Zaletel Lorna**	Doktor medicine
Zečević Maruša	Diplomirani inženir radiologije
Zlatič Jernej	Univerzitetni diplomirani fizik
Mag. **Zobec Logar Barbara Helena**	Doktor medicine

Dr. **Zwitter Matjaž**	Doktor medicine
Žager Valerija	Diplomirani inženir radiologije
Železnik Matej	Diplomirani inženir radiologije
Žumer Barbara	Doktor medicine
Županič Metka	Diplomirani inženir radiologije

4.0. Sektor internistične onkologije	
Benedik Jernej	Doktor medicine
Blatnik Ana	Doktor medicine
Dr. **Borštnar Simona**	Doktor medicine
Cerar Olga	Doktor medicine
Dr. **Čufer Tanja**	Doktor medicine
Ćirić Eva	Doktor medicine
Mag. **Grašič Kuhar Cvetka**	Doktor medicine
Mag. **Hlebanja Zvezdana**	Doktor medicine
Humar Mojca	Doktor medicine
Dr. **Jagodic Monika**	Doktor medicine
Dr. **Jezeršek Novaković Barbara**	Doktor medicine
Mag. **Južnič Šetina Tanja**	Doktor medicine
Lesnik Tina	Doktor medicine
Mag. **Matos Erika**	Doktor medicine
Mag. **Milanez Tomaž**	Doktor medicine
Dr. **Ocvirk Janja**	Doktor medicine
Mag. **Reberšek Martina**	Doktor medicine
Snoj Nataša	Doktor medicine
Mag. **Škof Erik**	Doktor medicine
Dr. **Škrbinc Breda**	Doktor medicine
Dr. **Volk Neva**	Doktor medicine
Mag. **Vovk Marjeta**	Doktor medicine
Dr. **Zakotnik Branko**	Doktor medicine

5.0. Skupne zdravstvene dejavnosti	
Hren Irena	Univerzitetni diplomirani inženir živilske tehnologije
Vrečar Alenka	Diplomirana medicinska sestra
Kerševan Tina	Diplomirana medicinska sestra
Snoj Zvezdana	Doktor medicine
Škufca Smrdel Andreja Cirila	Univerzitetni diplomirani psiholog
Mag. **Roš-Opaškar Tanja**	Doktor medicine
Milost Sonja	Diplomirani fizioterapevt
Jecić Natalija	Fizioterapevt
Primožič Irena	Diplomirani fizioterapevt
Šterlek Petra	Diplomirani fizioterapevt
Rotner Edita	Diplomirani fizioterapevt

Hotujec Janez	Delevec brez poklica
Mehle Jože	Delevec brez poklica
Adlešič Ksenija	Komercialni tehnik
Bašelj Blanka	Zdravstveni tehnik babica
Benulič Urška	Upravni tehnik
Božič Zorica	Poslovni sekretar
Bradeško Marija	Ekonomski tehnik
Dremelj Ivanka	Upravni tehnik
Gabrovšek Janja	Administrativni tehnik
Gostič Barbara	Upravni tehnik
Grabljevec Snežana	Ekonomski tehnik
Grabnar Janja	Upravni tehnik
Gredelj Sajma	Delevec brez poklica
Hamiti Nataša	Upravni tehnik
Jerman Gabrijela	Administrativni manipulant
Jontez Nataša	Ptt tehnik
Kadunc Simona	Upravni tehnik
Kelava Sanja	Upravni tehnik
Koprivec Mojca	Upravni tehnik
Koren Alojzija	Administrativni manipulant
Kristan Lidija	Upravni tehnik
Lovšin Sabina	Gimnazijski maturant
Ložar Sonja	Upravni tehnik
Majetič Dijana	Upravni tehnik
Majetić Francka	Delevec brez poklica
Marn Petra	Upravni tehnik
Martinkovič Marjana	Upravni tehnik
Mohorko Jožica	Administrativni tehnik
Ocepek Vesna	Organizator dela
Porenta Karmen	Upravni tehnik
Pšeničnik Katarina	Ekonomski tehnik
Pšeničnik Marija	Delevec brez poklica
Smolič Anja	Organizator poslovanja v turizmu
Sodnik Andreja	Upravni tehnik
Trstenjak Stanislava	Ekonomski tehnik
Urbanija Irena	Upravni tehnik
Velkavrh Milena	Delevec brez poklica
Vukšinič Stanka	Delevec brez poklica
Žitko Maja	Upravni tehnik
Vučko Jadranka	Višji upravni delavec

6.0. Dejavnost zdravstvene nege in oskrbe bolnika	
Aberšek Andreja	Zdravstveni tehnik
Aćimović Momirka	Zdravstveni tehnik
Ahmetović Anita	Zdravstveni tehnik
Alibabić Ramiza	Delavec brez poklica
Aničić Pelka	Delavec brez poklica
Antolović Elizabeta	Zdravstveni tehnik
Arsić Angelina	Industrijski oblikovalec
Arsić Slavica	Zdravstveni tehnik
Avsec Helena	Diplomirana medicinska sestra
Babić Vera	Zdravstveni tehnik
Balaban Tina	Diplomirana medicinska sestra
Bašić Elvedina	Zdravstveni tehnik
Begulić Fatima	Delavec brez poklica
Begulić Ramiza	Zdravstveni tehnik
Belcl Darinka	Zdravstveni tehnik
Berglez Branka	Zdravstveni tehnik
Bernot Marjana	Diplomirana medicinska sestra / Univerzitetni diplomirani organizator
Bevc Helena	Zdravstveni tehnik
Bilanović Ramza	Delavec brez poklica
Bizjak Silva	Višja medicinska sestra / Univerzitetni diplomirani organizator
Blatnik Petra	Zdravstveni tehnik
Bolta Magdalena	Višja medicinska sestra
Boršoš Špela	Diplomirana medicinska sestra
Breznik Cvetka	Zdravstveni tehnik
Bricelj Metka	Višja medicinska sestra
Brili Vera	Višja medicinska sestra
Bruner Robert	Zdravstveni tehnik
Bubregović Jasmin	Zdravstveni tehnik
Bučar Suzana	Diplomirana medicinska sestra
Budiša Tamara	Bolničar
Cerar Cvetka	Višja medicinska sestra
Cinac Anita	Zdravstveni tehnik
Colarič Ančka	Bolničar
Crljenica Suzana	Zdravstveni tehnik
Cvetek Elizabeta	Zdravstveni tehnik
Cvetko Marta	Zdravstveni tehnik
Čančar Miroslav	Bolničar
Čečelič Gabrijela	Pomožna šivilja
Červ Branka	Profesor zdravstvene vzgoje
Čizmić Ana	Diplomirana medicinska sestra

Ćudić Semra	Zdravstveni tehnik
Dacar Petra	Diplomirana medicinska sestra
Damjanović Brankica	Zdravstveni tehnik
Delagić Zumreta	Delavec brez poklica
Delorenzo Mojca	Zdravstveni tehnik
Dembsky Olga	Zdravstveni tehnik
Demić Irena	Bolničar
Deržek Anka	Zdravstveni tehnik
Despotović Vukana	Zdravstveni tehnik
Dešman Špela	Zdravstveni tehnik
Djurić Marinka	Diplomirana medicinska sestra
Domazet Zinka	Delavec brez poklica
Džafić Senada	Zdravstveni tehnik
Đošan Dobrinka	Zdravstveni tehnik
Đukić Slavica	Bolničar
Đurić Branka	Zdravstveni tehnik
Đurić Mirjana	Zdravstveni tehnik
Đurić Stamenka	Zdravstveni tehnik
Erdelji Petra	Zdravstveni tehnik
Erjavšek Zdenka	Diplomirana medicinska sestra
Erzin Irena	Višja medicinska sestra
Fajfar Ana	Zdravstveni tehnik
Farkaš Andreja	Zdravstveni tehnik
Fister Jasmina	Diplomirana medicinska sestra
Gavrić Robert	Zdravstveni tehnik
Gjergjek Hilda	Zdravstveni tehnik
Globokar Zdenka	Zdravstveni tehnik
Gobec Maja	Zdravstveni tehnik
Golob Irenca	Višja medicinska sestra
Gonc Marija	Zdravstveni tehnik
Gorenc Nataša	Diplomirana medicinska sestra
Gorjanc Romana	Zdravstveni tehnik
Gorta Marija	Višja medicinska sestra
Gradišek Margareta	Zdravstveni tehnik
Grbič Aleksandra	Diplomirana medicinska sestra
Grošelj Uršula	Zdravstveni tehnik
Hadžić Nives	Zdravstveni tehnik
Hamzić Vesna	Diplomirana medicinska sestra
Hedžić Zemine	Delavec brez poklica
Heimbring Barbara	Zdravstveni tehnik
Horvat Darja	Zdravstveni tehnik
Horvat Marija	Višja medicinska sestra

Hribar Katja	Zdravstveni tehnik
Hribar Milena	Zdravstveni tehnik
Hribernik Antonija	Zdravstveni tehnik
Hribernik Sabina	Diplomirana medicinska sestra
Hrovatin Petra	Zdravstveni tehnik
Hudarin Johana	Zdravstveni tehnik
Husić Azra	Zdravstveni tehnik
Iglič Petra	Višja medicinska sestra
Indić Dejan	Zdravstveni tehnik
Istenič Ana	Diplomirana medicinska sestra
Jakovac Kojek Jolanda	Diplomirana medicinska sestra
Janežič Marta	Zdravstveni tehnik babica
Janićijević Lidija	Zdravstveni tehnik
Jankovič Rajmonda	Zdravstveni tehnik
Jašič Vesna	Diplomirana medicinska sestra
Mag. **Jeleč Diana**	Univerzitetna diplomirana socialna delavka
Jelen Jurič Jožica	Diplomirana medicinska sestra
Jendrič Tatjana	Zdravstveni tehnik
Jeneš Anita	Zdravstveni tehnik
Jeneš Lilijana	Zdravstveni tehnik
Jeneš Robert	Zdravstveni tehnik
Jeneš Simon	Zdravstveni tehnik
Jenko Romana	Diplomirana medicinska sestra
Jesenšek Sonja	Zdravstveni tehnik
Jevševar Nevenka	Zdravstveni tehnik
Joska Tanja	Zdravstveni tehnik
Jovan Boštjan	Diplomirani zdravstvenik
Jovanović Cvetka	Zdravstveni tehnik
Jularić Kata	Delavec brez poklica
Junuzović Đula	Delavec brez poklica
Jusufagić Rasema	Delavec brez poklica
Kajtazović Esnefa	Zdravstveni tehnik
Kalan Veronika	Zdravstveni tehnik
Kalem Snježana	Zdravstveni tehnik
Kaligarič Lara	Diplomirana medicinska sestra
Kamnikar Ružica	Delavec brez poklica
Kastelic Nina	Diplomirana medicinska sestra
Kastelic Zvonka	Diplomirana medicinska sestra
Kaučič Klavdija	Zdravstveni tehnik
Kečkeš Janja	Kemijski laborant
Kiris Josipa	Delavec brez poklica
Klanjšek Petra	Diplomirana medicinska sestra

Klemenc Alojzij	Avtomobilski klepar
Klinc Andreja	Zdravstveni tehnik
Klopčič Natalija	Diplomirana medicinska sestra
Knafelc Jeromel Nataša	Višja medicinska sestra
Knez Lidija	Delavec brez poklica
Knez Marta	Delavec brez poklica
Kocet Sabina	Diplomirana medicinska sestra
Koci Klopčič Jasmina	Zdravstveni tehnik
Kočar Karina	Zdravstveni tehnik
Kojić Mihajlo	Delavec brez poklica
Kolenc Katja	Diplomirana medicinska sestra / Univerzitetni diplomirani komunikolog
Komić Jasmira	Zdravstveni tehnik
Koncilja Andrej	Diplomirani zdravstvenik
Korunić Maja	Diplomirana medicinska sestra
Košele Damjan	Zdravstveni tehnik
Kotar Martina	Zdravstveni tehnik
Kotar Simona	Zdravstveni tehnik
Kovačević Cvija	Delavec brez poklica
Kožuh Lidija	Zdravstveni tehnik
Kožuh Maja	Diplomirana medicinska sestra
Krajnc Polona	Zdravstveni tehnik
Kralj Tanja	Diplomirana medicinska sestra
Kralj-Serša Katja	Diplomirana medicinska sestra
Kranjc Marija	Delavec brez poklica
Kranjec Marija	Diplomirana medicinska sestra
Kranjec Sandra	Zdravstveni tehnik
Krečan Nina	Zdravstveni tehnik
Krivec Matijašič Romana	Zdravstveni tehnik
Križ Irena	Diplomirana medicinska sestra
Križan Debevc Sandra	Diplomirana medicinska sestra
Krmelj Antonija	Bolničar
Krstevska Alenka	Zdravstveni tehnik
Kuravica Danijel	Zdravstveni tehnik
Lampič Petra	Zdravstveni tehnik
Lavrič Sabina	Zdravstveni tehnik
Leskovar Vlasta	Višja medicinska sestra
Levičnik Nežka	Diplomirana medicinska sestra
Levpušček Helena	Zdravstveni tehnik
Lipič Urška	Zdravstveni tehnik
Lipuš Klavdija	Zdravstveni tehnik
Ljubojević Marica	Bolničar

Logonder Marija	Višja medicinska sestra
Lokajner Gordana	Diplomirana medicinska sestra / Univerzitetni diplomirani organizator
Lučić Zorica	Kuharski pomočnik
Macanović Minka	Diplomirana medicinska sestra
Maček Jadranka	Zdravstveni tehnik
Mahić Merima	Zdravstveni tehnik
Malič Marija	Višja medicinska sestra
Marić Kristina	Zdravstveni tehnik
Marinček Gordana	Diplomirana medicinska sestra
Marinko Leonida	Diplomirani socialni delavec
Markovič Jana	Diplomirana medicinska sestra
Matjaž Evelina	Zdravstveni tehnik
Matjaž Mojca	Zdravstveni tehnik
Matković Miladinka	Višja medicinska sestra
Mavrič Zlatka	Višja medicinska sestra
Mehle Majda	Zdravstveni tehnik
Mernik Marina	Zdravstveni tehnik
Mesaroš Marika	Višja medicinska sestra
Mihelčič Anica	Zdravstveni tehnik
Miklavčič Darinka	Zdravstveni tehnik
Miku Mirjana	Diplomirana medicinska sestra
Miladinović Biljana	Zdravstveni tehnik
Milanković Milena	Delavec brez poklica
Milanović Sanja	Zdravstveni tehnik
Milenković Gordana	Zdravstveni tehnik
Milić Krista	Blagovni manipulant
Miljković Mirjana	Zdravstveni tehnik
Milošević Rahima	Delavec v rastlinski proizvodnji
Mladenović Srbijanka	Zdravstveni tehnik
Mlakar Mastnak Denis	Specialistka klinične dietetike
Močivnik Uroš	Zdravstveni tehnik
Mršič Vesna	Zdravstveni tehnik
Mrzelj Irma	Diplomirana medicinska sestra
Muha Alenka	Višja medicinska sestra
Musić Darija	Višja medicinska sestra / Diplomirani ekonomist
Muzga Gradišek Blanka	Zdravstveni tehnik
Nikolić Marica	Delavec brez poklica
Nikolić Slavica	Delavec brez poklica
Oblak Brigita	Višja medicinska sestra
Ocvirk Jasna	Zdravstveni tehnik
Oder Tjaša	Zdravstveni tehnik

Okorn Tjaša	Diplomirana medicinska sestra
Okrajac Slavica	Zdravstveni tehnik
Osredkar Mojca	Delavec brez poklica
Ostrožnik Vesna	Diplomirana medicinska sestra
Paklec Branka	Diplomirana medicinska sestra
Palamar Nizra	Diplomirana medicinska sestra
Pangerc Mateja	Zdravstveni tehnik
Patekar Marija	Delavec brez poklica
Pavlovič Romana	Zdravstveni tehnik
Pavlović Sanja	Zdravstveni tehnik
Pečan Salokar Tjaša	Diplomirana medicinska sestra
Pečlin Petra	Zdravstveni tehnik
Pečnik Vavpotič Tjaša	Profesor zdravstvene vzgoje
Pejičić Barbara	Zdravstveni tehnik
Pejić Milena	Zdravstveni tehnik
Pelikan Žnidarič Karmen	Zdravstveni tehnik
Penič Špela	Diplomirana medicinska sestra
Petaci Jasmina	Zdravstveni tehnik
Peterlin Ksenija	Diplomirana medicinska sestra
Petje Marko	Zdravstveni tehnik
Petković Živka	Prodajalec
Petrica Laura	Diplomirana medicinska sestra
Petrijevčanin Biserka	Višja medicinska sestra
Pibernik Mateja	Zdravstveni tehnik
Pirih Maja	Zdravstveni tehnik
Poglajen Ksenija	Zdravstveni tehnik babica
Polak Bojan	Delavec brez poklica
Polanič Peter	Zdravstveni tehnik
Poljšak Kristina Marija	Zdravstveni tehnik
Pompe Nada	Zdravstveni tehnik babica
Popadić Smilja	Delavec brez poklica
Potrbin Jolanda	Zdravstveni tehnik babica
Pouh Tatjana	Diplomirana medicinska sestra
Poženel Polona	Diplomirana medicinska sestra
Prelovac Verica	Ekonomski tehnik
Prijatelj Brigita	Diplomirana medicinska sestra
Prosen Marija	Zdarvstveni tehnik
Prosenc Rozalija	Delavec brez poklica
Pršić Milica	Delavec brez poklica
Pučko Tatjana	Zdravstveni tehnik
Radolič Dejan	Zdravstveni tehnik
Raković Jožefa	Zdravstveni tehnik

Ramić Mugdin	Zdravstveni tehnik
Raušl Urban	Zdarvstveni tehnik
Raztočnik Damjana	Diplomirana medicinska sestra
Rebec Marjanca	Zdravstveni tehnik
Rebeušek Marija	Višja medicinska sestra
Rebrec Bernarda	Zdravstveni tehnik
Recek Cvetka	Bolničar
Redžić Lumnije	Zdravstveni tehnik
Redžić Senad	Zdarvstveni tehnik
Remić Edina	Diplomirana medicinska sestra
Ristič Marica	Delavec brez poklica
Roglič Štirn Mojca	Bolničar
Rozman Blaž	Delavec brez poklica
Sabo Stanka	Zdravstveni tehnik
Savić Anđelka	Delavec brez poklica
Selimović Zlate	Zdravstveni tehnik
Seljak Barbara	Zdarvstveni tehnik
Semenič Suzana	Diplomirana medicinska sestra
Senić Branka	Višja medicinska sestra
Sever Karmen	Diplomirana medicinska sestra
Simikić Slavica	Delavec brez poklica
Simovska Zlata	Zdravstveni tehnik
Skebe Anica	Zdravstveni tehnik
Sladić Ankica	Delavec brez poklica
Slak Helena	Zdravstveni tehnik
Slapar Tatjana	Diplomirana medicinska sestra
Slekovec-Kolar Breda	Diplomirana medicinska sestra
Smlatić Azra	Zdarvstveni tehnik
Smrekar Cvetka	Zdravstveni tehnik
Srdić Marina	Zdravstveni tehnik
Stanić Jelena	Zdravstveni tehnik
Stanojević Ozrenka	Zdravstveni tehnik
Stanovnik Maja	Diplomirana medicinska sestra
Stipanič Olga	Zdravstveni tehnik
Stojanović Olivera	Zdravstveni tehnik
Stojanović Violeta	Zdravstveni tehnik
Strle Nadja	Zdravstveni tehnik
Stupar Šerife	Delavec brez poklica
Šalehar Anamarija	Višja medicinska sestra
Šćulija Fina	Zdravstveni tehnik
Šegš Nataša	Diplomirana medicinska sestra
Šelih Anastazija	Zdravstveni tehnik

Šelih Jožefa	Zdravstveni tehnik
Šešet Aida	Diplomirana medicinska sestra
Šinko Aleš	Zdravstveni tehnik
Škarja Sabina	Zdravstveni tehnik
Špehar Anita	Bolničar
Špolar Nina	Zdravstveni tehnik
Mag. **Štrancar Klelija**	Univerzitetni diplomirani teolog
Štriker Gregor	Zdravstveni tehnik
Šundić Bojan	Zdravstveni tehnik
Švajger Cvetka	Komercialni tehnik
Švigelj Rogelj Barbara	Diplomirana medicinska sestra
Tabaković Lea Athena	Zdravstveni tehnik
Tabaković Supha	Delavec brez poklica
Terbovšek Robert	Višji zdravstveni tehnik
Tešanović Mara	Delavec brez poklica
Todorović Dragan	Zdravstveni tehnik
Todorović Gospava	Zdravstveni tehnik
Tomc Jelka	Višja medicinska sestra
Tomšič Urška	Diplomirana medicinska sestra
Topole Amadeja	Diplomirana medicinska sestra
Toprek Sanja	Zdravstveni tehnik
Turk Nives	Zdravstveni tehnik
Turna Zlatka	Diplomirana medicinska sestra
Učak Andreja	Delavec brez poklica
Učakar Blagunja	Zdravstveni tehnik
Umičević Snežana	Diplomirana medicinska sestra
Unofrejščuk Ankica	Delavec brez poklica
Urankar Milanka	Zdravstveni tehnik
Uršič Helena	Višja medicinska sestra
Us Bojana	Zdravstveni tehnik
Uštar Tanja	Diplomirana medicinska sestra
Varga Rozalija	Zdravstveni tehnik
Vehar Omahen Sonja	Višja medicinska sestra
Veljković Marica	Zdravstveni tehnik
Vidmar Mateja	Zdravstveni tehnik
Virant Veronika	Zdravstveni tehnik
Vojvodić Biljana	Diplomirana medicinska sestra
Vrečko Marjana	Diplomirana medicinska sestra
Vrhovac Kosanka	Delavec brez poklica
Vrhovnik Maja	Diplomirana medicinska sestra
Vrhovnik Kristina	Diplomirana medicinska sestra
Vrhovnik Veronika	Višja medicinska sestra

Vučko Alen	Zdravstveni tehnik
Vukelić Milka	Zdravstveni tehnik
Vukić Muhamedagić Dragica	Zdravstveni tehnik
Vukojević Anica	Delavec brez poklica
Zadel Mojca	Diplomirana medicinska sestra
Zajc Metka	Diplomirana medicinska sestra
Zaletelj Mateja	Zdravstveni tehnik
Zarić Cvijeta	Delavec brez poklica
Zavratnik Boštjan	Diplomirani zdravstvenik
Završnik Mojca	Delavec brez poklica
Zdolšek Nevenka	Diplomirana medicinska sestra
Zuka Sadika	Delavec brez poklica
Zulić Ana	Zdravstveni tehnik
Zupančič Janja	Tekstilno konfekcijski tehnik
Žagar Andreja	Višja medicinska sestra / Diplomirani ekonomist
Žibert Anja	Zdravstveni tehnik
Živić Slavica	Višja medicinska sestra
Živković Danka	Delavec brez poklica
Žnider Marta	Višja medicinska sestra
Žuljevič Ivana	Diplomirana medicinska sestra

7.0. Lekarna	
Eberl Andreja	Magister farmacije
Erman Verica	Farmacevtski tehnik
Fortuna Lužar Marijana	Magister farmacije
Grizila Katja	Farmacevtski tehnik
Hribar Majda	Farmacevtski tehnik
Jemec Albina	Gimnazijski maturant
Kobe Metka	Farmacevtski tehnik
Korošec Tanja	Farmacevtski tehnik
Novak Liljana	Farmacevtski tehnik
Nuredini Ramadani Šerije	Magister farmacije
Rožman Samo	Magister farmacije
Sonc Monika	Inženir farmacije
Tavčar Petra	Magister farmacije
Virant Igor	Magister farmacije
Vrhovnik Milena	Farmacevtski tehnik
Zorko Nina	Farmacevtski tehnik / Diplomirani inženir kemijske tehnologije
Zupančič Maja	Farmacevtski tehnik

Ii. Raziskovalna dejavnost	
8.1. Enota za raziskovalno in izobraževalno dejavnost	
Čakš Mojca	Profesor francoščine
Jerala Marjeta	Družboslovno jezikovi tehnik
Kaluža Vijoleta	Diplomirani upravni organizator
Košak Janja	Fotograf
Musek Matjaž	Univerzitetni diplomirani bibliotekar
Podgoršek Milena Dragica	Profesor francoščine
Štrukelj Breda	Administrativni tehnik
Turk Nives	Diplomirani upravni organizator
Writzl Petra	Univerzitetni diplomirani bibliotekar

8.2. Oddelek za eksperimentalno onkologijo	
Dr. **Čemažar Maja**	Univerzitetni diplomirani biolog
Kamenšek Urška	Univerzitetni diplomirani biolog
Dr. **Kranjc Simona**	Univerzitetni diplomirani biolog
Kremić Djemila	Delavec brez poklica
Lavrič Miroslava	Inženir farmacije
Mesojednik Suzana	Univerzitetni diplomirani biolog
Dr. **Serša Gregor**	Univerzitetni diplomirani biolog
Tevž Gregor	Univerzitetni diplomirani mikrobiolog

Iv. Epidemiologija in register raka	
Babuder Barbara	Diplomirana medicinska sestra
Brus Mojca	Delavec brez poklica
Dotzauer Anica	Višja medicinska sestra
Ferjančič Maruška	Višja medicinska sestra
Florjančič Mojca	Višja medicinska sestra
Ivanuš Urška	Gimnazijski maturant
Kirn Andrej	Poslovni sekretar
Mag. **Krajc Mateja**	Doktor medicine
Krašovec Andrej	Diplomirani zdravstvenik
Polajnar Ana Marija	Višja medicinska sestra
Dr. **Primic-Žakelj Maja**	Doktor medicine
Purić Firdeuza	Diplomirani ekonomist
Strle Darja	Upravni tehnik
Škrlec Frančiška	Univerzitetni diplomirani organizator informatik
Šturm Nataša	Diplomirana medicinska sestra
Šval Cveto	Univerzitetni diplomirani organizator informatik
Dr. **Zadnik Vesna**	Doktor medicine
Žagar Tina	Univerzitetni diplomirani fizik

V. Upravne dejavnosti	
Bačar Radenka	Prodajalec
Berlec Mojca	Univerzitetni diplomirani inženir elektrotehnike
Bolta Klara	Delavec brez poklica
Breskvar Mateja	Diplomirani ekonomist
Breskvar Sabina	Blagovni manipulant
Mag. **Češarek Jerica**	Univerzitetni diplomirani sociolog
Duralija Petar	Univerzitetni diplomirani ekonomist
Duratović Amela	Univerzitetni diplomirani komunikolog
Farkaš Majda	Delavec brez poklica
Florjanič Maša	Diplomirani upravni organizator
Fotivec Silvester	Transportni komercialist
Fuchs Igor	Strojni tehnik
Furar Alenka	Ekonomist za denarništvo, finance, računovodstvo
Gasar Aleš	Zdravstveni tehnik
Grahek Irena	Ekonomski tehnik
Grčar Zdena	Diplomirani upravni organizator
Groznik Franci	Trgovski poslovodja
Grujičić Darko	Delavec brez poklica
Hafner Sebastjan	Diplomirani ekonomist
Hlade Zvonko	Varnostni inženir / Univerzitetni diplomirani organizator
Janežič Matej	Avtomehanik
Josipović Igor	Ekonomski tehnik
Kanalec Zdenka	Gimnazijski maturant
Kastelic Branka	Konfekcionar tekstilij
Kermelj Matej	Ekonomski tehnik
Kovačič Mojca	Konfekcionar tekstilij
Krevl Klemen	Gimnazijski maturant
Kristančič Silva	Ekonomist za denarništvo, finance, računovodstvo
Lasnik Darinka	Upravni tehnik
Lavrih Jernej	Delavec brez poklica
Mihaldinec Klara	Univerzitetni diplomirani pravnik
Mivšek Peter	Elektrotehnik elektronik
Moškrič Marija	Sanitarni inženir
Noč Gorazd	Univerzitetni diplomirani inženir matematike
Orel Ankica	Diplomirani upravni organizator
Oštrbenk Brigita	Upravni tehnik
Pavešić Mojca	Univerzitetni diplomirani organizator
Pavšek Simon	Diplomirani varnostni inženir
Peterca Elizabeta	Ekonomski tehnik
Petre Rok	Diplomirani inženir elektrotehnike

Plestenjak Veronika	Prodajalec
Polajnar Vanja	Univerzitetni diplomirani organizator informatik
Polak Bojan	Delavec brez poklica
Preskar Božidara	Komercialni tehnik
Rant Nataša	Ekonomski tehnik
Rebol Milena	Delavec brez poklica
Savšek Uršula	Ekonomsko komercialni tehnik
Seršen Sonja-Andreja	Gimnazijski maturant
Sevnik Bojan	Gimnazijski maturant
Sluga Mojca	Ekonomist za komercialno dejavnost
Stanišič Majda	Delavec brez poklica
Struna Sonja	Ekonomist
Ševerkar Simona	Delavec brez poklica
Škof Nina	Diplomirani ekonomist
Šuštar Irena	Ekonomist za analize in planiranje
Šventner Vilko	Elektrotehnik
Torkar Marija	Ekonomski tehnik
Troha Luka	Diplomirani upravni organizator
Ulčar Alenka	Tekstilno konfekcijski tehnik
Vardijan Rudolf	Univerzitetni diplomirani ekonomist
Vrečar Franc	Inženir strojništva
Zadel Vidmar Marinka	Univerzitetni diplomirani ekonomist
Zuka Agim	Delavec brez poklica
Zupančič Krapež Sonja	Pomočnik tekstilnega konfekcionarja
Žličar Anica	Univerzitetni diplomirani ekonomist


LEICA RM2235

ISBN 978-961-6071-50-5

ONKOLOŠKI INŠTITUT LJUBLJANA

INSTITUTE OF ONCOLOGY LJUBLJANA