

Sistematični pregled raziskav vrednotenja koristi klinične farmacije in farmacevtske skrbi

Systematic review of studies evaluating benefits of clinical pharmacy and pharmaceutical care services

Mitja Kos, Darja Bečan

Povzetek: Namen članka je sistematični pregled raziskav, ki so vrednotile koristi klinične farmacije in farmacevtske skrbi. V bibliografski zbirki Medline je bilo zajetih 266 raziskav, ki so bile objavljene do 25.11.2011, in sicer 253 kliničnih raziskav ter 13 metaanaliz. Število raziskav sovпада z uveljavljanjem koncepta farmacevtske skrbi v 90. letih in znaša dobrih 20 raziskav na letni ravni po letu 2009. Največ raziskav so izvedli v ZDA, Kanadi in Avstraliji. V Evropi so se prve raziskave pojavile v zadnjih letih 20. stoletja in sicer v Združenem kraljestvu in na Švedskem. Največ raziskav je obravnavalo storitve, ki so jih farmacevti izvajali v ambulantah na primarni ravni in v lekarni. Raziskave so najpogosteje vrednotile storitve farmacevtov za bolnike s hipertenzijo, astmo, diabetesom, hiperlipidemijo, srčnim popuščanjem, bakterijsko infekcijo in depresijo. Poseben pomen imajo raziskave na področju polifarmakoterapije. Rezultati večine raziskav, ne pa vseh, kažejo na pozitivne izide storitev klinične farmacije in farmacevtske skrbi.

Ključne besede: sistematični pregled, koristi, klinična farmacija, farmacevtska skrb

Abstract: Aim of the manuscript is a systematic review of studies that evaluated benefits of clinical pharmacy and pharmaceutical care. In Medline 266 studies were captured published before 25.11.2011, 253 clinical studies and 13 metaanalyses. The number of studies corresponds to the uptake of pharmaceutical care concept in nineties and amounts 20 studies published on a yearly basis after 2009. The highest number of studies evaluated services in USA, Canada and Australia. In Europe the first studies were published in UK and Sweden in the last years of the 20th century. The highest number of studies evaluated services performed in general physicians' clinics and in community pharmacies. Most often studies evaluated pharmaceutical services for the patients with hypertension, asthma, diabetes, heart failure, bacterial infection and depression. Of particular importance are studies evaluating polypharmacy. Results of the majority of studies, but not all, show positive outcomes of clinical pharmacy and pharmaceutical care.

Key words: systematic review, benefits, clinical pharmacy, pharmaceutical care

1 Uvod

V procesu zdravljenja z zdravili lahko nastanejo težave povezane z zdravili (ang. Drug Related Problems), ki so posledica neprimerne izbire, izdaje ali uporabe zdravila.

V Franciji so poročali o 3 % hospitalizacij zaradi neželenih učinkov zdravil (1), na Švedskem pa je bilo kar 14 % bolnikov na oddelku interne medicine hospitaliziranih zaradi simptomov in znakov, ki so bili povezani z neželenimi učinki zdravil (2). Še več raziskav na to tematiko lahko zasledimo v ZDA, kjer so na primer ugotavljali, da je 11 – 28 % vseh hospitalizacij posledica težav povezanih z zdravili. Stroški, ki so s tem nastali, pa so znašali 30,1 – 136,8 milijard \$, kar je bilo več kot stroški samih zdravil (3). Ne prav številčne in obširne raziskave na tem področju v Sloveniji pritrjujejo, da je pomembno ustrezno upravljanja tega področja tudi pri nas. Tako je bila v zadnjem času posebej izpostavljena razmeroma številčna skupina, ki ima še posebej veliko tveganje za težave povezane z zdravili glede na to, da

gre za starejše od 65 let, ki imajo sočasno predpisanih po osem ali več različnih zdravil (4).

Z namenom reševanja problema težav povezanih z zdravili so se tudi med farmacevti razvile številne iniciative, ki se večinoma predstavljajo pod terminoma klinična farmacija in farmacevtska skrb. Klinična farmacija obsega aktivnosti in storitve farmacevta, ki vodijo k racionalni in optimalni uporabi zdravil in so komplementarne aktivnostim ostalih zdravstvenih delavcev (5). Farmacevtska skrb je po drugi strani definirana kot praksa v okviru katere farmacevt za posameznega bolnika na odgovoren način zagotavlja zdravljenje z zdravili, ki vodi k naprej definiranim zdravstvenim izidom in tako izboljša kakovost življenja bolnikov (6). Po svoji vsebini oba koncepta opisujeta enako oz. vsaj zelo podobno področje delovanja. Po mnenju nekaterih teoretikov naj bi bila razlika med farmacevtsko skrbjo in klinično farmacijo v prevzemanju odgovornosti za svoja dejanja, medtem ko drugi med obema koncepta ne vidijo bistvenih razlik. Tako so se npr. do

tega vprašanja posebej opredelili tudi v Evropskem združenje kliničnih farmacevtov ESCP in v definicijo klinične farmacije zapisali, da klinični farmacevti svoje storitve lahko izvajajo tako v bolnišnicah kot tudi v lekarnah, domovih starejših občanov ter drugih ustanovah, kjer se predpisujejo in uporabljajo zdravila.

Kljub številnim aktivnostim na tem področju, pa tako v slovenskem kot tudi mednarodnem prostoru, še vedno zasledimo pomisleke o smiselnosti in ustreznosti farmacevtovega delovanja, ki je vezano na aktivnejšo obravnavo težav povezanih z zdravili ter spremljanje bolnikov pri njihovem zdravljenju z zdravili. Nekateri izmed pomislekov so neosnovani in običajno rezultat nerazumevanja farmacevtovega strokovnega potenciala ter dojemanja njegove dejavnosti kot kompetitivne drugi stroki. Prav tako po drugi strani ni smiselno neracionalno in z dokazi nepodprto umeščanje novih storitev v zdravstveno prakso. Tisti, ki koncept klinične farmacije in farmacevtske skrbi sprejemajo, se predvsem sprašujejo o vsebini in terapevtskem področju storitve, ki bo dejansko pomenila korist za bolnike.

2 Namen

Namen raziskave je sistematični pregled raziskav, ki so vrednotile koristi klinične farmacije in farmacevtske skrbi.

3 Metode

V podatkovni bazi Medline (bibliografska zbirka podatkov, dostop: www.pubmed.com) smo zajeli klinične raziskave in metaanalize, ki so obravnavale storitve, aktivnosti in programe s področja klinične farmacije in farmacevtske skrbi. Iskalni profil, ki smo ga v ta namen oblikovali, je bil sledeč: "clinical pharmacy" or "clinical pharmacist" or "pharmaceutical care"

or ((pharmacy or pharmacist) and intervention) Limits: Clinical Trial, Meta-Analysis.

Vključili smo klinične raziskave ter metaanalize v angleškem jeziku, ki so obravnavale aktivnosti in storitve, ki so jih opravljali farmacevti. Vključili smo tudi raziskave, v katerih je intervencijo izvajal celoten zdravstveni tim (poleg farmacevta še splošni zdravnik, zdravnik specialist in/ali medicinska sestra), pri čemer je bila vloga farmacevta jasno določena oz. razvidna. Izključili smo raziskave, kjer storitev niso opravljali farmacevti, in raziskave, ki so programe klinične farmacije in farmacevtske skrbi le opisovale, niso pa podajale kliničnih, humanističnih ali ekonomskih izidov storitev.

4 Rezultati

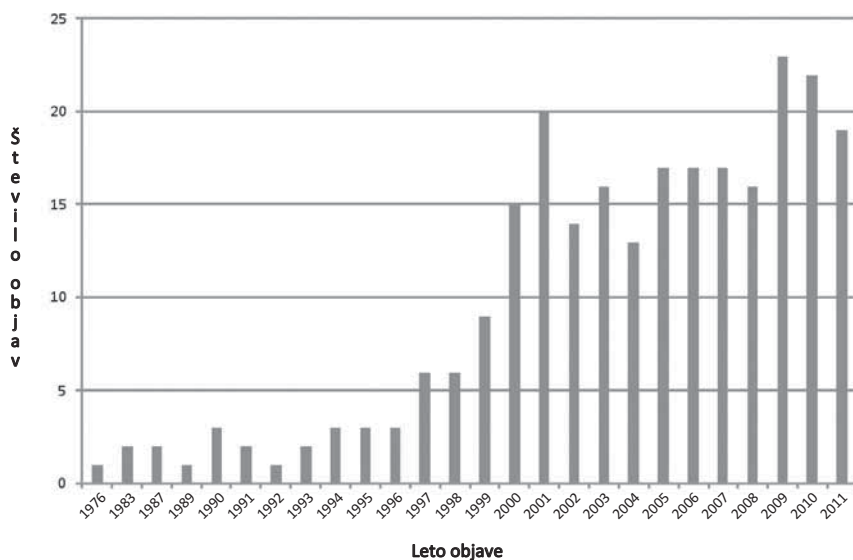
V bibliografski zbirki podatkov Medline je bilo do 25.11.2011 objavljenih 266 raziskav, ki so ustrezale vključitvenim kriterijem in sicer 253 kliničnih raziskav ter 13 meta analiz. Preglednica, ki prikazuje raziskave glede na terapevtsko področje in mesto izvajanja storitve, je zaradi svoje dolžine v celoti predstavljena na spletni strani te številke Farmacevtskega vestnika (http://www.sfd.si/modules/catalog/products/prodfile/fb_4_2012.pdf).

4.1 Pregled kliničnih raziskav

Na slikah od 1 do 4 je prikazan pregled kliničnih raziskav in sicer glede na leto, državo izvajanja storitve, mesto izvajanja storitve in terapevtsko področje.

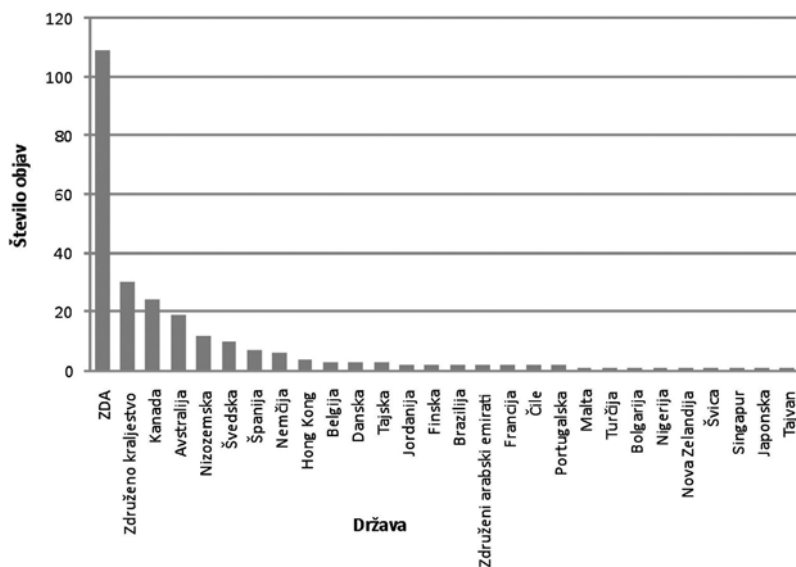
4.2 Pregled metaanaliz

V preglednici 1 (str. 214) je prikazan pregled metaanaliz raziskav, ki so vrednotile koristi klinične farmacije oz. farmacevtske skrbi.



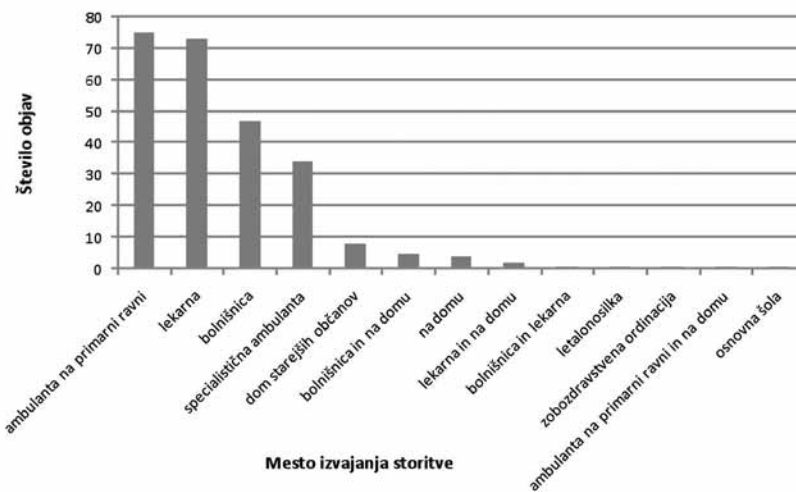
Slika 1: Števílo objav raziskav, ki so vrednotile koristi klinične farmacije in farmacevtske skrbi glede na leto objave (N=253 kliničnih raziskav).

Figure 1: Number of publications reporting benefits of clinical pharmacy and pharmaceutical care according to year of publication (N= 253 clinical studies).



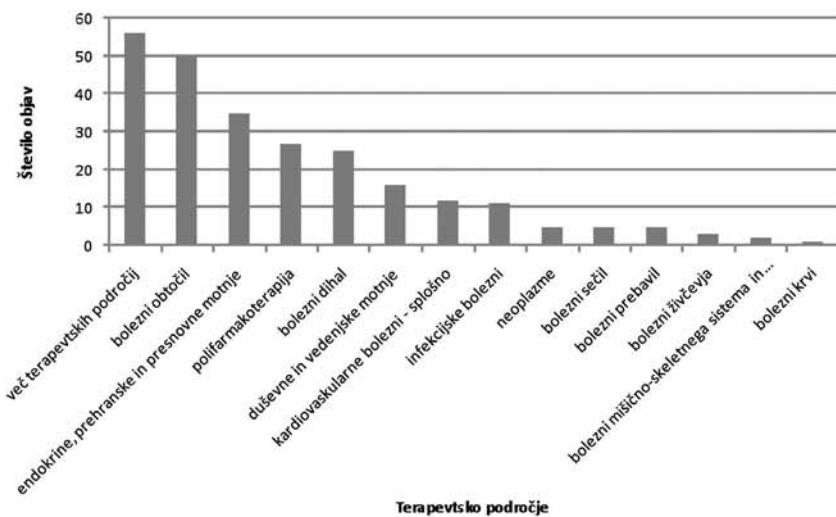
Slika 2: Število objav glede na državo izvedbe raziskave koristi klinične farmacije oz. farmacevtske skrbi (N=253 kliničnih raziskav).

Figure 2: Number of publications according to country in which benefits of clinical pharmacy or pharmaceutical care were evaluated (N= 253 clinical studies).



Slika 3: Število objav glede na mesto izvajanja storitve klinične farmacije oz. farmacevtske skrbi (N=253 kliničnih raziskav).

Figure 3: Number of publications according to location of clinical pharmacy or pharmaceutical care service (N= 253 clinical studies).



Slika 4: Število objav raziskav, ki so vrednotile koristi klinične farmacije in farmacevtske skrbi, glede na terapevtsko področje (N=253 kliničnih raziskav).

Figure 4: Number of publications according to therapeutic area of clinical pharmacy or pharmaceutical care service (N= 253 clinical studies).

Preglednica I: Število raziskav glede na terapevtsko področje in mesto izvajanja storitve.

Table I: Number of publications according to therapeutica area and location of clinical pharmacy or pharmaceutical care service (N= 253 clinical studies).

Terapevtsko področje	Mesto izvajanja storitve	Št. raziskav	Vir
bolezni dihal		25	
alregijski rinitis	lekarna	1	I
astma	ambulanta na primarni ravni	1	II
	lekarna	16	III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, XVIII
	osnovna šola	1	XIX
	specialistična ambulanta	2	XX, XXI
bolezni dihal - splošno	lekarna	3	XXII, XXIII, XXIV
KOPB	specialistična ambulanta	1	XXV
bolezni krvi		1	
anemija	specialistična ambulanta	1	XXVI
bolezni mišično-skeletnega sistema in vezivnega tkiva		2	
bolečina	ambulanta na primarni ravni	2	XXVII, XXVIII
bolezni obtočil		50	
hipertenzija	ambulanta na primarni ravni	15	XXIX, XXX, XXXI, XXXII, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, XXXVIII, XXXIX, XL, XLI, XLII, XLIII
	lekarna	6	XLIV, XLV, XLVI, XLVII, XLVIII, XLIX
	letalnosilka	1	L
	na domu	1	LI
	specialistična ambulanta	5	LII, LIII, LIV, LV, LVI
koronarna bolezen	bolnišnica	1	LVII
	lekarna	1	LVIII
miokardni infarkt	bolnišnica	1	LIX
možganska kap	bolnišnica in lekarna	1	LX
	specialistična ambulanta	1	LXI
srčno popuščanje	bolnišnica	5	LXII, LXIII, LXIV, LXV, LXVI
	lekarna	3	LXVII, LXVIII, LXIX
	lekarna in na domu	1	LXX
	specialistična ambulanta	4	LXXI, LXXII, LXXIII, LXXIV
tromboza	ambulanta na primarni ravni	1	LXXV
	bolnišnica	2	LXXVI, LXXVII
	specialistična ambulanta	1	LXXVIII
bolezni prebavil		5	
bolezni jeter	bolnišnica	1	LXXIX
bolezni prebavil - splošno	bolnišnica	1	LXXX
dispepsija	lekarna	1	LXXXI
gastritis	lekarna	1	LXXXII
	specialistična ambulanta	1	LXXXIII
bolezni sečil		5	
ledvična odpoved	bolnišnica	1	LXXXIV
	lekarna	1	LXXXV
	specialistična ambulanta	3	LXXXVI, LXXXVII, LXXXVIII
bolezni živčevja		3	
epilepsija, Parkinsonova bolezen	DSO	1	LXXXIX
glavoboli	lekarna	2	XC, XCI
duševne in vedenjske motnje		16	
depresija	ambulanta na primarni ravni	4	XCII, XCIII, XCIV, XCV
	lekarna	4	XCVI, XCVII, XCVIII, XCIX
	specialistična ambulanta	2	C, CI
duševne in vedenjske motnje - splošno	ambulanta na primarni ravni	1	CII
	bolnišnica	1	CIII
	DSO	3	CIV, CV, CVI
	specialistična ambulanta	1	CVII

Preglednica 1: Pregled metaanaliz raziskav, ki so vrednotile koristi klinične farmacije oz. farmacevtske skrbi.

Table 1: Review of metaanalyses that evaluated benefits of clinical pharmacy and pharmaceutical care.

Prvi avtor in leto publikacije	Namen	Storitev	Ključni izidi
Santschi 2011 (7)	Določiti vpliv farmacevtske skrbi na dejavnike tveganja za razvoj kardiovaskularnih bolezni.	Izobraževanje bolnikov o boleznih, zdravih in namenu zdravljenja, priprava opomnikov za bolnike, ovrednotenje kardiovaskularnih dejavnikov tveganja, priprava priporočil za zdravnike glede optimizacije terapije.	KT (19 raziskav): -8,1/-3,8 mm Hg, S. Celokupni holesterol (9 raziskav): -17,4 mg/L, S. LDL-H (7 raziskav): -13,4 mg/L, S. Kajenje (2 raziskavi): zmanjšanje, S.
Ryan R 2011 (8)	Združiti podatke sistematičnih preglednih člankov o učinkovitosti intervencij, katerih namen je bil izboljšati uporabo zdravil.	Izobraževanje bolnikov o njihovih zdravih in namenu zdravljenja ter o pomembnosti jemanja zdravil skladno z navodili, pogovor z bolniki o morebitnih težavah, pregled zdravil in reševanje težav povezanih z zdravih.	Intervencije so v večji ali manjši meri pozitivno vplivale na zdravstvene izide (npr. poenostavljeno odmerjanje in intervencije, ki so neposredno vključevale farmacevta), nekatere so bile večinoma neučinkovite (npr. samo izobraževanje). Nobena od intervencij ni imela pozitivnega vpliv na vseh področjih.
Morgado MP 2011 (9)	Vpliv farmacevtske intervencije na kontrolo krvnega tlaka in vodljivost bolnikov, ki so na antihipertenzivni terapiji.	Predlogi glede optimizacije terapije posredovani zdravniku, izobraževanje bolnikov o boleznih, zdravih in namenu zdravljenja, redno spremljanje KT, priprava opomnikov za bolnike, izobraževanje in opozarjanje zdravstvenih delavcev na morebitne napake.	Izidi zdravljenja: signifikantno izboljšanje 87,5 % rezultatov. Vodljivost bolnikov: signifikantno izboljšanje (43,8 % rezultatov). SKT: -4,9 mm Hg, p<0,001. DKT: -2,6 mm Hg, p<0,001.
Rubio-Valera M 2011 (10)	Ovrednotiti učinkovitost farmacevtske skrbi na izboljšanje vodljivosti bolnikov, ki so na terapiji z antidepresivi.	Izobraževanje in spremljanje bolnikov, identifikacija neželenih učinkov, svetovanje o pomembnosti jemanja zdravil skladno z navodili, optimizacija terapije.	Vodljivost bolnikov: OR=1,639, p<0,001.
Nkansah N 2010 (11)	Oceniti vpliv farmacevtskih storitev na izide pri bolnikih in zdravstvenih delavcih.	Izobraževanje bolnikov, reševanje težav povezanih z zdravih, priprava priporočil zdravnikom, izobraževanje zdravnikov.	Farmacevtske intervencije namenjene: a) bolnikom: 36 raziskav; b) zdravnikom: 7 raziskav. 1) 1 raziskava: izboljšanje KT. 2) 5 raziskav: storitve farmacevtov so zmanjšale pogostost podvajanja zdravil in celotno število predpisanih zdravil; 29 raziskav: poročanje o kliničnih in humanističnih izidih; rezultat farmacevtske intervencije je bilo izboljšanje kliničnih izidov, te izboljšave pa niso bile vedno signifikantne; 8 raziskav: poročanje o kvaliteti življenja, 3 raziskave so poročale o izboljšanju na vsaj treh področjih. 3) raziskav ni. 4) 2 od 7 raziskav kažeta signifikantno izboljšanje pri predpisovanju zdravil.
Carter BL 2009 (12)	Določiti učinek intervencij pri kontroli hipertenzije, če pri tem sodeluje zdravstveni tim, ki vključuje tudi farmacevte in medicinske sestre.	Izobraževanje bolnikov o zdravih, svetovanje o načinu življenja, obiski na domu, optimizacija terapije (priporočila zdravnikom).	Vpliv izobraževanja o zdravih: KT: -8,5/-3,60 mm Hg. Vpliv priporočil farmacevtov glede terapije: SKT: -9,30 mm Hg. Intervencije so izvajale medicinske sestre: SKT: -5,84 mm Hg; farmacevta v bolnišnicah: -7,76 mm Hg; farmacevta v lekarnah: -9,31 mm Hg.
Machado M 2008 (13)	Določiti vpliv farmacevtskih intervencij na izboljšanje kliničnih izidov pri zdravljenju hipertipidemije.	Izobraževanje in spremljanje bolnikov, upravljanje z zdravih.	Celokupni holesterol se je signifikantno zmanjšal: v primerjavi z začetno vrednostjo: -34,3 mg/dL, p<0,001; v primerjavi s KS: -22,0 mg/dL, p=0,034. LDL-H se je signifikantno zmanjšal: v primerjavi z začetno vrednostjo: -32,6 mg/dL, p=0,004; v primerjavi s KS: -17,5 mg/dL, NS. TG: NS zmanjšanje. HDL-H: NS spremembe. Možen je vpliv na vodljivost bolnikov ter na kvaliteto življenja.

Prvi avtor in leto publikacije	Namen	Storitev	Ključni izidi
Williams A 2008 (14)	Pregled raziskav, ki vključujejo intervencije, ki naj bi izboljšale vodljivost bolnikov pri sočasni terapiji več kroničnih bolezni.	Izobraževanje bolnikov o bolezni, zdravlilih in namenu zdravljenja. Identifikacija in reševanje težav povezanih z zdravlili.	Dokazi za učinkovitost intervencij, s katerimi bi izboljšali vodljivost bolnikov z več kroničnimi boleznimi, so slabi.
Tonna AP 2008 (15)	Določiti, kakšna je vloga farmacevtov v zdravstvenem timu pri optimizaciji antibiotične terapije ter opisati klinične izide takšnih intervencij.	Identifikacija neprimerno predpisanih zdravil, priprava priporočil glede zamenjave zdravil ali sprememb načina aplikacije, razvoj smernic, prisotnost na vizitah, racionalizacija protimikrobnih zdravil.	Uporaba zdravil: izboljšano upoštevanje smernic; klinični izidi: krajši čas bivanja v bolnišnicah, zmanjšana potreba po parenteralni FO, nižja umrljivost; finančni izidi: manjša poraba antibiotikov, uporaba cenejših bioekvivalentnih zdravil in posledično manjši stroški. Spremembe niso vse signifikantne.
Machado M 2007 (16)	Opredeliti in kvantificirati klinične izide, občutljive na farmacevtsko intervencijo.	Najbolj pogosto uporabljeni intervenciji sta bili upravljanje z zdravili (82%) in izobraževanje bolnikov na področju hipertenzije (68%).	39 rezultatov (57 % vseh ovrednotenih rezultatov) je potrdilo vpliv farmacevtske intervencije. V 13 raziskavah: SKT: -10,7 mm Hg (IS), -3,2 mm Hg (KS), p=0,047. DKT: razlika med IS in KS: 3,6 mm Hg, NS. Kvaliteta življenja: signifikantna razlika v 1/8 raziskavi. Vodljivost bolnikov: signifikantna razlika v 5/13 raziskav.
Machado M 2007 (17)	Opredeliti in kvantificirati klinične izide, občutljive na farmacevtsko intervencijo.	Najbolj pogosto uporabljeni intervenciji sta bili izobraževanje bolnikov na področju diabetesa (69%) in upravljanje z zdravili (61%).	51 rezultatov (69 % vseh ovrednotenih rezultatov) je potrdilo vpliv farmacevtske intervencije. V 16 raziskavah: HbA1c: -1,00 % (IS), -0,28 % (KS), p=0,03.
Royal S 2006 (18)	Identificirati in oceniti raziskave intervencij, ki bi zmanjšale neželene učinke zdravil, ki se izražajo v obolevnosti, hospitalizacijah in umrljivosti.	Farmacevtske intervencije (pregled zdravil) in intervencije drugih zdravstvenih delavcev (uporaba protokolov s strani medicinskih sester in izobraževalni programi za zdravnike).	17 raziskav je obravnavalo farmacevtske intervencije. Intervencije, ki jih je vodi farmacevt, zmanjšajo število hospitalizacij (OR=0,64), vendar analize randomiziranih kliničnih raziskav niso pokazale signifikantnih izboljšav. Rezultati na ostalih področjih niso pokazali signifikantnega učinka.
Morrison A 2001 (19)	Ovrednotenje raziskav, ki obravnavajo učinkovitost storitev klinične farmacije.	Izobraževanje in oskrba bolnikov, svetovanje zdravnikom.	Farmacevti so delovali kot klinični farmacevti v 24 raziskavah in kot lekarniški farmacevti v 2 raziskavah. Svetovanje bolnikom: statistično signifikantno boljša vodljivost bolnikov (5/6 raziskav). Svetovanje bolnikom in njihovim zdravnikom: rezultati signifikantno boljši v IS (6/7 raziskav). Svetovanje zdravnikom: v IS višji delež receptov, predpisanih v skladu s smernicami (1/2 raziskava). 4 raziskave niso dale dokončnih rezultatov.

IS- intervencijske skupina, KS: kontrolna skupina, KT – krvni tlak, SKT – sistolični krvni tlak, DKT – diastolični krvni tlak, LDL-H – LDL-holesterol, HDL-H – HDL-holesterol, TG – trigliceridi, HbA1c – glikiran hemoglobin, FO – farmacevtska oblika, NS – razlika ni signifikantna, S – razlika je signifikantna, OR – razmerje obolevnosti.

5 Razprava

Začetki klinične farmacije segajo v sredino šestdesetih let 20. stoletja, ko so farmacevti začeli svojo strokovnost izpopolnjevati in usmerjati v nove ter k pacientu usmerjene storitve (6). Pojav raziskav v večji meri sovpadajo z uveljavljanjem koncepta farmacevtske skrbi in sicer v 90. letih. V našem primeru najstarejša raziskava sega v leto 1976. Njihovo število je zelo naraslo predvsem po letu 1999 in znaša dobrih 20 raziskav na letni ravni po letu 2009. Največ raziskav so izvedli v ZDA, kjer lahko zasledimo tudi prve raziskave, tej sledita Kanada in Avstralija. V evropskih državah so se prve raziskave pojavile v zadnjih letih 20. stoletja in sicer v Združenem kraljestvu in na Švedskem.

5.1 Mesto izvajanja intervencije

Največ raziskav je obravnavalo intervencije, ki so jih farmacevti izvajali v ambulantah na primarni ravni. Ena od prednosti dela na tem mestu je

gotovo ta, da omogoča večjo stopnjo interakcije in sodelovanja farmacevta z zdravnikom in s tem t.i. brezšivno oskrbo. Namenska zaposlitev farmacevta na tem mestu obenem omogoča, da se v večji meri posveti optimizaciji in racionalizaciji zdravljenja z zdravili s tem, ko je razbremenjen aktivnosti vezanih na preskrbo z zdravili.

Raziskavam storitev farmacevta v ambulanti na primarni ravni sledijo raziskave storitev v lekarni. Ta predstavlja mesto, ki je neposredno vpeto v verigo preskrbe z zdravili. Zelo pogosto se nahaja blizu zdravstvenega doma oz. ambulate na primarni ravni. Lekarna pomeni tudi tim osebja, katerih strokovnost so zdravila in s tem najboljše možno izhodišče za ustrezno svetovanje o zdravlilih. Zaradi svoje dostopnosti (običajno brez posebne najave in čakalnih list) so farmacevti v lekarni zelo pogosto tudi prvi zdravstveni delavci, kamor bolniki pridejo po nasvet v primeru novih zdravstvenih težav.

Velik del raziskav je obravnavalo tudi intervencije, ki so jih farmacevti izvajali v bolnišnicah in specialističnih ambulantah. Največja prednost dela na tem področju je vključevanje farmacevta v multidisciplinarno zdravstveno timo, ki skrbi za celovito zdravstveno oskrbo bolnikov. Nekaj raziskav je obravnavalo tudi storitve, ki so jih farmacevti izvajali v domovih starejših občanov. Ker gre v tem primeru za posebej ranljivo populacijo starejših bolnikov, ki se običajno zdravijo za več kroničnimi boleznimi, lahko farmacevti s svojim strokovnim znanjem s področja zdravil pripomorejo k odkrivanju in reševanju težav povezanih z zdravili. Posebej velja omeniti raziskave, ki so vrednotile storitve v kombinaciji lokacij npr. domače oskrbe z oskrbo v lekarni, ambulanti oz. bolnišnici. Takšen način dela seveda nudi najboljše iz posameznih inštitucij, obenem pa se v največji možni meri približa bolnikovemu običajnemu življenju s tem, ko se izvaja oskrba na njegovem domu.

5.2 Terapevtska področja in vpliv na zdravstvene izide

Raziskave so vrednotile storitve farmacevtov, ki so obravnavale zelo različna terapevtska področja. Pri tem velja izpostaviti raziskave koristi storitev za bolnike s hipertenzijo, astmo, diabetesom, hiperlipidemijo, srčnim popuščanjem, bakterijsko infekcijo in depresijo. Poseben pomen imajo raziskave na področju polifarmakoterapije. Te so vrednotile storitve, katerih namen je reševanje težav povezanih z zdravili, ki so posledica sočasne uporabe več zdravil hkrati.

Storitve so najpogosteje vključevale izobraževanje bolnikov o bolezni, zdravilih in pomenu zdravljenja ter sodelovanje z zdravnikom pri predpisovanju zdravil in optimizaciji terapije.

Izobraževanje bolnikov je izboljšalo njihovo vodljivost in posledično klinične izide zdravljenja. Farmacevti so s svojimi aktivnostmi bistveno zmanjšali dejavnike tveganja za razvoj kardiovaskularnih bolezni: izboljšala se je kontrola hipertenzije ter zmanjšala raven glikiranega hemoglobina in lipidov v krvi. Izobraževanje bolnikov je izboljšalo tudi tehniko inhaliranja pri bolnikih z astmo in s tem izboljšalo kontrolo astme.

Farmacevt je kot strokovnjak s področja zdravil imel pomembno vlogo pri odkrivanju, reševanju in preprečevanju težav povezanih z zdravili, storitve klinične farmacije in farmacevtske skrbi pa so njihovo število zmanjšale. Posledično so se izboljšali klinični izidi ter zmanjšala uporaba zdravstvenih storitev (npr. zmanjšanje števila hospitalizacij in obiskov urgentnega oddelka). Rezultati raziskav nakazujejo pozitiven vpliv farmacevtskih storitev na kakovost življenja bolnikov ter zadovoljstvo bolnikov z zdravstvenimi storitvami.

Izobraževanje zdravnikov o predpisovanju zdravil v skladu s smernicami, svetovanje pri izbiri zdravila ter priporočila glede optimizacije terapije so vodila do ustrežnejšega predpisovanja zdravil, možen pa je bil tudi vpliv na zmanjšanje števila predpisanih zdravil. Pri tem je bil zelo pomemben osebni stik oz. komunikacija med farmacevtom in zdravnikom.

Storitve opisane v raziskavah so imele pozitiven vpliv na ekonomske izide v bolnišnicah, medtem, ko je raven dokazov o finančnih koristih na drugih mestih izvajanja storitev skromna.

5.3 Metaanalize

Rezultati metaanaliz, ki smo jih vključili v sistematičen pregled, nam kažejo, da storitve klinične farmacije in farmacevtske skrbi izboljšajo klinične izide na področju hipertenzije, hiperlipidemije in diabetesa ter na ta način

zmanjšajo tveganje za razvoj kardiovaskularnih bolezni. Storitve farmacevtov, ki so vplivale na takšne izide, so bile usmerjene tako na bolnike kot tudi na zdravnike. Farmacevti so bolnike izobraževali o boleznih, zdravilih in pomenu zdravljenja, zdravnikom pa so predvsem posredovali priporočila glede optimizacije terapije.

S področja vodljivosti bolnikov metaanalize ne dajejo povsem konsistentnih rezultatov. Pozitiven vpliv na vodljivost bolnikov je metaanaliza potrdila na področju zdravljenja depresije, medtem ko ostale metaanalize kažejo na možnost pozitivnega vpliva, ne morejo pa ga z gotovostjo potrditi.

Izboljšanje kvalitete življenja in stroškovne učinkovitosti, zmanjšanje števila hospitalizacij ter ustrežnejše predpisovanje zdravil je glede na ugotovitve metaanaliz možno, niso pa ti rezultati tako jasni kot v primeru vpliva farmacevtskih storitev na kontrolo krvnega tlaka ter glukoze in lipidov v krvi.

5.4 Pomanjkljivosti pregleda

Čeprav smo sistematično pregled skrbno načrtovali, postavljeni iskalni profil ni zajel vseh raziskav, ki so vrednotile storitve klinične farmacije in farmacevtske skrbi. Nekatere raziskave namreč ne omenjajo neposredno klinične farmacije oz. farmacevtske skrbi in so opisovale oz. pojmovalle storitve na drugačen način.

Z namenom celovite predstavitve vsebine storitev ter vpliva na zdravstvene izide bi bila smiselna usmerjena predstavitev rezultatov po posameznih terapevtskih področjih.

6 Zaključek

V znanstveno strokovni literaturi so bile objavljene številne raziskave, ki so vrednotile koristi klinične farmacije in farmacevtske skrbi. Rezultati večine raziskav, ne pa vseh, kažejo na pozitivne izide storitev klinične farmacije in farmacevtske skrbi. Pri implementiranju storitev v prakso je smiselno poglobljeni študij raziskav za specifično terapevtsko področje. Za uspešnost storitev je posebej pomembno ustrezno sodelovanje med zdravstvenimi delavci.

7 Literatura

1. Pouyanne P, Haramburu F, Imbs JL, Bégau B. Admissions to hospital caused by adverse drug reactions: cross sectional incidence study. *Br Med J* 2000; 320: 1036.
2. Mjörndal T, Boman MD, Hägg S, Bäckström M, Wiholm BE, Wahlin A, Dahlqvist R. Adverse drug reactions as a cause for admissions to a department of internal medicine. *Pharmacoepidemiology and Drug Safety* 2002; 11: 65-72.
3. Johnson JA, Bootman JL. Drug related morbidity and mortality: a cost-of-illness model. *Arch Int Med* 1995; 155: 1949-56.
4. Fürst J. Predpisovanje zdravil na recept starejšim od 65 let. *Recept* 2009; 2: 75.
5. ESCP. What is a clinical pharmacy? URL: http://www.escpweb.org/cms/Clinical_pharmacy (Dostop: 5.8.2012).
6. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm* 1990; 47: 533-534.
7. Santschi V, Chioloro A, Burnand B, Colosimo AL, Paradis G. Impact of pharmacist care in the management of cardiovascular disease risk factors: a systematic review and meta-analysis of randomized trials. *Arch Intern Med* 2011; 171: 1441-53.
8. Ryan R, Santesso N, Hill S, Lowe D, Kaufman C, Grimshaw J. Consumer-oriented interventions for evidence-based prescribing and medicines use: an

overview of systematic reviews. *Cochrane Database Syst Rev* 2011; 5: CD007768.

9. Morgado MP, Morgado SR, Mendes LC, Pereira LJ, Castelo-Branco M. Pharmacist interventions to enhance blood pressure control and adherence to antihypertensive therapy: Review and meta-analysis. *Am J Health Syst Pharm* 2011; 68 (3): 241-53.

10. Rubio-Valera M, Serrano-Blanco A, Magdalena-Belío J, Fernández A, García-Campayo J, Pujol MM, del Hoyo YL. Effectiveness of pharmacist care in the improvement of adherence to antidepressants: a systematic review and meta-analysis. *Ann Pharmacother* 2011; 45 (1): 39-48.

11. Nkansah N, Mostovetsky O, Yu C, Chheng T, Beney J, Bond CM, Bero L. Effect of outpatient pharmacists' non-dispensing roles on patient outcomes and prescribing patterns. *Cochrane Database Syst Rev* 2010; 7: CD000336.

12. Carter BL, Rogers M, Daly J, Zheng S, James PA. The potency of team-based care interventions for hypertension: a meta-analysis. *Arch Intern Med* 2009; 169 (19): 1748-55.

13. Machado M, Nassor N, Bajcar JM, Guzzo GC, Einarson TR. Sensitivity of patient outcomes to pharmacist interventions. Part III: systematic review and meta-analysis in hyperlipidemia management. *Ann Pharmacother* 2008; 42 (9): 1195-207.

14. Williams A, Manias E, Walker R. Interventions to improve medication adherence in people with multiple chronic conditions: a systematic review. *J Adv Nurs* 2008; 63 (2): 132-43.

15. Tonna AP, Stewart D, West B, Gould I, McCaig D. Antimicrobial optimisation in secondary care: the pharmacist as part of a multidisciplinary antimicrobial programme—a literature review. *Int J Antimicrob Agents* 2008; 31 (6): 511-7.

16. Machado M, Bajcar J, Guzzo GC, Einarson TR. Sensitivity of patient outcomes to pharmacist interventions. Part II: Systematic review and meta-analysis in hypertension management. *Ann Pharmacother* 2007; 41 (11): 1770-81.

17. Machado M, Bajcar J, Guzzo GC, Einarson TR. Sensitivity of patient outcomes to pharmacist interventions. Part I: systematic review and meta-analysis in diabetes management. *Ann Pharmacother* 2007; 41 (10): 1569-82.

18. Royal S, Smeaton L, Avery AJ, Hurwitz B, Sheikh A. Interventions in primary care to reduce medication related adverse events and hospital admissions: systematic review and meta-analysis. *Qual Saf Health Care* 2006; 15 (1): 23-31.

19. Morrison A, Wertheimer AI. Evaluation of studies investigating the effectiveness of pharmacists' clinical services. *Am J Health Syst Pharm* 2001; 58 (7): 569-77.

I O'Connor J, Seeto C, Saini B, Bosnic-Anticevich S, Krass I, Armour C, Smith L. Healthcare professional versus patient goal setting in intermittent allergic rhinitis *Patient Educ Couns* 2008 Jan; 70(1): 111-7.

II Petrie JL, Segal AR: Clinical pharmacy services provided to asthma patients in a school-based clinic *Am J Health Syst Pharm* 2010 Feb 1; 67(3): 185, 188-9.

III Armour C, Bosnic-Anticevich S, Brilliant M, Burton D, Emmerton L, Krass I, Saini B, Smith L, Stewart K: Pharmacy Asthma Care Program (PACP) improves outcomes for patients in the community *Thorax* 2007 Jun; 62(6): 496-502.

IV Barbanel D, Eldridge S, Griffiths C: Can a self-management programme delivered by a community pharmacist improve asthma control? A randomised trial *Thorax* 2003 Oct; 58(10): 851-4.

V Basheti IA, Reddel HK, Armour CL, Bosnic-Anticevich SZ: Improved asthma outcomes with a simple inhaler technique intervention by community pharmacists *J Allergy Clin Immunol* 2007 Jun; 119(6): 1537-8.

VI Bereznicki BJ, Peterson GM, Jackson SL, Walters EH, Fitzmaurice KD, Gee PR: Data-mining of medication records to improve asthma management *Med J Aust* 2008 Jul 7; 189(1): 21-5.

VII Bereznicki BJ, Peterson GM, Jackson SL, Walters H, Fitzmaurice K, Gee P: Pharmacist-initiated general practitioner referral of patients with suboptimal asthma management *Pharm World Sci* 2008 Dec; 30(6): 869-75.

VIII Cordina M, McElnay JC, Hughes CM: Assessment of a community pharmacy-based program for patients with asthma *Pharmacotherapy* 2001 Oct; 21(10): 1196-203.

IX de Vries TW, van den Berg PB, Duiverman EJ, de Jong-van den Berg LT: Effect of a minimal pharmacy intervention on improvement of adherence to asthma guidelines *Arch Dis Child* 2010 Apr; 95(4): 302-4.

X Kradjan WA, Schulz R, Christensen DB, Stergachis A, Sullivan S, Fullerton DS, Sturm L, Schneider G: Patients' perceived benefit from and satisfaction with asthma-related pharmacy services *J Am Pharm Assoc (Wash)* 1999 Sep-Oct; 39(5): 658-66.

XI Kritikos V, Armour CL, Bosnic-Anticevich SZ: Interactive small-group asthma education in the community pharmacy setting: a pilot study *J Asthma* 2007 Jan-Feb; 44(1): 57-64.

XII McLean W, Gillis J, Waller R: The BC Community Pharmacy Asthma Study: A study of clinical, economic and holistic outcomes influenced by an asthma care protocol provided by specially trained community pharmacists in British Columbia *Can Respir J* 2003 May-Jun; 10(4): 195-202.

XIII Mehuys E, Van Bortel L, De Bolle L, Van Tongelen I, Annemans L, Remon JP, Brusselle G: Effectiveness of pharmacist intervention for asthma control improvement *Eur Respir J* 2008 Apr; 31(4): 790-9.

XIV Närhi U, Airaksinen M, Tanskanen P, Erlund H: Therapeutic outcomes monitoring by community pharmacists for improving clinical outcomes in asthma *J Clin Pharm Ther* 2000 Jun; 25(3): 177-83.

XV Närhi U, Airaksinen M, Tanskanen P, Enlund H: The effects of a pharmacy-based intervention on the knowledge and attitudes of asthma patients *Patient Educ Couns* 2001 May; 43(2): 171-7.

XVI Petkova VB: Pharmaceutical care for asthma patients: a community pharmacy-based pilot project *Allergy Asthma Proc* 2008 Jan-Feb; 29(1): 55-61.

XVII Schulz M, Verheyen F, Mühlig S, Müller JM, Mühlbauer K, Knop-Schneickert E, Petermann F, Bergmann KC: Pharmaceutical care services for asthma patients: a controlled intervention study *J Clin Pharmacol* 2001 Jun; 41(6): 668-76.

XVIII Stergachis A, Gardner JS, Anderson MT, Sullivan SD: Improving pediatric asthma outcomes in the community setting: does pharmaceutical care make a difference? *J Am Pharm Assoc (Wash)* 2002 Sep-Oct; 42(5): 743-52.

XIX Bell HM, McElnay JC, Hughes CM, Gleadhill I: Primary schoolteachers' knowledge of asthma: the impact of pharmacist intervention *J Asthma* 2000; 37(7): 545-55.

XX González-Martin G, Joo I, Sánchez I: Evaluation of the impact of a pharmaceutical care program in children with asthma *Patient Educ Couns* 2003 Jan; 49(1): 13-8.

XXI Santos Dde O, Martins MC, Cipriano SL, Pinto RM, Cukier A, Stelmach R: Pharmaceutical care for patients with persistent asthma: assessment of treatment compliance and use of inhaled medications *J Bras Pneumol* 2010 Feb; 36(1): 14-22.

XXII Hämmerlein A, Müller U, Schulz M: Pharmacist-led intervention study to improve inhalation technique in asthma and COPD patients *J Eval Clin Pract* 2011 Feb; 17(1): 61-70.

XXIII Stuurman-Bieze AG, Kokenberg ME, Tobi H, de Boer WO, van Doormaal JE, Jong-vanden de Berg LT, Tromp TF: Complex pharmaceutical care intervention in pulmonary care: part B Patient opinion and process survey *Pharm World Sci* 2005 Oct; 27(5): 385-92.

XXIV Weinberger M, Murray MD, Marrero DG, Brewer N, Lykens M, Harris LE, Seshadri R, Caffrey H, Roesner JF, Smith F, Newell AJ, Collins JC, McDonald CJ, Tierney WM: Effectiveness of pharmacist care for patients with reactive airways disease: a randomized controlled trial *JAMA* 2002 Oct 2; 288(13): 1594-602.

XXV Khmour MR, Kidney JC, Smyth BM, McElnay JC: Clinical pharmacy-led disease and medicine management programme for patients with COPD *Br J Clin Pharmacol* 2009 Oct; 68(4): 588-98.

XXVI Allenet B, Chen C, Romanet T, Vialtel P, Calop J: Assessing a pharmacist-run anaemia educational programme for patients with chronic renal insufficiency *Pharm World Sci* 2007 Feb; 29(1): 7-11.

XXVII Peterson GM, Bergin JK, Nelson BJ, Stanton LA: Improving drug use in rheumatic disorders *J Clin Pharm Ther* 1996 Aug; 21(4): 215-20.

XXVIII Stergachis A, Fors M, Wagner EH, Sims DD, Penna P: Effect of clinical pharmacists on drug prescribing in a primary-care clinic *Am J Hosp Pharm* 1987 Mar; 44(3): 525-9.

XXIX Albsoul-Younes AM, Hammad EA, Yasein NA, Tahaineh LM: Pharmacist-physician collaboration improves blood pressure control *Saudi Med J* 2011 Mar; 32(3): 288-92.

XXX Bogden PE, Abbott RD, Williamson P, Onopa JK, Koontz LM, Department of Medicine, John A: Comparing standard care with a physician and

- pharmacist team approach for uncontrolled hypertension *J Gen Intern Med* 1998 Nov; 13(11): 740-5.
- XXXI Borenstein JE, Graber G, Saitli E, Wallace J, Ryu S, Archi J, Deutsch S, Weingarten SR: Physician-pharmacist comanagement of hypertension: a randomized, comparative trial *Pharmacotherapy* 2003 Feb; 23(2): 209-16.
- XXXII Carter BL, Bergus GR, Dawson JD, Farris KB, Doucette WR, Chrischilles EA, Hartz AJ: A cluster randomized trial to evaluate physician/pharmacist collaboration to improve blood pressure control *J Clin Hypertens (Greenwich)* 2008 Apr; 10(4): 260-71.
- XXXIII Carter BL, Ardery G, Dawson JD, James PA, Bergus GR, Doucette WR, Chrischilles EA, Franciscus CL, Xu Y: Physician and pharmacist collaboration to improve blood pressure control *Arch Intern Med* 2009 Nov 23; 169(21): 1996-2002.
- XXXIV Carter BL, Doucette WR, Franciscus CL, Ardery G, Kluesner KM, Chrischilles EA: Deterioration of blood pressure control after discontinuation of a physician-pharmacist collaborative intervention *Pharmacotherapy* 2010 Mar; 30(3): 228-35.
- XXXV Criswell TJ, Weber CA, Xu Y, Carter BL: Effect of self-efficacy and social support on adherence to antihypertensive drugs *Pharmacotherapy* 2010 May; 30(5): 432-41.
- XXXVI Hunt JS, Siemieniuc J, Pape G, Rozenfeld Y, MacKay J, LeBlanc BH, Touchette D: A randomized controlled trial of team-based care: impact of physician-pharmacist collaboration on uncontrolled hypertension *J Gen Intern Med* 2008 Dec; 23(12): 1966-72.
- XXXVII Magid DJ, Ho PM, Olson KL, Brand DW, Welch LK, Snow KE, Lambert-Kerzner AC, Plomondon ME, Havranek EP: A multimodal blood pressure control intervention in 3 healthcare systems *Am J Manag Care* 2011 Apr; 17(4): e96-103.
- XXXVIII Mehos BM, Saseen JJ, MacLaughlin EJ: Effect of pharmacist intervention and initiation of home blood pressure monitoring in patients with uncontrolled hypertension *Pharmacotherapy* 2000 Nov; 20(11): 1384-9.
- XXXIX Okamoto MP, Nakahiro RK: Pharmacoeconomic evaluation of a pharmacist-managed hypertension clinic *Pharmacotherapy* 2001 Nov; 21(11): 1337-44.
- XL Simpson SH, Majumdar SR, Tsuyuki RT, Lewanczuk RZ, Spooner R, Johnson JA: Effect of adding pharmacists to primary care teams on blood pressure control in patients with type 2 diabetes: a randomized controlled trial *Diabetes Care* 2011 Jan; 34(1): 20-6.
- XLI Tobari H, Arimoto T, Shimojo N, Yuhara K, Noda H, Yamagishi K, Iso H: Physician-pharmacist cooperation program for blood pressure control in patients with hypertension: a randomized-controlled trial *Am J Hypertens* 2010 Oct; 23(10): 1144-52.
- XLII Vivian EM: Improving blood pressure control in a pharmacist-managed hypertension clinic *Pharmacotherapy* 2002 Dec; 22(12): 1533-40.
- XLIII Weber CA, Ernst ME, Sezate GS, Zheng S, Carter BL: Pharmacist-physician comanagement of hypertension and reduction in 24-hour ambulatory blood pressures *Arch Intern Med* 2010 Oct 11; 170(18): 1634-9.
- XLIV Côté I, Moisan J, Chabot I, Grégoire JP: Health-related quality of life in hypertension: impact of a pharmacy intervention programme *J Clin Pharm Ther* 2005 Aug; 30(4): 355-62.
- XLV Garção JA, Cabrita J: Evaluation of a pharmaceutical care program for hypertensive patients in rural Portugal *J Am Pharm Assoc (Wash)* 2002 Nov-Dec; 42(6): 858-64.
- XLVI McLean DL, McAlister FA, Johnson JA, King KM, Makowsky MJ, Jones CA, Tsuyuki RT: A randomized trial of the effect of community pharmacist and nurse care on improving blood pressure management in patients with diabetes mellitus: study of cardiovascular risk intervention by pharmacists-hypertension (SCRIP-HTN) *Arch Intern Med* 2008; 168(21): 2355-61.
- XLVII Planas LG, Crosby KM, Mitchell KD, Farmer KC: Evaluation of a hypertension medication therapy management program in patients with diabetes *J Am Pharm Assoc* 2009; 49(2): 164-70.
- XLVIII Sookaneknun P, Richards RM, Sanguansermsri J, Teerasut C: Pharmacist involvement in primary care improves hypertensive patient clinical outcomes *Ann Pharmacother* 2004 Dec; 38(12): 2023-8.
- XLIX Zillich AJ, Sutherland JM, Kumbera PA, Carter BL: Hypertension outcomes through blood pressure monitoring and evaluation by pharmacists (HOME study) *J Gen Intern Med* 2005; 20(12): 1091-6.
- L Brouker ME, Gallagher K, Larrat EP, Dufresne RL: Patient compliance and blood pressure control on a nuclear-powered aircraft carrier *Mil Med* 2000 Feb; 165(2): 106-10.
- LI Strogatz DS, Earp JA: The determinants of dropping out of care among hypertensive patients receiving a behavioral intervention *Med Care* 1983 Oct; 21(10): 970-80.
- LII Aramwit P, Assawawitoontip S: Evaluation of patient counseling on blood pressure control of out-patients with hypertension at Chulalongkorn Hospital *J Med Assoc Thai* 2003 Jun; 86 Suppl 2: S496-500.
- LIII Chisholm MA, Mulloy LL, Jagadeesan M, Martin BC, DiPiro JT: Effect of clinical pharmacy services on the blood pressure of African-American renal transplant patients *Ethn Dis* 2002 Summer; 12(3): 392-7.
- LIV de Castro MS, Fuchs FD, Santos MC, Maximiliano P, Gus M, Moreira LB, Ferreira MB: Pharmaceutical care program for patients with uncontrolled hypertension Report of a double-blind clinical trial with ambulatory blood pressure monitoring *Am J Hypertens* 2006 May; 19(5): 528-33.
- LV Erhun WO, Agbani EO, Bolaji EE: Positive benefits of a pharmacist-managed hypertension clinic in Nigeria *Public Health* 2005 Sep; 119(9): 792-8.
- LVI Morgado M, Rolo S, Castelo-Branco M: Pharmacist intervention program to enhance hypertension control: a randomized controlled trial *Int J Clin Pharm* 2011 Feb; 33(1): 132-40.
- LVII Bailey TC, Noirot LA, Gage BF, Li X, Shannon WD, Waterman B, Sinha S, Bouselli DA, Reichley RM, Goldberg AC, Dunagan WC: Improving adherence to coronary heart disease secondary prevention medication guidelines at a community hospital *AMIA Annu Symp Proc* 2006: 850.
- LVIII Community Pharmacy Medicines Management Project Evaluation Team: The MEDMAN study: a randomized controlled trial of community pharmacy-led medicines management for patients with coronary heart disease *Fam Pract* 2007 Apr; 24(2): 189-200.
- LIX Bailey TC, Noirot LA, Blickensderfer A, Rachmiel E, Schaiff R, Kessels A, Braverman A, Goldberg A, Waterman B, Dunagan WC: An intervention to improve secondary prevention of coronary heart disease *Arch Intern Med* 2007 Mar 26; 167(6): 586-90.
- LX Hohmann C, Klotz JM, Radziwill R, Jacobs AH, Kissel T: Pharmaceutical care for patients with ischemic stroke: improving the patients quality of life *Pharm World Sci* 2009 Oct; 31(5): 550-8.
- LXI Chiu CC, Wu SS, Lee PY, Huang YC, Tan TY, Chang KC: Control of modifiable risk factors in ischemic stroke outpatients by pharmacist intervention: an equal allocation stratified randomized study *J Clin Pharm Ther* 2008 Oct; 33(5): 529-35.
- LXII Eggink RN, Lenderink AW, Widdershoven JW, van den Bernt PM: The effect of a clinical pharmacist discharge service on medication discrepancies in patients with heart failure *Pharm World Sci* 2010 Dec; 32(6): 759-66.
- LXIII Lewis KP, Cooper JW Jr, McKercher PL: Pharmacist's effect on digoxin usage and toxicity *Am J Hosp Pharm* 1976 Dec; 33(12): 1272-6.
- LXIV López Cabezas C, Falces Salvador C, Cubi Quadrada D, Arnau Bartés A, Ylla Boré M, Muro Perea N, Homs Peipoch E: Randomized clinical trial of a post discharge pharmaceutical care program vs regular follow-up in patients with heart failure *Farm Hosp* 2006 Nov-Dec; 30(6): 328-42.
- LXV Luzier AB, Forrest A, Feuerstein SG, Schentag JJ, Izzo JL Jr: Containment of heart failure hospitalizations and cost by angiotensin-converting enzyme inhibitor dosage optimization *Am J Cardiol* 2000 Sep 1; 86(5): 519-23.
- LXVI Varma S, McElnay JC, Hughes CM, Passmore AP, Varma M: Pharmaceutical care of patients with congestive heart failure: interventions and outcomes *Pharmacotherapy* 1999 Jul; 19(7): 860-9.
- LXVII Bouvy ML, Heerdink ER, Urquhart J, Grobbee DE, Hoeks AW, Leufkens HG: Effect of a pharmacist-led intervention on diuretic compliance in heart failure patients: a randomized controlled study *J Card Fail* 2003 Oct; 9(5): 404-11.
- LXVIII Murray MD, Young J, Hoke S, Tu W, Weiner M, Morrow D, Stroupe KT, Wu J, Clark D, Smith F, Gradus-Pizlo I, Weinberger M, Brater DC: Pharmacist intervention to improve medication adherence in heart failure: a randomized trial *Ann Intern Med* 2007 May 15; 146(10): 714-25.

<p>LXIX Turner CJ, Parfrey P, Ryan K, Miller R, Brown A: Community pharmacist outreach program directed at physicians treating congestive heart failure <i>Am J Health Syst Pharm</i> 2000 Apr 15; 57(8): 747-52.</p> <p>LXX Holland R, Brooksby I, Lenaghan E, Ashton K, Hay L, Smith R, Shepstone L, Lipp A, Daly C, Howe A, Hall R, Harvey I: Effectiveness of visits from community pharmacists for patients with heart failure: HeartMed randomised controlled trial <i>BMJ</i> 2007 May 26; 334(7603): 1098.</p> <p>LXXI Bucci C, Jackevicius C, McFarlane K, Liu P: Pharmacist's contribution in a heart function clinic: patient perception and medication appropriateness <i>Can J Cardiol</i> 2003 Mar 31; 19(4): 391-6.</p> <p>LXXII Gattis WA, Hasselblad V, Whellan DJ, O'Connor CM: Reduction in heart failure events by the addition of a clinical pharmacist to the heart failure management team: RESULTS of the Pharmacist in Heart Failure Assessment Recommendation and Monitoring (PHARM) Study <i>Arch Intern Med</i> 1999 Sep 13; 159(16): 1939-45.</p> <p>LXXIII Linné AB, Liedholm H, Israelsson B: Effects of systematic education on heart failure patients' knowledge after 6 months <i>A randomised, controlled trial Eur J Heart Fail</i> 1999 Aug; 1(3): 219-27.</p> <p>LXXIV Sadik A, Yousif M, McElnay JC: Pharmaceutical care of patients with heart failure <i>Br J Clin Pharmacol</i> 2005 Aug; 60(2): 183-93.</p> <p>LXXV Duran-Parrondo C, Vazquez-Lago JM, Campos-Lopez AM, Figueiras A: Impact of a pharmacotherapeutic programme on control and safety of long-term anticoagulation treatment: a controlled follow-up study in Spain <i>Drug Saf</i> 2011 Jun 1; 34(6): 489-500.</p> <p>LXXVI Andresescu AC, Possidente C, Hsieh M, Cushman M: Evaluation of a pharmacy-based surveillance program for heparin-induced thrombocytopenia <i>Pharmacotherapy</i> 2000 Aug; 20(8): 974-80.</p> <p>LXXVII Donovan JL, Schroeder WS, Tran MT, Foster K, Forrest A, Lee TB, Gandhi PJ: Assessment of eptifibatid dosing in renal impairment before and after in-service education provided by pharmacists <i>J Manag Care Pharm</i> 2007 Sep; 13(7): 598-606.</p> <p>LXXVIII Chan FW, Wong RS, Lau WH, Chan TY, Cheng G, You JH: Management of Chinese patients on warfarin therapy in two models of anticoagulation service - a prospective randomized trial <i>Br J Clin Pharmacol</i> 2006 Nov; 62(5): 601-9.</p> <p>LXXIX Klein A, Otto G, Krämer I: Impact of a pharmaceutical care program on liver transplant patients' compliance with immunosuppressive medication: a prospective, randomized, controlled trial using electronic monitoring <i>Transplantation</i> 2009 Mar 27; 87(6): 839-47.</p> <p>LXXX Connelly JF: Adjusting dosage intervals of intermittent intravenous ranitidine according to creatinine clearance: a cost-minimization analysis <i>Hosp Pharm</i> 1994 Nov; 29(11): 992, 996-8, 1001.</p> <p>LXXXI Westerlund T, Allebeck P, Marklund B, Andersson IL, Brånstad JO, Sjöblom M: Evaluation of a model for counseling patients with dyspepsia in Swedish community pharmacies <i>Am J Health Syst Pharm</i> 2003 Jul 1; 60(13): 1336-41.</p> <p>LXXXII Stevens VJ, Shneidman RJ, Johnson RE, Boles M, Steele PE, Lee NL: Helicobacter pylori eradication in dyspeptic primary care patients: a randomized controlled trial of a pharmacy intervention <i>West J Med</i> 2002 Mar; 176(2): 92-6.</p> <p>LXXXIII Al-Eidan FA, McElnay JC, Scott MG, McConnell JB: Management of Helicobacter pylori eradication—the influence of structured counselling and follow-up <i>Br J Clin Pharmacol</i> 2002 Feb; 53(2): 163-71.</p> <p>LXXXIV Alvarez Arroyo L, Climent Grana E, Bosacoma Ros N, Roca Meroño S, Perdiguero Gil M, Ordovás Baines JP, Sánchez Payá J: Assessment of a pharmaceutical interventional programme in patients on medications with renal risk <i>Farm Hosp</i> 2009 May-Jun; 33(3): 147-54.</p> <p>LXXXV Bhardwaja B, Carroll NM, Raebel MA, Chester EA, Komer EJ, Rocho BE, Brand DW, Magid DJ: Improving prescribing safety in patients with renal insufficiency in the ambulatory setting: the Drug Renal Alert Pharmacy (DRAP) program <i>Pharmacotherapy</i> 2011 Apr; 31(4): 346-56.</p> <p>LXXXVI Chisholm MA, Mulloy LL, Jagadeesan M, DiPiro JT: Impact of clinical pharmacy services on renal transplant patients' compliance with immunosuppressive medications <i>Clin Transplant</i> 2001 Oct; 15(5): 330-6.</p> <p>LXXXVII Pai AB, Boyd A, Chavez A, Manley HJ: Health-related quality of life is maintained in hemodialysis patients receiving pharmaceutical care: a 2-year randomized, controlled study <i>Hemodial Int</i> 2009 Jan; 13(1): 72-9.</p>	<p>LXXXVIII Pai AB, Boyd A, Depczynski J, Chavez IM, Khan N, Manley H: Reduced drug use and hospitalization rates in patients undergoing hemodialysis who received pharmaceutical care: a 2-year, randomized, controlled study <i>Pharmacotherapy</i> 2009 Dec; 29(12): 1433-40.</p> <p>LXXXIX Midlöv P, Bondesson A, Eriksson T, Petersson J, Minthon L, Höglund P: Descriptive study and pharmacotherapeutic intervention in patients with epilepsy or Parkinson's disease at nursing homes in southern Sweden <i>Eur J Clin Pharmacol</i> 2002 Feb; 57(12): 903-10.</p> <p>XC Hoffmann W, Herzog B, Mühlhög S, Kayser H, Fabian R, Thomsen M, Cramer M, Fiss T, Gresselmeyer D, Janhsen K: Pharmaceutical care for migraine and headache patients: a community-based, randomized intervention <i>Ann Pharmacother</i> 2008 Dec; 42(12): 1804-13.</p> <p>XCI Sondergaard J, Foged A, Kragstrup J, Gaist D, Gram LF, Sindrup SH, Muckadell HU, Larsen BO, Herborg H, Andersen M: Intensive community pharmacy intervention had little impact on triptan consumption: a randomized controlled trial <i>Scand J Prim Health Care</i> 2006 Mar; 24(1): 16-21.</p> <p>XCII Adler DA, Bungay KM, Wilson IB, Pei Y, Supran S, Peckham E, Cynn DJ, Rogers WH: The impact of a pharmacist intervention on 6-month outcomes in depressed primary care patients <i>Gen Hosp Psychiatry</i> 2004 May-Jun; 26(3): 199-209.</p> <p>XCIII Finley PR, Rens HR, Pont JT, Gess SL, Louie C, Bull SA, Lee JY, Bero LA: Impact of a collaborative care model on depression in a primary care setting: a randomized controlled trial <i>Pharmacotherapy</i> 2003 Sep; 23(9): 1175-85.</p> <p>XCIV Hoffman L, Enders J, Luo J, Segal R, Pippins J, Kimberlin C: Impact of an antidepressant management program on medication adherence <i>Am J Manag Care</i> 2003 Jan; 9(1): 70-80.</p> <p>XCV Pyne JM, Fortney JC, Tripathi SP, Maciejewski ML, Edlund MJ, Williams DK: Cost-effectiveness analysis of a rural telemedicine collaborative care intervention for depression <i>Arch Gen Psychiatry</i> 2010 Aug; 67(8): 812-21.</p> <p>XCVI Bosmans JE, Brook OH, van Hout HP, de Bruijne MC, Nieuwenhuysen H, Bouter LM, Stalman WA, van Tulder MW: Cost effectiveness of a pharmacy-based coaching programme to improve adherence to antidepressants <i>Pharmacoeconomics</i> 2007; 25(1): 25-37.</p> <p>XCVII Brook O, van Hout H, Nieuwenhuysen H, Heerding E: Impact of coaching by community pharmacists on drug attitude of depressive primary care patients and acceptability to patients; a randomized controlled trial <i>Eur Neuropsychopharmacol</i> 2003 Jan; 13(1): 1-9.</p> <p>XCVIII Brook OH, van Hout H, Stalman W, Nieuwenhuysen H, Bakker B, Heerding E, de Haan M: A pharmacy-based coaching program to improve adherence to antidepressant treatment among primary care patients <i>Psychiatr Serv</i> 2005 Apr; 56(4): 487-9.</p> <p>XCIX Crockett J, Taylor S, Grabham A, Stanford P: Patient outcomes following an intervention involving community pharmacists in the management of depression <i>Aust J Rural Health</i> 2006 Dec; 14(6): 263-9.</p> <p>C Finley PR, Bluml BM, Bunting BA, Kiser SN: Clinical and economic outcomes of a pilot project examining pharmacist-focused collaborative care treatment for depression <i>J Am Pharm Assoc</i> (2003) 2011 Jan-Feb; 51(1): 40-9.</p> <p>CI Pyne JM, Fortney JC, Curran GM, Tripathi S, Atkinson JH, Kilbourne AM, Hagedorn HJ, Rimland D, Rodriguez-Barradas MC, Monson T, Bottonari KA, Asch SM, Gifford AL: Effectiveness of collaborative care for depression in human immunodeficiency virus clinics <i>Arch Intern Med</i> 2011 Jan 10; 171(1): 23-31.</p> <p>CII Hartlaub PP, Barrett PH, Marine WM, Murphy JR: Evaluation of an intervention to change benzodiazepine-prescribing behavior in a prepaid group practice setting <i>Am J Prev Med</i> 1993 Nov-Dec; 9(6): 346-52.</p> <p>CIII Sorensen L, Nielsen B, Stage KB, Brøsen K, Damkier P: Implementation of a rational pharmacotherapy intervention for inpatients at a psychiatric department <i>Nord J Psychiatry</i> 2008; 62(3): 242-9.</p> <p>CIV Patterson SM, Hughes CM, Crealey G, Cardwell C, Lapane KL: An evaluation of an adapted U.S. model of pharmaceutical care to improve psychoactive prescribing for nursing home residents in northern Ireland (fleetwood northern ireland study) <i>J Am Geriatr Soc</i> 2010 Jan; 58(1): 44-53.</p> <p>CV Patterson SM, Hughes CM, Cardwell C, Lapane KL, Murray AM, Crealey GE: A cluster randomized controlled trial of an adapted U.S. model of pharmaceutical care for nursing home residents in Northern Ireland</p>
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- (Fleetwood Northern Ireland study): a cost-effectiveness analysis *J Am Geriatr Soc* 2011 Apr; 59(4): 586-93.
- CVI Schmidt I, Claesson CB, Westerholm B, Nilsson LG, Svarstad BL: The impact of regular multidisciplinary team interventions on psychotropic prescribing in Swedish nursing homes *J Am Geriatr Soc* 1998 Jan; 46(1): 77-82.
- CVII Valenstein M, Kavanagh J, Lee T, Reilly P, Dalack GW, Grabowski J, Smelson D, Ronis DL, Ganoczy D, Woltmann E, Metreger T, Wolschon P, Jensen A, Poddig B, Blow FC: Using a pharmacy-based intervention to improve antipsychotic adherence among patients with serious mental illness *Schizophr Bull* 2011 Jul; 37(4): 727-36.
- CVIII Choe HM, Mitrovich S, Dubay D, Hayward RA, Krein SL, Vijan S: Proactive case management of high-risk patients with type 2 diabetes mellitus by a clinical pharmacist: a randomized controlled trial *Am J Manag Care* 2005 Apr; 11(4): 253-60.
- CIX Jaber LA, Halapy H, Fernet M, Tummalapalli S, Diwakaran H: Evaluation of a pharmaceutical care model on diabetes management *Ann Pharmacother* 1996 Mar; 30(3): 238-43.
- CX Jameson JP, Baty PJ: Pharmacist collaborative management of poorly controlled diabetes mellitus: a randomized controlled trial *Am J Manag Care* 2010 Apr; 16(4): 250-5.
- CXI Kirwin JL, Cunningham RJ, Sequist TD: Pharmacist recommendations to improve the quality of diabetes care: a randomized controlled trial *J Manag Care Pharm* 2010 Mar; 16(2): 104-13.
- CXII Odegard PS, Goo A, Hummel J, Williams KL, Gray SL: Caring for poorly controlled diabetes mellitus: a randomized pharmacist intervention *Ann Pharmacother* 2005 Mar; 39(3): 433-40.
- CXIII Ragucci KR, Fermo JD, Wessell AM, Chumney EC: Effectiveness of pharmacist-administered diabetes mellitus education and management services *Pharmacotherapy* 2005 Dec; 25(12): 1809-16.
- CXIV Sarkadi A, Rosenqvist U: Experience-based group education in Type 2 diabetes: a randomised controlled trial *Patient Educ Couns* 2004 Jun; 53(3): 291-8.
- CXV Scott DM, Boyd ST, Stephan M, Augustine SC, Reardon TP: Outcomes of pharmacist-managed diabetes care services in a community health center *Am J Health Syst Pharm* 2006 Nov 1; 63(21): 2116-22.
- CXVI Wagner EH, Grothaus LC, Sandhu N, Galvin MS, McGregor M, Artz K, Coleman EA: Chronic care clinics for diabetes in primary care: a system-wide randomized trial *Diabetes Care* 2001 Apr; 24(4): 695-700.
- CXVII Elnour AA, El Mugammar IT, Jaber T, Revel T, McElnay JC: Pharmaceutical care of patients with gestational diabetes mellitus *J Eval Clin Pract* 2008 Feb; 14(1): 131-40.
- CXVIII Berringer R, Shibley MC, Cary CC, Pugh CB, Powers PA, Rafi JA: Outcomes of a community pharmacy-based diabetes monitoring program *J Am Pharm Assoc (Wash)* 1999 Nov-Dec; 39(6): 791-7.
- CXIX Fornos JA, Andrés NF, Andrés JC, Guerra MM, Egea B: A pharmacotherapy follow-up program in patients with type-2 diabetes in community pharmacies in Spain *Pharm World Sci* 2006 Apr; 28(2): 65-72.
- CXX Krass I, Armour CL, Mitchell B, Brilliant M, Dienaar R, Hughes J, Lau P, Peterson G, Stewart K, Taylor S, Wilkinson J: The Pharmacy Diabetes Care Program: assessment of a community pharmacy diabetes service model in Australia *Diabet Med* 2007 Jun; 24(6): 677-83.
- CXXI Al Mazroui NR, Kamal MM, Ghabash NM, Yacout TA, Kole PL, McElnay JC: Influence of pharmaceutical care on health outcomes in patients with Type 2 diabetes mellitus *Br J Clin Pharmacol* 2009 May; 67(5): 547-57.
- CXXII Gay CL, Chapuis F, Bendelac N, Tixier F, Treppoz S, Nicolino M: Reinforced follow-up for children and adolescents with type 1 diabetes and inadequate glycaemic control: a randomized controlled trial intervention via the local pharmacist and telecare *Diabetes Metab* 2006 Apr; 32(2): 159-65.
- CXXIII Suppapatiporn S, Chindavijak B, Onsanit S: Effect of diabetes drug counseling by pharmacist, diabetic disease booklet and special medication containers on glycemic control of type 2 diabetes mellitus: a randomized controlled trial *J Med Assoc Thai* 2005 Sep; 88 Suppl 4: S134-41.
- CXXIV Van Veldhuizen-Scott MK, Widmer LB, Stacey SA, Popovich NG: Developing and implementing a pharmaceutical care model in an ambulatory care setting for patients with diabetes *Diabetes Educ* 1995 Mar-Apr; 21(2): 117-23.
- CXXV Bogden PE, Koontz LM, Williamson P, Abbott RD: The physician and pharmacist team: An effective approach to cholesterol reduction *J Gen Intern Med* 1997 Mar; 12(3): 158-64.
- CXXVI Ellis SL, Carter BL, Malone DC, Billups SJ, Okano GJ, Valuck RJ, Barnette DJ, Sintek CD, Covey D, Mason B, Jue S, Carmichael J, Guthrie K, Dombrowski R, Geraets DR, Amato M: Clinical and economic impact of ambulatory care clinical pharmacists in management of dyslipidemia in older adults: the IMPROVE study *Pharmacotherapy* 2000 Dec; 20(12): 1508-16.
- CXXVII Konzem SL, Gray DR, Kashyap ML: Effect of pharmaceutical care on optimum colestipol treatment in elderly hypercholesterolemic veterans *Pharmacotherapy* 1997 May-Jun; 17(3): 576-83.
- CXXVIII Miller AE, Hansen LB, Saseen JJ: Switching statin therapy using a pharmacist-managed therapeutic conversion program versus usual care conversion among indigent patients *Pharmacotherapy* 2008 May; 28(5): 553-61.
- CXXIX Pape GA, Hunt JS, Butler KL, Siemenczuk J, LeBlanc BH, Gillanders W, Rozenfeld Y, Bonin K: Team-based care approach to cholesterol management in diabetes mellitus: two-year cluster randomized controlled trial *Arch Intern Med* 2011 Sep 12; 171(16): 1480-6.
- CXXX Straka RJ, Taheri R, Cooper SL, Smith JC: Achieving cholesterol target in a managed care organization (ACTION) trial *Pharmacotherapy* 2005 Mar; 25(3): 360-71.
- CXXXI Peterson GM, Fitzmaurice KD, Naunton M, Vial JH, Stewart K, Krum H: Impact of pharmacist-conducted home visits on the outcomes of lipid-lowering drug therapy *J Clin Pharm Ther* 2004 Feb; 29(1): 23-30.
- CXXXII Eussen SR, van der Elst ME, Klungel OH, Rompelberg CJ, Garssen J, Oosterveld MH, de Boer A, de Gier JJ, Bouvy ML: A pharmaceutical care program to improve adherence to statin therapy: a randomized controlled trial *Ann Pharmacother* 2010 Dec; 44(12): 1905-13.
- CXXXIII Paulós CP, Nygren CE, Celedón C, Cárcamo CA: Impact of a pharmaceutical care program in a community pharmacy on patients with dyslipidemia *Ann Pharmacother* 2005 May; 39(5): 939-43.
- CXXXIV Simpson SH, Johnson JA, Tsuyuki RT: Economic impact of community pharmacist intervention in cholesterol risk management: an evaluation of the study of cardiovascular risk intervention by pharmacists *Pharmacotherapy* 2001 May; 21(5): 627-35.
- CXXXV Simpson SH, Johnson JA, Biggs RS, Tsuyuki RT; SCRIP Investigators: Greater effect of enhanced pharmacist care on cholesterol management in patients with diabetes mellitus: a planned subgroup analysis of the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP) *Pharmacotherapy* 2004 Mar; 24(3): 389-94.
- CXXXVI Tsuyuki RT, Johnson JA, Teo KK, Simpson SH, Ackman ML, Biggs RS, Cave A, Chang WC, Dzavik V, Farris KB, Galvin D, Semchuk W, Taylor JG: A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP) *Arch Intern Med* 2002 May 27; 162(10): 1149-55.
- CXXXVII Vrijens B, Belmans A, Matthys K, de Klerk E, Lesaffre E: Effect of intervention through a pharmaceutical care program on patient adherence with prescribed once-daily atorvastatin *Pharmacoeconomic Drug Saf* 2006 Feb; 15(2): 115-21.
- CXXXVIII Yamada C, Johnson JA, Robertson P, Pearson G, Tsuyuki RT: Long-term impact of a community pharmacist intervention on cholesterol levels in patients at high risk for cardiovascular events: extended follow-up of the second study of cardiovascular risk intervention by pharmacists (SCRIP-plus) *Pharmacotherapy* 2005 Jan; 25(1): 110-5.
- CXXXIX Chung JS, Lee KK, Tomlinson B, Lee VW: Clinical and economic impact of clinical pharmacy service on hyperlipidemic management in Hong Kong *J Cardiovasc Pharmacol Ther* 2011 Mar; 16(1): 43-52.
- CXL Faulkner MA, Wadibia EC, Lucas BD, Hilleman DE: Impact of pharmacy counseling on compliance and effectiveness of combination lipid-lowering therapy in patients undergoing coronary artery revascularization: a randomized, controlled trial *Pharmacotherapy* 2000 Apr; 20(4): 410-6.
- CXLI Lee VW, Fan CS, Li AW, Chau AC: Clinical impact of a pharmacist-physician co-managed programme on hyperlipidaemia management in Hong Kong *J Clin Pharm Ther* 2009 Aug; 34(4): 407-14.

- CXLII Vande Griend JP, Linnebur SA, Ruscini JM, Vondracek SF, Wolfe P, McDermott MT: Vitamin D intervention by pharmacists in geriatric outpatients *J Am Pharm Assoc* 2008 Jul-Aug; 48(4): 501-7.
- CXLIII De Santis G, Harvey KJ, Howard D, Mashford ML, Moulds RF: Improving the quality of antibiotic prescription patterns in general practice *Med J Aust* 1994 Apr 18; 160(8): 502-5.
- CXLIV Ilett KF, Johnson S, Greenhill G, Mullen L, Brockles J, Gollidge CL, Reid DB: Modification of general practitioner prescribing of antibiotics by use of a therapeutics adviser (academic detailer) *Br J Clin Pharmacol* 2000 Feb; 49(2): 168-73.
- CXLV Clark PM, Karagoz T, Apikoglu-Rabus S, Izzettin FV: Effect of pharmacist-led patient education on adherence to tuberculosis treatment *Am J Health Syst Pharm* 2007 Mar 1; 64(5): 497-505.
- CXLVI Dranitsaris G, Spizzirri D, Pitre M, McGeer A: A randomized trial to measure the optimal role of the pharmacist in promoting evidence-based antibiotic use in acute care hospitals *Int J Technol Assess Health Care* 2001 Spring; 17(2): 171-80.
- CXLVII Fraser GL, Stogsdill P, Dickens JD Jr, Wennberg DE, Smith RP Jr, Prato BS: Antibiotic optimization: An evaluation of patient safety and economic outcomes *Arch Intern Med* 1997 Aug 11-25; 157(15): 1689-94.
- CXLVIII Gums JG, Yancey RW Jr, Hamilton CA, Kubilis PS: A randomized, prospective study measuring outcomes after antibiotic therapy intervention by a multidisciplinary consult team *Pharmacotherapy* 1999 Dec; 19(12): 1369-77.
- CXLIX Ho BP, Lau TT, Balen RM, Naumann TL, Jewesson PJ: The impact of a pharmacist-managed dosage form conversion service on ciprofloxacin usage at a major Canadian teaching hospital: a pre- and post-intervention study *BMC Health Serv Res* 2005 Jun 29; 5:48.
- CL Beaucage K, Lachance-Demers H, Ngo TT, Vachon C, Lamarre D, Guévin JF, Martineau A, Desroches D, Brassard J, Lalonde L: Telephone follow-up of patients receiving antibiotic prescriptions from community pharmacies *Am J Health Syst Pharm* 2006 Mar 15; 63(6): 557-63.
- CLI Ramström H, Erwander I, Mared L, Kornfält R, Seiving B: Pharmaceutical intervention in the care of cystic fibrosis patients *J Clin Pharm Ther* 2000 Dec; 25(6): 427-34.
- CLII Seager JM, Howell-Jones RS, Dunstan FD, Lewis MA, Richmond S, Thomas DW: A randomised controlled trial of clinical outreach education to rationalize antibiotic prescribing for acute dental pain in the primary care setting *Br Dent J* 2006 Aug 26; 201(4): 217-22; discussion 216.
- CLIII Marino EL, Alvarez-Rubio L, Miro S, Modamio P, Banos F, Lastra CF, Alberdi-Leniz A: Pharmacist intervention in treatment of patients with genotype 1 chronic hepatitis C *J Manag Care Pharm* 2009 Mar; 15(2): 147-50.
- CLIV Cioffi ST, Caron MF, Kalus JS, Hill P, Buckley TE: Glycosylated hemoglobin, cardiovascular, and renal outcomes in a pharmacist-managed clinic *Ann Pharmacother* 2004 May; 38(5): 771-5.
- CLV Clifford RM, Davis WA, Batty KT, Davis TM: Effect of a pharmaceutical care program on vascular risk factors in type 2 diabetes: the Fremantle Diabetes Study *Diabetes Care* 2005 Apr; 28(4): 771-6.
- CLVI Edelman D, Fredrickson SK, Melnyk SD, Coffman CJ, Jeffreys AS, Datta S, Jackson GL, Harris AC, Hamilton NS, Stewart H, Stein J, Weinberger M: Medical clinics versus usual care for patients with both diabetes and hypertension: a randomized trial *Ann Intern Med* 2010 Jun 1; 152(11): 689-96.
- CLVII Evans CD, Eurich DT, Taylor JG, Blackburn DF: The Collaborative Cardiovascular Risk Reduction in Primary Care (CCARP) study *Pharmacotherapy* 2010 Aug; 30(8): 766-75.
- CLVIII Hammad EA, Yasein N, Tahaineh L, Albsoul-Younes AM: A randomized controlled trial to assess pharmacist-physician collaborative practice in the management of metabolic syndrome in a university medical clinic in Jordan *J Manag Care Pharm* 2011 May; 17(4): 295-303.
- CLIX Lee JK, Grace KA, Taylor AJ: Effect of a pharmacy care program on medication adherence and persistence, blood pressure, and low-density lipoprotein cholesterol: a randomized controlled trial *JAMA* 2006 Dec 6; 296(21): 2563-71.
- CLX Majumdar SR, Guirguis LM, Toth EL, Lewanczuk RZ, Lee TK, Johnson JA: Controlled trial of a multifaceted intervention for improving quality of care for rural patients with type 2 diabetes *Diabetes Care* 2003 Nov; 26(11): 3061-6.
- CLXI Murray MD, Ritchey ME, Wu J, Tu W: Effect of a pharmacist on adverse drug events and medication errors in outpatients with cardiovascular disease *Arch Intern Med* 2009 Apr 27; 169(8): 757-63.
- CLXII Rothman RL, Malone R, Bryant B, Shintani AK, Crigler B, Dewalt DA, Dittus RS, Weinberger M, Pignone MP: A randomized trial of a primary care-based disease management program to improve cardiovascular risk factors and glycosylated hemoglobin levels in patients with diabetes *Am J Med* 2005 Mar; 118(3): 276-84.
- CLXIII Taveira TH, Friedmann PD, Cohen LB, Dooley AG, Khatana SA, Pirraglia PA, Wu WC: Pharmacist-led group medical appointment model in type 2 diabetes *Diabetes Educ* 2010 Jan-Feb; 36(1): 109-17.
- CLXIV Doucette WR, Witry MJ, Farris KB, McDonough RP: Community pharmacist-provided extended diabetes care *Ann Pharmacother* 2009 May; 43(5): 882-9.
- CLXV Kaczorowski J, Chambers LW, Dolovich L, Paterson JM, Karwalajtys T, Gierman T, Farrell B, McDonough B, Thabane L, Tu K, Zagorski B, Goeree R, Levitt CA, Hogg W, Laryea S, Carter MA, Cross D, Sabalot RJ: Improving cardiovascular health at population level: 39 community cluster randomised trial of Cardiovascular Health Awareness Program (CHAP) *BMJ* 2011 Feb; 342: d442doi: 10.1136/bmj.d442.
- CLXVI Costello MJ, Sproule B, Victor JC, Leatherdale ST, Zawertailo L, Selby P: Effectiveness of pharmacist counseling combined with nicotine replacement therapy: a pragmatic randomized trial with 6,987 smokers *Cancer Causes Control* 2011 Feb; 22(2): 167-80.
- CLXVII Giles JT, Kennedy DT, Dunn EC, Wallace WL, Meadows SL, Cafiero AC: RESULTS of a community pharmacy-based breast cancer risk-assessment and education program *Pharmacotherapy* 2001 Feb; 21(2): 243-53.
- CLXVIII Maguire TA, McElnay JC, Drummond A: A randomized controlled trial of a smoking cessation intervention based in community pharmacies *Addiction* 2001 Feb; 96(2): 325-31.
- CLXIX Dranitsaris G, Warr D, Puodziunas A: A randomized trial of the effects of pharmacist intervention on the cost of antiemetic therapy with ondansetron *Support Care Cancer* 1995 May; 3(3): 183-9.
- CLXX Simons S, Ringsdorf S, Braun M, Mey UJ, Schwindt PF, Ko YD, Schmidt-Wolf I, Kuhn W, Jaehde U: Enhancing adherence to capecitabine chemotherapy by means of multidisciplinary pharmaceutical care *Support Care Cancer* 2011 Jul; 19(7): 1009-18.
- CLXXI Allard J, Hébert R, Rioux M, Asselin J, Voyer L: Efficacy of a clinical medication review on the number of potentially inappropriate prescriptions prescribed for community-dwelling elderly people *CMAJ* 2001 May 1; 164(9): 1291-6.
- CLXXII Bregnhøj L, Thirstrup S, Kristensen MB, Bjerrum L, Sonne J: Combined intervention programme reduces inappropriate prescribing in elderly patients exposed to polypharmacy in primary care *Eur J Clin Pharmacol* 2009 Feb; 65(2): 199-207.
- CLXXIII Britton ML, Lurvey PL: Impact of medication profile review on prescribing in a general medicine clinic *Am J Hosp Pharm* 1991 Feb; 48(2): 265-70.
- CLXXIV Hanlon JT, Weinberger M, Samsa GP, Schmader KE, Uttech KM, Lewis IK, Cowper PA, Landsman PB, Cohen HJ, Feussner JR: A randomized, controlled trial of a clinical pharmacist intervention to improve inappropriate prescribing in elderly outpatients with polypharmacy *Am J Med* 1996 Apr; 100(4): 428-37.
- CLXXV Jameson JP, VanNoord GR: Pharmacotherapy consultation on polypharmacy patients in ambulatory care *Ann Pharmacother* 2001 Jul-Aug; 35(7-8): 835-40.
- CLXXVI Krska J, Cromarty JA, Arris F, Jamieson D, Hansford D, Duffus PR, Downie G, Seymour DG: Pharmacist-led medication review in patients over 65: a randomized, controlled trial in primary care *Age Ageing* 2001 May; 30(3): 205-11.
- CLXXVII Meyer TJ, Van Kooten D, Marsh S, Prochazka AV: Reduction of polypharmacy by feedback to clinicians *J Gen Intern Med* 1991 Mar-Apr; 6(2): 133-6.
- CLXXVIII Lowe CJ, Raynor DK, Purvis J, Farrin A, Hudson J: Effects of a medicine review and education programme for older people in general practice *Br J Clin Pharmacol* 2000 Aug; 50(2): 172-5.
- CLXXIX Al-Rashed SA, Wright DJ, Roebuck N, Sunter W, Chrystyn H: The value of inpatient pharmaceutical counselling to elderly patients prior to discharge *Br J Clin Pharmacol* 2002 Dec; 54(6): 657-64.

- CLXXX Bolas H, Brookes K, Scott M, McElnay J: Evaluation of a hospital-based community liaison pharmacy service in Northern Ireland *Pharm World Sci* 2004 Apr; 26(2): 114-20.
- CLXXXI Lipton HL, Bero LA, Bird JA, McPhee SJ: The impact of clinical pharmacists' consultations on physicians' geriatric drug prescribing *Med Care* 1992 Jul; 30(7): 646-58.
- CLXXXII Lipton HL, Bird JA: The impact of clinical pharmacists' consultations on geriatric patients' compliance and medical care use: a randomized controlled trial *Gerontologist* 1994 Jun; 34(3): 307-15.
- CLXXXIII Owens NJ, Sherburne NJ, Silliman RA, Fretwell MD: The optimal use of medications in acutely ill older patients *J Am Geriatr Soc* 1990 Oct; 38(10): 1082-7.
- CLXXXIV Furniss L, Burns A, Craig SK, Scobie S, Cooke J, Faragher B: Effects of a pharmacist's medication review in nursing homes *Randomised controlled trial Br J Psychiatry* 2000 Jun; 176: 563-7.
- CLXXXV Roberts MS, Stokes JA, King MA, Lynne TA, Purdie DM, Glasziou PP, Wilson DA, McCarthy ST, Brooks GE, de Looze FJ, Del Mar CB: Outcomes of a randomized controlled trial of a clinical pharmacy intervention in 52 nursing homes *Br J Clin Pharmacol* 2001 Mar; 51(3): 257-65.
- CLXXXVI Bernsten C, Björkman I, Caramona M, Crealey G, Frøkjær B, Grundberger E, Gustafsson T, Henman M, Herborg H, Hughes C, McElnay J, Magner M, van Mil F, Schaeffer M, Silva S, Søndergaard B, Sturgess I, Tromp D, Vivero L, Winterstein A: Improving the well-being of elderly patients via community pharmacy-based provision of pharmaceutical care: a multicentre study in seven European countries *Drugs Aging* 2001; 18(1): 63-77.
- CLXXXVII Bojke C, Philips Z, Sculpher M, Campion P, Chrystyn H, Coulton S, Cross B, Morton V, Richmond S, Farrin A, Hill G, Hilton A, Russell I, Wong IC: Cost-effectiveness of shared pharmaceutical care for older patients: RESPECT trial findings *Br J Gen Pract* 2010 Jan; 60(570): e20-7.
- CLXXXVIII Bryant LJ, Coster G, Gamble GD, McCormick RN: The General Practitioner-Pharmacist Collaboration (GPPC) study: a randomized controlled trial of clinical medication reviews in community pharmacy *Int J Pharm Pract* 2011 Apr; 19(2): 94-105.
- CLXXXIX Denneboom W, Dautzenberg MG, Grol R, De Smet PA: Treatment reviews of older people on polypharmacy in primary care: cluster controlled trial comparing two approaches *Br J Gen Pract* 2007 Sep; 57(542): 723-31.
- CXC Kwint HF, Faber A, Gussekloo J, Bouvy ML: Effects of medication review on drug-related problems in patients using automated drug-dispensing systems: a pragmatic randomized controlled study *Drugs Aging* 2011 Apr 1; 28(4): 305-14.
- CXCI Richmond S, Morton V, Cross B, Wong IC, Russell I, Philips Z, Miles J, Hilton A, Hill G, Farrin A, Coulton S, Chrystyn H, Campion P: Effectiveness of shared pharmaceutical care for older patients: RESPECT trial findings *Br J Gen Pract* 2010 Jan; 60(570): e10-9.
- CXCII Sellors J, Kaczorowski J, Sellors C, Dolovich L, Woodward C, Willan A, Goeree R, Cosby R, Trim K, Sebaldt R, Howard M, Hardcastle L, Poston J: A randomized controlled trial of a pharmacist consultation program for family physicians and their elderly patients *MAJ* 2003 Jul 8; 169(1): 17-22.
- CXCIII Sturgess IK, McElnay JC, Hughes CM, Crealey G: Community pharmacy based provision of pharmaceutical care to older patients *Pharm World Sci* 2003 Oct; 25(5): 218-26.
- CXCIV Vinks TH, Egberts TC, de Lange TM, de Koning FH: Pharmacist-based medication review reduces potential drug-related problems in the elderly: the SMOG controlled trial *Drugs Aging* 2009; 26(2): 123-33.
- CXCV Volume CI, Farris KB, Kassam R, Cox CE, Cave A: Pharmaceutical care research and education project: patient outcomes *J Am Pharm Assoc (Wash)* 2001 May-Jun; 41(3): 411-20.
- CXCVI Lenaghan E, Holland R, Brooks A: Home-based medication review in a high risk elderly population in primary care—the POLYMED randomised controlled trial *Age Ageing* 2007 May; 36(3): 292-7.
- CXCVII Wu JY, Leung WY, Chang S, Lee B, Zee B, Tong PC, Chan JC: Effectiveness of telephone counselling by a pharmacist in reducing mortality in patients receiving polypharmacy: randomised controlled trial *BMJ* 2006 Sep 9; 333(7567): 522.
- CXCVIII Avorn J, Soumerai SB: Improving drug-therapy decisions through educational outreach: a randomized controlled trial of academically based "detailing" *N Engl J Med* 1983 Jun 16; 308(24): 1457-63.
- CXCIX Coleman EA, Eilertsen TB, Kramer AM, Magid DJ, Beck A, Conner D: Reducing emergency visits in older adults with chronic illness: a randomized, controlled trial of group visits *Eff Clin Pract* 2001 Mar-Apr; 4(2): 49-57.
- CC Gourley GA, Portner TS, Gourley DR, Rigolosi EL, Holt JM, Solomon DK, Bass GE, Wicke WR, Braden RL: Humanistic outcomes in the hypertension and COPD arms of a multicenter outcomes study *J Am Pharm Assoc (Wash)* 1998 Sep-Oct; 38(5): 586-97.
- CCI Hogg W, Lemelin J, Dahrouge S, Liddy C, Armstrong CD, Legault F, Dalziel B, Zhang W: Randomized controlled trial of anticipatory and preventive multidisciplinary team care: for complex patients in a community-based primary care setting *Can Fam Physician* 2009 Dec; 55(12): e76-85.
- CCII Jameson J, VanNoord G, Vanderwoud K: The impact of a pharmacotherapy consultation on the cost and outcome of medical therapy *J Fam Pract* 1995 Nov; 41(5): 469-72.
- CCIII Malone DC, Carter BL, Billups SJ, Valuck RJ, Barnette DJ, Sintek CD, Okano GJ, Ellis S, Covey D, Mason B, Jue S, Carmichael J, Guthrie K, Sloboda L, Dombrowski R, Geraets DR, Amato MG: An economic analysis of a randomized, controlled, multicenter study of clinical pharmacist interventions for high-risk veterans: the IMPROVE study *Pharmacotherapy* 2000 Oct; 20(10): 1149-58.
- CCIV Malone DC, Carter BL, Billups SJ, Valuck RJ, Barnette DJ, Sintek CD, Okano GJ, Ellis S, Covey D, Mason B, Jue S, Carmichael J, Guthrie K, Sloboda L, Dombrowski R, Geraets DR, Amato MG: Can clinical pharmacists affect SF-36 scores in veterans at high risk for medication-related problems? *Med Care* 2001 Feb; 39(2): 113-22.
- CCV Mason JD, Colley CA: Effectiveness of an ambulatory care clinical pharmacist: a controlled trial *Ann Pharmacother* 1993 May; 27(5): 555-9.
- CCVI McKinnon A, Jorgenson D: Pharmacist and physician collaborative prescribing: for medication renewals within a primary health centre *Can Fam Physician* 2009 Dec; 55(12): e86-91.
- CCVII Rodgers S, Avery AJ, Meechan D, Briant S, Geraghty M, Doran K, Whyne DK: Controlled trial of pharmacist intervention in general practice: the effect on prescribing costs *Br J Gen Pract* 1999 Sep; 49(446): 717-20.
- CCVIII Scott JC, Conner DA, Venohr I, Gade G, McKenzie M, Kramer AM, Bryant L, Beck A: Effectiveness of a group outpatient visit model for chronically ill older health maintenance organization members: a 2-year randomized trial of the cooperative health care clinic *J Am Geriatr Soc* 2004 Sep; 52(9): 1463-70.
- CCIX Solomon DK, Portner TS, Bass GE, Gourley DR, Gourley GA, Holt JM, Wicke WR, Braden RL, Eberle TN, Self TH, Lawrence BL: Clinical and economic outcomes in the hypertension and COPD arms of a multicenter outcomes study *J Am Pharm Assoc (Wash)* 1998 Sep-Oct; 38(5): 574-85.
- CCX Sorensen L, Stokes JA, Purdie DM, Woodward M, Elliott R, Roberts MS: Medication reviews in the community: Results of a randomized, controlled effectiveness trial *Br J Clin Pharmacol* 2004 Dec; 58(6): 648-64.
- CCXI Steele MA, Bess DT, Franse VL, Graber SE: Cost effectiveness of two interventions for reducing outpatient prescribing costs *DICP* 1989 Jun; 23(6): 497-500.
- CCXII Taylor CT, Byrd DC, Krueger K: Improving primary care in rural Alabama with a pharmacy initiative *Am J Health Syst Pharm* 2003 Jun 1; 60(11): 1123-9.
- CCXIII Zermansky AG, Petty DR, Raynor DK, Freemantle N, Vail A, Lowe CJ: Randomised controlled trial of clinical medication review by a pharmacist of elderly patients receiving repeat prescriptions in general practice *BMJ* 2001 Dec 8; 323(7325): 1340-3.
- CCXIV Bergkvist A, Midlöv P, Höglund P, Larsson L, Bondesson A, Eriksson T: Improved quality in the hospital discharge summary reduces medication errors - LMM: Landskrona Integrated Medicines Management *Eur J Clin Pharmacol* 2009 Oct; 65(10): 1037-46.
- CCXV Crotty M, Rowett D, Spurling L, Giles LC, Phillips PA: Does the addition of a pharmacist transition coordinator improve evidence-based medication management and health outcomes in older adults moving from the hospital to a long-term care facility? *Am J Geriatr Pharmacother* 2004 Dec; 2(4): 257-64.
- CCXVI Dooley MJ, Allen KM, Doecke CJ, Galbraith KJ, Taylor GR, Bright J, Carey DL: A prospective multicentre study of pharmacist initiated

- changes to drug therapy and patient management in acute care government funded hospitals. *Br J Clin Pharmacol* 2004 Apr; 57 (4): 513-21.
- CCXVII Dudas V, Bookwalter T, Kerr KM, Pantilat SZ: The impact of follow-up telephone calls to patients after hospitalization *Dis Mon* 2002 Apr; 48(4): 239-48.
- CCXVIII Fortescue EB, Kaushal R, Landrigan CP, McKenna KJ, Clapp MD, Federico F, Goldman DA, Bates DW: Prioritizing strategies for preventing medication errors and adverse drug events in pediatric inpatients *Pediatrics* 2003 Apr; 111(4 Pt 1): 722-9.
- CCXIX Gauthier I, Malone M, Lesar TS, Aronovitch S: Comparison of programs for preventing drug-nutrient interactions in hospitalized patients *Am J Health Syst Pharm* 1997 Feb 15; 54(4): 405-11.
- CCXX Gillespie U, Alassaad A, Henrohn D, Garmo H, Hammarlund-Udenaes M, Toss H, Kettis-Lindblad A, Melhus H, Mörlin C: A comprehensive pharmacist intervention to reduce morbidity in patients 80 years or older: a randomized controlled trial *Arch Intern Med* 2009 May 11; 169(9): 894-900.
- CCXXI Gorgas Torner MQ, Gamundi Planas MC, Aguirre Zubia I, García Martín MA, Suárez Berea M, Marques Miñana R: The participation of the pharmacist in the design and follow-up of the drug treatment plan for patients with a cardiovascular condition *Farm Hosp* 2008 May-Jun; 32(3): 148-56.
- CCXXII Hawe P, Higgins G: Can medication education improve the drug compliance of the elderly? Evaluation of an in hospital program *Patient Educ Couns* 1990 Oct; 16(2): 151-60.
- CCXXIII Jack BW, Chetty VK, Anthony D, Greenwald JL, Sanchez GM, Johnson AE, Forsythe SR, O'Donnell JK, Paasche-Orlow MK, Manasseh C, Martin S, Culpepper L: A reengineered hospital discharge program to decrease rehospitalization: a randomized trial *Ann Intern Med* 2009 Feb 3; 150(3): 178-87.
- CCXXIV Klopotowska JE, Kuiper R, van Kan HJ, de Pont AC, Dijkgraaf MG, Lie-A-Huen L, Vroom MB, Smorenburg SM: On-ward participation of a hospital pharmacist in a Dutch intensive care unit reduces prescribing errors and related patient harm: an intervention study *Crit Care* 2010; 14(5): R174.
- CCXXV Koehler BE, Richter KM, Youngblood L, Cohen BA, Prengler ID, Cheng D, Masica AL: Reduction of 30-day postdischarge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle *J Hosp Med* 2009 Apr; 4(4): 211-8.
- CCXXVI Kwan Y, Fernandes OA, Nagge JJ, Wong GG, Huh JH, Hurn DA, Pond GR, Bajcar JM: Pharmacist medication assessments in a surgical preadmission clinic *Arch Intern Med* 2007 May 28; 167(10): 1034-40.
- CCXXVII Leape LL, Cullen DJ, Clapp MD, Burdick E, Demonaco HJ, Erickson JI, Bates DW: Pharmacist participation on physician rounds and adverse drug events in the intensive care unit *JAMA* 1999 Jul 21; 282(3): 267-70.
- CCXXVIII López MP, Saliente MT, Company ES, Monsalve AG, Cueva MA, Domingo EA, Hernández MM, Carrión CC, Martí MC, Querejeta NB, Blasco JB, Milá AR: Drug-related problems at discharge: results on the Spanish pharmacy discharge programme CONSULTENOS *Int J Pharm Pract* 2010 Oct; 18(5): 297-304.
- CCXXIX Makowsky MJ, Koshman SL, Midodzi WK, Tsuyuki RT: Capturing outcomes of clinical activities performed by a rounding pharmacist practicing in a team environment: the COLLABORATE study *Med Care* 2009 Jun; 47(6): 642-50.
- CCXXX McMullin ST, Hennenfent JA, Ritchie DJ, Huey WY, Lonergan TP, Schaiff RA, Tonn ME, Bailey TC: A prospective, randomized trial to assess the cost impact of pharmacist - initiated interventions *Arch Intern Med* 1999 Oct 25; 159(19): 2306-9.
- CCXXXI Nazareth I, Burton A, Shulman S, Smith P, Haines A, Timberal H: A pharmacy discharge plan for hospitalized elderly patients-a randomized controlled trial *Age Ageing* 2001 Jan; 30(1): 33-40.
- CCXXXII Schnipper JL, Kirwin JL, Cotugno MC, Wahlstrom SA, Brown BA, Tarvin E, Kachalia A, Horng M, Roy CL, McKean SC, Bates DW: Role of pharmacist counseling in preventing adverse drug events after hospitalization *Arch Intern Med* 2006 Mar 13; 166(5): 565-71.
- CCXXXIII Spinewine A, Swine C, Dhillion S, Lambert P, Nacheva JB, Wilmotte L, Tulkens PM: Effect of a collaborative approach on the quality of prescribing for geriatric patients: a randomized, controlled trial *J Am Geriatr Soc* 2007 May; 55(5): 658-65.
- CCXXXIV Voirol P, Kayser SR, Chang CY, Chang QL, Youmans SL: Impact of pharmacists' interventions on the pediatric discharge medication process *Ann Pharmacother* 2004 Oct; 38(10): 1597-602.
- CCXXXV Holland R, Lenaghan E, Harvey I, Smith R, Shepstone L, Lipp A, Christou M, Evans D, Hand C: Does home based medication review keep older people out of hospital? The HOMER randomised controlled trial *BMJ* 2005 Feb 5; 330(7486):293.
- CCXXXVI Smith L, McGowan L, Moss-Barclay C, Wheeler J, Knass D, Chrystyn H: An investigation of hospital generated pharmaceutical care when patients are discharged home from hospital *Br J Clin Pharmacol* 1997 Aug; 44(2): 163-5.
- CCXXXVII Stewart S, Pearson S, Luke CG, Horowitz JD: Effects of home-based intervention on unplanned readmissions and out-of-hospital deaths *J Am Geriatr Soc* 1998 Feb; 46(2): 174-80.
- CCXXXVIII Triller DM, Hamilton RA: Effect of pharmaceutical care services on outcomes for home care patients with heart failure *Am J Health Syst Pharm* 2007 Nov 1; 64(21): 2244-9.
- CCXXXIX Schmidt IK, Claesson CB, Westerholm B, Nilsson LG: Physician and staff assessments of drug interventions and outcomes in Swedish nursing homes *Ann Pharmacother* 1998 Jan; 32(1): 27-32.
- CCXL Zermansky AG, Alldred DP, Petty DR, Raynor DK, Freemantle N, Eastaugh J, Bowie P: Clinical medication review by a pharmacist of elderly people living in care homes - randomised controlled trial *Age Ageing* 2006 Nov; 35(6): 586-91.
- CCXLI Blalock SJ, Casteel C, Roth MT, Ferreri S, Demby KB, Shankar V: Impact of enhanced pharmacologic care on the prevention of falls: a randomized controlled trial *Am J Geriatr Pharmacother* 2010 Oct; 8(5): 428-40.
- CCXLII Clifford S, Barber N, Elliott R, Hartley E, Horne R: Patient-centred advice is effective in improving adherence to medicines *Pharm World Sci* 2006 Jun; 28(3): 165-70.
- CCXLIII Elliott RA, Barber N, Clifford S, Horne R, Hartley E: The cost effectiveness of a telephone-based pharmacy advisory service to improve adherence to newly prescribed medicines *Pharm World Sci* 2008 Jan; 30(1): 17-23.
- CCXLIV Fischer LR, Defor TA, Cooper S, Scott LM, Boonstra DM, Eelkema MA, Goodman MJ: Pharmaceutical care and health care utilization in an HMO *Eff Clin Pract* 2002 Mar-Apr; 5(2): 49-57.
- CCXLV Munroe WP, Kunz K, Dalmady-Israel C, Potter L, Schonfeld WH: Economic evaluation of pharmacist involvement in disease management in a community pharmacy setting *Clin Ther* 1997 Jan-Feb; 19(1): 113-23.
- CCXLVI Needham DS, Wong IC, Campion PD: Evaluation of the effectiveness of UK community pharmacists' interventions in community palliative care *Palliat Med* 2002 May; 16(3): 219-25.
- CCXLVII Nietert PJ, Tilley BC, Zhao W, Edwards PF, Wessell AM, Mauldin PD, Polk PP: Two pharmacy interventions to improve refill persistence for chronic disease medications: a randomized, controlled trial *Med Care* 2009 Jan; 47(1): 32-40.
- CCXLVIII Meredith S, Feldman P, Frey D, Giammarco L, Hall K, Arnold K, Brown NJ, Ray WA: Improving medication use in newly admitted home healthcare patients: a randomized controlled trial *J Am Geriatr Soc* 2002 Sep; 50(9): 1484-91.
- CCXLIX Sidel VW, Beizer JL, Lisi-Fazio D, Kleinmann K, Wenston J, Thomas C, Kelman HR: Controlled study of the impact of educational home visits by pharmacists to high-risk older patients *J Community Health* 1990 Jun; 15(3): 163-74.
- CCL Wennberg DE, Marr A, Lang L, O'Malley S, Bennett G: A randomized trial of a telephone care-management strategy *N Engl J Med* 2010 Sep 23; 363(13): 1245-55.
- CCLI Gammaitoni AR, Gallagher RM, Welz M, Gracely EJ, Knowlton CH, Voltis-Thomas O: Palliative pharmaceutical care: a randomized, prospective study of telephone-based prescription and medication counseling services for treating chronic pain *Pain Med* 2000 Dec; 1(4): 317-31.
- CCLII Lim WS, Low HN, Chan SP, Chen HN, Ding YY, Tan TL: Impact of a pharmacist consult clinic on a hospital-based geriatric outpatient clinic in Singapore *Ann Acad Med Singapore* 2004 Mar; 33(2): 220-7.
- CCLIII Tamai IY, Rubenstein LZ, Josephson KR, Yamauchi JA: Impact of computerized drug profiles and a consulting pharmacist on outpatient prescribing patterns: a clinical trial *Drug Intell Clin Pharm* 1987 Nov; 21(11): 890-5.