

NAČINI TESTIRANJA IN KONTROLA CELOVITOSTI OSEBNE VAROVALNE OPREME V DIAGNOSTIČNI RADIOLOGIJI

TESTING METHODS AND VERIFYING THE INTEGRITY OF PERSONAL PROTECTIVE EQUIPMENT IN DIAGNOSTIC RADIOLOGY

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IZVLEČEK

Uvod: Število radioloških preiskav se iz leta v leto povečuje, prav tako pa tudi poklicna izpostavljenost sevanju. Da bi bila doza, ki jo zaposleni prejme, najnižja možna, je nujna uporaba osebne varovalne opreme (OVO), ki mora biti celovita in nepoškodovana.

Namen: Namen raziskave je bil ugotoviti, katera metoda iskanja poškodb na zaščiti je najučinkovitejša. Zanimalo nas je tudi, koliko se poveča prejeta doza za zaposlenega, če uporablja poškodovano OVO.

Metode dela: Pregledali smo 64 zaščitnih plaščev z vsemi štirimi tehnikami pregledovanja, tj. vizualni in palpatorni pregled, pregled s svetlobo, pregled z računalniškim tomografom ter pregled z diaskopijo ali rentgenskim slikanjem, in ugotavljali, katera je najučinkovitejša. Nato smo izmerili dozo za nepoškodovanim in poškodovanim delom istega plašča v primarnem in sekundarnem snopu rentgenske svetlobe.

Rezultati: Z rentgenskim ali diaskopskim pregledom smo odkrili 16 poškodb, eno manj s CT-jem, z vizualnim in palpatornim pregledom smo odkrili 11 poškodb, pri pregledu s svetlobo pa 6 poškodb. Pri meritvah v primarnem snopu smo ugotovili, da je povprečni delež prepustnosti rentgenskih žarkov za napakami najmanjši pri plašču 1 (0,5 %) in največji pri plašču 31 (316,6 %). Prav tako, so bile najmanjše vrednosti v sekundarnem snopu sevanja izmerjene pri plašču 1 (1,3 %), največje pa pri plašču 48 (1643 %).

Razprava in zaključek: Iz dobljenih rezultatov lahko trdimo, da sta najučinkovitejši metodi odkrivanja napak tisti, pri katerih se uporablja rentgenska svetloba. Pri meritvah prepustnosti primarnega in sipanega sevanja smo ugotovili, da obstajajo statistično pomembne razlike med poškodovanim in nepoškodovanim delom. Prav tako smo ugotovili, da je treba določeno OVO umakniti iz nadaljnje uporabe.

Ključne besede: osebna varovalna oprema, kontrola celovitosti, pregledovanje osebne varovalne opreme, poklicna izpostavljenost sevanju

ABSTRACT

Introduction: The number of radiological examinations is increasing from year to year, as is occupational exposure to radiation. The use of personal protective equipment (PPE) is essential to minimize the dose to the employee. PPE is expected to be complete and undamaged.

Purpose: The purpose of the study was to determine which method is most effective for damage detection in shielding. We also wanted to determine how much the dose an employee receives is increased when using damaged PPE.

Methods: 64 coats were first examined using all four examination techniques: visual and palpation examination, light examination, computed tomography examination and diascopy or X-ray examination, to determine which was most effective. We then measured the dose behind the intact and the damaged part of the same shield, in the primary and secondary X-ray beam.

Results: 16 defects were detected by X-ray or diascopic examination, one less by CT, 11 defects were detected by visual and palpation examination, while six defects were detected by light examination. In the primary beam measurements, we found that the average proportion of X-ray transmission behind the defects was lowest in shield 1 (0.5 %) and highest in shield 31 (316.6 %). Similarly, the lowest values in the secondary beam were measured in shield 1 (1.3 %) and the highest in shield 48 (1643 %).

Discussion and conclusion: It was determined that the best detection method for evaluating damage to PPE is the method where ionizing radiation was used. When measuring the transmittance of primary and scattered radiation, we found that there were statistically significant differences between damaged and undamaged parts. We also concluded that certain PPE should not be used further.

Keywords: personal protective equipment, integrity check, inspection of personal protective equipment, occupational exposure to radiation

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