LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	Correlation between age and head diameters in the paediatric patients during CT examination of the head		
Jumlah Penulis	:	5 Orang		
Status Pengusul	:	~~Penulis pertama~~/ Penulis ke 2/ Penulis Korespondesi **		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Polish Journal of Medical Physics and Engineering
		b. Nomor ISSN	:	1898-0309
		c. Volume, Nomor, Bulan, Tahun	:	Vol. 25 No. 4, Desember 2019
		d. Penerbit	:	Polish Society of Medical Physics
		e. DOI artikel (jika ada)	:	10.2478/pjmpe-2019-0030
		f. Alamat web jurnal	:	https://sciendo.com/journal/PJMPE
		g. Terindeks di Scimagojr/Scopus ~~atau di….**~~		
Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat)	:	☑ ~~Jurnal Ilmiah Internasional~~ / Internasional Bereputasi **		
		☐ Jurnal Ilmiah Nasional Terakreditasi		
		☐ Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI, COPERNICUS**		

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi jurnal (10%)	3,8	3,7	3,75
b. Ruang lingkup dan kedalaman pembahasan (30%)	11,8	11	11,4
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	11,8	10,4	11,1
d. Kelengkapan unsur dan kualitas penerbit (30%)	11,5	11,1	11,3
Total = (100%)	**38,9**	**36,2**	**37,55**
Nilai untuk Pengusul : (40% x 37,55) = 15,02			

Semarang, 1 Desember 2021

Reviewer 1

Prof. Dr. Drs. Muhammad Nur, DEA
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Bidang ilmu/Unit kerja : Fisika/Fakultas Sains dan Matematika

Reviewer 2

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LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

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Nama/ Jumlah Penulis	:	5 Orang		
Status Pengusul	:	~~Penulis pertama~~/ Penulis ke 2/ Penulis Korespondesi **		
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		f. Alamat web jurnal	:	https://sciendo.com/journal/PJMPE
		Alamat Artikel	:	https://sciendo.com/article/10.2478/pjmpe-2019-0030
		g. Terindex	:	Scopus

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat)	:	☑	~~Jurnal Ilmiah Internasional~~/Internasional Bereputasi
		☐	Jurnal Ilmiah Nasional Terakreditasi
		☐	Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional ☑	Nasional Terakreditasi ☐	Nasional Tidak Terakreditasi ☐	
a. Kelengkapan unsur isi jurnal (10%)	4			3,8
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,8
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			11,8
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,5
Total = (100%)	**40**			**38,9**
Nilai Pengusul = 40% x 38,9 = 15,56				

Catatan Penilaian artikel oleh Reviewer :

1. **Kelengkapan unsur isi jurnal:**
   Artikel telah ditulis sesuai dengan Polish Journal of Medical Physics and Engineering *yang diterbitkan oleh Polish Society of Medical Physics. Pendahuluan sangat baik dan menggambarkan pentingnya penelitian ini*
2. **Ruang lingkup dan kedalaman pembahasan:**
   Ruang lingkup bahasan sudah luas, hasil dan pembahasan sudah didiskusikan dengan mengaiktan hasil-hasil dari referensi. Bahasan yang lengkap dan menarik
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Referensi sudah mutakhir. Metoda dapat dipahami oleh mereka yang ahli dibidang ini dan bisa direflikasi. Diskusi yang dilakukan dalam membahas hasil penelitian ini telah melibatkan referensi yang dijasikan acuan.
4. **Kelengkapan unsur dan kualitas terbitan:**
   Penerbitan sudah sangat baik dan jurnal terindeks Scopus, **Q4 SJR: 0.2** (2020). Nilai maksimum untuk journal katagori ini adalah 40. Jurnal ditata dengan sangat baik sesuai standard Polish Society of Medical Physics

Semarang, 29 Desember 2021
Reviewer 1

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LEMBAR
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		Alamat Artikel	:	https://sciendo.com/article/10.2478/pjmpe-2019-0030
		g. Terindex	:	Scopus

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :

- [√] ~~Jurnal Ilmiah Internasional~~/Internasional Bereputasi
- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional [√]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4			3,7
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			10,4
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,1
Total = (100%)	**40**			**36,2**
Nilai Pengusul = 40% x 36,2 = 14,48				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:**

Unsur isi jurnal sudah lengkap sesuai dengan tata cara penulisan yang memuat Title, Introduction, Materials and methods, Results and Discussion, Conclution, Acknowledgement dan References. Substansi artikel sesuai bidang ilmu penulis pertama.

2. **Ruang lingkup dan kedalaman pembahasan:**

Substansi artikel yaitu tentang korelasi antara umur dan diameter kepala pada pemeriksaaan CT Scan telah sesuai dengan ruang lingkup jurnal, dengan kedalaman pembahasan sangat baik

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**

Data-data hasil penelitian sudah menunjukkan ada kebaruan informasi. Pustaka -pustaka yang diacu sesuai dengan tema penelitian dan sebagian besar pustaka adalah mutakhir.
penelitian

4. **Kelengkapan unsur dan kualitas terbitan:**

Jurnal ini tergolong jurnal internasioanal dengan editorrial board lebih dari 4 negara, Kontributor lebih dari 2 negara, unsur dan kualitas terbitan sangat baik gambar dan simbol jelas terbaca. lndikasi plagiasi dengan Cek Turnitin: Similaritas = 11 % yang artinya jurnal ini bukan hasil plagiat.

Semarang, 23 Nopember 2021
Reviewer 2

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Correlation between age and head diameters in the paediatric patients during CT examination of the head

Fahmi A.[a], Anam C.[a], Suryono[a], Ali M.H.[b], Jauhari A.[c]

Save all to author list

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[b] Discipline of Medical Imaging Science, Faculty of Health Sciences, University of Sydney, 75 East St, Lidcombe, 2141, NSW, Australia

[c] Department of Medical and Radiation Imaging, Health Polytechnic Jakarta 2, Jakarta, Indonesia

Abstract

An estimate of patient dose, patient size should be used to normalise the output dose of CT machine in the terms of volume CT dose index, $CTDI_{vol}$. There are two metrics to characterise the patient size, i.e. the effective diameter (D_{eff}) and the water-equivalent diameter (D_w). These two metrics could be estimated by patient age . However, to date, relationships between the age and head patient size (D_{eff} and D_w) have not been established for the pediatric patients . The aim of this study was to establish the relationships between the age and head patient size (D_{eff} and the D_w) as the basis for calculating the size-specific dose estimate (SSDE) for paediatric head CT examination . The data were retrospectively collected from serial images of the CT head in the DICOM file from one hundred and thirteen paediatric patients aged 0-17 years (63 male and 50 female patients) underwent head CT examinations. The patient 's sizes (D_{eff} and D_w) were calculated from the patient 's images using the IndoseCT version 15a software. The D_{eff} and D_w values were correlated with age of patients using regression analysis. It was found that patient size (D_{eff} and D_w) correlated well with the age of the patient with R^2 more than 0.8. The size of the D_w is bigger than the D_{eff}. The D_{eff} values for male patients are 12.38 to 16.21 cm, and D_w values are 11.96 to 18.16 cm, respectively. For female patients , the values of D_{eff} are from 11.54 to 16.87 cm, and the values of D_w are from 11.60 to 17.86 cm, respectively. © 2019 Arif Fahmi et al., published by Sciendo.

Author keywords

effective diameter ; paediatric head ; SSDE; water-equivalent diameter

Indexed keywords

Device tradenames

SciVal Topics

Metrics

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Journal

Polish Journal of Medical Physics and Engineering

The Journal of Polish Society of Medical Physics

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Aims & Scope | Editorial Board | Abstracting & Indexing | Issues | Submit

Polish Journal of Medical Physics and Engineering (PJMPE) is an official publication of the Polish Society of Medical Physics (established in 1965, member of IOMP and EFOMP). The Journal has been published since 1995 and is a direct successor of *Postępy Fizyki Medycznej* (Advances in Medical Physics) which was published in Polish from 1966 to 1992. Members of the Editorial Board represent leading institutes and universities in Poland. The Journal is on the list of the scientific journals published by the Polish Ministry of Science and Higher Education and is indexed by several services, including Scopus and Web of Science - Emerging Sources Citation Index.

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Scientific Paper

Nuclear reaction applied to fluorine depth profiles in human dental tissues

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Abstract

The nuclear reaction $^{19}F(p, \alpha\gamma)^{16}O$ is presented as a valid method to measure the fluorine content in the first superficial layers of teeth. The analysis is performed *in-vitro* in extracted teeth, both healthy, fluorotic and decayed. It is performed irradiating the tooth with an energetic proton beam and analyzing the emitted high energy alpha particles. The quantitative analysis is performed comparing results with that of a standard sample at a known concentration. The depth profile of fluorine has a maximum content in the first superficial layers. The average concentrations in healthy enamel are of the order of 2 mg/g; it is of about 10 mg/g in fluorotic teeth, and below 0.1 mg/g in decayed teeth. The concentration in the dentine is about 50% lower than in the enamel and the concentrations decrease going from incisors to premolar and to molar teeth. Many results and a literature comparison are presented and discussed.

Key words: nuclear reaction; fluorine; tooth; fluorine concentration in teeth; dental tissue.

Introduction

Many works of literature report that fluorine has effects on the mineral skeletal tissue development and dental tissues, with particular regard to the period of formation and development of such hard tissues [1,2]. It has a high affinity for calcium and biologically it is mainly involved in the chemical bonding structure of calcium, phosphorus and orthophosphoric PO_4 groups. Its exchange with the OH hydroxyl group realizes more stable molecules, enhancing the physical and chemical resistance of the apatite at which, generally, it is bonded as fluorapatite ($Ca_5(PO_4)_3F$). Fluorapatite compound has a hard hexagonal crystalline structure, a density of 3.15 g/cm^3, a hardness of 5 in the Mohs scale and a refractive index of 1.64 [3].

Fluorine had to be incorporated into dental enamel during development to exert its maximum protective effect. Its provision in the human body comes mainly by food, water, environmental and toothpaste exposure [4-6]. Fluoroprophylaxis may be applied to patients with fluoride deficiency. The ingestion of fluorine during the pre-eruptive development of the teeth has a cariostatic effect, i.e. it reduces the risk of dental caries, due to the uptake of fluoride by enamel crystallites with the formation of fluorapatite, which is less acid-soluble than hydroxyapatite [7].

The dental enamel is particularly sensitive to this trace element and equilibrium is found with a specific concentration of fluorine in healthy enamel and dentine tissues, of the order of 2 mg per gram of matrix [7,8]. Too low or too high fluorine concentrations determine specific pathologies: dental caries and fluorosis, respectively. The correct intake of fluorine in the tissue confers considerable protection against diseases, as the well-known dental caries, and the anaesthetic opaque stains due to endemic fluorosis. Particular fluorine depth profiles in the tooth and gradient along the teeth of the dental arc are described in detail in the literature [9].

The chemistry of biological calcium phosphates and fluorapatite in the human body is very complex. Caries is a disease caused by bacteria that metabolize the sugars present in the oral cavity, producing corrosive acids against the enamel and the underlying dentin. Because of the acids, the enamel is deprived of its mineral component, formed essentially of calcium and phosphorus but also of fluorine. Literature reports that the daily fluoride requirement is estimated to be about 1.5-4 mg in the adult population [2].

Different methods of analysis of fluorine in teeth have been employed, such as chemical, physical and biological, as reported in the literature [10].

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Investigation of fast neutron shielding properties of new polyurethane-based composites loaded with B_4C, BeO, WO_3, ZnO, and Gd_2O_3 micro- and nanoparticles

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Abstract

The aim of the current research was to study the radiation shielding properties of polyurethane-based shielding materials filled with B_4C, BeO, WO_3, ZnO, and Gd_2O_3 particles against fast neutrons. The macroscopic cross sections of composites containing micro- and nanoparticles with a diameter of 10 µm and 50 nm were calculated using MCNPX (2.6.0) Monte Carlo code. The results showed that adding nano-scaled fillers to polyurethane matrix increases attenuation properties of neutron shields compared to micro-scaled fillers for intermediate and fast neutrons. Among the studied composites, WO_3 and Gd_2O_3 nano-composites presented higher neutron cross section compared to others.

Key words: nanoparticles; shielding; fast neutrons; Monte Carlo method.

Introduction

The application of ionizing radiation in industry and medicine has increased due to their potential benefits in different aspects of human life. However, the hazardous effects of ionizing radiation had been the main disadvantage for their medical and industrial utilizations. In accordance with the development of new techniques using ionizing radiation, the investigations on novel shielding materials such as concretes and flexible low weight materials have been conducted in recent years [1-5].

In recent years, the advent of nanoparticles as new materials in radiation shielding resulted in significant progress in fabrication of nano-based shields for photons and neutrons [1,2,6-8]. The majority of the investigations indicated that the nanoparticles improved attenuation coefficients of composites. Also, it was shown that photon and neutron energy, nanoparticle concentration and size of nanoparticles were effective parameters in the efficiency of nanoparticle-based shielding materials [9-11]. Several studies were investigated the effect of nano-materials on shielding properties of glasses [12,13]. Some of them also examined the attenuation effect of nanomaterials in concretes and bricks as shielding used in radiation therapy facilities [7,10]. And finally several reports in the literature can be found concerning the shielding effect of flexible nano- and microparticles-based sheets used in diagnostic radiology [6,8,14].

There is a wide range of materials that were investigated as nano- and microparticles fillers in the fabrication of new shielding materials for photon and neutron beams [11]. In the current study, several nano- and microparticles including B_4C, BeO, WO_3, ZnO, and Gd_2O_3 as potential candidates to make more efficient neutron attenuators were investigated by Monte Carlo method. The purpose was to provide comparative information on their neutron attenuating properties in the same simulation geometry and neutron energy.

Methods and Materials

Monte Carlo simulations

In the current study, we used MCNPX (2.6.0) MC code for simulation of neutron shields and calculation of macroscopic cross section of fast neutrons with designed shielding materials [15]. The simulation geometry consisted of a surface source of neutron with a radius of 3 mm, two cylinders made of lead with radius of 20 cm and length of 10 cm. A hole with radius of 5 mm and length of 5 cm was designed in each cylinder to provide location for the neutron source. The schematic representation of geometry is shown in **Figure 1**. These two cylinders made of lead were used as absorbers of scattered neutrons as well as collimators to provide the conditions for narrow beam geometry for attenuation measurements. The polyurethane-based composite with thickness of 5 cm width of