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

Judul Karya Ilmiah (Artikel)	:	An improved method for automated calculation of the water-equivalent diameter for estimating size-specific dose in CT
Jumlah Penulis	:	7 Orang
Status Pengusul	:	Penulis pertama/ ~~Penulis ke 2~~/ Penulis Korespondesi **
Identitas Jurnal Ilmiah	:	a. Nama Jurnal : Journal of Applied Clinical Medical Physics
		b. Nomor ISSN : 1526-9914
		c. Volume, Nomor, Bulan, Tahun : Vol. 22 No. 9, September 2021
		d. Penerbit : American Association of Physicists in Medicine (AAPM)
		e. DOI artikel (jika ada) : 10.1002/acm2.13367
		f. Alamat web jurnal : https://aapm.onlinelibrary.wiley.com/journal/15269914
		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**

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Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	**Reviewer II**	
a. Kelengkapan unsur isi jurnal (10%)	3,9	3,7	3,8
b. Ruang lingkup dan kedalaman pembahasan (30%)	11,8	11,1	11,45
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	11,8	10,5	11,15
d. Kelengkapan unsur dan kualitas penerbit (30%)	11,9	11,5	11,7
Total = (100%)	**39,4**	**36,8**	**38,1**
Nilai untuk Pengusul : (60% x 38,1) = 22,86			

Semarang, 1 Desember 2021

Reviewer 1

Prof. Dr. Drs. Muhammad Nur, DEA
NIP. 195711261990011001
Bidang ilmu/Unit kerja : Fisika/Fakultas Sains dan Matematika

Reviewer 2

Dr. Drs. Catur Edi Widodo, M.T.
NIP. 196405181992031002
Bidang ilmu/Unit kerja : Fisika/Fakultas Sains dan Matematika

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
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Nama/ Jumlah Penulis	:	7 Orang			
Status Pengusul	:	Penulis pertama/ ~~Penulis ke 2~~/ Penulis Korespondesi **			
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			Alamat Artikel	:	https://aapm.onlinelibrary.wiley.com/doi/10.1002/acm2.13367
		g.	Terindex	:	Scopus

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :
- [√] ~~Jurnal Ilmiah Internasional~~/Internasional Bereputasi
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- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

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Komponen Yang Dinilai	**Nilai Maksimal Jurnal Ilmiah**			**Nilai Akhir Yang Diperoleh**
	Internasional [√]	**Nasional Terakreditasi** [ ]	**Nasional Tidak Terakreditasi** [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4			3,9
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			11,9
Total = (100%)	**40**			**39,4**
Nilai Pengusul = 60% x 39,4 = 23,64				

Catatan Penilaian artikel oleh Reviewer :

1. **Kelengkapan unsur isi jurnal:**
Pendahuluan yang telah mempu menghantarkan pentingnya penelitian. Kebaruan dari penelitian tertera secara eksplisit. Artikel telah ditulis sesuai dengan Journal of Applied Clinical Medical Physics yang diterbitkan oleh (AAPM).
2. **Ruang lingkup dan kedalaman pembahasan:**
Ruang lingkup bahasan sudah luas, hasil dan pembahasan sudah didiskusika dengan mengaitkan hasil-hasil dari referensi. Bahasan yang sangat menarik
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
Referensi sudah mutakhir. Referensi juga digunakan untuk pembahasan dari hasil penelitian ini. Metoda dapat dipahami oleh mereka yang ahli dibidang ini dan bisa direflikasi
4. **Kelengkapan unsur dan kualitas terbitan:**
Penerbitan sudah sangat baik dan jurnal terindeks Scopus, Q1/Q2 SJR: 0.83 (2020). Nilai maksimum untuk journal katagori ini adalah 40. Jurnal ditata dengan sangat baik sesuai standard AAPM

Semarang, 29 Desember 2021
Reviewer 1

Prof. Dr. Drs. Muhammad Nur, DEA
NIP. 195711261990011001
Unit Kerja : Fisika
Bidang Ilmu: Fakultas Sains dan Matematika

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		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			11,1
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			10,5
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,5
Total = (100%)	**40**			**36,8**
Nilai Pengusul = 60% x 36,8 = 22,08				

Catatan Penilaian artikel oleh Reviewer :

1. **<u>Kesesuaian dan kelengkapan unsur isi jurnal:</u>**

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. **<u>Ruang lingkup dan kedalaman pembahasan:</u>**

Substansi artikel yaitu tentang peningkatan metode pengukuran secara otomatis utuk estimasi dosis CT Scan menggunakan metode water equivalent telah sesuai dengan ruang lingkup jurnal, dengan kedalaman pembahasan sangat baik

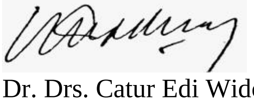
3. **<u>Kecukupan dan kemutakhiran data/informasi dan metodologi:</u>**

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. **<u>Kelengkapan unsur dan kualitas terbitan:</u>**

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 = 13 % yang artinya jurnal ini bukan hasil plagiat.

Semarang, 23 Nopember 2021
Reviewer 2



Dr. Drs. Catur Edi Widodo, M.T.
NIP. 196405181992031002
Unit Kerja : Fisika
Bidang Ilmu: Fakultas Sains dan Matematika

Document type
Article • *Gold Open Access* • *Green Open Access*

Source type
Journal

ISSN
15269914

DOI
10.1002/acm2.13367

Journal of Applied Clinical Medical Physics • *Open Access* • Volume 22, Issue 9, Pages 313 - 323 • September 2021

An improved method for automated calculation of the water-equivalent diameter for estimating size-specific dose in CT

Anam C.[a], Mahdani F.R.[a], Dewi W.K.[a], Sutanto H.[a], Triadyaksa P.[a], Haryanto F.[b], Dougherty G.[c]

Save all to author list

[a] Department of Physics, Faculty of Sciences and Mathematics, Diponegoro University, Central Java, Indonesia

[b] Department of Physics, Faculty of Mathematics and Natural Sciences, Bandung Institute of Technology, Bandung, West Java, Indonesia

[c] Department of Applied Physics and Medical Imaging, California State University Channel Islands, Camarillo, CA, United States

Abstract

Purpose: The aim of this study is to propose an algorithm for the automated calculation of water-equivalent diameter (D_W) and size-specific dose estimation (SSDE) from clinical computed tomography (CT) images containing one or more substantial body part. Methods: All CT datasets were retrospectively acquired by the Toshiba Aquilion 128 CT scanner. The proposed algorithm consisted of a contouring stage for the D_w calculation , carried out by taking the six largest objects in the cross-sectional image of the patient's body, followed by the removal of the CT table depending on the center position (y-axis) of each object. Validation of the proposed algorithm used images of patients who had undergone chest examination with both arms raised up, one arm placed down and both arms placed down, images of the pelvic region consisting of one substantial object, and images of the lower extremities consisting of two separated areas. Results: The proposed algorithm gave the same results for D_w and SSDE as the previous algorithm when images consisted of one substantial body part. However, when images consisted of more than one substantial body part, the new algorithm was able to detect all parts of the patient within the image. The D_w values from the proposed algorithm were 9.5%, 15.4%, and 39.6% greater than the previous algorithm for the chest region with one arm placed down, both arms placed down, and images with two legs, respectively. The SSDE values from the proposed algorithm were 8.2%, 11.2%, and 20.6% lower than the previous algorithm for the same images, respectively. Conclusions: We have presented an improved algorithm for automated calculation of D_w and SSDE. The proposed algorithm is more general and gives accurate results for both D_w and SSDE whether the CT images contain one or more than one substantial body part.

Author keywords

CT dose index (CTDI); patient dose; size-specific dose estimates (SSDE); water-equivalent diameter (D_w)

Indexed keywords

SciVal Topics

Chemicals and CAS Registry Numbers

Metrics

Funding details

References (34)

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Anam, C.; Department of Physics, Faculty of Sciences and Mathematics, Diponegoro University, Central Java, Indonesia; email:anam@fisika.fsm.undip.ac.id

JOURNAL OF APPLIED CLINICAL
MEDICAL PHYSICS

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Impact factor: 2.102
2020 Journal Citation Reports (Clarivate Analytics): 97/134 (Radiology, Nuclear Medicine & Medical Imaging)
Online ISSN: 1526-9914

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Received: 8 June 2020 | Revised: 17 May 2021 | Accepted: 26 May 2021

DOI: 10.1002/acm2.13328

RADIATION ONCOLOGY PHYSICS

JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS

How does CBCT reconstruction algorithm impact on deformably mapped targets and accumulated dose distributions?

Weihua Mao | **Chang Liu** | **Stephen J. Gardner** | **Mohamed Elshaikh** | **Ibrahim Aref** | **Joon K. Lee** | **Deepak Pradhan** | **Farzan Siddiqui** | **Karen Chin Snyder** | **Akila Kumarasiri** | **Bo Zhao** | **Joshua Kim** | **Haisen Li** | **Ning Winston Wen** | **Benjamin Movsas** | **Indrin J. Chetty**

Henry Ford Health System, Detroit, MI, USA

Correspondence
Weihua Mao, Henry Ford Hospital, Department of Radiation Oncology, 2799 W Grand Blvd, Detroit, MI 48322, USA.
Email: wmao1@hfhs.org

Funding information
Varian Medical Systems (Varian)

Abstract

Purpose: We performed quantitative analysis of differences in deformable image registration (DIR) and deformable dose accumulation (DDA) computed on CBCT datasets reconstructed using the standard (Feldkamp-Davis-Kress: FDK_CBCT) and a novel iterative (iterative_CBCT) CBCT reconstruction algorithms.

Methods: Both FDK_CBCT and iterative_CBCT images were reconstructed for 323 fractions of treatment for 10 prostate cancer patients. Planning CT images were deformably registered to each CBCT image data set. After daily dose distributions were computed, they were mapped to planning CT to obtain deformed doses. Dosimetric and image registration results based CBCT images reconstructed by two algorithms were compared at three levels: (A) voxel doses over entire dose calculation volume, (B) clinical constraint results on targets and sensitive structures, and (C) contours propagated to CBCT images using DIR results based on three algorithms (SmartAdapt, Velocity, and Elastix) were compared with manually delineated contours as ground truth.

Results: (A) Average daily dose differences and average normalized DDA differences between FDK_CBCT and iterative_CBCT were ≤1 cGy. Maximum daily point dose differences increased from 0.22 ± 0.06 Gy (before the deformable dose mapping operation) to 1.33 ± 0.38 Gy after the deformable dose mapping. Maximum differences of normalized DDA per fraction were up to 0.80 Gy (0.42 ± 0.19 Gy). (B) Differences in target minimum doses were up to 8.31 Gy (−0.62 ± 4.60 Gy) and differences in critical structure doses were 0.70 ± 1.49 Gy. (C) For mapped prostate contours based on iterative_CBCT (relative to standard FDK_CBCT), dice similarity coefficient increased by 0.10 ± 0.09 ($p < 0.0001$), mass center distances decreased by 2.5 ± 3.0 mm ($p < 0.00005$), and Hausdorff distances decreased by 3.3 ± 4.4 mm ($p < 0.00015$).

Received: 17 September 2020 | Revised: 17 October 2020 | Accepted: 16 June 2021

DOI: 10.1002/acm2.13347

JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS

RADIATION ONCOLOGY PHYSICS

Evaluation of dosimetric functions for a new ^{169}Yb HDR Brachytherapy Source

Elham Safaeipour[1] | **Hosein Poorbaygi**[2] | **Iraj Jabbari**[1] | **Shahab Sheibani**[2]

[1]Department of Nuclear Engineering, Faculty of Advanced Science & Technologies, University of Isfahan, Isfahan, Iran

[2]Radiation Application Research School, Nuclear Science and Technology Research Institute, Tehran, Iran

Correspondence
Hosein Poorbaygi, Radiation Application Research School, Nuclear Science and Technology Research Institute, Tehran, Iran.
E-mail: hpoorbaygi@gmail.com

Abstract

^{169}Yb has been recently used as an HDR brachytherapy source for cancer treatment. In this paper, dosimetric parameters of a new design of ^{169}Yb HDR brachytherapy source were determined by Monte Carlo (MC) method and film dosimetry. In this new source, the radioactive core has been encapsulated twice for safety purposes. The calculations of dosimetric parameters carried out using MC simulation in water and air phantom. In order to exclude photon contamination's cutoff energy, δ was set at 10 keV. TG-43U1 data dosimetric, including S_k, Λ, g(r), F(r, θ) was computed using outputs from the simulation and their statistical uncertainties were calculated. Dose distribution around the new prototype source in PMMA phantom in the framework of AAPM TG-43 and TG-55 recommendations was measured by Radiochromic film (RCF) Gafchromic EBT3. Obtained air kerma strength, S_k, and the dose rate constant, Λ, from simulation has a value of 1.03U ± 0.03 and 1.21 cGyh^{-1}U^{-1} ± 0.03, respectively. The radial dose function was calculated at radial distances between 0.5 and 10 cm with a maximum value of 1.15 ± 0.03 at 5–6 cm distances. The anisotropy functions for radial distances of 0.5–7 cm and angle distances 0° to180° were calculated. The dosimetric data of the new HDR ^{169}Yb source were compared with another reference source of ^{169}Yb-HDR and were found that has acceptable compatibility. In addition, the anisotropy function of the MC simulation and film dosimetry method at a distance of 1 cm from this source was obtained and a good agreement was found between the anisotropy results.

KEYWORDS
^{169}Yb HDR source, brachytherapy, dosimetric parameters, film dosimetry, Monte Carlo

1 | INTRODUCTION

A ^{169}Yb brachytherapy source with a half-life of 32 days is used in both permanent and temporary implant method and recently has taken into consideration in radiation therapy because ^{169}Yb is an intermediate energy photon emitter (main photon emissions in the range of 50–300 keV, emission probability weighted mean energy of 93 keV).[1-3] Because of its attractive properties including high specific activity and easy radiation protection, this source is emerging as an alternative source in high