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POSTER SECTIONS

ECR 2022 / C-17803

Comparative dose measurements in dentomaxillofacial imaging procedures: Are Barium and Bismuth shields useful for the protection of eyes and thyroid glands?

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Learning objectives

Imaging examinations play an essential role in dental practice, mainly due to the inclusion of three-dimensional techniques such as Multislice Computed Tomography (MSCT) and Cone Beam Computed Tomography (CBCT). Therefore, it is essential to know the levels of radiation at which patients are subject during these exams, to adopt strategies and procedures that make it possible to keep radiation levels as low as reasonably possible, respecting the ALARA (As Low As Reasonably Achievable) principle and based on the best available scientific evidence. Among the various...
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Background

Dose measurements were performed at the eye lens and thyroid level using TLD dosimeters, in different configurations (with and without shields) and using standard protocols with different values of voltage (kV) and current-time product (mAs). A total of 103 exposures were performed on patients, 84 of them using a MSCT GE Lightspeed 16 equipment and the remaining 19 using a CBCT NewTom GiANO equipment. These exposures were subdivided into 22 smaller samples (19 samples with 5 exposures each, 1 sample with 4 exposures and 2...
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Findings and procedure details

Patients undergoing to MSCT procedures had an average age of 52.6 years, ranging from a minimum of 18.0 to a maximum of 82.0 years, with 33 male and 51 female. As for anthropometric data (weight and height) for this group of users, mean values of 71.8 kg (minimum = 41.0; maximum = 110.0) and 167.7 cm (minimum = 154.0; maximum = 190.0) were observed, respectively. Regarding the users who underwent CBCT procedures, 9 were male and 10 were female, and the corresponding mean age was...

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Conclusion

It is recommended to use a bismuth thyroid shield for MSCT procedures. However, future studies must be conducted using other materials for eye shielding, since barium protection was not effective. Dose values obtained in CBCT procedures were extremely low in both settings (with and without protection).
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Personal information and conflict of interest

R. P. P. Almeida: Nothing to disclose A. F. C. L. Abrantes: Nothing to disclose C. da Silva: Nothing to disclose
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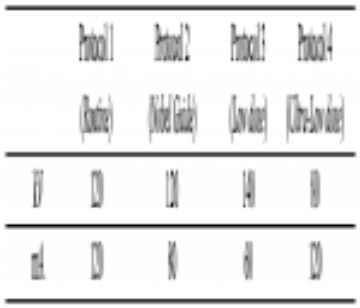
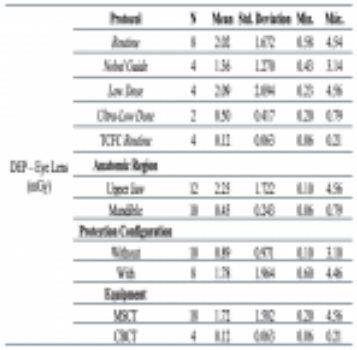


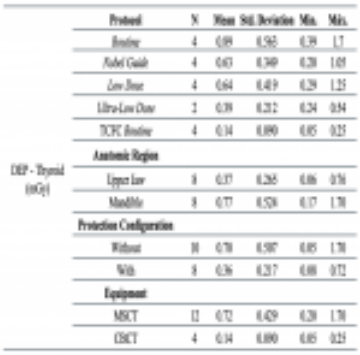
	Protocol 1 (Routine)	Protocol 2 (Nobel Guide)	Protocol 3 (Low-dose)	Protocol 4 (Ultra-low-dose)
kV	120	120	140	80
mA	120	80	40	120

Fig 1: *Voltage (kV) and current (mA) values used in Routine, Nobel Guide, Low-Dose and...*



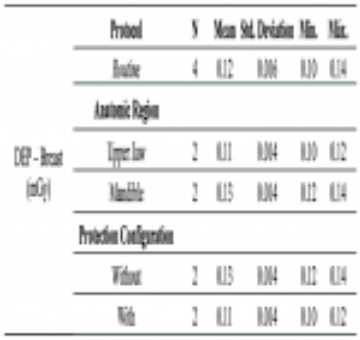
	Protocol	N	Mean	Std. Deviation	Min.	Max.
DEP - Eye Lens (mGy)	Routine	8	2.01	1.672	0.58	4.54
	Nobel Guide	4	1.36	1.270	0.45	3.14
	Low Dose	4	2.09	2.094	0.23	4.56
	Ultra-Low Dose	2	0.50	0.417	0.20	0.79
	TCFC Routine	4	0.12	0.063	0.06	0.21
	Anatomic Region					
	Upper Jaw	12	2.25	1.722	0.10	4.56
	Mandible	10	0.45	0.245	0.06	0.79
	Protection Configuration					
	Without	10	0.89	0.973	0.10	3.10
	With	8	1.78	1.964	0.60	4.46
	Equipment					
	MSCT	10	1.72	1.502	0.20	4.56
	CBCT	4	0.12	0.063	0.06	0.21

Fig 2: *Mean, minimum and maximum of DEP values obtained for the eye lens can be...*



	Protocol	N	Mean	Std. Deviation	Min.	Max.
DEP - Thyroid (mGy)	Routine	4	0.89	0.565	0.39	1.7
	Nobel Guide	4	0.63	0.369	0.28	1.05
	Low Dose	4	0.64	0.419	0.29	1.25
	Ultra-Low Dose	2	0.39	0.212	0.24	0.54
	TCFC Routine	4	0.14	0.090	0.05	0.25
	Anatomic Region					
	Upper Jaw	8	0.37	0.265	0.06	0.78
	Mandible	8	0.77	0.526	0.17	1.70
	Protection Configuration					
	Without	10	0.70	0.507	0.05	1.70
	With	8	0.36	0.217	0.08	0.72
	Equipment					
	MSCT	12	0.72	0.429	0.20	1.70
	CBCT	4	0.14	0.090	0.05	0.25

Fig 3: *Mean, minimum and maximum of DEP values obtained for the Thyroid gland level...*



	Protocol	N	Mean	Std. Deviation	Min.	Max.
DEP - Breast (mGy)	Routine	4	0.12	0.066	0.10	0.14
	Anatomic Region					
	Upper Jaw	2	0.11	0.064	0.10	0.12
	Mandible	2	0.13	0.064	0.12	0.14
	Protection Configuration					
	Without	2	0.13	0.064	0.12	0.14
	With	2	0.11	0.064	0.10	0.12

Fig 4: *DEP values at the breast level (only tested for MSCT routine protocol in the...*