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CR 及び 一般 X 線 発生装置の 被曝線量表の 作成と 線量 管理に 関する 調査 A Survey on Reduction of Irradiated Dose as per Basic Exposure Conditions by CR vs Various Types of Generator

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Purpose : The aim of the study is as follows; First, We had an intention to measure the exposure from each X-ray equipment. Second, We had an intention to select a specific technique to minimize the exposure for individual position. Third, We had an intention to select the minimal dose to satisfy the sensitivity and the latitude range in CR.

Devices and Materials : The subject equipment were single phase full wave rectification, three-phase 12 peak and CR equipment. Dosimeter was the Solidos detector which can measure the dose, KV and mAs.

Furthermore a phantom and FCR-9000 have been used.

Method : We checked the single phase full wave rectification, 3 phase 12 peak and ST-VA type (IP).

We measured the dose with most common techniques. However, we measured the dose with varying the kvp to up and down in ST-VA type equipment.

Results : We can see the result from table 1, 2, 3, 4.

Conclusion : 1) The guideline recommended by the provisions of IAEA regulation is being used at the time of radiation exposure and almost all of those equipments used for this study had less amount of doses than those in the guideline. 2) The FCR may be possible to decrease a certain amount of dose with effective application of it's automatic image compensation utilities and the verifying function in PACS.

3) Next time, it is required to add a great number of hospitals for wide range of studies and measurements, and make standard exposure control table which will bring in practice, material decrease of dose volumes when radiation exposure.

Table 1. Exposure dose for some X-ray generators (HAND)

Position	Equipment	KVP	mA	Sec	Screen	Grid	FFD(cm)	exposure dose(mGy)
HAND	Single-phase	46	100	0.060	rare earth	·	100	42.19
	Three-phase	40	80	0.040	Lonex regular	·	100	29.12
	ST-VA type	45	100	0.032	·	·	100	60.46

Table 3. Exposure dose for some X-ray generators (PELVIS A-P)

Position	Equipment	KVP	mA	Sec	Screen	Grid	FFD(cm)	exposure dose(mGy)
PELVIS	Single-phase	74	200	0.140	rare earth	8:1	100	0.961
	Three-phase	63	250	0.063	Lonex regular	8:1	100	0.590
	ST-VA type	75	200	0.125	·	8:1	100	1.458

Table 2. Exposure dose for some X-ray generators (CHEST P-A)

Position	Equipment	KVP	mA	Sec	Screen	Grid	FFD(cm)	exposure dose(mGy)
CHEST	Single-phase	112	100	0.030	rare earth	8:1	180	113.50
	Three-phase	140	300	0.008	FG-3	15:1	180	
	ST-VA type	120	200	0.032	·	8:1	180	259.50

Table 4. Exposure dose for some X-ray generators (SKULL A-P)

Position	Equipment	KVP	mA	Sec	Screen	Grid	FFD(cm)	exposure dose(mGy)
SKULL	Single-phase	76	200	0.140	rare earth	8:1	100	1.697
	Three-phase	62	250	1.063	Lonex regular	8:1	100	1.573
	ST-VA type	75	200	0.125	·	8:1	100	2.850