PALODEX GROUP

OP300

Scatter radiation

This document consists of scatter radiation test results of OP300.

1. TEST ARRANGEMENTS

Device under test: OP300 sn: Beta5

Test Instrument: MDH x-ray monitor model 9015

Tested by: J Vuorijärvi 23.3.2011

The scatter radiation was measured around the anthropomorphic skull phantom with the test instrument. Measurements were performed with both adult panoramic program and cephalometric, full lateral program. The height of the test instrument was altered to define the maximum scatter radiation direction.

The measurements in panoramic program were performed in panoramic-PIO position with the movement of the rotating unit. Exposure values were 90kV, 13mA and 16 sec. Reference measurement was measured first just in front of the skull to define the radiation level which is hitting the skull.

The measurements in cone beam programs were performed in CT-PIO position with the movement of rotation unit using hi-resolution option (maximum exposure time). Exposure values were 90kV, 13mA and 6.1 sec with small FOV and 90kV, 10mA and 13 sec with large FOV.

The measurements in cephalometric program were performed in ceph-PIO position with the movement of the ceph head. Exposure values were 90kV, 13mA and 10 sec. Reference measurement was measured first just in front of the skull to define the radiation hitting the skull.

2. SCATTER IN PANORAMIC PROGRAM

The radiation hitting the skull was measured to be 481.8mR (90kV, 13mA,16sec).

Test instrument was placed at 50 cm distance from the skull to measure the scattered radiation. The maximum radiation was found at the same vertical level that the primary beam.

See the following illustration of the measured radiation levels.

		Nose		
L-ear	45deg	Skull	45deg	R-ear
0.187mR	0.246mR	0.417mR	0.335mR	0.227(central beam)
0.158mR	0.134mR	0.161mR	0.144mR	0.158(15cm up from central beam)
0.171mR	0.202mR	0.275mR	0.248mR	0.204(15cm down from central beam)

3. SCATTER IN CONE BEAM PROGRAMS

Test instrument was placed at 50 cm distance from the skull to measure the scattered radiation.

See the following illustration of the measured radiation levels.

Small FOV:

		Nose		
L-ear	45deg	Skull	45deg	R-ear
0.598mR	0.414mR	0.382mR	0.531mR	0.543(central beam)
0.531mR	0.406mR	0.241mR	0.409mR	0.462(15cm up from central beam)
0.803mR	0.577mR	0.448mR	0.713mR	1.083(15cm down from central beam)

Large FOV:

		Nose		
L-ear	45deg	Skull	45deg	R-ear
0.826mR	0.661mR	0.603mR	0.735mR	0.861(central beam)
0.878mR	0.662mR	0.490mR	0.747mR	0.911(15cm up from central beam)
1.285mR	0.944mR	0.800mR	1.019mR	1.380(15cm down from central beam)

4. SCATTER RADIATION IN CEPH PROGRAM

Ceph head was in ceph-PIO position (beam hitting the secondary collimator, ear posts and sensor. Radiation at technique factors 90kV, 13mA, 10sec was measured just below the ear ports (equivalent to radiation hitting the skull) to be 36mR.

Scatter radiation was measured during the scanning of the ceph head. Full lateral ceph images were taken with 90kV, 13mA, 10sec scanning/exposure time and scatter radiation was measured at 50 cm distance from the head.

See the following illustration of the measured radiation levels.

R-ear	Skull / Nose	L-ear	
0.025mR	0,034mR	0.066mR	(at earpost level =central beam)
0.038mR	0.029mR	0.081mR	(15 cm lower from central beam)
0.021mR	0.022mR	0.059mR	(15 cm upper from central beam)