Dose based exposure values for Dental Imaging Systems.

It should now be obvious to all that dose based exposure values are essential when determining the safety and performance of Dental X-Ray machines and all others for that matter. If we know the equivalent or effective dose per examination and the workload of the facility, we can determine the level of shielding required, the potential for over exposure of staff, patients and the public, the cost of designing the facility, the need for personal shielding, the risk associated with the operation of the equipment, the performance of the imaging system post exposure etc. By measuring dose and its related determinants we can, as service and survey persons, control the performance of a dental x-ray machine. From this, everything else related to factors of radiation safety falls into place.

A factor of critical importance to dental imaging is the amount of radiation of various energies required to adequately expose film of differing speeds so that a diagnostic image can be obtained. This relationship has been studied quite extensively and from the data, a set of tables have been generated that relate the range of dose values for differing KV or KVP values ranging from 50 to 100. The table is generated below and the radiographic technique is the basic adult bight wing examination. This table forms part of SC 30. In practice, the B.C. survey program allows for a deviation of +/- 10% from these tabulated values.

KV or KVP	D film min (mR)	D film max (mR)	E film min (mR)	E film max (mR)	F film min (mR)	F film max (mR)	F film min (man)(mR)	F film max (man)(mR)
50	400	550	220	280	160	220	200	275
55	370	520	190	250	148	208	185	260
60	320	475	170	220	128	190	160	238
65	270	415	145	190	108	166	135	208
70	230	360	125	165	92	144	115	180
75	180	305	100	135	72	122	90	163
80	160	260	85	115	64	104	80	130
85	140	230	80	105	56	92	70	115
90	120	210	70	95	48	84	60	105
95	100	195	60	85	40	78	50	98
100	90	180	50	70	36	72	45	90

The numbers beneath the film types is the exposure in mR (MilliRoentgens) at the tip of the open ended PID when measured using properly calibrated equipment and correct measuring procedures.

The bracketed (man) in the F film column indicates manual processing.

Note that the table does not specify any limits for Digital Imaging. These will be developed as part of the new B.C. survey program and will be based on the Kerma Area Product .