Q.A. Collectible

Sponsored by CRCPD's Committee on Quality Assurance in Diagnostic X-Ray (H-7)

Testing of Dental Panoramic X-Ray Systems Using CT Chamber

The CT chamber of the MDH can be used to measure exposure reproducibility and half-value layer (HVL) on dental panoramic systems. When secured to the slit on the image receptor, the size and shape of the chamber make it ideal for capturing the x-ray beam. The radiation measurements gathered, using the following procedure, should NOT be used as an "ESE," but can provide the surveyor with some valuable information.

You may wish to first verify how well the beam is aligned with the slit on the image receptor. Do this by taping a fluorescent beam alignment test tool over the slit and making an exposure. If the test tool is not available or high ambient light does not allow you to observe the location of the useful beam, place intra-oral dental films at the top and bottom of the slit, make a sweep exposure, and develop the films. Analyze the resultant images with respect to where each film was placed.

Now securely tape the CT chamber along and over the slit so the center of the chamber is approximately at the center of the x-ray beam. (Careful! Some types of tape have been known to take paint with them when removed.) It is recommended that you leave the lucite sleeve on the CT chamber for protection. Certain models of panoramic systems have permanent face shields or head support mechanisms that will not allow enough clearance for the chamber. This procedure should be avoided on these units so as not to damage the chamber or the x-ray unit. Make sure the chamber's cable has enough slack and freedom of movement for an entire exposure cycle.

Set the MDH either on *Exposure* or *Pulse Exposure*. The *Exposure* setting is suggested for the S.S. White Panorex since the radiation exposure stops momentarily while the chair shifts, which will cause the MDH to reset if it is in the *Pulse Exposure* mode.

Make at least two exposures at a commonly used technique to check reproducibility. No correction factors need to be applied to the readings since you are only measuring consistency. Tape an appropriate amount of aluminum over the x-ray tube port and make another exposure for an HVL determination. If an anomaly is observed, confirm that it is not due to the chamber shifting during the survey process. A low HVL could mean several things, including inadequate inherent filtration or an inaccurate indication of kilovoltage. There are kVp meters available that are designed for use on panoramic systems.

Once you have some experience with these measurements and build up a database, you can begin to expect a certain output from each model of machine based on certain variables. If the technique settings for a typical patient or the radiation output is NOT what you expect for the film/screen combination and processing technique the facility is using, then there may be a problem that requires servicing by a qualified technician.

CAUTION: Be sure to allow an adequate amount of time between exposures or you may damage the x-ray tube. Consult the owner's manual if unsure.

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