WAC 246-226-090 Performance evaluation. The medical physicist shall conduct a performance evaluation to assess the quality and safety of the CT X-ray system and its operation.

(1) A performance evaluation must be conducted:

(a) Within thirty days of installation if the CT X-ray system passes all manufacture installation tests;

(b) Annually following the initial evaluation; and

(c) After any change, replacement, or reconfiguration of components which, in the opinion of the medical physicist, could cause a change in the radiation output or image quality.

(2) A performance evaluation must evaluate:

(a) Alignment light accuracy;

(b) Slice localization from scanned projection radiograph;

(c) Table increment and travel accuracy;

(d) Slice thickness accuracy;

(e) Image quality, including the following:

(i) High-contrast resolution;

(ii) Low-contrast resolution;

(iii) Image uniformity;

(iv) Noise; and

(v) Artifact evaluation.

(f) Gray level performance of CT acquisition display monitors;

(g) CTN uniformity, accuracy, and linearity;

(h) Safety, including the following:

(i) Visual inspection;

(ii) Audible and visual signals; and

(iii) Posting requirements.

(i) The ongoing quality control program under WAC 246-226-080, including evaluation results and corrective actions;

(j) Protocol review as required in WAC 246-226-040(5);

(k) Radiation output by:

(i) Using a calibrated dosimetry system that:

(A) Has been calibrated within the preceding twenty-four months; and

(B) Is traceable to a national standard.

(ii) Using a CT dosimetry phantom that:

(A) Is a right circular cylinder of polymethyl methacrylate of density 1.19 plus or minus 0.01 grams per cubic centimeter;

(B) Is at least 14 centimeters in length;

(C) Is 32.0 centimeters in diameter for evaluating CT X-ray systems designed to image any section of the body;

(D) Is 16.0 centimeters for systems designed to image the head, or for whole body CT X-ray systems operated in the head scanning mode; and

(E) Provides for the placement of a dosimeter along the axis of rotation and along a line parallel to the axis of rotation 1.0 centimeters from the outer surface and within the phantom. The medical physicist may place additional dosimeters or alignment devices at other locations.

(iii) Performing all dose assessments with the CT dosimetry phantom placed on the patient support device without additional attenuation materials present;

(iv) Measuring the $CTDI_{vol}$ by orienting the CT dosimetry phantom so that the measurement point 1.0 centimeter from the peripheral outer surface of the phantom and the measurement point along the axial line of the phantom is in the same angular position within the gantry as

the point of maximum surface $CTDI_{vol}$ identified. The parameters must correspond to typical values used for the average patient protocol. For the purpose of determining the $CTDI_{vol}$, the manufacturer's nominal tomographic section thickness for that particular CT X-ray system may be used.

(l) Accuracy of the displayed dose on the CT X-ray system console and verify the displayed dose is within twenty percent of the measured dose.

(3) The medical physicist shall prepare a performance evaluation report and provide it to the registrant within thirty days of completing the performance evaluation. The report must include:

(a) A summary of the performance evaluation required under this section.

(b) Recommendations for improvements, if any.

(c) Type of radiation detection instrument or system used, including the date of the last calibration.

[Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 16-23-030, § 246-226-090, filed 11/8/16, effective 1/1/17.]