

The CT Noise Metric Task Group goal is to standardize the characterization of image noise (CT noise metric) that is displayed on the control console of CT scanners. The CT noise metric will generalize between all protocols. These presentation will present an argument that such a Task Group is needed in spite of the existence of 2 previous AAPM reports on CT imaging. Some of CT science has not been incorporated into the medical physics practice leading to confusion when comparing protocols. Some contemporary textbooks still state that a simple change of pixel size will alter the pixel standard deviation (a simple noise metric). A simple experiment will demonstrate that the standard deviation is independent of pixel size. The pixel standard deviation altered considerably by the choice of reconstruction filter, which is not standardized between CT scanners of different vendors. Hence, there is need to develop a noise metric that generalizes. The slope of the noise power spectrum at zero spatial frequency is such a metric, however it is not intuitive and might be considered too complex to validate in the clinic or hospital. The subsequent presentations will describe more practical approaches that are under consideration by the Noise Metric Task Group.

One approach is to evaluate image quality in a manner similar to that used for mammography systems using the ACR phantom and CRT displays. This involves calculation of a signal-to-noise ratio that could be presented as points on a contrast detail curve. The signal-to-noise would be calculated from scans of small details and uniform phantoms.

ImPACT physicists have suggested a second approach that combines pixel noise measurements, spatial resolution measurements and radiation dose to obtain a measure that provides insight into the effects of reconstruction filter.