AbstractID: 2569 Title: Composite Fluorographic System Evaluation

This presentation explores methods for the assessment of total fluorographic system performance as related to typical clinical tasks. Many quantitative imaging system analyses focus on separately evaluating the characteristics of the individual system components. Although there is a place for such individualized characterization in product specification and troubleshooting, image quality depends on the interaction of a number of factors including the focal spot characteristics, the projection geometry of the object of interest, scattered radiation, and the image receptor. To determine how the system will perform requires a composite evaluation that includes the net effect of all components impacting image quality under clinical conditions. This is the intent of the NEMA XR 21-2000 Standard that specifies a procedure and phantom "to benchmark cardiac fluoroscopic and fluorographic performance." This standard provides a qualitative method of evaluation that is dependent on "trained human observers." For a quantitative analysis, a generalized systems approach has been developed to determine the GMTF, GNNPS, GNEQ and GDQE. This presentation reviews the mechanics of these methods and explores the advantages as well as limitations of composite system evaluation as opposed to component evaluation.

Educational Objectives:
1. To provide an understanding of those factors that influence the image quality of fluorographic systems
2. To describe methods of total system performance evaluation
3. To explore the usefulness and limitations of the NEMA XR 21 standard
4. To review the steps in the determination of the generalized system parameters of GMTF, GNNPS, GNEQ, and GDQE.