

The main goal of this presentation is to discuss factors which affect patient radiation dose delivered during various diagnostic radiology imaging examinations and to relate these radiation doses to potential biological risks. Measurement methods to estimate patient radiation doses and some examples of dose reduction for radiography, mammography, fluoroscopy, angiography and CT will be reviewed. Applications of these measurements to patient dose estimation will be shown. Procedures to obtain quick computational estimates of patient doses for IRB submissions, patient inquiries and fetal dose estimations will be provided. Approaches to convert entrance skin doses, dose area products and dose length products to effective doses and risks will be discussed. Typical patient radiation dose values for common diagnostic imaging procedures will be given. Limitations, uncertainties and ranges for patient radiation dose estimates will be examined. The utilization of “reference values” for patient radiation doses will be reviewed. Some guidelines to aid physicists with relating radiation dose issues to the public and informational media will also be included. The material is intended to provide a brief overview of one crucial aspect of the responsibilities with which diagnostic medical physicists and medical health physicists must routinely handle in their jobs. Our expectation is to stimulate introspective assessments and to expand the manner in which patient radiation dose determinations are viewed and performed.

Educational Objectives:

- 1. To review fundamental X-ray dosimetry quantities.**
- 2. To identify important factors that affect patient dose delivered by various X-ray imaging modalities.**
- 3. To describe common methods to measure patient dose and review strategies in developing patient dose charts for routine diagnostic imaging procedures.**
- 4. To examine the limitations of some current dosimetry methodologies.**
- 5. To present a practical guidance to physicists in providing day-to-day clinical support service such as IRB submissions, patient inquiries and fetal dose estimations.**