

AbstractID: 8591 Title: Effective doses to pediatric Cystic Fibrosis patients undergoing chest CT examinations

### Abstract

**Purpose.** To compare radiation doses to five year old pediatric patients with Cystic Fibrosis (CF) undergoing chest CT examinations at five North American imaging centers.

**Method.** A questionnaire was sent to five facilities participating in a CF research study (Chapel Hill NC; Washington WA; St Louis Mo; Denver Co; Toronto ON) to obtain their protocols for chest CT examinations on a five year old child with Cystic Fibrosis. The ImPACT CT dose calculator was used to determine adult effective doses for techniques used at each facility (i.e., kV/mAs/pitch). Adult effective doses were scaled to those for five year olds to account for differences in scan length, patient size and energy imparted.

**Results.** The five facilities used four different models of CT scanner from two vendors. CT techniques for five year old patients with CF were generally 120 kV, 60 mAs, and an average pitch ratio of ~ 1.2. Adult scan lengths were 30 cm whereas those for 5 year olds were 15 cm. Adults weigh 70 kg compared to 18.5 kg for a 5 year old. For a single 360 ° x-ray tube rotation, energy absorbed in the chest region of a five year old is only 55% of that for an adult. Three facilities had effective doses of ~ 2.4 mSv, whereas two facilities had lower doses of ~1.25 mSv. The main reasons for the lower doses were the use of lower x-ray technique (i.e., 30 mAs) or a lower x-ray tube voltage (i.e., 100 kV).

**Conclusions.** Effective doses to 5 year old CF patients can be obtained by scaling adult effective doses, and average to 2 mSv per patient examination.