

AbstractID: 8734 Title: Estimated cumulative effective dose from PET/CT in pediatric patients with malignancies

**Purpose:** To estimate the cumulative effective dose to pediatric patients with malignancy from regularly PET/CT scans. **Method and Materials:** We retrospectively reviewed 248 PET/CT studies performed on 78 pediatric patients with malignancies who were being periodically scanned for evaluation of disease progression. To estimate the effective dose from the CT portion of the exam, we used the ImPACT CT Patient Dosimetry Calculator software package which provides estimates based on patient specific scan parameters (scanner, kVp, mAs, collimation, scan coverage and so on). To estimate effective dose from the PET portion of the study, OLINDA software (Vanderbilt University) was used which provides estimates based on patient specific FDG doses. Since estimations from both parts were based on adult models, effective doses were adjusted for patient age according to published values. **Results:** The average effective dose from a single CT scan was 20.3mSv, ranging from 2.7 to 54.2 mSv. For the PET study the average effective dose was 4.6mSv, ranging from 0.4 to 7.7mSv. For a combined PET/CT study the average was 24.8 mSv, ranging from 6.2 to 60.7mSv. The average *cumulative* effective dose per patient from combined PET/CT studies was 78.9mSv, ranging from 6.2 to 399 mSv. Radiation doses varied significantly depending on the number of studies as well as the number of additional CT scans performed. **Conclusion:** Effective doses from combined PET/CT studies for pediatric patients with malignancies may be significant. While some of these patients will go on to radiation therapy, many will not. While PET/CT remains an important non-invasive diagnostic, staging, and surveillance modality, the decision to use PET/CT should be made with particular awareness to the cumulative radiation dose, potential dose reduction options (such as further reducing tube currents) and the overall benefit of this exam.