

## Transmission scan radiation risk and dosimetry

### All protocols for PET must have:

1. A dosimetry table with a reputable source listed (preferably a journal reference)
2. The maximum amount of activity to be injected.
3. Information as to whether the scans will be on the standalone PET, PET/CT or PET/MR.

Unless the scan is on the PET/MR, there will be an additional dose from the transmission scan. Transmission scanning is performed by the CT when using a PET/CT scanner. This information should be included in the same section where the dosimetry table is included. Doses for each method are as follows:

- **United uMI 550 PET/CT**
  - Brain scan: dose to the head = 44 mrem
  - Source: "Personal communication with Paul Vaska PhD, PET Core Medical Physicist"
  - Infrequently and unpredictably, a transmission scan will need to be repeated (subject moved mid-scan, scan needed to be stopped and restarted, etc.) In this rare case, the subject will incur double the anticipated transmission scan dose.

Below is the Standard SB Radiation Risk document. This must be included in the *Risk* section of the consent form. Document must state whether the subject is having a PET scan, PET/CT scan, or PET/MR scan.

- CT dosimetry for Head-only attenuation scan on the UMI 550 at the MART

Organ dose per scan	mrem
Brain	528
Skin	521
Thyroid	17
Lens of the eye	726
Effective Dose (ED)	44

Methods: Measured data from head16 phantom study performed on the UMI 550 at the MART, 40 mAs, 120 kVp, helical, performed by P. Vaska PhD (personal communication)

\* Organ values for head scan reported in Jaffe et al, 2010, scaled by the ratio of CTDIvol measured on the MART UMI550 (7.57 mGy) to the CTDIvol reported in Jaffe et al, 2010, based on a Siemens 64 slice CT scanner (57.7 mGy, Table 4, Scanner No. 9), plus 10% as a conservative margin.

\*\* DLP measured on MART UMI 550 (190.58 mGy\*cm) scaled by k factor for ED from AAPM Report 096 (0.0021 mSv mGy<sup>-1</sup> cm<sup>-1</sup>, Table 3, Adult Head) plus 10% as a conservative margin.

#### Literature Cited

Jaffe TA, Hoang JK, Yoshizumi TT, Toncheva G, Lowry C, Ravin C. Radiation dose for routine clinical adult brain CT: Variability on different scanners at one institution. AJR Am J Roentgenol.

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McCullough C, Cody D, Edyvean S, et al. AAPM Report No. 96: The Measurement, Reporting, and Management of Radiation Dose in CT. 2008