dose and Medical Physicist received 2.217 mSv and 66.61 mSv respectively. Technologists 3, 4 and 5 received 1.85 mSv, 1.76 mSv and 1.82 mSv as whole body doses respectively.

**Conclusion.** The personnel dose results are significantly lower than the recommended annual dose by International Commission for Radiological Protection. The higher value of gamma dose for PET/CT workers by comparison with the staff operating conventional Nuclear Medicine procedures is attributable to the higher specific gamma constant of $^{18}$F, as well as the longer exposure time required for accurate positioning.

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### PEDIATRIC NUCLEAR MEDICINE DOSIMETRY: A MONTE CARLO STUDY ON S-VALUE VARIABILITY DUE TO PATIENT SPECIFIC CHARACTERISTICS

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**Introduction.** Personalized internal radiopharmaceutical dosimetry is of great interest in the pediatric population, in whom the risk from exposure to ionizing radiation is greatly debated. Our proposed methodology is being evaluated based on the ground truth of realistic Monte Carlo (MC) simulations and anthropomorphic models.

**Purpose.** Our goal is to compute S-values and quantify the absorbed dose in the majority of organs according to the specified radiopharmaceutical biodistribution and personalized anatomical characteristics. The S-value calculation procedure is validated against already published data, while the S-value variability in children of different anatomical characteristics is studied.

**Materials/Methods.** A validation study was carried out for the calculation of S-values using monoenergetic photon sources (10 keV–1 MeV). Furthermore, S-values were calculated using the biodistribution of $^{123}$I-mIBG derived from clinical data of a 7 years old patient at 4 different time points. Male/female pediatric computational models were used for ages 5, 8 and 14 years respectively, in order to calculate S-values' variability. The GATE MC toolkit was used for the calculation of organ absorbed doses.

**Results.** Calculated photon liver-to-kidneys S-values were compared to previously reported S-values. The differences were ~2.6% for photons with energies 10 keV–100 keV, while a higher deviation (~30%) was observed for 1 MeV photons. The comparison study for the three ages revealed several variations. S-values deviated ~95% in liver, for girls with body masses ranging from 10.8 kg to 50.4 kg. Generally, children with similar body-masses had lower than ~30% variations in specific organs.

**Conclusion.** Radiopharmaceutical dosimetry shows large variations due to the patients’ anatomies, thus personalized characteristics should be considered. Our study is ongoing, extending our investigation to additional pediatric phantoms and for a variety of radiopharmaceuticals.

**Disclosure.** n/a.

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### A NOVEL STEREOTACTIC FRAME FOR TRUE PET GUIDED BIOPSIES

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**Introduction.** Most guided biopsies procedures are using a previously acquired PET/CT scan registered with procedural CT images. Other methods use radioactive sources coupled to the biopsy needle that are introduced in the patient. Many drawbacks arise in both cases: incorrect positioning, sterilized needles, expensive sources, radiation protection.

**Purpose.** We present a novel device to perform true PET guided biopsies that avoids the problems of other procedures.

**Materials and methods.** A 3D printed device was developed. It consists of four main components: A fixed circular base, an outer rotating crown with a U-shaped fixed piece, a header that moves along the U-shaped piece and a needle holder. The primary base contains three holders where radioactive markers doped with 18-FDG