The Quantitative Imaging for Personalized Cancer Medicine (QIPCM) PSMA-PET R&D program is in collaboration with UHN's Radiation Medicine Program (RMP).

STANDARDIZATION

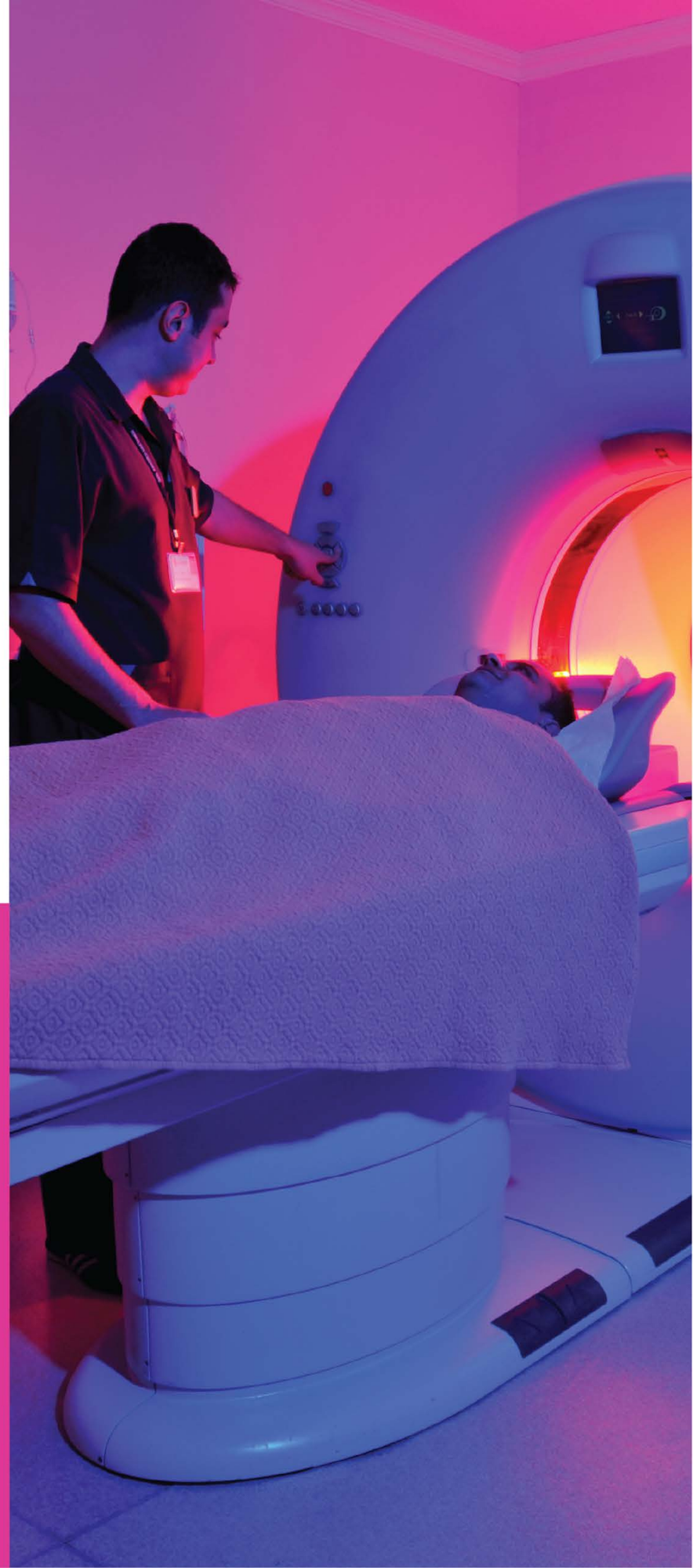
QIPCM has a strong track record in standardizing imaging and analytical techniques for clinical trials utilizing both PET/CT and PET/MR. Our R&D team has developed several imaging phantoms for scanner validation and QA. We also have tools and expertise to improve lesion detection, SUV quantification, tumour staging and response tracking. Our tools cover common areas including imaging **Sensitivity** to detect small lesions, **Partial Volume Effects** to correct blurring from small volumes, and correcting **Scatter Effects** from high signal regions (e.g., bladder) which can affect the quantification of imaging signal.

STANDARDIZATION: PARTIAL VOLUME EFFECTS

Our team has created an image derived input function (IDIF) phantom for the exploration of partial volume effects correction methods. These effects introduce errors in the quantification of small lesions, which are prevalent in PSMA-PET imaging. IDIF phantom's compartments mimic the sizes of the aorta, common iliac, internal iliac, and common carotid arteries, as these are the most common vessels used for IDIF.

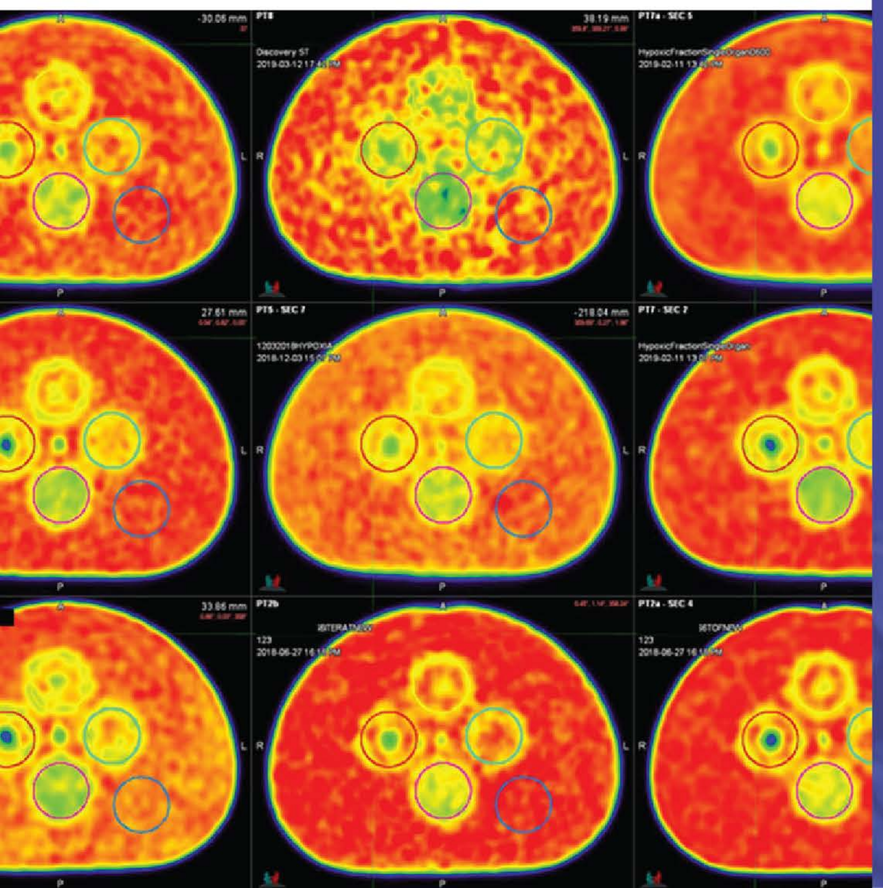
STANDARDIZATION: SENSITIVITY

PSMA-PET imaging for the detection of nodes in the whole body requires high imaging sensitivity. Many lesions are sub-2mm in diameter, and our PSMA small lesion phantom was designed to help quantify PSMA PET imaging sensitivity at these scales



STANDARDIZATION: SCATTER EFFECTS.

Regions of high tracer uptake can dwarf PET signals from nearby tissue with less tracer uptake. On images it presents as signal spilling over outside of the boundary of an organ (e.g., the bladder). This issue impacts lesion quantification near the liver, kidneys, and ureters. Our team has created an automated method of removing areas of contours impacted by spillover, and designed a bladder/scatter phantom for testing and validation. The phantom consists of compartments of bladder, tumour, and muscle. The distance between bladder and tumour are adjustable, so we can observe how spillover changes with activity differences and linear distances.



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