

Organ-based normative values in healthy subjects derived from whole-body [18F]FDG-PET/CT

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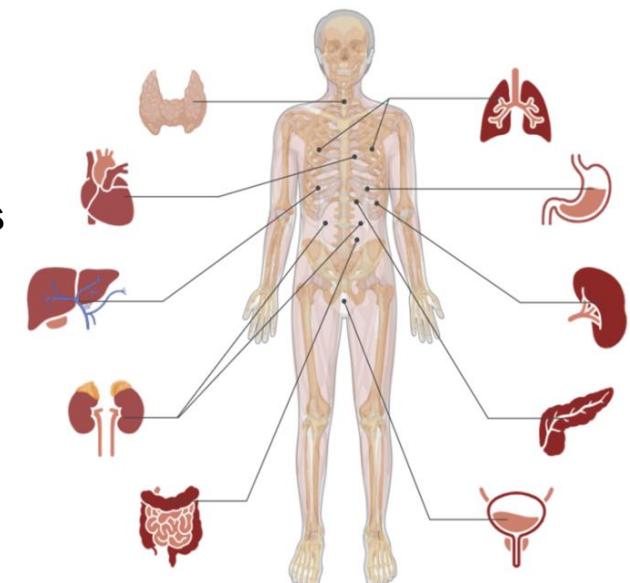
Aim: Establishing organ-specific normative uptake values and their variability using whole-body [18F]FDG-PET/CT in a cohort of healthy subjects.

Data: Test and retest (5 weeks apart) static [18F]FDG PET/CT scans of **48 healthy subjects** (25 females, 23 males; 38 ± 14 years) scanned at the **Medical University of Vienna**.



Methods:

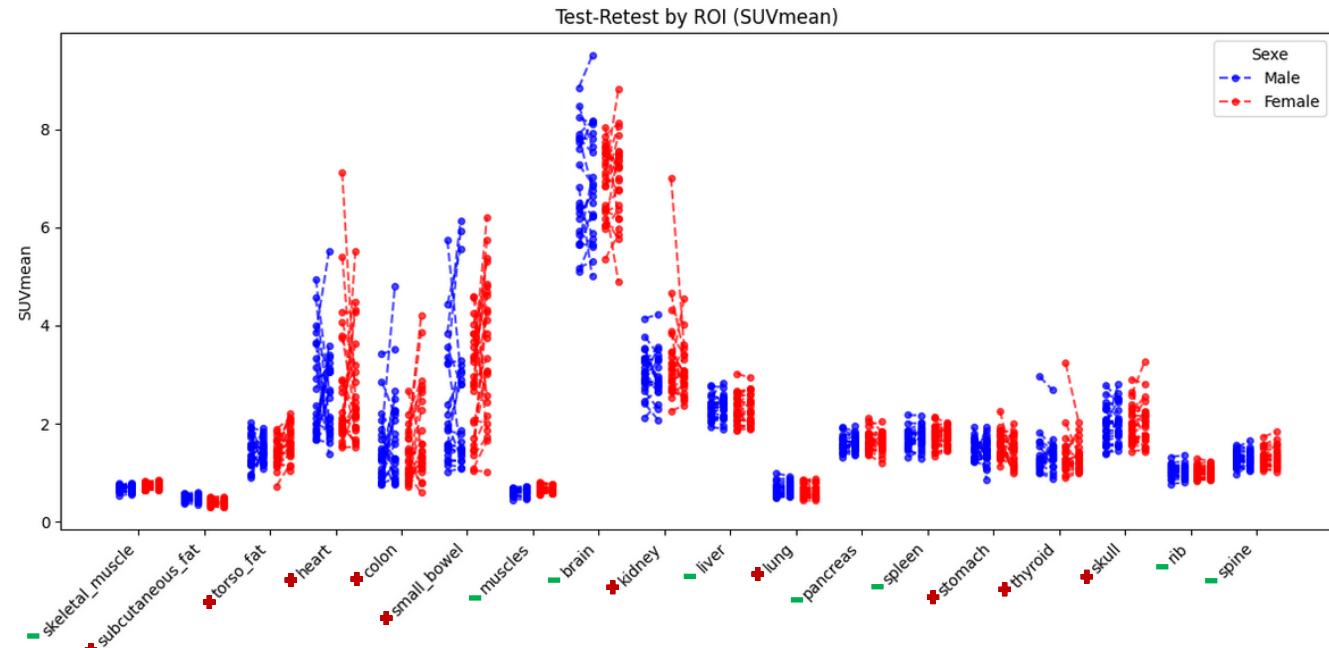
- **27 VOIs** segmented using **TotalSegmentator v2.8.0** and **MOOSE v3.0.13**.
- The **volume (mL)**, **SUVmean** and **HUmean** in each VOI were calculated.
- Differences between test and retest values for males and females separately were evaluated using **relative %-differences**, **t-tests** and **Wilcoxon signed-rank tests**.



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Results:

- Reproducibility (Test-Retest):**
 - No significant differences between test and retest, regardless of segmentation algorithm.
 - SUVmean was robust across methods, except for:
 - small bowel
 - tissues → segmentation tool bias
- Inter-subject Variability in SUVmean:**
 - High variability (>15%): 15/27 VOIs including heart, kidneys, bladder, fat, skull, digestive organs
 - Low variability (<15%): 12/27 VOIs including brain, liver, pancreas, spleen, muscles
- Sex-based Differences:**
 - Volumes higher in men (BMI-related) → Significant differences in SUVmean for skeletal muscle ($p=0.046$) and subcutaneous fat ($p<10^{-4}$) with a low inter-subject variability.



Conclusion:

- All organs demonstrated **reproducible measurements across test-retest**.
- SUVmean: Only **12 organs showed consistently low variability across subjects and segmentation methods**.