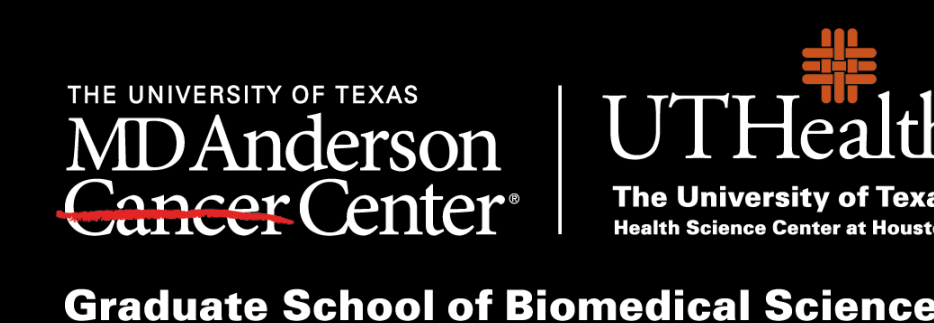




# A Novel SPECT/CT-based Lung Mean Dose Calculation for Treatment Planning in <sup>90</sup>Y-Microsphere Radioembolization Therapy

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Young Investigator Finalist  
Monday 30<sup>th</sup> 7:30 am  
Karl Dean Ballroom A1  
Abstract #40208

## Study Objective

To improve the accuracy of lung dose estimates in <sup>90</sup>Y-microsphere liver therapy using standard-of-care imaging

## Estimation of Lung Mean Dose (LMD)

- TheraSphere and SIR-Spheres package-inserts:
- Restrict LMD to 30 Gy in single treatment
  - Define lung mass and lung shunt fraction (LSF) as follows:

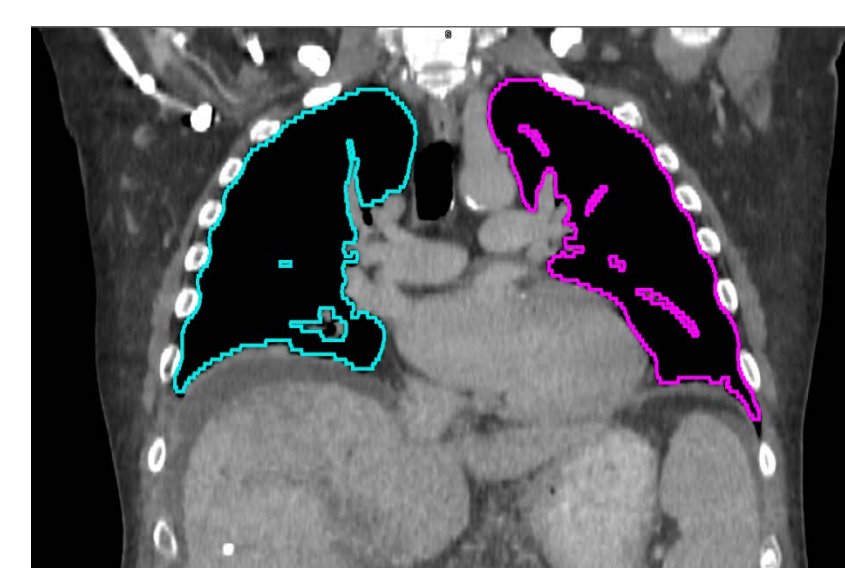
### Package Instructions (Standard Practice)

### Novel Method Proposed

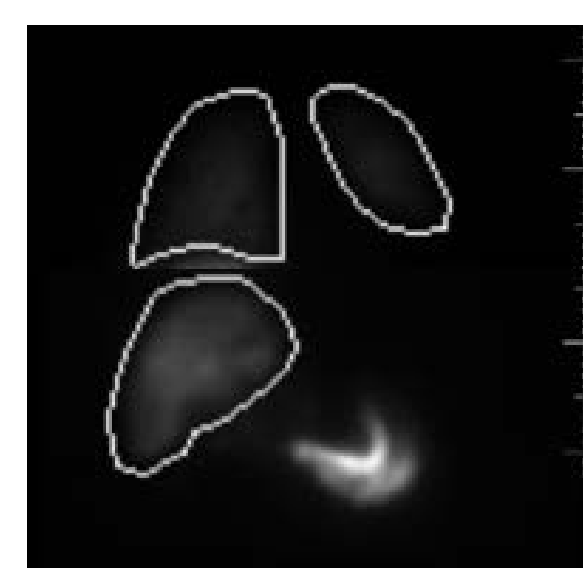
**Mass**

1 kg  
for all patients

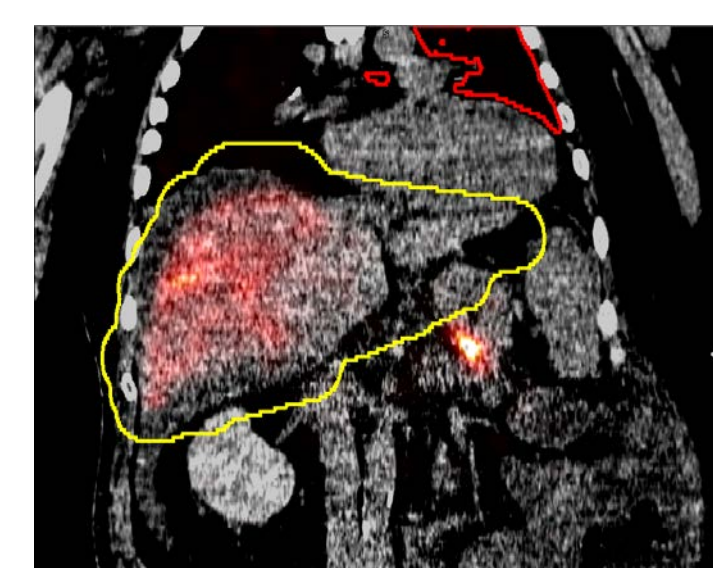
Diagnostic Chest CT



<sup>99m</sup>Tc-MAA Planar



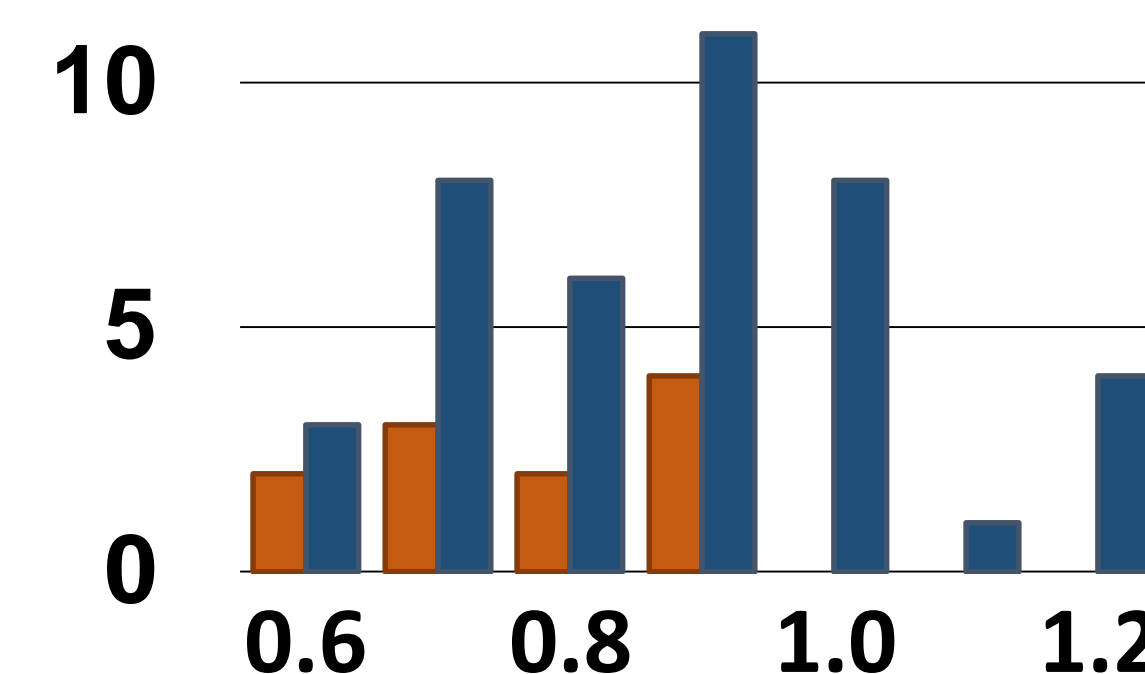
<sup>99m</sup>Tc-MAA SPECT/CT



**LSF**

## Key Results (n = 52)

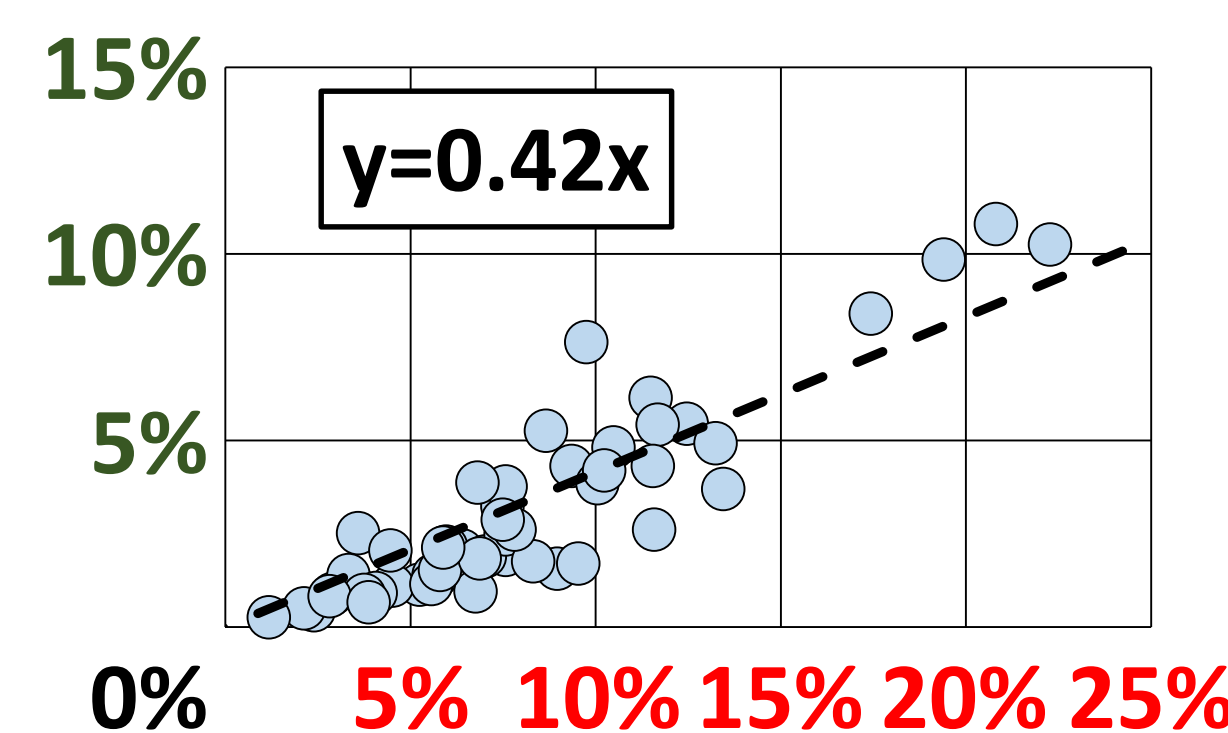
**Mass**



(Left) Distribution of CT-based masses [kg] ([males](#), [females](#))

CT-based masses are **~30% less** than 1 kg

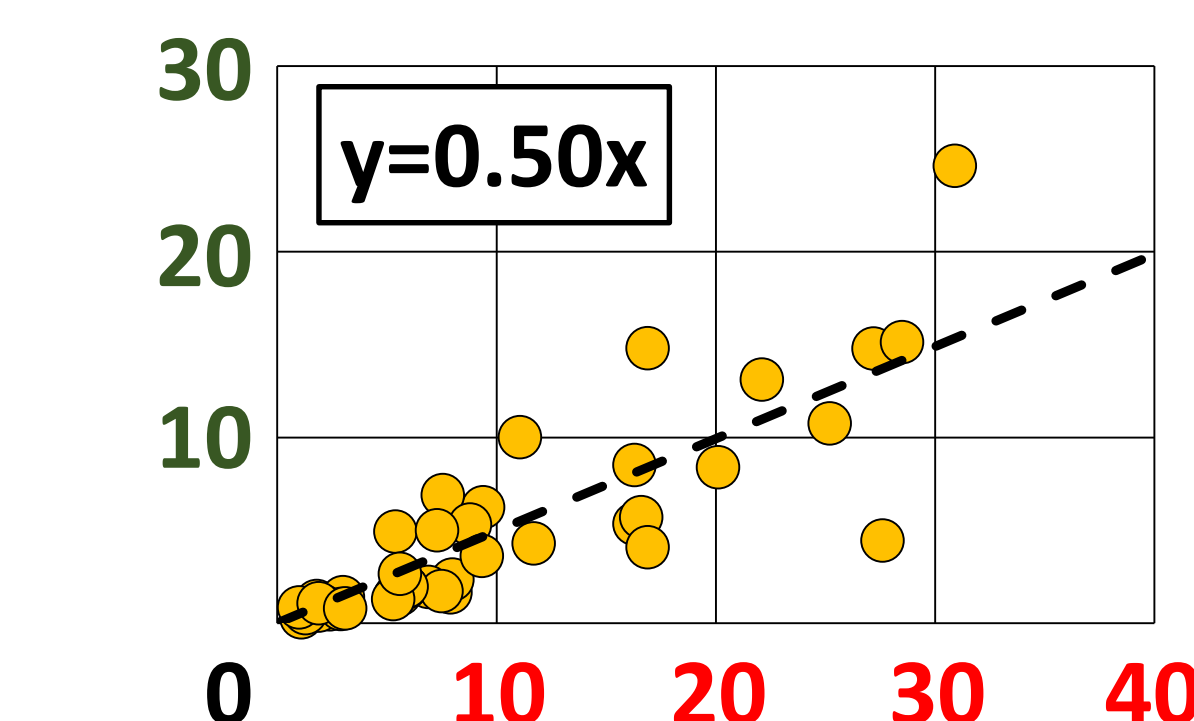
**LSF**



(Left) LSF: [Proposed Method](#) vs. [Standard Practice](#)

SPECT/CT LSFs are **~65% lower** than standard

**LMD**



(Left) LMD [Gy]: [Proposed Method](#) vs. [Standard Practice](#)

Novel method LMDs are **~50% lower** than standard

## Significance

**Standard Practice greatly overestimates LMD, which may restrict patients from receiving adequate dose to tumors**

**Our method: 1) more accurately estimates LMD, 2) uses standard-of-care imaging and 3) is easy to implement.**