

## Gamma Camera Imaging of Indium-111 for Yttrium-90 Dosimetry

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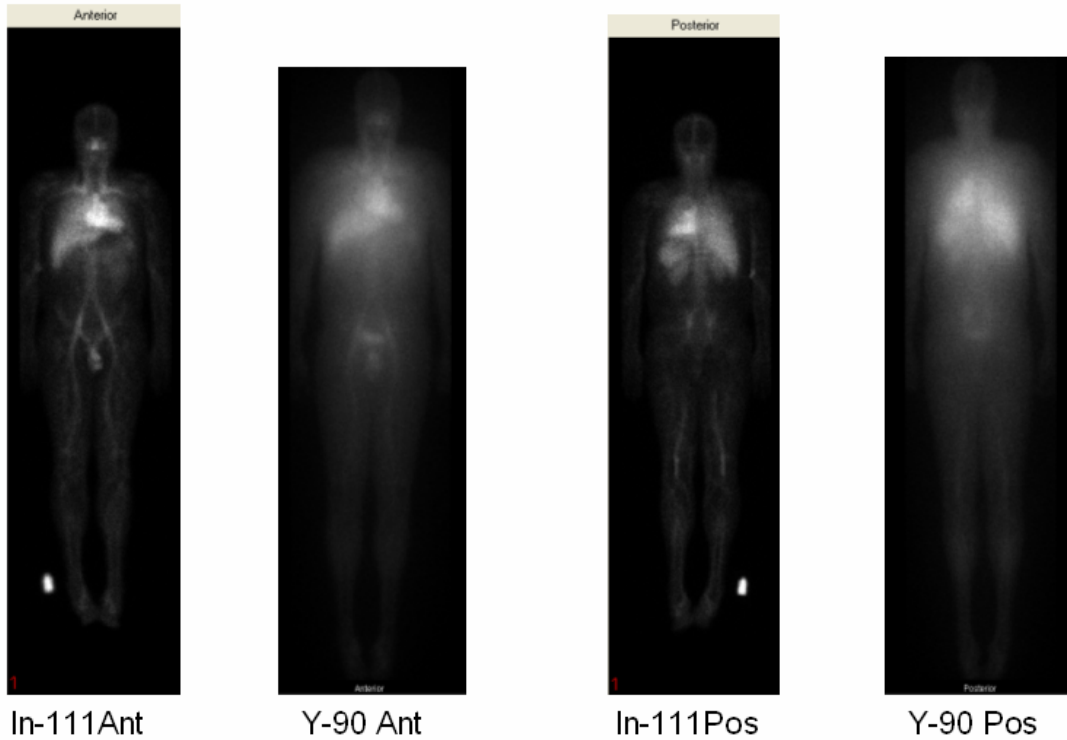
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**Purpose:** It was aimed to identify problems and investigate processing parameters in images for treatment planning and dosimetry in Y-90 Zevalin dose escalate trial. **Method and Materials:** 5 mCi of In-111 Zevalin was imaged (0, 4, 24, 72 and 144 hours) on Siemens eCam dual head gamma camera with MEGP collimators. Y-90 patient imaging was performed with 28 mCi of Y-90 labeled Zevalin. At 30 minutes post Zevalin injection, a whole body scan was performed on the same camera using a 194 cm bed length (5 cm/min, total 48 min), 256 x 1024 x 16 matrix without zooming. Both anterior and posterior images were transferred an IDL workstation for data analysis. Time activity curves were fitted with various functions for comparison. MIRD scheme was used to estimate patient dose. **Results:** In-111 images were processed with attenuation compensation. Quality control in acquisition and processing were important for consistency in dosimetry calculation. Mass correction was obtained using CT scan. Most of organ dose were under 2,000 rads if Y-90 activity was below 32 mCi. Kidney dose was sensitive to RoI definition and location of the background region. **Conclusions:** An energy window (75keV/50%) is adequate for characteristic X-ray and Bremsstrahlung imaging. Y-90 imaging depends on scatter characteristic of tissue and does not provide direct biodistribution of Yttrium-90. In-111 imaging simulates the distribution of Y-90 for dosimetry when quality control and consistency are followed.

**Supporting Document Page 1**

**“Gamma Camera Imaging of Indium-111 for Yttrium-90 Dosimetry”**

**IDEC In-111 & Y-90 Image of A  
Zevalin Patient – 0 hr**



## Supporting Document Page 2

“Gamma Camera Imaging of Indium-111 for Yttrium-90 Dosimetry”

# Estimate Kidney Dose Using In-111 Imaging

**Source Organ/Tumor**

- Kidneys
- Liver
- Lungs
- Spleen
- Total Body

**Region Definition**

- Organ/Tumor
- Background
- Standard Source
- Mirror

**ROI Statistics**

ANTERIOR	
Cts:	95976
Pixels:	1262
Bkgd Pixels:	3
Bkgd Cts/Pix:	47.1365
Std Cts:	67971
Std Pixels:	489

POSTERIOR	
Cts:	92240
Pixels:	1260
Bkgd Pixels:	3
Bkgd Cts/Pix:	41.0892
Std Cts:	72068
Std Pixels:	489

The interface displays four views of the kidneys: two small anterior and posterior views on the left, and two larger anterior and posterior views on the right. Red outlines indicate the regions of interest (ROIs) for the kidneys. The statistics table provides quantitative data for these ROIs, including counts, pixels, background pixels, and standard deviations.