

ACR Update in Nuclear Medicine Accreditation

Beth A. Harkness, MS, DABR, FACR
Henry Ford Health System
Detroit, MI



Disclaimer

- ACR physics subcommittee for nuclear medicine accreditation.
- My facility is ACR accredited for Nuclear Medicine and PET.
- I have attempted to provide accurate information. Information on the ACR website will be the most current and correct information.
 - (www.acr.org/Quality-Safety/Accreditation/Nuclear-Med-PET)

Changes to the NM Accreditation Process

- 7/1/2010 – Only the Data Spectrum Deluxe Phantom will be accepted.
- 8/1/2011 – Data Spectrum Small SPECT phantom approved.
- 9/19/2011 – ^{201}Tl and ^{67}Ga SPECT requirement removed.
- 7/10/2014 – Continuing experience and CME requirements for physicians and physicists.
- .

ACR Approved SPECT Phantom



- Cylindrical phantom
 - Internal radius 10.8 cm
 - Internal length 20 cm
- Lower half
 - 6 pie-shaped sections of Lucite rods.
 - Rod diameters: 4.8, 6.4, 7.9, 9.5, 11.1, and 12.7 mm
- Upper half
 - 6 Lucite spheres
 - Sphere diameters: 9.5, 12.7, 15.9, 19.1, 25.4, and 31.8 mm

Changes to the NM Accreditation Process

- 7/1/2010 – Only the Data Spectrum Deluxe Phantom will be accepted.
- 8/1/2011 – Data Spectrum Small SPECT phantom approved.
- 9/19/2011 – ^{201}Tl and ^{67}Ga SPECT requirement removed.
- 7/10/2014 – Continuing experience and CME requirements for physicians and physicists.

Data Spectrum Small SPECT Phantom Specification

- Length (inside)
 - 15 cm
- Diameter (Inside)
 - 14 cm
- Spheres
 - 6.4, 9.5, 12.7, 15.9, 19.1, and 25.4 mm
- Rods
 - 4.8, 6.4, 7.9, 11.1, 12.7 mm
 - Height 4.0 cm



Data Spectrum Small SPECT Phantom

Approved for:

- D-SPECT
- GE 530c
- GE 570c
- CardiArc (No longer available)
- maiCam
- C!
- P3000
- ClearVision
- Neurologica
- Digirad – 3XPO

Optional

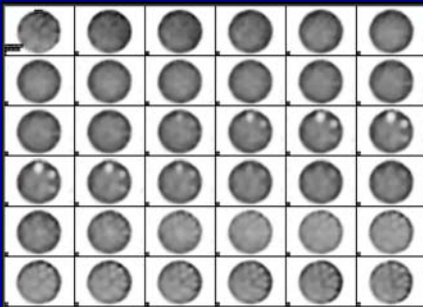
- c.cam
- Ventri
- CardioMD

Small Phantom – GE 530C

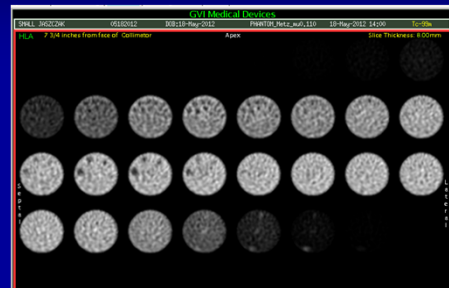


- 185 MBq
- 5 min acquisition
- Summed rods 2 cm
- Summed spheres 0.8 cm

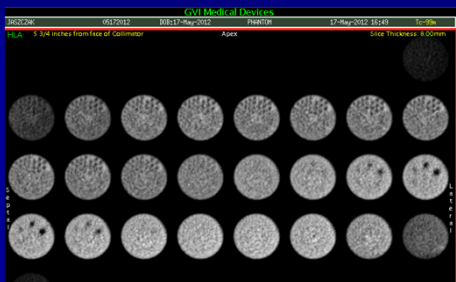
Small Phantom – GE 530C



ClearVision Camera – Small Phantom



ClearVision Camera – Deluxe Phantom



Changes to the NM Accreditation Process

- 7/1/2010 – Only the Data Spectrum Deluxe Phantom will be accepted.
- 8/1/2011 – Data Spectrum Small SPECT phantom approved.
- 9/19/2011 – ^{201}Tl and $^{67}\text{Ga}/^{111}\text{In}$ SPECT requirement removed.
- 7/10/2014 – Continuing experience and CME requirements for physicians and physicists.

Changes to the SPECT Phantom Instructions

Before September 2011

- Planar ACR phantom
 - 500 k counts
 - 1.45 zoom factor
- SPECT Phantom Acquisition
 - 24M counts
 - Circular orbit
 - Tc-99m and
 - Tl-201, Ga-67, or In-111

After September 2011

- Planar ACR phantom
 - 600 k counts
 - 1.0 zoom factor
- SPECT Phantom Acquisition
 - 32M counts
 - Circular or Body Contour Orbit
 - Pixel size 2.7 to 3.3 mm
 - Tc-99m only

Changes to the SPECT Phantom Instructions

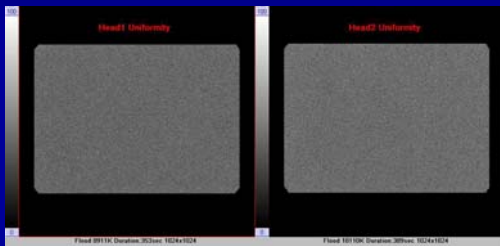
Before September 2011

- Process with a Butterworth filter
 - Cutoff 0.55
 - Order 6
- Submit
 - Complete set of transaxial images.
 - Summed images
 - Contrast 2 slices
 - Resolution 16 slices
 - Uniformity 6 slices

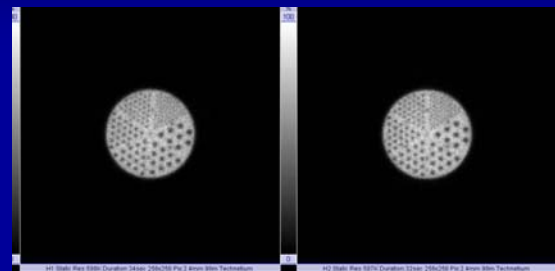
After September 2011

- Process with a Butterworth or clinical filter.
- Submit
 - Complete set of transaxial images (0.6-0.9 cm thick)
 - Summed resolution image
 - Delux phantom 12 slices
 - Small phantom 5 images

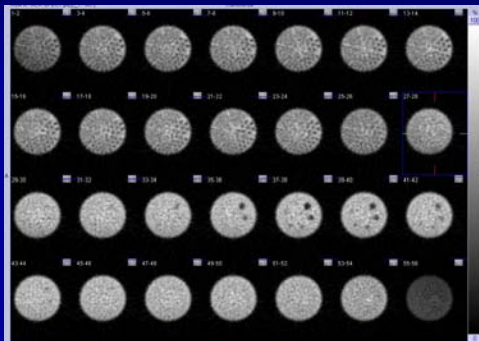
Submission Example Uniformity



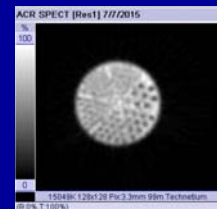
Submission Example Planar Resolution



All Tomographic Images (0.6-0.9 cm Thick)



SPECT Resolution (12 slices summed)



Changes to the NM Accreditation Process

- 7/1/2010 – Only the Data Spectrum Deluxe Phantom will be accepted.
- 8/1/2011 – Data Spectrum Small SPECT phantom approved.
- 9/19/2011 – ^{201}Tl and $^{67}\text{Ga}/^{111}\text{In}$ SPECT requirement removed.
- 7/10/2014 – Continuing experience and CME requirements for physicians and physicists.

Continuing Experience & CME Physicist

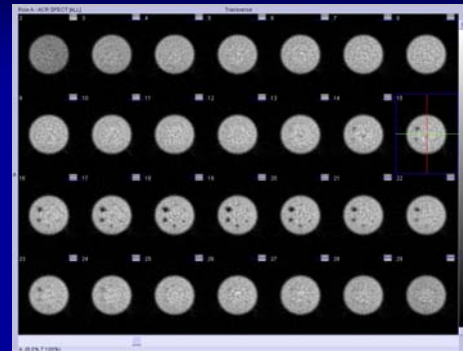
All renewing sites:

- Continuing Experience: Upon renewal, 2 NM camera surveys in prior 24 months
- Continuing Education: Upon renewal, 15 CEU/CME (1/2 Cat 1) in prior 36 months (must include credits pertinent to the accredited modality)

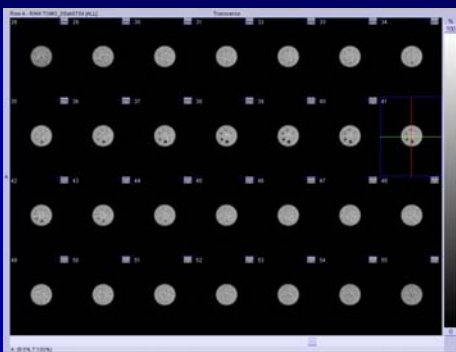
Common Pitfalls

- Incomplete paperwork
- Failure to read and then follow instructions
 - Images acquired for the wrong number of counts
 - SPECT data not processed properly.
 - ...
- Incomplete submission of data
- Procedures not in compliance with standards

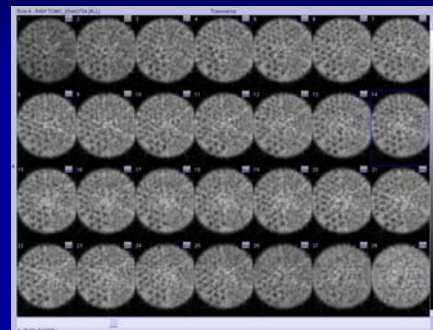
Images Correctly Sized



Images too Small



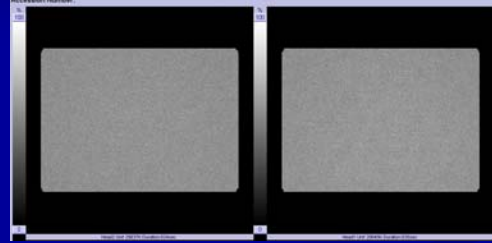
Images too Large



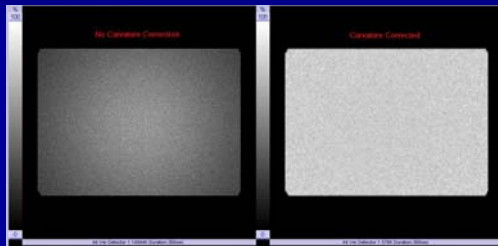
Calibration Flood Submitted



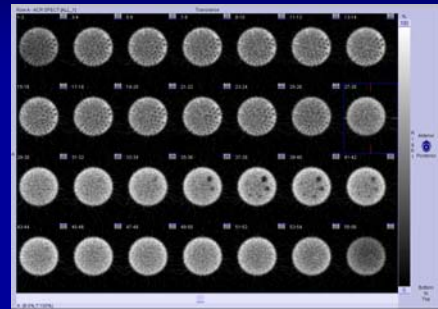
Too Many Counts



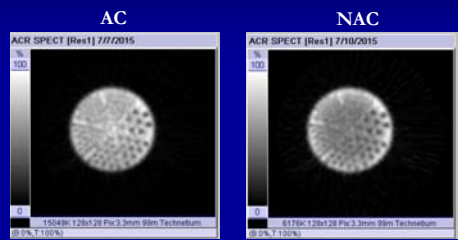
No Curvature Correction (Particular to Siemens Cameras)



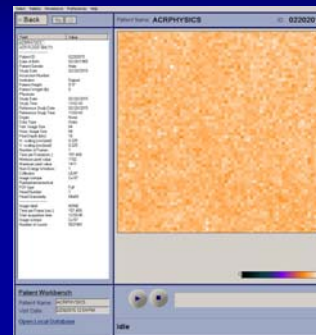
No Attenuation Correction



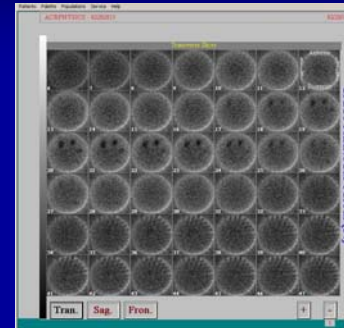
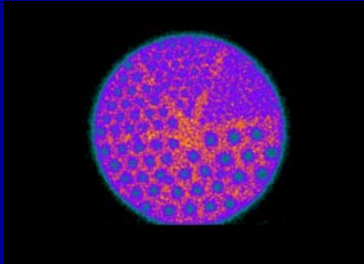
No Attenuation Correction



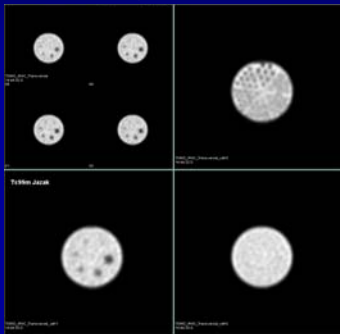
Color Image



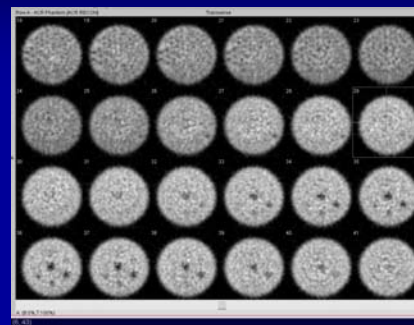
Color Images



Incomplete Data Wrong Protocol



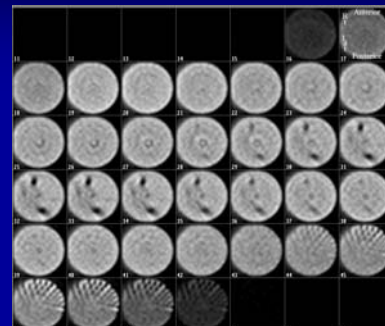
Severe Artifact



Phantom Assembled Incorrectly



Phantom Assembled Incorrectly



Plan for a Successful Experience

- Go to the websites and review the process and standards.
- Review your policies and procedures.
 - Are they current
 - Do they meet the accrediting organizations standards.
- Make sure that all routine maintenance and SPECT QC are done prior to phantom acquisition.

Plan for a Successful Experience

- Start the application process
 - Make a list of what needs to be done and assign a person to follow each task.
 - Make a list of questions for the accrediting organization.
 - Set a timeline for completing the application
- Don't be afraid to call and ask questions.
- Pay attention to deadlines; extensions are considered on a case by case basis.