

ACR Phantom Criteria

Nuclear Medicine Planar Only Images:

(4-quadrant bar phantom)

Tc99m or Co57:

Intrinsic spatial resolution images:

Satisfactory: 2.5 to 2.9 mm bars are resolved in one quadrant of a four quadrant pattern and they have low contrast
Marginal: 3.0 to 3.4 mm bars resolved in one quadrant of a four quadrant pattern

System spatial resolution images:

Satisfactory: 3.0 to 3.4 mm bars are resolved in one quadrant of a four quadrant pattern
Marginal: 3.5 to 3.9 mm bars resolved in one quadrant of a four quadrant pattern

Tl201, Ga67, or In111:

Intrinsic spatial resolution images:

Satisfactory: 3.0 to 3.4 mm bars are resolved in one quadrant of a four quadrant pattern and they have low contrast
Marginal: 3.5 to 3.9 mm bars resolved in one quadrant of a four quadrant pattern

System spatial resolution images:

Satisfactory: 3.5 to 3.9 mm bars are resolved in one quadrant of a four quadrant pattern
Marginal: 4.0 to 4.4 mm bars resolved in one quadrant of a four quadrant pattern

ACR Phantom Spatial Resolution Tc99m using the ACR-approved SPECT Phantom

(At least 75% of the rods in a segment must be visualized to qualify a set as “seen”.)

General purpose parallel hole collimators:

Satisfactory: 9.5 mm rods resolved with high contrast
Marginal: 9.5 mm rods resolved with low contrast

High resolution parallel hole collimators:

Satisfactory: 7.9 mm rods resolved with high contrast
Marginal: 7.9 mm rods resolved with low contrast

ACR Phantom Spatial Resolution Tl-201, Ga-67, or In111 using the ACR-approved SPECT Phantom

(At least 50% of the rods in a segment must be visualized to qualify a set as “seen”.)

General purpose parallel hole collimators (Tl201)

or

Medium energy general purpose parallel hole collimators (Ga-67 or In111)

Satisfactory: 11.1 mm rods visible

Marginal: 12.7 mm rods visible

High resolution parallel hole collimators (Tl-201)

Satisfactory: 9.5 mm rods visible

Marginal: 11.1 mm rods visible

Nuclear Medicine SPECT Phantom:

(Deluxe Phantom)

(If a phantom receives 2 scores of Marginal this equals a FAIL)

Tc99m SPECT:

Spatial Resolution (GP and HR):

Satisfactory: 11.1 mm rods resolved with low contrast

Marginal: 12.7 mm rods resolved with high contrast

Contrast (GP and HR):

Satisfactory: 19.1 mm and larger spheres resolved with high contrast

Marginal: 25.4 mm and larger spheres resolved with low contrast

Tl201 SPECT:

(If a phantom receives 2 scores of Marginal this equals a FAIL)

Spatial Resolution (GP and HR):

Satisfactory: 12.7 mm and larger rods resolved with high contrast

Marginal: 12.7 mm rods resolved with low contrast.

Contrast (GP and HR):

Satisfactory: 19.1 mm and larger spheres visible above background

Marginal: 25.4 mm and larger sphere visible above background

GA67 SPECT:

(If a phantom receives 2 scores of Marginal this equals a FAIL)

Spatial Resolution (MEGP):

Satisfactory: 12.7 mm and larger rods resolved with high contrast
Marginal: 12.7 mm rods resolved with low contrast.

Contrast (MEGP):

Satisfactory: 19.1 mm and larger spheres visible above background
Marginal: 25.4 mm and larger sphere visible above background

Uniformity (Same for all isotopes and collimators):

Satisfactory: Faint ring artifacts visualized in the UNIFORMITY and in the complete set of all slices that are not thought to be clinically significant or vice versa
Marginal: Strong artifacts are seen in no more than two slices of the complete set

PET Phantom:

(If a phantom receives 2 scores of Marginal this equals a FAIL)

Contrast:

Satisfactory: 12 mm vial is resolved with low contrast; larger vials resolved with high contrast
Marginal: 16 mm vial is resolved with acceptable contrast; larger vials resolved with high contrast

Spatial Resolution:

Satisfactory: 9.5 mm rods are resolved with low contrast; larger rods are resolved with high contrast
Marginal: 11.1 mm rods are resolved with low contrast; larger rods are resolved with high contrast

Uniformity:

Satisfactory: Artifacts are seen in only a few slices of the complete set but are not thought to be clinically significant.
Marginal: Strong artifacts are seen in a small number of slices.

NEW 2010 PASS/FAIL CRITERIA for SUV Values (effective July 1, 2010):

Mean Bkgd: 0.85 – 1.15

25 mm cylinder: >1.8 - <2.8

16/25 ratio: >.7

A phantom acquisition with two or more marginal scores for any category will be failed.