QUALIFICATION REQUIREMENTS FOR PET BODY QUANTITATIVE
(PTBQ)

1. All scanners for which a site is seeking scanner qualification must be a PET/CT scanner. PET-only scanners will no longer be accepted for qualification.

2. Phantom must be a water-filled cylinder injected with F-18. Ga-68/Ge-68 solid cylinders are no longer acceptable.

3. Uniform cylinder acquisition for trials involving PET/CT Body Scans must be acquired and reconstructed on a FOV of at least 500 mm diameter. A two bed position scan is required.

4. The phantom data submitted for qualification should be acquired within two or three weeks of the application submission.

5. The Test Patient Studies submitted for initial qualification should also of been acquired within the last 30 days of the application submission.

6. Test Patient Studies are only required for initial qualification. Requalification does not require new Test Patient Studies to be submitted.

REQUALIFICATION OF THE PET/CT SCANNER MUST OCCUR FOR ANY OF THE FOLLOWING SCENARIOS:

1. One year from the initial qualification.

2. A new scanner is installed that will be used to scan trial participants.

3. Any PET/CT system that undergoes a major upgrade (i.e., any upgrade that may affect quantitative (SUV) determination).

MATERIALS REQUIRED

Submit the following for every PET/CT scanner that will be used for research:

1. Application (online)

2. Uniform Phantom Images (DICOM)

3. Two Test Patient Studies (Body: skull base to mid-thigh) ** Test cases are only required for initial qualification. Requalification does not require new Studies to be submitted.
**UNIFORM PHANTOM SCAN REQUIREMENTS**

The uniform cylinder can be any fill-able, cylindrical phantom that does not have any internal structure; the phantom should have an internal diameter of 18 cm - 22 cm and a length that is greater than the axial FOV of the scanner.

Inject a known amount of FDG or F-18 fluoride; the activity should be within the range of 135 - 165 nCi/mL.

- GE: 5,640 mL phantom, inject 0.76 - 0.93 mCi
- Siemens: 6,283 mL phantom, inject 1.0 - 1.5 mCi
- Philips: 9,293 mL phantom, inject 1.25 - 1.53 mCi

Place the phantom on its side on the scanner table. Some sheets may be used under the phantom to prevent the phantom from rolling and to assist in leveling. Align the phantom so that its long axis is parallel to the axis of the scanner. A bubble level should be used to ensure that the phantom is properly positioned in the horizontal plane. Adjust the table height so that the phantom is centered in the transverse FOV.

The scan length will be two bed-position with the phantom centered in the axial extent of the combined two bed positions. The phantom should be acquired using your site's standard clinical protocol for Body PET, in accordance with the manufacturer's recommendations. Typical imaging times, based on a 70 kg, 170 cm (~24 BMI) patient, vary from 2 - 5 minutes per bed position, depending on whether the scan acquisition is in 2D or 3D mode. Enter the 'patient' weight as the phantom volume, in liters, (i.e. 5.64 kg for a phantom with volume 5,640 mL). If the software requests a height, enter 170 cm. The dose should be entered as the net dose obtained from the values recorded on the application form.

The Body acquisition should be reconstructed using your site's standard reconstruction parameters. For a Body FOV, typical slice thickness ranges from 3 - 5 mm and typical transverse pixel sizes ranges from 3 x 3 - 4 x 4 mm.

ROI Analysis - On a transverse slice of phantom acquisition, draw a 2D circular ROI that encompasses an area of ~ 200 cm² of the center of each slice. The same ROI can then be copied and applied across all slices of the phantom. The SUV analysis of this region should read between 0.90 and 1.10 with less than 10% axial variation across the entire axial field. An optional SUV analysis spreadsheet is available upon request ([rdigati@acr.org](mailto:rdigati@acr.org)) but is not required.

For all Phantom studies, the site must submit:
1. PET attenuation corrected (PET AC)

2. PET non-attenuation corrected (PET NAC)

3. CT images used for attenuation correction (CTAC)

TEST PATIENT IMAGE REQUIREMENTS

Submit images of two de-identified patients consisting of three volumes or multi-slice files as follows:

1. Whole Body (torso) transmission CT

2. Whole Body (torso) PET attenuation corrected (PET AC)

3. Whole Body (torso) PET non-attenuation corrected (PET NAC)

Note: The two test patient images must have been acquired in the last 30 days.