UK PET Core Lab

PET QC Form

**Introduction**

The aim of this form is to ensure sites comply with the requirements for site accreditation by the UK PET Core Lab. The form should be completed as part of the initial accreditation and then on an annual basis. This should be submitted along with the NEMA IQ phantom data to the UK PET Core Lab in order to maintain accreditation.

If any of the site local procedures detailed in this document change, the Core Lab should be informed as soon as possible to determine if this impacts on the scanner accreditation status.

Sites may be asked to use different acquisition and /or reconstruction parameters to those used in routine clinical scanning. This is intended to match image quality and quantitation across PET systems in the trials network. The UK PET Core Lab will work with sites to determine the appropriate parameters at the time of initial accreditation and accreditation will be issued based on these agreed parameters. The agreed acquisition and/or reconstruction parameters should be used for all Core Lab trial patients and any deviations should be recorded on the trial specific PET acquisition form for the patient. Sites who repeatedly deviate to these requirements risk losing their accreditation status.

**Site Details**

|  |  |
| --- | --- |
| PET Centre: |  |
| Name of Person Completing the PET QC Form: |  |
| Date: |  |

**Site Responsibilities**

|  |  |
| --- | --- |
| **Role** | **Name & Email** |
| Routine Scanner QC: |  |
| Site Accreditation: |  |
| Patient Scanning: |  |
| Data Anonymisation & Transfer: |  |

**Scanner Details**

|  |  |
| --- | --- |
| Scanner Manufacturer and Model: |  |
| Scanner Type: | Fixed [ ]  Mobile [ ]  ID: |
| Year of Installation: |  |

PET Component:

|  |  |
| --- | --- |
| Crystal Type: (e.g. BGO, LSO) |  |
| Number of PET Detector Rings: |  |
| Acquisition Modes Available: | 2D [ ]  3D [ ]  TOF [ ] Step-&-shoot [ ]  continuous bed motion [ ]   |
| Reconstruction Options Available: | Iterative [ ]  Iterative + PSF [ ]  Iterative + TOF [ ] Iterative + TOF + PSF [ ] Bayesian Penalised -Likelihood (QClear) [ ] Other (please specify) [ ]  |
| Scatter Correction Options Available: |  |

CT Component:

|  |  |
| --- | --- |
| CT Model: |  |
| Number of CT slices: |  |
| Acquisition Modes Available: | Auto mA (z-axis) [ ]  Rotational AEC (x-y axis) [ ]   Auto kV [ ]  Dual-Energy [ ]   |
| Reconstruction Options Available: | Iterative [ ]  Metal Artefact Reduction (MAR) [ ] Q.AC (GE only) [ ]  Other (please state) [ ]  |

**Clinical Scanning Details**

Please provide details of the routine half/whole-body 18FDG-PET/CT protocol used for scanning clinical oncology patients:

PET Component:

|  |  |
| --- | --- |
| Protocol used for FDG Injected Activity (if weight-based please describe protocol used, such as maximum & target injected activity values or formula for calculation): | Fixed:  Weight-based:  |
| Acquisition Mode: | 2D [ ]  3D [ ]  TOF [ ]  |
| Scan Duration (if weight-based please describe protocol used): | Step-&-shoot (min/bed): Continuous bed motion (mm/s):   |
| Percentage or number of slices Bed Overlap (step-&-shoot only): | **%       Slices** |
| How long are RAW PET Sinogram Data stored? |  |

|  |  |  |
| --- | --- | --- |
|  | **Reconstruction 1** | **Reconstruction 2** |
| Reconstruction Options Used: | Iterative [ ]  Iterative + PSF [ ]  Iterative + TOF [ ] Iterative + TOF + PSF [ ] Bayesian Penalised -Likelihood (QClear) [ ] Other (please specify) [ ]  | Iterative [ ]  Iterative + PSF [ ]  Iterative + TOF [ ] Iterative + TOF + PSF [ ] Bayesian Penalised -Likelihood (QClear) [ ] Other (please specify) [ ]  |
| Reconstruction Parameters (iterations/subsets or beta value):  |  |   |
| Reconstruction Matrix (e.g 128x128, 256x256) |  |  |
| Pixel Size (mm2): |  |  |
| Slice Thickness (mm): |  |  |
| Post Filter Type and Parameters used (e.g. cut-off or FWHM): |  |  |

CT Component:

|  |  |
| --- | --- |
| Acquisition Mode: | Auto mA (z-axis) [ ]  Rotational AEC (x-y axis) [ ]   Auto kV [ ]  Dual-Energy [ ]   |
| Tube Potential (kVp): | Fixed:  Weight-based:  |
| Protocol used for mA (if weight-based please describe protocol including Noise Index (NI) or reference mAs used): | Fixed:  Weight-based:  |
| Pitch: |  |
| Rotation Time (s) |  |
| Total Beam Collimation (mm): |  |
| Acquired Slice Thickness and Interval (mm): |  |

|  |  |  |
| --- | --- | --- |
|  | **Reconstruction 1** | **Reconstruction 2** |
| Reconstruction Options Used (if using iterative, please include the parameters used e.g. ASiR 40% or SAFIRE 3): | FBP [ ] MAR [ ]  Iterative [ ]   | FBP [ ] MAR [ ]  Iterative [ ]   |
| Reconstruction Kernel:  |  |  |
| Pixel Size (mm2): |  |  |
| Reconstructed Slice Thickness and Interval (mm): |  |  |
| Window Width / Level |  |  |

**Quality Control Procedures**

|  |  |
| --- | --- |
| Is a documented Quality Assurance program in place? | Yes [ ]  No [ ]   |
| Does your site abide by GCP guidelines? (see <http://www.ncri-pet.org.uk/gcp_list.php> for a checklist) | Yes [ ]  No [ ]   |

Please indicate the frequency of the following quality control checks:

|  |  |
| --- | --- |
| Test | Frequency  |
| CT Air Calibration |  |
| CT Number Accuracy & Noise (in water) |  |
| CT Number Uniformity (in water) |  |
| PET to CT alignment  |  |
| Comprehensive couch and CT output testing by CT Physicist |  |
| PET PMT or SiPM Tuning |  |
| PET Normalisation |  |
| PET 18F Calibration Factor |  |
| PET SUV Accuracy using a (18F/68Ge) uniform cylinder. |  |
| Radionuclide Calibrator Accuracy (traceable to primary standard) |  |
| Weighing Scales Accuracy |  |

Please returned the completed form via email/post to the Core Lab:

**Core Lab Physicists**

**UK PET Core Lab**

**PET Imaging Centre**

**1st Floor, Lambeth Wing**

**St Thomas’ Hospital**

**Westminster Bridge Road**

**London, SE1 7EH**

**Email: pet-trials@kcl.ac.uk**