

^{68}Ga -PSMA PET-CT Scanning Protocol UK

1. Introduction

This protocol MUST be used when performing 68-Gallium (^{68}Ga) Prostate Specific Membrane Antigen (PSMA) PET-CT imaging.

2. Scope

The procedures laid out in this protocol apply to the radiographer/ technologists in PET-CT and MUST be carried out when performing a ^{68}Ga PSMA PET-CT.

3. Responsibilities

The radiographer/technologist working in PET-CT is responsible for performing the examination in accordance with this document.

All staff must be trained by an entitled, qualified staff member to an agreed level of competency and have read and understood this procedure and any other relevant procedures and documentation before they are allowed to carry out the procedure.

4. Policy and Procedures

4.1. Indications

- All referrals must be discussed with a Nuclear Medicine Practitioner/ARSAC Licence holder who will justify the examination.
- ^{68}Ga PSMA PET-CT is used to stage patients with intermediate and high-risk prostate cancer, restaging patients with biochemical failure following radical treatment and for prostate cancer detection in select patients e.g. those with contraindications to MRI.
- Pre-evaluation before ^{177}Lu -PSMA therapy and following ^{177}Lu -PSMA therapy

4.1.1. Contraindications

- Patients having chemotherapy should not have a PET/CT scan until at least 10 days post treatment, if less than 10-day period, it should be as near as possible to next cycle of treatment.
- Patients having radiotherapy should not have a PET scan for a minimum period of 3 months after last treatment session, unless assessing disease outside the RT field or suspected in field progression.
- Patients having ¹⁷⁷Lu-PSMA therapy should not have a PET/CT scan for minimum period of 3 months, unless this is indicated to assess treatment response.

4.2. Patient Preparation:

- The patient should receive an appointment letter, explaining the procedure, risks and benefits of the procedure. A phone call will always be made on the day prior to the scan, to confirm attendance; ensure the patient understands all aspects of the examination and clarify any specific requirements.
- Eat as normal prior to the appointment, encouraged to drink 500mls of fluid 2 hours before.
- If the patient is on hormonal treatment, there is no need to discontinue this.
- **If a patient scan is cancelled please make sure that you also cancel the 68-Ga PSMA order for that patient, re-order and re-schedule as required.**
- On the day of the scan:
 1. On arrival, check the patient's identity as per GenesisCare policy Explain the procedure to the patient and complete a PET-CT questionnaire form.
 2. Discuss any radiation protection concerns with the patient, this should include any restrictions and transportation considerations
 3. Measure the patient's weight and record it on the questionnaire form, and make note of the following:
 - Any prior surgical procedures/biopsies and dates
 - Treatment History (dates and details)
 - Radiotherapy/Chemotherapy/Hormonal therapy
 - Areas of pain and/or discomfort
 - Injuries/fractures

- Recent cough, cold, sore throat
 - **Any other relevant clinical history**
4. Patients are required to remove all metallic objects (rings, earrings etc).
 5. Patients will be provided with a gown to change into prior to the study.
 6. The patient will lie supine on the couch in the patient preparation room under observation, ensuring they are comfortable and have been informed of access to the emergency contact.
- Establish intravenous (IV) access using a cannula. Do not attempt more than 2 times – if required please seek additional assistance.
 - Ensure that the injection site is chosen carefully so as not to interfere with any area on the scan which may be critical.
 - Always follow the injection technique protocol. (Note the cannula should be removed following completion of the injection).
 - When the cannula is inserted, check the line by flushing with 10mls of saline.
 - The patient must empty their bladder in the hot toilet prior to the start of the scan.

4.3. Diagnostic Reference Levels:

- Adult dose: 150MBq +/- 10%
 - ARSAC DRL – 200MBq
 - Based 1.8MBq/kg [1]
- Effective dose: 3 mSv [1]
- Isotope – Ga68
- Pharmaceutical – PSMA (prostate specific membrane antigen)

4.4. Scanner Protocol

- Select GC_GaPSMA_Adult

4.5. Instrumentation

- Siemens mCT Biograph 64 slice (PET-CT)

4.6. CT Scan Parameters

Scan Range	kVp	Ref mAs	Slice width	Rotation	Pitch	Safire	Recon Filter
Upper Thigh to Skull Base	120	60	3@3mm	0.5 secs	0.95	3	I30f

- Local DRL – 318mGy cm
- Same CT parameters are used for Delayed Pelvic scan

4.7. PET Reconstruction Parameters

Series	Recon Method	Scatter Correction	Iterations	Subsets	Output image type
PET WB AC PSF	TrueX + TOF (UltraHD_PET)	Relative	2	21	Corrected
PET WB NAC	Iterative + TOF	None	3	21	Uncorrected

4.8. Scanning Technique

4.8.1. Upper thigh to skull base (performed 60 minutes post injection).

4.8.2. Delayed Pelvic scan

- Due to the possibility of full bladder, a delayed pelvic image might be required. **Delayed Pelvis Scan only if specifically authorized by the practitioner (perform 90 minutes post injection).** Patient must empty their bladder prior image acquisition.
- Area covered dependent on individual patient and practitioner guidance

4.9. Image Processing

- Create the following images:
 - MIP Range
 - FUSED AX
 - FUSED COR.
- Send the above images to PACS.
- Ensure all the above image reconstructions, PET & CT reconstructions have automatically been sent through to PACS.
- Allocate the reporting to the ARSAC practitioner for reporting.

5. Reference

[1] 68Ga-PSMA PET/CT: Joint EANM and SNMMI procedure guideline for prostate cancer imaging: version 1.0.: Wolfgang P et al, Eur. J. Nucl. Med. Mol. Imaging (2017)

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6. Approval

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