DIMP Registration Assessment Form
Competency for Medical-Scientific Expert Domain
Nuclear Medicine Physics

Applicant surname:	
Applicant given names:	
Applicant speciality:	Nuclear Medicine ☐

This form is to provide information about the areas considered when assessing Competency for Medical-Scientific Expert Domain, for applications for entry to the ACPSEM Register of Qualified Medical Physics Specialists.

Competency for Medical Scientific Expert Domain

Demonstration of competence in relevant key clinical activities in the following areas is assessed:

i. Scientific knowledge in a medical context
ii. Practical skills in a medical context
iii. Application of relevant theory to novel situations
iv. Scientific judgment and responsibility
v. Provision of high-quality and safe care

Application requirements including evidence of expertise

Please fill in as much detail as possible against each subtopic area specified in the tables on the following pages. Inclusion of evidence to support statements of knowledge and experience is critical for candidates not holding overseas registrations/certifications as outlined in clause 5.2 of the ACPSEM registration policy. Providing comprehensive information will greatly assist and expedite the assessment of your application.

Separate attachments of reports, presentations, certificates, published papers, or other documents should be included.

Competency for Nuclear Medicine Medical Physics Speciality

Demonstration of competence in relevant key clinical activities in the following areas is assessed:

(i) patient and occupational dosimetry, including foetal and paediatric
(ii) equipment performance testing and image formation
(iii) radiation safety
(iv) dose audit and subsequent optimisation
(v) Clinical applications and common artefacts
(vi) Radionuclide therapy

For each TEAP module specified for a topic there are three possible outcomes:

Acceptable (A)	Candidate meets the knowledge and skills expected of a minimally competent person based on the portfolio assessment.
Not Acceptable (N)	Candidate does not demonstrate the knowledge and skills expected of a minimally competent person
Revise and resubmit (R)	Candidate has not provided enough evidence for a determination. Ask to revise portfolio in specific areas and resubmit for further consideration Only a single opportunity to revise and resubmit is available, after the revised material is received a final decision is made, based on the latest submission, about the suitability to proceed to the next phase.

Possible overall outcomes

- Suitable to proceed to structured interview
- Revise and resubmit with more evidence (NB: only one resubmission allowed)
- Refusal (prescribed work – one chance only); Portfolio reassessed following submission of prescribed work
- Reject (TEAP suggested, with recognition of prior experience as appropriate);
- Dismiss

Medical Scientific Expert Domain Assessment

Medical-Scientific Expert Subdomain i.

i. Scientific knowledge in a medical context
Discussion of Postgraduate Education and/or clinical practice experience that aligns to this domain. Details of experience in this topic area and evidence available.

Medical-Scientific Expert Subdomain ii.

ii. Practical skills in a medical context
Discussion of Postgraduate Education and/or clinical practice experience that aligns to this domain. Details of experience in this topic area and evidence available.

Medical-Scientific Expert Subdomain iii.

iii. Application of relevant theory to novel situations
Discussion of Postgraduate Education and/or clinical practice experience that aligns to this domain. Details of experience in this topic area and evidence available.

Medical-Scientific Expert Subdomain iv.

iv. Scientific judgment and responsibility
Discussion of Postgraduate Education and/or clinical practice experience that aligns to this domain. Details of experience in this topic area and evidence available.

Medical-Scientific Expert Subdomain v.

v. Provision of high-quality and safe care
Discussion of Postgraduate Education and/or clinical practice experience that aligns to this domain. Details of experience in this topic area and evidence available.

Detailed Topic Area Assessment

(i) Patient and occupational dosimetry, including fetal and paediatric

Basic patient and fetal dose and detriment from diagnostic imaging procedures		ACPSEM TEAP Module Reference	CB3.1
Knowledge	• Radiation quantities, units and dosimetric formalism relevant to diagnostic imaging.		
Skills	• Use established tables for estimating organ and effective dose (including fetal dose) from frequently used diagnostic nuclear medicine radiopharmaceuticals • Estimate typical organ and effective dose from CT dose metrics • State typical organ and effective dose (including fetal dose) for CT and nuclear medicine studies		
Details of experience in this topic area and evidence available			

Formalism and Application of Internal Dosimetry		ACPSEM TEAP Module Reference	SN3.6
Knowledge	• Understand the knowledge and skills of applying established formalisms for internal dosimetry calculations.		
Skills	• The ability to calculate absorbed dose to organs according to MIRD formalism and to calculate the effective dose.		
Details of experience in this topic area and evidence available			

Patient Specific Dosimetry for Radionuclide Therapeutic Procedures		ACPSEM TEAP Module Reference	SN3.7
Knowledge	• The radiation dose required to achieve a therapeutic effect • Radiation doses to critical organs and potential side effects from critical organ exposure		
Skills	Ability to: • Calculate the administered activity for nuclear medicine radionuclide therapies, including factors that determine limiting activities.		
Details of experience in this topic area and evidence available			

(ii) Equipment performance testing and image formation

Performance Testing and Quality Control of Dose Calibrators		ACPSEM TEAP Module Reference	SN4.8
Knowledge	• Understand the process involved in acceptance testing, quality control and routine operation of dose calibrators.		
Skills	Ability to • perform acceptance testing of a dose calibrator • design a program of routine quality control for a dose calibrator, and provide advice regarding accurate calibration factors for a range of radioisotopes		
Details of experience in this topic area and evidence available			

Performance Testing of Gamma Cameras		ACPSEM TEAP Module Reference	SN4.9
Knowledge	• Understand the operation of gamma cameras and the factors that affect image quality and clinical performance of the equipment.		
Skills	Ability to • Perform acceptance testing of a gamma camera.		
Details of experience in this topic area and evidence available			

Performance Testing of PET Cameras		ACPSEM TEAP Module Reference	SN4.10
Knowledge	• Understand the operation of PET cameras and the factors that affect image quality and clinical performance of the equipment.		
Skills	Ability to • Perform acceptance testing of a PET camera.		
Details of experience in this topic area and evidence available			

Performance Testing of CT for Hybrid Imaging		ACPSEM TEAP Module Reference	SN4.11
Knowledge	• Understand the processes involved in acceptance testing of a CT in a hybrid imaging system..		
Skills	Ability to • perform acceptance and quality tests specific to hybrid imaging systems.		
Details of experience in this topic area and evidence available			

(iii) Radiation safety

Radiation Protection Legislation, Principles, Control Methods and Operational Considerations		ACPSEM TEAP Module Reference	CE2.1
Knowledge	Understand: • Radiation protection legislation and recommendations at an international, national, state and local level. • Radiation protection principles and control methods.		
Skills	Ability to • Review and revise a radiation management plan for a hospital radiation site ensuring consistency with relevant regulatory requirements and good practice. • Conduct an audit at a radiation site against the associated radiation management plan or recognised radiation protection benchmark.		
Details of experience in this topic area and evidence available			

Monitoring Radiation Levels, Including Personal Dose Monitoring		ACPSEM TEAP Module Reference	CE2.2
Knowledge	Understand: • Varied aspects of monitoring of radiation levels in diagnostic imaging • Purpose, principles and operation of a personal dosimetry program.		
Skills	Ability to: • Conduct quantitative measurement of surface radioisotope contamination and environmental radiation dose rates • Manage a personal dosimetry program		
Details of experience in this topic area and evidence available			

Sources of Exposure, Incidents and Emergencies		ACPSEM TEAP Module Reference	CE2.5
Knowledge	• Understand what constitutes a radiation exposure incident in general and specifically in a nuclear medicine department, the implications and required response		
Skills	Ability to • Conduct quantitative measurement of surface radioisotope contamination and environmental radiation dose rates.		
Details of experience in this topic area and evidence available			

Radiation Shielding for Diagnostic Imaging Facilities		ACPSEM TEAP Module Reference	CE2.6
Knowledge	• Understand the principles and requirements of shielding design for diagnostic imaging facilities.		
Skills	Ability to • The ability to design and verify satisfactory radiation shielding for all types of diagnostic imaging equipment.		
Details of experience in this topic area and evidence available			

Areas Designated for the Use of Unsealed Sources and Associated Waste Management		ACPSEM TEAP Module Reference	CN2.7
Knowledge	Understand: • The general design requirements of a Nuclear Medicine department using unsealed radioactive material for diagnosis and therapy.		
Skills	Ability to • Design areas of the workplace for the use and storage of diagnostic and therapeutic unsealed radioactive substances, and an inpatient facility for radionuclide therapy. • Manage radioactive waste associated with the sources used in a Nuclear Medicine Department.		
Details of experience in this topic area and evidence available			

Exposure from Unsealed Sources and the Risk of Contamination		ACPSEM TEAP Module Reference	CN2.3
Knowledge	• Understand the methods to reduce exposure from unsealed radioactive sources		
Skills	Ability to • Safely handle unsealed radioactive sources • Deal with accidents and spills		
Details of experience in this topic area and evidence available			

Radiation Risk Assessment and Advice to Staff, Carers and General Public in Diagnostic Nuclear Medicine		ACPSEM TEAP Module Reference	CN2.4
Knowledge	• Understand effective dose to the patient and dose rates from the patient for common diagnostic nuclear medicine procedures		
Skills	Ability to • Apply radiation protection regulations to radiation exposure to staff, patients and the general public from diagnostic nuclear medicine • Perform a radiation risk assessment and provide advice for various scenarios involving radiation exposure from nuclear medicine patients undergoing diagnostic studies and to communicate this risk to staff, patients and the general public		
Details of experience in this topic area and evidence available			

(iv) Dose audit and subsequent optimization

Clinical Audit		ACPSEM TEAP Module Reference	CE5.2
Knowledge	Understand the: • Nature, purpose and importance of clinical audit and its relationship to accreditation in the medical imaging setting • Structure, objectives and terminology used in a quality management system		
Skills	Ability to • The ability to effectively contribute as a member of a multidisciplinary team to a medical imaging clinical audit		
Details of experience in this topic area and evidence available			

(v) Clinical applications and common artefacts

Physiological Basis and Protocols for Diagnostic Nuclear Medicine Procedures		ACPSEM TEAP Module Reference	CN5.1 SN5.7
Knowledge	For the common clinical nuclear medicine investigations, the ability to: • Explain the principles, physiological basis and radiopharmaceuticals administered • State typical activities administered, • Outline typical image acquisition, reconstruction and analysis methods		
Skills	Ability to • Assist technologists and Nuclear Medicine specialists in troubleshooting issues with imaging protocols or poor quality scans • Translate the above knowledge to the development of imaging protocols for new investigations.		
Details of experience in this topic area and evidence available			

Physiological Basis and Protocols for PET imaging		ACPSEM TEAP Module Reference	SN5.8
Knowledge	• Understand the physiological basis and procedure protocols for common clinical PET studies.		
Skills	Ability to • Recognise typical and abnormal PET images		
Details of experience in this topic area and evidence available			

Common Artefacts in Clinical Images		ACPSEM TEAP Module Reference	SN5.9
Knowledge	• Understand the probable causes of common nuclear medicine image artefacts.		
Skills	Ability to • Identify artefacts in nuclear medicine images, and recommend appropriate preventative and remedial action.		
Details of experience in this topic area and evidence available			

Computer Image Processing Techniques		ACPSEM TEAP Module Reference	SN5.10
Knowledge	Understand the • Structure and properties of image file formats commonly utilized in nuclear medicine. • Underlying algorithms developing simple image analysis / processing programs in an interactive environment		
Skills	Ability to • Manipulate image data provided in commonly used formats and develop, test and document simple image processing applications in a high level programming environment.		
Details of experience in this topic area and evidence available			

Quantitative Nuclear Medicine Imaging		ACPSEM TEAP Module Reference	SN5.11
Knowledge	• Understand the main factors affecting quantitative measurements in nuclear medicine.		
Skills	Ability to • Acquire quantitative measures from planar, SPECT and PET studies.		
Details of experience in this topic area and evidence available			

Optimisation Processes in Nuclear Medicine		ACPSEM TEAP Module Reference	SN5.12
Knowledge	• Understand the principles behind diagnostic reference levels		
Skills	Ability to • Apply the principles of optimisation in diagnostic nuclear medicine procedures		
Details of experience in this topic area and evidence available			

(vi) Radionuclide Therapy

Principles and Application of Radionuclide Therapy		ACPSEM TEAP Module Reference	CN6.1 SN6.2
Knowledge	Understand: • The basic principles and legislation pertaining to radionuclide therapy • Common indications and radiopharmaceuticals used for therapy in nuclear medicine, • The wide range of diseases in which radionuclide therapy is being used and the selection of the appropriate radionuclide for the specific patient		
Skills			
Details of experience in this topic area and evidence available			

Treatment Procedures and Radiation Safety Precautions for Therapy using Unsealed Radionuclide Sources		ACPSEM TEAP Module Reference	SN6.3
Knowledge	Understand the • Purpose, principles and operational procedures of the radionuclide therapy • Application of legislation, guidelines and international best practices to ensure radiation safety, before, during and after administration of radionuclide therapy • Chemical forms of commonly used therapy radiopharmaceuticals and how this affects their distribution in the environment when excreted by the patient or if spilt from a container		
Skills	Ability to • Manage patients appropriately from a radiation safety perspective both pre and post administration		
Details of experience in this topic area and evidence available			