



MALAYSIAN MEDICAL COUNCIL

SPECIALTY-SPECIFIC REQUIREMENTS (SSR)

(NUCLEAR MEDICINE)

Prepared By:

Specialty Education Subcommittee (SEC)
of the Medical Education Committee (MEC),
Malaysian Medical Council

Approved by the Malaysian Medical Council:

20th May 2025

Preface

1. The Specialty-Specific Requirements (SSR) pertain to requirements within each specialty and specify the minimum requirements pertaining to the training curriculum, trainers, educational resources and head of programme.
2. The Specialty-Specific Requirements (SSR) are intricately linked to the MMC Malaysian Standards for Medical Specialist Training 2019, and the Standards and SSR must be read and applied together.

**Specialty-Specific Minimum Requirements for Training
Curriculum (Based on Area 1.2.4 of Malaysian Standards
for Medical Specialist Training) -**

Nuclear Medicine

Specialty-Specific Requirements (Reference Standard)	Criteria
1) Minimum entry requirements for postgraduate training (Standard 3.1.)	1. Fully registered with the Malaysian Medical Council with a current annual practicing certificate 2. Successful entry evaluation to programme
2) Minimum duration of training programme (Standard 1.2.4 - Table 2)	Completion of a minimum of 48 months of specialised training in the specialty program.
3) Structure of training (rotation/modules) (Standard 1.2.4 - Table 3 & Table 4) Training overview	The program should have a clear pathway encompassing phases of training which shall include the basic and advanced components in Nuclear Medicine comprising The programme shall provide training in the following areas: use of various radiopharmaceuticals, clinical application, specific indications, integration of physics, instrumentation, dosimetry, anatomy, biochemistry and pathophysiology relevant to or specific

to each individual study, principle and methodology of data acquisition, analysis and interpretation of each individual procedure and correlation with other imaging and diagnostic modalities as deemed relevant to the practice of nuclear medicine.

Phase	Details	Minimum Duration (Weeks)
Basic	Radiation science (medical physics and nuclear physics)	32
	Imaging devices in nuclear medicine and radiology	
	Mathematics and biostatistics	
	Computer science	
	Radiation biology	
	Radiation protection and safety	
	Nuclear pharmacy (radiopharmaceuticals)	
	Principles of clinical use of radioisotope	
	Anatomy and physiology	
	Training in radiology comprising CT and MRI examinations.	16
	Posting in nuclear medicine with the following: - Oncology - Radiology comprising CT and MRI examination - Nuclear	14

		cardiology		
		Intermediate	Training includes: - Nuclear medicine and disease pathology - Diagnostics and therapeutics use of radioisotopes - Training in the latest technology in nuclear medicine: - Imaging science (SPECT/CT, PET/CT and PET/MRI) - Radionuclide therapy and radioimmunotherapy - Oncology and radiotherapy - Research methodology, biostatistics - Medical ethics	64
		Advanced	Advanced training in Nuclear Medicine and relevant areas	32
			Administrative management including quality assurance programme.	
*Duration of training per year is 46 weeks				
4) Assessments (Standard	Assessments should i. Employ appropriate methods and levels that are well-aligned with learning outcomes. These include a variety of methods and tools such as written assessments, clinical			

2.2.1)	assessments, supervisor's report, logbook, attendance, training attended, practice diary and case report. ii. Include methods appropriate to assess communication skills, ethics and professionalism. iii. Include formative and summative assessments throughout each rotation, semester, or year of study. iv. Include clear criteria for progression to next year of study. v. Include an exit evaluation/assessment.
5) Additional requirements for completion of training (Standard 1.2.4)	i. Completion of graduate level research or clinical audit project
6) List of competencies to be acquired upon completion of training (Standard 1.1.4)	Generic competencies Able to i. Diagnose, investigate and manage common nuclear medicine cases whilst considering social, safety and health economics aspects ii. Anticipate and manage complications iii. Work independently and in teams competently and professionally iv. Practice good ethical conduct v. Practice good communication skills vi. Perform critical review, plan and conduct scientific research vii. Exemplify self-advancement through continuous academic and/or professional development including digital health viii. Apply evidence-based medicine in the field of nuclear medicine ix. Demonstrate exemplary leadership qualities in the multi-disciplinary team management of nuclear medicine cases x. Demonstrate an entrepreneurial mindset, creative problem-solving and resilience

	Specialty Specific Competencies Able to i. Perform and manage nuclear medicine diagnostic and therapeutic procedures. ii. Report nuclear medicine examinations and procedures iii. Critically evaluate and discuss nuclear medicine findings with healthcare providers involved with patient care. iv. Critically evaluate research findings and to contribute towards medical research, education and training in nuclear medicine. v. Perform administrative management including quality assurance programmes. vi. Manage nuclear radiation emergencies and related issues vii. Manage radiation protection programmes and related issues
--	---

Note : These criteria represent the minimum standards. Each educational programme provider may exercise their autonomy to state criteria above and beyond these minimum standards.

Specialty-Specific Minimum Requirements for Training Centres and Head Programme (Based on Areas 3-6 of Malaysian Standards for Medical Specialist Training) - Nuclear Medicine								
Item no	Specialty-Specific Requirements (Reference standard)	Criteria						
4	Trainer-to-trainee ratio. (Standard 3.1.3)	1:4						
5	Minimum qualifications and experience of trainers (Standard 4.1.2)	i. Registered with National Specialist Register ii. Completed Training-of-Trainer course/equivalent						
6	Minimum requirements for educational resource (Standard 5.1.1)	The diagnostic facilities and equipment requirement of the programme training centres must collectively be able to accommodate the following minimum requirements: i. Physical facilities - Meeting/ tutorial room - Computers with internet facilities - Library/ reading room equipped with nuclear medicine books and journals (physical or digital) ii. Service areas <table><tr><th>Service Areas</th></tr><tr><td>Clinic</td></tr><tr><td>Patient waiting area</td></tr><tr><td>Treatment room</td></tr><tr><td>Isolation room</td></tr><tr><td>Facility for preparation, dispensing and disposal of</td></tr></table>	Service Areas	Clinic	Patient waiting area	Treatment room	Isolation room	Facility for preparation, dispensing and disposal of
Service Areas								
Clinic								
Patient waiting area								
Treatment room								
Isolation room								
Facility for preparation, dispensing and disposal of								

		<table><tr><td>radiopharmaceuticals</td></tr><tr><td>Camera room</td></tr><tr><td>Therapeutics (radionuclide therapy facility)</td></tr><tr><td>Facility for preparation, dispensing and disposal of radiopharmaceuticals</td></tr><tr><td>Radiation safety features</td></tr></table>	radiopharmaceuticals	Camera room	Therapeutics (radionuclide therapy facility)	Facility for preparation, dispensing and disposal of radiopharmaceuticals	Radiation safety features
radiopharmaceuticals							
Camera room							
Therapeutics (radionuclide therapy facility)							
Facility for preparation, dispensing and disposal of radiopharmaceuticals							
Radiation safety features							
		iii. Equipment <table><tr><th>Equipment</th></tr><tr><td>Diagnostic imaging equipment • (Single-Photon Emission Computed Tomography (SPECT) • Single-Photon Emission Computed Tomography with Computed Tomography (SPECT-CT) • Positron Emission Tomography (PET-CT) </td></tr></table>	Equipment	Diagnostic imaging equipment • (Single-Photon Emission Computed Tomography (SPECT) • Single-Photon Emission Computed Tomography with Computed Tomography (SPECT-CT) • Positron Emission Tomography (PET-CT)			
Equipment							
Diagnostic imaging equipment • (Single-Photon Emission Computed Tomography (SPECT) • Single-Photon Emission Computed Tomography with Computed Tomography (SPECT-CT) • Positron Emission Tomography (PET-CT)							
		iv. Case Load The case load of the programme training centre(s) must collectively be able to accommodate the following minimum requirements: Diagnostic Nuclear Medicine Procedures Adequate number of procedures must be either observed, assisted or performed by the trainee during the training period. These should include a wide range of systems and pathologies in adult as well as paediatric patients. The quality of these procedures must be audited. The training centres should collectively be able to provide 750 diagnostic procedures and examinations per trainee per year. Studies and procedures should be performed in the following systems:					

		(a) central nervous system (b) skeletal system (c) cardiovascular system (d) pulmonary system (e) gastro-intestinal and hepatobiliary system (f) urogenital system (g) endocrine system (h) haemopoietic and lymphatic system(s) (i) tumours (j) inflammatory states Sufficient experience and technical exposure in various subsets of nuclear medicine procedures including:- (a) Static planar studies (b) Dynamic studies (c) Gated studies (d) Tomographic / Hybrid imaging studies Therapy Training in therapeutic applications must include aspects of dosimetry and radiation protection. The training centres should collectively be able to provide 105 therapeutic procedures per trainee per year. Therapeutic procedures should include the following: (a) Radioiodine therapy for benign and malignant diseases of the thyroid (b) Radionuclide therapy for benign diseases (c) Radionuclide therapy for malignant disease (d) Other radionuclide treatments
--	--	--

		Areas	Minimum Quantity (cases/ trainee/ year)
		Diagnostic general nuclear medicine	500
		PET /CT Scan	250
		Radioiodine therapy	100
		Radionuclide therapy (other than radioiodine)	5
7	Minimum qualifications and experience of Head of Programme (Standard 6.2.2)	i. 5 years or more of working experience after national specialist registration ii. Experience in administration and/or academic management	

Note : These criteria represent the minimum standards. Each educational programme provider may exercise their autonomy to state criteria above and beyond these minimum standards.

ACKNOWLEDGEMENT

Authors:

Specialty Education Subcommittee (SSC) Edu Nuclear Medicine 2022 – 2024

1. Dato' Dr. Mohamed Ali B. Abdul Khader (Chair)
2. Dr. Sulaiman Tamanang
3. Dr. Fadzilah Hamzah
4. Dr. Felix Xavier Sundram
5. Dr. Khor Phay Phay
6. Dr. Nor Salita Binti Ali

Specialty Education Subcommittee (SSC) Edu Nuclear Medicine 2024 – 2026

1. Dr. Nor Salita binti Ali (Chair)
2. Dato' Dr. Mohamed Ali B. Abdul Khader
3. Dr. Fadzilah Hamzah
4. Dr. Khor Phay Phay
5. Dr. Hazlin Hashim
6. Dr. Mahayuddin Manap

Editors:

Medical Education Committee (MEC)

1. Prof. Datuk Dr. Rohaizat Bin Yon (Chair)
2. Prof. Dato' Dr. Mafauzy bin Mohamed
3. Prof. Dr. Zaleha Abdullah Mahdy
4. Prof. Datin Dr. Yong Rafidah binti Abdul Rahman
5. Prof. Dr. G. R. Letchuman Ramanathan
6. Dato' Dr. Jiffre bin Din
7. Dato' Dr. Jafri Malin bin Abdullah
8. Prof. Dr. Azad Hassan Bin Abdul Razack
9. Prof. Dato' Dr. Yang Faridah binti Abdul Aziz
10. Dr. Sri Wahyu Binti Taher
11. Prof. Dr. Sharifah Sulaiha Binti Syed Aznal
12. Prof. Dr. Shatriah Binti Ismail
13. Prof. Dr. Lee Way Seah
14. Dr. Rafidah Binti Abdullah
15. Datuk Dr. Asits Bin Sanna
16. Dr. Veronica Lugah
17. Dr. Hirman bin Ismail

Specialty Education Subcommittee (SEC)

1. Prof. Dr. G. R. Letchuman Ramanathan (Chair)
2. Prof. Dr. Roslina Abd Manap
3. Dr. Hirman bin Ismail
4. Prof. Dr. Jamiyah binti Hassan
5. Prof. Dr. Nazimah Idris
6. Dr. Giri Shan
7. Dr. Hanif Hussein
8. Prof. Madya Dr. Bahiyah Abdullah
9. Datuk Seri Dr. Paras Doshi
10. Prof. Datin Dr. Yong Rafidah Abdul Rahman
11. Dr. Rafidah Abdullah
12. Prof. Dr. Zaleha Abdullah Mahdy
13. Dr. Ahmad Badruridzwanullah Bin Zun