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.

Attachment 2

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

<table>
<tr>
<td>Training rotation and case mix</td>
<td>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.
<table>
<tr><th>Phase</th><th>Details</th><th>Minimum Duration (Weeks)</th></tr>
<tr><td rowspan="10">Basic</td><td>Radiation science (medical physics and nuclear physics)</td><td rowspan="9">32</td></tr>
<tr><td>Imaging devices in nuclear medicine and radiology</td></tr>
<tr><td>Mathematics and biostatistics</td></tr>
<tr><td>Computer science</td></tr>
<tr><td>Radiation biology</td></tr>
<tr><td>Radiation protection and safety</td></tr>
<tr><td>Nuclear pharmacy (radiopharmaceuticals)</td></tr>
<tr><td>Principles of clinical use of radioisotope</td></tr>
<tr><td>Anatomy and physiology</td></tr>
<tr><td>Training in radiology comprising CT and MRI examinations.</td><td>16</td></tr>
<tr><td></td><td>Posting in nuclear medicine with the following:
- Oncology
- Radiology comprising CT and MRI examination
- Nuclear</td><td>14</td></tr>
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<table>
<tr><td></td><td>
<table>
<tr><td rowspan="2">Intermediate</td><td>cardiology</td><td></td></tr>
<tr><td>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</td><td>64</td></tr>
<tr><td rowspan="2">Advanced</td><td>Advanced training in Nuclear Medicine and relevant areas</td><td rowspan="2">32</td></tr>
<tr><td>Administrative management including quality assurance programme.</td></tr>
</table>
*Duration of training per year is 46 weeks
</td></tr>
<tr><td>4)
Assessments

(Standard</td><td>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</td></tr>
</table>

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.

Attachment 4

<table>
<tr><th colspan="3">Specialty-Specific Minimum Requirements for Training Centres and Head Programme (Based on Areas 3-6 of Malaysian Standards for Medical Specialist Training) - Nuclear Medicine</th></tr>
<tr><th>Item no</th><th>Specialty-Specific Requirements

(Reference standard)</th><th>Criteria</th></tr>
<tr><td>4</td><td>Trainer-to-trainee ratio.

(Standard 3.1.3)</td><td>1:4</td></tr>
<tr><td>5</td><td>Minimum qualifications and experience of trainers

(Standard 4.1.2)</td><td>i. Registered with National Specialist Register
ii. Completed Training-of-Trainer course/equivalent</td></tr>
<tr><td>6</td><td>Minimum requirements for educational resource

(Standard 5.1.1)</td><td>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></td></tr>
</table>

radiopharmaceuticals
Camera room
Therapeutics (radionuclide therapy facility)
Facility for preparation, dispensing and disposal of radiopharmaceuticals
Radiation safety features

iii. Equipment

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

<table>
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<table>
<tr><th>Areas</th><th>Minimum Quantity (cases/ trainee/ year)</th></tr>
<tr><td>Diagnostic general nuclear medicine</td><td>500</td></tr>
<tr><td>PET /CT Scan</td><td>250</td></tr>
<tr><td>Radioiodine therapy</td><td>100</td></tr>
<tr><td>Radionuclide therapy (other than radioiodine)</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Minimum qualifications and experience of Head of Programme

(Standard 6.2.2)</td><td>i. 5 years or more of working experience after national specialist registration
ii. Experience in administration and/or academic management</td></tr>
</table>

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

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