POSTGRADUATE INSTITUTE OF MEDICINE

UNIVERSITY OF COLOMBO, SRI LANKA

PROSPECTUS

POST MD TRAINING AND BOARD CERTIFICATION IN NEUROSURGERY

***(To be effective from the year* 2018)**

Specialty Board in Neurosurgery

Board of Study in Surgery

BOM Approved – 11.11.2017

Senate Approved – 05.12.2017

Table of contents

This prospectus is made under the provisions of the Universities Act, the Postgraduate Institute of Medicine Ordinance, and the General By-Laws: No. 1 of 2016 and By-Laws No. 2 of 2016 for Degree of Doctor of Medicine (MD) and Board Certification as a Specialist.

1. Background / Introduction

A neurosurgeon is a specialist in the management and surgical intervention of brain and spinal diseases. He/ She plays a significant role in the multidisciplinary approach to the prevention, diagnosis, treatment and rehabilitation of brain and spinal patients. He/she will lead the decision-making process and management of: trauma and non-trauma emergencies and the congenital, vascular, degenerative and oncological conditions of the brain and spine.

The Specialty Board in Neurosurgery is the Specialty Board under the Board of study in Surgery (BOS), responsible for the training and assessment of trainees selecting a career in neurosurgery. Changes in the higher education sphere in relation to training and assessments coupled with advances in subspecialties have necessitated revision of the training programme. The programme meets the requirements of the relevant qualification descriptors and level descriptors of the Sri Lanka Qualifications Framework, and is set at Level 12 of the Sri Lanka Qualifications Framework.

2. Eligibility for entry into training programme

Candidates who are successful at the MD (Surgery) examination are eligible to apply. Such trainees should not be board certified by the PGIM in any specialty or subspecialty.

3. Selection of trainees

The trainees shall be selected based on the merit order at the MD (Surgery) Examination. The prospective applicants will be informed of the number of positions available through an advertisement by the PGIM and at the post-MD allocation meeting.

4. Number to be selected

The number of trainees will be predetermined by the Specialty board and approved by the Board of Study in Surgery and the Board of Management in consultation with the Ministry of Health.

5. The aim and the outcomes of the training programme

The aim of the training program is to produce a competent neurosurgeon who can handle both elective and emergency cranial and spinal surgeries. Thus, at the end of the programme, trainees in Neurosurgery should be able to;

- Undertake the full range of emergency and elective operative procedures in neurosurgery during the training stage.
- Demonstrate sufficient operative experience to be able to undertake these procedures and manage operative difficulties and complications, without supervision.

- Function as a team leader and a useful member of the multidisciplinary team managing neurosurgical patients.
- Appreciate the biology and natural history of the disease as well as the contributions made by other disciplines to patient care.
- Competently handle both brain and spinal diseases effectively on par with the rest of the world.
- Apply the principles of clinical governance including reflective practice and maintain such standards.
- Conduct original research which will benefit the specialty.
- Teach the specialty of Neurosurgery.

6. Structure of training programme

Total duration of training in Neurosurgery is four years. Local training shall be two years and overseas training shall be two years in approved training centres.

6.1. Local training

A trainee may select either one or maximum of three, trainers recognised by the Specialty Board in Neurosurgery. After the first year, the trainees may continue their second year of training in the same training centre or will have the option of selecting any other approved training unit for the second year of training. In the alternative the trainee selects two training centres for the second year of training and train six (6) months in each of the selected centres. The initial trainer shall continue to monitor the progress of a particular trainee.

6.2. Overseas training

A trainee with more than 18 months of Post MD training and has been successful in Surgical In-training Assessments (SITA) shall proceed to overseas training in Neurosurgery, in a centre which provided General neurosurgical care and not in a sub-Specialty of neurosurgery. The trainee can continue in the same centre or change to a different centre with above facilities for the second year if he/she wishes.

7. Neurosurgery Training Curriculum

The neurosurgical curriculum leading to the award of Board Certification in Neurosurgery is a framework for the systematic training required to develop the competencies to practice as a Specialist Neurosurgeon.
Under each topic, learning objectives are assigned and the level of performance/competence to be achieved is described under the domains of

- Core knowledge
- Clinical skills
- Procedural skills

Detailed curriculum / syllabus for post MD training in Neurosurgery can be found in **annexure 1.**

8. Learning activities

The trainees are expected to engage in the following learning activities in addition to the routine clinical activities.

8.1. Research project leading to a dissertation

A trainee is required to complete a research project. The project should be undertaken according to the generic guidance of the PGIM for research projects for MD Programmes at any time of the training. The research project should be submitted before the Pre-Board assessment. It should be a study which is either hospital based, or community based and could be in the fields of clinical, epidemiological, genetic or immunological areas of Neurosurgery. The study may be observational or interventional.

All aspects of the study have to be assessed and deemed to be satisfactory by the Specialty Board before embarking on the proposed study. Thus, a research proposal in accordance with the given format in **Annexure 2** should be submitted by the trainees to the Specialty Board prior to the commencement of the study. If indicated, evidence of ethical clearance must be submitted before final approval for the proposed study is granted by the Specialty Board in Neurosurgery.

According to generic guidance of the PGIM for research projects undertaken at this level, acceptance of the research project by the Specialty Board will be based on fulfilment of either of the following:

- Publication of the research findings as an original full paper (not case reports) in a peer reviewed journal (preferably indexed) with the trainee as first author.
- Submission of a detailed project report to the BOS and be successful in its assessment.

Please refer to the generic format for a dissertation in **Annexure 3**.

8.2. Academic meetings

During local training, trainees must attend the Morbidity & Mortality meetings as well as Neuro-radiology, Neuro-pathology, Neuro-oncology, Intensive care and unit meetings /journal club/clinical case presentation with evidence of presentation as a summary or a copy of the slide set certified by the supervising consultant. These evidences may be part of the portfolio described later.

8.3. Neurosurgical conferences / workshops / symposia

Trainees must participate in neurosurgical conferences / workshops / symposia minimum of two per year and produce certificates and evidence of attendance within the portfolio described later.

8.4. Operative log book

Every trainee shall maintain an operative log book that carries details of all surgical procedures observed/performed during local and foreign training. Log-book entries should follow a structure similar to the one presented in **Annexure 4**.

8.5. Training Portfolio

During the entire training period, a trainee has to document the progress of his or her training and maintain a comprehensive record as a Portfolio. This will enable the Trainee to reflect on his/her training experience and identify and correct any weaknesses in the competencies expected from him/her, and also recognize and analyse any significant clinical events experienced, so that appropriate changes in management could be adopted in order to reduce the risks arising from such situations in the future. The Trainer needs to conduct regular assessments and certify that the Trainee has satisfactorily acquired the required competencies. The Training Portfolio will be used at the Pre-Board Certification Assessment, to evaluate the trainee's competence to practice independently as a Specialist in Neurosurgery.

The trainee shall maintain a paper based training portfolio as described in **Annexure 5**. The documents shall be computer generated. The Portfolio shall be in the form of a ring binder so that additional sheets of paper could be inserted easily to different sections.

9. Trainers and training units

The trainees will be allocated to the following main teaching hospitals:

- National hospital of Sri Lanka (NHSL), Colombo
- Teaching hospital, Kandy
- Teaching hospital, Karapitiya, Galle

New training centres approved by the Specialty Board/Board of Study will be accredited for training by the PGIM and will be notified to the trainees at the allocation committee meeting.

10. Monitoring progress

5.1. Six monthly assessments

Candidates will be subjected to 6 monthly assessments by the trainer both during the local and overseas training programme, where the training portfolio would be evaluated.

5.2. Surgery In-Training Assessment

Formats of Surgery In-Training Assessment (SITA) are given in **Annexure 6. T**rainee should achieve level III or IV SITA assessment, more than 80% attendance and reasonable progress in research project in every 6-month period. If the trainee fails to achieve the expected standard, Specialty Board in Neurosurgery has the right to extend training.

5.3. Assessment reports - overseas training

The Specialty Board in Neurosurgery should receive confidential assessment reports about the trainee from the overseas trainer/s every six months. It is the responsibility of the trainee to make sure that these reports are dispatched at the correct time periods.

5.4. Multisource Feedback System of the PGIM

All trainees should take part in the Multisource Feedback System conducted by the PGIM.

11. Eligibility for Pre-Board Certification Assessment (PBCA)

The trainee shall be eligible to appear for the PBCA after having satisfactorily completed the following:

1. Satisfactory completion of the local training programme.
2. Satisfactory completion of the overseas training programme.
3. Acceptance of progress reports and SITA reports.

4. Submission of the Portfolio including the surgical log book.
5. Acceptance of dissertation by the Specialty Board in Neurosurgery /PGIM
   Or evidence of publication / acceptance for publication based on the post-MD research project.
6. Complete the Multi-Source Feedback cycles of the PGIM

12. Pre – Board Certification Assessment (PBCA)

The Assessment shall be based on:
a) The Portfolio assessment and PBCA viva: A pair of examiners nominated by the BOS shall conduct the desk review of the Portfolio and the PBCA viva based on the marking scheme described in **Annexure 7.**
b) Oral Presentation: The candidate shall make a 10 minutes oral presentation to the Board of Study on the post-MD training and future vision for improvement of quality of patient care/diagnostic services in Sri Lanka.
Successful candidates shall be recommended for board certification as a subspecialist in the relevant discipline.

Failed candidates: A failed candidate shall follow a counselling Session and sit for the PBCA again within a period of three months. If the candidate is successful at this attempt, the date of Board certification shall not be affected. If unsuccessful at the second attempt, the trainee shall follow further training for a period of six months in a unit allocated by the BOS before sitting for the PBCA again. The date of Board certification will be based on the date of passing the subsequent assessment according to the general rules and regulations of the PGIM.

13. Board Certification

A trainee who has successfully completed the Pre-Board Certification Assessment is eligible for Board Certification as a Specialist in Neurosurgery on the recommendation of the Specialty Board in Neurosurgery and the Board of Study in Surgery.

14. Recommended text books and other learning material

Recommended text books and other learning materials can be found in Annexure 8

ANNEXURE 1: DETAILED CURRICULUM / SYLLABUS FOR POST MD TRAINING IN NEUROSURGERY

1.1. General Introduction of Neurosurgery (Orientation of 2 weeks)

1.2. Clinical and para-clinical training

1.2.1. General Neuro Trauma and resuscitation: General management of the head injured patient

OBJECTIVE

Manage a patient with head-injury without supervision

KNOWLEDGE

- Pathophysiology of head injury and of multiple trauma including an understanding of: Cerebral perfusion and oxygenation, Raised intracranial pressure, Impaired intracranial compliance, Intracranial herniation
- Medical management of acutely raised intracranial pressure
- Indications for operation intervention including the use of pressure monitoring
- Principles, diagnosis and confirmation of brain death
- Principles of intensive care of head injured patients
- Principles of spinal stabilisation and radiological assessment in head injured patients
- Natural history of recovery from head injury including neurological, cognitive and behavioural disability and posttraumatic epilepsy
- Role of neurological rehabilitation
- Pathophysiology of head injury and of multiple trauma
- Prevention of secondary insults
- Indications for operative intervention

CLINICAL SKILLS

- Clinical assessment of the multiply-injured patient
- Neurological assessment of the head-injured patient including: Assessment and categorisation of impaired consciousness, Recognition and interpretation of focal neurological deficits
- Prioritisation of clinical risk
- Interpretation of CT scans and plain radiology
- Clinical assessment of the head-injured and multiply-injured patients
- Interpretation of multi-modality cerebral monitoring
- Ability to assess and advise on the transfer of head-injured patient using image-transfer and telemedicine

TECHNICAL SKILLS AND PROCEDURES

Insertion of ICP monitor, EVD catheter

OBJECTIVE

To achieve competence in the insertion of subdural and intraparenchymal ICP monitors

KNOWLEDGE

- Indications for ICP monitoring
- Applied anatomy of the skull vault
- Calibration, zeroing and interpretation of ICP traces
- Potential complications of the procedure

CLINICAL SKILLS

- Non-specified

TECHNICAL SKILLS AND PROCEDURES

- Insertion of frontal subdural and intraparenchymal ICP monitors using a standard frontal burr hole and/or twist drill craniotomy.

Burr hole evacuation of chronic subdural haematoma

OBJECTIVE

To achieve competence in burr hole evacuation of chronic subdural haematomas

KNOWLEDGE

- Pathophysiology of chronic subdural haematomas
- Applied anatomy of the skull vault and subdural space
- Indications for surgery
- Surgical options
- Complications of surgery
- Management of anti-platelet and anti-coagulant medication

CLINICAL SKILLS

- Neurological assessment of patients with a CSDH
- Interpretation of CT scans
- Obtaining informed consent
- Post-operative assessment and management

TECHNICAL SKILLS AND PROCEDURES

- Performance of single and multiple frontal and parietal burr hole evacuation of CSDHs

1.2.2. Neuro Anaesthesia, Intensive/ Critical care

OBJECTIVE

To achieve competence in the neurointensive care of head-injured patients

KNOWLEDGE

- Pathophysiology of head injury
- The management of raised intracranial pressure, impaired intracranial compliance, and cerebral ischaemia
- Prevention and management of secondary insults

CLINICAL SKILLS

- Assessment of the unconscious patient
- Use and interpretation of multimodality monitoring
- Interpretation of CT scans
- Ability to advise on management of secondary complications and further surgical intervention

1.2.3. Neuro pathology

OBJECTIVE

To understand the neuropathology of infection, inflammation, ischaemia, neoplasia and trauma affecting the nervous system

KNOWLEDGE

- Acute and chronic inflammatory processes in the CNS including demyelination
- Bacterial, fungal and parasitic meningitis, encephalitis and abscess formation
- Viral encephalitis
- Slow viruses, CJD
- HIV associated infections, tumours and leukoencephalopathies
- Cytopathology of neurones and glial in response to ischaemia, hypoxia and trauma
- Diffuse axonal injury
- Macroscopic brain and spinal cord injury including effects of brain shift, herniation and raised ICP
- Classification, epidemiology and pathology of CNS tumours

1.2.4. Neuro Endoscopy Functional Neurosurgery

OBJECTIVE

To achieve competence in basic procedures of neuroendoscopy

1.2.5. Epilepsy and Functional neuro surgery

OBJECTIVE

To achieve competence in the surgical aspects of the multi-disciplinary management of patients with epilepsy

KNOWLEDGE

- The pathophysiology of idiopathic and lesional epilepsy
- Indications for medical and surgical management
- Principles of ictal, interictal, sphenoidal and intraoperative EEG
- Complications of surgery and their management
- Surgical aspects of the multi-disciplinary assessment of epilepsy patients
- Interpretation of CT, MRI and SPECT scans
- Image-guided resection of cortical lesions
- Mesial temporal resection
- Vagal nerve stimulation
- Functional hemispherectomy
- Corpus callosotomy

1.2.6. Movement disorders

OBJECTIVE

To achieve competence in the surgical aspects of the multi-disciplinary management of patients with movement disorders

KNOWLEDGE

- The aetiology and pathophysiology of movement disorders
- Indications for medical, minimally-invasive and surgical management
- Applied surgical anatomy
- Complications of surgery and their management
- Surgical aspects of the multi-disciplinary assessment of patients with movement disorders
- Interpretation of CT and MRI scans
- Pre-operative counselling and preparation
- Deep brain stimulation
- Microvascular decompression for hemi-facial spasm

1.2.7. Neuro- Paediatric brain and spinal cord tumours

OBJECTIVE

To achieve competence in all aspects of the management of accidental and non-accidental paediatric

KNOWLEDGE

- Epidemiology, natural history and pathology of tumours of the central nervous system in children including medulloblastoma, pilocytic astrocytoma, high grade gliomas, supratentorial PNET, pineal region tumours, brain stem tumours and intramedullary spinal cord tumours
- Imaging of paediatric CNS tumours
- Radiological and biochemical staging of tumours
- Indications for surgery, radiotherapy, primary and adjuvant chemotherapy
- Goals of surgery, Long-term effects of treatment on cognition, hypothalamic-pituitary function and quality of life

PROCEDURE SKILL

- Multidisciplinary approach to treating patients with paediatric brain tumours
- Emergency operative management of a deteriorating child with an intracranial haemorrhage and/or hydrocephalus secondary to tumour
- endoscopic biopsy of intracranial tumours
- Supratentorial craniotomy for hemispheric tumour
- Midline posterior fossa craniotomy for tumour
- Laminoplasty approach to spine cord tumours.

Paediatric head and spinal injury

OBJECTIVE

To achieve competence in all aspects of the management of accidental and non-accidental paediatric head and spinal injuries.

KNOWLEDGE

- Pathophysiology of raised intracranial pressure in children following head injury
- Prevention and treatment of secondary insults relating to transfer and emergency surgery in head-injured children
- Medical management and intensive care in paediatric head injury
- Indications for decompressive craniectomy in management of intractable increases in ICP

PROCEDURAL SKILLS

- Insertion of ICP monitor
- Insertion of ventriculostomy
- Craniotomy for traumatic intracranial haematoma
- Repair of depressed skull fracture

Hydrocephalus

OBJECTIVE

To achieve competence in all aspects of the management (operative and non-operative) of paediatric patients with hydrocephalus.

KNOWLEDGE

- Pathophysiology and investigation of abnormal CSF dynamics in hydrocephalus and BIH Indications for third ventriculostomy and for shunt insertion
- Principles of shunt design and function
- Assessment and clinical management of neonates and children presenting with shunt malfunction including obstruction, over-drainage and slit ventricle syndrome
- Interpretation of CT, MRI scans and ultrasound scans

PROCEDURAL SKILLS

- Insertion of intracranial pressure monitor
- Insertion of ventricular access device in neonates
- Insertion and revision of ventriculoperitoneal shunt/subduroperitoneal shunt
- Endoscopic third ventriculostomy
- Endoscopic fenestration of loculated ventricles
- CT, MRI and ultrasound guided ventricular access

- Spinal dysraphism - Paediatrics

OBJECTIVE

To achieve competence in the neurosurgical aspects of the multidisciplinary management of spinal dysraphism children.

KNOWLEDGE

- Epidemiology, natural history, pathology and clinical presentation of spinal dysraphism.

PROCEDURE SKILL

- Clinical Skills Assessment and clinical management of children presenting with open or closed dysraphic spines and other congenital
- Closure of myelomeningocoele
- Untethering and resection of bony spur in diastematomyelia
- Untethering of lipomyelomeningocoele
- Instrumented stabilization and fusion in the treatment of congenital spinal disorders

1.2.8. Skull Base surgery

OBJECTIVE

To achieve competence in the neurosurgical aspects of the multidisciplinary management of patients with benign and malignant cranial base tumours

KNOWLEDGE

- Epidemiology, natural history, pathology and clinical presentation of benign and malignant tumours of the skull base including cranial nerve schwannomas, chordomas, paragangliomas, adenoid cystic carcinomas, angiofibromas and nasopharyngeal carcinomas
- Indications for radical or subtotal resection of skull-base tumours
- Indications for radio-surgical treatment
- Applied surgical anatomy of the skull base and craniofacial skeleton
- Selection of optimal approaches in relation presenting pathology and imaging
- Clinical Skills Neurosurgical aspects of the multidisciplinary assessment and clinical management of patients with rarer skull base tumours

PROCEDURAL SKILLS

- Frontobasal approaches to the anterior fossa and orbito-ethmoidal complex
- Transfacial and mid-face approaches to the skull base X 1
- Lateral approaches to the infratemporal fossa and pterygo-palatine fossa
- Transtemporal approaches to the jugular bulb and petrous apex
- Professional Skills Multidisciplinary working with neontologists, maxillofacial surgeons and oncologists

1.2.9. Peripheral Nerve surgery

Carpal tunnel compression

OBJECTIVE

To achieve competence in carpal tunnel decompression

KNOWLEDGE

- Presentation, differential diagnosis and management of carpal tunnel syndrome
- Interpretation of nerve conduction studies
- Indications for surgery
- Applied surgical anatomy

CLINICAL SKILLS
- Assessment and counselling of patients with carpal tunnel syndrome

TECHNICAL SKILLS AND PROCEDURES
- Carpal tunnel decompression

Ulnar neuropathy

OBJECTIVE
To achieve competence in the management of ulnar neuropathy

KNOWLEDGE
- Presentation, differential diagnosis and management of ulnar neuropathies
- Interpretation of nerve conduction studies
- Indications for surgery
- Applied surgical anatomy

CLINICAL SKILLS
- Assessment and counselling of patients with an ulnar neuropathy

TECHNICAL SKILLS AND PROCEDURES
- Cubital ulnar nerve decompression with and without transposition

Peripheral nerve sheath tumours

OBJECTIVE
To achieve competence in the resection of major and minor peripheral nerve tumours

KNOWLEDGE
- Pathology of peripheral nerve sheath tumours
- Indications for complete and subtotal resection of tumours
- Applied surgical anatomy of the major peripheral nerves

CLINICAL SKILLS
- Assessment and counselling of patients with peripheral nerve sheath tumours

TECHNICAL SKILLS AND PROCEDURES
- Microsurgical excision of peripheral nerve sheath tumour

1.2.10. Neurology and Neuroelectrophysiology

OBJECTIVE
To understand the basic principles of clinical neurophysiology

KNOWLEDGE
- Principles of electroencephalography

- Principles of somatosensory, motor and brainstem evoked potential monitoring
- Peripheral neuropathies and entrapment neuropathies including: structure and function of peripheral nerves, use of nerve conduction studies
- Disorders of the neuromuscular junction including: structure and function of smooth and striated muscle, use of electromyographic studies

CLINICAL SKILLS

- Interpretation of the results of EEG, EMG and NC studies

1.2.11. Spinal trauma:

Acute Spinal Disorders Management of the spinal injury patient

OBJECTIVE
To achieve competence in all aspects of the non-operative management of spinal injury patients

KNOWLEDGE

- Pathophysiology of spinal cord injury
- Classification of spinal fracture dislocations
- Biomechanics of spinal instability
- Indications for halo traction and external stabilisation
- Indications for and principles of open reduction and stabilisation

CLINICAL SKILLS

- Clinical assessment of the spinal injury patient
- Management of spinal shock
- Interpretation of plain radiology, CT and MRI scans
- Liaison with spinal injury units

TECHNICAL SKILLS AND PROCEDURES

- Use of external mobilisation including cervical collars and spinal boards
- Application of halo traction
- Application of a halo-body jacket

1.2.12. Non-traumatic acute spinal disorders

OBJECTIVE
To achieve competence in the management of patients presenting with acute spinal disorders

KNOWLEDGE

- The assessment and peri-operative management of patients presenting with spinal cord, cauda equina and spinal root compression
- The management of spinal shock
- The ward management of patients with spinal instability

- The detection and initial management of post-operative complications including compressing haematomas, CSF
- fistula and spinal sepsis

CLINICAL SKILLS

- Assessment and identification of non-traumatic acute spinal disorders

TECHNICAL SKILLS AND PROCEDURES

- Surgical management, Decompressive thoracic and lumbar laminectomy and anterior, posterior or 360 spinal fixation/stabilisation

Cervical spine fracture-subluxation

OBJECTIVE

To achieve competence in the general management of fracture-subluxations of the cervical spine

KNOWLEDGE

- Pathophysiology of spinal cord injury
- Classification of cervical spinal fracture dislocations
- Biomechanics of spinal instability
- Indications for halo traction and external stabilisation
- Indications for and principles of open reduction and stabilisation

CLINICAL SKILLS

- Clinical assessment of the spinal injury patient
- Management of spinal shock
- Interpretation of plain radiology, CT and MRI scans
- Liaison with spinal injury units
- Counselling and pre-operative preparation of spinal injury patients

TECHNICAL SKILLS AND PROCEDURES

- Application of cranial-cervical traction
- Anterior cervical corporectomy with anterior column re-construction and anterior cervical plating
- Anterior cervical discectomy
- Posterior reduction and lateral mass screw fixation.

Malignant spinal cord compression

OBJECTIVE

To achieve competence in the general management of patients with malignant spinal cord compression

KNOWLEDGE

- The pathophysiology of spinal cord compression
- The classification, aetiology and natural history of vertebral metastases
- Spinal instability associated with vertebral malignancy

- Indications for surgical intervention
- Role of primary radiotherapy and adjuvant radiotherapy or chemotherapy
- Indications for percutaneous and open spinal biopsy
- Indications for spinal decompression with and without instrumented spinal stabilisation

CLINICAL SKILLS

- Clinical assessment of patients with malignant spinal cord compression
- Interpretation of plain radiology, CT and MRI scans
- Liaison with medical oncologists and radiotherapist
- Counselling and pre-operative preparation of patients with malignant spinal cord compression

TECHNICAL SKILLS AND PROCEDURES

- Decompressive thoracic and lumbar laminectomy with extradural tumour resection
- Posterior pedicle screw stabilisation
- Anterior cervical corporectomy with anterior column re-construction and anterior cervical plating

1.2.13. Spontaneous intracranial haemorrhage:

Primary intracerebral haematomas

OBJECTIVE
To achieve competence in the operative management of space-occupying spontaneous intracerebral haematomas

KNOWLEDGE

- Aetiology of supra and infratentorial intracerebral haemorrhage
- Pathophysiology of spontaneous intracerebral haemorrhage
- Indications for surgical evacuation
- Management strategies to reduce the risk of intra-operative re-bleeding in presence of suspected aneurysm or AVM
- including partial haematoma evacuation, pre or post-operative embolization and definitive surgical treatment

CLINICAL SKILLS

- Assessment of patients with intracerebral haematomas and raised intracranial pressure Interpretation of CT and MRI scans and identification of probable aetiology
- Indications for pre-operative CT angiography, MRA and digital subtraction angiography

TECHNICAL SKILLS AND PROCEDURES

- Craniotomy for supratentorial haematoma including
- Planning and siting of craniotomies
- Use of ventricular drainage

- Intracerebral haemostasis in the coagulopathic patient

General management of subarachnoid haemorrhage

OBJECTIVE
To achieve competence in the general management of subarachnoid haemorrhage (SAH)

KNOWLEDGE
- Aetiology of SAH
- Pathophysiology of SAH
- WFNS grading of SAH
- Principles of resuscitation and timing of interventions.
- Indications for CT scanning, diagnostic lumbar puncture, CT angiography and digital subtraction angiography
- Principles of management of post-haemorrhagic hydrocephalus
- Indications for endovascular and surgical intervention

CLINICAL SKILLS
- Interpretation of CT scans including assessment of intracranial blood load, haematomas and hydrocephalus
- Basic interpretation of cerebral angiography
- Delayed intra-cranial ischemia
- Management of systemic complications

TECHNICAL SKILLS AND PROCEDURES
- Lumbar puncture

1.2.14. Intracranial aneurysms

OBJECTIVE
To achieve competence in the surgical aspects of the multi-disciplinary management of ruptured and unruptured intracranial aneurysms

KNOWLEDGE
- Aetiology, epidemiology and natural history of unruptured and ruptured intracranial aneurysms
- Pathophysiology and general management of subarachnoid haemorrhage
- Angiographic and microsurgical anatomy of the cerebral circulation
- Indications for surgical management of intracranial aneurysms by clipping, trapping, microsurgical reconstruction and
- microvascular bypass
- Complications of surgery and their management

CLINICAL SKILLS
- The assessment, counselling and pre-operative preparation of patients with ruptured and unruptured aneurysms
- Interpretation of CT, MR and catheter angiography

TECHNICAL SKILLS AND PROCEDURES

- Standard pterional and subfrontal approaches
- Clipping of anterior circulation aneurysm

1.2.15. Management of hydrocephalus

OBJECTIVE

The management of hydrocephalus complicating intracranial haemorrhage, head injury and intracranial space occupying lesions; insertion and taping of CSF reservoirs; insertion and maintenance of lumbar and ventricular drains

KNOWLEDGE

- The pathophysiology of CSF circulation
- Applied surgical anatomy of the ventricular system
- Indications for external ventricular drainage, ventriculoperitoneal shunting, lumbar CSF drainage and shunting,
- ventriculo-cisternostomy
- Complications of surgery
- Surgical complications and their management

CLINICAL SKILLS

- The assessment, counselling and pre-operative preparation of patients with hydrocephalus, including interpretation of
- CT and MRI scans and identification of shunt malfunction
- The assessment, counselling and pre-operative preparation of patients with hydrocephalus
- Interpretation of pressure studies and CSF infusion studies
- Interpretation of CT and MRI scans and identification of shunt malfunction

TECHNICAL SKILLS AND PROCEDURES

- Insertion of ventricular drain/access device
- Insertion of VP shunt
- Revision of VP shunt
- Lumbar subarachnoid drainage
- External ventricular drainage
- Primary ventriculoperitoneal shunt
- Lumbo-peritoneal shunt
- Competence in all aspects of primary and revisional shunt surgery including
- Intra-operative testing of shunt function
- Selection of appropriate shunts
- Management of peri-operative ventricular haemorrhage
- Lumbo-peritoneal shunt
- Third ventriculo-cisternostomy

1.2.16. Neuro-Radiology

OBJECTIVE
To understand the principles of neuro-radiological imaging of the structure and function of the nervous system

KNOWLEDGE

- Assess and order the relevant radiological investigations
- Review and discuss films as necessary with the radiologist pre-operatively
- Interpretation of radiographs of the skull and spine
- Principles of CT brain, skull and spine
- Interpretation of CT scans of acute cranial trauma, spinal trauma, hydrocephalus, intra-cranial tumours, spontaneous SAH
- Principles of MRI scans, acute spinal disorders, cranial trauma, hydrocephalus and intra-cranial tumours
- Principles of advanced Magnetic Resonance imaging. Eg: DWI spectroscopy, etc.
- Interpretation of angiographic modalities such as CTA, MRA and DSA

1.2.17. Oncology

Assessment and peri-operative management of patients with space-occupying intracranial tumours

OBJECTIVE
To achieve competence in the assessment and peri-operative management of patients with intracranial tumours

KNOWLEDGE

- The neuropathology of primary and secondary intracranial tumours including: classification, epidemiology, natural history
- Clinical presentations of intracranial tumours
- Indications for neuroimaging
- Management of raised intracranial pressure
- Principles of operative management
- Detection and management of post-operative complications

CLINICAL SKILLS

- Neurological history taking and examination
- Basic interpretation of CT and MRI scans

TECHNICAL SKILLS AND PROCEDURES

- Image-guided biopsy of intracranial tumour

OBJECTIVE
To undertake image-guided biopsy of an intracranial tumour under supervision

KNOWLEDGE

- Indications for biopsy of intracranial tumours
- Risks of biopsy
- Principles of image-guided surgery

CLINICAL SKILLS

- Interpretation of CT and MRI scans and selection of biopsy targets

- TECHNICAL SKILLS AND PROCEDURES
- Image-guided frameless and/or frame-based stereotactic biopsy including: Setting up a computer workstation and
- importing and interrogating image data, Positioning the patient and applying a cranial fixator, Obtaining and confirming
- accurate patient registration, Positioning and performing a suitable burr hole, Passage of biopsy probe and biopsy,
- Preparation of smear histology (when available)
- Should discuss management options both pre- and post-operatively with the relevant oncologists.

1.2.18. Management of intracerebral abscess

OBJECTIVE
To achieve competence in the operative management of cerebral abscess using burr hole aspiration

KNOWLEDGE

- Indications for surgery
- Applied surgical anatomy
- Principles of peri-operative care
- Complications of surgery

CLINICAL SKILLS

- The assessment and pre-operative preparation of patients with a cerebral abscess

TECHNICAL SKILLS AND PROCEDURES

- Burr hole aspiration of a cerebral abscess with and without image-guidance

General microbiological principles

OBJECTIVE
To achieve competence in the general management of CNS infections including ventriculitis, cerebral abscess, subdural empyema and spinal epidural abscess

KNOWLEDGE

- The pathophysiology of intracranial and spinal sepsis
- Principles of anti-microbial chemotherapy
- Indications for operative intervention

CLINICAL SKILLS

- Clinical assessment of patients with CNS infections
- Interpretation of CT and MRI scans

1.2.19. Neuro-rehabilitation

OBJECTIVE

To understand the principles of neurological rehabilitation

KNOWLEDGE

- The principles of neurological rehabilitation including strategies to optimise the recovery of cognition, communication.

ANNEXURE 2: GENERIC FORMAT FOR WRITING A RESEARCH PROPOSAL

In general, the research proposal should be limited to 3000 words. The following structure is suggested:

- Title of the study
- List of investigators
- Collaborating institutions
- Background/introduction: this should include an overview of the subject related to the research project, with a relevant review of the literature.
- Justification: This section should provide a brief justification of the importance and relevance of the study proposed, including the feasibility of the study.
- Objectives: general and specific objectives of the study should be clearly defined.
- Methods: The methodology to be adopted to achieve the listed objectives should be given in detail; the following sub-sections are suggested as a guide:
- Study design
- Study period
- Study population
- Sample size calculation
- Sampling technique
- Study instruments
- Data collection
- Proposed statistically analysis
- Ethic clearance and consent, and confidentiality of data
- Proposed methods for dissemination of findings
- Annexes: the following annexes should be provided:
    - Data proforma/s
    - Consent forms, where relevant in all three languages
    - Other relevant supporting documents

The trainees are advised to use Microsoft Word® for formatting documents. The software Endnote®, Reference Manager® or Mendelay® should be used, if possible, for citations. The reference format should follow the Vancouver® Style. Both soft and hard copies of the documents should be submitted to the Board of Study, through the supervisor.

ANNEXURE 3: GENERIC FORMAT FOR THE DISSERTATION

The following format should be adopted for project reports or dissertations.

The preliminaries should precede the text. They should comprise the following:

- Title page
- <Title of dissertation>
- <Author's name>
- MD (subject)
- <Year of submission>
- Statement of originality: This is a declaration that the work presented in the dissertation is the candidate's own, and that no part of the dissertation has been submitted earlier or concurrently for any other degree. The statement should be signed by the author, and countersigned by the supervisor.
- Abstract: This should consist of a brief summary of not more than 350 words describing the objectives of the work, the materials and methods used, the results obtained, and the conclusions drawn. This may be in a structured format if helpful.
- Table of contents: The table of contents immediately follows the abstract and lists in sequence, with page numbers, all relevant divisions of the dissertation, including the preliminary pages.
- List of tables: This lists the tables in the order in which they occur in the text, with the page numbers.
- List of figures: This lists all illustrative material (maps, figures, graphs, photographs etc) in the order in which they occur in the text, with the page numbers.
- Acknowledgments

- Main text
    - The dissertation should be divided into clearly defined sections. Sections may be subdivided.
    - Introduction: The aim of this section is to state briefly the current position and the reasons for carrying out the present work. Generally, only a few references should be cited here.
    - Literature Review: This section should be reasonably comprehensive, and most of the references to be quoted normally occur here. The relevant references dealing with the general problems should be reviewed first and this is followed by a detailed review of the specific problem. The review is in many cases approached as a historical record of the development of knowledge of the subject. This chapter should conclude with a brief statement of what you propose to find out.
    - Materials and Methods: These should be described so that a reader could repeat all the experiments. Where specific details are available in the literature, reference should be made to the original papers, and comments kept to a minimum. If modifications have been made to the published techniques, these should be described in full.
    - Results: Much of the data should be given in tables and figures and these should be inserted in the text at the appropriate place. The results must be fully described in the text. It is not sufficient to merely present the tables and

figures without any comment. The tables and figures should be clear without references to the text, and this requires concise explanations in legends. Where possible, data presented in the text should have already been analyzed and the complete 'raw' figures should not be included in this section but should be contained in tables in the Appendix. Only data from the present work should be included in this section and in particular no comparison should be made at this stage with results from other workers.

- Discussion: The discussion is the most difficult part of the dissertation to write because the author has to compare critically the present results with those of other workers and to draw valid conclusions from these studies. Descriptions of other workers findings which already appear in the Literature Review should not be repeated in the Discussion. Instead, refer to the Review. The limitations of the study and recommendations for future research on the subject should also be included in this chapter. As your project proceeds, keep notes of your thoughts and discussions relevant to this section.

- References

  All references should be cited in the text. The Vancouver style should be used for references, and should be listed in the order of citation. Endnote ®, Reference Manager® or Mendelay®referencing software should be used for citations.

ANNEXURE 4: SAMPLE OPERATIVE LOG-BOOK STRUCTURE

Procedure	Observation	Assisted	Performed and assisted	Performed with supervision	Performed
• Burr hole					
• Craniotomy – convexity					
• Craniotomy – pterional					
• Craniotomy – midline supratentorial					
• Craniotomy midline posterior fossa					
• Trans-sphenoidal approach					
• Lateral posterior fossa					
• Lumbar fenestration					
• Laminectomy					
• Insertion of lumbar drain					
• Tapping/ draining of CSF reservoir					
• Application of skull traction					
• Image guidance/ stereotaxy set up					
• Insertion of intra-cranial (ICP) monitor					
• Burr hole evacuation of C/ SDH					
• Elevation of depressed skull fracture					
• Craniotomy for traumatic Haematoma (ICH)					
• Craniotomy for supratentorial ICH					
• Craniotomy for intratentorial ICH					
• Insertion of ventricular drain/ access device					
• Insertion of VP shunt					
• Revision of VP shunt					
• Supratentorial tumour biopsy					
• Craniotomy for supratentorial intrinsic tumour/ metastasis					
• Craniotomy for posterior fossa intrinsic tumour/ metastasis					
• Craniotomy for convexity meningioma					
• Excision of intradural extra-medullary tumours					
• Lumbar microdiscectomy					
• anterior cervical discectomy					
• insertion of EVD					
• evacuation of intracranial haematoma (ICH)					

Please note that the above table contains a generic set of procedures and trainees may expand depending on their exposure.

ANNEXURE 5: PORTFOLIO STRUCTURE AND CONTENT

Contents of Portfolio

The contents of the portfolio should be divided into sections according to the outcomes expected. The broad areas of outcomes include:

1. Subject expertise
2. Teaching
3. Research and audit
4. Ethics and Medico-legal issues
5. Information technology
6. Lifelong learning
7. Reflective practice

The main components and the type of evidence that is relevant to each component are as follows:

A. Subject expertise:

- Progress reports from supervisors (essential, should be according to prescribed format)
- Supervisor feedback on communication skills
- Log of procedures carried out
- Results of any work-place assessments conducted

B. Teaching

- Undergraduates - Power point presentation or Summary of Lecture
- Postgraduates - Power point presentation or Summary of Lecture
- Ancillary health staff - - Power point presentation or Summary of Lecture
- Communication skills: to be assessed by the supervisor during this period.

C. Research and Audits

- Research papers published – Copies of the published articles
- Research papers accepted for publication - Manuscript accepted for publication
- Oral presentations at scientific conferences – A copy of the abstract and the power point presentation
- Audits

D. Ethics

- The “certificate of attendance” received from the “Professionalism” workshop to be complied. As evidence of participation

E. Information Technology

- Participation in training programmes / workshops
- Evidence of searching for information and application of findings in practice

F. Life-long learning

- Participation in conferences and meetings- training workshops

G. Reflective practice

- Narration of at least one learning event experienced by the trainee, in relation to each of the above outcomes, with reflection on what and how the trainee learned from this experience

ANNEXURE 6 – SITA FORMS

The diagram below presents an example set of milestones for one sub-competency in the same format as the milestone report worksheet. For each reporting period, a trainee's performance on the milestones for each sub-competency will be indicated by:

- selecting the level of milestones that best describes the trainees' performance in relation to the milestones

  or

- selecting the "Critical Deficiencies" response option

  or

- selecting the "Not Yet Assessable" response option

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Care for diseases and conditions	INTERPERSONAL AND COMMUNICATION SKILLS (ICS1)	This trainee is not able to clearly, accurately, and respectfully communicate with patients and families. This trainee fails to Effectively communicate basic healthcare information to patients and families.	This trainee uses a variety of techniques to ensure that communication with patients and their families is understandable and respectful. (e.g. non-technical language, teach back, appropriate pacing, and small pieces of information). This trainee effectively communicates basic health care information to patients and families.	This trainee customizes communication, taking into account patient characteristics (e.g. age, literacy, cognitive disabilities, culture). This trainee provides timely updates to patients and families during hospitalizations and clinic visits.	The trainee is capable of delivering bad news to patients and families sensitively and effectively.	This trainee can customize emotionally difficult information, for example, when participating in end of life discussions. This trainee is capable of negotiating and managing conflict among patients and families.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments				Not Yet Assessable ☐				

- Selecting a response box in the middle of a level implies that milestones in that level and in lower levels have been substantially demonstrated.
- Selecting a response box on the line in between levels indicates that milestones in lower levels have been substantially demonstrated as well as some milestones in the higher level(s).

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Care for diseases and conditions	PATIENT CARE (PC1)	This trainee is not able to perform an efficient and accurate initial history and physical examination for patients admitted to the hospital.	This trainee performs a focused, efficient, and accurate initial history and physical examination of a full spectrum of patients admitted to the hospital, including critically- ill patients.	This trainee accurately diagnoses many "core" surgical conditions in the curriculum and initiates appropriate management for some "core" conditions. This trainee can develop a diagnostic plan and implement initial care for patients seen in the Emergency Department (ED).	This trainee accurately diagnoses most "core" conditions in the curriculum and some "advanced" conditions and initiates appropriate management for most "core" and some "advanced" surgical conditions independently.	This trainee can lead a team that cares for patients with "core" and "advanced" conditions in the curriculum and delegates appropriate clinical tasks to other health care team members. This resident recognizes atypical presentations of a large number of the aforementioned conditions
		☐	☐	☐	☐	☐ ☐ ☐ ☐
		Comments		not yet assessable ☐		
Care for diseases and conditions	PATIENT CARE (PC2)	This trainee is unable to recognize or manage common post-operative problems such as fever, hypotension, hypoxia, confusion, and oliguria.	This trainee recognizes and manages common post-operative problems such as fever, hypotension, hypoxia, confusion, and oliguria with the assistance of senior trainees or staff members who are physically present.	This trainee recognizes and manages common post-operative problems such as fever, hypotension, hypoxia, confusion, and oliguria with the assistance of senior trainees or staff members who are available for consultation, but not physically present.	This trainee recognizes and manages complex post-operative problems such as sepsis, systemic inflammatory response syndrome, and multiple system organ failure independently.	This trainee can lead a team and provide supervision in the evaluation and management of complex post-operative problems such as sepsis, systemic inflammatory response syndrome, and multiple system organ failure.
		☐	☐	☐	☐	☐ ☐ ☐ ☐
		Comments		Not Yet Assessable ☐		

....

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Care for diseases and conditions	PATIENT CARE (PC3)	This trainee lacks basic surgical skills such as airway management, knot tying, simple suturing, suture removal, administration of local anaesthetic, universal precautions and aseptic techniques (eg. Surgical scrub, gowning & gloving) and is unable to reliably perform basic procedures, including venepuncture, arterial puncture, incision and drainage, minor skin and subcutaneous lump excisions, placement of an IV drip, nasogastric tube or urinary catheter.	This trainee has basic surgical skills such as airway management, knot tying, simple suturing, suture removal, administration of local anaesthetic, universal precautions and aseptic techniques (eg. surgical scrub, gowning & gloving) and is able to reliably perform basic procedures, including venepuncture, arterial puncture, incision and drainage, minor skin/ subcutaneous lump excisions, placement of an IV drip, nasogastric tube, or urinary catheter. This resident can perform basic operative steps in "core" operations/ procedures.	This trainee has respect for tissue, and is developing skill in instrument handling. This trainee moves through portions of common operations without coaching and makes straightforward intra- operative decisions. This resident performs some of the "core" operations with minimal assistance.	This trainee demonstrates proficiency in the handling of most instruments and exhibits efficiency of motion during procedures. This trainee moves through the steps of most operations without much coaching and makes intra operative decisions. This trainee performs many of the "core" operations and is beginning to gain experience in the "advanced" operations.	This trainee demonstrates proficiency in use of instruments and equipment required for "essential" operations, guides the conduct of most operations and makes independent intra- operative decisions. This resident can perform most of the "core" operations and has significant experience in the This trainee can effectively guide other trainees in "core" operations.
		☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐
		Comments				☐ Not Yet Assessable

……………………………… Consultant Surgeon/ Unit(Seal)

…………………………………. Signature of Trainer

……………………. Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Care for diseases and conditions	MEDICAL KNOWLEDGE (MK1)	This trainee does not have basic knowledge about common surgical conditions to which a medical student would be exposed in clerkship.	This trainee has a basic understanding of the symptoms, signs, and management of the "core" diseases in the curriculum and has basic knowledge about common surgical conditions to which a medical student would be exposed in clerkship.	This trainee has basic knowledge about many of the "core" diseases in the SCORE curriculum and can make a diagnosis and recommend appropriate initial management. This trainee can recognize variations in the presentation of common surgical conditions.	This trainee has significant knowledge about many "core" diseases in the curriculum and a basic knowledge of the "advanced" diseases in the curriculum, and can make a diagnosis and initiate appropriate initial management.	This trainee has a comprehensive knowledge of the varying patterns of presentation and alternative and adjuvant treatments for "core" diseases in the curriculum and can make the diagnosis and provide initial care for the "advanced" diseases in the curriculum.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments				not yet assessable ☐
Performance of Operation and Procedures (POP)	MEDICAL KNOWLEDGE (MK2)	This trainee does not have basic knowledge about the common "core" operations to which a medical student would be exposed in clerkship.	This trainee has a basic knowledge of the "core" surgical operations in the curriculum to which a medical student would be exposed in clerkship.	This trainee has basic knowledge of the operative steps, perioperative care, and post-operative complications for many of the "core" operations in the curriculum.	This trainee has a significant knowledge of the operative steps, perioperative care, and post-operative complications for most of the "core" operations in the curriculum and a basic knowledge of some of the "advanced" operations.	This trainee has a comprehensive level of knowledge of the operative steps, perioperative care, and post-operative complications for the "core" operations in the curriculum and a basic knowledge of many of the "advanced" operations.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments				Not Yet Assessable ☐

....

Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Coordination of Care (CC)	SYSTEMS BASED PRACTICE (SBP1)	This trainee does not have a basic understanding of the resources available in this hospital, regionally and nationally for coordinating patient care including: specialized medical services, nurse specialists (eg stoma & wound care), physical and occupational therapists.	This trainee has a basic understanding of the resources available in this hospital, regionally and nationally for coordinating patient care including: specialized medical services, nurse specialists (eg stoma & wound care), physical and occupational therapists.	This trainee knows the necessary resources to provide optimal coordination of care and how to access them. This trainee is aware of specialized services like pain clinics, medical nutrition clinics, alcohol/ substance abuse clinics, prosthetic/ orthotic workshops, rehabilitation centres	This trainee is able to efficiently arrange disposition planning for his or her patients and takes responsibility for preparing all materials necessary for discharge or transfer of his or her patients. The trainee is familiar with the patient's background, support system and facilities available in the region.	This trainee coordinates the activities of surgeons, nurses, and other health care professionals to provide optimal care to the patient at the time of discharge or transfer, and to provide post-discharge advice and referrals for care that is appropriate for the patient's particular needs.
		☐ ☐	☐	☐	☐	☐ ☐
		Comments			not yet assessable	☐
Improvement of Care (IC)	SYSTEMS BASED PRACTICE (SBP2)	This trainee does not demonstrate evidence that he or she considers how hospital and health care systems impact his or her practice. This trainee does not demonstrate awareness of variation in practice within or across health care systems.	This trainee has basic knowledge of how health systems operate. This trainee knows system factors that contribute to medical errors and is aware that variations in care occur.	This trainee understands how patient care is provided in his or her system and recognizes certain specific system failures that can affect patient care. This trainee follows protocols and guidelines for patient care.	This trainee makes suggestions for changes in the health care system that may improve patient care. This trainee reports problems with technology (e.g., devices and automated systems) or processes that could produce medical errors.	This trainee participates in work groups or performance improvement teams designed to reduce errors and improve health outcomes. This trainee understands the appropriate use of standardized approaches to care and participates in creating such protocols of care.
		☐ ☐	☐	☐	☐	☐ ☐
		Comments			Not Yet Assessable	☐

....

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Teaching (TCH)	PRACTICE-BASED LEARNING AND IMPROVEMENT (PBLI1)	This trainee does not Communicate effectively as a teacher (e.g. is disorganized, is inattentive, uses language unsuitable for the level of the learner, discourages and disregards questions).	This trainee willingly imparts educational information clearly and effectively to medical students and other health care team members.	This trainee communicates educational material accurately and effectively at the appropriate level for learner understanding. This trainee accurately and succinctly presents patient cases in conferences.	This trainee demonstrates an effective teaching style when asked to be responsible for a conference or formal presentation.	This trainee recognizes teachable moments and readily and respectfully engages the learner. This trainee is a highly effective teacher with an interactive educational style and engages in constructive educational dialogue. This trainee facilitates conferences and case discussions based on assimilation of evidence from the literature.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments				Not Yet Assessable ☐				

....

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Self-directed Learning (SDL)	PRACTICE-BASED LEARNING AND IMPROVEMENT (PBLI2)	This trainee does not engage in self-initiated, self-directed learning activities. This trainee does not complete simulation assignments. This resident is frequently absent for scheduled simulation exercises without a valid excuse.	This trainee completes learning assignments using multiple sources. This trainee participates in assigned skills curriculum activities and simulation experiences to build surgical skills e.g. basic surgical skills and basic laparoscopic skills workshops	This trainee independently reads the literature and uses sources (eg. peer-reviewed publications, practice guidelines, textbooks, library databases, and online materials) to answer questions related to patients. This trainee develops a learning plan based on feedback with some external assistance. This trainee identifies gaps in personal technical skills and works with faculty members to develop skills learning plan.	This trainee looks for trends and patterns in the care of patients and reads and uses sources to understand such patterns. This trainee can select an appropriate evidence-based information tool to answer specific questions while providing care. This trainee independently practices surgical skills in a simulation environment to enhance technical ability.	This trainee participates in local, regional, and national activities, optional conferences, and/or self-assessment programs. This trainee demonstrates use of a system or process for keeping up with changes in the literature, and initiates assignments for other learners. This trainee leads surgical skills experiences for students and residents and participates in skills curriculum development.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments						Not Yet Assessable		☐

…… …… …… ……

Date of Assessment consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Improvement of Care (IC)	PRACTICE-BASED LEARNING AND IMPROVEMENT (PBLI3)	This trainee does not demonstrate interest or ability in learning from the results of his or her practice. This trainee fails to recognize the impact of errors and adverse events in practice.	This trainee actively participates in Morbidity and Mortality (M&M) and/or other Quality Improvement (QI) conferences with comments, questions, and/or accurate presentation of cases. This trainee changes patient care behaviours in response to feedback from his or her supervisors. This trainee recognizes when and how errors or adverse events affect the care of patients.	This trainee evaluates his or her own surgical results and the quality and efficacy of care of patients through appraisal and assimilation of scientific evidence. This trainee uses relevant literature to support his or her discussions and conclusions at M&M and/or other QI conferences. This trainee performs basic steps in a QI project (e.g., generates a hypothesis, conducts a cause-effect analysis, creates method for study). This trainee understands how to modify his or her own practice to avoid errors.	This trainee evaluates his or her own surgical results and medical care outcomes in a systematic way and identifies areas for improvement. This trainee identifies probable causes for complications and deaths at M&M and/or other QI conferences with appropriate strategies for improving care. This trainee begins to recognize patterns in the care of his or her patients and looks for opportunities to systematically reduce errors and adverse events.	This trainee exhibits on-going self-evaluation and improvement that includes reflection on practice, tracking and analysing his or her patient outcomes, integrating evidence-based practice guidelines, and identifying opportunities to make practice improvements. This trainee discusses or demonstrates application of M&M and/or other QI conference conclusions to his or her own patient care. This trainee leads a QI activity relevant to patient care outcomes.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments						Not Yet Assessable		☐

…… …… …… ……

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Care for Diseases and Conditions (CDC)	PROFESSIONALISM (PROF1)	This trainee displays Undesirable behaviours, including not being polite or respectful, not respecting patient confidentiality and privacy, demonstrating lack of integrity, or failing to take responsibility for patient care activities.	This trainee is polite and respectful toward patients, their families, and other health care professionals. This trainee demonstrates a commitment to continuity of care by taking personal responsibility for patient care outcomes. This trainee responds to calls and consultation requests promptly. This trainee is honest and trustworthy. This trainee consistently respects patient confidentiality and privacy.	This trainee maintains composure in accordance with ethical principles even in stressful situations. This trainee exhibits compassion and empathy toward patients and their families. This trainee recognizes the limits of his or her knowledge and asks for help when needed.	This trainee ensures patient care responsibilities are performed and continuity of care is maintained. This trainee accepts responsibility for errors in patient care and can initiate corrective action. This trainee consistently demonstrates integrity in all aspects of care and professional relationships.	This trainee serves as a role model for ethical behaviour. This trainee positively influences others by assertively modelling professionalism. The trainee consistently places the interests of patients ahead of self interests when appropriate.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments						Not Yet Assessable		☐

....

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Maintenance of Physical and Emotional Health (MPEH)	PROFESSIONALISM (PROF2)	This trainee's behaviour and/or physical condition concern me. This trainee flagrantly and repeatedly violates duty hour requirements.	The trainee understands the institutional resources available to manage personal, physical, and emotional health (e.g., acute and chronic disease, substance abuse, and mental health problems). The trainee complies with duty hours' standards. This trainee understands the principles of physician wellness and fatigue mitigation.	This trainee monitors his or her own personal health and wellness and appropriately mitigates fatigue and/or stress. This trainee effectively and efficiently manages his or her own time and assures fitness for duty.	This trainee sets an example by promoting healthy habits and creating an emotionally healthy environment for those working with him or her. The trainee models appropriate management of personal health issues, fatigue and stress.	The trainee promotes a healthy work environment. This trainee recognizes and appropriately addresses personal health issues in other members of the health care team. This trainee is proactive in modifying schedules or intervening in other ways to assure that those caregivers under his or her supervision maintain personal wellness and do not compromise patient safety (e.g., requires naps, counsels, refers to services, reports to program director).
		☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
		Comments			Not Yet Assessable	☐

....

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Performance of Assignments and Administrative Tasks (PAT)	PROFESSIONALISM (PROF3)	This trainee consistently fails to meet requirements for timely performance of administrative tasks and/or requires excessive reminders, follow-up, etc.	This trainee completes his or her operative case logs and duty hour logs, performs other assigned and required administrative tasks in a timely fashion, and does not require excessive reminders or follow-up (e.g. visa renewal, credentialing, obtaining a medical license).	This trainee is prompt in attending conferences, meetings, operations, and other activities. This trainee responds promptly to requests from faculty members and departmental staff members (e.g. Call responsiveness, contact ability).	This trainee assures that others under his or her supervision respond appropriately to responsibilities in a timely fashion.	This trainee sets an example for conference attendance, promptness, and attention to assigned tasks.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments				Not Yet Assessable ☐				

…… ……. …… ……

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Care for Diseases and Conditions (CDC)	INTERPERSONAL AND COMMUNICATION SKILLS (ICS1)	This trainee is not able to clearly, accurately, and respectfully communicate with patients and their families. This trainee fails to Effectively communicate basic health care information to patients and families.	This trainee uses a variety of techniques to ensure that communication with patients and their families is understandable and respectful (e.g., non-technical language, teach back, appropriate pacing, and small pieces of information). This trainee effectively communicates basic health care information to patients and their families.	This trainee customizes communication, taking into account patient characteristics (e.g., age, literacy, cognitive disabilities, culture). This trainee provides timely updates to patients and their families during hospitalizations and clinic visits.	This trainee is capable of delivering bad news to patients and their families sensitively and effectively.	This trainee can customize emotionally difficult information (e.g. when participating in end-of-life discussions). This trainee is capable of negotiating and managing conflict among patients and their families.
		☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
		Comments		Not Yet Assessable		☐

…… ……. …… ……

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Coordination of Care (CC)	INTERPERSONAL AND COMMUNICATION SKILLS (ICS2)	This trainee displays disrespectful or resentful behaviours when asked to evaluate a patient or participate in a care conference with other members of the health care team.	This trainee willingly exchanges patient information with team members. This trainee responds politely and promptly to requests for consults and care coordination activities. This trainee performs face-to-face hand-overs of patients.	This trainee exhibits behaviour that invites information sharing with health care team members (e.g. respect, approachability, active listening). This trainee performs hand-over best practices (e.g. uses multiple forms of information transfer, confirms receipt of information, invites questions).	This trainee discusses care plans with the members of the health care team and keeps them up to date on patient statuses and care plan changes. This trainee delivers timely, complete, and well organized information to referring physicians and to providers of follow-up care at the time of patient care transitions.	This trainee assumes overall leadership of a health care team responsible for his or her patients, while at the same time seeking and valuing input from the members of the team. This trainee negotiates and manages conflict among care providers. This trainee takes responsibility for ensuring that clear hand-overs are given at transitions of care.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments							Not Yet Assessable	☐

....
Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

Appointment: Post-MD Senior Registrar (Year 1) 7-12 months Trainee name –

Practice domain	Competency	Critical deficiencies	Level 1	Level 2	Level 3	Level 4
Performance of Operations and Procedures (POP)	INTERPERSONAL AND COMMUNICATION SKILLS (ICS3)	This trainee does not Communicate effectively with patients, hospital staff members, and/or the senior surgeon in the operating room.	This trainee communicates basic facts effectively with patients, hospital staff members, and the senior surgeon in the operating room. This trainee understands the necessary elements of informed consent for procedures.	This trainee effectively describes various aspects of the procedure and perioperative care to the patient and his or her family and other operating room team members. This trainee leads a preoperative "time out" using the WHO checklist. This trainee performs clear informed consent discussion for basic procedures.	This trainee anticipates logistical issues regarding the procedure and engages members of the operating team to solve problems. This trainee performs clear informed consent discussion for complex procedures.	This trainee is capable of leadership when unexpected events occur in the operating room and is able to communicate effectively with the family when unexpected events occur in the operating room.
		☐	☐	☐	☐	☐	☐	☐	☐	☐
		Comments						Not Yet Assessable		☐

…… ……. …… ……

Date of Assessment Consultant Surgeon/ Unit(Seal) Signature of Trainer Signature of Trainee

ANNEXURE 7: FORMAT OF THE PBCA EVALUATION

Marking Scheme for portfolio evaluation

Two examiners shall conduct the portfolio evaluation upon completion of the Post MD training and award marks independently.

a. Portfolio desk evaluation (Total Marks 250)

- Subject expertise 75
- Teaching 20
- Research and audit 25
- Ethics and medico-legal issues 20
- Information technology 15
- Life-long learning 20
- Reflective practice 75

b. PBCA Viva (Total Marks 150)

- Subject expertise 25
- Teaching 20
- Research and audit 25
- Ethics and medico-legal issues 20
- Information technology 15
- Life-long learning 20
- Reflective practice 25

To pass the PBCA evaluation a candidate shall obtain 60% (240 marks) or more out of the Total 400 Marks.

ANNEXURE 8 - RECOMMENDED TEXT BOOKS AND OTHER LEARNING MATERIALS

Textbooks:

Principles and Practice of short text book of Neurosurgery – Greenburg
Clinical Neurosurgery – Schmidek and Sweet
Clinical Neurosurgery – Youmanas
Operative Neurosurgery – Andrew Kye and Peter Black
Handbook of Neurosurgery - Mark S. Greenberg

Journals and periodicals:

Journal of neurosurgery
Neurosurgery
British journal of neurosurgery
Neurosurgery clinics of North America

Web Based learning and guidelines:

NICE (http://www.nice.org.uk/guidance)
European Society of Neurosurgery (http://www.essoweb.org/eursso).

** Trainee is encouraged to explore and study new and updated guidelines in the internet for the expansion Neurosurgical intellect.