Ng Teng Fong General Hospital Jurong Community Hospital

BASIC NEUROSURGERY FELLOWSHIP TRAINING PROGRAMME IN NTFGH

Components		Information
1	**Division/ Department**	General Surgery / Neurosurgery
2	**Title of Programme**	Basic Neurosurgery Fellowship Training Programme (B-NFTP)
3	**Overview**	The Basic Neurosurgery Fellowship Training Programme (B-NFTP) is particularly suitable for overseas doctors intending to practice neurosurgery and spine surgery in an established institution, but who have had limited experience in the field, in their country of origin. It is a 1 year full-time programme which includes systematic lectures, in-patient and out-patient teaching sessions and on-duty training of neurosurgical operative skills and techniques. The training also includes education on clinical neuroanatomy, neurophysiology and neuropathology together with the fundamentals of clinical neurosurgery and neuroanaesthesia, as well as current neurosurgical research. The major emphasis is on clinical knowledge and the development of clinical and surgical skills to handle basic neurosurgical conditions. Fellows who have successfully completed this programme will be eligible to proceed to the Advanced Neurosurgery Fellowship Training Programme (A-NFTP).
3.1	Background information	
3.2	Goal/ aim(s)	
3.3	Duration	
4	**Target Audience**	1. Candidates will be selected on the basis of their CV and an interview with the Programme Director or faculty member. 2. Candidates should preferably have obtained a post-graduate diploma qualification – Membership of the Royal College of Surgeons (MRCS) – or its equivalent. 3. Candidates should have good written and verbal command of the English language. 4. Candidates must be in good standing with their country's medical council and will be required to complete temporary registration with the Singapore Medical Council.
4.1	Pre-requisite /eligibility requirement(s)	
5	**Course/Training Syllabus**	**COMPONENTS OF TRAINING (B-NFTP):** **<u>Module 1- Non-operative/Basic sciences</u>** **<u>Anatomy</u>** 1. Draw lateral ventricle anatomy as seen in ETV (endoscopic third ventriculostomy) view. 2. Draw floor of third ventricle anatomy as seen in ETV. 3. Draw floor of fourth ventricle as seen in approach to posterior brainstem. 4. Draw cross section of spinal cord. 5. Draw cross sections of brainstem at the level of superior colliculus, inferior colliculus, mid-pons, medulla oblongata. 6. Draw brachial plexus anatomy. 7. Identify surface landmarks for sylvian fissure, central sulcus. **<u>Coagulation and Thrombosis</u>** 1. Diagnose and manage DVT/PE. Understanding the context of ICH with DVT/PE. 2. Correction of coagulopathy before emergency/elective surgery, in a neurosurgical patient initially on warfarin/aspirin. 3. Indications and timing of restarting warfarin after a neurosurgical procedure. 4. Describe the coagulation pathway. 5 Describe the mechanism of action, dosing, complications of warfarin, heparin, LMWH, aspirin. 6. Understanding the incidence of DVT/PE in neurosurgical patients in Asian vs Western countries.

	<u>Module 2- Neuro-critical care and anesthesia</u> Physiology/Endocrine/ICU Cerebral auto-regulation curves, pressure auto-regulation, CO2 auto-regulation. Monroe-Kellie curve. CPP-MAP-ICP equation. CBF in brain, grey matter, white matter. Neuroendocrine principles and application. ABG interpretation. ICP monitoring - how much drift per day in probe? Methods of ICP monitoring. Understanding the pressure-volume curve for ICP. Brainstem testing, light reflex. Brain death – criteria & pre-conditions. ICP/CBF/CPP/Brain oedema. Steroids and usage; antiepileptic medications usage and indications. CN III palsy / Kernohan's notch / EDH. Intravenous fluids – types/risks in head injury. **<u>Module 3- Brain and Spine trauma</u>** Basic mechanisms of shunts/shunt valves. Draw the flow-pressure curves of shunt valves. Assess and Diagnose Normal Pressure Hydrocephalus (NPH). Discuss the treatment options. Describe operative steps for Extradural, Subdural and Intra-cerebral haemorrhage. Interpretation of CT findings of both brain and spine trauma. Interpretation of MR findings of both brain and spine trauma. Application of all orthoses for spine trauma eg Gardner Tongs, Halo vest, collar. Shunt operation for post traumatic hydrocephalus. Cranial and Spinal Implants - understanding and selection. Describe operative steps for Cranioplasty operation. Understand the various materials used for cranioplasty. Spinal fixation in trauma – principles and operative steps.
6 Training Method	**CLINICAL RESPONSIBILITIES:** Fellows will attend ward rounds, outpatient clinics and both elective and emergency operating sessions with all members of the faculty. Fellows will be educated via an evidence-based approach and should successfully complete the two education modules outlined for the B-NFTP. In addition, they will be exposed to a wide range of adult cranial and spinal neurosurgical conditions in the inpatient, outpatient and operative settings. Fellows will be expected to participate in the on-call rota for Neurosurgery. Fellows should maintain and update their logbook regularly, to track their work and experience. Fellows will also attend regular multidisciplinary meetings in both cranial and spinal conditions. This can be either at a division level or at the wider Cluster (NUHS) and 'Combined Spine Service' settings. They will also have the opportunity to participate in the weekly NUHS Resident Teaching sessions. These may be held in our campus or at the National University Hospital (NUH). It is anticipated that the fellow will be involved in approximately 350 neurosurgical procedures in the 12-month fellowship period. He/she will have the opportunity to be the first surgeon and will be under close supervision of a senior surgeon.

RESEARCH AND TEACHING:

Fellows will be expected to participate in ongoing research, workshops and audits organised by the division of Neurosurgery. They are encouraged to lead such projects as well during their tenure.
Fellows will be granted one half-day session for academic or research activities, each week.

SUPERVISION METHOD:
The Programme Director will be overall in-charge of the fellowship programme.A faculty member will be assigned to the fellow as a direct supervisor to ensure that the training needs are suitably met. The supervisor will be responsible for monitoring the training and performance and will provide feedback to the fellow as well as the Programme Director. The fellow will be working under the supervision of a specialist at all times, during elective and emergency settings.

TEACHING FACILITIES:
i) Fully-equipped Neurosurgery Operating Theatre with access to specialised equipment:
a. Brainlab® and Stealth® navigation system for Stereotactic Neurosurgery.
b. 2 Carl Zeiss Pentero® microscopes.
c. Medtronic O-Arm® scanner for spinal intraoperative Imaging.
d. Hybrid Theatre Suite with monoplanar C-arm for concomitant vascular imaging alongside neurosurgery.
e. Endoscopes for cranial skull base and spinal applications.
f. Cranial Ultrasound for real-time intraoperative imaging.
ii) Digital and Hardcopy library, Multimedia facilities.
iii) Dedicated Skills Lab equipped for cadaveric training and teaching of cranial and spinal procedures.

Weekly Timetable

Day	Activity (e.g. outpatient clinics, endoscopy, etc.)	Frequency (e.g. weekly, monthly)
Mon	Didactic teaching 0730 to 0830HR Ward round from 0900 to 1000HR Academic / Research Activities 1300 to 1730HR	Weekly (NUHS)
Tue	Journal club 0730 to 0830HR NTFGH Neuroradiology Round / Morbidity and Mortality Round 0830 to 0930HR Ward round 0930 to 1100HR Clinic 1400 to 1730HR	Weekly (rotated between NUH/NTFGH/KTPH)
Wed	Ward round 0800 to 1000HR Neurosurgery Operation Theatre 1000 to 1730HR	Weekly
Thur	Paediatric Neuroradiology/Neuro-oncology/Neuro-vascular MDT and Morbidity & mortality round 0730 to 1030HR VC Clinic Teaching 1030 to 1230HR (NUHS) Clinic 1300 to 1730HR	Weekly (NUHS)
Fri	Spine Multidisciplinary Team Meeting 0730 to 0830HR Ward round 0830 to 1000HR Neurosurgery Operation Theatre 1000 to 1730HR	Weekly
Sat/Sun	Private/study time	

7	**Assessment and Evaluation**	**ASSESSMENT AND FEEDBACK:** At the end of the tenure, competency will be assessed in • Understanding and application of neuro-critical care. • Postop management of complications. • Understanding of non-operative neurosurgery principles and basic sciences. • Understanding rehabilitation for these patients. • Technical skills in performance of selected brain and spine surgery. Feedback to the fellows, from the Programme Director and Supervisor, will be conducted at 3-monthly intervals. Fellows can also provide feedback on their training opportunities and needs. Log books will be reviewed simultaneously.
8	**Number of Clinical Fellow to be accepted at any one time**	1