

HIGHER SPECIALTY TRAINING

CURRICULUM

FOR

Neurology

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Joint Committee on Higher Medical Training
5 St Andrews Place
Regent's Park
London NW1 4LB

Tel: 020 7935 1174

Fax: 020 7486 4160

Email: HMT@rcplondon.ac.uk

This curriculum is available on the JCHMT website
<http://www.jchmt.org.uk>

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1. Overview

This document summarizes requirements for specialist training in Neurology. The training period is currently evolving into a two year Foundation (F1&2) phase¹ followed by SHO (Basic Specialty) training (≥1 year) and subsequent competitive entry into Higher Specialist Training (HST) (5 years) (see Appendix 1).

2. F2 and SHO (Basic Speciality) Training

Within F2 and SHO (basic speciality) training candidates for HST in Neurology trainees will be expected, over a minimum of two years, to achieve a core of knowledge and acquire a generic portfolio of skills and competencies relevant to general internal medicine. Most of this period must be spent in gaining experience, through a variety of specialties, of acutely ill patients including unselected emergency medical take over a period of at least 6 months. Not more than 6 months of the minimum two year period should be spent in Neurology.

Applicants for HST in Neurology should have attained the MRCP(UK) (or equivalent), have a range of clinical competencies in core and generic areas of general medicine and have satisfactory indicators on measures of attitude and conduct. They will normally have undertaken at least 4 months in an approved Neurology training post.

Applicants for HST in Neurology may have undertaken extra training during SHO training (BST) in specialty posts with substantial clinical neuroscience components. Competencies, experience and knowledge achieved through such posts and in excess of the minimum requirements may, in the future, be retrospectively taken into account against HST training time on entry into HST (see 5 below) but currently this is not permitted.

An annual externally validated review (currently RITA) will be the mechanism for evaluating progress throughout the Neurology training programme based on scrutiny of activities undertaken, assessments undertaken, knowledge and competencies achieved and educational requirements identified by appraisal. Successful completion of this annual review will be required for each year of training: deficiencies identified at review will need to be addressed and remedied during subsequent training with the emphasis being on achieving required standards.

3. Duration and Organisation of Higher Specialist Training (HST) in Neurology

The minimum duration of HST in general neurology is **five** years.

A minimum of **four** years of Neurology HST should be in approved Neurology training posts which a) cover core and subspecialty neurology (see detailed curriculum **15** below) b) allow the trainee exposure to a broad range of common presentations of neurological disorder (see table 1 curriculum **15** below) c) permit neurology training in a range of different clinical settings including District General Hospital practice and Neuroscience Centre practice.

One year (in excess of 4) of HST may be approved for research or for training modules or fellowships in a subspecialty of Neurology or in a related Specialty (eg Clinical Neurophysiology, Neurorehabilitation, Stroke etc) provided that this year is a) in an approved training post b)

¹ In this document the term “Foundation Programme” or F1/2 years is considered equivalent to the current pre-registration PRHO year and the first subsequent SHO year

incorporates evidence through annual review of satisfactory completion (see also **14** below)

HST may be further extended with the approval of the SAC and Postgraduate Dean for research or for training towards dual accreditation in related Specialty areas, for flexible training or relevant out of programme activity(see also 7 & 13 below).

4. Entry Process

Entry to a Neurology HST programme will be via competitive application for advertised posts and an interview process. Entry will be subject to successful completion of the Foundation Programme (or current PRHO and SHO posts), completion of minimum requirements in medicine (see **5** below) and possession of MRCP (UK) or equivalent together with satisfactory annual reviews of training in the F1/2 and SHO/BST years. Undergraduate training and achievement, performance in the Foundation and SHO/BST years can be taken into account: the demonstration of appropriate previous aptitude, interest or experience in the neurosciences will be considered relevant (e.g. the possession of intercalated BSc or PhD in basic or applied neurosciences, elective periods spent in clinical neurosciences and extent of evaluated training in Neurology and related specialties).

Non-UK graduates without the MRCP who compete for HST in neurology must provide evidence of appropriate knowledge, training and experience, particularly in the care of acute medical conditions.

5. SHO Training (BST) in Neurology and related Specialties (NB see final paragraph)

The combined F2 and basic specialty training should contain a minimum of 2 years in approved posts with direct involvement in patient care and offering a wide range of experience in a variety of medical specialties other than pure neuroscience specialties (eg neurology, neurosurgery, psychiatry): 18 months of this 2 years must be spent in posts providing experience in the evaluation and management of emergencies of which 6 months must be “unselected” medical take.² This component is to ensure that trainees aiming for careers in Neurology have opportunities to develop necessary supporting general medical knowledge and competencies.

Further valuable experience (see below) appropriate to a career in Neurology can be gained during further years of SHO training (BST) in a range of training posts containing substantive clinical neuroscience components provided that posts were a) in excess of the minimum of two years (F2 +1 SHO/BST year) b) appropriate to training in clinical Neurology with documentation of the components relevant to the Neurology HST curriculum c) that the posts were approved for training d) that there is evidence of satisfactory completion of posts. The educational purpose of such posts is to gain increased experience, skills and knowledge relevant to managing a broad range of common presentations of clinical neuroscience disorders in primary or secondary care (see **15** table 1). Appropriate experience may be in posts in neurology (including paediatric neurology), neurosurgery, psychiatry, rehabilitation, general practice, geriatric medicine (including experience of stroke and dementia), acute medicine, intensive care (including neurointensive care), ophthalmology, accident & emergency; limited periods in neuropathology,

² “Unselected” take is defined as acute medical intake encompassing the broad generality of medicine ie not restricted to any single or small group of specialties. If any major component of acute medicine (eg strokes, myocardial infarctions) is excluded from the take, this experience must be obtained in other posts.

neuroradiology, clinical neurophysiology and other investigative neuroscience posts may also be of value. Learning methods are indicated below: in some of these fields alternative methods of learning using accredited schemes may be incorporated (eg Neuroradiology).

The experience and understanding of component disciplines within Clinical Neurosciences at an early stage is considered important both for clinical practice and to gain perspective of career options and of possible research opportunities. Such learning opportunities may be more difficult to organize in the later stages of training.

Currently such SHO/BST neuroscience experience, though intrinsically valuable and supporting the development of useful competencies and knowledge, **cannot** offset time in HST. This may change in the future with review of accreditation procedures.

6. Supervision of Higher Specialist Training

Each HST Neurology scheme will have a Programme Director and named consultant trainers who will undertake educational supervision of individual trainees. Upon enrolment with the JCHMT the trainee will receive a copy of the Handbook, the curriculum for Training in Neurology and the Training Record. A written record of training will be maintained by the trainee, to be counter-signed by the relevant trainer and postgraduate dean annually (see also **13** below); it will remain the property of the trainee but must be produced at the annual review. The Programme Directors' responsibility is to ensure that the JCHMT requirements are met, to structure and coordinate rotations in liaison with the Postgraduate Dean, to facilitate where possible the educational needs of the trainees and, at each annual review, to suggest any future modifications in training or experience that may be necessary.

Training under the supervision of several trainers and in two or more different centres with a broad range of learning opportunities is strongly encouraged. All elements of work in training posts must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure and case mix undertaken. Outpatient and referral supervision must routinely include the opportunity to personally discuss all cases if required.

During HST the trainee must demonstrate increasing responsibility and capability across the full range of practice expected of a generic independent neurologist. Unless seconded to one of the subspecialties the trainee should undertake two to three supervised outpatient clinics weekly throughout the training period: this must not be routinely increased to four. The nature of the clinics, and the ratio of new to follow up patients, will depend on the experience of the trainee: it is expected that, in planning neurology outpatients for trainees, 40 minutes should normally be allowed for a new case and 20 minutes for a follow up. Sufficient experience to support the development of knowledge and competencies in the broad range of common neurological disorders seen in primary care and district general hospitals is essential (see **15** table 1 below), and must include a minimum of one day per week over 2 years (outpatients and ward consultations) supervised experience.

All trainees must demonstrate acquisition of generic skills and competencies of a doctor as laid out in "Good Medical Practice" and as defined in the twelve headings outlined in HMT Generic Curriculum (JCHMT 1/1/03)

7. Academic posts (see also Research 8)

Training within an academic post, eg. lecturer, is perfectly acceptable for Specialist Training. Prospective approval should be obtained from the SAC to ensure that the duration and content of clinical training are sufficient to meet the requirements for a CCST.

8. Research and other out of programme experience (including training abroad)

Research experience in basic or applied Neurosciences, Neurology and its related clinical neuroscience disciplines is strongly encouraged and supported by the SAC. Ideally it should be undertaken in a department where the trainee can retain maintain and develop some clinical experience. Some trainees may wish to spend two or three years in research: this can be undertaken at any stage before or after entry into HST. Educational credit (up to 1 year of 5) may be granted at the discretion of the SAC for clinical experience, knowledge and competencies gained during the research programme.

All trainees will be encouraged to undertake research but in any case must develop an appreciation and understanding of research methodology related to clinical neurology sufficient to allow a critical approach to areas relevant to practice. At least one half day per week should be protected educational time available for study and research throughout HST (apart from normal study leave)

HST may be extended to allow a period of special training overseas of up to one year, (preferably not in the final year of the higher phase training) provided that the training programme receives prospective approval from the SAC and Postgraduate Dean, is subject to satisfactory reports from educational supervisor(s) and contains appropriate assessments.

9. Flexible training

Trainees who are unable to work full-time are entitled to request flexible training programmes.

EC Directive 93/16/EEC requires that:

- i) Part-time training shall meet the same requirements as full-time training, from which it will differ only in the possibility of limiting participation in medical activities to a period of at least half of that provided for full-time trainees;*
- ii) The competent authorities shall ensure that the total duration and quality of part-time training of specialists are not less than those of full-time trainees*

The above provisions must be adhered to. Flexible trainees should undertake sufficient on call experience to allow them to develop the necessary knowledge and competencies for dealing with emergency referrals. For details of appointment and funding arrangements for flexible trainees, please see the revised Dept of Health / Devolved Health Administration and Deanery guidelines.

10. Career Planning

For those who have decided on a career in Neurology at an early stage careful planning of the F2/BST can result both in broad general medical training together with some valuable neuroscience training. The minimum total period of training for a Neurology CCST is thus 8 years from qualification (F1/2, SHO/BST1, HST1-5).

For others entering Neurology HST from different training backgrounds an ad hominem evaluation of their prior training and experience, knowledge and evaluated competencies by the SAC will determine the requirements and duration of training. Trainees must discuss their career plans with their educational supervisors at an early stage and on a regular basis to determine the

appropriate posts and/or rotations to apply for. Prospective advice should be sought from the SAC if there is uncertainty about a training plan. Potential entrants to HST in Neurology from non-standard training pathways should similarly seek early advice about the likely accreditation which may be accorded (if any) to previous training. Unevaluated experience will not normally count towards HST. Particular care is thus required to ensure that, in the selection of training posts in other countries, appropriate assessments are available.

11. Learning Methods

A range of learning methods and activities are appropriate to the curricular objectives: these substantially overlap but include:

- Observation of and case discussion with other staff / trainees
- Supervised clinical practice (inpatient, outpatient, primary care, referral and on – call)
- Clinical attachments (predominant observation, discussion and modeling)
- Clinical and other presentations: preparation of case reports
- Participation in clinical meetings, seminars & tutorials
- Self directed learning by reading of texts, reviews and papers, e-learning
- Specific lectures or focused courses
- General (generic or specific) courses and appropriate educational meetings
- Research and presentation of research
- Teaching of undergraduates & postgraduates (medical and other health professionals)

12. Assessment

Assessments of a) knowledge and understanding b) clinical skills and competencies c) attitude and conduct are currently being developed and it is expected that these will be undertaken throughout training as recommended and updated from time to time by the SAC: confirmation of completion of these assessments will be through the annual review process. The assessment process will be expected to demonstrate knowledge and competency across a range of specific and generic curricular topics with particular emphasis on common neurological presentations in the District General Hospital environment and in referral practice in larger centres. The range of assessment methods is set out in 12a-c below.

Important precepts in evaluations of trainees are that they should be frequent, broadly based, should involve multiple trainers, should cover clinically important areas of the curriculum on several occasions, should incorporate learning and feedback for the trainee and should be documented. It is not anticipated that every component of the curriculum be evaluated but that a sampling approach be adopted to ensure satisfactory performance across each educational domain in a broad range of topics.

12a Knowledge & understanding will be assessed by a range of methods which may include:

Evidence of exposure (portfolio of cases)	Record
Presentations undertaken	Record
Audit undertaken	Record
Specific training undertaken	Documentation
Specific courses attended	Documentation
Formative tests of knowledge completed	Documentation
Trainer reports	Report
Basic and applied research undertaken	Report/Higher degree
Publications	Record
Summative assessment of knowledge	Neurology/Neuroscience exam

12b Skills & Competencies will be assessed by a range of methods which may include:

Observation by trainers	Report
MINICEX or similar competency assessment for procedures	Record/Score
Video assessments	Record
Participation in Skills based training	Documentation
Evidence of exposure (portfolio of cases)	Record
Review of casenotes by trainer	Report
Evidence of ability to interpret data, reports and notes	Record
External formative/summative tests	Clinical exam

12c. Attitude & Conduct will be assessed by a range of methods which may include:

Observation of trainers	Report
360 deg appraisal	Record
Attendance	Sickness/Absence Record
Complaints	Record

13. Training Record and Appraisal

It is the responsibility of the trainee to keep their training record up to date with clear documentation of all generic and specific training experience, all assessments undertaken, reports from trainers and other required information. During any research period or other out of programme module the training record will include an account of work undertaken.

The trainee should have regular (at least six monthly) appraisal meetings with their educational supervisor to review progress, discuss strengths and weaknesses and set agreed targets for the next training period. Trainees will meet their Programme Director at least once each year and submit the training record for approval through the annual review process. The Programme Director, Postgraduate Dean, and external assessor will certify the training and assessments undertaken and, if necessary, advise the trainee and his/her trainer about any shortcomings of the trainee or the training posts, with suggestions how to remedy these in the coming year. A successful annual review (currently RITA) will be further required in each year of HST before a CCST can be recommended.

Trainees in HST are expected to be highly motivated in self-directed learning through reading, planning and organizing (in discussion with their trainers) clinical attachments, attendance at appropriate meetings and courses and specific projects. A proactive approach to such activities is an essential part of training for lifelong learning through Continuing Professional Development after Specialist Registration. Similarly a positive and proactive approach to appraisal, assessments and annual review documentation throughout training is essential and constitutes an important element in preparation for ongoing revalidation as a Specialist.

14. Subspecialty Training / Fellowships / Dual certification

Some trainees, having completed the generic specialist training in Neurology, may wish to undertake extra subspecialty training to acquire knowledge, skills and competencies beyond those required for a CCST. This may be particularly relevant if a trainee already has special expertise in an area (eg through research) or wishes to take a lead role in the development of a subspecialty in the future. For some topic areas such experience may be gained within specific neurology departments with special expertise whilst for others clinical attachments may be required within other specialties with, in some cases, dual accreditation (see below). Examples of subspecialist training may include epilepsy, stroke, movement disorder, peripheral neuromuscular disorders, sleep disorders, headache, multiple sclerosis, motor neuron disease or dementia. Examples of extra training requiring posts in Other Related Specialties include clinical neurophysiology, neurorehabilitation, neurogenetics, neuro-ophthalmology, and neuro-otology.

Trainees may seek dual certification in Neurology and another Specialty (eg Clinical Neurophysiology, Rehabilitation etc). The ad hominem requirements for dual certification should be discussed with the relevant SACs at an early stage in training. Trainees may either:

- (a) serially accredit in both specialties, ie acquire a training number in one specialty then in open competition gain a training number in the other specialty. Usually it is best in this circumstance to check with the relevant SAC that they are eligible to go onto the specialist register in the first specialty before starting the second or
- (b) they apply for a dually accredited post, eg neurology and neurophysiology – dual certification can be achieved with 3.5 years Neurology and 2 years Clinical Neurophysiology plus 1 year or research (or other relevant work) making a total of 6.5

years

15. DETAILED CURRICULUM

By the end of the specified HST training period the trainee must have acquired the generic skills and competencies as laid out in ST Generic Curriculum (RCP 1/1/03) and the Specialty knowledge, skills and competencies and attitudes for a CCST in Neurology. The curriculum may broadly be divided into:

- A) the generic knowledge and skills for Neurology practice including experience of patients with broad range of common neurological presentations
- B) the core subject areas which comprise the practice of Neurology (including its subspecialty areas)
- C) appropriate experience and understanding of other related Specialties which interface with Neurology

The topic areas with reference to the assessment of each (in notes below) are set out in **TABLE 1**. It is not anticipated that every component of the curriculum is assessed according to the methods defined but that a sampling approach is used to demonstrate satisfactory performance across a broad range of areas.

The learning outcomes for each topic of the generic and core curriculum are set out in **TABLE 2**: these comprise a brief statement followed in some cases within brackets some more detailed information.

The curriculum below sets out the topic areas and learning objectives within each of these three groups and their methods of assessment. Subsequently there are notes relating to the more detailed learning objectives of these topic areas:

TABLE 1: Curriculum Generic neurology		Evaluation of: (1-4 defined below)				
	<u>Learning Objectives</u>	<u>Knowledge</u>	<u>Comp'y</u>	<u>Conduct</u>	<u>Evidence</u>	
History taking	1	2	3	4	2/3/4	
Mental and physical examination	1	2	3	4	2/3/4	
Differential diagnosis	1	2	3	4	2/3/4	
Investigation	1	2	3	4	2/3/4	
Management plan	1	2	3	4	2/3/4	
Multidisciplinary involvement	1	2	3	4	2/3/4	
Communication issues	1	2	3	4	2/3/4	
Clin Pharm of Neuro Disorders	1	2	3	4	2/3/4	
Special patient groups	1	2	3	4	2/3/4	
Women and pregnancy	1	2	3	4	2/3/4	
The teenager	1	2	3	4	2/3/4	
The elderly	1	2	3	4	2/3/4	
Terminally ill	1	2	3	4	2/3/4	
Common Neurological Presentations	1	2	3	4	2/3/4	
Neural Injury (Head, Brain & Spine)	1	2	3	4	2/3/4	
Headache (acute, chronic)	1	2	3	4	2/3/4	
Sudden loss of consciousness	1	2	3	4	2/3/4	
Coma	1	2	3	4	2/3/4	
Acute behaviour disturbance	1	2	3	4	2/3/4	
Chronic behaviour disturbance	1	2	3	4	2/3/4	
Anxiety and depression	1	2	3	4	2/3/4	
Weakness and paralysis	1	2	3	4	2/3/4	
Pain	1	2	3	4	2/3/4	
Sensory disturbance	1	2	3	4	2/3/4	
Unsteadiness and falls	1	2	3	4	2/3/4	
Abnormal movements	1	2	3	4	2/3/4	
Visual problem	1	2	3	4	2/3/4	
Hearing problem	1	2	3	4	2/3/4	
Language or speech problem	1	2	3	4	2/3/4	
Swallowing problem	1	2	3	4	2/3/4	
Bladder, bowel or sexual dysfunction	1	2	3	4	2/3/4	
Functional disorder	1	2	3	4	2/3/4	
Developmental disorder	1	2	3	4	2/3/4	
Learning disabled patient	1	2	3	4	2/3/4	

(Table 1 continued overleaf)

Table 1 (continued):
Specific neurology curriculum

Head Injury	1	2	3	4	2/3/4
Headache	1	2	3	4	2/3/4
Disorders of consciousness	1	2	3	4	2/3/4
Disorders of sleep	1	2	3	4	2/3/4
Disorders of higher function & behaviour	1	2	3	4	2/3/4
Epilepsy	1	2	3	4	2/3/4
Cerebrovascular disease	1	2	3	4	2/3/4
Tumours of the NS & systemic cancer	1	2	3	4	2/3/4
Infections of NS	1	2	3	4	2/3/4
CSF disorders	1	2	3	4	2/3/4
Demyelination & vasculitis	1	2	3	4	2/3/4
Immunological disorder & NS	1	2	3	4	2/3/4
Parkinsonism & Movement disorders	1	2	3	4	2/3/4
Motor neuron disease	1	2	3	4	2/3/4
Metabolic & toxic states	1	2	3	4	2/3/4
Disorders of the visual system	1	2	3	4	2/3/4
Disorders of cranial nerves	1	2	3	4	2/3/4
Disorders of spine, cord, roots, injury	1	2	3	4	2/3/4
Disorders of peripheral nerve	1	2	3	4	2/3/4
Disorders of autonomic system	1	2	3	4	2/3/4
Disorders of muscle	1	2	3	4	2/3/4
Pain	1	2	3	4	2/3/4

TABLE 1 (continued):	Evaluation of:				
	Related Speciality curriculum³	Learning Outcomes	Knowledge	Compy⁴	Conduct
Clinical neurophysiology	1	2	3	4	2/3/4
Neuroendocrinology (Endocrinology)	1	2	3	4	2/3/4
Neurogenetics (Medical Genetics)	1	2	3	4	2/3/4
Neurointensive care (Intensive Care Med)	1	2	3	4	2/3/4
Neurotology (Audiological Medicine)	1	2	3	4	2/3/4
Neuropaediatrics (Paediatrics)	1	2	3	4	2/3/4
Neuropathology (Pathology)	1	2	3	4	2/3/4
Neuropsychiatry (Psychiatry)	1	2	3	4	2/3/4
Neuropsychology (Clinical Psychology)	1	2	3	4	2/3/4
Neuroradiology (Radiology)	1	2	3	4	2/3/4
Neurorehabilitation (Rehabilitation)	1	2	3	4	2/3/4
Neurosurgery	1	2	3	4	2/3/4
Uro-neurology	1	2	3	4	2/3/4

³ The list does not infer that all related specialties are of equal weight educationally: for instance knowledge and understanding of principles of Neuroradiology, Clinical Neurophysiology, Rehabilitation, Neurosurgery and ITU as they pertain to Adult Neurology may be weighted above others although some knowledge and understanding of all is essential.

⁴ Competency in the listed Specialty is not meant to infer the level of proficiency expected of the holder of CCST in the Specialty but at the level defined by the learning objectives appropriate to the holder of a CCST in Neurology

TABLE 1
Footnotes

1	Learning Outcomes		
	Specific areas of learning to be attained in each curricular area are below		
2	Assessment of Knowledge	Evidence of Assessment (See also 12a-c)	
a	Evidence of exposure (portfolio of cases)	Record	REVIEW
b	Presentations undertaken	Record	REVIEW
c	Audit undertaken	Record	REVIEW
e	Specific training undertaken	Documentation	REVIEW
f	Specific courses attended	Documentation	REVIEW
g	Documented tests of knowledge completed	Documentation	REVIEW
h	Trainer reports	Report	REVIEW
I	Clinical research undertaken	Report	REVIEW
j	Publications	Record	REVIEW
3 Competencies		Evidence	
	Assessment of clinical skills	Mini-CEX record	REVIEW
	Supervisors report		
	Assessment of management	Mini-CEX; Review of letters	REVIEW
4 Conduct			
	Supervisors report	Report	REVIEW
	360 degree assessment		
		Summary of assessmeht	REVIEW
	Complaints or thanks	Summary	REVIEW

The assessments should provide broad coverage of the curriculum to indicate breadth of knowledge and competence. Through the annual RITA reviews areas where further evidence needs to be collected may be indicated. By the Penultimate Year Assessment there should be evidence to allow a demonstration of appropriate breadth and depth of knowledge and competence, and appropriate attitude.

It is the responsibility of the trainee to provide this evidence and absence of evidence will be interpreted as lack of evidence.

Learning outcomes for curricular topics: general statement followed by more detail in []

TABLE 2A

GENERIC CLINICAL CURRICULUM IN NEUROLOGY	
Ability to undertake the following clinical activities as applied to patients with neurological disorders:	LEARNING OUTCOMES
History taking	Able to take an appropriate, focused and comprehensive history, including where appropriate information from others, and communicate this verbally or in writing and in summary form
Mental and physical examination	Able to undertake an appropriate, focused and comprehensive examination of mental and physical state and communicate verbally or in writing and in summary form
Differential diagnosis	Able to formulate an appropriately ordered differential diagnosis based on an appreciation of the patient, their past history and current problems and their likely causes
Investigation	Able to formulate a focused and relevant series of investigations
Management plan	Able to plan and order appropriate observations, liaise with members of the MDM, determine and prescribe fluids and medications, seek appropriate opinions and interventions and, with others, develop an overall plan for the individual patient
Multidisciplinary team (MDM) involvement	Able to liaise with, refer to and communicate with all members of the MDM in a constructive and professional manner in the interests of the patient and their carers Able to liaise with and understand the role of specialist nurses
Communication issues	Able to communicate effectively with the patient, their family and carers and other staff in relation to the individual needs of the patient and with appropriate regard for confidentiality. Able to give a prognosis, to explain the patient's condition, to break bad news, to obtain full and informed consent for investigations and treatment. Able to inform concerning patient support groups and relevant charities
Clin Pharm of Neuro Disorders	Able to plan and administer pharmacological treatments safely and effectively. Able to refer to local and national guidelines (NICE) and sources of evidence and information about treatments [Synapse and neurotransmitter physiology. Principles of neuro-pharmacokinetics and pharmacodynamics. Modes of actions of drugs used to treat neurological diseases] Understand principles of treatment especially: Vascular disease, migraine, epilepsy, pain, psychiatric disorders, movement disorders. multiple sclerosis. autoimmune disorders.

	dementia, motor neuron disease. Understand limitations: compliance, adverse effects, interactions, cost implications Understand information needs of patients and others
Special patient groups	
Women and pregnancy	Understand the effects of menarche, menstrual cycle and menopause on common neurological disorders [methods of contraception, failure rate and interaction with drugs (especially antiepileptic drugs): teratogenic risks of commonly prescribed drugs (especially AEDs) and genetic risks of neurological diseases: presymptomatic/prenatal diagnosis of neurological conditions: psychosexual dysfunction in neurological illness (especially epilepsy)] Understand the effect of pregnancy on existing neurological disorders and neurological disorders as complications of pregnancy [eclampsia; neonatal complications in offspring of affected women; communication with obstetricians; effects of drugs on pregnancy (foetus and mother) and pregnancy on drugs]
The teenager	Understand the special needs of teenagers, particular issues of confidentiality, and transition disorders
The elderly	Understand the normal clinical and radiological findings in the elderly; special presentations of neurological disease in the elderly; diagnosis, investigation and management of dementia; effects of drugs in the elderly; hospital based & community services; communication with relatives and care agencies; role of departments of medicine for the elderly
Terminally ill	Understand end of life issues in neurological disorders and the role of palliative care services and specialist nurses [ethical and legal aspects of terminal care]
Common Neurological Presentations	Able to clinically evaluate patients with the presenting syndromes, initiate appropriate observations, investigations and treatment, make appropriate referrals and effectively communicate to patient and relatives and other staff about condition, procedures and prognosis. Able to effectively communicate with medical and nursing staff in referral situations

TABLE 2B

Specific neurology curriculum	
Ability to evaluate and manage people with the following neurological disorders:	LEARNING OUTCOMES
Head Injury	<p>Ability to evaluate and manage people with acute head injury [Perform immediate resuscitative measures; formulate a strategy for immediate and short term management: primary and secondary effects of head injury: symptoms and signs of head injury and its complications: indications for investigations: indications for medical interventions, ITU referral, urgent and delayed neurosurgery]</p> <p>Ability to evaluate and manage post traumatic change in consciousness, behaviour and cognition, and other post-traumatic symptoms (including epilepsy)</p>
Headache	<p>Ability to evaluate and manage people with headache & facial pains.</p> <p>[Clinical features, differential diagnosis and specific pharmacological and general treatment of the causes of headache and facial pain:</p> <p>Investigations: role of brain scanning, urgent blood tests, lumbar puncture]</p>
Disorders of consciousness	<p>Ability to assess the unresponsive patient and to formulate plan of investigation and management.</p> <p>[Anatomy and physiology of consciousness, and the pathophysiology of disorders of consciousness: definitions, causes, pathophysiology, clinical features and prognosis of persistent vegetative state, locked in state and brainstem death: legal issues relating to disorders of consciousness: assessment of patient with disordered consciousness: use of tests for brainstem death: interpersonal skills for relating to management of the family of people with disorders of consciousness]</p>
Disorders of sleep	<p>Ability to evaluate and manage people with sleep disorders [Narcolepsy, daytime hypersomnolence, parasomnias, obstructive sleep apnoea, effects of neurological conditions on sleep: indications, scope and limitations of the sleep laboratory: effects of sleep on the EEG: principles of physical and pharmacological treatment: driving regulations: consequences and complications of sleep disorders]</p>
Disorders of higher function & behaviour	<p>Ability to evaluate and manage people with disordered higher function & behaviour [Understanding of memory, language, visuospatial function & behaviour: definition and epidemiology of dementia; pathology and clinical features of individual dementias: relevant investigations: specific treatments: genetic</p>

	aspects; risks and costs of investigations; role of neuropsychological evaluation (inc dementia and mood scales): evaluation of competency: community and support services]
Epilepsy	Ability to evaluate and manage people with epilepsy. [Differential diagnosis of paroxysmal and transient events: scope and limitations of investigations: use of anti-epileptic drugs: treatment of refractory seizures: serial seizures and status epilepticus: role of epilepsy surgery: awareness of issues related to women and pregnancy, driving, vocation: sudden death: psychological and social consequences of epilepsy especially teenagers]
Cerebrovascular disease	Ability to evaluate and manage people with stroke. [Cerebral circulation and its determinants: pathophysiology of cerebral infarction, cerebral haemorrhage, subarachnoid haemorrhage, cerebral venous thrombosis & vascular dementia: epidemiology, risk factors and their management: features of stroke /TIA, intracranial haemorrhage and venous thrombosis: investigation and management of acute stroke, the role of medical and surgical interventions: role of evaluation scales: cerebral aneurysm and AVM; interventional, surgical and radiotherapy treatment: multidisciplinary stroke care, organisation of stroke units, nutrition after stroke, rehabilitation techniques, community stroke care]
Tumours of the NS, neurological complications of systemic cancer, complications of treatment of cancer	Ability to evaluate and manage people with tumours of the NS or effects of systemic tumours or their treatment. [Neuropathological classification of brain tumours: clinical features of the common tumours of the nervous system including malignant meningitis: clinical features and immunology of paraneoplastic syndromes: benefits and risks of therapies including surgery and radiotherapy: neurological complications of chemotherapy and radiotherapy]
Infections of NS	Ability to evaluate and manage people with infections of NS [Principles of neurological infectious disease: clinical features of these diseases and their causes: diagnostic techniques and their appropriate use: anti-microbial therapies and their use: the importance of liaison with infectious disease physicians, microbiologists, public health and occupational health medicine in relation to neurological infections]
CSF disorders	Able to evaluate and manage people with disorders of CSF [CSF composition and dynamics; anatomy and radiology of the ventricular system; genesis of hydrocephalus; biochemistry and immunology of CSF; blood brain barrier; indications, techniques, & contraindications of csf examination: methods of intracranial pressure monitoring: treatments of raised

	intracranial pressure, management of shunts]
Demyelination and vasculitis	Ability to evaluate & manage people with demyelinating & vasculitic disorders [Biology of demyelination & vasculitis: clinical features of multiple sclerosis, related demyelinating disorders and vasculitic and arteritic disorders: management of specific impairments and disabilities arising in MS: role of disease modifying drugs, symptomatic treatments and therapies]
Immunological disorder and NS	Ability to evaluate & manage people with immunological disorder caused by disease or treatment. [Principles of immune responses in relation to the NS: immunological basis underlying auto-immune neurological disease: clinical features of these diseases: diagnostic techniques and their appropriate use: immuno-suppressive and immunomodulatory therapies: their actions, side effects and indications]
Parkinsonism & Movement disorders	Ability to evaluate & manage people with Parkinsonism & Movement Disorders [Clinical features and differential diagnosis of parkinsonism, chorea/athetosis, dystonia, tics and tremor: role of investigations in diagnosis and treatment: treatment of movement disorders: role of neurosurgical interventions]
Motor neuron disease	Ability to evaluate & manage people with motor neuron disease [Clinical features and differential diagnosis of motor neuron syndromes: disease modifying and symptomatic treatments: special issues of breaking bad news and prognosis: palliative care aspects]
Metabolic & toxic states	Ability to evaluate and manage people with metabolic/toxic state [Biochemistry and neuropathology of exposure to alcohol and other recreational drugs (cocaine, amphetamine, opiates), heavy metals, pesticides and therapeutic agents: clinical features of alcohol, cocaine, opiate, amphetamine neurotoxicity; of Pb, Hg, Mn, CO, NO and organophosphate poisoning; of therapeutic agents neurotoxicity (e.g. vincristine, lithium, radiation): role & value of blood and urine toxicology, imaging and neurophysiology: assessment of other organ damage: psychiatric morbidity associated with substance abuse: clinical features and management of hyper- hypo-thermia, sodium, potassium, calcium and acid base disorders]
Disorders of the visual system	Ability to evaluate and manage people with disorders of the visual system [Applied anatomy and physiology of the visual and oculomotor systems: clinical evaluation of the eye and adnexae, vision (acuity, fields and high function): clinical features & conditions]

	which may affect these systems: driving regulations]
Disorders of cranial nerves	Ability to evaluate and manage people with disorders of cranial nerve function [anatomy of the skull base, particularly the orbit, cavernous sinus, pituitary fossa, foramen magnum and jugular foramen: pathological processes involving cranial nerves and their central connections: clinical features & clinical assessment of cranial nerve function: management of cranial nerve disorders including multidisciplinary approaches to visual, hearing & balance, speech & swallowing disorders]
Disorders of spine, spinal cord, roots and spinal injury	Ability to evaluate and manage people with disorders of the spine, spinal cord and roots and the acute & chronic consequences of acute spinal cord injury including effects of paralysis, autonomic dysfunction and sensory loss [Anatomy of the spine, spinal cord, roots: clinical features of spinal cord, root and cauda equina syndromes: indications for urgent investigation: potential and limitations of spinal CT, MRI, myelography and spinal angiography: emergency management of spinal cord or root compression, of spinal injury: management of neck & low back pain and sciatica]
Disorders of peripheral nerve	Ability to evaluate and manage people with disorders of peripheral nerves (including plexus lesions) [Anatomy and pathology of peripheral nerves: clinical features & investigation of genetic and acquired axonal and demyelinating neuropathies, traumatic & entrapment neuropathies and plexopathies: management of Guillain-Barré syndrome and other severe paralysing neuropathies: general management of acute neuromuscular paralysis]
Disorders of autonomic system	Ability to evaluate and manage people with disorders of the autonomic nervous system (ANS) [Anatomy and physiology of ANS. clinical features of ANS disorders alone and as part of other condition eg multisystem atrophy: investigations including autonomic function tests: pharmacological and physical managements of urinary retention, erectile disorder, constipation, postural hypotension, autonomic dysreflexia]
Disorders of muscle	Ability to evaluate and manage people with disorders of muscle [Clinical features and investigation of genetic & acquired disorders of the neuromuscular junction and voluntary muscle including periodic disorders and disorders of energy metabolism (eg mitochondrial disorders): management including cardiorespiratory & anaesthetic considerations]
Pain	Ability to evaluate and manage people with neurological disorders causing pain and common non neurological causes of

	pain including musculoskeletal [Theories of pain generation: pain patterns in neurological and systemic diseases: effective use of pharmacological agents and other measures for pain relief including nerve blocks, TNS, acupuncture, & neurosurgical interventions: role of Pain Clinic: psychological and social effects of chronic pain]
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Table 2 continues overleaf

TABLE 2C

RELATED SPECIALITY CURRICULUM	
Ability to recognise the role, limitations and utility of the Specialities below in the evaluation and management of neurological disorders:	LEARNING OUTCOMES
Clinical neurophysiology	Understand role and practice of neurophysiological investigations in disorders of the nervous system: ability to interpret a neurophysiology report [EEG - normal range of EEG findings: common epileptiform abnormalities: capabilities and limitations in neurological disorders: role of monitoring techniques (telemetry, ambulatory); evaluation of sleep disorders: neurological emergencies EMG/NCS/repetitive stimulation – principles of techniques: abnormalities in common nerve entrapments, peripheral neuropathies: motor neuron disease; disorders of neuro-muscular junction; muscle disease Evoked potentials - common abnormalities in neurological diseases, particularly demyelination: role of intraoperative EP] <i>see also sections on epilepsy, sleep disorders, peripheral nerve and muscle</i>
Neuroendocrinology	Understand the principles of the NS in endocrine function and neurological features of endocrine disorder and need for referral [Clinical features and investigations in endocrine disorders: emergency management of disorders: relationships with neurological disorders: steroid therapy]
Neurogenetics	Understand the principles of genetics as applied to neurological disorder: ability to interpret a genetics report [basic genetic principles and common diagnostic methods: roles of a detailed family history, of DNA based diagnostic tests, of liaison with Clinical Genetics: genetic contribution to multifactorial neurological disease (eg stroke, multiple sclerosis, subarachnoid haemorrhage, epilepsy): clinical features of common genetic conditions (hereditary ataxias, Huntington’s disease, hereditary neuropathies, muscle diseases, and neurocutaneous syndromes): bioinformatic databases of human disease]
Neurointensive care	Ability to evaluate and manage (with others) people in ICU [Clinical features, causes, investigation and management of coma (including epilepsy and raised intracranial pressure), failure to regain consciousness and paralysis: diagnosis of and ability to define the vegetative state: ICU neurological complications of major surgery, sepsis, drugs & medical disorders: management of status epilepticus: the principles of cardiovascular and respiratory support: indications for and

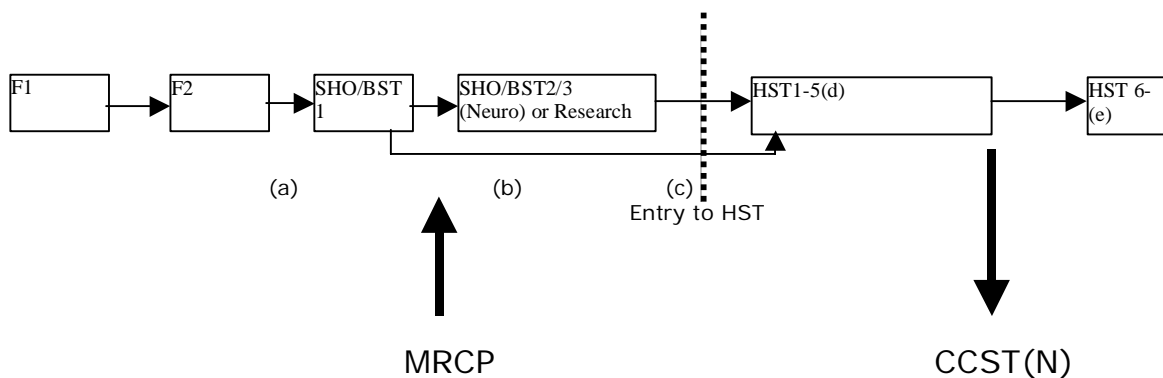
	methods of artificial nutrition: clinical, legal and ethical issues in brain death, coma and vegetative state: communication issues with patients, relatives & staff in ICU]
Neurotology	Ability to evaluate the deaf and / or dizzy person and interpret reports [Applied anatomy and physiology of hearing and balance: history and examination techniques: conditions affecting the vestibulocochlear system: appropriate referral pathways]
Neuropaediatrics	Understanding of neurological disorders in intrauterine life and childhood: ability to evaluate and manage neurological disorders in teenagers in liaison with paediatric neurologists [Key stages of development and range of normality: ability to examine teenage children: to interpret investigations: knowledge of developmental disorders (including effects of intrauterine and perinatal factors on neural development), effects of injury, metabolic conditions, cerebral palsy, learning disability and autism, epilepsy, migraine and stroke in childhood, neuromuscular disorders, and immunization: NHS and social service agencies; role of educational psychology (statements of special need); special educational services: role of paediatric neurology and paediatricians in the care of sick children: communication with children, parents and other agencies]
Neuropathology	Ability to appropriately request pathological investigations and interpret pathology reports [understand the pathological and biochemical basis of neurological disorders; anatomy of brain sections, brain preparation, histological, histochemical, immunocytochemical and E.M. techniques; biochemical, immunological & microbiological techniques; and understand and interpret reports issued: role of and consent process for necropsy examination]
Neuropsychiatry	Ability to evaluate and interpret psychiatric symptoms in and as presentations of neurological disorders, psychiatric consequences of neurological disease and neurological features in people with psychiatric disorders [Understanding of common psychiatric disorders (including learning disability), neurological features which may have psychiatric causes (including medically unexplained symptoms): the mental health act and when it can be used: ability to evaluate and manage acute organic brain syndromes: ability to liaise effectively and appropriately with Psychiatry services]
Neuropsychology	Ability to utilise basic clinical tests of cognitive function, to understand the need to refer to and the role of the Clinical

	<p>Neuropsychologist and to interpret reports. [Understanding of neuroanatomical and neurophysiological basis of memory, attention, language and perception: understand the value and limitations of Neuropsychological interventions such as Cognitive Behavioural Therapy: understand mini-mental state examination, , basic neuropsychological tests employed by Clinical Psychologists, e.g. NART, WAIS]</p>
Neuroradiology	<p>Ability to request and evaluate neuroradiological investigations and reports and liaise effectively with the neuroradiologist: understand the role, risks & limitations of common techniques [Request, interpret and utilize neuro-radiological investigations appropriately: explain the nature, risks and benefits of neuro-radiological investigations (CT scan cranial / angiography; MR scan cranial/spinal/ angiography; catheter angiography diagnostic/interventional; myelography; ultrasound carotid/trans-cranial/cardiac; other special investigations e.g. PET, SPECT) to patients]</p>
Neurorehabilitation	<p>Ability to evaluate the requirement for rehabilitation in people with neurological disorders in the context of a multidisciplinary team and make appropriate referrals [Understand the difference between pathology, impairment, activity & participation: understanding the potential and limitations of neuro-rehabilitation; ability to perform and utilize a functional assessment; contribute to and, if appropriate, lead an MDT meeting being aware of the different roles, skills, approach and agenda of rehabilitation teams: understand the social perspective, relevant social work legislation and availability of care in the community]</p>
Neurosurgery	<p>Ability to evaluate the requirement for neurosurgical interventions in people with neurological disorders and to liaise effectively with the neurosurgeon [Understand the role of neurosurgery in the management of head injury, raised intracranial pressure, intracranial haemorrhage and ischaemic stroke, aneurysm, vascular malformation and tumours, spinal cord and root disorder and peripheral nerve lesions; understand the purpose, limitations, process and complications of biopsy procedures (brain, muscle, nerve); understanding of the principles of general and specific risks and complications of neurosurgical interventions]</p>
Uro-neurology	<p>Ability to evaluate, manage and or refer people with disordered micturition and sexual function due to neurological disorder [understand normal control of micturition and sexual function: differential diagnosis of causes of disordered micturition and</p>

	erectile dysfunction: understand hypo- and hyper-sexuality: understand treatment strategies for disorders of micturition and sexual function: ability to refer appropriately to [Urology, Genitourinary Medicine or Uro-neurologist]
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Revised Neurology HST APPENDIX 1

MINIMUM TRAINING TIMES WHICH MAY BE LONGER DEPENDING ON CONTINUOUS ASSESSMENT



- (a) F2 plus part of SHO training (BST) to provide Gen Med for Neurology (MRCP).
- (b) Training posts relevant to neurology may usefully be undertaken in BST 2/3 (SHO 2/3). Currently these **cannot** count towards HST though this may change in future.
- (c) Competitive entry to HST at HST 1 or 2 depending on previous training/research
- (d) Option of 1 year Fellowship/Module in subspecialty or related Speciality or 1 year Research
- (e) Dual accreditation