ANS RECOMMENDATIONS AND GUIDELINES FOR THE PRACTICE OF CLINICAL NEUROPHYSIOLOGY IN THE UNITED KINGDOM

Terms of Reference

The Association of Neurophysiological Scientists (ANS), as one of the Professional Bodies for Neurophysiology, has a responsibility to provide robust and reliable advice on professional standards and workforce issues. The purpose of this document is to review and update recommendations and guidelines for the provision of Clinical Neurophysiology Services in the United Kingdom. The use of this document is primarily aimed at Healthcare Scientists (Neurophysiology), in particular Service Managers. It will also be a useful reference document for commissioners and healthcare planners. The documentation will be of value in service redesign, the setting up of new services, commissioning new departments etc.

Introduction

Clinical Neurophysiology Service

Neurophysiology is primarily a diagnostic speciality. It provides diagnostic and other services to a wide spectrum of the patient population across acute, mental health and direct access including:

- Neurophysiology investigations of the central and peripheral nervous systems
- Provision of services to in-patients and out-patients in dedicated and non-dedicated environments.

Effective diagnostic services are essential to the provision of the 18-week referral to treatment target. This is particularly problematic to this small discipline which has been underdeveloped for some time. New and innovative ways of working will be key to achieving this goal.

http://webarchive.nationalarchives.gov.uk/+/http://www.dh.gov.uk/en/Publicationsandstatistics/Bulletins/Chiefnursingofficerbulletin/Browsable/DH_5913479

National Institute for Health and Care Excellence (NICE) guidance, National Service Framework (NSF) for long-term conditions, and Department of Health 18-week pathways targets, require Neurophysiological intervention above and beyond current provision, which will be extremely challenging, given waiting lists which already exceed guidelines, poorly developed services and a lack of appropriately trained staff.

Basic Minimum Standards

Range of services:

- **Investigations**
- **Interventions**
- **Advisory services**
- **Education and training**

Investigations:

Clinical Neurophysiology involves the measurement of electrical activity from the central and peripheral nervous system. The range of investigations commonly performed can be divided into 3 distinct areas:

1. Electroencephalography (EEG),
2. Peripheral Neurophysiology (PN) including Nerve Conduction Studies (NCS) / Electromyography (EMG)
3. Evoked Potentials (EP)

These are usually accessed in a dedicated, purpose-built environment, but can be performed - when appropriate - on wards, in theatres etc. A number of investigations are performed in each area (see tables for examples). Performance of the investigations consists of several components – planning, equipment selection & preparation, patient preparation, performing the investigation, analysis and reporting.

Neurophysiological investigations are inherently time-consuming and complex. The time varies from 30-45 minutes, for the simplest screening test for carpal tunnel syndrome (CTS), to several days for long-term monitoring for each patient. When compared with other diagnostic disciplines the throughput therefore tends to appear lower. It is essential, therefore, to describe the case mix appropriately in any demand/capacity exercise.

Electroencephalography (EEG)		
Type of EEG	**Inclusions / Exclusions / Examples**	**Time ****
Routine/Standard	Inc. Paediatrics over 3 yrs.	75-90mins
Paediatric	Under 3 (most) / Inc. baby sleep	140 mins +/- reporting time depending on difficulties encountered
Complex Outpatient	e.g. prolonged EEG	2-4 hours
Complex Inpatient	e.g. Status Epilepticus, drug monitoring	3-6 hours
Portable	On site	150 mins
Portable	Off site	4 hours
Sleep	Inc. sleep deprived, drug induced etc.	140 mins
Sleep	Overnight/day time	4-6 hours
Multiple Sleep Latency Test	4-5 opportunities to sleep throughout the day	8-10 hours
Polysomnography		6-7 hours
Ambulatory	Per 24-hour recording	2-5 hours
Cerebral Function or Long Term Monitoring	24hrs +	4-9 hours (per 24 hours)
Video Telemetry (VT)/Video Ambulatory	2-7 days	3.5 hours (per 24 hours)
VT for Epilepsy Surgery Work up	2-10 days	6 hours (per 24 hours monitoring)
Intraoperative Monitoring Procedures	e.g. Corticography, epilepsy surgery, endarterectomy etc.	8-12 hours
Magnetoencephalography (MEG)		Varies depending on local protocol
EEG functional Magnetic Resonance Imaging		Varies depending on local protocol
Dense Array EEG		Varies depending on local protocol
** *performing investigation, analysis and factual report*		

The International Federation of Clinical Neurophysiology (IFCN) in 2017 revised their glossary of terms for reporting EEG. The link to this is available below

https://www.cnp-journal.com/article/S2467-981X(17)30021-5/fulltext

In 2017 they defined the minimum number, position and nomenclature of scalp electrodes for standard recordings and discussed the yield of higher electrode numbers for special clinical questions. For further information see the link below:

https://www.sciencedirect.com/science/article/pii/S1388245717304832

Peripheral Neurophysiology (PN)		
Investigation Type	**Description**	**Time ****
Median/Ulnar	Screening	30-45 mins
Peripheral Nerves Upper/Lower Limbs	Screening	60-90 mins
NCS EMG	Simple	60 mins
NCS EMG	Complex e.g. Single Fibre	1.5-2.5 hours
Thermal Threshold		30-60 mins
*** performing investigation, analysis and factual report*		

Evoked Potentials (EP)		
Investigation Type	**Type / Inclusion**	**Time ****
Visual Pattern ERG Flash ERG	This may include central and half fields	60-90 mins
Brainstem Auditory		60-90 mins
Somatosensory	Upper	60-90 mins
Somatosensory	Lower	60-90 mins
Central Motor		60-90 mins
Dermatomal		60-90 mins
ERG	Flash/pattern	60-90 mins
Trans Magnetic Stimulation (TMS) Navigated Transcranial Magnetic Stimulation (nTMS)		45-90mins
Intra-Operative Monitoring, including SSEPs and TcMEPs	Scoliosis	4-12 hours
BSEP Operative Monitoring	Acoustic Neuromas, MVD	4-12 hours
*** performing investigation, analysis and factual report*		

Interventions and therapeutic involvement:

EEG / EP / Peripheral Neurophysiology		
Type	**Conditions**	**Time ****
Vagal Nerve Stimulation (Adjusting programming)	Epilepsy	90 mins
EMG Guided Botox	Muscular Problems	30-90 mins
Deep Brain Stimulation	Movement Disorder	8 hours
Motor Cortex Stimulation	Pain Relief	8 hours
One stop diagnose and treat	Carpal Tunnel Syndrome	1-2 hours
*** performing investigation, analysis and factual report*		

It should be noted that the timings for performing all investigations, analysis and factual reporting are for guide purposes and do not include the clinical report. Actual timings will vary depending on complexity and co-operation of the patient.

Advisory services:

Advice may be given as follows to:
Patients and carers - advice about tests, consent, contraindications etc.
Self-help and charity groups
Referring physicians, with regard to the appropriateness of referrals, and clinical advice, with regard to treatment
Other healthcare professionals, with regard to service development and multi-disciplinary working to enhance patient care
Other professional groups, regarding inter-disciplinary research
Senior management, on service planning and provision, e.g. equipment procurement, service redesign and service level agreements etc.

Education and training:

The introduction of Modernising Scientific Careers has seen a dramatic change in how people are trained with regard to scientific careers.

Apprenticeships
For latest information regarding apprenticeships see links below and also available in Appendix 4.

Practitioner Training Programme (PTP)
PTP is the undergraduate training scheme. This involves a 3-year full time Degree in Neuro-Sensory Health Care Science, with practical experience placements in the workplace in Neurophysiology, Audiology and Visual Science.

Accredited Specialist Scientific Practice (ASSP)
Post-Graduate certificate in Neurophysiology providing the Neurophysiology. This is designed to top up the PTP, to meet specific workforce needs in Nerve Conduction, as well as Paediatric and Intensive Care EEG.

Scientist Training Programme (STP)
STP is the postgraduate training scheme. This involves a 3-year part-time Masters in Neuro-Sensory Health Care Science, alongside employment with a Neurophysiology Department. This can be accessed as a direct entry student, or home grown within the department. It also involves practical experience placements in Audiology and Visual Science, Pathology and Medical imaging.

Higher Specialist Scientist Training (HSST)
HSST is now available for Neuro-sensory pathway. This consists of a 5 year Professional Doctorate aimed at developing extended roles for Physiologists and providing support for Consultant Neurophysiologists.

For up to date information regarding Healthcare Science training see:

Association of Neurophysiological Scientists Website: https://www.ansuk.org/careers/ The National School of Healthcare Science: https://www.nshcs.hee.nhs.uk/curricula
The National School of Healthcare Science Apprenticeships:

https://www.nshcs.hee.nhs.uk/news/item/361-new-healthcare-science-apprenticeship-programme

Training and supervision of Practitioner and Scientist trainees is an integral part of most services. It involves:
Qualified trainers and assessors, who teach trainees to develop the required skills at both PTP and STP levels and also for apprenticeship levels 2-6.
Mentoring and development of newly qualified graduate practitioners/scientists
Postgraduate clinical training of advanced techniques to appropriately developed Practitioners and Scientists.
Delivery of education to other healthcare workers, e.g. nurses, medical staff etc.
Participation in the delivery of education and training of specialist registrars within the field.
CPD - Continual Professional Development

Improving Quality in Physiological Services (IQIPS)

The IQIPS scheme is a professionally-led assessment and accreditation scheme that is designed to help healthcare organisations ensure that patients receive consistently high quality services, tests, examinations and procedures delivered by competent staff working in safe environments. IQIPS Standards are developed and owned by professional bodies.

For further information on IQIPS see the IQIPS website:

https://www.ukas.com/services/accreditation-services/physiological-services-accreditation-iqips/

The IQIPS standards in Neurophysiology are available via the following link.

https://www.ukas.com/download/iqips/Printable%20version%20of%20standard-%20Neuro.pdf

Access to services

Neurophysiology is a relatively small speciality. Service provision is primarily in secondary care, with some provision in mental health. Therefore, Neurophysiology services are not provided in all acute trusts and patients are required to travel, often long distances, to access these services, with very little local provision. Sources of referrals are usually from secondary or tertiary care, but some departments allow limited direct access from primary care. Recent developments, with regard to provision of service in the community, are particularly challenging for small disciplines and are not cost effective if delivery is multi-site in the bid to facilitate patient choice. Tension exists between ease of access to services and the need to achieve financial balance. Each Primary Care Trust (PCT) will need to develop plans to meet these often divergent requirements to suit their local population.

Waiting Time Standards
Within the 18-week referral to treatment pathway, it is suggested that diagnostics should be completed within 6 weeks of the referral date; this is defined from the raise date of the referral i.e. the date the request is written, to the actual attendance

Waiting Time Standards
To achieve this, it would be wise to anticipate a maximum wait of 6 weeks. Refer to the 18-week document for further information on the application of the 18-week rules: http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Publicationsandstatistics/Bulletins/Chiefnursingofficerbulletin/Browsable/DH_5913479

Referral pathways

There are several drivers currently impacting upon the patient pathways e.g. NICE guidance, National Service Frameworks (NSFs) and Delivering the 18-week Patient Pathway.

Examples of NICE guidance - CG 20 Epilepsy (Diagnosis of Epilepsy in Primary and Secondary Care) recommends initial diagnostics within 4 weeks
https://www.nice.org.uk/guidance/cg137
https://www.nice.org.uk/Search?q=Epilepsy

NSF for long-term conditions requires timely access to diagnostics for chronic conditions and, therefore, impacts upon a large proportion of the work carried out in Clinical Neurophysiology, with regards to subsequent management.
http://webarchive.nationalarchives.gov.uk/20130605080705/http://longtermconditions.dh.gov.uk/?p=954

Equipment:

Minimum requirements needed to provide the above services

Oxygen, suction, access to emergency equipment

EEG	
Number of channels	min 32 EEG
Polygraphy Channels	min 11
Sampling rate	min 512Hz
Sampling accuracy	min 16bit
Screen resolutions	min 1296 x 1024 up to 1920 x 1080
Sensitivity range	2–2000uV
Frequency band	0.3–128Hz
CMRR	min 110dB
Synchronised video capture and storage	FULL HD 1920x1080 low-light capable; Adjustable zoom
Adequate storage space on a server	1Terabyte (more if a lot of video will be stored)

EP	
Number of channels	min 5; optional 9 or 16 channels
Sampling rate	min 2048Hz per channel
Sampling accuracy	min 16bit
Screen resolutions	min 1296x1024
Sensitivity range	100nV–2mV
Frequency band	0.1–5000Hz
CMRR	min 100dB
Stimulators	Visual: chequerboard Auditory: click Somatosensory: Constant current electrical ERG: Ganzfeld Central motor: Magstim Thermal threshold: Peltier thermode

EMG/NCS	
Number of channels	min 1
Sampling rate	min 20KHz per channel
Sampling accuracy	min 16bit

Screen resolutions	min 1296x1024
Sensitivity range	2uV–20mV
Frequency band	10–10000Hz
CMRR	min 100dB
Stimulators	Constant current electrical

Department Size (Accommodation):

The recommendations for 'best practice' in this document have been compiled as consensus opinion after wide consultation with interested parties. Any published evidence base is provided where available.

This document is limited mainly to facilities where Clinical Neurophysiology investigations are performed. There are many factors that may influence the size and space required in a Clinical Neurophysiology department. These include type of hospital (e.g. District General Hospital, tertiary centre), patient throughput and range of services offered. This section will aim to make recommendations on what space is required for a Clinical Neurophysiology department to provide a professional and efficient service, taking into account environmental and health & safety issues. This does not mean that existing services are not fit for purpose if they do not comply with these recommendations.

Environmental

There are a number of environmental conditions that need to be met for patients, staff and equipment to operate effectively in the Clinical Neurophysiology. Door openings need to be wide enough to allow persons with mobility impairments to pass through, especially wheelchair users, and those attending from other hospitals/centres on a trolley/bed. Ideally, doors should be able to open both ways to maximise access and minimise the risk of a patient becoming trapped behind a door.

Health and Safety at Work Act (1974)
States general duties which employers have towards employees and members of the public, and employees have to themselves and to each other
Main requirement of the Act is that employers carry out regular risk assessments
Where applicable, any significant findings are recorded and appropriate actions taken

Health and Safety Guidance
Cables from diagnostic equipment should not be trailing across the floor
Extension leads should not be used under any circumstances
Computer workstations should be big enough to allow the user to arrange the screen, keyboard and documents in a flexible way
It is recommended that staff have regular eye tests due to the increasing use of VDU equipment
Workstation chairs should be available to allow the user to work comfortably and be fully adjustable
Workstation chairs should also be wipeable, without any tears for infection control purposes
Appropriately located sharps bins, in close proximity to user to avoid unnecessary movement minimising risk

Advice on any health and safety issues can usually be sought by Trust Health and Safety Departments.

Fire Safety
Fire Practice Note 105 provides guidance on the standards of fire safety for hospital laboratory facilities

Fire hazards in laboratories merit special attention, due to the presence of flammable substances and chemicals used in diagnostic procedures or cleaning/disinfection of equipment
Department managers are responsible for ensuring that fire safety policies and particular instructions are brought to the attention of all staff and observed by them
They should also ensure that all staff participate in mandatory fire safety training
Alarm and detection systems should be designed in accordance with the guidance in Fire code: HTM 826
Design and construction of all healthcare premises, including Clinical Neurophysiology departments, should ensure that fires are detected at the earliest possible opportunity and suitable warning is given to occupants and emergency services
Department/building design and construction should ensure that patients, visitors and staff can move away from a fire to a place of temporary safety on the same level, from where further escape is possible to a place of safety outside the building. This is called progressive horizontal evacuation.
Departments where beds and patient trolleys are being moved, the width of the circulation spaces required for these activities should be adequate for escape purposes
The width of escape routes should be determined by the number of people who would normally be expected to use them in an emergency
There should be two water extinguishers or extinguishers of an equivalent medium, of 9-litre capacity or the equivalent for every 400m2
Extinguishers using carbon dioxide (CO2) or other media should be provided as required
All electrical equipment should undergo annual electrical safety testing, and recorded appropriately

The Chief Executive has overall responsibility for fire safety in all premises used by the Trust. Advice regarding fire safety issues can usually be addressed by the Trust Fire Safety Prevention Officer. All staff have duties and responsibilities in fire safety.

Further information regarding Fire Safety and Precautions should be available from your Trust Fire Safety Prevention Officer.

Buildings Act 1984 Buildings Regulations 2000
Deal with building control in new and altered premises.
Ensure health and safety of people using building by providing functional requirements for building design and construction

The requirements of the Building Regulations are contained in a series of documents called “Approved Documents”, covering many areas, including fire safety, soundproofing, ventilation and access and facilities for disabled people.

Further details can be obtained from the following website
www.communities.gov.uk/planningandbuilding/buildingregulations

Space requirements
Clinical Neurophysiology departments should be fit for purpose self-contained units (with the exception of video-telemetry), with provision for patient reception, adequate clinical investigation rooms and analysis areas.
Individual rooms located on a variety of wards or corridors are not only wholly inadequate, but unsafe, preventing the provision of a high quality, efficient and patient-focused service.
Departments should be sited away from areas such as lift bays and Radiology departments, to ensure minimal contamination from electrical sources.
Clinical Neurophysiology departments must establish working practices that effectively deliver patient confidentiality, which is required by law, ethics and policy. Especially

important in departments where multiple patients may undergo investigations simultaneously.
Measures should be in place to ensure patient privacy and confidentiality is respected and maintained.
Patient records should be stored in a manner which ensures confidentiality and inhibits accessibility by members of the public.
Electronic records, whether on diagnostic equipment or hospital databases, should only be accessible by authorised and appropriate personnel.

Space Requirements
Size and space requirements required for Clinical Neurophysiology departments will vary, according to many factors, including type of hospital, patient throughput and range of services offered.
Workplace health, safety & welfare regulations suggest clinical rooms should have enough free space to move about with ease.
The volume of rooms, when empty, divided by the number of people working in them, should be at least 11 cubic metres. All or part of a room over 3.0 metres high should be counted as 3.0m.
Eleven cubic metres per person is a minimum and maybe insufficient, depending on the layout, contents and nature of work being performed. Moreover, rooms should be large enough to allow resuscitation procedures to be performed and for a stretcher or trolley to enter the room.

Check List
Is your working area too small?
▭ Inform your Manager and ask for their support in obtaining more space
▭ Ensure your area is free from clutter
▭ Can the room layout be changed to make better use of available space?
▭ Undertake regular Health and Safety risk assessments
▭ Review your departmental working practices (e.g. patient throughput etc.)
▭ Use this paper as a source of reference
▭ Seek advice and support from your Health and Safety Department and
▭ Resuscitation Officer, if applicable

Table of rooms/areas required
Clinical Areas*
EEG recording room(s)
EEG sleep recording room(s)
Video-telemetry room(s)
Evoked Potential room(s)
EMG/NCS room(s)
Review/Reporting room
Adult waiting area/reception area
Children waiting area/reception area (child safe and age appropriate)
Dirty Utility room (e.g. disposal of clinical waste/laundry etc.)
Office Space(s)
Toilets/access to toilets
Staff Restroom
Staff Changing Area/Locker rooms
Showering facilities
Training/CPD Area
Store room or appropriate storage/stationary area
Patient-related consumables store

Clean Utility room (e.g. separate room for electrode cleaning/sterilising – essential to separate from patient areas for appropriate infection control)

**Clinical areas required will depend on the level of Service Provision.*

See Appendix 1: Suggested layout for an EEG room

List of other factors for rooms

In addition to having sufficient space for patients and staff, Clinical Neurophysiology departments need to have sufficient space for the following:

EEG recording room(s)
Double doors, to allow admission of beds
Doors able to open both ways
Sinks, for cleaning equipment and for hand washing
Waste disposal
Storage space (e.g. clinical consumables)
EEG recording equipment
Oxygen and suction, resuscitation equipment
Preparation chair
Additional chairs for relatives/carers**
Beds/couch with cot sides
Preparation area/trolley
Windows with appropriate blinds, including blackout facilities for EP room (to enable multi use)
Adequate/adjustable lighting
Adjustable temperature/ventilation settings
Non slip/easy-clean flooring
Sufficient electrical outlets, appropriately sited and on the same phase
Emergency/panic alarm
Networking facilities
Electrical screening
Video/Audio camera facilities
Sufficient size to enable simultaneous video full field view and close up of patients whether located on bed or in chair (see diagram)
Security measures for patients and equipment

***The presence of friends, relatives or carers is often helpful in achieving a successful outcome when undertaking this investigation, particularly when dealing with children, the elderly, those with mental/behavioural disabilities, or for patients whose first language is not English.*

EEG Sleep recording room(s)

Sleep recording rooms should have an environment conducive to sleep. They should contain all the requirements identified for EEG recording room(s), but should have the additional:

EEG Sleep Recording Room
Separate sleep monitoring room to house the recording equipment
Glass partition between both rooms
Sound-proofing

See Appendix 2: Suggested layout for a sleep recording room

Video-telemetry room(s)

This should, ideally, be sited on a Neurology ward and include:
Double doors to allow admission of beds
Doors able to open both ways
Sinks, for cleaning patient and hand washing
Video-telemetry recording equipment, housed in lockable cupboard
Oxygen and suction, resuscitation equipment
Preparation chair
Additional chairs for relatives/carers
Bed with cot sides
Window
Adequate/adjustable lighting
Adjustable temperature/ventilation settings
Non slip/easy-clean flooring
Sufficient electrical outlets with UPS
Emergency/panic alarm
Networking facilities
Electrical screening
Video/Audio camera facilities
Security measures for patients and equipment
Additional monitor at nurses station and in the department
En-suite facilities
TV

Evoked Potential room(s)
Double doors to allow admission of beds
Doors able to open both ways
Sinks, for cleaning equipment and for hand washing
Waste disposal
Storage space (e.g. clinical consumables)
EP recording equipment, including VDUs / Stimulators
Equipment/facility to test Visual Acuity
Oxygen and suction, resuscitation equipment
Preparation chair
Additional chairs for relatives/carers
Beds/couch with cot sides
Preparation area/trolley
Windows with appropriate blinds
Adequate/adjustable lighting
Adjustable temperature/ventilation settings
Non slip/easy-clean flooring
Sufficient electrical outlets
Emergency/panic alarm
Networking facilities
Electrical screening
Security measures for patients and equipment
Height measuring equipment
Curtain screening for patient privacy whilst undressing

EMG/NCS room(s)

Should contain all the requirements identified for EP recording room(s), but with appropriate recording equipment.

See Appendix 3: Suggested layout for an NCS/EMG room

Review/Reporting room

Clinical Neurophysiology diagnostic equipment usually uses computers to display text, graphics and numbers.

Display Screen Regulations 1992
Dependent upon the amount of use, the Health and Safety (Display Screen Equipment) Regulations 1992 may apply, and give outlines of what employers and employees should do to comply
Regulations require employers to minimise the risk of VDU work, by ensuring that workplaces and jobs are well designed for their intended purposes

Workstations
Workstations should be considered when performing risk assessments. Poorly designed workstations may result in aches and pains in the hands, wrists, arms, neck, shoulders and back, especially after long periods of uninterrupted work
Such problems can often be avoided by good workstation design and good working practices

A Display Screen Equipment checklist is available: http://www.docs.csg.ed.ac.uk/Safety/ra/DSE.pdf, which helps to identify and address various risk factors (e.g. display screens, keyboards, furniture and work environment).

Further information regarding workstation design should be available from IT Departments or Occupational Health Departments.

Workforce:

The Workforce of a Neurophysiology department will normally consist of medical, scientific, support and administrative/clerical staff. The skill-mix and grading of staff will be dependent on the clinical workload.

The RCP recommends that one Consultant Clinical Neurophysiologist is required to serve a population of approximately 300,000.

Medical Consultant Clinical Neurophysiologist		
Consultant work programme for Clinical Neurophysiology		
Activity	Workload (Patients per PA)	Programmed Activities (PAs)
Direct Clinical Care		
Outpatient EMG Clinics	4-6 (depending on complexity)	2-5
Inpatient EMG	3-4 studies in the department, fewer if on ward	Up to 1
Supervision and Reporting of HCS NCS clinics	8-10 (4-5 per HCS clinic)	0-2
Reporting routine EEG	10-15 (depending on complexity)	1-3
Performing and reporting specialised tests e.g. video-telemetry or visual electrophysiology	1-5	0-3 (may be more in specialist centres)
Intra-operative procedures, e.g. evoked potential	0.5-1	0-4

monitoring, intracranial recording/ functional mapping		
Multidisciplinary team meetings		Up to 2
Total number of direct clinical care PAs		7.5 on average
Supporting professional activities (SPAs)		
CPD/appraisal/revalidation		1.5
Teaching/training		0-1
Service development, clinical governance, audit		0-1
Research		0-1
		2.5 on average
Other NHS duties		By local agreement
External duties e.g. for deaneries, royal colleges, Department of Health		By local agreement

Consultant work programme for Clinical Neurophysiology (Kennett and Kandler 2013)

For further information see:
Royal College of Physicians website - https://www.rcplondon.ac.uk/

RCP Medical Care - https://www.rcplondon.ac.uk/projects/outputs/medical-care-0

Below is a list of the roles and HCS Career Pathway Levels for scientific and support staff (Please note this is the career framework level and not Agenda for Change (AfC) banding):

Role / Applications		
Level	**Role Title**	**Work Activities**
2/3	Assistant & Senior Assistant practitioner	Assist with limited range of Neurophysiological procedures under the auspices of registered practitioner e.g. stock control, clinic room prep Chaperone, prepare patient for EMG, limb temperature adjustment, undressing etc.
4	Associate practitioner	Plan, prepare, perform and factually report on EEGs within a defined patient group and environment
5	Registered practitioner	Plan, prepare, perform and factually report on EEGs, CTS and routine VEPs within a defined range
6	Specialist practitioner	As above, plus 2-3 more advanced techniques. For example complex EPs, ambulatory monitoring etc. Teaching/training
7	Advanced Practitioner/Team leader	As specialist practitioner, plus 2-3 additional advanced techniques, and/or team leader responsibility Research & Development and/or clinical audit

8	Professional Service Manager or Consultant Practitioner	For professional service manager - As advanced practitioner, plus managerial responsibility for provision of service. Consultant practitioner – as advanced practitioner, plus responsibility for independent clinical interpretation of investigations and/or leadership of R&D projects; advice
9	Consultant Director	As consultant practitioner, plus strategic accountability for the planning and provision of services across a district/area/region. Responsibility for resources, staffing etc.

For more details Healthcare Science National Profiles:
http://www.nhsemployers.org/~/media/Employers/Documents/Pay%20and%20reward/Healthcare_Science_Generic.pdf

http://www.nhsemployers.org/your-workforce/pay-and-reward/job-evaluation/national-job-profiles

The profiles define the job titles and work activities for the Healthcare Science staff of a Neurophysiology department. Consultant work programmes will vary, according to hospital size and the specialist services provided, and the job plan will have to take into account local needs.

These roles have developed, and are further developing, which is anticipated in the DH document - Transforming Clinical Neurophysiology Services to Deliver 18 weeks – A good practice guide.

http://webcache.googleusercontent.com/search?q=cache:LKfTz0fbOswJ:www.bscn.org.uk/data/files/Links/Neurophysiology_goodpractice_230807.pdf+&cd=1&hl=en&ct=clnk&gl=uk

Viability and variety of service provision
There needs to be a reasonable critical mass of staff and workload to sustain a viable service. When considering this the following factors need to be considered:
Continual provision of high quality service delivered in a timely manner, including reporting (e.g. urgent same-day; routine 10 working days)
Appropriate CPD, audit and clinical governance (some of which should be external to trust, regional or national)
Cost effective provision of service, in terms of use of resources - appropriately utilised staff, equipment and facilities. The current potential for multi providers could have a destabilising effect on service provision, unless managed effectively by the purchasers
Recruitment, retention and training of appropriate staff
Appropriate model of high quality service to meet the needs of the local population:
i. Poly clinics
ii. Hub and spoke models
iii. Single DGH provision
iv. PCT provision
v. Tertiary provision
vi. Independent sector provision

Clinical Governance:

INFECTION CONTROL: MINIMUM GUIDELINES FOR CLINICAL NEUROPHYSIOLOGY DEPARTMENTS

All those in direct contact with patients have a responsibility to ensure that transfer of infection is kept to a minimum. This includes patient-to-patient, patient-to-staff, and staff to-patient transfer. The Guidelines, which can be found on the OSET website (www.oset.org), are designed to assist neurophysiology staff in achieving that aim.

OSET Guidelines
General Recommendations
Standard Precautions for Routine Procedures
Additional Recommendations for Specific Procedure/Investigations on Patients in High Risk Groups i.e. Human Immunodeficiency Virus (HIV), hepatitis B and Creutzfeldt-Jakob Disease (CJD)
Recommendations for use in operating theatre environment

Infection Control Strategy
Planned
Implemented
Monitored
Updated in accordance with current state of knowledge

Infection control practices for staff should be documented. Communication is critical in reinforcing infection control practices. It is important that patient care staff notify other staff about potential or actual infection risk situations. The process should be covered by a previously agreed protocol.

The requirements of local regulations need to be taken into consideration in drawing up the code, and departmental practices should be drawn up in consultation with the local infection control team.

The documentation should form part of an induction process, and on-going training should be provided to staff to enable them to understand and adopt the requirements detailed.

Infections can be transmitted by any of three routes:
Direct contact
Indirect contact
Airborne

Infection Control
Prevent contact and airborne transmission of infection
Ensure adequate cleaning of electrodes, equipment and hand hygiene
Minimise risk of airborne transmission by ensuring adequate room cleaning, good ventilation, appropriate handling of patients
Minimise risk of hospital acquired infection
Minimise risk to certain patient groups, or those cared for in specialised areas, who may be at increased risk. These include neonates and those who may be immunocompromised by disease or drug therapy

Similarly, patients in high dependency units (HDU), e.g. special care baby units, intensive therapy units, etc., are vulnerable because of the severity of their illness and the requirement for multiple invasive procedures and monitoring.

Recognition of these factors is an essential pre-requisite in minimising infection transmission.

The document makes recommendations for dealing with all of these risks, including the high risk groups such as Creutzfeldt-Jakob disease (CJD), Gerstmann-Straussler-Scheinker (GSS), Human Immunodeficiency Virus (HIV), and Acquired Immune Deficiency Syndrome (AIDS).

There are also specific recommendations dealing with Methycillin Resistant Staphylococcus aureas (MRSA) and botulinum toxin.

Recommendations
Standard precautions (as defined by NHMRC 1996 Infection Control in the Health Care Setting) are work practices required for the basic level of infection control. They include good hygiene practices, particularly: washing and drying hands before and after patient contact; the use of protective barriers, which may include gloves, gowns, plastic aprons, masks, eye shields or goggles; appropriate handling of sharps and other contaminated or infectious waste; and the use of aseptic techniques.

Cleaning and care of electrodes and other equipment:
All departments must have local infection control policies which specifically address the use, cleaning and sterilisation of equipment. These must be embedded within standard operating procedures (SOP)
It is preferable that disposable consumables (e.g. EMG needles, EEG / NCS, Dtl electrodes) should be used at all times (seek advice from local infection control departments)
Where this is not implemented, it is essential that all reusable electrodes are sterilised to an agreed protocol. **NB:** this includes NCS pads
Other potentially reusable patient contact equipment e.g. tape measures, NCS/EMG connecting leads, combs etc. all need to be cleaned / sterilised.
Other patient contact equipment and furniture e.g. head boxes, chairs, beds, trolleys, must also be cleaned/sterilised as appropriate.

Evidence based practice

Practice must be underpinned by SOP and protocols. These should be evidence based, bench-marked where possible, and be reviewed as part of a continuous audit cycle.

Below is a link to the clinical governance page in the members area of ANS website . This may be a useful resource when considering changing practice.
https://www.ansuk.org/members/clinical-governance/

Research, innovation and development
Clinical Neurophysiology departments should be encouraged to be involved in all of these areas:
Audits should be undertaken on a regular basis, with a view to improving patient outcomes and/or experience.
Research is strongly encouraged and, where undertaken, must be adequately costed and resourced. This includes the provision of additional personnel to either carry out the research or to back-fill the research work being carried out by existing post holder(s). Primary research proposals should be sufficiently robust to attract sponsorship and

overcome the complex ethical process.
It is recognised that not all departments can be involved with primary research for many reasons. However, a minimum requirement of any service is the expectation of continual assessment of service provision against national standards, bench-marked statements of best practice, and making changes that benefit and improve patient care.
Innovation may occur as a result of audit or research, but can also be driven externally e.g. government targets, new technology etc.
Development of new services or extending service provision should take place to meet the needs of the local population. This should be done through the presentation of a strong business case, utilising best practice or by emulating centres of excellence in other areas.

Summary

This document aims to assist in the planning, redesign and maintenance of clinical neurophysiology services in the NHS. It provides suggested models of service provision in terms of range of services, staffing, equipment and accommodation.

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NICE Guidelines for Epilepsy - http://www.nice.org.uk/guidance/index.jsp?action=byID&r=true&o=10954

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NSF for long term conditions - http://webarchive.nationalarchives.gov.uk/20130605080705/http://longtermconditions.dh.gov.uk/?p=954

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Websites

Association of Neurophysiological Scientists (ANS) www.ansuk.org

British Society of Clinical Neurophysiology (BSCN) www.bscn.org.uk

Building Regulations www.communities.gov.uk/planningandbuilding/buildingregulations

General Medical Council (GMC) website https://www.gmc-uk.org/education/index.asp

Improving Quality in Physiological Sciences (IQIPS) https://www.ukas.com/services/accreditation-services/physiological-services-accreditation-iqips/

National Institute for Health and Care Excellence (NICE) http://www.nice.org.uk

The National School of Healthcare Science: https://www.nshcs.hee.nhs.uk/curricula

The National School of Healthcare Science Apprenticeships: https://www.nshcs.hee.nhs.uk/news/item/361-new-healthcare-science-apprenticeship-programme

International Organisation of Societies for Electrophysiological Technology (OSET) www.oset.org

Royal College of Physicians http://www.rcplondon.ac.uk

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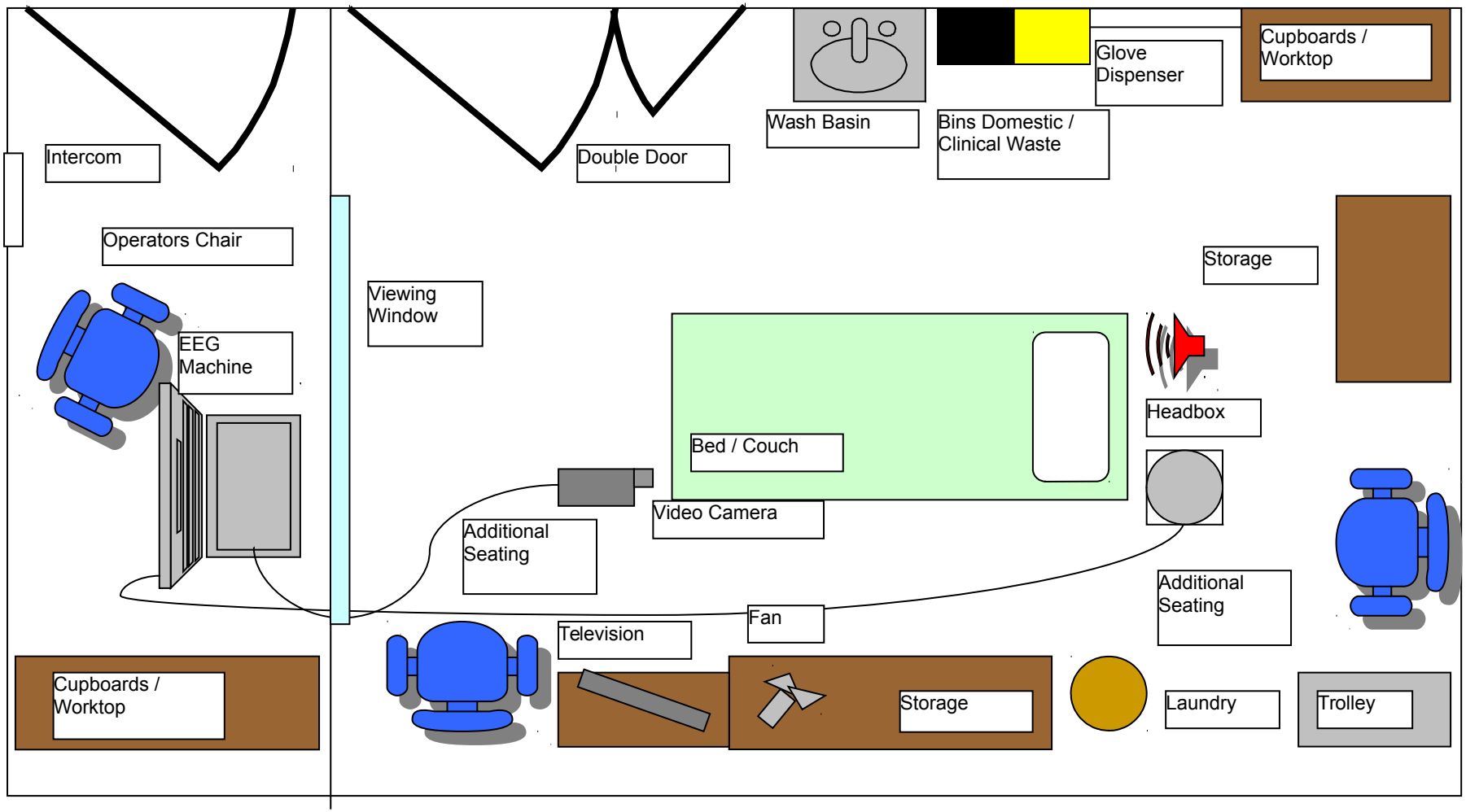
Thanks are also due to ANS Council members who kindly read and commented on the document

Micromed for guidance on machine specifications

Appendix 1: Suggested layout for an EEG room

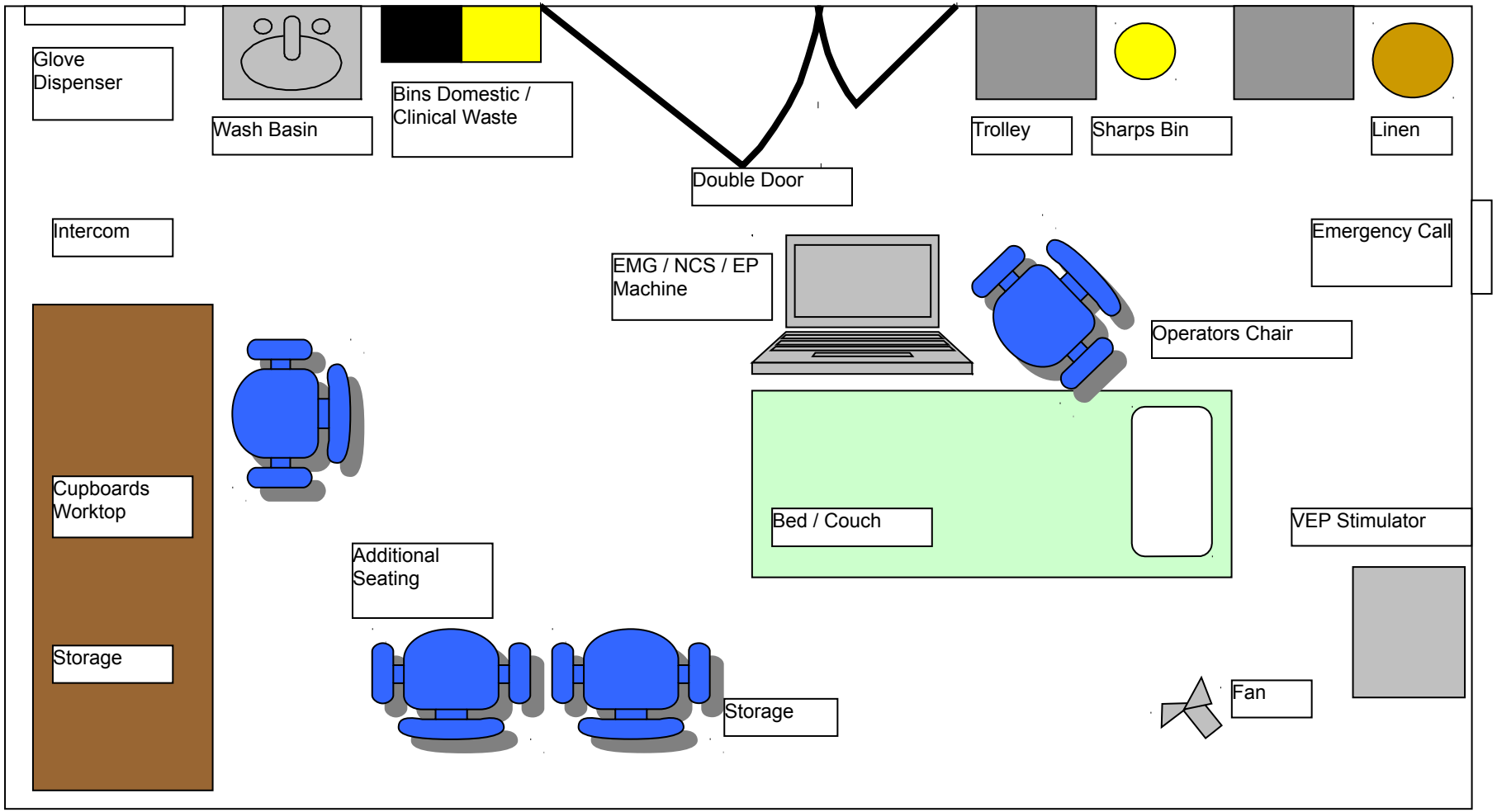
3.5m by 4 – 4.5m Approximate sizes

Appendix 2: Suggested layout for a Sleep Study room



3.5m by 6m Approximate size

Appendix 3: Suggested layout for an NCS/EMG room



5 – 6m 3.5m Approximate size

Appendix 4: Training and Education

For up to date information regarding Healthcare Science training see:

Association of Neurophysiological Scientists Website: https://www.ansuk.org/careers/
The National School of Healthcare Science: https://www.nshcs.hee.nhs.uk/curricula
The National School of Healthcare Science Apprenticeships:
https://www.nshcs.hee.nhs.uk/news/item/361-new-healthcare-science-apprenticeship-programme