



UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif

International non-profit organisation

RUE DE L'INDUSTRIE, 24
BE- 1040 BRUSSELS
www.uems.eu

T +32 2 649 51 64
F +32 2 640 37 30
info@uems.eu

European Training Requirements for Neurology

Updated Version October 2016

Introduction

Neurology is medical speciality dealing with the inborn, developmental and acquired, acute and chronic diseases of the central and peripheral nervous system and skeletal muscle at all ages. Neurology covers their diagnosis, the understanding of underlying mechanisms and management. Neurology is a constantly evolving field parallel to the development of the neurosciences and overlaps with numerous other medical specialties, in particular neurosurgery, psychiatry, clinical genetics, paediatrics, rehabilitation, internal medicine and public health.

European Union of Medical Specialists (Union Européenne des Médecins Spécialistes) (UEMS) commits itself to contribute to the improvement of medical training at the European level through the development of European Standards in the different medical disciplines. The European professional advisory organization for neurology is the Section of Neurology of the UEMS (UEMS-SN). It communicates with the executive Bureau of the UEMS and serves in the interest of the various national professional and scientific neurological societies of the European Union and associated countries.

The present update was realized with the input of the European Scientific Society for Neurology, the European Academy of Neurology (EAN) and its predecessors.

The aims of the UEMS-SN with regard to education and training are to ensure that minimal standards for the qualification of European neurologists are achieved in all European Union and other associated countries.

As a general recommendation to all in charge of neurological training at any level, the UEMS-SN encourages the application of modern principles of educational sciences.

Provides recommendations for the selection of the candidates to enter postgraduate neurology training and for the requirements for training institutions and for those who are in charge of training in neurology.

Recommends that training institutions should have a system of visitation/external peer review. The UEMS-SN recommends and updates standards for, and offers visitations of training institutions at a European level. Having successfully completed a visitation the institution

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

becomes an UEMS-SN accredited department for specialist training in neurology.

Holds a European Board Examination annually (<http://www.uems-neuroboard.org>). The examination is open to candidates world-wide. The examination is considered as an additional sign of excellence without legal value but national authorities can adopt it as equivalent to or instead of their national exam or accept it as an exit exam if no national equivalent exists.

Recommends standards on communication with patients, their carers, their associations and the general public and also on ethical issues to ensure a high level of professionalism in all aspects of a neurologist's activity.

This document also contains a core curriculum for European residents in adult neurology. The structure of this description follows the format as proposed by the UEMS.

The endeavor of this document is to promote high standards of care for patients with neurological conditions throughout the European Union and sets the basic requirements in the domains listed below to enable specialists to move across European country borders for professional purposes. The data that would be provided to a receiving country/employer about a doctor is shown in the Appendix at the End of this document.

Training and Lifelong Learning

Neurology is a compulsory part of pregraduate (university) training. Postgraduate training can be divided into specialist residency training and continuous medical education or CME/CPD. This document focuses on the postgraduate training (residency) of neurologists.

Undergraduate level

Neurology deals with acute and chronic diseases. Training in neurology must be an essential part of university curricula devoted to medical training. A minimum number of hours/credits and case evaluations should be part of the general medical training programme. At pregraduate level the major neurological diseases should be covered and teaching on basic history taking and clinical neurological examination should be included. Every university should have a clearly defined curriculum for neurology including teaching of clinical neurological examination.

Postgraduate level

Postgraduate neurological training comprises a minimum period of 4 years of clinical neurology and at least 1 additional year to be devoted to related disciplines and furthermore, there should be a lifelong participation in continuous medical education/professional development.

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

A neurology specialist is an individual who has undertaken successfully a recognized program of postgraduate training within neurology. The appointment as a neurologist is made by an institution within the individual's country of training and takes due note of satisfactory completion of training as required within that country as related to the domains of knowledge, clinical skills, experience and professional behaviors.

CME/CPD

Continuous medical education (CME) and continuous professional development (CPD) to keep updated with developments in diagnosis and management of neurological conditions as well as of global professional skills is an obligation of the accredited neurologist. Type, duration, content and monitoring of CME/CPD activity fall under the authority of national medical societies (in some countries government health bodies), which should consider the general recommendations of the UEMS. The UEMS provides European Accreditation of CME (EACCME) for international events according to defined quality standards.

It is recommended that trainees in neurology are introduced to CME/CPD during their postgraduate training period.

Competencies to be acquired in a post-graduate training in Neurology

It is widely accepted that properly going through a consultation process requires knowledge, skills and behaviour. These three abilities come together in the concept 'competency'. The current document summarizes knowledge and skills, attitudes are not yet explicitly defined, as they are for example in CanMEDs based curriculum descriptions.

The UEMS values professional competence as *'the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served'*.

General Aspects of training

In order to train the most suitable individuals for the medical speciality of neurology, selection principles should be set up on a national basis. The selection procedure must be transparent and application must be open to all persons who have completed basic medical training.

A total training time of 5 years including a minimum of 4 years of clinical neurology should be mandatory before achieving full registration as a clinical neurologist.

If the director of training agrees that neurology training can be followed part time, the total training time will increase proportionally.

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

The 4 years of training in clinical neurology should include acute, unselected and planned selected neurological admissions, emergency and intensive care and rehabilitation of neurological patients. Trainees should be exposed to balanced proportions of inpatients and outpatients with a wide spectrum of neurological diseases and have the opportunity to see patients for follow-up.

The training should comprise at least 6 months spent in an outpatient department. Training periods totalling up to 6 months spent in relevant clinical neuro-disciplines like paediatric neurology, emergency and neuro-intensive care, neuro-rehabilitation or neurosurgery can be considered as belonging to the 4 years of training in clinical neurology.

The additional 5th year (not necessarily chronologically last of the training period) of the total training time may be spent as described in the paragraph above, but also in other specialties such as neuro-radiology, clinical neurophysiology, psychiatry or research relevant for neurology leading to scientific publications.

The training and teaching instruments for the training programmes should be in line with the recommendations of modern educational science.

The quality of the training may benefit if it takes place in different institutions with rotations within one country or some time spent abroad, provided that all training institutions are nationally certified. The responsible authorities or training institutions should facilitate the rotations and ensure that the rotation system is useful for the trainee's curriculum and avoid unnecessary duplication.

The exact training curriculum is the prime responsibility of the national boards. The training programmes should be in line with the UEMS-SN recommended core curriculum, which undergoes regular updating.

The prime aim of the specialty training in neurology is the acquisition of broad neurological knowledge and skills. The development of a particular competence in a subspecialty area of neurology is to be encouraged and could be started during specialty training.

As neurologists are often involved in the long-term management of complex chronic disorders, trainees should get acquainted with the concepts of WHO's International Classification of Functioning, Disability and Health (ICF). This is important to be able to take the medical lead in the multidisciplinary team approach while respecting the specific role, knowledge and skills of the other professionals.

During the training period a continuous evaluation of knowledge, abilities and skills should be performed and the UEMS-SN recommends that the European Board of Neurology exit exam is taken after completion of the training period as a sign of excellence.

Requirements for Trainees

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Entry into the training programme for neurology depends on national regulations and should be transparent.

The number of trainees in national programmes should reflect the projected manpower needs in neurology. These depend on the organization of the national health care system and the demographics of the existing neurological manpower, which should be sufficient so that patients with neurological diseases have timely access to specialist care.

The trainee must have sufficient linguistic ability to be able to communicate with patients and colleagues. He/she should be able to work in the social and cultural context of the country in which he/she is based.

Adequate language, computer and internet skills are basic requirements for accessing and studying the international medical literature and communicating with foreign colleagues.

He/she must be able to communicate and work in an interdisciplinary setting.

Basic communication skills with patients and carers should have been acquired before entering specialty training and will be subject of continuous professional development. Experience with patient organisations is encouraged.

Basic knowledge of scientific methodology, skills in critical interpretation of study results and experience with current methods such as evidence-based medicine are required.

The acquisition of organisational skills and knowledge of local medico-legal issues, as well as ethical and palliative issues is encouraged.

Organization of training

1. Schedule of training

A duration of 5 years, with at least 4 years of core neurology training, is recommended.

The training period in neurology will be in keeping with EU requirements and is in any case sufficient to ensure that a trainee has met all the required educational and training needs. Specific arrangements for the overall training for any individual trainee would be decided locally and be influenced by relevant national requirements. The list of conditions shown below is a guide to the knowledge base required of a specialist/consultant. The clinical experience should encompass all common neurological clinical conditions as shown in this list.

At applying for a post in another EU country, the trainee should be able to show the curriculum he actually followed with details about the required nature and extent of

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

clinical experiences, the methods by which a trainee is supported in his/her development and how judgments are made about the progress as regards the development of knowledge and understanding, the progression of his/her clinical work and his/her development as a professional.

2. Curriculum of training

The curriculum is outcome focused but with sufficient flexibility to allow personal development distinguished by the needs of the individual, the centre in which he/she is training and the country where this takes place.

Training should include teaching skills for generic competences and neurology specific competences.

Thus, the curriculum would be based on the following principles.

A European Neurologist would:

- be a pluripotent specialist and a multi-system disease expert
- be competent in history taking, physical examination, management and continuing care of patients with common and a number of other neurological conditions
- communicate effectively with patients, their families and with professional collaborators
- be able to practice evidence-based care
- be able to practice cost-effective care
- understand the nature of and degree of risk taken in his/her clinical practice
- maintain the quality of his/her practice by being aware of personal developments
- undertake multi-disciplinary team (MDT) work
- provide clinical leadership
- provide ability to work as part of a multi- disciplinary team
- demonstrate a lifelong commitment to reflective learning
- promote the health and well-being of individual patients, communities, and populations
- have an understanding of specialty-based Public Health
- be able to teach and support trainees
- be committed to the health and well-being of individuals and society through profession-led regulation and high standards of personal behavior and clinical practice
- have a portfolio of evidence that he/she has achieved the above goals; especially should there be a wish to seek employment in a country different from the country of training.

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Different countries will have different approaches to achieve these outcomes but the evidence that they have been achieved should be increasingly of a homogeneous nature that facilitates the learning and experiences of trainees, the engagement of clinical supervisors and ease of recognition of progress and achievements across EU member countries. In addition, such an approach will help provide confidence to the public and to individual countries that the training has been of an appropriate standard and that the performance of doctors is likewise of a satisfactory standard.

3. *Support of trainees*

A trainer on location will supervise a trainee's clinical work. The trainer will be responsible for providing the trainee with regular feedback as regards his/her their performance and guidance in matters related to the clinical care that they are delivering.

Additionally it is recommended to link every trainee to a *mentor*, who will follow the trainee during the whole period of training for monitoring progress with help of a continuing portfolio and adjusting it if necessary.

All training programs in neurology will be led in an institution (or in a group or network of allied institutions) by a *Program Director*.

While actively cultivating traditional teaching such as regular grand rounds and weekly structured teaching sessions, training institutions should be proactive in introducing new training methods according to the modern principles of adult learning.

A programme of formal bleep-free regular teaching sessions to cohorts of trainees could include

- Case presentations
- Lectures and small group teaching
- Grand Rounds
- Clinical skills demonstrations and teaching
- Critical appraisal and evidence based medicine and journal clubs
- Research and audit projects
- Joint specialty meetings

Trainees will meet with their Program Director on a regular basis, which typically would be every six months, to discuss his/her work. Such discussions will take the format of an appraisal with the trainee providing information about how he/she is progressing, accompanied by documented evidence of clinical engagement and achievement of learning and training outcomes.

The purpose of the appraisal is to enable a constructive discussion about how the learning needs of the trainee should be met. Subsequent appraisals will revisit earlier appraisals to determine progress in achieving these needs. The appraisals are not part of any summative assessment process but are designed entirely to support the trainees.

4. *Assessment and evaluation*

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Training institutions should provide a system of appraisal – at entry into every part of the programme, at mid point and at the end. A structured goal setting for each training period according to the curriculum at its evaluation is recommended.

All trainees should keep a logbook to record their clinical activity – emergency admissions, ward work and outpatients seen. This ensures that the trainees and their supervisors can identify areas of the curriculum that have not been covered.

In addition it is recommended that the trainee documents the following structured assessments

- Mini CEX (observed clinical skills)
- DOPS (directly observed procedural skills, e.g. lumbar puncture)
- Case based discussions
- Multisource feedback (from colleagues, nurses and other professionals)
- Patient feedback from in- and outpatients

The minimal numbers per year of each of these items should be determined nationally.

An exit examination, delivered across Europe on a regular basis, should test knowledge in the areas of relevant science (basic medical and clinical sciences, public health sciences and behavioral sciences) and clinical practice (diagnosis, investigation and treatment) as described in this document.

Further testing in order to judge other competencies than theoretical neurology is recommended.

Clinical experience will be assessed by a review of the patients seen by a trainee and for whom the trainee has had a personal responsibility as regards care. Evidence of such engagement will be maintained in a clinical log-book or equivalent.

Professional behavior should be part of the assessment strategy, typically a 360-degree multi-source feedback (MSF) would take place at intervals to be defined locally.

The Program Director would be central to the discussion and reflection undertaken after each MSF and provide guidance and support in response to comments made by those providing the MSF to a trainee. The trainee could do additional MSFs if the initial MSF demonstrated a less than adequate performance. Local standards as regards an individual's suitability for clinical practice would determine whether or not a trainee was employable as a consultant/specialist.

Research. Trainees will be expected to develop an understanding of research methodology and to be able to evaluate publications. They should keep a record of the articles presented and ideally of their posters presented and their articles published.

In order to be eligible to apply for a post in a country other than the country of training or to be recognized as a European Neurologist all aspects of the above assessment approaches will need to be completed satisfactorily.

5. Governance

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

The governance of an individual's training program will be the responsibility of the Program Director and the institution(s) in which the training program is being delivered. A trainer will be responsible to the Program Director for delivering the required training in this/her area of practice.

Training requirements for trainers

1. Process of recognition as trainer

a. Required qualification and experience

A trainer would be a registered medical practitioner and as a neurology specialist/consultant within his/her own country. He/she will have satisfied any relevant national requirements as regards accreditation/appraisal/training to be a trainer. A Program Director would be someone who has been or still is a trainer and who has considerable knowledge and experience in training doctors. Trainers and Program Directors must be in active clinical practice and engaged in training in the training centre or network.

The director of training should be a (have been) practising neurologist for at least 5 years after specialist accreditation, have a sound practical knowledge of the whole field of neurology and must be recognised by the national monitoring authority. The medical staff acting as educational supervisors should be actively practising neurology and devoted to residency training.

Recognition across the EU as regards competence to be a trainer despite practitioners coming from different countries and having different routes and extents of training is covered by Directive 2005/36/ EC (Paragraph C2/20).

b. Core competencies for trainers

A trainer will be:

1. Familiar with all aspects of the overall neurology curriculum as it relates to practice within his/her country.
2. Experienced in teaching and in supporting learners.
3. Skilled in identifying the learning needs of the trainees and in guiding the trainees to achieve their educational and clinical goals.
4. Able to recognize trainees whose professional behaviors are unsatisfactory and initiate supportive measures as needed.
5. Trained in the principles and practice of medical education and follow regular updating in educational and team leader skills.

2. Quality management for trainers

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Trainers and Program Directors should have their job description agreed with their employer which will allow them sufficient time for support of trainees and in the case of Program Directors, sufficient time for their work with trainers. A trainer should not have more than four trainees. The number of trainees would determine the amount of time that would be allocated to their support.

Trainers will collaborate with trainees, the Program Director and their Institution to ensure that the delivery of training is optimal. They should meet at least twice a year with all trainees to openly discuss all aspects of training including the evaluation and approval of their log books and portfolios.

The educational work of trainers and Program Directors should be appraised annually within their Department/Institution.

Educational support of trainers and Program Directors will be provided by their Department and Institution and through the Section and Board of Neurology of UEMS.

Training requirements for training institutions

1. Recognition as training centre

a. Requirement on staff and clinical activities

A ‘Training Center’ is a place or number of places where trainees are able to develop their neurological competences. Such provision may include sites, which are condition specific and thus not offer a wide clinical experience such as that provided by a large centre.

Thus, neurology training may take place in a single institution or in a network of institutions working together to provide training in the full spectrum of clinical conditions and skills detailed in the curriculum. This should include a hospital or institution that provides academic activity and is also recognized for training in internal medicine and surgery. Each participating institution in a network must be individually recognized at national level as a provider of a defined section of the curriculum.

Within a training centre there would be a number of specialist/consultant neurologists (trainers) able to supervise and personally train a trainee. Whilst the trainer will not manage patients with all the diagnoses listed above, he/she will be able to ensure, by working with the Program Director and other local trainers that the clinical experience of the trainee will prepare them for clinical work as a specialist.

It is essential that as part of their training, trainees will be responsible for caring for patients on both an emergency and routine basis. This may need the

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

involvement of multiple training sites. The trainee should be involved in the management of new patients, the follow up of outpatients and inpatient care.

A trainee must have progressively increasing personal responsibility for the care of patients with neurological conditions and retain general medical skills to be able to identify in patients who present to a neurology service underlying clinical problems that are not neurological.

The staff of a training center will engage collaboratively in regular reviews of the center's clinical activity and performance. There will be regular multi-disciplinary meetings to determine optimal care for patients and such meetings will involve both medical and other healthcare staff. There will be clinical engagement outside of the centre with other clinical groups such as rehabilitation medicine, orthopedics, pediatrics, neurosurgery, immunology, cardiology, pneumology, geriatrics and rheumatology.

Within a training centre for neurology, there should be a wide range of clinical services available so that a trainee will be able to see and contribute to the care of all common neurological problems. In addition, the patient numbers and specialist numbers should be sufficient that trainees will be able to be instructed and supervised in the clinical procedures required for a specialist.

The balance between inpatient and outpatient numbers is constantly changing as neurology becomes more outpatient based. Thus, no specific in- or outpatient numbers are stated as being necessary to be seen by a trainee during their training.

Specialist staff members appointed to a training centre will have completed all training requirements themselves and will have been trained also in teaching and mentoring a trainee. Specialists already in post will undertake training, if they have not already completed this, to enable them to support trainees optimally. Such training and maintenance of skills and knowledge in this area will be part of their job-plan and subject to appraisal (see above).

It is recommended that a trainee will not have only one trainer during their entire training period. A trainee should have a number of named trainers with whom he/she works on a day-to-day basis. Each trainer would cover different aspects of a trainee's clinical training but this individual will not be the only person who will provide educational support for a trainee. (See above for comments about the Program Director and his/her role). In addition to medical staff supporting a trainee's development it is likely that non-medical members of staff will also be engaged. The specialists in a training centre probably represent a wide range of neurological expertise and have to demonstrate that they remain up-to-date with their clinical practice, knowledge and educational skills.

There is no specific trainee/trainer ratio that is required but it would be unusual for there to be less than three specialists in a training center or clinical network and for a trainer to have more than four trainees attached to him/her at any one

time. If a trainee moves between several centers for his/her training it is recommended that, whenever possible, although the trainers may change, the Program Director should remain the same.

It is not a requirement that a training center is also an academic centre for neurology but it is desirable that a training centre would have strong academic links and contribute to research.

b. Requirement on equipment, accommodation

A training centre would need to have sufficient equipment and support to enable the clinical practice that would be expected of a training centre and thus provide the necessary educational opportunities for trainees.

Trainees would have suitable accommodation for their work.

Computing and Information Technology and library resources must be available. All trainees must engage in clinical audit and have the opportunity to engage in research.

2. Quality management within training institutions

a. Accreditation

Training centers would be recognized within their own country as being suited for their task and for being suitable for the care of patients with a wide range of neurological conditions. It would be expected that training centers would be subject to regular review within their country and this would include data relating to the progress of trainees and their acquisition of specialist accreditation.

The UEMS-Section/Board of Neurology may recognize a neurology department/center as a European training center after successful completion of their procedure of a European appraisal.

b. Clinical Governance

Training centers should undertake internal audits of their performance as part of the requirements for continuing national recognition/accreditation. Any national evaluation of a training center's performance is expected to include the demonstration that it is:

1. Providing care for patients with a wide range of neurological conditions
2. Providing educational and training support for trainees and others
3. Part of a healthcare system that provides immediate access to relevant laboratory and other investigations as well as providing when necessary

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

immediate access to other clinical specialties that may be required by their patients.

Training centers should keep records of the progress of their trainees, including any matters relating to Fitness to Practice or other aspects that might affect a trainee's registration with the relevant national body. The Program Director has specific responsibilities in this regard.

c. Transparency of training programs

It would be expected that a training centre would publish details of the training provision available with details of the clinical service it provides and the specialist and other staff. Such information would include the training program, the nature of the clinical experiences with which a trainee would be engaged and the support and interaction with the trainer and Program Director. There would be a named individual whom a prospective trainee might contact and discuss the program.

To assist a neurology specialist from one EU country to another it would be expected that they have satisfactorily completed a training program in neurology thus demonstrating that he/she has the required knowledge, clinical skills and competences as well as having demonstrated appropriate professional behaviors and has been engaged with sufficient amount of clinical work for employment in the post they are seeking. Such accomplishments would be verified both by relevant documents and comments made by referees (Appendix).

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

1. General Competencies

To be appointed as a specialist an individual should show a level of competence sufficient to allow independent clinical practice and to be able to care for patients both in acute and chronic situations. Such a level of performance may vary from country to country and from post to post but the lists and competencies in this document describe the basic requirements one would expect of a ‘European Neurologist’

In addition to the knowledge and skills in practical procedures detailed below an applicant for a specialist post in Neurology would be expected to show evidence of having been personally and continuously involved with the care of patients with a wide a range of common neurological problems as possible.

A European specialist in Neurology should be well informed in research principles: principles and methods of epidemiological research, principles of clinical research, evidence-based medicine, data analysis and medical informatics, laboratory techniques, ethical aspects of clinical and basic research, critical appraisal.

A ‘European Neurologist’ would be expected to demonstrate professional behavior, in keeping with the requirements of his/her country’s medical registry/statutory body. A ‘European Neurologist’ would be in good standing with his/her relevant National Registration Body.

2. Specific Competencies

a. Theoretical and clinical knowledge

Knowledge of basic science includes:

- Anatomy and biology of the central and peripheral nervous system as well as of the musculoskeletal system.
- Immunology
- Neurobiology of pain
- Pharmacology
- Neurophysiology
- Genetics
- Neurochemistry
- Epidemiology
- Research methodology
- Ethics and Law

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

- Principles of Public and Global Health

Theoretical knowledge of Neurology includes the following aspects.

- Knowledge of specific clinical neurological topics as given in section A.
- Knowledge of (interpretation of) laboratory tests as summarized in section B.
- Knowledge to be shared with Other Specialties as described in section C. The separation from some of these neighboring specialties, especially pediatric neurology, may be different in various countries, therefore some items in section C may need a transfer to A and vice versa, according to the country under concern.
- Ability to face problems as described in section D.

These conditions define the basis of the core curriculum. By the time an individual is appointed as a specialist he/she would be expected to have the following armentarium:

- Knowledge and understanding of the relevant medical sciences, public health sciences, pathophysiology and principles of management and care of patients with any of the core clinical conditions
- Ability to indicate and interpret diagnostic testing: laboratory test, diagnostic imaging techniques, test performance characteristics.
- An understanding of the modes of action and potential adverse effects of therapies and experience in advising patients about the risks and benefits of such therapies.
- Ability to analyze and utilize research finding in neurology so that his/her clinical practice is, as far as possible, based upon evidence.
- Be able to provide evidence that the/she is maintaining his/her general medical as well as neurological knowledge at a sufficient level to ensure a high standard of clinical practice.
- An understanding of the healthcare system(s) within the country of training.
- Be prepared for his/her role as future clinical leader.
- Be able to be an effective member and a leader of a multidisciplinary team.

We will use here a subdivision of the curriculum in two phases, **with an** initial phase (the first 2 years) and an advanced phase comprising the remaining years of the curriculum.

The following levels are used:

Applied clinical knowledge

1. Knows of
2. Knows basic concepts

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

3. Knows generally (able to make a complete diagnosis)
4. Is competent to manage a problem and to play a role in the medical process as far as can be expected from a neurologist. Has knowledge on own capacities and limitations, ready for referral to other specialists.

These levels should be considered as minimal requirements for residents in neurology after 2 years and at the end of their training. Local habits may dictate modifications in this level-setting, especially where clinical neurophysiology and neuropaediatrics are concerned.

b. Clinical Skills

List of conditions: see Section E

Trainees should demonstrate competence of the required skills prior to being appointed as a specialist. In some countries specialists may be required to demonstrate the retention of such skills for reaccreditation purpose.

Again, we will use here a subdivision of the curriculum in two phases, to wit an initial phase (the first 2 years) and an advanced phase comprising the remaining years of the curriculum.

Applied clinical skills

1. Has observed or knows of
2. Can manage with assistance
3. Can manage whole but may need assistance
4. Competent to manage without assistance including complications, knowledge on own capacities and limitations, ready for referral to other specialists.

These levels should be considered as minimal requirements for residents in neurology after 2 years and at the end of their training. Local habits may dictate modifications in this level-setting, especially where clinical neurophysiology and neuropaediatrics are concerned.

A Specific Learning Objectives in Neurology

For all of the diseases in this paragraph the following issues should be considered

- Anatomy and pathophysiology
- Clinical semiology
- Clinical course
- Comorbidity
- Disability
- Epidemiology
- Radiological and neurophysiological aspects
- Psychological and behavioural aspects

and furthermore as far as relevant:

- Causes and environmental influences

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

- Pharmacological therapy
- Non-pharmacological interventions
- Diagnosis and management of treatment complications
- Rehabilitation
- Psychological care
- Genetics and counseling
- Primary prevention
- Secondary prevention

Applied clinical knowledge

1. Knows of
2. Knows basic concepts
3. Knows generally (able to make a complete diagnosis)
4. Knows specifically and broadly (competent to treat as far as possible) , knowledge on own capacities and limitations, ready for referral to other specialists.

Initial Advanced

1 Neuro-oncology

1.1	Intracranial tumors including the brain stem	2	3
1.2	Intracranial metastasis including leptomeningeal metastasis	2	3
1.3	Intracranial paraneoplastic syndromes <i>see also A5.6</i> Spinal cord <i>see A12.3, A12.9</i>	2	4

2 Neurological trauma

2.1	Head trauma without brain injury	3	4
2.2	Mild and moderate brain injury	3	4
2.3	Severe brain injury	2	4
2.4	Secondary neurological complications of brain injury	2	4
2.5	Intracranial hematoma including epidural, subdural, intracerebral	3	4
2.6	Decompression sickness (barotrauma)	2	3
2.7	Fractures of skull and skull base	2	4
2.8	Flexion-extension trauma of the neck Spinal cord trauma <i>see A12.1</i> Peripheral nerve trauma <i>see A14.3</i>	2	4

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

3 Problems with circulation of CSF

3.1	Hydrocephalus (including reversible types)	2	3
3.2	(Idiopathic) Intracranial Hypertension	2	4
3.3	Intracranial Hypotension	2	4
	Syringomyelia <i>see A12.4</i>		

4 Neurological infections

4.1	Acute and chronic meningitis	3	4
4.2	Cerebral abscess and epi/sub-dural empyema	2	3
4.3	Encephalitis, particularly Herpes Encephalitis	2	4
4.4	Spinal myelitis	2	4
4.5	Neuroborreliosis	2	4
4.6	Neurotuberculosis	2	3
4.7	Sexually transmitted infections including HIV/AIDS	2	3
4.8	Tropical infections	2	3
4.9	Prion diseases	1	3
4.10	Post-infectious neurological syndromes	1	4
4.11	Diseases caused by bacterial toxins (tetanus, botulism)	1	3

5 Immune mediated diseases

5.1	Multiple Sclerosis	2	4
5.2	Acute Demyelinating Encephalomyelitis (ADEM)	2	4
5.3	Neuromyelitis Optica	2	4
5.4	Vasculitis, anti-phospholipid syndromes	2	4
5.5	Sarcoidosis	2	4
5.6	Auto-immune encephalitis	2	4
	Transverse myelitis, <i>see A12.11</i>		
	Immunemediated peripheral neuropathies, <i>see A13.2 and A16.3</i>		

6 Neurovascular disorders

6.1	Ischemic stroke including Transient Ischemic Attacks	3	4
6.2	Cerebral small vessel disease	3	4
6.3	Intracerebral haemorrhage	3	3
6.4	Subarachnoid haemorrhage	3	3
6.5	Occlusion/dissection carotid and vertebrobasilar system	2	3
6.6	Cerebral vasculitis	2	4
6.7	Cerebral venous thrombosis	3	4
6.8	Hypertensive encephalopathy, posterior reversible encephalopathy syndrome.	2	4
6.9	Postanoxic encephalopathy	2	4
6.10	CADASIL	2	4

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

7 Epilepsies and other paroxysmal disorders

7.1	In adults	4	4
7.2	In children (see also section C)	3	4
7.3	Non-epileptic attacks simulating epilepsy	4	4
7.4	Cardiac and Reflex syncope	3	3

8 Sleep disorders

8.1	Narcolepsy	2	4
8.2	Idiopathic hypersomnia a.o. disturbances of the Sleep-Waking cycle.	2	3
8.3	Sleep Apnea Syndrome	2	3
8.4	Parasomnia and the differentiation of epilepsy.	2	3
8.5	Restless legs and periodic limb movements	2	4

9 Headache

9.1	Acute headache syndromes	3	4
9.2	New daily persistent headache	3	4
9.3	Tension type headache, chronic daily headache	3	4
9.4	Analgesic overuse headache	3	4
9.5	Migraine	3	4
9.6	Facial pain syndromes and trigeminal autonomic cephalalgias	3	4
9.7	Cranial Arteritis	3	4
9.8	Secondary headache (e.g. internal diseases a.o.)	2	4

10 Cognitive disorders

10.1	Neurocognitive disorders including Alzheimer, Frontotemporal lobar degeneration, Lewy body, Creutzfeld-Jacob Disease	2	4
10.2	Vascular neurocognitive impairment	2	4
10.3	Infectious disorders	2	4
10.4	Neurocognitive impairment associated with metabolic deficiencies, endocrine disorders and biochemical disturbances Auto-immune encephalopathies <i>see</i> A5.6	3	4

11 Neurodegenerative and Movement disorders

11.1	Parkinson's disease and Parkinsonism	3	4
11.2	Other dyskinesias, a.o. Huntington's Disease	3	4

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

11.3	Multiple system atrophy	2	4
11.4	Ataxias	2	4
11.5	Syndromes with spasticity, a.o. spastic paraplegia	2	4
11.6	Motor neuron disease	2	4
11.7	Leuco-encephalopathy, metabolic, adrenoleukodystrophy and other leukodystrophies, (i.e. Krabbe, metachromatic)	2	3

12 Spinal cord diseases

12.1	Spinal cord compression		
	- Cervical spondylotic myelopathy	3	4
	- Traumatic	3	4
	- In infectious diseases (tuberculosis, abscess)	2	3
12.2	Vascular problems		
	- Infarction, incl. anterior spinal artery syndrome	4	4
	- Hemorrhage	2	4
	- Vascular malformations	2	4
12.3	Spinal cord tumor (epi- and intradural, intramedullar)	3	4
	- Leptomeningeal metastasis	2	4
12.4	Syringomyelia	3	4
12.5	Nutritional deficiencies (a.o. B ₁₂)	2	4
12.6	Toxic myelopathies	2	4
12.7	Radiation damage	3	4
12.8	Paraneoplastic myelopathies	2	4
12.9	Transverse myelitis of unknown cause	2	4
	Demyelinating and immune-mediated diseases <i>see A5</i>		
	Spinal cord infections <i>see A4</i>		

13 Poly(radiculo)neuropathies

13.1	Hereditary	4	4
13.2	Inflammatory and infectious	2	4
13.3	Infectious neuropathies (incl. HIV)	2	4
13.4	Metabolic and Toxic	3	4
13.5	Paraneoplastic polyneuropathy	2	4
13.6	Idiopathic	2	4

14 Mono(radiculo)neuropathies

14.1	Radiculopathies		
	- Compression	2	4
	- Traumatic	3	4
	- Infectious	3	4
	- Tumor (e.g. neurinoma)	2	4

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

14.2	Plexopathies		
-	Compression	2	4
-	Traumatic	3	4
-	Infectious	3	4
-	Hereditary	2	4
-	Radiation	2	4
-	Associated with diabetes	2	4
-	Idiopathic	2	4
-	Tumor (e.g. neurinoma)	2	4
14.3	Mononeuropathies		
-	Compression	3	4
-	Traumatic	3	4
-	Infectious	3	4
-	Tumor (e.g. neurinoma)	2	4
-	Associated with systemic disease, e.g. diabetes, amyloidosis, hypothyroidism	2	4

15 Cranial nerve disorders

15.1	Neuro-ophthalmology		
-	Optic neuritis	2	3
-	Optic nerve ischemia	2	4
-	Optic nerve compression	2	4
-	Other optic neuropathies including hereditary (Leber)	2	3
-	Oculomotor disorders with a neuronal, muscular or neuromuscular junction origin	2	4
15.2	Neuro-otology		
-	Vestibular Neuritis	2	4
-	Vestibular migraine	2	3
	Benign Paroxysmal Positional Vertigo	3	4
-	Ménière's disease	2	3
-	Sensory deafness	2	3
15.4	Facial nerve disturbances	3	4
15.6	The trigeminal nerve and its diseases	3	4
15.7	Diseases of remaining cranial nerves	2	4

16 Myopathies

16.1	Congenital and hereditary myopathies, myotonias, muscle dystrophies, and channelopathies	1	2
16.2	Metabolic, endocrine and toxic myopathies	2	3
16.3	Inflammatory and paraneoplastic myopathies, incl Inclusion Body myositis	2	3

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

17 Myasthenias (Neuromuscular Transmission disorders)

17.1	Postsynaptic acquired	3	4
17.2	Presynaptic acquired	2	3
17.3	Congenital	1	2

18 Neurologic manifestations and complications of non-primary neurological diseases/conditions

18.1	Neurological complications of biochemical dysregulation	3	4
18.2	Neurological complications of pregnancy	3	4
18.3	Neurological complications of endocrine disease	3	4
18.4	Neurological complications of cardiovascular disease	3	4
18.5	Neurological complications of connective tissue disorders	2	4
18.6	Metabolic deficiencies	3	4
18.7	Alcohol and other substances abuse	3	4
18.8	Intoxications a.o. carbon monoxide	3	4
18.9	Complications of therapy a.o. chemotherapy	2	4
18.10	Mitochondrial diseases, Peroxisomal diseases	2	3

19 Disorders of consciousness

19.1	Metabolic coma	2	4
19.2	Coma in intoxications	2	4
19.3	Delirium	2	4
19.4	Pseudocomma	2	4
19.5	Locked-in syndrome	2	4
19.5	Traumatic coma <i>see A2.3</i>		
19.6	Vegetative state	2	4
19.7	Brain death	2	4
	Coma caused by intracranial space occupying lesions <i>see A1</i>		
	Coma caused by in vascular disease <i>see A6</i>		
	Coma caused by infections and auto-immune encefalitis <i>see A4 and A5.6</i>		
	Postictal coma <i>see A7</i>		
	Brain death and organ donation <i>see C3.14</i>		

20 Other diseases

20.1	Orphan diseases not previously mentioned	1	2
20.2	Neurological diseases related to occupation	2	4
20.3	Neurological diseases due to toxic exposures	2	3

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES
EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

20.4 Neurological diseases due to environmental factors 2 3

B Learning Objectives in Laboratory Investigations

Levels of knowledge

1. Knows of
2. Knows basic concepts
3. Knows generally (able to make a complete diagnosis)
4. Knows specifically and broadly (competent to treat as far as possible) , knowledge on own capacities and limitations, ready for referral to other specialists.

	<u>Initial</u>	<u>Advanced</u>
1. General laboratory knowledge		
1.1 Interpretation of laboratory data of blood, CSF and other bodyfluids or –tissue as relevant for neurology	2	3
1.2 Investigation techniques on CSF.	2	2
2. Neurophysiology		
2.1 Electroencephalography		
2.1.1 Basic concepts, recording, technical problems	2	4
2.1.2 Interpretation, limitations and normal findings at different ages.	2	3
2.1.3 Optional special techniques: video EEG, telemetry, polysomnography and multiple sleep latency, depth recording and cortical mapping.	1	1
2.2 Nerve conduction tests, thermal thresholds.	2	3
2.2.1 Reflex techniques (H-, F-, C-responses)	2	3
2.3 Electromyography and SFEMG	1	2
2.4 Evoked potentials.	1	2
2.5 Magnetic stimulation.	1	2
2.6 Autonomic function tests	1	2
3. Imaging		
3.1 Basic principles, techniques, limitations in neuroradiology including CT, MRI, SPECT and PET scanning.	2	3
3.2 Vascular investigations: Digital, MR and CT angiography.	2	2
3.3 Interventional neuroradiology.	1	2
3.4 Extra and transcranial Doppler/Duplex.	2	2

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

3.5	Nerve and muscle ultrasound	2	2
3.6	Indications, cost, value and risks of different investigations.	2	4
3.7	Reading CT/MRI for acute intervention in vascular disorders	3	4
4. Neuropathology (CNS, Spinal Cord, Nerve and Muscle)			
4.1	Gross and microscopic pathology.	3	3
4.2	Knowledge on techniques for brain fixation and cutting, and on staining methods including immunocytochemistry, electron microscopy.	1	2
4.3	Indications for and limitations of different techniques and correct interpretation of information obtained from biopsy, surgical and autopsy material.	1	2
4.4	Knowledge on forensic neuropathology.	1	1
5. Genetics			
5.1	Molecular genetic principles	2	3
5.2	Neurogenetic modes of hereditance: see specific diseases	2	4
5.3	Neurogenetic diagnostics: see specific diseases	2	3
6. Pharmacology			
6.1	Ability to apply knowledge on Pharmacodynamics and -kinetics	3	3
6.2	Knowledge on interactions of drugs in neurology	3	4

C Interdisciplinary aspects

The value of items in this section is dependent on local habits. This holds especially for the relation between neurology and neuropaediatrics, which differs in several countries. Nevertheless it will be important for each neurologist to be familiar with many topics in neighbouring specialisms, to be able to communicate and collaborate, and to warrant a proper transition for patients moving from one specialism to another. Also here the relation between neurology and neuropaediatrics is to be regarded. Neuropaediatric patients passing the limit between puberty and adolescence will be confided to the care of neurologists and this transition should be as smoothly as possible.

The ability to provide a smooth *transition* and optimal *collaboration* should be a key competency in this section, both for trainees as for neurologists.

Levels of knowledge

1. Knows of
2. Knows basic concepts
3. Knows generally (able to make a complete diagnosis)
4. Knows specifically and broadly (competent to treat as far as possible), knowledge on own capacities and limitations, ready for referral to other specialists.

Initial Advanced

1. Knowledge and skills concerning pain conditions

1.1	Understanding the scope of a pain problem and the assessment of quality of life, being able to outline a diagnostic work-up and treatment plan of a pain problem.	2	3
1.2	Usage of definitions of pain, nociception, allodynia, hyperalgesia, neuropathic pain, nociceptive pain.	4	4
1.3	Pain-neurological examination, specific diagnostic tests.	4	4
1.4	Assessing pain intensity and pain relief.	3	4
1.5	Pharmacology of opioids and management of side-effects. Principles of addiction, tolerance and physical dependency.	3	4
1.6	Management of neck and low back pain	3	4
1.7	Management of central pain	3	4
1.8	Understanding the principles of palliative care medicine.	3	4
1.9	Understanding diagnostic properties and indications of interventions such as sympatholytic blocks, nerve and root blocks, provocative discograms.	2	3
1.10	Pain management in paediatrics and geriatrics.	2	3

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

2. Neurorehabilitation

2.1	Making functional assessment and outcome measures	2	3
2.2	Working in an interdisciplinary rehabilitation team.	3	4
2.3	Knowledge about the use of orthotics, wheelchairs and other forms of adaptive equipment.	2	3
2.4	Knowledge of restorative neuropharmacology.	2	3
2.5	Management of chronic problems as spasticity, and other gait difficulty, chronic pain, neurogenic bowel and bladder disturbances, cognitive and behavioural disorders, depression, eating and swallowing problems, sexual dysfunction.	2	3
2.6	Knowledge on prevention of complications of persistent disability, e.g., contractures, pressure ulcers, deep venous thrombosis.	2	3
2.7	Develop particular familiarity with the role of rehabilitation for common debilitating neurological disorders.	2	3
2.9	Palliative Care (depends on country).	2	3/4

3. Neurosurgical aspects

3.1	Knowledge of indications and limitations of neurosurgical treatment.	2	4
3.2	Ability to manage the acute neuromedical problems that can arise following neurosurgery.	2	4
3.3	Knowledge of correct indications for and harvesting of central and peripheral nervous system biopsies.	2	4

4. Psychiatric aspects

4.1	Basic skills in taking a psychiatric history and evaluating psychiatric symptomatology (including mental status) as far as relevant for neurology.	2	3
4.2	Knowledge of common psychiatric symptoms as derealisation, hallucination, anxiety-symptoms.	2	3
4.3	Knowledge of the common psychiatric disorders - acute and chronic, especially those related to alcohol and other substance abuse, other intoxications (drug overdose, medication, water), dementia, epilepsy and delirious and other confusional states.	2	3
4.4	Understanding of somatization disorders, including conversion disorders and somatically unexplained problems	2	3
4.5	Perceive suicidality	2	3
4.6	Skill in the use of the common psychoactive drugs, their		

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

indications, contraindications and (especially neurological)
side effects 2 4

5. Neuropaediatric aspects

5.1	Knowledge of normal child development – gross and fine motor, language, cognition and behaviour.	2	3
5.2	Understanding family psychological responses to neurological illness in childhood	2	3
5.3	Knowledge of malformations and neurocutaneous syndromes	2	3
5.4	Knowledge of hereditary metabolic disorders	2	2
5.5	Knowledge of developmental disorders: Autism, ADHD, dyslexia, obsessive compulsive, developmental coordination and conduct disorders	2	3
5.6	Knowledge of common types of cerebral palsy, antecedents, presentation and management.	2	4
5.7	Knowledge of genetics and ability of genetic counseling Childhood epilepsy, <i>see</i> A7.2	2	3
5.8	Knowledge of childhood neuro-oncology and late sequellae or complications of treatment	2	3
5.9.	safeguarding vulnerable children, child abuse and non-accidental injury	2	3

6. Neurological aspects in the very old

6.1	Understand special challenges of clinical assessment of the elderly.	2	4
6.2	Differential diagnosis of common geriatric problems such as visual and auditory disturbances, delirium, depression, dementia, weakness, falls, and transient losses of consciousness.	2	4
6.3	Maintaining functional abilities, and illness prevention in the case of limited resources	2	4
6.4	Palliative Medicine Care	2	4

D Problems to be recognized and addressed

The following problems should be recognized and appropriately addressed.

There is no definition of levels of knowledge or skills but the neurologist should be able to work-up each problem with an appropriate differential diagnosis for a treatment plan, or a referral to another specialist.

1. (Sub)Cortical problems

Aphasia (expressive, receptive, conduction, transcortical, aprosodia, etc)
Apraxia (ideomotor, ideatory, dressing, constructive, miction, ocular, gait-, limb kinetic -)
Agnosia (visual, auditory, prosopagnosia, tactile, pure word deafness, etc)
Acalculia
Alexia, Agraphia
Amnesia
Anosognosia
Problems with judgment
Problems with decision making
Dementia
Memory disturbances
Migrainous Aura
Epileptic Aura
Déjà vu, déjà vécu
Extinction phenomena
Mutism
Specific syndromes (e.g. Dejerine, Gerstmann, Balint, Anton, Bonnet, etc)

2. Cranial nerves and Brainstem syndromes

Dysosmia
Dysgeusia
Diplopia
Disturbance of gaze and external ophthalmoplegia
Nystagmus, ocular oscillations a.o. conjugated eye movement disorders
Internuclear Ophthalmoplegia
Vision loss, incl. amaurosis fugax
Visual field defects
Metamorphopsia
Abnormalities of the optic nerve
Eyelid abnormalities, Ptosis
Pupillary abnormalities
Facial weakness
Chewing problems

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Tongue weakness/atrophy/fibrillations/apraxia
Dysphagia and swallowing problems (*see also E6*)
Dysarthria (*see also E6*)
Hiccup
Hearing loss, tinnitus
Sensory disturbances in the face
Vertigo, dizziness

Horner's syndrome
Parinaud's syndrome
One-and-a-half syndrome
Brainstem stroke syndromes

3. Pain and discomfort

Headache
Meningism
Facial pain
Neuropathic pain
Central pain
Neuralgia
Cramps
Itch
Complex regional pain syndrome
Arm Pain, Neck Pain
Lower Back Pain, Leg Pain.
Claudicatio

4. Muscle problems

Weakness (proximal, distal, generalised, bulbar, respiratory)
Atrophy
Hypertrophy
Myotonia
Hypotonia (*see also D6*)
Muscle pain/myalgia
Cramps
Fasciculations/myokymia
Fatigue/exercise intolerance/decreased stamina
Polymyalgia rheumatica

5. Sensory problems

Numbness, paresthesia, hyperpathia, hypesthesia
Proprioception, vibration sense, stereognosis

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Disturbances of feeling with dissociation of deep and vital sensory functions
Spinal cord syndromes (Brown-Séquard, central cord, conus/cauda-syndrome, etc)

See also: D3. Pain

6. Movement problems

Gait disturbances

Falls and Drop-attacks

Spasticity

Rigidity

Hemiplegia, Monoplegia, Diplegia, Paraplegia

Hypotonia

Hypo-, hyperkinesia (incl. Chorea)

Dyskinesia (including ballism, tardive -, tics, etc.)

Dystonia (including blepharospasm, torticollis, writer's cramp, oculogyric crisis)

Myoclonus

Tremor

Ataxia

Akathisia

Cataplexy

Psychogenic movement disorders

Motor Impersistence and Perseveration

Apraxia, *See D1*

7. Disturbance of consciousness

Seizures

Psychogenic non-epileptic seizures

Syncope

Fainting

Delirium

Perceptual disturbances (including hallucinations, delusions, derealisation)

Coma

Confusion

Disturbed Sleep-Wake Cycle

Parasomnia

Attentional deficits

Vegetative state

8. Autonomic problems

Positional tension problems (orthostasis etc)

Sexual disturbances

Sweating disturbances

Neurological bladder dysfunction

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

Neurological bowel dysfunction
Trophic disturbances
Complex regional pain syndrome
Palpitations

9. General symptoms

Fatigue
Nausea
Fever
Depression
Addiction

10. Other Problems

Developmental Delay
Behavioural disturbances
Personality disturbances
Depression
Somatically unexplained complaints
Safeguarding vulnerable children, child abuse and non-accidental injury

E Skills in Neurology

Levels of skills

1. Has observed or knows of
2. Can manage with assistance
3. Can manage whole but may need assistance
4. Competent to manage without assistance including complications, knowledge on own capacities and limitations, ready for referral to other specialists.

Initial Advanced

1. Diagnostic Skills

1.1	Adequate history taking	3	4
1.2	Adequate communication e.g. breaking bad news	3	4
1.3	Reliable neurological examination and cognitive screening	4	4
1.4	Lumbar puncture	3	4

2. Interventional Skills

2.1	Parenteral application of Botulin Toxin and Spasmolytics.	1	2
2.2	Control of neurostimulators	1	2
2.3	Acute intervention in stroke	3	4
2.4	Handling PEG-catheters	2	2
2.5	Control of shunt function	2	3
2.6	Local anesthesia	1	2
2.7	Application of drugs into the ventricular system	1	3

3. Skills in center intensive care and emergency neurology

3.1	Management of raised intracranial pressure and CSF pressure	2	3
3.2	Management of coma and post coma states	2	4
3.3	Management of cerebrovascular disease and complications	3	4
3.4	Management of status epilepticus	3	4
3.5	Management of severe brain injury / use of coma scales for monitoring.	3	4
3.6	Management of life threatening neuromuscular diseases	2	3
3.7	Management of intracranial infections (meningitis, encephalitis)	3	4
3.8	Management of malignant hyperthermia, rhabdomyolysis	2	3

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif – International non-profit organisation

3.9	Management of hypoxic brain damage	2	3
3.10	Respiratory support and Artificial ventilation.	2	3
3.11	Monitoring of homeostasis and management of metabolic problems	2	3
3.12	Cardiovascular support.	2	3
3.13	Psychological care for ICU patients and relatives.	3	4
3.14	Diagnosis of brain death, dealing with organ donation	3	4

Appendix **Data to be provided to a receiving country about a doctor.**

Record of clinical work and clinical skills

Many trainees already keep a record or have a record kept automatically of patients for whom they have provided care. It is not proposed as a requirement of becoming a European Neurologist that any additional record should be kept but when a doctor seeks to gain employment in an EU country other than his/her own (or the one in which he/she has been trained) he/she will be required to provide access to appropriate records (logbook) demonstrating the extent and nature of his/her clinical experience and skills to a future potential employer and any other relevant body (for example a statutory medical body that grants employment rights within a country).

Independent confirmation of progress of a trainee (or of work as a specialist)

Doctors seeking to gain employment in a country other than their own or the country in which they have been trained will be required to provide references that provide details about:

1. The curriculum that the trainee has followed
2. The nature of assessments completed by the trainee and the outcomes of any assessments undertaken by him/her
3. The outcomes of assessments of a trainee's professional behaviors
4. The good standing of the trainee
5. The nature of the quality assurance processes by which it is known locally that the quality of the curriculum and its delivery are satisfactory
6. As regards a specialist seeking to work in another country, references will be required to contain confirmation regarding an individual's clinical experience and good-standing, including outcomes of any assessments of professional behaviors.