

# **European Paediatric Neurology Training Programme**

**FIRST REVISION 5 JANUARY 2009/ O. F. Brouwer and L. Palm**

Approved by The European Paediatric Neurology Society and by the European Committee of National Advisers.

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## **1. Introduction**

Paediatric Neurology has been practised in Europe for more than 60 years. In some countries paediatric neurology has been recognised as a separate speciality. Although the majority of paediatric neurologists have come from general paediatrics, in certain member states adult neurology is the usual route of entry to the speciality.

This syllabus describes the European training programme in paediatric neurology. It is regularly reviewed and updated. The first version of this document was approved in November 2002 by The European Paediatric Neurology Society and by the European Committee of National Advisers (comprised of representatives of National Paediatric Neurology Societies in Europe) and by the Sections of Paediatrics and of Neurology of the Union of European Medical Specialists in December 2002 and March 2003 respectively.

### **1.1. Definition of paediatric neurology**

Paediatric neurology is the medical discipline devoted to normal and abnormal development of the central nervous and peripheral neuromuscular systems from foetal life up to and including adolescence. It involves the diagnosis, treatment and research into diseases of these systems and the comprehensive management of the consequent disabilities.

### **1.2. Aims of this training programme**

- To improve the care of children with neurological disorders and the support that medical services are able to give to parents/ carers, associated medical professionals and other disciplines involved in child health and welfare.
- To establish clearly defined standards of knowledge and skills required to practice paediatric neurology at tertiary level.
- To ensure that research is developed and encouraged within paediatric neurology.
- To harmonise training programmes in paediatric neurology between different European countries and to support a high standard of practice of paediatric neurology in Europe.

## **2. Training content**

Specialist training of doctors in paediatric neurology involves several elements of which a factual syllabus can cover only parts:

- i) A base of knowledge about normal and abnormal neurological function in childhood.
- ii) Direct personal experience of the clinical assessment and management of a wide range of paediatric neurological diseases.
- iii) The training should take place in fully equipped departments, which are subject to regular inspection by the national training authority.

- iv) Arrangements for obtaining widened experience in paediatric neurology at other hospitals must be made within the individual training programmes where specific equipment and experience is not available at the main site of training.
- v) There are strong psychosocial and multi-disciplinary elements to the practice of paediatric neurology. It is important that these dimensions are included in the training of paediatric neurologists.
- vi) A period of research is not obligatory in the training programme but is strongly encouraged. It is important that there are systems in place whereby selected trainees can engage in research.

## 2.1 Knowledge of paediatric neurology

### A *Basic fields of paediatric neurology*

The knowledge base should be at least at the level of major current textbooks of paediatric neurology.

- i) Detailed information on normal and the common patterns of abnormal development.
- ii) Principles of antenatal brain development, both normal and abnormal.
- iii) Neonatal neurology: acute and chronic neurological illness presenting in the neonatal period.
- iv) Epidemiology, aetiology, pathogenesis, pathology, clinical features, treatment and outcome measures for:
  - a) Neurological diseases in childhood including metabolic disorders.
  - b) Genetic and acquired disabling neurological conditions of childhood.
  - c) Developmental delay (mental retardation), learning disability and specific learning difficulties, language and complex communication disorders.
- v) Natural history and manifestations of the common behavioural abnormalities of childhood (autistic spectrum disorders, attention deficit/hyperactivity, obsessive compulsive disorder, oppositional behaviour, depression, anxiety, adolescent psychosis and anorexia nervosa)
- vi) Neurological emergencies in childhood, e.g. presenting with status epilepticus or coma.
- vii) Neurosurgical diseases of childhood including disturbed cerebrospinal fluid circulation.
- viii) Inter-relationship of neurological diseases with other body systems including growth and nutrition, feeding difficulties, gastro-oesophageal reflux and aspiration.
- ix) Paediatric orthopaedics, orthotics and bioengineering in the clinical setting.
- x) Genetic issues including taking a pedigree, recurrence risk, prenatal diagnosis, gene localisation, imprinting and the principles of molecular genetics.
- xi) Prevention in paediatric neurology (accident prevention, abuse of psychoactive drugs, immunisation programmes). The national legislation on child protection.

*B Diagnostic measures*

- i) Prenatal diagnosis as it relates to neurological disorder.
- ii) Biochemical and neurometabolic investigations relevant for neurological disorder in children.
- iii) Methodology of genetic and immunological investigations relevant for neurological disorders.
- iv) Tissue biopsy: interpretation of histological abnormalities.
- v) Methods in neuroradiology, neuropathology and clinical neurophysiology as well as techniques to monitor nervous system function and intracranial pressure.
- vi) Relevant psychological tests and ability to interpret a test report.
- vii) International Classification of Function, Disability and Health (ICF).

*C Therapy*

- i) Current treatment plans and newly developing therapies for all forms of neurological disorder.
- ii) Neuropharmacology
- iii) Principles underlying habilitation and rehabilitation of children with neurological impairments.
- iv) Principles of management of behaviour disorders including pharmacotherapy, counselling and psychotherapy.
- v) Aids used in treatment and habilitation; hearing and vision aids, seating, mobility aids, orthoses, communication aids, computers, ventilatory assistance etc.
- vi) Nutritional and gastrointestinal aspects.
- vii) The range and potential consequences of unconventional and alternative therapies.

*D Multi- and interdisciplinary care*

- i) Responsibility of the paediatric neurologist in a team approach to the management of neurological disorders and disabilities, including occupational-, speech- and language-, and physio-therapists, nurses, dieticians, psychologists, teachers and social workers.
- ii) Methods used by other medical and paramedical specialists.
- iii) Community based care of children with neurological impairments
- iv) Educational provision for children with neurological impairments.
- v) Transition of care from children's to adult services
- vi) Care and counseling in the case of a suspected abnormality of the nervous system of the fetus.
- vii) Palliative medicine.

*E Social care*

- i) Social services/ benefits in the country of training.

*F Ethical issues*

- i) Ethical aspects of clinical paediatric neurology in dealing with life-long disabling, sometimes progressive conditions, including aspects of prenatal diagnosis, care and life support decisions as well as palliative care.
- ii) Ethics of research in children. Process of informed consent.
- iii) Issues governing ethics and consent for clinical trials.
- iv) United Nations Convention on the rights of the child and other relevant proclamations and judgements set down in Law.

## **2.2 Skills in paediatric neurology**

*Clinical skills*

- i) Adequate and supportive history taking.
- ii) Clinical examination of children of all ages including developmental assessment.
- iii) Clinical observation and analysis concerning normal development, play, motor performance and abnormal movements including gait analysis.
- iv) The use of relevant diagnostic measures to interpret the patient's clinical condition, draw relevant conclusions and engage in relevant therapy.
- v) Assessment of hearing and vision.
- vi) Tests to determine death using neurological criteria.
- vii) Co-ordination of care for the critically ill child: the management of neurological emergencies and neurological aspects of multi-system illness.
- viii) Effective and appropriate approach to parents and children including understanding the emotions generated within children and their families by possible neurological illness. To share difficult information in an appropriate fashion and to provide structured counselling at an appropriate level; to know when more skilled or different psychological help is required.
- ix) To provide consultation to other paediatric specialties.

*B Academic skills*

- i) Critical evaluation of clinical results from literature review and audit.
- ii) Manuscript preparation.
- iii) To give oral presentation.
- iv) Support to or be active in research.
- v) Formal and informal teaching at undergraduate and postgraduate level.

## **3. Training programme**

The overall period of training required is 6 years. One significant period of general paediatrics and/or neurology is followed by the training period in paediatric neurology. Entry to the training programme should normally be through application for a vacant post, which is nationally advertised and interviewed for in the normal fashion.

Many paediatric trainees will spend at least one year in paediatric neurology/neurodisability and it is therefore appropriate to regard at least one year of paediatric neurology training as paediatric training. The recommended training in paediatrics (see Section 3.1) will therefore contain at least three years of paediatric training. Adult neurologists do a minimum of four years in neurology. Paediatric neurologists will do three and a half years neurology (see Section 3.2) plus the acute neurology experience within paediatrics and the neonatal neurology within the six months neonatology. The recommended training in neurology within paediatric neurology will therefore contain at least four years of neurological training.

It is expected that training programmes will contain a mix of (1) direct supervised clinical care of patients, (2) a taught programme, which contains formal lectures and seminars, (3) informal clinical and tutorial style work, (4) national and international training courses and (5) supervised library work. The detailed structure of such programmes is not given but the expected outcomes are.

Clearly the ideal way of satisfying a training programme is through demonstrating effective learning. However, because of the difficulties of this style of assessment alone, we give minimum duration times of obligatory modules as an additional guide to trainees and trainers.

### **3.1 General Paediatric training**

General paediatric training as a prerequisite for entry into a Paediatric Neurology training program should normally reach the level of the common trunk training in Paediatrics as defined by the European Academy of Paediatrics/Paediatric Section of the Union Européenne des Médecins Spécialistes (UEMS). Up to one year of training in Paediatric Neurology can also be counted as general paediatric training. It is emphasised that all specialists in Paediatric Neurology should have a solid training in General Paediatrics including Neonatology.

This syllabus acts as a European guideline and at times relevant national regulations might deviate substantially from it. When such national rules allow an entry from General Neurology, it is recommended that trainees should also complete a minimum of two years of general paediatric training which, in combination with the additional general paediatric year from Paediatric Neurology training (see above) would then satisfy the EAP request of a common paediatric trunk. It is suggested that national regulations which deviate substantially from this concept are revised stepwise in order to achieve a common trans-European standard.

### 3.2 Paediatric neurology training

#### *Main modules*

The paediatric neurology training programme is structured in four main obligatory modules, each containing a specific area of expertise and skill.

i. Acute paediatric neurology module

The trainee works in a recognised specialist/ tertiary paediatric neurology unit(s). During this time the trainee acquires expertise in the diagnosis and management of infants, children and adolescents with neurological disease. This includes direct involvement with children in intensive and neonatal care units. This module should include the assessment and management of children undergoing neurosurgery. This training involves attendance at investigation meetings (e.g. radiology, genetics, pathology and neurophysiology), which are integral to clinical management. Required duration 1-2 years.

ii. Habilitation/ neurodisability/rehabilitation module

The trainee works in a recognised paediatric neurology/habilitation service, which comprises a multidisciplinary team including psychology and paramedical therapies in addition to the senior medical staff. During this time the trainee acquires expertise in the diagnosis and management of paediatric neurodisability patients of all ages. Required duration 1-2 years.

Note: The acute and neurodisability modules together will occupy a total of three years. The two modules may be integrated. It is envisaged that some trainees will focus on acute paediatric neurology and have two years in that area and others will focus on neurodisability and have two years in that area reflecting their specific training needs.

iii. Adult neurology module

The trainee works in a recognised adult neurology unit with inpatient and outpatient responsibility for patients with neurological diseases. This training will involve attendance at investigation meetings (e.g. radiology, pathology, and neurophysiology). This module may be integrated with paediatric neurology modules and may include transitional clinics for older teenage patients. Required minimum duration 6 months or equivalent.

iv. Child psychiatry module

This training period may be part-time and may be completed within basal paediatric or paediatric neurology training. It will consist of supervised direct clinical experience of children with psychiatric illness in a general or neuropsychiatry setting. This module may be integrated within the paediatric neurology modules. Required minimum duration 1 half-day/ week for 6 months or equivalent.

## *B Special fields*

Some fields of paediatric neurology need special attention during the training. They are not necessarily subject to any extra time: completion is certified by the tutor. The trainee may wish to focus on some of these fields in agreement with the tutor. Some examples are given below, others can be considered:

Paediatric neuroimaging	Paediatric neurointensive care
Paediatric neurophysiology	Neonatal neurology
Paediatric neuropathology	Paediatric epileptology
Neurogenetics	Paediatric and adolescent
Paediatric neurometabolic disease	neuropsychiatry

## *C Research training in paediatric neurology*

It is important that trainees are encouraged to carry out research and that some units are equipped to provide a research training, supervision of research and a peer group of research workers. The clinical content of the research should be recognised as part of their clinical training as agreed upon with the senior paediatric neurology tutor and national rules.

## **4. Tutoring of training**

A senior paediatric neurology tutor is assigned to each trainee at the beginning of his/ her training. This tutor is a senior Paediatric Neurologist who has appropriate teaching and management experience. Ideally the tutor should have research experience in paediatric neurology. He/she supervises the broad programme for the trainee's progress at yearly intervals.

On a shorter-term basis, each trainee's progress is monitored by the tutor (or one of the teachers) in the training centre and by the trainee themselves. The trainee maintains a portfolio, which documents relevant training experiences.

Successful completion of a training module is certified by the tutor in a detailed documentation of the module and the experience and knowledge acquired.

## **5. Training centres**

Training centres and units are defined by the clinical and teaching facilities available as they apply to the detailed requirements of the modules

Several institutions, located in close proximity, may combine in the one training centre. In such a case one qualified individual must be the designated training centre director who represents this centre to outside bodies and carries responsibility for the programme.



Most of those practising paediatric neurology will work at least in part within the framework of a specialised tertiary care unit, department or hospital. A paediatric neurologist working for a significant amount of time within a secondary level unit would be expected repeatedly to have sessions within a fully equipped tertiary unit.

## **6 Examinations/certifications**

It will happen that not every department can provide all of the content of this syllabus. The task of the final assessment is not merely to “tick all the boxes”, but to review the whole training and the performance of the trainee to see if they broadly satisfy the training requirements and are effective paediatric neurologists.

It is a matter for national bodies to decide if they wish to conduct exit examinations in paediatric neurology.

## **7 National training programmes**

### **7.1 Countries with existing programmes**

National training programmes in paediatric should be considered as compatible when they have a content that clearly fulfils the educational aims of the European programme. A national training programme can be evaluated on a voluntary basis by the European Training Advisory Board of Paediatric Neurology, in which the European Paediatric Neurology Society as well as the Committee of National Advisers are represented.

### **7.2 Countries without existing programmes**

National professional medical bodies should be encouraged to adopt a national training programme in paediatric neurology and to structure it in close compatibility with this European programme. The instruments to evaluate such training programmes are with the European Training Advisory Board of Paediatric Neurology.

Until implementation of such a national training programme, motivated individuals should have the opportunity to train according to this European programme and to document their obtained qualification.

### **7.3 National Training Co-ordinator for paediatric neurology**

Each country may consider having a national training co-ordinator who will for example:

- Communicate with European bodies with responsibility for paediatric neurology.
- Co-ordinate paediatric neurology training activities.
- Advise on training issues.
- Maintain a database of people in training, training centres, tutors and teachers and regularly update it.