

European Society for Pediatric Gastroenterology, Hepatology, and Nutrition Syllabus for Subspecialty Training: Moving Towards a European Standard

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ABSTRACT

The requirements for and conditions of subspecialty training in paediatric gastroenterology, hepatology, and nutrition (PGHN) are rather variable across European countries. The European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) agreed on a training syllabus aimed to foster a harmonised European PGHN curriculum and to support national PGHN societies and governmental bodies to promote and establish high-quality training programmes and levels of certification in the field. The document provides PGHN training prerequisites and objectives and the basic knowledge elements to acquire the clinical, technical, and management skills needed. Guidelines and instruments for self-monitoring and appraisal are proposed, and a logbook is available online. These training standards are a first step towards a European certification and recognition as a specialist in PGHN.

Key Words: academic medicine, education and training, physician scientist, professional competence, subspecialty training

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This article aims at presenting the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) subspecialist syllabus for training in paediatric gastroenterology, hepatology, and nutrition (PGHN) and its background. This training syllabus was prepared with contributions from the Committees on Gastroenterology, Hepatology, Nutrition and Trainees of ESPGHAN and from national PGHN societies across Europe.

Paediatric gastroenterology established itself as a distinct subspecialty in the 1970s, along with significant progress in clinical and laboratory research in the field. The rapidly increasing knowledge in the field led to shaping a unique profile for paediatric gastroenterologists that differs from that of adult specialists in many aspects. A PGHN specialist requires broad expertise in both general paediatric and paediatric gastroenterology. Nutrition, growth, and development need to be adequately assessed and considered when evaluating a child with gastroenterological complaints. A multidisciplinary approach is generally needed in PGHN considering that gastroenterological, endocrine, metabolic, developmental, psychosocial, and many other aspects are closely intertwined. Specific paediatric endoscopy expertise is also needed for a comprehensive diagnostic approach. Moreover, as in other paediatric subspecialties, thorough communication skills are required to achieve a good relationship with and provide adequate care to patients from early childhood through to adolescence, with their families or caregivers, and with the different health care professionals involved in paediatric care. All of these aspects should be addressed by specific training. PGHN fellowship programmes have been established in different parts of Europe and other parts of the world. In some European countries and in the United States and Canada, guidelines for training have been updated as the standards for PGHN qualification (1–4).

Despite a recognised need for a structured PGHN training, in Europe there is still a lack of standardised fellowship programmes or paths for paediatric subspecialty qualification in this field, and the opportunities for and quality of training are extremely variable in the different European countries. In many parts of Europe, the paediatric subspecialty training is not yet well structured, not only in the area of PGHN but also with respect to other paediatric subspecialties. Since the late 1970s, the European Academy of Paediatrics (EAP, formerly Confédération Européenne de Spécialistes en Pédiatrie) and the European Board of Paediatrics (EBP) have promoted the establishment of a Tertiary Care Working Group including representative members of all the European societies of paediatric subspecialties, with the aim of facing the challenges for harmonised and standardised tertiary training programmes in Europe. In this regard, some major challenges were identified (5), including the following:

1. The need for updating the training programmes of the paediatric subspecialties
2. The creation of a list of suitable European training centres for each paediatric subspecialty
3. The creation of standards for individual recognition of European subspecialists

ESPGHAN is dedicated to supporting and improving training and has actively participated in the EAP initiative. The first training syllabus was published by ESPGHAN in 2002 (6) and subsequently updated in 2009. It described the core objectives of training in PGHN and the requirements to obtain the recognition as a European specialist. The ESPGHAN Council gave its Education Secretary the task of updating the syllabus that was previously developed, to evaluate consistency with the present needs considering medical and technological innovations in this field.

To assess the present situation on PGHN tertiary training, ESPGHAN performed a survey based on key informants from 17 European countries (Table 1). The results demonstrate an extremely high variability for training and accreditation in PGHN across Europe, and sometimes even within countries from state to state. Surprisingly, the government, or a board of physicians on behalf of the government, formally recognised the subspecialty only in half of the countries. This lack of formal acknowledgement of the subspecialty is a major barrier in achieving a satisfactory certified training path and standard of practice; however, even in those countries where PGHN is not recognised as a certified subspecialty, a training syllabus from ESPGHAN or national scientific societies is generally adopted and training is available, with few exceptions only. Substantial differences still exist at the national level for approaches to and organisation of training. The required minimum duration of training in PGHN is variable, ranging from 22 to 48 months, and it can be based on rotation between different centres or provided by a single centre. In less than half of countries a logbook has been created for training monitoring. In the majority of countries a formal examination is required for certification.

These results emphasise the need for establishing both standardised concepts on training in PGHN throughout Europe and a harmonised European certification for a specialist in PGHN, which the updated ESPGHAN training syllabus presented here aims

to support. This initiative is not intended to replace the training programmes and standards of national PGHN societies, but rather to work along with them towards an agreed common syllabus. Therefore, the ESPGHAN training syllabus has been shared with the presidents and representatives of the European national PGHN societies who were invited to a dedicated forum by ESPGHAN during its annual meeting in May 2013, and they were asked to provide comments and suggestions from their national societies, which were considered in the adoption of the final syllabus presented here.

STRUCTURE OF TERTIARY TRAINING

At the European level, the EAP so far has not defined training requirements or subspecialty registers for tertiary training in PGHN or other subspecialties. In 1994, the European Union of Medical Specialists agreed on the general guiding principles for higher medical education, summarised in the "Charter on Training of Medical Specialists" (7); however, in 2008 the European Union of Medical Specialists established the European Council for Accreditation of Medical Specialist Qualifications with the aim to achieve a common background for the assessment and certification of medical specialists' competence all over Europe. This process should be based on competence-based learning with periodical assessments of knowledge, skills, and professionalism. Here the role of scientific societies is of major importance in designing and implementing agreed-upon postgraduate specialty training guidelines.

EUROPEAN TRAINING SYLLABUS IN PGHN: PREREQUISITES AND AIMS

This document describes the revised European training syllabus in PGHN. A specialist in PGHN is a trained paediatrician specialising in the investigation and treatment of children with gastrointestinal (GI), liver, and nutritional conditions, although different specialists may have a different focus, for example, primarily in gastroenterology or hepatology. It is expected that most PGHN specialists will practice within the setting of tertiary care medicine wherein they are able to carry out a broad range of

TABLE 1. Present status of tertiary training in PGHN in 17 European countries

	BE	CR	FI	DE	FR	GR	HU	IT	LT	NL	PL	PT	RO	SL	SI	TR	UK
PGHN training recognised by the government/colleges of physicians	No	Yes	No	Yes	No	No	Yes	No	Yes	No	No	Yes	No	No	Yes	Yes	Yes
Months of PGHN training	24	22	24	(18) changed to 36	24	36*	24	N/A	48	30	36	24	N/A	N/A	36	36	36
Availability of complete PGHN training in the country	Yes	Yes	Yes	Yes	Yes	Yes [†]	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	Yes	Yes
Adoption of a PGHN training syllabus	No	Yes [‡]	Yes [§]	Yes [‡]	Yes [‡]	Yes [§]	Yes [§]	N/A	Yes [§]	Yes [‡]	Yes [§]	Yes [‡]	N/A	Yes [§]	Yes [‡]	Yes [‡]	Yes [‡]
Adoption of a logbook for intervention skills	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Requirement to pass final examinations for qualification	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes

BE = Belgium; CR = Croatia; DE = Germany; FI = Finland; FR = France; GR = Greece; HU = Hungary; IT = Italy; LT = Lithuania; N/A = no data available; NL = the Netherlands; PGHN = paediatric gastroenterology, hepatology, and nutrition; PL = Poland; PT = Portugal; RO = Romania; SI = Switzerland; SL = Slovenia; TR = Turkey; UK = United Kingdom.

* Proposed at the Ministry of Health.

† Unofficial training programme.

‡ A syllabus is provided by the German national scientific society and state colleges of physicians decide on the requirements for accrediting the subspecialty.

§ Syllabus provided by ESPGHAN.

|| Training centres qualified by staff and structure.

diagnostic procedures and guide the patient to the facilities needed for the treatment of intestinal, liver, or nutritional conditions.

This training syllabus aims to do the following:

1. Harmonise subspecialty training conditions in PGHN across different European countries
2. Define minimum standards of knowledge and skills for tertiary PGHN care
3. Foster the development of a European network of competent tertiary care centres in PGHN
4. Further enhance the European contribution to international scientific progress in PGHN

Before the specialist training described in this document, a trainee in PGHN should have successfully completed training in general paediatrics. At the end of the subspecialty training period, the trainee should be qualified for appointment as a specialist in PGHN at a tertiary centre. The required minimal duration of full-time training in the specialty is 2 years (or an equivalent duration of part-time training), provided that all of the training requirements for the subspecialty are fulfilled, whereas a duration of 3 years is considered highly desirable. An opportunity for a further period of full-time research is highly recommended, preferably leading to an academic degree. There should be an opportunity to vary the PGHN training components depending upon the trainees' requirements and preferences. Training in nutrition should be integrated into the training (8).

During the period of training the trainee should have achieved the following:

1. Broad clinical experience and expertise in GI, pancreatic, and liver diseases of children together with their associated nutritional issues
2. Broad experience of nutritional conditions in children
3. Specific training in diagnostic techniques and their interpretation
4. Experience in basic and/or clinical research
5. Collaboration with adult gastroenterologists/hepatologists to enable organisation of a smooth transition of patients from adolescent medicine to adult care
6. Knowledge of the administrative and organisational aspects of care for chronic PGHN diseases
7. Experience of working as part of a multidisciplinary team, including, in particular, developmental, psychosocial, dietetic, and nursing aspects of care

TRAINING IN PROCEDURES

Endoscopy and other procedures are an integral part of the PGHN curriculum. Trainees are expected to achieve and demonstrate competence in a broad list of procedures and to verify whether their expectations in this area of training are met. Endoscopy simulators may be extremely helpful in paediatric gastroenterology training (9–11). The trainee should also know the indications, conditions, and complications of relevant procedures that may be performed by surgeons or radiologists.

CURRICULUM

Core Objectives

1. Gain clinical experience and knowledge of the epidemiology of the principal diseases encountered in PGHN
2. Gain knowledge of diagnostic and therapeutic procedures required for examination of the GI tract and liver as well as nutritional evaluation and interventions:

- a. Upper GI endoscopy
 - b. Ileocolonoscopy
 - c. Endoscopic procedures such as polypectomy, removal of foreign bodies, sclerotherapy and/or variceal banding, clipping of bleeding vessels, pneumodilatation and bougie-dilatation, percutaneous endoscopic gastrostomy insertion
 - d. Knowledge of endoscopic retrograde cholangiopancreatography, cholangiography, and video capsule endoscopy, double-balloon endoscopy, endosonography procedure
 - e. Suction rectal biopsy
 - f. Liver biopsy
 - g. Motility studies such as pH and luminal impedance monitoring, transit studies, and knowledge of manometry
 - h. Interpretation of pancreatic function tests such as screening tests, faecal elastase, and knowledge of intubation tests
3. Gain knowledge of nutritional skills:
 - a. Assessment of nutritional status
 - b. Dietary requirements of children
 - c. Pathophysiology of malnutrition
 - d. Theory and techniques of special therapeutic diets, enteral, and parenteral nutritional support
 - e. Role of nutrition support teams
 4. Acquire skills in cooperation with other specialists (surgeons, pathologists, radiologists, laboratory scientists, adult specialists)
 5. Achieve skills in relevant aspects of organisation and management
 6. Gain experience in clinical audit
 7. Achieve skills in teaching
 8. Achieve knowledge and some experience of research in PGHN

Syllabus

The content of this syllabus details the additional training required for a specialist in PGHN and also defines the boundaries between general paediatricians and PGHN specialist paediatricians.

The training requirements for tertiary specialists are divided into the following:

1. Basic knowledge
2. Clinical, technical, and management skills and competencies
3. Attitudes
4. Particular problems

Basic Knowledge

Gastroenterology

1. Know the causes of growth failure/failure to thrive, malnutrition, and chronic diarrhoea
2. Know the causes of maldigestion and malabsorption disorders (eg, coeliac disease, cystic fibrosis, pancreatic insufficiency, immunodeficiencies)
3. Know the causes of intractable diarrhoea syndrome
4. Know the chronic inflammatory bowel diseases (IBDs)
5. Know the composition of different diets/feeds used to treat IBD
6. Know and manage GI food allergy
7. Know and manage *Helicobacter pylori* gastritis and peptic ulcer disease

8. Know and manage gastro-oesophageal reflux disease and oesophagitis in preterm and term infants and in children with neurodevelopmental disabilities
9. Know congenital anomalies of the GI tract
10. Know and recognise intestinal failure such as short bowel syndrome
11. Know and recognise functional bowel disorders
12. Know the differential diagnosis and be able to investigate a patient with acute abdominal pain
13. Be able to assess dehydration and start management of acute gastroenteritis
14. Be able to perform a differential diagnosis and to resuscitate a patient in the acute phase of GI bleeding
15. Know GI motility disorders
16. Know the causes of intestinal obstruction
17. Recognise when a surgical opinion is required
18. Be able to investigate pyloric stenosis, Hirschsprung disease, and intussusception
19. Know the differential diagnosis of bilious vomiting
20. Be able to differentiate and investigate abdominal masses
21. Be able to differentiate between primary and secondary chronic constipation
22. Know pancreatitis
23. Be able to advise on postoperative management, especially in cases in which rehabilitation with enteral or parenteral nutrition support is required
24. Be able to interpret a small bowel biopsy and an upper and lower GI endoscopy
25. Be able to interpret a dual-energy x-ray absorptiometry bone densitometry result
26. Be able to interpret breath tests
27. Be able to interpret a pH-impedance study

Hepatology

1. Know the common causes of prolonged neonatal jaundice
2. Know the differential diagnosis of conjugated hyperbilirubinemia of infancy
3. Be able to promptly recognise biliary atresia and know its clinical features and outcome
4. Know the infectious causes of liver disease
5. Know about the metabolic and toxic liver disorders
6. Know the causes of chronic liver disease
7. Know the causes and management of acute liver failure
8. Know and manage complications of end-stage liver disease
9. Know the correct timing to refer for liver transplantation
10. Know the presentation of portal hypertension and its medical, endoscopic, and surgical management
11. Know the differences between prehepatic and hepatic portal hypertension
12. Be able to liaise with intensivists, liver transplant surgeons, and transplant coordinators regarding management of liver failure and its complications

Nutrition

1. Understand the basis of normal infant/childhood growth and feeding
2. Understand assessment of feeding ability and nutritional status

3. Know the physiology of nutrient digestion, absorption, metabolism, and elimination
4. Recognise and manage feeding disorders, including anorexia nervosa and bulimia
5. Understand the mechanisms of malnutrition in GI and liver disease
6. Understand methods of nutritional support and their use
7. Know the dietary requirements of children
8. Know the short- and long-term effects of malnutrition in the infant, child, and adolescent
9. Be able to manage iron deficiency anaemia
10. Know the techniques for measuring dynamic nutritional parameters (eg, resting energy expenditure)
11. Understand the role of nutritional support teams in hospital and community settings, and the roles of individual team members
12. Know the different types of growth charts available and how to use them
13. Know indications and contraindications for commencing enteral and parenteral nutritional support
14. Know the composition of different enteral feeds and of parenteral nutrition
15. Be able to devise a feeding management plan in conjunction with other team members for patients requiring home enteral tube feeding or parenteral nutrition
16. Know how to investigate and manage a parenterally fed patient with pyrexia

Investigations

1. Understand the basis of tests for maldigestion and malabsorption, liver dysfunction, oesophageal pH/luminal impedance monitoring, and manometric studies
2. Know the indications and usefulness of relevant imaging and endoscopic techniques

Clinical, Technical, and Management Skills and Competencies

Clinical Skills

1. Assessment of nutritional status of infants and children, including anthropometric measurements (height, weight, head circumference, skin-fold thickness, mid-arm circumference)
2. Assessment of obesity and its complications
3. Assessment of dehydration and planning fluid therapy
4. Interpretation of plain x-ray films, contrast and other imaging studies such as ultrasound, endoscopic ultrasound, computed tomography, magnetic resonance imaging, small bowel biopsy, video capsule endoscopy
5. Management of enteral and parenteral nutrition
6. Prescription of elimination diets
7. Prescription of medication to diagnose and/or treat diseases of the GI tract

Technical Skills

1. Small intestinal biopsy
2. Upper GI endoscopy (diagnostic/therapeutic) and biopsy
3. Pneumodilatation and bougie-dilatation

4. Ileocolonoscopy
5. Pancreatic function tests
6. Oesophageal pH and motility studies such as transit studies and knowledge of manometry, intraluminal impedance
7. Liver biopsy
8. Knowledge of cholangiography
9. Sclerotherapy and banding of oesophageal varices and endoscopic management of other causes of bleeding
10. Placement of endoscopic gastrostomy
11. Polypectomy
12. Removal of foreign bodies

Management Skills

1. Conduct a clinical audit
2. Manage admission policies, endoscopy lists and the like
3. Understanding of contracting and purchasing wherever appropriate
4. Organise postgraduate teaching programmes

Attitudes

1. Understanding the need for multidisciplinary approach
2. Understanding that investigations may be unpleasant, painful, or frightening and that child and parents must be counselled in advance
3. Developing communication skills with the child and parents to ensure their full understanding of and willing participation in the care process
4. Understanding the need to deliver compassionate care
5. Understanding the particular needs of adolescents with regard to their independence and autonomy, compliance with treatment, and how this affects management of chronic conditions
6. Understanding issues around transition from paediatric to adult care, and being able to contribute effectively to transitional care services

Particular Problems

Requirement for completion of training in PGHN is the ability to recognise, initiate diagnostic tests, and outline the medical and nutritional management of the following conditions.

1. Gastroesophageal reflux disease (including extraoesophageal manifestations)
2. Dysphagia
3. Achalasia
4. Pyloric stenosis
5. Intussusception
6. Hirschsprung disease
7. Peptic ulceration and *H pylori* infection
8. Vomiting
9. Constipation
10. Recurrent, protracted, or chronic diarrhoea
11. Coeliac disease
12. Acute and recurrent abdominal pain and functional GI disorders
13. Persistent jaundice in the young infant
14. Bleeding of the GI tract
15. Intestinal obstruction
16. Differentiation of abdominal masses
17. Pancreatitis

18. Pancreatic insufficiency, including GI manifestations of cystic fibrosis
19. Acute liver failure
20. Short gut syndrome
21. Intestinal transplantation and rehabilitation
22. Chronic IBD
23. Small intestinal failure and intractable diarrhoea syndrome
24. Infections of GI tract and liver
25. Gastroenterological problems with AIDS
26. GI food allergy and eosinophilic GI disorders, including eosinophilic oesphagitis
27. Acute diarrhoea, including the use of oral rehydration therapy
28. Outbreak of hospital-acquired diarrhoea
29. Chronic liver disease and metabolic liver disease
30. Pre- and postliver transplant management
31. Intestinal motility problems, including idiopathic intestinal pseudoobstruction syndrome
32. GI problems in children with neurological impairment
33. Chronic undernutrition/failure to thrive
34. Obesity
35. Feeding disorders, including anorexia nervosa
36. Childhood feeding problems
37. Specific nutrient deficiencies, including vitamins, minerals, trace elements, and fatty acids

Principles Regarding the Assessment of Meaningful Accomplishment in Research

Research experience is an essential part of training in PGHN, and each trainee is encouraged to produce evidence of productive research. Acceptable evidence could include 1 or more of the following:

1. Author of research papers accepted for publication in pertinent peer-reviewed journals, author of abstracts accepted at international PGHN scientific meetings
2. Submission of research grant proposal which has been approved by peer review
3. A postgraduate degree in a field relevant to PGHN
4. Any other evidence that may be considered appropriate

The trainee's supervisor will be responsible for ensuring appropriateness of research activity and be involved in planning research.

Recognition of Specialists in PGHN

Recognition as a European Specialist in PGHN at either the secondary or tertiary level will require satisfactory certified completion of a recognised training programme.

National Training Programmes

Where national training programmes in PGHN already exist or are at an advanced stage of development, they should be considered compatible with this European programme when:

1. They have a comparable syllabus
2. They have a duration of 2 to 3 years of full-time training (or an equivalent duration of part-time training)
3. They have means of assessment of the trainee

Where a training programme does not exist, national professional training bodies should be encouraged to adopt a national training programme in PGHN, which is closely compatible with this European programme.

Training Programme

Structure of the Programme

The syllabus is arranged as a series of modules, which can be completed in 1 or several different training centres. It is recommended that training be carried out at no more than 4 centres. Each module contains training in a specific area, expertise, or skill. All of the modules should be completed by the majority of trainees, but there should be the option to adapt the PGHN training components depending upon the trainees' requirements and preferences. It is anticipated that training programmes will be able to provide the necessary breadth of teaching and experience, including access to trainers skilled in all aspects of clinical PGHN.

Monitoring of Training: The Logbook

Each trainee's progress is monitored both by the trainee herself or himself and by an assigned tutor. The trainee will maintain a personal logbook, where she or he will document relevant training experiences and will complete a self-assessment for each module/topic. The logbook and the trainee's progress will be discussed with the tutor at 3 monthly intervals. Successful completion of a training module/topic will be certified by the tutor in the trainee's logbook. A suggested scheme of self-assessment for PGHN is provided with the proposed content of the logbook (<http://links.lww.com/MPG/A343>).

Implementation Through E-Learning

A relevant part of these contents may be effectively delivered through e-learning. E-learning is a modular, Web-based format that has several advantages for the trainee (availability, flexibility, low cost), allows easy updating, is available on demand, and bears final assessment of the acquired competencies of the trainees, which is a capital requirement for certification. A substantial contribution to the ever-growing importance of e-learning has been the need for continual learning to enable health care professionals to maintain and develop their knowledge and skills (12–15).

In 2012, ESPGHAN launched its e-learning educational initiative in partnership with United European Gastroenterology Federation (<http://www.e-learning.ueg.eu>), and in collaboration with the Early Nutrition Academy (<http://www.early-nutrition.org/enea.html>). The implementation of e-learning into the European PGHN curriculum is a promising future direction.

The ESPGHAN syllabus for subspecialty training in PGHN presented here should help to achieve adequate and harmonised

standards of training across Europe. Although this syllabus is based on present standards and knowledge in the field, it should be reviewed and an update considered within a period of approximately 5 years.

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