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Proposal for a Postgraduate
Training Curriculum in
Pediatric Neurology-
Neuropsychiatry

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Summary

Documentary basis.....	2
1 Training structure.....	3
1.1 Common Trunk.....	3
1.2 General goals of common trunk training.....	3
1.2.1 Communication and interpersonal skills.....	4
1.2.2 Ethics and professionalism.....	4
1.2.3 Patient safety and quality improvement.....	4
1.2.4 Teamwork and collaborative skills.....	4
1.2.5 Leadership, management skills and a commitment to lifelong learning.....	4
1.2.6 Health advocacy and global health awareness.....	5
1.3 Specialist pediatrics areas.....	5
2 Training organization.....	6
3 Content of training and learning outcome.....	7
3.1 Theoretical knowledge.....	7
3.2 Practical and clinical skills.....	7
4 Common trunk general skills and competencies.....	9
5 Common trunk specialist skills and competencies.....	13
6 Training course chronogram.....	25

Documentary basis

This Pediatric Neurology / Neuropsychiatry Postgraduate Training curriculum is based on a synthesis of the following documents:

- 1) Union of European Medical Specialists – Section of Pediatrics - European Training Requirements in Pediatrics
- 2) Union of European Medical Specialists - European Academy of Pediatrics - Curriculum for Common Trunk Training in Pediatrics
- 3) Polish Syllabus in Pediatrics
- 4) German Pre- and postgraduate training program in Pediatrics
- 5) Italian Specialization Schools in Pediatrics Program
- 6) ChildCA Baseline document

1 Training structure

Postgraduate training in Pediatric Neurology / Neuropsychiatry can be accessed after the Bachelor in a Medical Faculty, and includes former Internship and Residency. The training is planned on a modular structure, with increasing complexity structure from the general to the more specialized, on a 2 + 2 years basis:

- **2 years - Common trunk with Pediatrics**
- **2 years - Specialist Pediatric Neurology / Neuropsychiatry**

While implementing the new system, the Specialist pediatric neurology training can be condensed in one year, moving to the first year of employment the completion of the training. It will be thus possible to concentrate in 3 years the formal postgraduate training, anyway aiming to reach the European standard of a 4 to 5 years postgraduate training.

The duration of training of medical specialists must be sufficient to ensure training for independent practice of the specialty after the completion of training; therefore, a four-year period is considered the bare minimum for an adequate training to live up to the best international standards.

1.1 Common Trunk

A three-year basic common trunk training program is foreseen, during which the pediatric trainee shall acquire a central core of knowledge embracing physiology, development and growth, metabolism and nutrition, immunology and infectious diseases, pathology, neonatology, trauma and resuscitation, basic and advanced life support, emergency and intensive care, safeguarding. Optional courses on basics of **Ultrasound in Pediatrics** should be ideally added.

On top of these clinical knowledges, courses extending on the whole training period ("*Longitudinal tracks*") on the following topics must be added:

- a. **Medical English.** No working knowledge of the international scientific language hampers access to the most advanced medical literature and guidelines, online training, online international patient consultation.
- b. **Evidence-based medicine.** Introduction and implementation of internationally acknowledged clinical protocols.
- c. **On-line International medical literature data mining.** Updated medical knowledge, access to evidence-based medicine, online and simulation training, pediatric research must resort to the Internet, but its utilization implies critical interpretation of retrieved data and cannot be tackled "*en amateur*".
- d. **Deontology, bioethics, law and professionalism,** development of intuition and logical thinking.
- e. **Communication abilities,** with parents, patients and colleagues.

A period of basic or clinical research within the training program is strongly recommended.

1.2 General goals of common trunk training

General goals of common trunk training in pediatrics include the acquisition of skills, theoretical knowledge and attitudes in relation to seven key areas:

1.2.1 Communication and interpersonal skills

Good communication is a core clinical skill for pediatricians, utilizing effective listening and nonverbal cues. Trainees should learn to:

- Establish a positive therapeutic relationship with children/adolescents and their families in an age appropriate manner.
- Respect patient confidentiality, privacy, autonomy and ability to consent.
- Communicate relevant understandable information and provide support in a crisis situation.
- Elicit and draw together relevant information and perspectives of children, families, colleagues and other professionals/caregivers; taking into account factors such as age, gender, disability, ethno-cultural background, social support and emotional influences, and appropriately respecting the child and family's different value systems.
- Develop a common understanding on issues, problems and plans with patients, families, and other professionals to develop a shared plan of care.
- Convey effective oral and written information about a medical encounter, both to families and to other professionals.

1.2.2 Ethics and professionalism

Trainees must learn to display the following:

- Compassion, integrity, and respect for others
- Sensitivity and responsiveness to a diverse patient population, including diversity in gender, age, culture, race, religion, and disability
- Responsiveness to situations where the wellbeing of the child is endangered/compromised
- Accountability to patients, society and the profession
- Compliance with all legal and moral obligations for reporting disease and potential or real abuse/neglect
- Recognition of special issues pertaining to children participating in research³. Patient safety and quality improvement

1.2.3 Patient safety and quality improvement

Trainees should:

- Participate in activities that contribute to effectiveness/quality of the healthcare system and patient safety.
- Commit to quality assurance through systemic quality process evaluation and improvement.
- Maintain their own health and that of the team they work with.

1.2.4 Teamwork and collaborative skills

Trainees should:

- Participate appropriately in a professional healthcare team to achieve optimal patient care.
- Maintain respect for the views of colleagues in a range of pediatric roles.
- Maintain effective time management skills.
- Ensure proper handover, referral and discharge planning.
- Understand the effects of national and international policies on child health.

1.2.5 Leadership, management skills and a commitment to lifelong learning

Trainees should learn to:

- Effectively delegate and follow-up on tasks, be able to manage stressful situations and know when to ask for help.
- Deliver the highest quality of care.
- Manage tasks including prioritizing, and assigning.
- Maintain comprehensive, timely, and legible medical and hospital records and legal documents.
- Make a lifelong commitment to learning by accepting responsibility for developing implementing and monitoring a personal continuing education strategy.
- Conduct a systematic review of the literature in search for evidence.
- Use a range of sources of research publications and electronic literature databases.

1.2.6 Health advocacy and global health awareness

- Pediatric trainees, as Health advocates, must responsibly use their influence and expertise to advance child health as well as the well-being of individual patients, families, communities and populations.

1.3 Specialist pediatrics areas

The common trunk training in general pediatrics sets the foundation for an additional year in one of the three options the discipline of pediatrics can encompass:

1. **Primary care or community pediatrics**
2. **Secondary care or hospital-based general pediatrics**
3. **Tertiary care or hospital-based pediatric subspecialties**

Training in this last year of specialist pediatrics areas (to be ideally completed in the first year of employment) will focus mainly on practical activities, in the meanwhile deepening the theoretical knowledge in the particular field selected for the trainee's future career.

Pediatric subspecialties having a specific syllabus at European level are the following: Allergology, Cardiology, Dermatology, Endocrino & Diabetes, Emergency Medicine, Gastroenterology & Hepatology, Hemato-Oncology, Immunology, Infectious Diseases, Intensive Care Medicine, Metabolic Diseases, Neonatology, Nephrology, Pulmonology, Rheumatology.

For Neurology and Mental health and behavioral disorders see the appropriate curriculum.

2 Training organization

Trainees must acquire experience in each of the areas of responsibility as detailed in the following chapters. Skill experience should be documented in adequate **log-books** (for each item patient's initials or hospital admission number, type of procedure, date of procedure and approval with signature by the tutor have to be provided).

Credit as pediatrician can only be claimed when the trainee has actively participated in all phases of treatment; has made or confirmed the diagnosis, participated in the selection of the appropriate procedure, has either performed or been responsibly involved in performing procedures and has been a responsible participant in both acute and chronic care.

To build up their experience the trainees should be involved in the management of a sufficient number of inpatients, day care patients and ambulatory patients. They must perform a minimum number of practical procedures.

Training must take place in an institution or group of institutions which together offer the trainee practice in the full range of the specialty. Consultations and procedures should be sufficiently varied, quantitatively and qualitatively sufficient, and include training in inpatient care, day care and ambulatory care.

Neighboring specialties must be present to a sufficient extent to provide the trainees the opportunity of developing their skills in a team approach to patient care.

Lack of appropriate teachers on some of the curricular topics can be dealt with mutual interaction among partner Universities via long-distance teaching through the ICT system provided by ChildCA project.

3 Content of training and learning outcome

Pediatrics is an independent medical specialty based on the knowledge and skills required for the prevention, diagnosis and management of all aspects of illness and injury affecting children of all age groups from birth to the end of adolescence, up to the age of 18 years.

Pediatrics is not just about the recognition and treatment of illness in babies and children. It also encompasses child health, which covers all aspects of growth and development and the prevention of disease.

The practice of Pediatrics encompasses several aspects including preventive pediatrics, social and community pediatrics as the influence of the family and other environmental factors play a large role in the development of the child, and acute and specialized pediatrics. These specialized areas include many conditions that require life-long management and follow-up before a smooth transition of care to adult services (“*Transitional care*”).

The pediatrician must have acquired and must maintain “**Theoretical knowledge**” in basic sciences required in the practice of pediatrics, namely genetics, physiology of organ development, growth and nutrition, immunology and infectious diseases, pharmacology and metabolism, and “**Practical and clinical skills**” relating to diagnosis and therapy. Chapters 5 and 6 will be organized according to this specification, detailing the contents of theoretical knowledge, practical and clinical skills and – where appropriate – also some **specific conditions** for each one of the pediatric subspecialties listed in the following paragraph.

3.1 Theoretical knowledge

The specialty of general Pediatrics, to be dealt with in the common trunk period, requires documented and assessed knowledge in:

- 1) Adolescent medicine
- 2) Allergy
- 3) Cardiology
- 4) Community medicine
- 5) Dermatology
- 6) Diseases of the Orbita and Eyes
- 7) ENT Disorders
- 8) Endocrinology & Diabetes
- 9) Emergency medicine
- 10) Gastrointestinal & Hepatic diseases
- 11) Genetics & Dysmorphology
- 12) Hematological & Oncological Disorders
- 13) Infectious and Immune deficiencies
- 14) Mental health & Behavioral Disorders
- 15) Metabolic Diseases
- 16) Neonatology
- 17) Nephro-Urology Disorders
- 18) Neurology & Neuromuscular Disorders
- 19) Pre-, Peri-, and Post-surgical Care
- 20) Respiratory Disorders
- 21) Rheumatic Diseases
- 22) Sports Medicine

3.2 Practical and clinical skills

General competences in practical and clinical skills a pediatrician should acquire at the end of the 3-year common trunk are:

- Skills in advanced neonatal and paediatric life support.
- History taking, clinical examination, effective skills in paediatric assessment and formulating an appropriate differential diagnosis in pediatrics.

- Initial management of ill-health and clinical conditions in pediatrics, seeking additional advice and opinion as appropriate.
- Recognition of behavioral, emotional and psychosocial aspects of illness in children and families.
- Safe practical skills in pediatrics.

Technical procedures a trainee should be able to perform **independently** at the end of the 3-year common trunk are:

- Temperature, pulse rate and noninvasive arterial pressure measurements
- Capillary or peripheral blood samplings
- Nasal, pharyngeal and dermal swabs
- Vital signs monitoring using a cardiomonitor, pulseoxymetry
- Electrocardiogram
- Lumbar puncture
- Stomach probing, stomach lavage, enema
- Urethral catheterization, supra-pubic aspiration of urine
- Collection of blood from central lines
- Umbilical venous and artery cannulation and sampling
- Spirometric test, oxygen therapy
- Bag, valve and mask ventilation
- External chest compression
- Tracheal intubation of term newborn babies
- Tracheal intubation of preterm babies and older children
- Administration of exogenous surfactant
- Safeguarding
- Administer intradermal, subcutaneous, intramuscular & intravenous drugs

Technical procedures a trainee should be able to perform **under supervision** at the end of the 3-year common trunk are:

- Needle thoracocentesis for pleural effusion or pneumothorax
- puncture of the pericardial sac
- Insertion of intraosseous needle
- blood and blood components transfusions
- fine needle biopsy
- Percutaneous long line insertion
- Abdominal paracentesis

4 Common trunk general skills and competencies

NORMAL AND ABNORMAL DEVELOPMENT		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> • Normal and abnormal gross and fine motor-, cognitive-, social and emotional-, receptive and expressive language development of infants and young children • Pre-, peri-and postnatal risk factors and causes of delayed-or abnormal development • Common patterns of developmental abnormality (gross motor-, speech- and language, global) • Range of deficits in common genetic syndromes (eg, fragile X, trisomy 21, fetal alcohol syndrome) • Current neonatal and childhood screening tests used in respective national child health visits • Screening-and diagnostic assessment instruments for developmental delay and mental retardation • Indications for imaging tools (ultrasound, MRI), metabolic and genetic testing • Indications for physio-, educational-, occupational-and/or speech therapy • Indications for referral of a child to a pediatric neurologist, speech pathologist 	<ul style="list-style-type: none"> • Taking a history of developmental milestones reached • Developmental assessment of a child 5 years AND under. • Basic assessment of hearing and vision • Initiation of appropriate investigations to make a diagnosis based upon the history and pattern of abnormal development observed • Communication of findings and implications of developmental assessment to parents 	
		<i>Specific conditions</i>

NORMAL AND ABNORMAL GROWTH		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> • Normal physical growth from birth to the completion of puberty • Genetic, hormonal, nutritional, environmental, psychological, and social factors affecting normal growth • Common disorders of height and weight which need to be evaluated • Effects of fetal growth restriction on long-term health • Meaning, uses and limitations of bone age 		
		<i>Specific conditions</i>

- Causes of poor weight gain in infants and young children
- Normal and abnormal variations in head shape

NUTRITION		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> • Recommended nutritional requirements at different ages • Effect of disease states on nutritional requirements • Practical aspects and benefits of breast feeding • Practical aspects of infant formulae • Health implications of restricted diets, fad diets, diets determined by custom or socioeconomic situation • Indications for, physiological basis of and complications of parenteral and enteral nutrition 	<ul style="list-style-type: none"> • Nutritional assessment • Interpretation of biochemical and other laboratory indices of nutritional status 	
	<i>Specific conditions</i>	
	<ul style="list-style-type: none"> • Obesity • Failure to thrive • Nutritional deficiencies and excesses • Feeding disorders • Recognition and early management of anorexia nervosa 	

PHARMACOLOGY		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> • Pharmacodynamics: absorption / systemic availability / interpretation of drug concentrations • Drug interactions & adverse drug reactions • Pathophysiology of drug action mechanisms, correction of pathophysiological states • Pharmacokinetics in children in different age groups • Placental transfer and breast milk excretion of drugs • Drug toxicity and therapeutic drug monitoring • Guidelines and protocols for antimicrobial prescribing • Drug dosage modification in disease (liver/kidney dysfunction) • Drug selection: generic vs. labelled / cost implications / compliance issues / health insurance planning 	<ul style="list-style-type: none"> • Prescribing skills / rational drug therapy • Formulary use in practice 	
	<i>Specific conditions</i>	
	<ul style="list-style-type: none"> • Management of pain • Principles of sedation for procedures • Drug withdrawal 	

- Off label use
- Complementary and alternative medicines: availability / prevalence / efficacy

RESEARCH

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Biostatistics / Types of variables • Data distribution patterns • Common statistical tests • Understand measurement of association • Regression analysis • Diagnostic tests (sensitivity and specificity, positive and negative predictive value) • Principles of systematic reviews and meta-analysis (interpretation and application) • Principles of epidemiology and types of epidemiologic studies • Bias and confounding variables • Causality (causal versus association) • Incidence and prevalence / Decision analysis / Cost- benefit, cost- effectiveness and outcomes • Sensitivity analysis • Measurement principle (reliability and validity; accuracy and precision) 	<ul style="list-style-type: none"> • Assessment of study design • Assessment of generalization of results • Critical reading of literature • Application of information to patient care • Appropriate evaluation and critique of medical literature • Research ethics
	<i>Specific conditions</i>

SAFEGUARDING

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • WHO definitions of neglect and of physical, emotional, and sexual abuse • Other forms of abuse: bullying at school, cyber-bullying; institutional abuse, • Munchhausen by proxy etc. • Family, social and other characteristics associated with increased risk of abuse/neglect • Features in the history that raise suspicions that the presenting symptoms are due to abuse or neglect 	<ul style="list-style-type: none"> • Recognition and assessment of suspected acute physical, emotional, sexual abuse • Differentiation of intentional neglect from deprivation associated with poverty or low education • Utilization of appropriate laboratory tests and skeletal-imaging to differentiate between disease, accidental and intentional injury, including sexual abuse • Complete documentation of clinical signs and procedures that are made to identify the abuse

<ul style="list-style-type: none"> • Clinical signs of non-accidental injuries • Diseases that may mimic physical abuse/neglect • Sequelae of shaking of a child during the first year after birth • Common fracture locations and types in physically abused children / Locations of fractures, bruises, burns/scalds, scars that are rarely accidental • Clinical, psychological and behavioral signs suggesting emotional abuse • Possible physical, psychological, behavioral and maturational problems due to neglect or abuse • Clinical, psychological and behavioral signs suggesting child sexual abuse • Indications for referral of a child to other specialists experienced in child abuse evaluation • Indications for referral to social and/or psychological services, interprofessional care 	or neglect in accordance with local and/or national law <ul style="list-style-type: none"> • Appropriate communication with the abused/neglected child and the family
	<i>Specific conditions</i>

SUBSTANCE ABUSE/TOXICOLOGY/POISONING	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Epidemiology of substance abuse: current data & trends / developmental patterns / risk factors (genetic & social) • Common substances abused / age profiles • Common childhood poisonings / exposures • Epidemiology of poisoning: local / global / age demographics • Prevention measures • Poison centres / operating procedures / poison information data / online • Toxicology signs and symptoms • Types of ingestions / poisonings • Community and home chemical hazards: pesticides / industrial waste / occupational home renovation risks, lead poisoning • Poisoning as possible sign of child abuse / neglect • Poisoning by unknown agent 	<ul style="list-style-type: none"> • Assessment / vital signs, monitoring / history taking • Acute management • Diagnosis: clinical assessment / laboratory methods, screening
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Paracetamol poisoning • Specific therapies elimination measures/antidotes • Toxins: button batteries / coins / iron / ethylene glycol • Plants / complementary medicines / over the counter medicines

5 Common trunk specialist skills and competencies

ADOLESCENT MEDICINE	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Legal and ethical principles dealing with adolescents • Normal bio-psycho-social development of puberty in boys and girls • Level of cognitive reasoning in early, middle and late adolescents • Influence of family and peers in modelling adolescent behaviour • Epidemiology of the pattern of social and sexual behaviour at various ages • Gender and sex identity • Safer sex practices, sexually transmitted infections, contraception and post-coital • contraception • Causes of delayed puberty • Impact of chronic conditions on adolescent social, psychological and physical • development • Transition from paediatric to adult care 	<ul style="list-style-type: none"> • Effective communication, developing a professional relationship with adolescents, • including evaluation of compliance • Discussion with a young person the concept of confidentiality and assent/consent • depending on the degree of his/her maturity and in accordance with the local legal • guidance • Assessment of growth and development including sexual maturity rating (Tanner • stages) • Assessment and diagnosis of substance misuse, violence and risk-taking behaviour • Assessment of suspected psychiatric symptoms using validated screening • questionnaires • Assessment and diagnosis of eating disorders • Assessment and delivery of anticipatory guidance of healthy lifestyle including eating • habits, physical exercise and media • Planning, providing and integrating care for adolescents
	<i>Specific conditions</i>

ALLERGIC DISEASES	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Knowledge of basis of host defence mechanisms • Basic knowledge of immunology relevant to allergic diseases 	<ul style="list-style-type: none"> • Taking a history in allergic patients • Recognizing clinical symptoms and signs of allergy • Prescribing a diet for food allergic children

<ul style="list-style-type: none"> • Influence of genetic and environmental factors on allergic disease • Variations in normal immune response with age • Various phenotypes of allergic diseases • Basic diagnostic laboratory techniques involving the immune system • Pharmacologic and immunologic therapy of allergic disorders 	<ul style="list-style-type: none"> • Demonstration of the use of an adrenalin pre-loaded injection • Demonstration of the performance and interpretation of the skin prick test • Management of acute anaphylaxis
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Allergic diseases, including rhinitis, eczema and anaphylaxis • Allergy testing (including skin prick testing, RAST, serum IgE, serum tryptase) • Indications for immunoglobulin therapy • Management of cow's milk protein intolerance

CARDIAC DISEASES	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<i>Knowledge - general</i> <ul style="list-style-type: none"> • Anatomy physiology and pathophysiology of normal heart; cardiac malformations and diseases • Assessment and initial treatment of congenital heart disease • Foetal circulation and changes in circulation at birth • Clinical manifestations of heart disease • Basis understanding and means of echocardiography • Principles of pharmacotherapy • Referral thresholds for a specialist cardiology opinion 	<ul style="list-style-type: none"> • Assessment of the cardiovascular system, including pulses • Assessment of heart sounds and murmurs • Measurement of blood pressure in different ages • Cardiopulmonary resuscitation
	<i>Specific conditions</i>
<i>Knowledge – specific</i> <ul style="list-style-type: none"> • Common causes of chest pain • Common murmurs • Common ECG abnormalities • Endocarditis (causes, investigations, indications for prophylaxis) • Palpitations, tachycardia, arrhythmias, syncope • Common causes of hypertension 	<ul style="list-style-type: none"> • heart defects • myocarditis, endocarditis, pericarditis • cardiomyopathy • rhythm abnormalities • cardiac failure • arterial hypertension • fainting

COMMUNITY MEDICINE		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> Local, national, and international structures of community based healthcare Key social determinants of child health and well being Effects of family composition, socioeconomic factors and poverty on child health Community assets and resources toward preventing illness, injury, and related morbidity and mortality Resources that may be available from health agencies, including the voluntary sector and allied health professionals Support programs for families and children with special health care needs National vaccination program 	<ul style="list-style-type: none"> Ability to work together with schools, child care, facilities and others Management of children in need of protection and the pathways to ensure follow-up Demonstration of advocacy skills to address relevant individual, community, and population health issues 	
	<i>Specific conditions</i>	
		<ul style="list-style-type: none"> Complex disability in the pre-school child

DERMATOLOGY		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> Anatomy and histology of the skin, hair and nails Characteristics of common dermatological problems and serious erythematous, rashes 	<ul style="list-style-type: none"> To recognize common exanthemas Skin manifestations of common infectious diseases Skin manifestations of systemic disease (i.e. Henoch Schonlein, Lupus) Identify mucosal, skin infection, bacterial infected eczema, eczema herpeticum Plan and manage appropriate treatment 	
	<i>Specific conditions</i>	
		<ul style="list-style-type: none"> Common pigmentary or vascular congenital lesions e.g. nevi, Hemangiomas Molluscum contagiosum, warts Hair disorders (eg, hypertrichosis and hair loss) Pigmented lesions (hyper-and hypopigmentation) Contact dermatitis Seborrhoeic and atopic dermatitis Urticaria Acne

DISEASES OF THE ORBITA AND EYES

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Normal vision development • Common causes of visual impairment • Ophthalmic presentations of systemic diseases 	<ul style="list-style-type: none"> • Measure visual acuity by use of standard visual acuity charts • Check strabismus by strabismus charts, • Examination of the fundus of the eye
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Management of squint • Acute management of trauma • Disorders of refraction • Conjunctivitis • Retinopathy of prematurity Orbital infection, orbital swelling, oedema

ENT DISORDERS

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Anatomy and pathophysiology of the ear, nose, throat and upper airway • Congenital malformations (external and middle ear) • Deafness and hearing loss 	<ul style="list-style-type: none"> • Understand the techniques for hearing evaluation at different ages • Performance of simple tests of hearing • Interpretation of soft tissue X-rays in acute upper airway obstruction • Institute the appropriate treatment for laryngitis
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Rhinitis (allergic rhinitis, infectious rhinitis), polyps • Epistaxis • Trauma or foreign body • Tonsillitis and complications, adenoidal hypertrophy • Pharyngitis • Cleft lip, cleft palate • Laryngitis, Croup • Otitis media / otitis externa • Mastoiditis and sinusitis

ENDOCRINE DISORDERS AND DIABETES

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Normal anatomy, embryology, physiology of the endocrine glands • Normal growth patterns, including constitutional delay and growth disorders • Normal and abnormal puberty development, ambiguous genitalia, precocious puberty, disorders of sexual development • Recognition and initial investigation of commonly presenting endocrine disorders, including hypothyroidism, AGS, diabetes type 1 and 2 • Understanding of the endocrine manifestation of systemic diseases • Understanding the pathophysiology and signs of diabetes 	<ul style="list-style-type: none"> • Taking history in endocrine disorders • Ability to measure growth accurately and to chart and interpret it appropriately • Ability to assess pubertal status (Tanner staging) • Ability to institute appropriate insulin regimes to treat diabetes mellitus • Ability to manage acute diabetic ketoacidosis, including assessment of major complications • Ability to manage acute hypoglycaemia, including an understanding of the importance of glucose testing and administration in patients with impaired consciousness
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Common congenital and acquired endocrine disorders, including pituitary, thyroid, and adrenal disease • Ambiguous genitalia • Maldescended testis • Short and tall stature • Precocious puberty and pubertal delay • Thyroid disease and adrenal disease • Obesity, including complications and clinical management strategies • Rickets • Tetany • Convulsions

EMERGENCY MEDICINE

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Pathophysiology of shock / respiratory failure / cardiopulmonary arrest • Principles of monitoring: invasive / non-invasive, biochemistry • Fluid & electrolyte management in the acutely ill patient 	<ul style="list-style-type: none"> • Resuscitation, including access • Acute seizure intervention • Patient stabilisation and transfer
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Assessment/ triage of the acutely ill child

<ul style="list-style-type: none"> • Intra & inter-hospital transport • Child protection issues 	<ul style="list-style-type: none"> • Acute respiratory distress, hypoxia • Shock • Acute allergy/anaphylaxis • Acute febrile illness • Burns • Diarrhoea / vomiting / dehydration • Seizures • Syncope • Coma • Trauma: abdominal / multisystem / head / limb • Wound and laceration management • Special needs children in emergency department
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GASTROINTESTINAL AND HEPATIC DISEASES	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Anatomy, physiology and pathophysiology of the gastrointestinal tract, liver, biliary tract and pancreas. • Normal nutritional needs and common causes of malnutrition • GI symptoms of systemic disease • Gastrointestinal infectious diseases and infection control • Indications for diagnostic procedures –eg , sonography, radiology, endoscopy and biopsy 	<ul style="list-style-type: none"> • Taking history in GI and hepatic diseases • Assessment of GI system and liver • Assessment of nutritional status • Ability to manage paracetamol poisoning
	<p style="text-align: center;"><i>Specific conditions</i></p> <ul style="list-style-type: none"> • Acute and chronic abdominal pain • Common congenital conditions • Constipation • Common causes of dysphagia • Gastroenteritis and diarrhoea • Principles of oral rehydration and intravenous fluid therapy • GI Bleeding • Gastro-esophageal reflux • Common causes of hepatitis • Common causes of jaundice • Inflammatory bowel disease • Iron deficiency anemia • Malabsorption, including coeliac disease and cystic fibrosis

GENETICS AND DYSMORPHOLOGY

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> Principles and molecular basis of Mendelian- and non-Mendelian inheritance Embryological basis of malformation and environmental factors in fetal development Principles of dysmorphism and syndrome identification Basis of genetic and molecular techniques Ethical and social implications of genetic testing Indications and limitations of prenatal diagnosis Rationale of newborn screening 	<ul style="list-style-type: none"> Construction and interpretation of a family pedigree Recognition of common genetic, chromosomal and dysmorphic syndromes Genetic counselling related to common conditions Ability to access genetic databases
	<i>Specific conditions</i>

HEMATOLOGICAL AND ONCOLOGY DISORDERS

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> Physiology and pathophysiology of bone marrow derived cells Pathophysiology of anaemia and Hemolytic diseases Physiology and pathophysiology of the coagulation system Management of common non-malignant Hematological conditions Risks and benefits of blood transfusion Principles of management of cancer Short and long term side effects of chemotherapy and radiotherapy Indications for bone marrow transplantation Principles of palliative care 	<ul style="list-style-type: none"> Taking history in Hematologic and oncologic disorders Ability to assess children presenting with Hematological or oncological conditions Interpretation of blood smears results Acute management of child with febrile neutropenia Management of long term central lines Care of child requiring isolation
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> Anemia Sickle cell disease and thalassemia Acute lymphoblastic leukemia Lymph node enlargement, lymphadenopathy Hodgkin and non-Hodgkin lymphoma Medullo-, neuro-, nephro-, hepatoblastoma Coagulation disorders, Hemophilia Common causes of neutropenia Common causes of purpura

INFECTIOUS DISEASES AND IMMUNDEFICIENCIES

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Physiology and pathophysiology of host defence mechanisms • Common infectious agents: epidemiology / pathogenicity / characteristics • Common infant and childhood infections: viral / bacterial / fungal / parasitic • Appropriate and safe prescribing of antibiotic or antiviral therapy • Principles of infection control • Principles of immunization and national policy • Patterns of antimicrobial resistance / safe prescribing • Use of diagnostic tests, culture methods bacterial & viral 	<ul style="list-style-type: none"> • Taking history in infectious diseases • Ability to assess child presenting with infectious disease • Care of child requiring isolation • Hygiene • Adequate prescribing • Considering development of resistance
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Perinatal infections • Pyrexia of unknown origin • Communicable disease control/prevention/immunization • Diarrhea and vomiting • Pneumonia • Septic shock • TB / HIV • Travel medicine / infections / immunization

MENTAL HEALTH AND BEHAVIORAL DISORDERS

See curriculum pediatric neurology

METABOLIC MEDICINE

<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Principles of metabolic disorders: mitochondrial, , beta-oxidation, lipids, carbohydrates and amino acids; storage diseases • Metabolic crisis • Common presentations of metabolic disease (including encephalopathy, neurodevelopmental regression, weakness, visceromegaly and poor growth) • Genetic base of common metabolic disorders • Screening tests for metabolic disease 	<ul style="list-style-type: none"> • Adequate sampling of biomaterials • Newborn screening for metabolic diseases • Consider underlying metabolic disease in unclear clinical presentation •
	<i>Specific conditions</i>

- Dietary principles in the care of children with metabolic disease
- Specific Conditions
- Acute metabolic presentation in the newborn and infant

NEONATOLOGY	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Fetal physiology and the physiology of extrauterine adaptation • Antenatal and perinatal effects on neonatal outcomes • Epidemiology: Outcomes for survival and factors influencing outcome • Prematurity and low birthweight sequelae • Growth aberrance: IUGR, SGA/LGA • Principles of neonatal stabilization / resuscitation • Introduction of mechanical ventilation and principles of assisted ventilation • Principles of surfactant and nitric oxide administration • Neonatal nutrition and feeding • Newborn screening • Neonatal jaundice/Exchange transfusion • Congenital and neonatal infections • Congenital malformations, major and minor including surgical/cardiac malformations • Respiratory conditions, RDS • Neonatal neurology including hypoxic ischemic encephalopathy/hypotonia • Drug withdrawal • Ethical principles involved in the management of the dying baby • Prescribing for newborns and breastfeeding mothers 	<ul style="list-style-type: none"> • Gestational assessment • Examination of the newborn at birth and 6 weeks examination • Neonatal resuscitation • Insertion of chest drain • Stabilisation and transfer of the sick neonate • Blood sampling, interpretation of common laboratory tests, umbilical arterial and venous catheterization • Fluid management • Use of /imaging / point of care abdominal ultrasound/cardiac evaluation/cranial ultrasound interpretation/IVH • Communication with parents/family

NEPHRO-UROLOGY DISORDERS	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Development of the kidney, urinary tract and external genitalia. • Renal physiology and pathophysiology, principles of fluid balance, electrolyte and acid base regulation • Renal imaging and function tests • Drug prescribing in renal failure 	<ul style="list-style-type: none"> • Taking history in nephro-urological disorders • Measurement of blood pressure • Appropriate urine collection: catheterization / bladder aspiration • Interpretation of urinalysis, microscopy, dipstick • Interpretation of biochemical investigation results • Recognized renal failure
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Urinary tract infection • Vesicoureteric obstruction and reflux • Enuresis: nocturnal and diurnal • Management of voiding disorders • Hematuria/proteinuria, including nephrotic syndrome • Hemolytic uremic syndrome • Common causes of hypertension • Indications for renal dialysis and transplantation • Acute scrotal pain and torsion • congenital abnormalities of the urinary system • nephrotic syndrome • nephrolithiasis • acute and chronic renal failure • acute and chronic nephritis • systemic renal disease

NEUROLOGY AND NEUROMUSCULAR DISORDERS

See curriculum pediatric neurology

PRE-PERI-AND POST-SURGICAL CARE		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> • Basic principles of pre-operative assessment • Basic principles of surgical referrals • Principles of peri-operative management • Principles of post-operative management, including pain management • Know high risk patient factors 	<ul style="list-style-type: none"> • Be able to diagnose acute abdomen, peritonitis, ileus • Able to take care of surgical wounds 	
	<i>Specific conditions</i>	
	<ul style="list-style-type: none"> • Hernias • Maldescended testis • The acute abdomen • Acute scrotal pain • Bowel obstruction • Appendicitis • Abscess 	

RESPIRATORY DISORDERS		
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>	
<ul style="list-style-type: none"> • Physiology and pathophysiology of the respiratory system in children, including age dependent changes. • Important epidemiological and genetic factors for respiratory diseases, including tobacco smoke exposure, pollution and allergens. 	<ul style="list-style-type: none"> • Take a respiratory history and examination. • Recognize and respond to respiratory distress and respiratory failure. • Develop a management plan for common respiratory disorders. • Prescribe and interpret common laboratory tests, chest x-rays and basic lung function. • Prescribe appropriate inhalation devices according to age and be able to educate the patient and his/her parents on how to use them. 	
	<i>Specific conditions</i>	
	<ul style="list-style-type: none"> • Acute and chronic diseases of upper and lower respiratory tract • Acute or recurrent stridor • Acute respiratory distress • Asthma • Cystic fibrosis • Lower respiratory tract infection (including pneumonia and bronchiolitis) • Recurrent or chronic cough • Sore throat and/or mouth 	

	<ul style="list-style-type: none"> • Snoring and obstructive sleep apnea • Congenital respiratory defects
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RHEUMATIC DISEASES	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Etiology and pathophysiology of rheumatic diseases • Inflammatory and non-inflammatory connective tissue diseases • Effects of chronic rheumatic diseases on physical growth and social development • Rheumatological manifestations of systemic diseases 	<ul style="list-style-type: none"> • Taking a musculoskeletal history • Detailed examination of the joints and musculoskeletal system
	<i>Specific conditions</i>
	<ul style="list-style-type: none"> • Acute / chronic arthritis • Common causes of joint swelling • Common gait disorders (limp, torsional and angular deformities of lower limbs) • Common causes of musculoskeletal pain, including limb pain, neck pain, back pain • Juvenile Idiopathic Arthritis (JIA) • Normal patterns of leg alignment (bow legs, knock knees, in toeing) • Septic arthritis and osteomyelitis • Connective tissue disorders • Rheumatic fever • Lupus erythematosus

SPORTS MEDICINE	
<i>Theoretical knowledge</i>	<i>Practical and clinical skills</i>
<ul style="list-style-type: none"> • Understand common sports injury and treatment / the importance of regular exercise to promote good general health • Understand the importance of skeletal maturity in dictating the appropriate type of training • Understand the risks due to incomplete healing of previous injury • Understand the risks of contact sports in healthy children 	<ul style="list-style-type: none"> • Physical examination of the musculoskeletal system. • Recognition of examination findings that are consistent with common sports injuries. • Plan the appropriate management / treatment of an athlete with sports injury.
	<i>Specific conditions</i>

6 Training course chronogram

What follows is a proposed chronogram of the four years postgraduate training, to be intended as a guideline and as an indicator of the mutual importance to be allocated to each topic.

It is structured on the basis of the European Credit Transfer System (ECTS), based on the convention that 60 credits measure a full-time student's workload over an academic year. The workload of a full-time study program in Europe is equivalent in most cases to 36/40 weeks per year and in such cases a credit represents a workload ranging from 25 to 30 hours per week. The workload refers to the theoretical time in which an average student is believed to be able to obtain the required learning outcomes.

The whole postgraduate 4-year training workload (240 ECTS) has then been subdivided in 25% allotted to theoretical knowledge (frontal lectures, seminars, webinars, congresses, simulation learning, etc.) for a total of 60 credits, and 75% allotted to practical and clinical skills (attendance to the hospital wards, pediatric activities on the field, etc.) for a total of 180 credits, equivalent to 45 credits per year (for practical purposes we can adopt the equivalence 1 credit = 1 working week).

Practical training has been allotted to 12 weeks (3 months) of intensive care neonatology and 12 weeks of intensive care pediatrics (listed under "Emergency medicine"); 3 months of neonatology, 3 months of infectious diseases, 2 months of laboratory medicine, 3 + 3 months in community medicine (intended as activity on the field with a general pediatrician or in a peripheral hospital); the remainder weeks have been allotted to various fields of general and specialist pediatrics. The fourth year has been left purposefully undefined: 10 ECTS of theoretical knowledge (TK) and 45 ECTS of Practical and clinical skills (PCS) will be allotted to the specialist pediatric area selected by the trainee for his/her future career, according to what detailed at paragraph 1.3.

topic	1 year		2 year		3 year		4 year		Total	
	common trunk						specialist pediatrics			
	TK = theoretical knowledge				PCS = practical and clinical skills					
	TK	PCS	TK	PCS	TK	PCS	TK	PCS	TK	PCS
LONGITUDINAL TRACK										
Medical English	1		1		1		1		4	0
Evidence-based medicine	0,25		0,25		0,25		0,25		1	0
International medical literature data min	0,25		0,25		0,25		0,25		1	0
Deontology, bioethics, law and professio	0,25		0,25		0,25		0,25		1	0
Communication abilities	0,25		0,25		0,25		0,25		1	0
TOTAL LONGITUDINAL TRACK	2	0	2	0	2	0	2	0	8	0
GENERAL SKILLS AND COMPETENCIES										
Normal-Abnormal Development-Growth	1								1	0
Nutrition	1								1	0
Pharmacology	1								1	0
Safeguarding							1		1	0
Substance Abuse/Toxicology/Poisoning							1		1	0
Laboratory		8							0	8
Genetics & Dysmorphology	1		1						2	0
Pediatric surgery			1	4					1	4
Imaging	1	8					1		2	8
TOTAL GENERAL SKILLS	5	16	2	4	0	0	3	0	10	20
SPECIALISTSKILLS AND COMPETENCIES										
									10	45
Adolescent medicine	1		0		0				1	0
Allergy					1				1	0
Cardiology					1				1	0
Community medicine	1		1	12	1	12			3	24
Dermatology			1						1	0
Diseases of the Orbita and Eyes			1						1	0
ENT Disorders			1						1	0
Endocrinology & Diabetes		5			1				1	5
Emergency medicine	1	12	1	12	1				3	24
Gastrointestinal & Hepatic diseases	1		1	4					2	4
Hematological & Oncological Disorders			1			12		10	1	12
Infectious and Immune deficiencies	1	12	1		1				3	12
Mental health & Behavioral Disorders					1				1	0
Metabolic Diseases	1		1						2	0
Neonatology	1		1		1	12			3	12
Nephro-Urology Disorders					1	9			1	9
Neurology & Neuromuscular Disorders					1				1	0
Pre-, Peri-, and Post-surgical Care			1						1	0
Respiratory Disorders	1			8	1				2	8
Rheumatic Diseases				5	1				1	5
Sports Medicine					1				1	0
TOTAL SPECIALIST SKILLS	8	29	11	41	13	45	10	45	42	160
SUBTOTAL	15	45	15	45	15	45	15	45	60	180
TOTAL ECTS	60		60		60		60		240	