UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

General and Specialistic Pediatrics

2627-6-H4101D037-H4101D119M

Aims

The Module of Pediatrics aims to provide students with specific theoretical and practical knowledge in the following areas:
a) physiology and development of the newborn, infant, child, and adolescent, each with their own age-specific characteristics;
b) preventive medicine in pediatrics;
c) the most epidemiologically significant pathological conditions in pediatrics, including those whose clinical manifestations follow a distinctive course during this stage of life.

The lecture program will therefore cover a broad spectrum of topics, ranging from prevention to diagnosis and clinical management of the pediatric patient, mirroring the most recent advances in medical and healthcare practice.

In the setting of dedicated interactive activity-based learning sessions, clinical cases will be presented using a Problem-Based Learning (PBL) approach, encouraging students to actively engage in differential diagnosis of pediatric diseases, with careful consideration of differences related to the patient's age, sex, and ethnic or geographical background.

Contents

a) General framework and clinical management of children with the most common pathological conditions of childhood, including their epidemiology across different age groups.
b) How to conduct a pediatric clinical evaluation and effectively manage the relationship between the physician, the patient, the family, and the referring specialist.
c) How to perform a comprehensive pediatric physical examination, including the assessment of the most important parameters of normal and pathological growth (auxological measurements and neurodevelopmental milestones), with the aim of early identification of findings that require medical attention and/or immediate intervention.

d) Impact of multicultural and gender-related factors on the diagnostic and therapeutic pathways of complex and rare diseases in the pediatric age group, including those of genetic origin.
e) General principles of pharmacological and clinical management.

Detailed program

GENERAL APPROACH TO THE PEDIATRIC PATIENT
Assessment of the healthy child and clinical management of children presenting with the most common childhood diseases.
NUTRITION
Developmental aspects of nutritional physiology, nutritional requirements, and dietary needs in relation to age. Stages of nutritional development in children: breastfeeding and formula feeding, weaning, and necessary dietary supplementation (refer to the syllabus of the 5th year: Insegnamento PEDIATRIA 5° anno - cod 2627-5-H4101D334
THE NEWBORN

- Physiological changes characterizing the fetal-to-neonatal transition and the persistence of fetal circulation.
- Neonatal resuscitation in the delivery room: equipment and current clinical guidelines.
- The healthy newborn: how to perform a physical examination, normal parameters, organization of the Neonatal Unit, promotion of breastfeeding, and rooming-in practices.
- The low birth weight newborn: etiology of intrauterine growth restriction and low birth weight (metabolic, infectious, and malformative conditions; pulmonary hypertension).
- The preterm newborn: causes and definition of prematurity; specific conditions including Respiratory Distress Syndrome (etiopathogenesis, clinical presentation, diagnosis, and principles of treatment).
- Intraventricular hemorrhage in the newborn: classification, diagnosis, complications, and prognosis.
- Hypoxic-ischemic encephalopathy and periventricular leukomalacia: etiopathogenesis, diagnosis, and prognosis.
- Necrotizing enterocolitis: etiopathogenesis, diagnosis, treatment, and outcomes. Nosocomial infections: epidemiology, prevention, and treatment.
- Major maternal conditions with implications for the fetus and newborn, including congenital maternal-fetal infections.
- Etiopathogenesis and prevention of Sudden Infant Death Syndrome (SIDS).
- The most common genetically transmitted disorders.
- Neonatal jaundice: physiological jaundice and jaundice due to ABO and Rh blood group incompatibility.

GROWTH

- Main characteristics of physical growth and somatic development from the newborn to the adolescent, and the interrelationships among the maturation processes of the various organs and systems (also refer to the syllabus of the 5th wear: PEDIATRIA *cod 2627-5-H4101D334 *).
- Auxological parameters and the principal methods for organizing auxological data; major deviations from normal growth patterns.
- Growth arrest, short stature, and failure to thrive (height and/or height-weight discordance).

DISEASE PREVENTION

- Screening programs in developmental age (prenatal, neonatal, expanded newborn screening, and postnatal screening) and screening for risk factors of metabolic, degenerative, and vascular diseases with onset in pediatric age.
- Immunization schedule and mandatory and recommended (optional) vaccinations. Benefits of the main vaccination measures in pediatric age.

PRINCIPLES OF THERAPY IN PEDIATRIC AGE

- General principles of pediatric clinical pharmacology.
- Antipyretic therapy in children: drugs and dosages.
- Criteria for the rational use of antibiotics.

GENETICS

- Recurrence risk in pediatrics for hereditary diseases (monogenic and polygenic).
- Key advances in molecular diagnostics.
- Clinical warning signs and diagnostic workup for the most common chromosomal disorders and malformative syndromes.
- Clinical features of several syndromes: Down syndrome, Turner syndrome, Klinefelter syndrome, Cornelia de Lange syndrome, Williams syndrome, Noonan syndrome, and Neurofibromatosis type I.
- Basic care approach to the child with complex disability of genetic origin.

INGESTION OF TOXIC SUBSTANCES

Accidental ingestion in pediatric age: etiology, pathophysiology, and therapeutic approach.

GASTROENTEROLOGY

- Dyspepsia in infancy and associated symptoms: gastroesophageal reflux, regurgitation, vomiting
- Dehydration states and therapeutic approaches.
- Disorders of digestion and absorption in pediatric age (celiac disease, cystic fibrosis of the pancreas) and the main conditions affecting the small intestine, ileum, and colon (diarrhea, constipation, acute and recurrent abdominal pain, chronic inflammatory bowel diseases).
- Abdominal pain in pediatric age.

ALLERGIES / INTOLERANCES / ADVERSE REACTIONS

Adverse reactions to food, cow's milk proteins, and lactose.

HEPATOLOGY

- Differential diagnosis of the main acute and chronic liver diseases with onset in pediatric age.
- Acute liver failure.
- Causes of jaundice in pediatric age.
- Therapeutic and nutritional support for the child with liver disease.

PNEUMOLOGY

- Pediatric manifestations of the main diseases of the upper and lower respiratory tract, pleura, and mediastinum (in particular pharyngotonsillitis, acute otitis media, laryngitis, epiglottitis, bronchiolitis, and bronchopneumonia).
- Etiology, clinical warning signs, and diagnostic workup for hypersensitivity states to aeroallergens in children.
- Signs and symptoms of bronchial asthma in children in both its acute and chronic presentations.
- Management of acute asthma attacks and long-term chronic asthma management.
- Pulmonary manifestations of allergic diseases.

HEMATOLOGY AND HEMATO-ONCOLOGY

- Main age-related changes in hematological values (full blood count)
- Acute and chronic anemia.
- Thalassemia: main clinical manifestations and carrier status; therapeutic strategies for thalassemia major.
- Sickle cell disease.

- Hereditary spherocytosis.
- G6PD deficiency (Favism): awareness of drugs that may trigger a hemolytic crisis;
- autoimmune hemolytic anemias, aplastic anemias, and dyserythropoietic anemias.
- Indications and risks associated with splenectomy and prophylaxis against overwhelming post-splenectomy infections.
- Etiology, diagnostic workup, and treatment of iron deficiency anemia in children. Iron supplementation in preterm infants.
- Immune-mediated diseases and characteristics of congenital and acquired immunodeficiencies in pediatric age.
- Immune Thrombocytopenic Purpura (ITP) and the main platelet disorders.
- Splenomegaly, lymphadenopathy, and hepatomegaly in pediatric age.
- Hemophilia.
- Childhood leukemias: incidence, clinical presentation at onset, main therapeutic strategies, referral centers, prognosis, and psychosocial approach.
- Most common solid tumors in childhood: incidence, warning signs and symptoms, principles of treatment, and prognosis (neuroblastoma, Wilms tumor, lymphomas, brain tumors).
- Histiocytosis: clinical features, principles of treatment, and prognosis.

INFECTIOUS DISEASES

- Pediatric manifestations of the main diseases of the upper and lower respiratory tract, pleura, and mediastinum (in particular pharyngotonsillitis, acute otitis media, and bronchopneumonia).
- Measles, varicella, rubella, scarlet fever, erysipelas, minor exanthems, enanthems, erythema infectiosum, roseola infantum, rashes, and other cutaneous and mucosal manifestations associated with infectious or systemic diseases in pediatric age.
- Infections caused by HSV, varicella-zoster virus (VZV), CMV, EBV, and mononucleosis-like syndromes (with attention to infection during pregnancy and in immunocompromised patients).
- Influenza, whooping cough (pertussis), and epidemic parotitis (mumps).
- Distinctive features of tuberculosis (TB) in pediatric age. Prophylaxis in tuberculin-positive children.
- Staphylococcal and streptococcal infections.
- Clinical warning signs of acquired immunodeficiency syndrome (AIDS) in pediatric age: clinical features, modes of HIV transmission to children, staging of infection and disease, and therapeutic strategies. Clinical presentations that raise suspicion of encephalitis or meningitis.
- Etiology of meningitis in pediatric age: bacterial, viral, and fungal meningitis.

RHEUMATOLOGY

- Osteoarticular diseases and inflammatory conditions in childhood: septic arthritis, reactive arthritis, arthritis associated with rheumatic fever, and juvenile chronic arthritis.
- Rheumatic fever.
- Juvenile idiopathic arthritis (JIA).
- Henoch-Schönlein Purpura (IgA Vasculitis).
- Kawasaki disease.

NEPHROLOGY AND UROLOGY

- Oliguria, dysuria, pollakiuria, anuria, and enuresis in pediatric age.
- Urinary tract infections in pediatric age.
- Hematuria and proteinuria in children.
- Nephrotic syndrome and glomerulonephritis in pediatric age.
- Hemolytic uremic syndrome (HUS).
- Geneal characteristics of urinary tract malformations, with particular reference to vesicoureteral reflux.
- Pediatric uropathies (hypospadias, phimosis, undescended testes, posterior urethral valves, ureteropelvic junction obstruction, anomalies in number and structure of the kidney, neurogenic bladder).
- Chronic kidney disease (CKD).

ENDOCRINOLOGY / GROWTH AND PUBERTY

- Obesity in pediatric age.
- Short stature, including familial short stature, constitutional growth delay, growth hormone (GH) deficiency, and other endocrine causes.
- Turner syndrome and Klinefelter syndrome.
- Thyroid function disorders and thyroid nodules.
- Stages of pubertal development.
- Genital malformations (in particular cryptorchidism, hypospadias, and disorders of sexual development).
- Precocious or delayed puberty.
- Congenital adrenal hyperplasia
- Main disorders of calcium-phosphorus metabolism in childhood, with particular emphasis on rickets.
- Diabetes mellitus with onset in pediatric age.
- Diabetes insipidus.
- Hypoglycemia.

CONGENITAL METABOLIC DISORDERS

- Lysosomal storage diseases (with particular reference to Fabry disease, Pompe disease, and Mucopolysaccharidoses).
- Metabolic intoxication disorders (urea cycle disorders, organic acidemias, aminoacidopathies).
- Energy deficiency disorders (glycogen storage diseases).

CARDIOLOGY

- Methods for investigating the cardiovascular system through clinical and instrumental semiotics, and identification of the main signs of cardiac disease.
- Hypertension in childhood.
- The most common congenital and acquired heart diseases encountered in pediatrics and available therapeutic options.

THE CHILD WITH CHRONIC SYSTEMIC DISEASE

- Cystic fibrosis.
- Movement disorders of central and peripheral origin.

PEDIATRIC EMERGENCIES

- Trauma in pediatric age.
- Bronchiolitis.
- Laryngitis, croup, and epiglottitis.
- Dehydration.
- Sepsis and septic shock.
- Acute management of seizures and febrile convulsions.
  Methods for investigating the cardiovascular system through clinical and instrumental semiotics, and identification of the main signs of cardiac disease.

Prerequisites

Knowledge of the physiology and basic sciences course
Attendance and participation in the internship activities of the first part of the course, 5th year (semester second - see related syllabus: PEDIATRIA 5° anno *cod 2627-5-H4101D334 *)

Teaching form

Lectures: in-person delivery method starting from clinical cases proposed by the teacher, divided by pathologies/ nosological areas (48 hours, 4 CFU)

Activity-based learning

- classroom simulations, with proactive engagement of students in the differential analysis of clinical cases according to the PROBLEM BASED LEARNING method and purposing/developing clinical issues. Students will be divided into 3 groups (20 hours/group)
- activities under the supervision of the Teacher (4 hours/group)

Textbook and teaching resource

Nelson Essentials of Pediatrics –10th edition (english version) Autore/i: Marcdante - Kliegman - Behrman – Nelson Editore: Elsevier – Saunders

Semester

First semester

Assessment method

see syllabus PEDIATRIA 6° anno INSEGNAMENTO CON UNITA' DIDATTICHE - cod. 2627-6-H4101D037

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Sustainable Development Goals

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