

Continuing Professional Development

Paediatric Respiratory Diseases

*This syllabus is for general paediatricians with an interest in paediatric respiratory medicine:
The target patient population referred to in this syllabus comprises infants, children and young adults below the age of 18 years*

Module 1. Structure and function of the respiratory system

1. Anatomy and development
 - 1.1. Surface anatomy of lung lobes and basic bronchial and lung anatomy
2. Applied respiratory physiology and pathophysiology (including common respiratory symptoms)
 - 2.1. Physiological principles underlying flow-volume curves, measurement of lung volumes and bronchial lability
 - 2.2. Physiology of breathing
 - 2.3. Ventilation, perfusion, gas exchange and oxygen transport and how these relate to clinical findings and management
 - 2.4. Pathophysiology that explains wheeze, stridor, snoring, airway tone, cough and crackles
 - 2.5. Physiology of sleep: basic respiratory physiological changes during rapid eye movement and non-rapid eye movement sleep
3. Immunology and defence mechanisms
 - 3.1. Adaptive immunity and hypersensitivity reactions
 - 3.2. Innate immunity and mucosal defence mechanisms in the respiratory tract
4. Environmental determinants of respiratory health and disease in childhood
 - 4.1. Environmental effect on respiratory health, particularly cigarette smoke exposure, indoor and outdoor air pollution and the early-life environment

Module 2. Evaluation and management of respiratory symptoms and signs

1. Acute and chronic cough
 - 1.1. Current published guidelines
 - 1.2. Clinical evaluation of isolated cough and knowledge of when to refer a patient for specialist assessment
2. Stridor, wheezing and other respiratory noises
 - 2.1. Distinguish different forms of noisy breathing
 - 2.2. Undertake clinical evaluation of noisy breathing in different age groups
 - 2.3. Know when to suspect functional stridor/vocal cord dysfunction and when to refer a patient
3. Assessment and management of a breathless or dyspnoeic child
4. Respiratory distress and respiratory insufficiency
 - 4.1. Clinical signs of respiratory insufficiency in children with and without underlying disorders
 - 4.2. Detailed interpretation of blood gas analysis
5. Common causes of haemoptysis and the diagnostic approach
6. Questionnaires in clinical assessment
 - 6.1. Validity and reliability of questionnaires as clinical, epidemiological and research tools
 - 6.2. Application of questionnaires in clinical practice
 - 6.3. Comprehension of reasons why some parents and patients may have difficulties in completing questionnaires

Module 3. Pulmonary function and diagnostic testing: measurement, performance and interpretation

1. Volume-time and flow-volume curves in school-age children
 - 1.1. Reversibility testing in school-age children

- 1.2. Awareness and application of American Thoracic Society (ATS)/European Respiratory Society (ERS) standards
- 1.3. Recognise disease-specific abnormalities in the flow-volume curve
- 1.4. Recognise technical limitations in the performance of spirometry
2. Bronchial provocation testing: referral of school-age children for bronchoprovocation testing
3. Indications for cardiopulmonary exercise testing (CPET)
4. Performance, supervision and interpretation of blood gas analysis and pulse oximetry
5. Hygiene and infection control during test procedures
 - 5.1. Understands how to avoid cross-infection during spirometric testing
6. Definitions of measured indices
 - 6.1. Definitions and significance of spirometric lung function indices
 - 6.2. Integration of the test results for diagnosis and management of a patient
7. Choice and appropriate use of reference values
 - 7.1. Basis of reference equations for lung function and the concept of z scores
 - 7.2. Importance of reference values for the correct interpretation of results
8. Exhaled nitric oxide measurements
 - 8.1. Understands how measurements of exhaled nitric oxide contribute to diagnosis and management
9. Assessing the respiratory risk of air travel, high altitude and diving (knowledge only)
 - 9.1. Principles of fitness-to-fly (FTF) testing
 - 9.2. Knowledge of which patients should be referred for FTF testing
10. Awareness of the role of specialist tests
 - 10.1. Multiple breath washout test
 - 10.2. Transfer factor
 - 10.3. Impedance oscillometry
 - 10.4. Body plethysmography
 - 10.5. Lung clearance index

Module 4. Airway endoscopy

1. Identification of when to refer a patient for airway endoscopy

Module 5. Imaging

1. Principles of conventional radiography and ultrasonography
 - 1.1. Indications for and advantages and limitations of different imaging methods and ability to select the most appropriate imaging method for different clinical problems
 - 1.2. Interpretation of imaging findings in relation to the clinical respiratory presentation
2. Comparative radiation burden of commonly used imaging methods in children, and the ability to balance the risks and benefits

Module 6. Respiratory infections

Epidemiology, diagnosis, management and complications of respiratory infections, including recognition of long-term effects of common infections.

1. Acute upper respiratory tract infections
2. Acute lower respiratory tract infections
3. Pleural infections
4. TB and non-TB mycobacterial diseases
5. Recognition of high-risk situations and appropriate referral
6. Recognition of protracted bacterial bronchitis and non-cystic fibrosis (CF) bronchiectasis and knowledge of when to refer a patient for further investigation
 - 6.1. Aetiology and pathophysiology of bronchiectasis

7. Lung involvement in an immunocompromised host
 - 7.1. Recognition of possible complications of immunodeficiencies and indications for referral
8. Immunisations for respiratory pathogens
 - 8.1. Local availability of immunisations
 - 8.2. Local and international guidelines for use and administration of immunisations
 - 8.3. Advise families and healthcare workers about the need for and timing of immunisations
 - 8.4. Ability and willingness to communicate the benefits, risks and limitations of immunisations
 - 8.5. Understanding of the perceived risks of immunisations
9. Accuracy and interpretation of microbiological tests
 - 9.1.1. Diagnostic accuracy of available tests
 - 9.1.2. Optimal methods for collection and processing of specimens
 - 9.1.3. Ability to advise healthcare workers about collection and processing of specimens
 - 9.1.4. Management of unexpected results**

Module 7. Asthma and wheezing disorders

1. Phenotypes and their different pathologies and long-term outcomes (including underlying pathophysiology and basic epidemiology)
 - 1.1. Asthma syndrome and its complexity, including the difference between allergic and non-allergic asthma and the various types of recurrent wheezing in preschool children
 - 1.2. Changing patterns of recurrent wheeze and asthma across children of different ages
2. Environmental factors relevant to asthma and other wheezing disorders
 - 2.1. Controversies surrounding allergen avoidance measures
 - 2.2. Interaction of physical activity, sports and asthma
 - 2.3. Gene-environment interactions, including the role of viral infections and their effect on the airways
 - 2.4. Influence of passive smoking and air pollution on asthma morbidity
3. Atypical wheezing and knowledge of when to refer a patient
4. Management of uncomplicated asthma and wheezing at different ages, including age-related pharmacology, and pharmacological and non-pharmacological management
5. Difficult-to-treat asthma and when to refer patients with difficult and severe asthma

Module 8. Allergic disorders: epidemiology, diagnosis and management

1. Anaphylaxis
 - 1.1. Current guidelines for diagnosis, differential diagnosis and treatment
 - 1.2. Risks of anaphylaxis
 - 1.3. Management of an acute reaction
 - 1.4. Prescription of epinephrine appropriately and explain its correct use
2. Allergic rhinitis
 - 2.1. Current guidelines for diagnosis, differential diagnosis and treatment
 - 2.2. Evaluation of the anterior portion of the nasal cavities
 - 2.3. Prescription of oral and topical treatments according to current guidelines
3. In vivo and in vitro testing for allergic disorders
 - 3.1. Normal values and the diagnostic accuracy of tests
 - 3.2. Physiological, technical and methodological aspects of these tests
 - 3.3. Performance of a skin prick test
 - 3.4. Supervision of others who perform tests
 - 3.5. Interpretation of results, including IgE values
4. Preventative measures
 - 4.1. Value of avoidance measures
 - 4.2. Current guidelines
 - 4.3. Appropriately prescribe or advise on avoidance measures

5. Diagnosis and basic management of associated allergic conditions
 - 5.1. Current guidelines for diagnosis, differential diagnosis and treatment
 - 5.2. Initiation of topical treatment according to current guidelines
 - 5.3. Recognition of a child with a suspected food allergy
 - 5.4. Differentiate food sensitivity across different age groups
 - 5.5. Initiation of appropriate investigations and knowledge of when to refer a patient
6. Difficulties and complications of exclusion diets

Module 9. CF

1. Epidemiology, genetics, pathophysiology and prognosis (for paediatricians who perform shared care; be able to provide counselling)
 - 1.1. Genotype identification, its relevance to basic cellular abnormalities and its relationship with structural and functional pathology
- Epidemiology, diagnosis, management and complications of:
2. CF lung disease
 - 2.1. Principles of drug treatment, aerosol therapy and physiotherapy
 - 2.2. Nutritional requirements
 - 2.3. Recognition of possible pulmonary complications of CF lung disease and appropriately refer a patient
 - 2.4. Psychosocial and developmental issues related to CF
 - 2.5. Interpretation of clinical features and clinical test results
 - 2.6. Burden of disease and treatment on the child and his/her family
 - 2.7. Indications for the use of CF transmembrane conductance regulator modulators
 3. Extrapulmonary manifestations of CF including nutrition
 - 3.1. Range of presentations of CF
 - 3.2. Recognition of extrapulmonary manifestations of CF
 - 3.3. Holistic approach for clinical care
 4. Microbiology relevant to CF, including cross-infection
 - 4.1. Knowledge of the relevant respiratory pathogens
 - 4.2. Problems associated with cross-infection from respiratory aspects in CF
 5. Collection of appropriate respiratory specimens from children of all ages

Module 10. Congenital malformations

1. Presentation of common congenital malformations that affect the respiratory system
2. Antenatal diagnosis and management
 - 2.1. Basic knowledge of options for antenatal diagnosis and management of congenital thoracic malformations
3. Follow-up and long-term outcomes. Basic knowledge of:
 - 3.1. Long-term outcome and possible late complications of congenital thoracic malformations
 - 3.2. Advantages and disadvantages of surgical versus “watch and wait” approaches
 - 3.3. Assessment and management of thoracic cage deformities

Module 11. Bronchopulmonary dysplasia (BPD)/chronic neonatal lung disease

1. Basic knowledge of epidemiology, aetiology, prevention, diagnosis, management and complications of BPD
 - 1.1. Current published guidelines and evidence on the management of BPD
 - 1.2. Principles of drug treatment and aerosol therapy in different age groups
 - 1.3. Comorbidities associated with BPD
 - 1.4. Acute and chronic problems including non-pulmonary comorbidities associated with BPD
2. Follow-up and long-term outcomes
 - 1.1. Respiratory and non-respiratory consequences of BPD during infancy and adolescence
 - 1.2. Communication of management and prognosis in a language that the family can understand

Module 12. Ear-nose-throat and aerodigestive-related respiratory problems

1. Recognition of aspiration due to feeding and swallowing disorders
2. Anatomical and functional aspects of gastro-oesophageal reflux disease
3. Possible foreign body inhalation and knowledge when to urgently refer a patient

Module 13. Rare diseases

1. Recognition of disease and knowledge of when to refer a patient with:
 - 1.1. Primary ciliary dyskinesia
 - 1.2. BO
 - 1.3. ILDs
 - 1.4. PVDs
 - 1.5. Pulmonary haemorrhage
 - 1.6. Pleural diseases including spontaneous pneumothorax (initiate emergency treatment when needed)
 - 1.7. Drug- and radiation-induced lung diseases
 - 1.8. Other rare lung diseases

Module 14. Sleep medicine and breathing control disorders

1. Basic pathophysiology of sleep-disorder breathing (SDB)
2. Recognition of clinical situations where sleep studies may be appropriate
3. Obstructive sleep apnoea syndromes
 - 3.1. Presenting symptoms of SDB in different age groups and when to refer a patient for further assessment
4. Central sleep apnoea/hypoventilation
 - 4.1. Presentations of congenital central hypoventilation syndrome
5. Dysfunctional breathing/hyperventilation syndromes
 - 5.1. Recognition of dysfunctional breathing/hyperventilation and appropriate referral

Module 15. Long-term management of chronic respiratory disorders

1. Patient education and self-management
2. Conduct appropriate two-way communication with patients and their parents
3. Nutritional management
 - 3.1. Nutritional requirements of children with chronic respiratory diseases
4. Psychological support for children and families
 - 4.1. Awareness of and recognition of psychosocial and developmental problems associated with chronic illness in children
 - 4.2. Referral of children and their families for help with psychological or developmental problems

Module 16. Inhalation therapy

1. Basic science of aerosol production and delivery including principles and objectives
2. Indications for inhalation therapy
 - 2.1. Appropriate aerosol therapy in various forms of respiratory disease
 - 2.2. Choice of appropriate aerosol therapy and devices for children with different conditions and at different ages
 - 2.3. Ability to teach patients, their families and allied health professionals about aerosol therapy

Module 17. Technology-dependent children (management, monitoring and weaning)

1. Physiological, technical and methodological aspects of long-term oxygen therapy
 - 1.1. Current national and international guidelines regarding long-term use of home oxygen in children
 - 1.2. Local protocols for prescribing and delivering home oxygen
 - 1.3. Performance and interpretation of an overnight oximetry recording
 - 1.4. Organisation and prescription of home oxygen for a child
2. Knowledge of when to refer a patient for non-invasive ventilation

Module 18. Epidemiology and environmental health

1. Epidemiological principles
 - 1.1. Difference between local and international epidemiology
 - 1.2. Interpretation of the relevance of published data
 - 1.3. Ability to audit local prevalence data and monitor international data
2. Impact of indoor and outdoor air pollution on respiratory health
 - 2.1. Effects of particulate and non-particulate matter on respiratory health
 - 2.2. Effects of tobacco smoke and other pollutants on patients' health
 - 2.3. Advise effectively about avoidance
 - 2.4. Provide non-judgemental advice about lifestyle modifications
3. Impact, prevention and cessation of smoking including the initiation and support of effective smoking cessation interventions
4. Burden of paediatric respiratory diseases on healthcare resources
 - 4.1. Local costs of hospital and community care
 - 4.2. Ability to minimise unnecessary costs
 - 4.3. Evaluation of the cost-effectiveness of care

Module 19. Evidence-based medicine and research

1. Literature search strategies
2. Critical evaluation of published research