

Document 2a

Curriculum of Training in Paediatric Respiratory Medicine (PRM)

OBJECTIVES

The objective of training is to produce a subspecialist in PRM who:

1. Can independently manage a variety of respiratory problems in children and adolescents
2. Has some basic experience and skills in research
3. Can supervise trainees and coordinate a PRM service, and
4. Has the ability and attitude for continued medical education and further professional development.

KNOWLEDGE

1. Knowledge should be built on the sound basis of training obtained from basic and higher training in General Paediatrics.
2. Should demonstrate an understanding of **respiratory symptoms and signs**, being able to organize investigations to aid diagnosis or to measure disease severity, and recommend and institute appropriate age-related treatments for common in- and out-patient respiratory conditions.
3. Know the indications, contraindications, risks and complications of **bronchoscopy** and its related procedures in children and be able to explain these to parents.
4. Understand the science of **aerosol delivery** and its limitations in children, and the differences between various aerosol treatments.
5. Should know the epidemiology, natural history and genetics of **allergy**, and choice and interpretation of allergy tests, with special reference to the respiratory tract.
6. Should understand the embryology and anatomy of **congenital malformations** of the airway, lung and chest wall, and how the congenital malformations affect lung function and be familiar with the principles underlying medical and surgical management.
7. Should understand the difficulties, variability, and range of presentation resulting in the diagnosis of **asthma** and know how and when to investigate for alternative diagnoses, understand the underlying abnormalities in lung function, recognizing asthma phenotypes, their different pathologies and long term outcome.
8. Should know the epidemiology of the **wheezing disorders of childhood**, the pharmacology of both common and unusual

asthma medication, and the evidence basis for treatments at different age groups.

9. Should know the aetiology and pathogenesis of **chronic lung disease** (CLD), current strategies and therapies used in Neonatal intensive Care Units to try and prevent CLD occurring and the evidence base underpinning this, and treatment strategies for CLD.
10. Should demonstrate an understanding of the epidemiology, diagnosis, clinical presentation and treatment of common and rare **respiratory infections**. The trainee should be able to diagnose and manage common respiratory infections including: 1. upper and lower respiratory tract respiratory illness, croup, viral bronchiolitis, all forms of pneumonitis, lung abscess, empyema, bronchiectasis, and 2. the diagnosis and management of respiratory infections in high risk situations especially the child who is **immunosuppressed**.
11. Should know the epidemiology and clinical presentation for **childhood tuberculosis**, understand the development of tuberculin sensitivity and the limitations of current diagnostic methods.
12. Understand the developmental changes in respiratory physiology and pathophysiology of **acute and chronic respiratory failure** in children. Understand the methods used in the diagnosis and monitoring of ventilation in children and their limitations. Understand the principles and working of the commonly used ventilatory modalities including CPAP, BiPAP, and pressure and volume support. Understand the place of long term oxygen therapy in children with chronic respiratory failure.
13. Know the physiology of **sleep** at different ages, sleep stages, their effects on cardiorespiratory status and changes with age. Know what clinical conditions disturb sleep and in particular those which result in airway obstruction and central apnoea. Know the different clinical pictures caused by different conditions and be familiar with the advantages and limitations of polysomnography, cardiorespiratory studies and oximetry recordings.
14. Know the pathogenesis, diagnosis and management of **less common pulmonary diseases**: Obliterative bronchiolitis; Primary Ciliary Dyskinesia; Gastro-oesophageal Reflux related Lung Disease; Interstitial Lung Disease; Pulmonary vascular disorders including pulmonary hypertension; Pulmonary haemorrhage.

15. Know the impact of **environmental factors** from air pollution to smoking on the developing lungs and the family.
16. Should have acquired a basic knowledge of **research methods and statistics**, and has participated in a research team.

SKILLS

1. **Determine** the need for admission when assessing those referred, able to determine, plan and explain to families the appropriate investigations and treatment. **Recognise and manage** severe and/or deteriorating respiratory problems including the need for and implementation of invasive and non-invasive ventilatory support.
2. **Liaise with multidisciplinary team** caring for the patients, and give discharge advice to families with acute or chronic respiratory problems and arrange follow up as necessary, and serve as the pivotal liaison in long term management.
3. **Communicate** with the primary care team about the patient's future management, and be able to identify and manage unrelated conditions where appropriate.
4. Able to perform **lung function tests** and teach the underlying physiology - flow-volume curves, measurement of lung volumes, the principles of bronchial lability, ventilation, perfusion and gas exchange. Able to perform spirometric testing, measurement of bronchodilator responsiveness, measurement of lung volumes, bronchial responsiveness, exercise challenge and assessing fitness to fly.
5. Know the delivery of **aerosol therapy** to children of different ages, and instruction of children, parents, nurses and doctors in the use of inhalers and devices.
6. Have undertaken **skin prick testing**, management of allergic rhinitis and eczema and can appropriately discuss the role of immunotherapy with families.
7. Should be familiar with the diagnosis of all the major **congenital upper and lower respiratory tract abnormalities**, be able to select appropriate diagnostic techniques in elucidation and have had practical experience in the initial assessment and follow up of the major congenital abnormalities to the satisfaction of his/her supervisor
8. Management of infants and older children with **acute wheezing disorders**, including bronchiolitis and acute severe asthma,

management of chronic infant wheezing/asthma in a clinic setting and evaluate difficult asthma, arrange investigations and understand potential further treatments.

9. Should have managed the **respiratory and nutritional care of babies with CLD**. This should include managing the discharge and home care planning process and follow-up.
10. Should be able to perform a **naso-pharyngeal aspirate** and washings, take a cough swab, perform a diagnostic pleural tap and insert a chest drain and bronchoscopic bronchoalveolar lavage
11. To perform and interpret **tuberculin skin testing**.
12. Practical experience of the diagnosis, assessment and management of children with **chronic respiratory failure** including specifically children with neuromuscular disorders, ventilatory control disorders, severe chronic lung disease, severe obstructive sleep apnoea and/or craniofacial anomalies unresponsive to adenotonsillectomy. Practical experience of long-term ventilatory support in children including the choice and set up of equipment, discharge planning, and follow-up and troubleshooting.
13. Practical experience in the prescription, initiation, and supervision of children who require **home oxygen therapy**.
14. Principles and practice of **tracheostomy** care in children.
15. Able to take a sleep history, set up a **sleep study**, score respiratory events, report sleep studies and assess clinical status for intervention.
16. Ability to recognize presentations of **rare lung diseases** with appropriate degree of suspicion, to perform and interpret an oesophageal pH study, to perform a nasal ciliary biopsy and to assess the indications for lung biopsy and interpret the report.
17. Able to use and interpret **imaging of the respiratory tract** from Xrays, ultrasound, CT scans, MRI and radio-isotope scans of the respiratory tract for diagnosis and assessment of disease and function in children.
18. Should be able to perform **flexible bronchoscopy** for the diagnosis, assessment and treatment of airway diseases in children.
19. Should be able to give proper counseling to parents and children on **smoking and environmental factors** affecting pulmonary health in children and the family.
20. Should have mastered **basic research skills** of hypothesis formation, study design, trial conduct and result analysis.

ATTITUDES

1. Appreciation of the **scope and limitations** of clinical, laboratory and radiological investigations for respiratory diseases.
2. Appreciation of the **need to participate** in formulation of guidelines and protocols for respiratory diseases to maintain the standard of care.
3. Appreciation of the importance of appropriate, effective and timely **communication** with children, parents, colleagues and other allied health professionals.
4. Appreciation of the importance of **team work**, and **willingness to teach** and train junior staff.
5. Appreciation of the need to **maintain one's knowledge** of recent advances and current concepts of the subspecialty over a professional lifetime.

DOCUMENTATION

At the end of the training, the trainee should:

1. Have a portfolio of a minimum of **50 cases of in-patient management** of respiratory diseases during the training period.
2. Have a portfolio of a minimum of **50 cases of out-patient management** of respiratory diseases during the training period.
3. Performed **specialist procedures** as required in Appendix III.
4. Have been involved in **clinical audit** in the discipline.

Document 2b

Guideline Document on Training: Duration and Content

1. The training should span a minimum of 3 years, of which a maximum of 12 months may overlap with the higher training in General Paediatrics if this period was done in paediatric respiratory medicine.
2. A minimum of 30 months should be spent in clinical training in at least 2 hospitals in the same cluster. A minimum of 6 months should be spent in any 1 of the hospitals.
3. It is recommended that at least 3 months of clinical training should be spent in the paediatric intensive care unit (PICU). Total time spent in the PICU or Neonatal Intensive Care Unit (NICU) should not exceed **9 months, with not more than 3 months spent in NICU**. The work in the PICU and NICU should be significantly more advanced than that done during general paediatric training. The trainee should be given a more supervisory role.
4. Overseas training in an accredited paediatric respiratory unit is strongly recommended for a minimum period of 6 months. It is possible for a significantly larger proportion of the training to be done overseas.
5. A minimum of 3 months of protected time (or equivalent) for research is highly recommended.
6. Elective training may be done for a maximum of 6 months in one or two of the following disciplines, subject to the approval of the Subspecialty Board:
 - a. Paediatric anaesthesia
 - b. Adult respiratory medicine
 - c. Paediatric imaging
 - d. Laboratory research, related to PRM
 - e. Paediatric otorhinolaryngology
 - f. Clinical allergy
 - g. Epidemiology

h. Other related or new disciplines as approved by the Subspecialty Board

7. At least 6 teaching sessions to post-graduates of at least 1 hour each should be carried out during the training period, preferably under supervision.
8. At least 2 dissertations should be written and submitted as part of the exit assessment. At least 1 of these dissertations should lead to publication of a scientific paper in a peer-reviewed journal. At least one of the dissertations should be a scholarly study or original research.
9. At least 2 papers should be accepted for presentation in local or international meetings. One or more of them should have been an oral presentation.
10. Administrative responsibilities should be part of the training, as assigned by the trainer.