

**FELLOWSHIP PROGRAM**  
**IN**  
**PAEDIATRIC Respiratory Medicine**

**1429-1430 (2008-2009)**

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## **I. Introduction**

Respiratory diseases in children are a major health problem in Saudi Arabia today, causing more disability and use of medical services than any other group of diseases. In addition, a shortage exists of health care workers who are equipped with the skills and attributes necessary to affect changes that will more fully meet the needs of children with chronic respiratory diseases. To meet this need the Pediatric Pulmonology Fellowship program is developed. This program is designed to develop a specialist with clinical and laboratory skills essential in the care of the respiratory system of newborns, infants and children in health and in disease.

## **II. Admission Requirements**

To be admitted to the Pediatric Pulmonology subspecialty program, an individual must:

1. possess a certificate of the Saudi Commission for Health Specialties in pediatrics or equivalent recognized degrees.
2. pass successfully the admission interview.
3. Provide three letters of recommendation from consultant with whom the candidate has worked for a minimum of three months.
4. provide a written permission from the sponsoring institution of the candidates allowing him/her to participate in the training program as a full time for the entire period of the program.
5. register annually and pay the fees at the Saudi Commission for Health Specialties for the program.

## **III. Program Accreditation Requirements:**

For a hospital to be accredited to offer a fellowship training program in pediatric Pulmonology or to participate in such training, the following requirements must be fulfilled:

1. Meet the requirements for accreditation detailed in the general accreditation bylaws of the Saudi Commission for Health Specialties.
2. Has a minimum of two (2) qualified full time consultants with satisfactory experience in teaching and commitment to carry out the approved teaching and training program as stipulated by the Saudi Council for Health Specialties (SCHS).
3. Has an inpatient pulmonology service with a minimum of 4 beds.
4. Has an average inpatient load of 4-5 patients/week.
5. Availability of active Pediatric Pulmonology Consultation Service.

6. Availability of Pediatric Pulmonology Outpatient Clinic supervised by a Pediatric Pulmonologist.
7. Availability of Pulmonary Function Laboratory for children that is able to perform spirometry, lung volumes (by plethysmography and inert gas dilution), and diffusion capacity.
8. Availability of Pediatric Surgery/ Thoracic surgery and ENT Services.
9. Availability of Radiology Department with all diagnostic facilities needed for patients with respiratory diseases.

#### **IV. Number of Fellows:**

The program will accept one fellow per 4 inpatient bed per training level.

#### **V. Program outline**

**1. Duration:** total duration of the program will be 24 months of full time teaching /training in pediatric Pulmonology. The first year will be concentrated mainly on clinical pediatric Pulmonology. The second year will also include laboratory training, research, and electives approved by the program.

#### **2. The structure of the program:**

##### **A. First year:**

- a) Consultation service (inpatient, outpatient and bronchoscopy) 8 months (2 blocks each block is 4 months)

The fellow will be the initial contact for all the consultations from medical, surgical and emergency departments. He/She is expected to interpret all PFT done during the rotation under the supervision of the attending consultant pulmonologist. The trainee will observe all the bronchoscopy procedures during the rotation. He/She will be allowed to do some in the second year of training.

- b) PICU: 2 months

The candidate is expected to learn the different ventilatory strategies and the treatment of acute lung injuries.

- c) Pulmonary Function Test Laboratory: 1 month

To perform the spirometry, body plethysmography for the thoracic volume and airways resistance measurement, bronchial challenge, diffusion capacity (DICO), measurement of lung volume by gas dilution techniques (helium dilution nitrogen washout).

- d) Vacation: 1 month

**B. Second year:**

- a) Consultation service (inpatient, outpatient and bronchoscopy) 6 months (2 blocks 3 months each)

(As stated above)

- b) Pediatric Allergy/ Immunology: 1 month

The fellow will be exposed to different type of immunological and allergic disorders related to the respiratory system.

- c) Elective Rotation: 2 months

The fellow will choose the specialty he/she wants to rotate like Pediatric ENT, Pediatric Radiology, Lung Pathology, home health care.

- d) Adult Pulmonology: 1 month

The fellow will be exposed to the adult spectrum of respiratory diseases and bronchoscopy.

- e) Sleep Medicine: 1 month

The fellow will assess the pediatric respiratory sleep disorder in sleep lab setting especially during night like obstructive sleep apnea, central sleep apnea and mixed sleep breathing disorders

- f) Vacation: 1 month

**C. Structured Activities:**

The candidate is expected to participate in:

- a) A minimum of 3 times weekly inpatient rounds with the consultant
- b) Active participation in pediatric pulmonology outpatient clinics under the consultant supervision.
- c) Clinical discussion, rounds and conferences.
- d) Weekly Grand Round
- e) Monthly Journal club
- f) Monthly topic presentation
- g) Monthly radiology rounds.

- h) Physiology and clinical post graduate teaching seminars: Shared by all of the training centers.
- i) The candidate will be participating in research projects and presentations at regional and national scientific meetings and/or publication in journals.

#### **D. Responsibilities of the Fellows:**

The final goal of the program is to bring all trainees to the point where they can act independently and demonstrate appropriate competence in Pediatric Pulmonology. Therefore, the fellow's responsibilities are:

1. Admitting and clerking all the pulmonology patients suggesting a work-up plan and discussing the management with the Consultant Pulmonologist.
2. Evaluation and management of all patients who need pulmonology consultation and discussing plans of management with the Consultant Pulmonologist.
3. Supervising and teaching Pediatric Residents in Pediatric Pulmonology Rotation.
4. Reporting pulmonary Function testing done for patients during the general pulmonology rotation.
5. Attending and participating in all structured activities as mentioned above.

#### **E. Educational Objectives and Content:**

##### **1. General Objectives**

On completion of the education program,

1. The candidate will be competent to function independently in pediatric pulmonology.
2. The candidate will acquire the requisite knowledge, skills and attitudes to be able to recognize, investigate, and manage all respiratory diseases.
3. The knowledge base will include a broad appreciation of general pediatrics and the basic sciences relevant to the specialty.
4. The professional characteristics to be demonstrated and developed include responsibility, intellectual curiosity, self-appraisal, compassion, and a commitment to continuing medical education.
5. The candidate will acquire the clinical skills to treat and counsel patients with diseases affecting the respiratory system; this includes primary and secondary prevention and pulmonary rehabilitation.
6. He/she will be able to supervise a clinical pulmonary function laboratory.

7. He/she will work effectively with a health care team and acquire the skills to be an effective teacher of other physicians (including house officers), other health care personnel and patients.
8. He/she will also learn to appraise his/her own professional performance, to assess the medical literature critically and to maintain his/her level of competence.

## 2. Specific Objectives

The following list is meant as a guideline and is not all-inclusive.

### A. Knowledge:

#### 1. Basic Sciences *as they apply to pediatric respiratory*:

- Developmental physiology
- The embryologic development of the respiratory system and how congenital anomalies arise.
- The basic principles of clinical genetics.
- The gross and microscopic anatomy of the lungs, pulmonary vasculature, chest wall, and neuromuscular apparatus.

#### 2. Respiratory physiology

- alveolar gas composition
- ventilation
- control of ventilation
- distribution of alveolar ventilation
- diffusion
- perfusion and vascular physiology
- ventilation perfusion relationships
- oxygen delivery, utilization, and transport
- CO<sub>2</sub> transport
- acid base balance
- mechanics of breathing
- respiratory muscle function

- respiratory system in sleep
  - respiratory system during exercise
3. The basic principles of clinical immunology.
  4. The basic principles of cellular and molecular biology.
  5. The mechanisms of action of major pharmaceutical agents with effects on the respiratory apparatus.
  6. A broad knowledge of microbiology (including normal defense mechanisms)
  7. Fundamental principles of imaging techniques including nuclear medicine and magnetic resonance (MR) studies.
  8. Fundamental principles of epidemiology.
  9. Clinical Sciences:
    - The understanding of family and psychosocial variables in the care of children.
    - The understanding of pathophysiology, clinical manifestations, differential diagnosis, general approach to prevention, diagnosis and management, natural history and prognosis of the following:
      1. Signs and symptoms: dyspnea, cough, snoring, hemoptysis, chest pain, cyanosis, adventitial sounds, clubbing.
      2. Abnormalities of developmental origin: e.g. pulmonary agenesis, diaphragmatic hernia, bronchopulmonary sequestration, bronchogenic cysts, congenital cystadenomatoid malformation, bronchial atresia and malacia, anomalous venous drainage, pulmonary artery stenosis, A-V malformations, vascular rings, congenital lobar emphysema.
      3. Diseases of prematurity:
        - Respiratory distress syndrome
        - Bronchopulmonary dysplasia
      4. Airways obstruction:



- Upper airway: e.g. epiglottitis, laryngotracheobronchitis
  - Lower airway: e.g. asthma, cystic fibrosis, bronchiectasis, bronchiolitis
5. Respiratory Failure
- Acute and chronic
  - Hypoxemic and hypercapneic
6. Pleural disorders
- Pleural effusions (transudative, exudative, purulent, haemorrhagic chylous), pneumothorax, pleural thickening
7. Mediastinum
- Mediastinitis, pneumomediastinum, mediastinal masses
8. Neoplastic disorders
- Benign
  - Malignant (primary and secondary)
9. Infectious Diseases
- Infections of the upper and lower respiratory tract
  - Infections in the normal host (community acquired and nosocomial) and in the immunocompromised host (including HIV related infectious diseases)
  - Infections caused by bacterium, virus, mycoplasma, Chlamydia, fungus, mycobacterium (typical and atypical), parasite.
  - Extrapulmonary tuberculosis
10. Environmental diseases
- Air pollution, active and passive smoking
  - Reactive airways dysfunction syndrome

- Hypersensitivity lung disease

11. Complications of aspiration of:

- Gastric contents
- Foreign bodies
- Lipoid material
- Water (i.e. drowning)

12. Allergic and immunologic diseases

- Rhinitis
- Asthma
- Allergic alveolitis
- Eosinophilic lung disease
- Respiratory manifestations of collagen vascular diseases
- Pulmonary complications of immunological deficiency states
- Vasculitis

13. Cystic fibrosis and other suppurative lung diseases (e.g. primary ciliary dyskinesia)

14. Lung injury

- Trauma
- Drugs (including illicit drugs)
- Radiation
- Oxygen
- Thermal
- Barotrauma

15. Restrictive diseases:

- Chest wall deformities (including kyphoscoliosis, congenital sternal abnormalities, obesity)
- Neuromuscular diseases

- Interstitial lung diseases, idiopathic (e.g. DIP, LIP, UIP) and associated with systemic disease (e.g. SLE, sarcoidosis)

- Granulomatous and non-granulomatous inflammatory lung disorders (e.g. Wegener's granulomatosis, sarcoidosis)
16. Pulmonary hemorrhage syndromes - primary and secondary causes
  17. Disorders of the pulmonary circulation:
    - Pulmonary embolism (thrombo-embolism, fat, air, tumor)
    - Pulmonary hypertension - primary and secondary causes
    - Pulmonary edema (cardiogenic)
    - Cor pulmonale
    - Pulmonary AV malformations, fistulae and other vascular abnormalities
    - Non cardiogenic pulmonary edema
  18. Sleep related respiratory disorders and hypoventilation syndromes
  19. Respiratory manifestations of extrapulmonary disorders
  20. Sudden Infant Death Syndrome
  21. The understanding of indications, benefit, contraindications, complications, and general techniques of the following therapeutic interventions:
    - Pulmonary rehabilitation
    - Lung transplantation
    - Respiratory therapy
    - Physical therapy

## **B. Attitude**

1. Demonstrates compassion and empathy in dealing with patients, parents and other family members.
2. Demonstrates professional responsibility to the patient, family and the health care team.

3. Is honest, reliable and dependable.
4. Demonstrates intellectual curiosity.
5. Integrates criticism in a constructive fashion.

### **C. Skills**

1. Performs a complete history and physical (with emphasis on the respiratory system), synthesizes problems and correctly develops investigational and management plans
2. Able to evaluate and manage emergencies in pediatric respirology
3. Communicates effectively with patients, families, colleagues and other health care personnel and can access support services in the community
4. Maintains complete and accurate medical records
5. Is able to appropriately select diagnostic tests
6. Demonstrates proficiency in interpretation of chest radiographs
7. Recognizes common abnormalities on chest CT and MRI scan
8. Demonstrates proficiency in interpretation of pleural fluid analysis
9. Demonstrates proficiency in the interpretation of arterial blood gases and common pulmonary function tests, including exercise tests; understands the indications, technical aspects and quality assurance issues of such tests.
10. Performs spirometry properly
11. Performs and understands the indications, contraindications, techniques and complications of the following:
  - Endobronchial intubation (oro and nasotracheal)
  - Initiation, maintenance and weaning of mechanical ventilation (including non-invasive techniques)
  - Thoracentesis
  - Arterial puncture and cannulation
  - Placement of closed intrapleural chest tube
  - Monitoring in the critically ill patient

12. Is familiar with and understands the indications, contraindications and complications of bronchoscopy and bronchoalveolar lavage
13. Able to supervise home care for a child on home oxygen, home mechanical ventilation and with chronic tracheostomy.
14. Critically evaluates scientific publications
15. Demonstrates self learning skills (is able to formulate learning objectives, develop action plans, access the medical literature and other resources, and has a commitment to the maintenance of competence)
16. Demonstrates familiarity with the research

process **VI. Evaluation**

The fellow will be subjected to end of rotation evaluation based on knowledge, skills and professional growth of the fellow using appropriate criteria and procedures. The outcome of each evaluation will be communicated to the fellows individually.

Promotion of the fellow to higher position of responsibility will be made on the basis of their satisfactory evaluation and the result of the end year exam. The end year exam will be conducted at the end of each academic year.

**VII. Certification:**

A written and clinical/oral examination covering different topics in Pediatric Pulmonology will be given at the successful completion of the two years fellowship program and Saudi Pediatric Pulmonology Certification will be awarded.