



Quality Assurance Unit



**Tanta University
Faculty of Medicine**

**Department of Chest
Course Specifications**

Master Degree of Chest

6th semester

2021-2022

Master Degree of Chest Course Specifications

University: Tanta

Faculty: Medicine

Department: Chest

A- Administrative Information

1. Course title: M Sc. Chest Diseases 6th semester
2. Department offering the program: Chest Department
3. Department responsible for the course: Chest Department
4. Course code: CHEST 8009
5. Level: Second Part: 9 credit-hours. (15 weeks)
6. No. of Credit / taught hours:

The course	Obligatory hours	Practical hours	Scientific activity	Elective hours
Credit hours	4 hours	3 hours	1 hour	1 hours
Taught hours	60 hours	90 hours	60 hours	15 hours

7. Authorization date of course specification:21-8-2019

B- Professional Information

1 – Overall Course aims

Purpose of the curriculum:

The purpose of this curriculum is to provide the basis for training in the specialty of Chest Diseases to the level of award of a Certificate of Completion of Training. At this level, the doctor should have the knowledge, skills, attitudes and competencies to practice as an independent specialist practitioner, at Consultant level.

Professionalism is a difficult quality to define. One definition proposed by the Royal College of Physicians is “a set of values, behaviors’ and relationships that underpin the trust that the public has in the profession.” Professionalism includes the ability to deal with diagnostic and therapeutic uncertainty. Whilst this curriculum attempts to spell out the knowledge, skills attitudes and behaviors’ that underpin training in Chest Diseases, the attributes which make up the “professional” specialist are much more than the simple sum of all these added together. The progression from candidate to professional requires, in addition to the simple acquisition of the building blocks

described in this curriculum, the development of a high degree of personal and professional maturity and this requires time, experience and the internalization by the candidate of a whole variety of attributes that he/she is exposed to in the work place. In part, this also involves learning by example, such that it is incumbent on all trainers to ensure that their candidates are exposed to appropriate work place and learning environments.

OBJECTIVES OF CHEST DISEASES SPECIALTY CURRICULUM:

The candidate will be given the opportunity to become competent in:

1. Establishing a differential diagnosis for patients presenting with clinical features of respiratory disease by appropriate use of history, clinical examination and appropriate investigations.
2. Applying knowledge derived from the appropriate basic sciences which are relevant to Chest Diseases.
3. Applying appropriate and sufficient knowledge and skills in the diagnosis and management of patients with respiratory disease to ensure safe independent practice at NHS independent Consultant Specialist level.
4. Developing a management plan for the "whole patient." This should include not only the appropriate treatment but also take into account health promotion, disease prevention, long-term management plans and palliative care medicine where appropriate.

2 – Intended learning outcomes (ILOs):

a. knowledge and understanding:

By the end of the 6th semester the candidate will have gained knowledge and systematic understanding of:

- a.1. Discuss the various causes and pathogenesis of diseases in respiratory medicine.
- a.2. Express the clinical manifestations and differential diagnosis of respiratory diseases with an emphasis on the incidence of the different manifestations and their relative importance in establishing the diagnosis, and the early manifestations of serious diseases .
- a.3. Explain the scientific basis and interpretation of diagnostic studies with knowledge of the study / studies of choice in any specific situation and of the accuracy of the study in establishing diagnosis.

a.4. Express the principles, the indications, the relative advantages and disadvantages of various therapeutic modalities including mental health care and behavioral modification, nutritional therapy, pharmacotherapy, surgery, radiotherapy, immunotherapy and physical rehabilitation as applied to common clinical situations in respiratory medicine.

a.5. Summarize the theories and principles that govern ethical decision making in clinical practice and the major ethical dilemmas in respiratory medicine, particularly those that arise at the beginning and the end of life and from the rapid expansion of medical knowledge and technology.

a.6. Summarize the classification, mode of action, indications, contraindications, interactions and adverse effects of drugs used in the field of pulmonary medicine.

a.7. Outline the WHO International Health Regulations (2005)

a.8. Express the principles of genetics, the role of genetics in health and disease and the basic principles of gene therapy and genetic counseling in respiratory medicine.

b. Intellectual skills:

By the end of 6th semester the trainee will be able to:

(b.1.) Data acquisition:

b.1.1. Obtain and document a complete and a focused medical history for a patient with respiratory disease.

b.1.2. Perform and document a complete and a focused physical and mental status examination for a patient.

b.1.3. Perform an emergency - directed examination for patients with common respiratory emergencies.

b.1.4. Utilize sources of information in addition to the patient interview to augment the medical history. Such sources include family or friends, medical records and other health care professionals.

b.1.5. Identify anatomic landmarks on postmortem specimens

b.1.6. Take a relevant history of a patient's medication regimen

(b.2.) Data analysis and problem solving:

b.2.1. Interpret patient symptoms and physical findings in terms of their anatomic, pathologic and functional diagnostic significances.

b.2.2. Identify problems, prioritize them, and generate a list of initial diagnostic hypotheses (differential diagnosis) for each problem.

b.2.3. Select the most appropriate and cost effective diagnostic and therapeutic producers for each problem.

b.2.4. Interpret the results of diagnostic procedures.

b.2.5. Use the results of all tests ordered to modify the problem list and the differential diagnosis accordingly.

b.2.6. Combine the clinical and investigational database, with the evidence based knowledge in clinical problem solving.

b.2.7. Clinical assessment of different cardiac, renal and hepatic diseases and their impact on the chest.

(b.3.) Skills related to treatment strategies:

b.3.1. Recognize patients with immediately life-threatening conditions and institute appropriate initial therapy.

b.3.2. Recognize patients with serious conditions requiring critical care and institute course of management according guide lines available.

b.3.3. Design and apply rational therapeutic strategies for both acute and chronic conditions that take into account the various variables that influence these strategies.

b.3.4. Deal with complications of respiratory diseases.

b.3.5. Achieve consensus with the patient or the patient's relatives on the treatment plan selected.

b.3.6. Monitor the effectiveness of therapy by identifying clinical and investigative parameters to be used in assessing the patient's response to treatment and re-evaluate management plan accordingly.

c. Professional and practical skills :

By the end of the 6th semester the trainee will be able to:

(c.1.) Communication skills:

(c.1.1.) Patient- doctor relationship

c.1.1.1. Apply respect to all patients irrespective of their socioeconomic levels, culture or religious beliefs and use language appropriate to the patient's culture.

c.1.1.2. Conduct patient interviews that are characterized by patience and attentive listening.

c.1.1.3. Explain to the patient or the patient's relatives the nature of illness, the diagnostic plan, the treatment options and the possible complications in such a way that is easily understood, answers patient's questions, encourages discussion and promotes the patient's participation in decision making.

c.1.1.4. Write clear concise patient records: admission sheet, progress notes, physician orders, and referrals for consultation, discharge summary and follow-up notes.

c.1.1.5. Use appropriate skills and strategies of communication during difficult situations such as giving bad news and dealing with angry patients.

c.1.1.6. Discuss medical errors or professional mistakes honestly and openly in a way that promotes patient trust and self-learning.

(c.1.2.) Relation to collaboration with healthcare professionals:

c.1.2.1. Communicate effectively with other health care professionals to maximize patient benefits and minimize the risk of errors.

c.1.2.2. Respect the role and contributions of other health care professionals regardless of degree or occupation.

c.1.2.3. Undertake appropriate formal and informal consultations with colleagues and perform appropriate referrals to other health care professionals.

c.1.2.4. Write a concise and informative report on patient(s) conditions.

c.1.2.5. Work effectively as a member or a leader of an interdisciplinary team, and acquire the ability to develop and apply management plans for patients in collaboration with the members of the team.

c.1.2.6. General measures to reduce spread of infection in hospital wards

d. General and transferable skills:

by the end of the 6th semester the trainee will be able to

(d.1.) Life-long learning:

d.1.1. Show commitment to life-long self-learning.

d.1.2. Use the sources of biomedical information to remain current with advances in knowledge and practice.

d.1.3. Frame a question, search the literature and utilize the obtained information to solve a particular clinical problem or plan management of an individual patient according to the principles of Evidence-Based Medicine.

d.1.4. Know the principles of critical Appraisal of scientific research.

(d.2.) Ethical behavior:

d.2.1. Identify alternatives in difficult ethical choices, analyze considerations supporting different alternatives and formulate course of action that takes account of this ethical complexity.

d.2.2. Behave towards patients in a manner consistent with the ideals of profession by consistently doing the following:

d.2.3. Treat the patient as a person, not a disease, and understand that the patient is a person with beliefs, values, goals and concerns which must be respected.

d.2.4. Respect the patient's dignity, privacy, information confidentiality and autonomy.

d.2.5. Deliver care in a way that will allow the patient to feel he / she has received medical care in a caring, compassionate and human manner.

d.2.6. Maintain honesty and integrity in all interactions with patients, patient's families, colleagues and others with whom physicians must interact in their professional lives.

d.2.7. Maintain a professional image in manner, dress, speech and interpersonal relationships that is consistent with the medical profession's accepted contemporary standards in the community.

d.2.8. Be responsible towards work and in emergency situations.

d.2.9. Advocate the patient's interests over ones' own interests.

d.2.10. Provide care to patients who are unable to pay.

d.2.11. Recognize and effectively deal with unethical behavior of other members of the healthcare team.

d.2.12. The trainee should consider the cost implications of cost benefit of various treatment modalities.

(d.3.) skills related to social and community context of healthcare:

d.3.1. Define the Egyptian healthcare system and the community based resources and services and properly-utilize them to provide high quality and cost-effective patient and community care.

d.3.2. Participate actively in health promotion, disease prevention.

d.3.3. Deal appropriately with a specific community health problem

3-Course contents

1. Obligatory hours

4 credit hours = 60 taught hours distributed as follows:

1 Thoracic tumours	12 hours
2 Pulmonary vascular diseases	10 hours
3 Pleural diseases	8 hours
4 Diseases of the chest wall, respiratory muscles and diaphragm	6 hours
5 Mediastinal diseases	6 hours
6 Genetic and developmental disorders	6 hours
7 Lung transplantation	6 hours
8 Pleural procedures	6 hours

2. Practical training:

3 credit hours =Total 90 hours .

Clinical problems that must be observed, managed under supervision & managed independently by Pulmonary Medicine candidate

Pleural effusion & empyema

Pneumothorax

Pulmonary embolism

Pulmonary hypertension and cor pulmonale

Lung Neoplasm

Mediastinal Lesion

3. Scientific activity

1credit hour =Total 60 hours.

a- Seminars and bedside teaching:

1 taught hour /week

b- Workshops, Congresses, Thesis discussion and Chest conferences (Those which have credit hours will be accepted as it is)

c- Practical procedures:

Each procedure has 1 scientific hour.

The candidate should fulfill at least 10 different procedures.

Procedure/ Investigation	Level of participation	Level of Competence
Spirometry	Interpret & report	III
ABG	Attend &Interpret perform	III
Thoracocentesis	Attend	III

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Procedure/ Investigation	Level of participation	Level of Competence
	Perform	
FOB: BAL	Attend Assist Perform	III
FOB: NB	Attend Assist Perform	II
Non invasive ventilation	Attend Assist Perform	III
Invasive ventilation	Attend Assist	II
Endotracheal intubation	Attend & assist Perform	II
Polysomnography& Sleep studies	Attend Perform	II
Pulmonary rehabilitation & physiotherapy	Attend & assist Perform	III
Nutritional support in ICU	Attend & assist Perform	III
CXR & CT	Interpret & report	III
Thoracoscopy	Attend & observe	II

Procedure/ Investigation	Level of participation	Level of Competence
Intercostal intubation & pleural biopsy	Attend & observe	II
ECG & Echocardiography	Perform & interpret Attend & interpret	III II
Rigid bronchoscopy	Attend & observe	II
Cardio-pulmonary resuscitation	Attend & assist Perform	III
Advanced pulmonary functions	Attend & observe interpret	II

Definition of the levels of competence

Level I: Experience of selecting the appropriate diagnosis modality & interpreting the results or choosing an appropriate treatment for which the patient should be referred. This level of competence does not include performing a technique.

Level II: Practical experience, but not as an independent operator (has assisted in or performed a particular technique under the guidance of a superior staff).

Level III: Is able to independently perform the technique or procedure unaided.

4-Teaching and learning methods:hybride

The following methods of teaching and learning will be used in fellowship of Pulmonary Medicine training program

1) Apprenticeship learning (experiential learning):

- Observation b-1,b-2,b-3
- Assisting b-2, b-3, d-3
- Participation c-1, d-3
- Supervised Performance d-1,d-2, d-3
- Independent Performance b-1,b-2,b-3 ,c-1,d-1,d-2,d-3.

2) Formal Teaching:online lecturer Practical:attendance

- Lectures a-1, a-2,a-3.
- Seminars a-4, a-5, a-6, a-7.
- Clinical ward rounds b-1,b-2,b-3 ,c-1,d-1,d-2,d-3
- Crash courses
- Workshops. d-1, d-2, d-3.

3) Self study

- Library a 1- 10
- Textbook a 1- 10
- Journals d-1, d-2, d-3.
- Internet b-1,b-2,b-3,d-1,d-2,d-3

4) Meetings and Conferences c-2, d-1,d-2,d-3

5) Supervised Research b-1,b-2, c-2, d-1

5-Student Assessment: may be electronic but inside the faculty(face to face)

The general rules and regulations of assessment approved by Tanta University.

The end semester exam:

In addition to the successful completion of the training program, all candidates must successfully pass the end semester exam in the form of

6-List of references

6.1 Course notes

6.2 Text book

Fishmann's Chest Diseases

Murray Pulmonary Medicine

Crofton and Douglas Pulmonary Medicine

6.3 Recommended books

6.4 Periodicals and web site

American Review Respiratory and Intensive Care Medicine

European Respiratory Journal

Chest

Thorax

7-Other resources/ facilities required for teaching and learning to achieve the above ILOs

None

8-we certify that all of the information required to deliver this course is contained in the above specifications and will be implemented

We verify that the above Course and the analysis of students and external evaluator opinions are accurate.

Course coordinator and head of department
name.....signature.....Date.....

Head of quality assurance unit:
name.....signature.....Date.....

The ILOs of the 6th semester course specifications included in the appendix are integral part of this course program.

Appendix

A. Clinical ILOs

1 Breathlessness

Objective

☑☑☑Be competent to carry out specialist assessment of severity and form a structured differential diagnosis leading to appropriate further investigation and management

☑☑Candidate must have experience (minimum of 2 years) in dealing with patients presenting with

chronic symptoms in outpatient department

acute symptoms in acute/emergency admissions unit

☑☑Be able to manage the breathless patient effectively

Knowledge

☑☑Causes of breathlessness

☑☑Differentiate cardiac, respiratory, neuromuscular and metabolic causes

☑☑Know and understand pathogenesis of causes

☑☑Know and understand management/treatment

☑☑Pharmacology of drugs used

☑☑Relevant guidelines

Skills:

☑☑Performance and interpretation of spirometry (competence)

☑☑Interpretation of other appropriate Lung Function Tests (competence)

☑☑Interpretation of Chest Radiology:

- Chest X-Ray

- V/Q scans

- Chest CT scans (competence))

☑☑Performance and interpretation of arterial blood gases (competence)

☑☑Use of inhaled and nebulised drug therapy (competence)

2 Cough

Objective

☐☐Be competent to carry out specialist assessment and form a structured differential diagnosis of causes leading to appropriate further investigation and management

☐☐Candidate must have experience in assessing patients referred to the outpatient department with cough (minimum of 2 years)

☐☐Be able to manage the patient with cough effectively

Knowledge

☐☐Causes of cough with:

oNormal CXR

oAbnormal CXR

☐☐How to formulate an appropriate differential diagnosis

☐☐Appropriate investigation of cough, including specialist studies

☐☐ENT causes

☐☐Management/treatment of cough linked to underlying diagnosis

☐☐Pharmacology of drugs used

☐☐Relevant guidelines

Skills:

☐☐Performance and interpretation of spirometry.

☐☐Interpretation of other appropriate Lung Function Tests

☐☐Interpretation of Chest Radiology

☐☐Special investigations, including bronchoscopy

☐☐Use of inhaled and nebulised drug therapy.

3 Haemoptysis

Objectives

☐☐Be competent to undertake specialist assessment and form a structured differential diagnosis in patients with haemoptysis leading to appropriate further investigation and management

☐☐Candidate must have experience of patients presenting with:

ohaemoptysis in outpatient setting

oacute severe haemoptysis in acute/emergency admissions unit setting (minimum of 2 years)

??Be able to manage the patient with haemoptysis effectively

Knowledge

??Causes of haemoptysis

??How to assess severity and formulate diagnostic strategy

??How to formulate management plan, appropriate to degree of urgency

??Need for interventional radiology/surgery

??Relevant guidelines

Skills:

??Interpretation of Chest Radiology

??Bronchoscopy

??Resuscitation, including basic airway skills

4 Pleuritic Chest Pain

Objectives:

??Be competent to undertake specialist assessment and form structured differential diagnosis in patients with pleuritic chest pain

??Candidate must have experience in dealing with patients presenting with chronic symptoms in outpatient department

oacute symptoms in acute/emergency admissions unit

(minimum of 2 years)

??Be able to manage the patient with pleuritic chest pain effectively

Knowledge:

??Causes of pleuritic chest pain

??Understand pathogenesis of causes

??Differential diagnosis of causes

??How to formulate a plan of investigation, including appropriate use of ultrasound, closed and CT-guided pleural biopsy and Medical Thoracoscopy

?? Treatments and Management

?? Pharmacology of drugs

?? Relevant guidelines

Skills:

?? Interpretation of Chest Radiology including Chest XRay, V/Q scans, CT scans, CTPA scans

?? Pleural biopsy

?? Ultrasound

?? Medical Thoracoscopy (knowledge of; some candidates may gain experience in.

5 Abnormal Chest X-Ray

Objectives:

?? Be competent to assess and form differential diagnosis in patients with:

o localized abnormalities on chest x-ray, for instance mass lesions

o diffusely abnormal chest x-ray, for instance interstitial pulmonary fibrosis

?? Candidate must have experience in dealing with patients presenting with the following throughout training:

o abnormal chest x-ray in outpatient department

o abnormal chest x-ray in acute/emergency admissions unit

?? Be able to formulate an appropriate plan for investigation and management

Knowledge:

?? Causes of abnormal Chest X-Ray

?? Differential diagnosis of causes

?? Know and understand pathogenesis of causes

?? Know how to formulate plan for further investigation and management

Skills:

?? Interpretation of Chest Radiology

B. Practical Procedures ILOs

1. Closed Pleural Biopsy and Thoracic Ultrasound

Objective

☑☑Be safe, efficient and competent at pleural biopsy (optional)

☑☑Have knowledge of the technique of physician practiced thoracic ultrasound

Knowledge:

☑☑Indications for closed pleural biopsy

☑☑Various techniques of closed pleural biopsy, both blind and image guided

☑☑The role of physician - practised thoracic ultrasound

☑☑Patient consent and explanation of risks and benefits

☑☑Relevant guidelines

Skills:

☑☑Be competent in safely performing closed blind pleural biopsy. A minimum of 10 should be recorded in the training record

☑☑Initially candidate should be under the supervision of a senior colleague skilled in the performance of this technique and then perform independently when competent

☑☑Some candidates may wish to acquire training in thoracic ultrasound.

2. Intensive Care (ICU) and High Dependency Units (HDU)

Objective

☑☑Be competent to recognize patients who will benefit from intensive care or high dependency units

☑☑Have knowledge and experience of the care provided in intensive care and high dependency units

☑☑Candidate may care for inpatients in ICU and HDU during their clinical placements. Candidate must also spend at least 60 working days in an intensive care unit approved by the Regional Chest Diseases STC/PD. Ideally this should occur in one block. If this is not possible, 4 units of 15 consecutive working days is acceptable

☑☑Candidates may have to be seconded to a specialized unit to gain experience as this is not available in all placements

Knowledge

☑☑Conditions requiring ICU and HDU, particularly Acute Respiratory Distress Syndrome (ARDS) and septic syndromes

☑☑Knowledge of measures used to monitor and support all vital organ systems in an intensive care unit

☒☒ Requirements for an adequately staffed and equipped unit

☒☒ Interaction of anaesthetists physicians, surgeons, nurses, microbiologists, physiotherapists, dieticians

☒☒ Role of the multidisciplinary team in ICU and HDU

☒☒ Knowledge of the interface between ICU/HDU and the general/specialty wards, including outreach services

☒☒ Relevant guidelines

Skills

☒☒ ALS skills (competence)

☒☒ Basic airway skills (competence)

☒☒ Ability to advise on and manage respiratory patients on ICU and HDU (competence)

☒☒ Ability to advise on the respiratory care of general patients on ICU and HDU (competence)

☒☒ Ventilatory support modalities (competence in C-PAP and NIV; experience of mechanical ventilation and mechanical ventilation strategies)

☒☒ Chest drain insertion (competence)

☒☒ Bronchoscopy (competence)

C. Obligatory ILOs

1: Thoracic tumours (TT)

Knowledge

- Definition, classification and aetiology of TT: lung cancer (LC), mesothelioma (M), metastatic TT (MTT), benign intrathoracic

tumours, mediastinal (MT), chest wall tumours, sarcoma and lymphoma (L)

- Epidemiology of TT

- Risk factors for LC, M and L

- Clinical symptoms, syndromes and physical signs of TT including paraneoplastic syndromes

- Relevant investigations: noninvasive (chest X-ray, ultrasound, fluoroscopy, CT, MR, nuclear techniques, PET-CT) and invasive (sampling methods for cytology and histology).

- Tumour markers
- Histological and TNM classification of TT
- Performance status
- Therapeutic modalities in LC, M, MT and in other TT: chemotherapy (including targeted molecular therapy), radiotherapy, interventional bronchoscopic techniques, palliative therapy, best supportive care
- Indications for surgical interventions (pathological assessment, functional assessment and pre-operating staging)
- Complications of surgery, chemotherapy and radiotherapy
- Prognosis (survival, functional consequences, disability)
- Rehabilitation

Skills:

- Application of the above knowledge
- Evaluation of functional status
- Sputum induction
- Flexible bronchoscopy, rigid bronchoscopy
- Endobronchial ultrasound
- Transbronchial lung biopsy
- Transbronchial needle aspiration
- Percutaneous needle biopsy
- Fine needle lymph node aspiration for cytology
- Pleural ultrasound imaging
- Thoracocentesis
- Interventional bronchoscopic techniques
- Medical thoracoscopy (level 2#)
- Pleural drainage
- Chemotherapy, management of adverse events
- Palliative care

Behaviour and attitudes

- **Multidisciplinary approach**

2: Pulmonary vascular diseases (PVDs)

Knowledge

- **Definition, classification and aetiology of PVDs**
- **Physiology and pathophysiology of the pulmonary circulation**
- **Physiology and pathophysiology of coagulation and thrombosis**
- **Genetic and acquired risk factors for PVDs**
- **Current epidemiology and relevant pathology of PVDs**
- **Respiratory and non-respiratory clinical manifestations**
- **Respiratory and non-respiratory complications.**
- **Relevant investigations (lab tests (D-dimer), scintigraphy, CT, MRI, pulmangiography, right heart catheterisation)**
- **Indications for, and special problems of lung transplantation in selected PVD patients, including psychosocial**
- **Indication for surgical interventions, e.g., in pulmonary embolism (thrombectomy)**
- **Pharmacology and interactions of drugs used in the treatment of PVDs**

Skills

- **Application of the above knowledge**
- **ECG, echocardiography and imaging interpretation (scintigraphy, CT-scan, angiography).**
- **Evaluation of functional status**
- **Right heart catheterisation**
- **Assessment of severity of respiratory and systemic involvement**
- **Prevention, diagnosis and treatment of both cardiovascular and systemic complications**
- **Identification and management of patients with end-stage disease**
- **Assessment of eligibility for lung transplantation/ thrombectomy**

Behaviour and attitudes

- **Multidisciplinary approach**

3: Pleural diseases (PD)

Knowledge

- Definition, classification and aetiology of pleural effusions (serothorax, chylothorax, haemothorax, empyema)
- Epidemiology and pathophysiology of infectious, inflammatory, and neoplastic pleural disorders
- Macroscopic appearance of pleural fluids
- Distinction between transudative and exudative pleural effusions
- Definition, classification and aetiology of pleural thickening including pleural plaques
- Definition, classification and aetiology of pneumothorax (primary and secondary)
- Related complications such as tension pneumothorax
- Relevant investigations: non-invasive (chest X-ray, ultrasound, fluoroscopy, CT, MR, nuclear techniques, pulmonary function tests) and invasive (thoracentesis and biopsy techniques)
- Relevant therapeutic measures including antibiotics, fibrinolytics and pleurodesis
- Indications for surgical intervention

Skills

- Application of the above knowledge
- Ultrasound
- Evaluation of functional status
- Thoracentesis (diagnostic and therapeutic)
- Pleural biopsy
- Pleural drainage
- Medical thoracoscopy (pleuroscopy)
- Pleurodesis (talc and other chemical agents)
- Chemotherapy and other local or systemic anti-tumour therapy in selected patients (malignant pleural effusion including mesothelioma)
- Irrigation and fibrinolytic treatment for empyema

Behaviour and attitudes

- **Multidisciplinary approach**

4: Diseases of the chest wall, respiratory muscles and diaphragm (CW, RM, D)

Knowledge

- **Definition, classification and aetiology of chest wall diseases including kyphoscoliosis, ankylosing spondylitis, flail chest, pectus excavatum, and pathological effects of thoracoplasty**
- **Definition, classification and aetiology of diseases of the respiratory muscles (hemiplegia, poliomyelitis, and generalized neuromuscular diseases)**
- **Definition, classification and aetiology of diseases of the diaphragm, including diaphragmatic paralysis, hiccups, herniae**
- **Epidemiology and pathophysiology of diseases of CW, RM, and D**
- **Differential diagnosis of acute chest pain**
- **Related complications such as respiratory failure**
- **Relevant investigations: non invasive (chest X-ray, ultrasound, fluoroscopy, CT, pulmonary function tests)**
- **Relevant therapeutic measures including ventilatory support**
- **Indications for surgical intervention**

Skills

- **Application of the above knowledge**
- **Ultrasound**
- **Evaluation of functional status**
- **Invasive and non-invasive ventilatory support**
- **Home care (oxygen therapy, home ventilation)**
- **Palliative care**

Behaviour and attitudes

- **Multidisciplinary approach**

5: Mediastinal diseases (MD)

Knowledge

- Definition, classification and aetiology of mediastinal diseases including tumours and cysts of the mediastinum, mediastinitis, Mediastinal fibrosis, and pneumomediastinum
- Epidemiology and pathophysiology of MD
- Related complications such as superior vena cava syndrome
- Relevant investigations: non-invasive (chest x-ray, fluoroscopy, CT, MR, pulmonary function tests) and invasive (bronchoscopy including transbronchial needle aspiration and endobronchial ultrasound)
- Relevant therapeutic measures
- Indications for surgical intervention (mediastinoscopy, mediastinotomy, VATS)

Skills:

- Application of the above knowledge
- Evaluation of functional status
- Bronchoscopy
- Transbronchial needle aspiration
- Endobronchial ultrasound

Behaviour and attitudes

- Multidisciplinary approach

6: Genetic and developmental disorders (GDD)

Knowledge

- Definition and classification of GDD
- Clinical manifestations of Primary Ciliary Dyskinesia (PCD), Alpha-1-Antitrypsin Deficiency (A1ATD) and genetic surfactant deficiency disorders (GSDD)
- Genetic background of PCD, A1ATD and GSDD
- Developmental causes of upper and lower respiratory tract malformations
- Late (adolescent/adult) manifestations of respiratory tract malformations
- Morphological and functional diagnosis of GDD (imaging modalities, lung function testing)
- Therapeutic options for managing respiratory manifestations.
- Management of outpatients and of hospitalised patients.

- Treatment of respiratory exacerbations and complications
- Diagnosis and management of non respiratory sequelae and complications
- Long term sequelae and the residual morbidity of respiratory malformations after management and surgery in infancy and childhood

Skills

- Application of the above knowledge
- Evaluation of functional status
- Flexible bronchoscopy including BAL and TBLB
- Replacement therapy using alpha-1- antitrypsin and surfactant

Behaviour and attitudes

- Knowledge of the special psychological aspects of long term disease management
- Cooperation with paediatric respiratory physicians and thoracic surgeons

7: Lung transplantation

Knowledge

- Diseases treatable by lung transplantation (IPF, CF, bronchiectasis, PPH, COPD, sarcoidosis)
- Types of lung transplant (single, double and heart-lung)
- Surgical considerations
- Criteria for patient selection (age, psychological /physical/nutritional status and prognosis)
- Pre-transplant preparation and monitoring (pulmonary rehabilitation and NIV)
- Donor selection
- Immunosuppressive regimens
- Principles of monitoring immunosuppressive drug therapy
- Principles of transbronchial lung biopsy for detection of rejection
- Diagnosis and treatment of acute and chronic complications, including rejection
- Obliterative bronchiolitis
- Diagnosis and treatment of opportunistic infections
- Prognosis

Skills

- Application of above knowledge
- Assessment of patient suitability for transplantation (physical and psychological)
- Nutritional supplementation
- Immunosuppressive treatment of rejection
- Bronchoscopy with bronchoalveolar lavage and appropriate imaging for detection of opportunistic infection
- Interventional bronchoscopic techniques such as stent placement

Behaviour and attitudes

- Multidisciplinary approach with thoracic surgeons, microbiologists and psychologists.

8: Pleural procedures

Knowledge

- Relevant anatomy of the chest wall and lungs
- Indications for pleural ultrasound, thoracentesis, closed pleural needle biopsy, pleuroscopy (medical thoracoscopy), intercostal tube drainage and pleurodesis
- Equipment required for pleural ultrasound, thoracentesis, closed pleural needle biopsy, pleuroscopy (medical thoracoscopy), intercostal tube drainage and pleurodesis
- Assessment of suitability for a pleural procedure, including knowledge of the contraindications for pleural procedures and awareness of the possible complications.
- Relevant pathology
- Appearance of anatomy and pathology with pleural ultrasound imaging
- Macroscopic appearance of pleural fluid and appropriate laboratory tests on it
- Pharmacology of drugs required for pleural procedures
- Knowledge of different uses of pleuroscopy (medical thoracoscopy)
- Indications for surgical intervention

Skills

- Application of the above knowledge

- Patient consent and explanation of the risks and benefits associated with pleural procedures
- Arrange and interpret relevant tests associated with selecting patients for a pleural procedure
- Performance of pleural ultrasound imaging and interpretation of pleural ultrasound images, correlation with other imaging modalities
- Performance of thoracentesis, closed pleural needle biopsy, pleuroscopy (medical thoracoscopy, and pleurodesis
- Performance of intercostal tube drainage, ability to secure correctly the intercostals tube and to confirm suitable position
- Appropriate management of a patient with a chest drain

Behaviour and attitudes

- Awareness of the limitations of pleural procedures
- Multidisciplinary approach