The Royal Australasian College of Physicians

Respiratory Medicine

Advanced Training Curriculum

Adult Medicine Division

TSANZ
The Thoracic Society of Australia & New Zealand Inc

The Royal Australasian College of Physicians

Physician Readiness for Expert Practice (PREP) Training Program

Respiratory Medicine Advanced Training Curriculum

TO BE USED IN CONJUNCTION WITH:

Basic Training Curriculum – Adult Internal Medicine

Professional Qualities Curriculum

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The process was managed by the Curriculum Development Unit within the College's Education Deanery, who designed the document, drafted content material, organised and facilitated writing workshops, developed resource materials, and formatted the final document.

CONTACT DETAILS

THE ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

AUSTRALIA

145 Macquarie Street
Sydney
NSW 2000
Australia

Tel: (+61) (2) 9256 5444
Fax: (+61) (2) 9252 3310

Email: racp@racp.edu.au
Website: www.racp.edu.au

AOTEAROA NEW ZEALAND

Level 10
3 Hunter Street
Wellington 6011
New Zealand

Tel: (+64) (4) 472 6713
Fax: (+64) (4) 472 6718

Email: racp@racp.org.nz
Website: www.racp.edu.au

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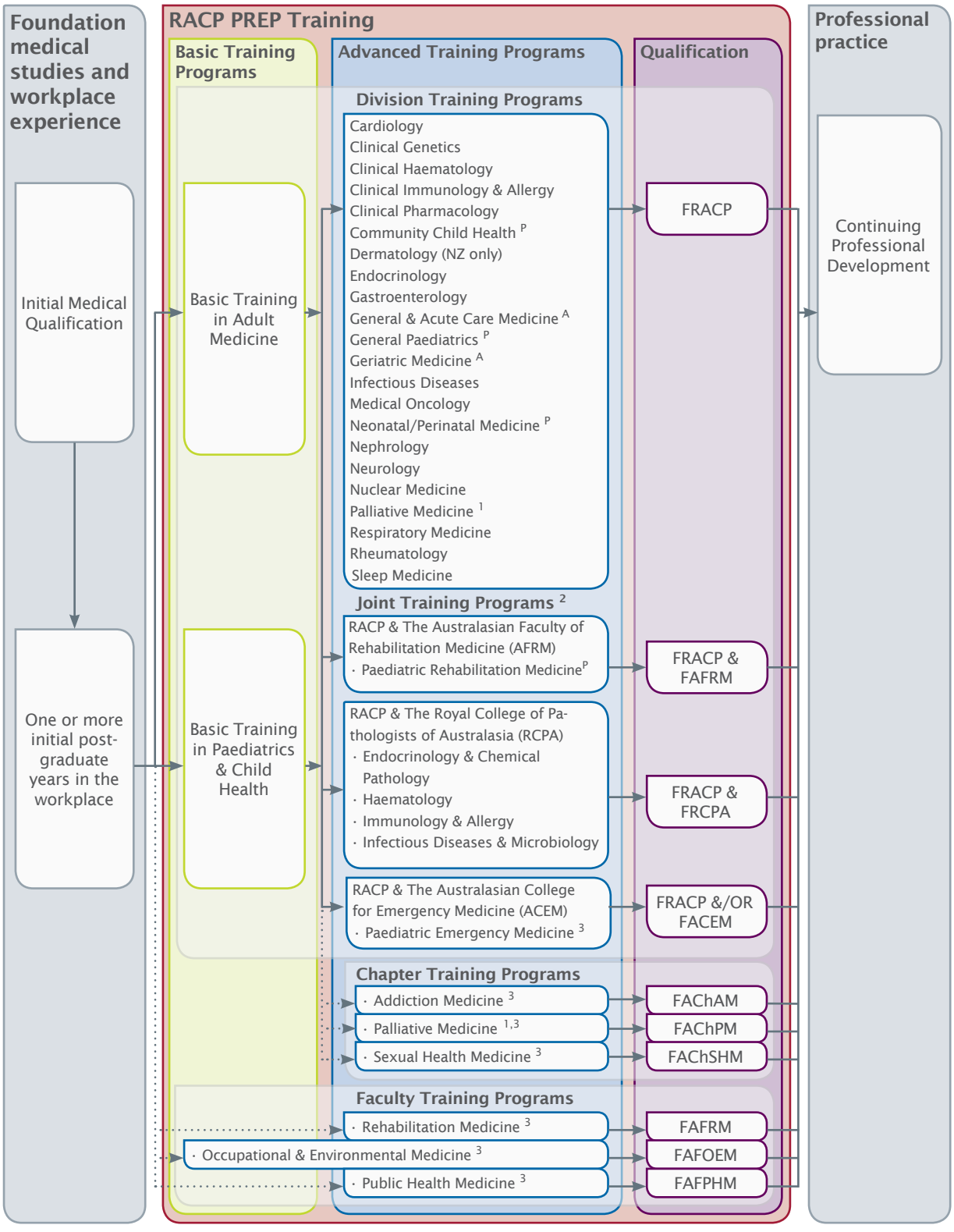
Please note: No Domains, Themes or Learning Objectives have been updated for this edition; design changes ONLY.

RACP FELLOWSHIP TRAINING PATHWAYS AND THE CONTINUUM OF LEARNING



P Trainees must complete Basic Training in Paediatrics & Child Health to enter this program.
A Trainees must complete Basic Training in Adult Medicine to enter this program.
1 Trainees who have entered Advanced Training in Palliative Medicine via a RACP Basic Training Program will be awarded FRACP upon completion and may subsequently be awarded FAChPM. Trainees who have NOT entered Advanced Training in Palliative Medicine via a RACP Basic Training Program will only be awarded FAChPM upon completion.
2 The Child & Adolescent Psychiatry Joint Training Program with the Royal Australian and New Zealand College of Psychiatrists (RANZCP) is currently under review by the RACP and RANZCP and closed to new entrants at present.
3 Alternative entry requirements exist for these training programs; please see the corresponding PREP Program Requirements Handbook for further information.

NB1: This diagram only depicts training programs that lead to Fellowship. Please see the RACP website for additional RACP training programs.
NB2: For further information on any of the above listed training programs, please see the corresponding PREP Program Requirements Handbook.

OVERVIEW OF THE SPECIALTY

Respiratory medicine is a subspecialty of internal medicine, encompassing diseases of the respiratory system, including the upper airway, the lungs, the chest wall and the ventilatory control system. It incorporates knowledge of normal and disordered respiratory structure and function, clinical respiratory diseases and the specialised diagnostic techniques, tests and procedures employed in clinical assessment.

The importance of the specialty's role within both the medical profession and the broader community is recognised through the increasing need for respiratory services as a result of a growth in the incidence and prevalence of respiratory related diseases within our population.

Advances in respiratory medicine have been at the forefront of improvements in health over the last century. In particular, control of tuberculosis was a major milestone in public health in developed countries. Recognition of appropriate dust control measures in a working environment has almost eradicated the incidence of the pneumoconioses in Australasia, although they remain a problem worldwide. Respiratory medicine has also been at the forefront of the understanding of the molecular basis of disease, particularly in relation to asthma, cystic fibrosis and lung cancer.

Respiratory disorders include a wide range of pathology, giving ample opportunity for intellectual challenge, the satisfaction of improving the health of others, as well as subspecialisation if desired.

Features of the specialty and its practice include:

- working in a diversity of environments (academic, public hospital, private, metropolitan, and regional) that draw on the specialist's full range of consultative and procedural skills
- drawing on a broad based general medical knowledge as specific respiratory diseases are frequently associated with other system disorders
- an opportunity to specialise in an area or subspecialty of interest. This includes a wide spectrum of clinical practice (such as cystic fibrosis, thoracic malignancies, physiology, sleep related disorders, respiratory infections, airway diseases, lung transplantation, occupational lung disease, public health, interventional pulmonology)
- an opportunity to engage in academic medicine, teaching and research in fields such as epidemiology, respiratory physiology, immunology, molecular biology and genetics
- management of a range of disorders which include both acute and chronic conditions with the potential to deal with challenging diagnostic problems, to establish long-term therapeutic relationships with patients and their families, to utilise a multidisciplinary, team based approach to patient management, and to ease patient discomfort both acutely and in the practice of end of life care.

Evolving developments:

Some of the currently identified emerging developments within this broad field include the:

- significant growth in interventional pulmonology with diagnostic, staging and therapeutic impacts on lung cancer management; medical thoracoscopy for diagnosis and treatment purposes; the use of lung volume reduction techniques in the management of emphysema; and possible treatment of some forms of asthma with thermoplasty
- significant advances in medical technology particularly in relation to imaging techniques, endobronchial ultrasonography, nuclear medicine and associated diagnostic procedures
- advances in the management of thoracic malignancies
- advances in management of pulmonary vascular disease
- research in the area of genetic screening and associated therapies
- advances in lung transplantation procedures
- development of non invasive ventilation procedures for respiratory failure
- advances in relation to the diagnosis and management of sleep related disorders
- advances in the range and alternative delivery mechanisms for pharmaceuticals, particularly in relation to aerosol therapies
- advances in molecular biology, which promise novel therapies for the future
- advances in the understanding of respiratory and exercise physiology in health and disease.

Significance of respiratory disease to the community:

Respiratory disorders have a high prevalence in the community. In 1993 - 1994 the AIHW estimated the health costs for all lung diseases to be 8% of total health system costs. Some examples of the more common disorders are briefly illustrated below:

Asthma is a common chronic condition among Australians, particularly in children. Asthma affects 14 to 16% of children and 10 to 12% of adults in Australia. It is estimated that 4 million Australians have been diagnosed with asthma by a doctor or nurse at some time in their lives, equating to over 20% of Australians reporting ever having been diagnosed with asthma. It is also estimated that in adults 10% of asthma can be attributed to occupational exposure.

The numbers of people who have asthma in Australia increased through the 1980s and 1990s, although evidence suggests that there has been no further increase in the proportion of people affected in recent years. Over this period the institution of effective treatment and education has reduced annual asthma mortality from over 800 patients to just over 300 patients.

Asthma is a National Health Priority and has a National Service Improvement Framework.

Chronic Obstructive Pulmonary Disease (COPD) is the third largest contributor of disease burden in Australia and is increasing rapidly amongst women. It is the fourth leading cause of mortality in Australia and a leading cause of death among indigenous Australians. In 1998 COPD accounted for 5532 deaths in Australia. Available data indicates that COPD could affect more than one in 10 people aged over 45 years. Estimates suggest the prevalence of COPD to be between 1.2 million and 2.6 million persons in Australia. Recent surveys in Australia have estimated the prevalence of moderate and severe COPD at 12% in women and 9% in men (Sydney BOLD data). The estimated cases of moderate to severe COPD in Australia in 2000 were 474,000.

On average, 1740 people visit a GP every day for COPD, and 1000 people occupy a hospital bed as a result of this condition. Each year approximately 50,000 hospital separations have the principal diagnosis of COPD. The total direct and indirect costs of COPD to the community have been estimated at approximately $800 million per annum.

The advent of newer medications including those for assistance with nicotine addiction, pulmonary rehabilitation programmes, noninvasive ventilation, and surgical and medical lung volume reduction procedures have made a positive impact on patients suffering from this potentially debilitating condition.

Lung Cancer is one of the eight cancers that have been targeted for action as part of the National Health Priority Areas. It has a high prevalence of about 9000 new cases each year. The prevalence is increasing amongst women and now equates to breast cancer as a cause of death from cancer in women. Lung cancer has a high mortality and is the leading cause of cancer death overall, eclipsing the combined mortality from colorectal cancer, breast cancer and prostate cancer.

The previously nihilistic attitude to lung cancer is now changing with the increasing use of novel chemotherapy agents, advances in radiotherapy (including brachytherapy), and targeted therapies. Work in this field provides the physician with the opportunity to engage in a very broad range of activities from application of the very latest cutting edge discoveries in genetic and molecular science, new diagnostic and palliative interventional pulmonology procedures and through to the issues around palliative medicine and end of life care. The respiratory physician occupies a central role in modern multidisciplinary team approach to cancer management. New interventional bronchoscopic approaches are playing an increasingly important role in the diagnostic and staging processes, in the early detection of lung cancer through screening and in some therapeutic interventions.

Genetic Diseases

Cystic fibrosis is the most common serious genetic disorder affecting Caucasian populations. Life expectancy for patients has improved dramatically in recent decades such that there is an ever-increasing adult population with the disease. Management is complex requiring a multidisciplinary approach to the many challenging physical and psychological issues these patients face. Improvements in the understanding of the molecular biological basis of the disorder are leading to novel therapies. Other frequently seen genetic conditions include alpha-1 antitrypsin deficiency and pulmonary hypertension.

Respiratory infections affect all sections of the community: young or old, chronically ill or well. Respiratory infections have a huge diversity, both in their epidemiology and likely severity, and may involve the upper airway, the lower airway, and/or the lung itself. Pneumonia accounts for approximately 44,000 hospital admissions each year with an average length of stay of 6.3 days. Over 3000 deaths are attributable to pneumonia and influenza each year, and pneumonia is the sixth leading cause of death in Australia.

Lower respiratory tract infections account for almost 3 million visits to GPs each year and croup and bronchiolitis account for the majority of winter hospitalisations in children.

Respiratory infection is a common cause for exacerbations of asthma and COPD. Chronic respiratory infection with intermittent exacerbations play a major role in the natural history of bronchiectasis and cystic fibrosis, the latter being the most common life limiting genetic disorder in western societies.

Viral infections such as influenza and SARS can cause epidemics and pandemics with enormous morbidity and mortality.

Mycobacterium tuberculosis infection remains a threat to the community with approximately 1000 newly diagnosed patients each year in Australia. In addition, non-tuberculous mycobacterial disease is increasingly recognised as a cause of morbidity in the population, especially the elderly or immunocompromised.

The lung is also affected by occupational and environmental diseases, pulmonary vascular diseases, diffuse interstitial lung diseases, iatrogenic diseases, pulmonary manifestations of systemic/extrapulmonary disorders, immunodeficiency disorders, sleep related disorders, genetic and developmental disorders, and a variety of orphan lung diseases.

Sleep Medicine

The last two decades have seen huge advances in the understanding and treatment of sleep related disorders. Australia and New Zealand remain at the forefront of sleep research with major contributions to the development of CPAP therapy and mandibular advancement splints in particular.

Sleep related respiratory disorders are highly prevalent in the community causing substantial morbidity and mortality. There is currently large unmet demand for services in this area. Respiratory physicians remain well placed to contribute to this growing clinical and research area.

All respiratory physicians require basic expertise in sleep related disorders. In light of the aging population and the obesity epidemic, sleep apnoea has become a highly prevalent medical problem. Sleep apnoea results in large costs to the community both through lost productivity and increased propensity for cardiovascular complications. Sleep-related breathing disorders commonly co-exist with and complicate the management of other chronic respiratory and cardiovascular conditions. Co-existence of non-respiratory sleep disorders such as the highly prevalent complaint of insomnia can further complicate the picture.

It is recognised that some respiratory trainees may wish to gain further expertise in sleep medicine and **Dual Accreditation in Respiratory and Sleep Medicine** is a highly popular career path. Those wishing to consider this track are advised to consult the **Adult Sleep Medicine Advanced Training Curriculum**. Currently almost all sleep medicine practitioners in Australia and New Zealand have trained in respiratory medicine, reflecting the close synergies between the specialities. These synergies enable respiratory trainees to achieve accreditation in sleep medicine more expeditiously than trainees from other backgrounds. Combined training is facilitated by virtue of the joint STC in Respiratory and Sleep Medicine. For details on the combined training pathway, trainees should consult the respiratory and sleep training handbook.

More training and experience in adult sleep medicine would particularly include advanced training in the following areas in addition to topics included in the Adult Respiratory Medicine Advanced Training Curriculum:

- more detailed understanding of the physiology of sleep and breathing, including detailed understanding of the effects of aging and medications on sleep architecture and physiology
- in depth knowledge and understanding of polysomnography and other sleep-related investigations
- greater expertise in the management of sleep disordered breathing and complex combined central and obstructive apnoea
- greater competence in the initiation and management of continuous positive airway pressure and noninvasive ventilation in sleep disorders using latest generation devices
- understanding of the broader field of sleep medicine including sleep-wake transition disorders, circadian rhythm disorders, parasomnias, disorders of excessive daytime sleepiness, psychiatric and psychological issues.

Summary:

Respiratory medicine is a specialty which provides many attractions in the diversity of its conditions, both acute and chronic; the diagnostic and therapeutic challenges that these conditions provide; the opportunity for procedural work if so desired; the emergence of new diagnostic and therapeutic approaches; the opportunity for development of a subspecialty interest; the opportunity to work in a diversity of environments (academic, public hospital, private, metropolitan and rural); and its relevance and importance to the community at large. The Thoracic Society of Australia and New Zealand (TSANZ) is a growing and friendly society with a balanced mixture of physicians, respiratory scientists, basic scientists, nurses and allied health professionals.

CURRICULUM OVERVIEW

Adult Respiratory Medicine – Advanced Training Curriculum

This curriculum outlines the broad concepts, related learning objectives and the associated theoretical knowledge, clinical skills, attitudes and behaviours required and commonly utilised by adult respiratory medicine physicians within Australia and New Zealand.

The purpose of Advanced Training is for trainees to build on the cognitive and practical skills acquired during Basic Training. At the completion of the adult respiratory medicine Advanced Training Program, trainees should be competent to provide at consultant level, unsupervised comprehensive medical care in adult respiratory medicine.

Attaining competency in all aspects of this curriculum is expected to take three years of training. It is expected that all teaching, learning and assessment associated with the Adult Respiratory Medicine Advanced Training Curriculum will be undertaken within the context of the physician's everyday clinical practice and will accommodate discipline-specific contexts and practices as required. As such it will need to be implemented within the reality of current workplace and workforce issues and the needs of health service provision.

There may be learning objectives that overlap with or could easily relate to other domains; however, to avoid repetition, these have been assigned to only one area. In practice, however, it is anticipated that within the teaching/learning environment, the progression of each objective would be explored.

Note: The curricula should always be read in conjunction with the relevant College Training Handbook available on the College website.

The curriculum for Advanced Training in adult respiratory medicine is based on the essential roles and key competencies of specialist physicians defined by the CanMEDS 2005© project. The following is a summary of the medical expert role.

Medical Expert

The specialist must be able to:

- demonstrate diagnostic and therapeutic skills for ethical and effective patient care
- access and apply relevant information to clinical practice
- demonstrate effective consultation services with respect to patient care, education, and legal opinions.

To be a medical expert in respiratory medicine, the trainee should acquire:

1. Knowledge of normal and abnormal respiratory system structure and function

The respiratory system includes respiratory control centres, chemoreceptors, respiratory muscles, airways, lungs, pulmonary vasculature, and chest wall. Detailed knowledge is required of the:

- normal anatomy
- normal physiology
- development and aging
- pharmacology.

Some knowledge of the basic sciences (histopathology, molecular biology, immunology and defence mechanisms, genetics, microbiology, chemical pathology) is required to understand the pathogenesis of diseases of the respiratory system.

2. Knowledge and skills to assess people presenting with the following respiratory problems:

Symptoms:

- Dyspnoea
- Cough
- Haemoptysis
- Chest pain
- Wheeze
- Snoring and sleepiness

Abnormal findings:

- Abnormal radiology
- Abnormal respiratory function

Environmental and occupational exposures

3. Knowledge of the indications, risks and interpretation of investigations of the respiratory system:

- Respiratory function tests*
- Imaging
- Radiology
- Nuclear medicine
- Microbiology
- Immunology
- Pathology

** To be able to perform or supervise these investigations*

4. Knowledge and skills to perform interventions in respiratory medicine; to know indications, benefits, harms, costs, and procedures:

- Oxygen therapy*
- Assisted ventilation*
- Aerosol therapy*
- Pleural procedures * (pleural aspiration, pleural biopsy, large and small bore chest tube insertion, pleurodesis, tunnelled pleural catheter)
- Bronchoscopy – diagnostic and interventional *
- Thoracoscopy – diagnostic and therapeutic *
- Smoking cessation*
- Pulmonary rehabilitation
- Chest physiotherapy

** To be able to perform or supervise these interventions*

5. Knowledge and skills to manage respiratory disorders

This requires knowledge of basic sciences to understand their pathogenesis, manifestations and complications.

In addition, knowledge is required of current information on diagnosis, treatment, prognosis and cause.

Diseases of the respiratory system involving:

- ventilatory control
- respiratory muscles
- airways
- lung parenchyma
- lung circulation
- chest wall
- respiratory neoplasms
- respiratory infections.

6. Knowledge and skills to understand and conduct research

- Identify and apply methods used in clinical and/or basic research in respiratory medicine
- Plan and execute a clinical or basic respiratory research project

Professional Qualities Curriculum

The Professional Qualities Curriculum (PQC) outlines the range of concepts and specific learning objectives required by, and utilised by, all physicians, regardless of their specialty or area of expertise. It spans both the Basic and Advanced Training programs and is also utilised as a key component of the Continuing Professional Development (CPD) program.

Together with the various Basic and Advanced Training Curricula, the PQC integrates and fully encompasses the diagnostic, clinical, and educative-based aspects of the physician's/paediatrician's daily practice.

Each of the concepts and objectives within the PQC will be taught, learnt and assessed within the context of everyday clinical practice. It is important, therefore, that they be aligned with, and fully integrated into, the learning objectives within this curriculum.

EXPECTED OUTCOMES AT THE COMPLETION OF TRAINING

Graduates from this training program will be equipped to function effectively within the current and emerging professional, medical and societal contexts. At the completion of the Advanced Training Program in adult respiratory medicine, as defined by this curriculum, it is expected that a new Fellow will have developed the clinical skills and have acquired the theoretical knowledge for competent respiratory medicine practice. It is expected that a new Fellow will be able to:

- investigate and manage patients presenting with common respiratory symptoms and problems
- apply and interpret diagnostic investigations commonly used in the management of respiratory conditions
- describe the indications, benefits, risks and clinical processes of interventions used in the management of common respiratory conditions and acquire proficiency in performing these procedures
- diagnose and manage a range of respiratory conditions as detailed in the curriculum
- demonstrate a compassionate, caring attitude to patients and possess skills in communication, especially in regard to conveying bad news and the management of end of life issues
- behave in a professional and ethical manner
- work with other health professionals and within a team where appropriate.

CURRICULUM THEMES AND LEARNING OBJECTIVES

Each of the curriculum documents has been developed using a common format, thereby ensuring a degree of consistency and approach across the spectrum of training.

Themes

The Themes identify and link more specific aspects of learning into logical or related groups.

Learning Objectives

The Learning Objectives outline the specific requirements of learning. They provide a focus for identifying and detailing the required knowledge, skills and attitudes. They also provide a context for specifying assessment standards and criteria as well as providing a context for identifying a range of teaching and learning strategies.

Themes within this curriculum reflect both Background and Specialised Knowledge:	
Background knowledge	relates to that acquired from general medical education and from Basic Training.
Specialised knowledge	is additional or more detailed knowledge, which is expected to be acquired during respiratory medicine Advanced Training.
Topics have been classified according to levels of competence as follows:	
Competence level:	
Level 1	Awareness sufficient to recognise and know when to refer.
Level 2	Knowledge sufficient to manage with supervision (or refer).
Level 3	Advanced knowledge sufficient for independent specialist practice.
Assessment is currently mainly on the basis of observation and logbook documentation but more structured courses or programs may be instituted.	

LEARNING OBJECTIVES TABLES

Theme 1	Structure and Function of the Respiratory System
Learning Objective	
1.1	Identify the normal and abnormal structure and function of the components of the respiratory system
Theme 2	Presenting Problems
Learning Objectives	
2.1	Apply diagnostic procedures and develop a management plan for patients presenting with dyspnoea
2.2	Apply diagnostic procedures and develop a management plan for patients presenting with cough
2.3	Apply diagnostic procedures and develop a management plan for patients presenting with haemoptysis
2.4	Apply diagnostic procedures and develop a management plan for patients presenting with wheeze
2.5	Apply diagnostic procedures and develop a management plan for patients presenting with snoring and sleepiness
Theme 3	Investigations
Learning Objectives	
3.1	Apply diagnostic procedures and interpret results of respiratory function tests
3.2	Describe the principles and indications for more complex tests of lung function, and interpret results
3.3	Describe the indications for, and risks of radiological tests, and interpret results
3.4	Describe the indications for, and risks of miscellaneous tests, and interpret results
3.5	Explain the properties of investigations and interpret abnormal results in asymptomatic patients
Theme 4	Interventions and Prevention Measures
Learning Objectives	
4.1	Perform or supervise pleural procedures
4.2	Perform or supervise diagnostic bronchoscopy
4.3	Perform or supervise therapeutic bronchoscopy
4.4	Administer oxygen therapy
4.5	Apply ventilatory support interventions
4.6	Describe the indications, benefits, risks and clinical processes of pulmonary rehabilitation

4.7	Describe the indications, benefits, risks and clinical processes of upper airways management
4.8	Supervise the use of airway delivery systems
4.9	Explain the indications, benefits, risks and clinical processes of smoking cessation
Theme 5	Diseases
Learning Objectives	
5.1	Diagnose and manage airways disease (excluding asthma and COPD)
5.2	Diagnose and manage asthma and related conditions
5.3	Diagnose and manage conditions relating to COPD and emphysema
5.4	Diagnose and manage conditions relating to eosinophilic diseases
5.5	Diagnose and manage thoracic tumours
5.6	Diagnose and manage conditions relating to pulmonary infections (other than mycobacterial)
5.7	Diagnose and manage conditions relating to bronchiectasis (non cystic fibrosis)
5.8	Diagnose and manage conditions relating to mycobacterial infections
5.9	Diagnose and manage conditions relating to HIV/AIDS and their pulmonary manifestations
5.10	Diagnose and manage conditions relating to pulmonary disorders in the immune-compromised host
5.11	Manage post-lung transplant patients
5.12	Diagnose and manage conditions relating to venous thrombo-embolic disease
5.13	Diagnose and manage conditions relating to pulmonary vascular disease and other vasculitidies
5.14	Diagnose and manage conditions relating to pleural disease
5.15	Diagnose and manage pneumothorax
5.16	Diagnose and manage conditions relating to occupational and environmental lung disease
5.17	Diagnose and manage asbestos related lung disorders
5.18	Diagnose and manage sarcoidosis
5.19	Diagnose and manage conditions relating to idiopathic interstitial pneumonias
5.20	Diagnose and manage pleuro-pulmonary manifestations of systemic disease and extrapulmonary disorders
5.21	Diagnose and manage conditions relating to cystic fibrosis
5.22	Diagnose and manage conditions relating to genetic and developmental disorders
5.23	Diagnose and manage pulmonary disease in pregnancy

5.24	Diagnose and manage iatrogenic disease
5.25	Diagnose and manage orphan lung disease
5.26	Diagnose and manage conditions relating to diseases of the chest wall and respiratory muscles
5.27	Diagnose and manage conditions relating to respiratory failure
5.28	Describe the causes and treatment of sleep disordered breathing
Theme 6	Research
Learning Objectives	
6.1	Identify and apply methods used in clinical and/or basic research in respiratory medicine
6.2	Plan and execute a clinical or basic respiratory research project

Theme 1	Structure and Function of the Respiratory System	
Learning Objective 1.1	Identify the normal and abnormal structure and function of the components of the respiratory system	Level 3

Knowledge of normal structure and function	Components of the Respiratory System
• normal anatomy • normal physiology • development and ageing • immunology and defence mechanisms • pharmacology • molecular biology • genetics • biochemistry.	• respiratory muscles • chest wall • airways (upper and lower) • lungs • pulmonary vasculature • respiratory control centres • chemoreceptors.

Theme 2	Presenting Problems	
Learning Objective 2.1	Apply diagnostic procedures and develop a management plan for patients presenting with dyspnoea	Level 3

Background Knowledge	Specialised Knowledge	Skills
• describe the causes and mechanisms of dyspnoea • identify the indicators for further investigation of dyspnoea and methods of treatment.	• describe respiratory physiology including neural mechanisms • elicit a history of dyspnoea • discuss dyspnoea scales • describe indications for and interpretation of cardiopulmonary exercise testing • explain symptom control including respiratory rehabilitation.	• take a history • conduct a clinical examination • interpret spirometry and measures of gas exchange • interpret radiological examinations • formulate differential diagnoses.

Theme 2	Presenting Problems	
Learning Objective 2.2	Apply diagnostic procedures and develop a management plan for patients presenting with cough	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• describe the causes and mechanisms of cough • identify the indicators for further investigation of a cough and methods of treatment.	• describe respiratory and neural anatomy and physiology including upper airway • list indications for respiratory and non-respiratory investigations • list indications for and interpretation of bronchial provocation testing • describe indications for bronchoscopy.	• take a history • conduct a clinical examination • interpret spirometry and measures of gas exchange • interpret radiological examinations • interpret cough symptom complex.

Theme 2	Presenting Problems	
Learning Objective 2.3	Apply diagnostic procedures and develop a management plan for patients presenting with haemoptysis	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• describe the causes and mechanisms of haemoptysis • identify the indicators for further investigation of haemoptysis and methods of treatment.	• describe respiratory anatomy and physiology including upper airway • explain grading of severity • list indications for bronchoscopy and imaging including angiography • list indications for bronchial artery embolisation and surgery • discuss emergency management.	• take a history • conduct a clinical examination • interpret radiological examinations • perform bronchoscopy.

Theme 2	Presenting Problems	
Learning Objective 2.4	Apply diagnostic procedures and develop a management plan for patients presenting with wheeze	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• describe the causes and mechanisms of wheeze • identify the indicators for further investigation of wheeze and methods of treatment.	• describe respiratory anatomy and physiology, including upper airway • list indications for direct and indirect laryngoscopy and bronchoscopy • list non-asthma causes of wheeze • discuss the role of novel noninvasive measures of airway inflammation (e.g. exhaled nitric oxide).	• take a history • conduct a clinical examination • interpret spirometry including flow-volume loops, measures of gas exchange and bronchial provocation testing • interpret radiological examinations.

Theme 2	Presenting Problems	
Learning Objective 2.5	Apply diagnostic procedures and develop a management plan for patients presenting with snoring and sleepiness	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• describe the causes and mechanisms of snoring and sleepiness • identify the indicators for further investigation of snoring and sleepiness and methods of treatment.	• describe anatomy and physiology of the upper airway, particularly neuromuscular function • discuss respiratory control mechanisms • list indications for monitoring of sleep • describe treatment options • identify non-sleep disordered breathing causes of sleepiness.	• take a history • conduct a clinical examination • refer appropriately for sleep investigations.

Theme 3	Investigations	
Learning Objective 3.1	Apply diagnostic procedures and interpret results of respiratory function tests	
Investigations include:		**Competency Level**
• Spirometry		Level 3
• Lung volumes		Level 3
• Gas transfer		Level 3
• Blood gases		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• define the anatomy and physiology of the respiratory system • define reference standards.	• explain reference standards • explain technical aspects and limitations of tests • recognise operator dependent and patient related issues • discuss contraindications and potential complications • explain definitions and clinical relevance of bronchial reversibility testing.	• perform and interpret lung function tests • perform spirometry, and arterial blood gases • perform lung volumes and diffusing capacity of the lung for carbon monoxide (DLCO) measurements under supervision.

Theme 3	Investigations	
Learning Objective 3.2	Describe the principles and indications for more complex tests of lung function, and interpret results	
Investigations include:		**Competency Level**
• Cardiopulmonary exercise testing (CPT)		Level 3
• 6 minute walk test (6MWT) and the shuttle test		Level 3
• Bronchial provocation testing		Level 3
• Altitude simulation tests		Level 3
• Maximal inspiratory and expiratory pressure measurements		Level 3
• Pulmonary shunt calculations		Level 3
• Lung compliance/resistance testing		Level 2
• Complex diaphragmatic and respiratory muscle function tests		Level 1
• Forced oscillometry		Level 1
• Nasal resistance testing		Level 1
• Specific occupational bronchial provocation tests.		Level 1
Background Knowledge	**Specialised Knowledge**	**Skills**
• define the anatomy and physiology of the respiratory system • define reference standards.	• describe the reference standards • appraise technical aspects including limitations of data • discuss operator dependant and patient related issues • list contraindications and complications • discuss clinical relevance • list clinical indications and limitations of CPT.	• interpret results of these tests • supervise CPT.

Theme 3	Investigations	
Learning Objective 3.3	Describe the indications for, and risks of radiological tests, and interpret results	
Investigations include:		**Competency Level**
• Chest x-rays		Level 3
• CT scans		Level 3
• Transthoracic fine needle aspiration (FNA)		Level 3
• Fluoroscopy		Level 3
• MRI		Level 2
• Ultrasonography		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**
• describe anatomy and physiology relevant to radiological tests • define reference standards.	• list indications for specific tests • recognise clinical implications • recognise implications of radiation dose of the above outlined tests.	• interpret chest x-rays • interpret CT scans • apply the safe use of fluoroscopy.

Theme 3	Investigations	
Learning Objective 3.4	Describe the indications for, and risks of miscellaneous tests, and interpret results	
Investigations include:		**Competency Level**
• Allergy tests (RAST and skin prick testing)		Level 3
• Mantoux testing		Level 3
• Ventilation/Perfusion (V/Q) scans		Level 3
• Bone scans		Level 3
• Positron emission tomography (PET) scans		Level 3
• Echocardiography		Level 3
• Oesophageal manometry and pH monitoring		Level 1
Background Knowledge	**Specialised Knowledge**	**Skills**
• discuss anatomy and physiology relevant to the above miscellaneous tests • define reference standards • discuss the technical aspects of the tests, including limitations and data • identify operator dependant issues • discuss interpretation of results and clinical implications • discuss potential complications.	• describe the indications, contraindications and limitations of V/Q scanning • discuss the properties of tests and the use of likelihood ratios in the interpretation of V/Q scans and their clinical application • describe the implications of radiation dose of the above outlined tests • discuss indications and limitations of PET scanning • describe the indications for above tests.	• perform skin prick tests under supervision • perform Mantoux testing under supervision • interpret test results.

Theme 3	Investigations	
Learning Objective 3.5	Explain the properties of investigations and interpret abnormal results in asymptomatic patients	Level 3
Knowledge of normal structure and function	**Components of the Respiratory System**	
• describe the principles of sensitivity, specificity, likelihood ratios, pre- and post-test probability • evaluate the role of screening tests for respiratory illness.	• interpret abnormal results from investigations and manage appropriately.	

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.1	Perform or supervise pleural procedures	
Investigations include:		**Competency Level**
• Needle thoracentesis (fluid and air)		Level 3
• Intercostal tube drainage (large and small bore)		Level 3
• Tube pleurodesis		Level 3
• Closed pleural needle biopsy		Level 2*
• Pleural ultrasound imaging		Level 2*
• Medical thoracoscopy (pleuroscopy)		Level 2*
• Tunnelled pleural catheter		Level 1
Background Knowledge	**Specialised Knowledge**	**Skills**
• define pleural anatomy and physiology • define the indications for pleural procedures • identify the procedural skills required • discuss procedure risks and benefits • discuss potential complications.	• describe physiology and biochemistry of pleural fluid • identify normal and abnormal anatomy of the pleura • discuss the diagnostic and therapeutic indications for pleural procedures • evaluate the risks and benefits of each of the diagnostic/therapeutic interventions.	• select and assess patients for procedural intervention • administer sedation, topical anaesthesia and analgesia • perform pleural aspiration • perform pleural biopsy • perform intercostal tube placement • manage pleural empyema • perform pleurodesis • perform thoracoscopy • insert a tunnelled pleural catheter* • manage common complications (e.g. hypoxia, bleeding, pneumothorax).
** Useful but not essential, where the technique is available in your hospital*		

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.2	Perform or supervise diagnostic bronchoscopy	
Investigations include:		**Competency Level**
• Flexible bronchoscopy		Level 3
• Broncho-alveolar lavage (BAL)		Level 3
• Transbronchial lung biopsy (targeted and non-targeted)		Level 3
• Transbronchial needle aspiration		Level 2*
• Endobronchial ultrasound (convex and miniprobe)		Level 2*
• Autofluorescence bronchoscopy		Level 2*
Background Knowledge	**Specialised Knowledge**	**Skills**

• define respiratory anatomy and physiology
• define the indications for diagnostic bronchoscopy
• identify the procedural skills required
• discuss procedure risks and benefits
• discuss potential complications.
	• identify normal and abnormal anatomy of the tracheobronchial tree (both bronchoscopic and radiological)
	• identify indications for diagnostic flexible bronchoscopy
	• evaluate the risks and benefits of bronchoscopy and associated procedures
	• evaluate the utility of diagnostic techniques:
	  • washings
	  • brushings
	  • broncho-alveolar lavage
	  • transbronchial biopsies
	  • transbronchial fine needle aspiration (TB-FNA).
	• describe the common complications (hypoxia, bleeding, pneumothorax, infection) and identify management strategies.
		• select and assess patients for diagnostic bronchoscopy
		• administer sedation and topical anaesthesia
		• perform flexible bronchoscopy
		• apply diagnostic techniques and specimen handling principles:
		  • washings
		  • brushings
		  • broncho-alveolar lavage
		  • transbronchial biopsies
		  • TB-FNA
		• manage common complications (hypoxia, bleeding, pneumothorax).

** Useful but not essential, where the technique is available in your hospital*		

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.3	Perform or supervise therapeutic bronchoscopy	
Investigations include:		**Competency Level**
• Foreign body removal/mucus plugging removal		Level 3
• Rigid bronchoscopy		Level 2*
• Laser		Level 2*
• Stents		Level 2*
• Argon plasma coagulation (APC)		Level 2*
• Diathermy		Level 2*
• Balloon dilatation		Level 2*
• Endobronchial valves		Level 1
Background Knowledge	**Specialised Knowledge**	**Skills**
• define respiratory anatomy and physiology • define the indications for therapeutic bronchoscopy • identify the procedural skills required • discuss procedure risks and benefits • discuss potential complications.	• identify normal and abnormal anatomy of the tracheobronchial tree (both bronchoscopic and radiological) • distinguish intralumenal, extrinsic and mural large airway obstruction • describe indications for therapeutic bronchoscopy • compare and contrast optical properties and tissue effects of laser light, APC, diathermy • evaluate the risks and benefits of flexible and rigid bronchoscopy and associated procedures • describe important complications and their management (e.g. hypoxia, bleeding, pneumothorax, infection, airway penetration).	• select and assess patients for therapeutic bronchoscopy • administer sedation and analgesia • perform flexible bronchoscopy • perform rigid bronchoscopy* • perform the specific techniques listed above • manage common complications (hypoxia, bleeding, pneumothorax).
		** Useful but not essential, where the technique is available in your hospital*

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.4	Administer oxygen therapy	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• define respiratory anatomy and physiology • define the indications for oxygen therapy • identify the procedural skills required • discuss therapy risks and benefits • discuss potential complications.	• describe physiology of ventilatory drive and gas exchange • define indications and guidelines for use • explain assessment for oxygen therapy • explain adverse effects.	• measure and interpret oxygen saturation and arterial blood gases (ABGs) • apply oxygen delivery systems (nasal prongs, masks etc) • prescribe oxygen according to guidelines.

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.5	Apply ventilatory support interventions	
Investigations include:		**Competency Level**
• Continuous positive airway pressure (CPAP)		Level 3
• Noninvasive ventilation (NIV)		Level 3
• Invasive ventilation		Level 2
• Volume cycled ventilation		Level 1
Background Knowledge	**Specialised Knowledge**	**Skills**
• define respiratory anatomy and physiology • define the indications for ventilatory support interventions • identify the procedural skills required • discuss intervention risks and benefits • discuss potential complications.	• describe the physiology of respiratory control mechanisms, respiratory failure and sleep related breathing disorders • evaluate the indications for, use, effects, and limitations of CPAP and Bi-level NIV • describe initiation, monitoring and weaning procedures • explain anatomy and control of upper airway and respiratory muscles • discuss the role of specialised monitoring procedures for patients on NIV, including ABGs, transcutaneous CO2 monitoring and capnography.	• apply NIV masks • adjust device settings • monitor patient progress • use humidification circuits in NIV.

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.6	Describe the indications, benefits, risks and clinical processes of pulmonary rehabilitation	Level 3

Background Knowledge	Specialised Knowledge	Skills
• define respiratory anatomy and physiology • define the indications for pulmonary rehabilitation • identify the procedural skills required • discuss rehabilitation risks and benefits • discuss potential complications.	• describe physiological changes and expected areas of improvement • assess patient suitability for pulmonary rehabilitation • compare and contrast different tests of exercise capability, including 6MWT, shuttle tests, and pulmonary function tests • discuss physiotherapy, educational and psychological aspects • discuss the role of a multidisciplinary approach.	• refer patients appropriately for pulmonary rehabilitation • supervise a 6MWT • evaluate exercise test results.

Theme 4	Interventions and Prevention Measures
Learning Objective 4.7	Describe the indications, benefits, risks and clinical processes of upper airways management

Investigations include:	Competency Level
• Tracheostomy care and weaning	Level 2
• Emergency intubation	Level 2
• Intratracheal oxygen therapy	Level 1
• Percutaneous tracheostomy	Level 1

Background Knowledge	Specialised Knowledge	Skills

• define upper airway anatomy and physiology
• define the indications for upper airway management
• identify the procedural skills required
• discuss management risks and benefits
• discuss potential complications.
	• identify and explain aspects of the following in upper airways management:
	  • intubation
	  • tracheostomy care
	  • intratracheal oxygen therapy*
	  • percutaneous tracheostomy.*
		• manage tracheostomy care and weaning.

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.8	Supervise the use of airway delivery systems	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• define airway anatomy and physiology • define the indications for airway delivery system • identify the procedural skills required • discuss system risks and benefits • discuss potential complications.	• describe principles of pressurised metered dose inhalers, dry powder inhalers and nebulisers and their distribution to the lung • describe adverse effects of aerosol medications and their mechanisms • identify infection control issues with airway delivery systems.	• demonstrate, instruct and supervise the use of the various inhalers and nebulisers in patients.

Theme 4	Interventions and Prevention Measures	
Learning Objective 4.9	Explain the indications, benefits, risks and clinical processes of smoking cessation	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**
• define respiratory anatomy and physiology.	• describe adverse effects of smoking on health • discuss principles of smoking cessation • describe motivational interviewing techniques • evaluate non-pharmacological and pharmacological treatments available for smoking cessation • describe the side effects of pharmacologic therapies.	• document smoking history in every patient • encourage all patients to stop smoking at every visit • assess the degree of nicotine dependence (e.g. Fagerstrom questionnaire) • provide brief cessation counselling • provide advice and support including relevant referrals to smoking cessation clinics and counselling services • formulate smoking cessation plans including pharmacotherapy and nicotine replacement therapy.

Theme 5	Diseases	
Learning Objective 5.1	Diagnose and manage airways disease (excluding asthma and COPD)	
Investigations include:		**Competency Level**
• Rhinosinusitis and post nasal drip		Level 3
• Acute and chronic bronchitis		Level 3
• Bronchiolitis		Level 3
• Airway stenosis and malacia		Level 3
• Foreign body aspiration		Level 3
• Gastro-oesophageal reflux disease (GORD)		Level 3
• Vocal cord dysfunction		Level 3
• Tracheo-oesophageal fistula		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for airway diseases:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• recognise, diagnose and treat each of the airways diseases listed above.	• take a history and perform an examination
		• perform spirometry and flow volume loops
		• perform bronchoscopy where indicated.

Theme 5	Diseases	
Learning Objective 5.2	Diagnose and manage asthma and related conditions	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for asthma and related conditions:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• discuss asthma phenotypes
	• evaluate asthma guidelines
	• appraise various treatments and side effects
	• demonstrate patient education techniques, goals and management plans
	• evaluate different forms of provocation testing
	• describe role of noninvasive tests (e.g. FENO)
	• distinguish the role of allergy and allergen testing define occupational asthma
	• identify complications of asthma
	• identify community based services (e.g. asthma foundations).
		• manage acute severe asthma
		• manage chronic asthma
		• provide asthma education
		• take an occupational history
		• develop asthma management plans
		• produce a written action plan
		• perform spirometry
		• use peak flow (PEF) charts
		• perform allergy skin prick testing.

Theme 5	Diseases	
Learning Objective 5.3	Diagnose and manage conditions relating to COPD and emphysema	Level 3

Background Knowledge	Specialised Knowledge	Skills

• describe the following for asthma and related conditions:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• define COPD and emphysema phenotypes
	• discuss the management of acute exacerbations
	• compare and contrast COPD and asthma
	• discuss the aetiology of COPD including smoking and other factors
	• evaluate smoking cessation techniques
	• evaluate COPD guidelines
	• evaluate the severity of COPD (e.g. BODE index)
	• describe the role of functional exercise tests (e.g. 6MWT)
	• discuss the role of NIV and escalation of care
	• discuss the role of nutrition and BMI status
	• explain pharmacological treatments and side effects
	• describe the role of community based services
	• discuss the role of pulmonary rehabilitation
	• evaluate the role of surgical treatments including lung volume reduction techniques and lung transplantation.
		• manage acute exacerbations of COPD
		• manage COPD
		• perform and interpret spirometry
		• measure and interpret ABGs
		• manage acute and chronic respiratory failure
		• apply and manage NIV where indicated
		• prescribe oxygen therapy
		• demonstrate patient education and management techniques
		• manage end of life issues.

Theme 5	Diseases	
Learning Objective 5.4	Diagnose and manage conditions relating to eosinophilic diseases	
Investigations include:		**Competency Level**
• Allergic bronchopulmonary aspergillosis (ABPA)		Level 3
• Acute and chronic eosinophilic pneumonia		Level 3
• Churg-Strauss syndrome		Level 3
• Nonasthmatic eosinophilic bronchitis		Level 3
• Hypereosinophilic syndrome		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to eosinophilic diseases:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• list causes of eosinophilia
	• describe an approach to the investigation and management of patients with eosinophilic diseases
	• evaluate investigations and treatments for ABPA, including the role of corticosteroids, antifungal agents and anti-IgE therapies
	• evaluate emerging monoclonal antibody therapies.
		• interpret skin and blood immunologic testing relevant to allergic lung disorders including asthma and ABPA
		• explain the roles and limitations of invasive investigative procedures, including transbronchial lung biopsies, bronchoalveolar lavage and open lung biopsy.

Theme 5	Diseases	
Learning Objective 5.5	Diagnose and manage thoracic tumours	
Investigations include:		**Competency Level**
• Lung cancer		Level 3
• Metastatic pulmonary tumours		Level 3
• Metastatic and other pleural tumours		Level 3
• Benign intrathoracic tumours		Level 3
• Mediastinal tumours		Level 2
• Chest wall tumours e.g. neurofibromas		Level 2
• Sarcomas		Level 2
• Lymphomas		Level 2
N.B. mesothelioma is included in asbestos related diseases		
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for thoracic tumours:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe the cause and classification of lung cancers
	• describe the staging and prognosis of lung cancer, including the role of genetic factors
	• discuss principles of screening for lung cancer
	• evaluate the role of diagnostic procedures, including bronchoscopy
	• define performance status
	• compare and contrast investigations for staging of lung cancer, including the role of PET and mediastinal lymph node sampling (EUS, EBUS and surgical techniques)
		• investigate lung nodule/ mass with bronchoscopy, endobronchial ultrasound and other modalities
		• interpret radiology and nuclear medicine tests
		• stage lung cancer according to current criteria
		• assess patients pre-operatively for suitability for surgery
		• prescribe appropriate therapy for symptom control (e.g. pain, breathlessness)
		• work as part of a multidisciplinary team
		• identify and engage community supports and services
		• provide palliative support and end of life care.

Theme 5	Diseases	
Learning Objective 5.5	Diagnose and manage thoracic tumours	

	• assess the role of:
	  • surgery
	  • chemotherapy (including adjuvant treatment)
	  • targeted/biological therapies
	  • radiotherapy (including brachytherapy)
	  • endobronchial palliative procedures (e.g. stent and laser)
	• describe the role of pleurodesis
	• discuss the role of palliative care and psychological support
	• discuss the management of complications including superior vena cava (SVC) syndrome and paraneoplastic syndromes.	

Theme 5	Diseases	
Learning Objective 5.6	Diagnose and manage conditions relating to pulmonary infections (other than mycobacterial)	
Investigations include:		**Competency Level**
• Upper and lower respiratory tract infections		Level 3
• Community acquired pneumonia (CAP)		Level 3
• Nosocomial pneumonia		Level 3
• Pneumonia in the immunocompromised host		Level 3
• Parapneumonic effusion and empyema		Level 3
• Lung abscess		Level 3
• Fungal infection		Level 3
• Viral infection (including epidemic e.g. influenza)		Level 3
• Parasitic infection		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to pulmonary infections:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe treatment of community and hospital acquired pulmonary infections including ventilator-associated pneumoni
	• describe relevant microbiology and choose appropriate antibiotics
	• evaluate appropriate guidelines
	• assess the role of intrapleural fibrinolytic therapy and the role of surgical procedures in the treatment of parapneumonic effusions and empyema
	• describe public health issues, including infection control guidelines
	• discuss the role of vaccination
	• discuss the role of physiotherapy.
		• assess severity of CAP
		• provide supportive therapy for patients (e.g. oxygenation, ventilatory support, nutritional support)
		• use diagnostic techniques including bronchoscopy, lavage, and brushings
		• utilise diagnostic pleural techniques
		• select and interpret appropriate radiological investigations.

Theme 5	Diseases	
Learning Objective 5.7	Diagnose and manage conditions relating to bronchiectasis (non cystic fibrosis)	Level 3

Background Knowledge	Specialised Knowledge	Skills

• define the following for conditions relating to bronchiectasis:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe underlying causes and pathophysiological mechanisms in bronchiectasis
	• discuss investigations and specialised tests (e.g. HRCT, nasal potential differences, sweat tests, ciliary studies, immunoglobulin deficiencies, genetic screening)
	• describe the importance of drug treatment and sputum clearance techniques in treatment and prevention of progression
	• evaluate the role of surgery and lung transplantation in treatment of bronchiectasis
	• discuss environmental, social and cultural issues in Aboriginal and Torres Strait Islander, and Māori and Pacific Islander populations.
		• utilise a multidisciplinary approach to management, including physiotherapy
		• interpret high resolution computed tomography (HRCT) scans
		• manage acute exacerbations
		• provide long term management of bronchiectasis
		• manage complications including haemoptysis, pneumothorax and respiratory failure
		• manage underlying immunodeficiency syndromes where relevant
		• manage chronic respiratory failure.

Theme 5	Diseases	
Learning Objective 5.8	Diagnose and manage conditions relating to mycobacterial infections	
Investigations include:		**Competency Level**
• Pulmonary tuberculosis (TB)		Level 3
• Extra-pulmonary TB		Level 3
• TB in the immunocompromised host		Level 3
• Latent tuberculous infection		Level 3
• Non-tuberculous mycobacterial diseases		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• define the following for conditions relating to bronchiectasis:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe the pathophysiology of tuberculous and non-tuberculous infection
	• describe the diagnosis of tuberculosis, including emerging investigations and differentiation from non-TB mycobacterial diseases
	• identify relevant public health legislation
	• evaluate the role of TB clinics, including contact tracing and screening
	• describe the importance of TB in a global perspective
	• discuss the role of directly observed therapy
	• discuss occupational and community health and safety issues
	• discuss the role of isolation of patients in diagnostic stages (infection control)
	• recognise risk factors
	• discuss acute and long term complications including haemoptysis and bronchiectasis
	• discuss multi drug resistant TB.
		• manage TB in the immune competent host
		• manage TB in the immunocompromised host (esp. AIDS)
		• diagnose and treat non-tuberculous mycobacterial disease
		• interpret Mantoux and other tests
		• arrange appropriate contact screening
		• manage complications of TB and its treatment.

Theme 5	Diseases	
Learning Objective 5.9	Diagnose and manage conditions relating to HIV/AIDS and their pulmonary manifestations	Level 2

Background Knowledge	Specialised Knowledge	Skills

• describe the following for conditions relating to HIV/AIDS and their pulmonary manifestations:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• explain virology and immunology of HIV, and AIDS defining criteria
	• identify at risk populations
	• identify pulmonary manifestations of HIV, including infective and neoplastic
	• describe types of HIV-related infections in the lung
	• discuss the role and management of infections including pneumocystis and mycobacterial disease
	• evaluate the role of bronchoscopy and BAL
	• describe appropriate imaging, invasive tests and microbiology
	• discuss occupational health and safety issues for staff
	• describe appropriate acute and prophylactic treatment for pulmonary infections
	• describe other pulmonary complications of HIV, such as pulmonary hypertension.
		• perform bronchoscopy and associated techniques of brushing and BAL
		• administer appropriate sedation and analgesia for patients on protease inhibitors
		• formulate appropriate differential diagnoses for patients with pulmonary infiltrates
		• use universal precautions.

Theme 5	Diseases	
Learning Objective 5.10	Diagnose and manage conditions relating to pulmonary disorders in the immune–compromised host	
Investigations include:		**Competency Level**
• Drug induced immunosuppression		Level 3
• Congenital immunodeficiency syndrome		Level 3
• Graft versus host disease		Level 2
• Post-transplantation immunodeficiency		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to pulmonary disorders in the immune–compromised host:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• assess the conditions and treatments producing immunodeficiency
	• describe the immunopathology of graft versus host disease
	• describe the range of potential infections in the immuno-compromised host
	• describe the relevant investigation of respiratory symptoms, including complications and atypical presentation due to immunocompromised status
	• appraise treatment (including novel antibiotics and antifungicides) and potential side effects.
		• perform bronchoscopy and related techniques such as BAL
		• formulate appropriate differential diagnoses for patients with pulmonary infiltrates
		• prescribe immunosuppressive drugs including use of prophylactic agents.

Theme 5	Diseases	
Learning Objective 5.11	Manage post-lung transplant patients	Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for post-lung transplant patients:
  • definition
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• identify issues and complications relating to lung transplantation, including immunosuppression (e.g. infection, malignancy, renal disease)
	• describe bronchiolitis obliterans syndrome, and its assessment and management
	• discuss the role of bronchoscopy in the assessment and management of patients following transplantation.
		• undertake diagnostic tests for infection versus rejection, including the use of bronchoscopy
		• liaise with specialised transplant centres.

Theme 5	Diseases	
Learning Objective 5.12	Diagnose and manage conditions relating to venous thrombo-embolic disease	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to venous thrombo-embolic disease:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe the pharmacology of drugs used to treat pulmonary emboli (PE)
	• discuss prophylaxis in medical and surgical patients
	• discuss risk factors
	• evaluate emerging medical vasoactive therapies (including thrombolytics and direct thrombin inhibitors)
	• discuss the role of surgery and filters as part of a management plan
	• discuss chronic thrombo-embolic pulmonary hypertension (CTEPH) and its medical and surgical management
	• evaluate diagnostic and treatment guidelines.
		• assess for risk factors, including genetic susceptibility
		• assess clinically suspected venous thrombo-embolic disease
		• interpret investigation results (e.g. CT pulmonary angiogram (CTPA), ventilation-perfusion (VQ) scan, D-dimer)
		• assess the severity of PE
		• manage acute presentation, including anticoagulation and thrombolysis
		• manage complications of therapy, or contra-indications to therapy
		• recognise CTEPH.

Theme 5	Diseases	
Learning Objective 5.13	Diagnose and manage conditions relating to pulmonary vascular disease and other vasculitidies	
Investigations include:		**Competency Level**
• Pulmonary arterial hypertension		Level 3
• Secondary pulmonary hypertension		Level 3
• Vasculitis and diffuse pulmonary haemorrhage		Level 3
• Abnormal a-v communication		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to pulmonary vascular disease and other vasculitidies:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• discuss pathophysiology and genetics of pulmonary hypertension
	• define at risk groups
	• discuss tests for detection of pulmonary hypertension
	• describe pulmonary vasculitis, lung-renal syndromes, hepatopulmonary syndrome and pulmonary arteriovenous malformations
	• discuss palliative management options
	• discuss appropriate referral for transplantation.
		• assess patients with pulmonary hypertension, in order to determine the aetiology, severity/prognosis and need for specific therapies
		• interact collaboratively within a multidisciplinary team
		• use appropriate therapies for pulmonary hypertension.

Theme 5	Diseases	
Learning Objective 5.14	Diagnose and manage conditions relating to pleural disease	
Investigations include:		**Competency Level**
• Pleural effusions		Level 3
• Empyema		Level 3
• Chylothorax		Level 3
• Haemothorax		Level 3
• Pleural thickening (other than asbestos-related disease)		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to pleural disease:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• list causes of pleural effusions
	• differentiate transudates from exudates
	• discuss the role of diagnostic procedures including bronchoscopy, ultrasound, pleural aspiration and biopsy
	• evaluate the role of pleurodesis
	• discuss the management of complicated pleural effusions and empyema.
		• insert an intercostal catheter and manage underwater sealed drains where indicated
		• perform closed needle biopsy or thoracoscopy*
		• investigate and manage pleural effusions and empyema
		• investigate and manage malignant effusions.

		**Useful but not essential*

Theme 5	Diseases	
Learning Objective 5.15	Diagnose and manage pneumothorax	
Investigations include:		**Competency Level**
• Spontaneous pneumothorax		Level 3
• Secondary pneumothorax		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for pneumothorax:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• list risk factors for spontaneous pneumothorax
	• describe iatrogenic causes of secondary pneumothoraces
	• evaluate the implications for air travel and diving for patients with a pneumothorax
	• discuss treatment options, including simple aspiration, intercostal catheter, and pleurodesis
	• describe the role of surgical options in the management of pneumothorax.
		• perform simple aspiration
		• insert intercostal catheter where appropriate
		• manage underwater sealed drains and valves
		• perform medical pleurodesis.

Theme 5	Diseases	
Learning Objective 5.16	Diagnose and manage conditions relating to occupational and environmental lung disease	
Investigations include:		**Competency Level**
• Occupational asthma		Level 3
• Reactive airway dysfunction syndrome		Level 3
• Pneumoconiosis and asbestos-related disease		Level 3
• Hypersensitivity pneumonitis		Level 3
• Dust and toxic gas inhalation disease		Level 3
• Indoor and outdoor pollution related disease		Level 3
• Smoking related disease		Level 3
• High-altitude disease		Level 3
• Diving related disease		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to occupational and environmental lung disease:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe the causes of occupational and environmental lung disease (organic and inorganic)
	• discuss hazards of particular occupations and environments, with particular reference to Australian and New Zealand conditions including:
	  • effects of asbestos and silica
	  • hypersensitivity pneumonitis
	  • occupational asthma
	• discuss the role of occupational history, imaging and invasive tests
	• interpret lung function assessment in patients with occupational lung disease
	• describe work related implications for patients with occupational lung disease
	• describe medico-legal implications of occupational lung disease.
		• take an occupational history
		• use PEF records in suspected occupational asthma
		• arrange challenge testing where appropriate
		• interpret radiological investigations
		• prepare medico legal reports and act as expert witness.

Theme 5	Diseases	
Learning Objective 5.17	Diagnose and manage asbestos related lung disorders	
Investigations include:		**Competency Level**
• Asbestos related pleural plaques		Level 3
• Asbestos related pleural disease, including benign pleural effusions		Level 3
• Asbestosis		Level 3
• Malignant mesothelioma		Level 3
• Lung cancer (see separate learning objective)		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for asbestos related lung disorders:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• discuss the epidemiology of asbestos exposure
	• describe diagnostic criteria for asbestos related disorders
	• describe radiological investigations
	• discuss diagnostic techniques
	• evaluate emerging serological investigations and screening techniques
	• evaluate the role of chemotherapy, radiotherapy and surgery
	• discuss appropriate use of palliative care services
	• discuss the appropriate use of psychological supports.
		• prepare medico-legal reports and act as expert witness
		• consider compensation mechanisms
		• take a detailed occupational history
		• perform diagnostic pleural procedures, including pleural biopsies and pleurodesis
		• monitor disease progression.

Theme 5	Diseases	
Learning Objective 5.18	Diagnose and manage sarcoidosis	Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for sarcoidosis:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe the pulmonary and extrapulmonary manifestations of sarcoidosis
	• describe the natural history and prognosis of sarcoidosis
	• describe diagnostic techniques for sarcoidosis
	• discuss the role of mediastinoscopy and other lymph node sampling techniques in the diagnosis of sarcoidosis
	• discuss the role of extrapulmonary tissue diagnosis.
		• utilise bronchoscopic techniques in the diagnosis of sarcoidosis, including BAL, transbronchial biopsy (TBB), lymph node biopsies
		• interpret radiological and physiological investigations
		• formulate treatment plans for pulmonary and extrapulmonary sarcoidosis
		• monitor progress of patients with pulmonary and extrapulmonary sarcoidosis
		• monitor treatment side effects
		• refer to appropriate subspecialties (e.g. ophthalmology).

Theme 5	Diseases	
Learning Objective 5.19	Diagnose and manage conditions relating to idiopathic interstitial pneumonias	
Investigations include:		**Competency Level**
• Idiopathic pulmonary fibrosis (IPF) – usual interstitial pneumonia (UIP)		Level 3
• Nonspecific interstitial pneumonia (NSIP)		Level 3
• Acute interstitial pneumonia (AIP)		Level 3
• Respiratory bronchiolitis-associated interstitial lung disease (RB-ILD)		Level 3
• Desquamative interstitial pneumonia (DIP)		Level 3
• Lymphoid interstitial pneumonia (LIP)		Level 3
• Bronchiolitis obliterans organising pneumonia (BOOP)/cryptogenic organising pneumonia (COP)		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to idiopathic interstitial pneumonias:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• identify current classifications and guidelines
	• describe relevant investigations, including interpretation of lung function, HRCT scans, exercise tests, nuclear medicine tests, and lung biopsy (invasive and other)
	• describe available treatments including evidence base for current treatment and potential new agents
	• describe the prognostic indicators in idiopathic interstitial pneumonia
	• evaluate the appropriate timing for referral for lung transplantation.
		• take a clinical history, including occupational dust, fume and other exposures (drugs, allergens etc)
		• perform bronchoscopy with BAL and TBB
		• refer for open lung biopsy using appropriate indications
		• interpret HRCT and other investigations
		• monitor progress of patients with idiopathic interstitial pneumonia
		• manage exacerbations of idiopathic interstitial pneumonia
		• monitor treatment side effects
		• evaluate need for palliative care and end of life discussion
		• manage respiratory failure.

Theme 5	Diseases	
Learning Objective 5.20	Diagnose and manage pleuro-pulmonary manifestations of systemic disease and extrapulmonary disorders	
Investigations include:		**Competency Level**
• Connective tissue disease		Level 3
• Cardiac disease		Level 3
• Haematological disease (e.g. lymphomas)		Level 3
• Abdominal conditions, inflammatory bowel disease etc		Level 3
• Obesity		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for pleuropulmonary manifestations of systemic disease and extrapulmonary disorders:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• recognise, diagnose and manage these conditions.	• take an appropriate clinical history
		• perform a clinical examination
		• interpret clinical, radiological and laboratory investigations.

Theme 5	Diseases	
Learning Objective 5.21	Diagnose and manage conditions relating to cystic fibrosis	Level 2

Background Knowledge	Specialised Knowledge	Skills

• describe the following for cystic fibrosis:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe typical phenotypic features
	• discuss common genetic abnormalities and cystic fibrosis transmembrane conductance regulator (CFTR) class mutations
	• describe the effects of CFTR abnormalities
	• define the incidence and prevalence in populations
	• describe clinical manifestations
	• describe multisystem effects (e.g. cystic fibrosis related diabetes, gastrointestinal, fertility)
	• identify atypical presentations
	• evaluate diagnostic tests (physiological and molecular)
	• describe physical, pharmacological and nutritional management
	• discuss issues of adolescent health and behaviour
	• discuss the importance of social issues
	• discuss the management of cystic fibrosis during pregnancy
	• discuss principles of and indications for genetic counselling
	• describe infection control measures
	• discuss common morbidities of disease and complications of therapies
	• define indications for lung transplant.
		• utilise multidisciplinary team management
		• manage issues of adolescent health and behaviour
		• manage home intravenous therapy
		• prescribe inhaled therapies, including antibiotics
		• manage nutrition
		• manage CF associated diabetes, pancreatic insufficiency and hepatic disorders
		• manage end of life issues.

Theme 5	Diseases	
Learning Objective 5.22	Diagnose and manage conditions relating to genetic and developmental disorders	
Investigations include:		**Competency Level**
• Primary ciliary dyskinesia		Level 3
• Alpha-1 antitrypsin deficiency		Level 3
• Malformations		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to genetic and developmental disorders:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• describe pulmonary and extrapulmonary manifestations of cilial dyskinesia
	• describe pulmonary and extrapulmonary manifestations of alpha-1 antitrypsin deficiency
	• discuss the role of replacement therapy for alpha-1 antitrypsin deficiency
	• describe the radiological manifestations of malformations.
		• interpret radiological examinations
		• apply sputum clearance techniques for bronchiectasis
		• refer appropriately for lung transplantation.

Theme 5	Diseases	
Learning Objective 5.23	Diagnose and manage pulmonary disease in pregnancy	
Investigations include:		**Competency Level**
• Asthma		Level 3
• Pneumonia		Level 3
• Cystic fibrosis		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for pulmonary disease in pregnancy:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• recognise, diagnose and manage these conditions
	• identify the teratogenicity of drugs used for pulmonary disease
	• describe radiation exposure issues.
		• advise pregnant patients of the relative risks and benefits of different interventions to the patient and the foetus
		• apply appropriate treatment strategies
		• manage patients in conjunction with the gynaecologist and obstetrician.

Theme 5	Diseases	
Learning Objective 5.24	Diagnose and manage iatrogenic disease	
Investigations include:		**Competency Level**
• Drug induced disease		Level 3
• Radiation induced disease		Level 3
• Complications of invasive procedures		Level 3
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for iatrogenic disease:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• recognise, diagnose and manage these conditions.	• interpret radiological examinations
		• use bronchoscopic techniques, including BAL where appropriate
		• insert intercostal catheter for iatrogenic pneumothorax if required
		• apply appropriate treatment strategies.

Theme 5	Diseases	
Learning Objective 5.25	Diagnose and manage orphan lung disease	
Investigations include:		**Competency Level**
• Langerhan's cell histiocytosis		Level 2
• Lymphangioleiomyomatosis (LAM)		Level 2
• Pulmonary alveolar proteinosis (PAP)		Level 2
• Amyloidosis		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for orphan lung disease:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• recognise, diagnose and manage these diseases
	• identify radiological manifestations
	• discuss the role of whole lung lavage in PAP
	• describe the role of transplantation.
		• interpret radiological examinations, particularly HRCT
		• use bronchoscopy as a diagnostic tool where appropriate
		• apply appropriate treatment strategies.

Theme 5	Diseases	
Learning Objective 5.26	Diagnose and manage conditions relating to diseases of the chest wall and respiratory muscles	
Investigations include:		**Competency Level**
• Phrenic nerve palsy		Level 3
• Disorders of the diaphragm		Level 3
• Chest wall deformities		Level 3
• Neuromuscular disorders		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to diseases of the chest wall and respiratory muscles:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• recognise, diagnose and manage these conditions
	• describe biochemical variables
	• evaluate the role of neurological testing (EMG etc).
		• apply tests of lung function, including supine and erect spirometry, maximal inspiratory and expiratory pressures (MIPs and MEPs)
		• interpret radiological examinations (e.g. sniff tests)
		• use noninvasive ventilatory support in respiratory failure.

Theme 5	Diseases	
Learning Objective 5.27	Diagnose and manage conditions relating to respiratory failure	
Investigations include:		**Competency Level**
• Acute respiratory failure		Level 3
• Obstructive lung disease		Level 3
• Chest wall disease		Level 3
• Restrictive diseases		Level 3
• Neuromuscular disease		Level 2
Background Knowledge	**Specialised Knowledge**	**Skills**

• describe the following for conditions relating to respiratory failure:
  • pathogenesis
  • pathophysiology
  • epidemiology
  • clinical features
  • differential diagnosis
  • investigations
  • treatment
  • prognosis and complications.
	• identify appropriate treatments including oxygen therapy and NIV
	• discuss ethical issues (including limitation or withdrawal of therapy)
	• discuss the role of palliative care.
		• assess patients with hypercapnic or hypoxic respiratory failure
		• determine aetiology and prognosis of patients with respiratory failure
		• apply oxygen therapy and non-invasive ventilation
		• monitor patients with respiratory failure, including oximetry and ABGs
		• assess the potential for weaning from assisted ventilation
		• discuss end of life issues with patients and their carers.

Theme 5	Diseases
Learning Objective 5.28	Describe causes and treatment of sleep disordered breathing

Investigations include:	Competency Level
• Obstructive sleep apnoea	Level 3
• Central sleep apnoea	Level 3
• Sleep hypoventilation syndromes	Level 3

Knowledge	Skills
• list the causes and treatment of obstructive sleep apnoea, central sleep apnoea and sleep hypoventilation syndromes • describe the prevalence, causes and clinical presentations of obstructive sleep apnoea, central sleep apnoea and sleep hypoventilation syndromes • define the indications for polysomnography versus screening sleep investigations • describe the indications for arterial blood gas and other tests of ventilatory function • analyse the evidence base for CPAP, NIV, dental devices, surgery and other treatments in these disorders • explain the natural history, complications and range of treatments available for the common neuromuscular disorders associated with hypoventilation and sleep hypoventilation syndromes • utilise community, rehabilitation, and palliative care services in the management of these patients.	• identify patients at risk • refer for treatment of central sleep apnoea and sleep hypoventilation syndromes.

Theme 6	Research
Learning Objective 6.1	Identify and apply methods used in clinical and/or basic research in respiratory medicine

Knowledge	Skills
• identify methods used in clinical and/or basic research in respiratory medicine • identify components involved in conducting clinical and/or basic research, including study design, data analysis and interpretation of research • describe the strengths and weaknesses of the various tools used in respiratory research • identify the major journals which publish respiratory related research.	• apply research methods, using the various tools employed in respiratory research • apply issues related to study design, data analysis and interpretation • critically evaluate respiratory research in clinical journal clubs • appraise relevance of respiratory research to clinical practice.

Theme 6	Research
Learning Objective 6.2	Plan and execute a clinical or basic respiratory research project

Knowledge	Skills
• identify the types of study design • describe the ethical implications of respiratory research and requirements to submit research projects for ethical approval • describe statistical analysis methods, including issues related to sample size and statistical power • describe measurement techniques • describe the methods of literature review • describe the requirements for publication of research projects.	• formulate a hypothesis • design a basic research protocol • critically evaluate published research studies • collect and analyse research data • construct and write an abstract containing data from a research study • present a research project to an audience in oral or poster format • write a manuscript for publication in a peer review journal*.

**Useful but not essential*