



RESPIRATORY MODULE PHASE I

Faculty of Medical Sciences
University of Sri Jayewardenepura



Respiratory Module - Phase I

*Faculty of Medical Sciences
University of Sri Jayewardenepura*

Introduction

Respiratory module in Phase 1 is designed to facilitate learning of the normal structure / function relationships of respiratory system. The main content areas of the module are covered over a period of 4 weeks during the 2nd term of the medical curriculum.

Respiration occurs through out life and respiratory adjustments are constantly made in health & in disease states. A good knowledge of the structure and function of the respiratory system is the key to understand & interpret normal and diseased states.

Apart from the aspects of normal structure & function of respiratory system, features of common respiratory disorders are highlighted in preparation for Phase II of the respiratory module.

You are encouraged to engage on active self learning using the respiratory module hand book and the list of reading materials as guides.

Teaching / learning activities of this module will be in the form of lectures, tutorials, dissections, practicals, seminars, hospital visits & small group discussions. Interactive learning modules in the IT lab, activities in the Language and Communication laboratory and practicing clinical skills relevant to respiration will enhance your own learning process during these four weeks.

In order to help you learn the structure and function of the respiratory system in an integrated manner several real life situations which you may see in your daily life are introduced into the module. You will work out these problems and use the worksheets during your module, to strengthen your learning.

**Members of the Module Committee- Development of
Respiratory module**

Dr P T R Makuloluwa (Chairperson) - Dept. of Physiology

Dr Bawantha Gamage (Convener) - Dept. of Surgery

Dr Rasika Perera -Dept. of Biochemistry

Dr Kamani Wanigasuriya -Dept. of Medicine

Dr Rohitha Senevirathna -Dept. of Paediatric

Dr Kamani Samarasinghe -Dept. of Pathology

Dr Roshan Liyanage -Dept. of Anatomy

**Members of the Module Committee- Implementation of
Respiratory module-2008**

<i>Dr S W Wimalasekera (Chairperson)</i>	<i>-Dept. of Physiology</i>
<i>Dr Rasika Perera (Convener)</i>	<i>-Dept. of Biochemistry</i>
<i>Dr Kamani Wanigasuriya</i>	<i>-Dept. of Medicine</i>
<i>Dr Rohitha Senevirathna</i>	<i>-Dept. of Paediatrics</i>
<i>Dr Kamani Samarasinghe</i>	<i>-Dept. of Pathology</i>
<i>Dr Roshan Liyanage</i>	<i>-Dept. of Anatomy</i>

**Members of the Module Committee- Implementation of
Respiratory module-2009**

<i>Dr N.R. Jazeel (Chairperson)</i>	<i>-Dept. of Physiology</i>
<i>Dr Rasika Perera (Convener)</i>	<i>-Dept. of Biochemistry</i>
<i>Dr Kamani Wanigasuriya</i>	<i>-Dept. of Medicine</i>
<i>Dr Rohitha Senevirathna</i>	<i>-Dept. of Paediatrics</i>
<i>Dr Kamani Samarasinghe</i>	<i>-Dept. of Pathology</i>
<i>Dr Roshan Liyanage</i>	<i>-Dept. of Anatomy</i>

General Objectives

At the end of the respiratory module, the student should be able to:

- 1. describe the normal structure / function relationships of respiratory system*
- 2. apply the basic scientific knowledge in understanding the respiratory adjustments in health and in disease states*
- 3. describe the physiological basis of signs / symptoms of altered structure & function of respiratory system*
- 4. interpret the results of respiratory investigations in the underlying derangements*
- 5. outline the physiological principles of treatment of common respiratory disorders*
- 6. provide Cardiopulmonary Resuscitation in the event of cardio – respiratory arrest*

Main Content Areas

Structure of Nasal air passages

Structure / Function of larynx

Structure / Function of diaphragm

Embryology of Respiratory Apparatus

General Structure of Thorax

Structure of airways / lungs

Histology of airways / lungs

Mechanics of Ventilation

Lung volumes and capacities

Pulmonary blood flow & its regulation

Gas exchange across Alveolar Capillary Membrane

Distribution of Ventilation & V/Q ratios

Modified acts of respiration

Gas transport between lungs & tissues

Hypoxia

Regulation of respiration

Lung Function Tests

Principles of O₂ therapy

Physiological adjustments in diving & at high altitude

Cardio respiratory adjustments during exercise

Applied anatomy of chest wall

X rays, CT / MRI scans as diagnostic aids in respiratory disorders

Respiratory failure

Cardiopulmonary Resuscitation

Real life situations

Real life situation 1 : Stridor

Real life situation 2 : Acute Shortness of Breath

Real life situation 3 : Chest infection

Procedural Skills

Obtain a basic respiratory history

Physical examination of the respiratory system

Conduct Peak expiratory flow test and interpret Lung Function Tests

Perform Cardio pulmonary resuscitation

Recommended Reading Material

Anatomy

Cunningham's Manual of Practical Anatomy

Volume 1 Upper & Lower limbs

Volume 11 Thorax & Abdomen

Volume 111 Head, Neck & Brain

by G. J. Romanes

Clinical Anatomy Revision & Applied Anatomy for Clinical Students

by Harold Ellis

Grant's Atlas of Anatomy ***by Anne M. R. Agur***

Last's Anatomy ***by R. M. H. Mc Minn***

Biochemistry

Lippincott's illustrated reviews ***by Pamela C. Champe, Richard A. Harvey***

Physiology

Review of Medical Physiology

by William F. Ganong

Clinical Medicine – Kumar & Clark

by Praveen Kumar & Michael Clark

Davidson's Principles & Practice of Medicine

by Edwards Bouchier, Haslett Chilvers

Physiological principles Of Medicine series, Respiratory Physiology ***by***

John Widdicombe & Andrew Davies (Edward Arnold Publishers)

Respiratory Module - Phase I

STRUCTURE OF NASAL AIR PASSAGES

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to ➤ describe the general structure of external nose, nasal cavity, paranasal sinuses & nasopharynx	A	➤ General structure of external nose, nasal cavity, paranasal sinuses & nasopharynx	Lecture 1 hr x 1 Dissections 3 hrs x 1	1 hr 3 hrs	Anatomy

STRUCTURE OF DIAPHRAGM

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to					
➤ describe the general structure of the diaphragm	A	➤ General structure of diaphragm	Lecture		Anatomy
➤ describe the embryological development of the diaphragm	C	➤ Embryological development of diaphragm	1 hr x 1	1 hr	
➤ outline briefly the developmental anomalies of: <ul style="list-style-type: none"> • tracheoesophageal fistula • diaphragmatic hernia • hiatus hernia 	B	➤ Developmental anomalies of <ul style="list-style-type: none"> • tracheoesophageal fistula • diaphragmatic hernia • hiatus hernia 	Dissections 3 hrs x 1	3 hrs	
			Tutorial 2 hrs x 1	2 hrs	

STRUCTURE / FUNCTION OF LARYNX

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to ➤ describe the anatomy of larynx ➤ explain the structure / function relationships of larynx ➤ outline how Heimlich maneuver relieves airway obstruction in choked individuals ➤ draw & label the structures seen during laryngoscopic examination ➤ define stridor ➤ outline briefly the causes / mechanisms of stridor in laryngeal disorders ➤ identify the landmarks for cricothyroid puncture ➤ identify the landmarks for tracheostomy	A A A B A B A A	➤ Structure of larynx ➤ Mechanisms of speech, swallowing & cough ➤ Heimlich maneuver in choking ➤ Laryngoscopic view of laryngeal inlet ➤ Causes / mechanisms of stridor in laryngeal disorders ➤ Surface mark / identify site for cricothyroid puncture ➤ Surface mark / identify site for tracheostomy	Lecture 1 hr x 1 Dissections/ Demonstration of Prosected specimens 2 hrs x 1	1 hrs 2 hrs	Anatomy

EMBRYOLOGY OF RESPIRATORY APPARATUS

Intermediate Objectives		Broad Content Areas	Activity	Duration	Department
Should be able to ➤ describe the normal developmental embryology of the respiratory apparatus	B	➤ Normal developmental embryology of the nasal passages, larynx, trachea, bronchi, lungs, pleura, & thoracic cavity	Lecture 1 hr x 1	1 hr	Anatomy

GENERAL STRUCTURE OF THORAX

Intermediate Objectives		Broad Content Areas	Activity	Duration	Department
Should be able to					
➤ describe the general structure of the thoracic cage	A	➤ Bones, cartilages & joints of thoracic skeleton	Demonstrations		Anatomy
➤ identify the following important bony landmarks:	A	➤ Muscles of respiration	Dissections	9 hrs	
• sternal angle		➤ Segmental innervation & blood supply of thoracic wall	3 hrs x 3		
• sternocostal joints		➤ Boundaries & important anatomical structures of thoracic inlet / outlet	Lecture	1 hr	
• xiphoid process			1 hr x 1		
• midclavicular point			Tutorial	2 hrs	
• tip of the 9 th costal cartilage			2 hrs x 1		
➤ draw the anterior / middle / posterior axillary lines and mid clavicular line on the chest wall	A				
➤ surface mark lungs and pleura on the chest wall	A	➤ Surface marking of the lungs & pleura			

STRUCTURE OF AIRWAYS & LUNGS

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to ➤ describe the anatomy of trachea , bronchial tree, lungs & pleura	B	➤ structural anatomy of trachea, bronchial tree, broncho pulmonary segments, lungs & pleura	Dissections Demonstration of prosected specimens & models 3 hrs x 1 Lecture 1 hr x 1	3 hrs 1 hr	Anatomy

HISTOLOGY OF AIRWAYS & LUNGS

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to ➤ identify & describe the microstructure of upper / lower respiratory tracts & alveoli	B	➤ Histology of the upper / lower respiratory tracts & alveoli	Lecture 1 hr x 1 Practical 3 hrs x 1	1 hr 3 hrs	Anatomy

MECHANICS OF VENTILATION

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to describe the ➤ mechanics of ventilation	A	➤ Physical / Physiological principles of ventilation ➤ Mechanism of air trapping / airway closure during forceful respiratory effort	Lectures 1hr x 3 Tutorial 1hr x 2	3hrs 2 hrs	Physiology
define the terms ➤ compliance & airway resistance	A	➤ Compliance and its influence on ventilation of the lungs			
list the conditions with altered ➤ compliance & airway resistance	A	➤ Airway resistance and its influence on ventilation			
explain the respiratory adaptations in conditions with altered compliance & airway resistance	A	➤ Respiratory adaptations in conditions with altered compliance & airway resistance			
describe the ➤ role of surfactant in maintaining alveolar stability name the conditions with surfactant deficiency and to outline the deranged physiology	A	Surfactant ➤ synthesis ➤ physical properties aiding the reduction of surface tension ➤ alveolar stability explained on the basis of "Law of Laplace" ➤ deficiency states and associated problems			

LUNG VOLUMES AND CAPACITIES

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to enumerate & define the tests used in the assessment of <ul style="list-style-type: none"> ➤ ventilatory functions ➤ gas exchange of the lungs 	A	<ul style="list-style-type: none"> ➤ Lung volumes & capacities ➤ Dead space volumes ➤ Usefulness of FEV₁ / FVC ratios in differentiating obstructive from restrictive airway diseases 	Lecture 1hr x 1	1 hr	Physiology
To identify the volumes & capacities on <ul style="list-style-type: none"> ➤ a spiograph 	A				

PULMONARY BLOOD FLOW AND REGULATION

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to explain the					
➤ characteristics of pulmonary circulation in comparison to systemic circulation	A	➤ Pressure / flow characteristics of pulmonary circulation	Lectures 1hr x 2	2 hrs	Physiology
➤ distribution of pulmonary blood flow in standing / recumbent positions	A	➤ Factors governing the distribution of pulmonary blood flow			
➤ Regulation of pulmonary blood flow	A	➤ Factors affecting pulmonary blood flow			

GAS EXCHANGE ACROSS THE ALVEOLAR CAPILLARY MEMBRANE (ACM)

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to describe the	A	<ul style="list-style-type: none"> ➤ Physical factors governing gas exchange across ACM ➤ Characteristics of ACM facilitating gas exchange 	Lectures 1hr x 1	1 hr	Physiology
<ul style="list-style-type: none"> ➤ factors governing gas exchange across the Alveolar Capillary Membrane (ACM) 			Tutorial 1hr x 1	1 hr	
apply the knowledge on gas exchange in outlining the mechanisms of altered gas exchange	B	<ul style="list-style-type: none"> ➤ Disease states with altered gas exchange ➤ α_1 anti trypsin deficiency & emphysema 		2 hrs	

DISTRIBUTION OF VENTILATION & V/Q RATIOS

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to explain the ➤ “regional variation” in the distribution of ventilation in standing / recumbent positions ➤ distribution of ventilation in relation to alveolar perfusion (V/Q ratios) ➤ the effects of abnormal V/Q ratios on arterial blood gases	A	➤ Factors governing the distribution of ventilation	Lectures 1hr x 1	1 hrs	Physiology
	A	➤ V/Q ratios ➤ Normal “V/Q scatter” and its influence on blood gases ➤ Causes of increased “V/Q scatter” and their influence on blood gases	SGD 2 hrs x 1	2 hrs	
	A	➤ Causes of normal & abnormal A-a gradients			

GAS TRANSPORT

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to describe the					
➤ carriage of O ₂ to the tissues with reference to the “O ₂ flux equation”	A	➤ Methods of O ₂ transport between lungs & tissues	Lectures 1hr x 2	2 hrs	Physiology
➤ influence of P _a O ₂ on the affinity of haemoglobin for O ₂ (SO ₂) with reference to Oxygen Haemoglobin Dissociation Curve (O- HbDC)	A	➤ Relationship between P _a O ₂ & SO ₂ with reference to Oxygen Haemoglobin Dissociation Curve (O- HbDC) ➤ Factors altering the affinity of haemoglobin for O ₂ ➤ Significance of right / left shift of O-Hb DC with reference to O ₂ transport ➤ CO transfer factor			
describe the role of RBC & plasma in the transport of CO ₂	A	➤ Methods of CO ₂ transport between lungs & tissues ➤ Mechanism of release of CO ₂ at the pulmonary capillaries ➤ Role of “Haldane effect” on CO ₂ transport	Tutorial 1hr x 1	1 hr	

REGULATION OF RESPIRATION

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to explain the <ul style="list-style-type: none"> ➤ regulatory mechanisms of respiration in health & in disease states 	A	<ul style="list-style-type: none"> ➤ Role of respiratory center in controlling respiration ➤ Chemical control of respiration via Chemoreceptors ➤ Non chemical influences on respiration ➤ Respiratory adjustments in disease states 	Lectures 1hr x 2 SGD 2hrs x 1	2 hrs 2hrs	Physiology

HYPOXIA

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to					
Explain the likely types and causes of hypoxia	A	<ul style="list-style-type: none"> ➤ Define Hypoxia ➤ Types & causes of hypoxias 	Lectures 1hr x 2	2hrs	Physiology
Explain the pathophysiological basis of hypoxia in Restrictive lung disease & obstructive lung disease	A				
Explain the compensatory mechanisms in the body in hypoxia	A	<ul style="list-style-type: none"> ➤ Compensatory mechanisms of acute & chronic hypoxias 			
explain the mechanisms of O ₂ uptake by the tissues	A	<ul style="list-style-type: none"> ➤ Diffusion of O₂ to the tissues Role of “Bohr effect” on O₂ delivery to the tissues 			

CORRELATION OF STRUCTURE AND FUNCTIONS OF THE RESPIRATORY SYSTEM

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to Correlate the ➤ Structure and function of respiratory system	A B	➤ Respiratory functions of the organs of Respiration ➤ Non respiratory functions of the organs of respiration	Seminar 2hrs x 1	2 hrs	Physiology & Anatomy

LUNG FUNCTION TESTS (LFT)

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to enumerate & define the tests used in the assessment of <ul style="list-style-type: none"> ➤ ventilatory functions ➤ gas exchange of the lungs 	A	<ul style="list-style-type: none"> ➤ Lung volumes & capacities ➤ Dead space volumes 	Practical 3 hrs x 2	6 hrs	Physiology
To identify the volumes & capacities on <ul style="list-style-type: none"> ➤ a spirograph 	A				
To calculate the FEV ₁ / FVC ratio on a vitalograph	A	<ul style="list-style-type: none"> ➤ Usefulness of FEV₁ / FVC ratios in differentiating obstructive from restrictive airway diseases 			
To interpret the results of LFT to diagnose underlying physiological derangement / clinical abnormality <ul style="list-style-type: none"> ➤ Lung volumes & capacities ➤ PEFr ➤ Blood gas reports ➤ FEV₁ / FVC ratios 	A	<ul style="list-style-type: none"> ➤ Interpretation of LFT with reference to the deranged lung functions / underlying diseases of the lungs 			
To acquire the skill of using a peak flow meter to measure & interpret the results of PEFr	A				

MODIFIED ACTS OF RESPIRATION

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to explain the physiological basis of					
➤ deglutition apnoea	A	➤ Mechanisms of deglutition apnoea	Practical 3 hrs x 2	6 hrs	Physiology
➤ the period of voluntary apnoea following	A	➤ Factors governing the period of voluntary apnoea			
<ul style="list-style-type: none"> • normal breaths • hyperventilation • re breathing of CO₂ • O₂ therapy 					
➤ signs / symptoms accompanying voluntary hyperventilation	A	➤ Consequences of voluntary hyperventilation			

RESPIRATORY FAILURE

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to define respiratory failure	A	➤ Types & causes of respiratory failure	Lectures 1 hr x 1	1 hr	Physiology
list the types & likely causes of respiratory failure	A	➤ Physiological basis of the deranged blood gases in 2 types of respiratory failure			
describe the ➤ effects of deranged respiratory physiology on blood gas tensions	B	➤ Blood gas analysis based diagnosis of the type & severity of respiratory failure	SGD 2hrs x 1	2 hrs	
interpret a blood gas report in relation to the ➤ type & severity of respiratory failure	A				
outline the principles of ➤ treatment ➤ artificial ventilation	B	➤ Outline of treatment			

PRINCIPLES OF O₂ THERAPY

Intermediate Objectives		Content areas	Activity	Duration	Department
<p>Should be able to describe the</p> <ul style="list-style-type: none"> ➤ principles of O₂ therapy 	A	<ul style="list-style-type: none"> ➤ O₂ cascade ➤ Usefulness of O₂ therapy in different types of hypoxias ➤ Physiological basis of “Controlled O₂ therapy” in patients with chronic hypercarbia 	Lectures 1hr x 1	1 hr	Physiology
<p>outline the</p> <ul style="list-style-type: none"> ➤ risks associated with O₂ therapy 	A	<ul style="list-style-type: none"> ➤ O₂ toxicity (causes & effects on the body) ➤ Hyperbaric O₂ therapy 			

PHYSIOLOGICAL ADJUSTMENTS AT HIGH ALTITUDES, SPACE & DIVING

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to describe the					
➤ physiological adjustments at high altitudes, Space.	A	➤ Acute & chronic changes (acclimatization) at high altitudes and space	Lectures 1hr x 3	3 hrs	Physiology
➤ physiological adjustments derangements in diving	A	➤ Decompression sickness and N ₂ / CO ₂ narcosis in divers			

CARDIO RESPIRATORY ADJUSTMENTS DURING EXERCISE

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to describe the					
➤ changes in muscles during isometric / isotonic type of exercise	A	➤ Physiological changes in muscles during isometric / isotonic type of exercise	Lectures 2 hrs x1	2 hrs	Physiology
➤ cardio – respiratory adjustments during isometric / isotonic type of exercise	A	➤ Cardio – respiratory changes during isometric / isotonic type of exercise ➤ “O ₂ debt” mechanism	Practical 3 hrs x 2	6 hrs	
discuss the exercise tolerance in	A	➤ Physiological adjustments in athletes to increase exercise capacity ➤ Beneficial effects of regular form of exercise ➤ Effect of cardio respiratory diseases on exercise tolerance			

CARDIO- PULMONARY RESUSCITATION (CPR)

Intermediate Objectives		Content areas	Activity	Duration	Department
Should be able to ➤ Define cardiac arrest & cardio pulmonary resuscitation ➤ List the types and causes of cardiac arrest ➤ Outline the components and stages of CPR ➤ Perform Basic Life Support accurately ➤ Understand the basic principles of Advanced Life Support	A A A A B	➤ Define Cardiac arrest and CPR ➤ types and causes of cardiac arrest ➤ Airway, Breathing and Circulation of resuscitation Anatomical considerations in <ul style="list-style-type: none"> • Opening up the Airway • Establish Airway • Establish Breathing and Circulation • Maintaining Breathing & Circulation ➤ Establish A B C in Advanced Life Support	Practical 3 hrs x 3	9 hrs	Physiology

X RAYS, CT / MRI SCANS AS DIAGNOSTIC AIDS IN RESPIRATORY DISORDERS

Intermediate Objectives		Broad Content Areas	Activity	Duration	Department
<ul style="list-style-type: none"> ➤ identify and comment on the normal radiological appearances of the following on a chest x ray <ul style="list-style-type: none"> • borders of the heart • trachea, main bronchi & hilar regions, mediastinum • lung fields, lobes & fissures • bony skeleton • domes of the diaphragm ➤ identify the following abnormalities on a chest x ray <ul style="list-style-type: none"> • Cardiomegaly • Tracheal, mediastinal shift • Pneumothorax, pleural effusions • Collapse of the lung • Emphysema • Bony abnormalities ➤ identify the normal / abnormal appearances of paranasal sinuses ➤ identify the thoracic structures on scan reports 	A	<ul style="list-style-type: none"> ➤ X rays of the chest 	Lecture 1 hr x 1	1 hr	Anatomy
	B	<ul style="list-style-type: none"> ➤ Cardiomegaly ➤ Tracheal, mediastinal shift ➤ Pneumothorax, pleural effusions ➤ Collapse of the lung ➤ Emphysema ➤ Bony abnormalities 	Practical 3 hrs x 1	3 hrs	
	B	<ul style="list-style-type: none"> ➤ X rays of paranasal sinuses 			
	C	<ul style="list-style-type: none"> ➤ CT / MRI scans of chest 			

Real Life Situation-1

Stridor

Topic: Stridor

Scenario:

Your neighbor visits you to inform that his grandfather was suddenly admitted to the hospital last night. The reason for the admission was sudden difficulty in breathing and he also noticed a “sound” coming from the throat when “breathing in”. He tells you that his grandfather is about 70 years old and has had noisy breathing especially at night and his voice was becoming hoarse. He refused to see a doctor as it was not causing much problems. The family has also noticed a recent loss of weight & loss of interest in food, which they attributed to “ageing”.

He was admitted immediately to the hospital. The family was informed that “a block in the throat” was causing difficulty in breathing. In order to ease the breathing they had made a hole in his wind pipe to bypass the block.

The family had been told that certain tests will be needed to find the cause for his “noisy breathing”. They were also told that surgery may be needed.

Your neighbor asks you to help him understand his grandfather’s condition and need for surgery.

You are just about to start your module on respiratory system. You are keen to find out the causes for his problems. You make a list of possible causes and identify the areas you need to gather more knowledge to understand his condition.

Real Life Situation-2

Acute Shortness of breath

Topic: Sudden SOB

Conversation between a medical student & his mother

Scenario:

Your mother telephones you in the morning to inform that your elder sister was admitted to the hospital last night following a sudden attack of difficulty in breathing, breathlessness with noisy breathing.

The doctors have told the mother that your sister has developed an attack of asthma for which she was being treated with O₂ & “nebulized” with a drug called salbutamol. They also have informed your mother that your sister may even need admission to the Intensive Care Unit, if she does not show any improvement with the present treatment.

Your mother tells you not to come home immediately but to find out how bad her condition is and why she has been treated with O₂. She also wants to know why the doctors think your sister may need admission to the ICU.

You remember that your sister has been treated for an episode of cough and wheeze several times in the past, but never needed hospital admissions before. You decide to go and meet the doctors at the hospital immediately.

You are keen to find out as much as possible with the help of a senior medical student colleague. Therefore you decide to make a list of what you already know and the issues you would need more information.

Real Life Situation-3

Chest infection

Scenario:

Your grand father is a 68 year old diabetic patient on insulin treatment. He suddenly developed a cough and was spitting out yellow coloured sputum. On the third day he experienced high swinging fever and a dull ache on the right lower chest. He coughed out yellow colored sputum and a little amount of blood on two occasions. He is a heavy smoker and a heavy alcoholic.

With these symptoms you took him to see his family doctor. After examining the patient, the doctor prescribed him a cough syrup and paracetamol for the chest pain. Since he did not improve he was admitted to hospital on the following day.

What are your worries for this patient?

Using the knowledge you have acquired during your respiratory module how will you plan to investigate his condition and plan his treatment.