

# KING SAUD UNIVERSITY COLLEGE OF MEDICINE

## WEEK 1 – RESPIRATORY BLOCK A (Male)

Week (1) Starting:

20/2/2010 (6/3/1431H)

CHAIR PERSON : Dr.Sami Al-Nassar

CO-CHAIR: Prof.Abdulmajeed Kambal

Saturday	Sunday	Monday	Tuesday	Wednesday
8:00 ~ 9:00 am Functions and Organization of the Respiratory System(Phys) <b>Dr. Tariq</b>	8:00-9:30am Small Group Discussion	8:00 ~ 9:00 am Histology of the Nasal Cavity, Larynx and Trachea <b>Dr.Ali Mohammed</b>	8:00 ~ 9:00am Small Group Discussion	8:00 ~ 9:00 am Chronic Obstructive Airways Diseases (Path) <b>Dr.Ammar AL-Rikabi</b>
9:00 ~ 10:00 am Muscles involved in respiration <b>Dr.Ahamed Fathallah</b>	9:30– 11:00am Independent Learning	9:00 ~ 10:00 am <b>(Practical)</b> Histology of the Nasal Cavity, Larynx and Trachea <b>Room 122</b> <b>1<sup>st</sup> Floor</b>	9:00 ~ 10:30 am Independent Learning	9:00- 10:30 am <b>(Practical)</b> Chronic Obstructive Airways Diseases <b>Dr.Ammar AL-Rikabi</b>  <b>Dr.Amer Al-Shafi</b> Pathology Dept. Student Lab Room 051142
10:00 ~ 11:00am Atopy , Allergic Disease and Anaphylaxis (Immunology) <b>Prof.Gad El-Rab</b>	11:00 -12:00am Mechanism of Breathing (Phys)  <b>Dr. Tariq</b>	10:00 ~ 11:00am Respiratory Ventilation (Phys1) <b>Dr. Tariq</b>	10:30 ~ 12:00pm Nasal Cavity, Larynx and Trachea <b>Dr.Essam</b>	10:30 ~ 12:00pm Pharmacological Treatment of Asthma and COPD (2) <b>Prof. Al-Haider</b>
11:00- 12:00 pm Bronchial Asthma(Path) <b>Dr.Ammar AL-Rikabi</b>		11:00 ~ 12:00 Pharmacological Treatment of Asthma and COPD (1) <b>Prof. Al-Haider</b>		
<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
1:00 ~ 3:00 pm <b>(Practical)</b> Thoracic wall , Intercostals Space	1:00 ~3:00pm Salam	1:00 ~ 3:00 pm Independent Learning	1:00 ~ 3:00 pm <b>(Practical)</b> Nasal Cavity, Larynx and Trachea <b>Room 118</b> <b>1<sup>st</sup> Floor</b>	1:00-300pm Salam

LECTURE THEATER:

Room No. 2141- Level 2- Seat Cap.153

# KING SAUD UNIVERSITY COLLEGE OF MEDICINE

WEEK 2 – RESPIRATORY BLOCK A (Male)				
Week (2) Starting: 27/2/2010 (13/3/1431H)				
CHAIR PERSON : Dr.Sami Al-Nassar				
CO-CHAIR: Prof.Abdulmajeed Kambal				
Saturday	Sunday	Monday	Tuesday	Wednesday
8:00 - 9:00 am Development of Larynx, Trachea, Bronchi <b>Dr.Mojahed</b>	8:00 - 9:30 am Small Group Discussion	8:00 - 9:00 am Respiratory Ventilation (Phys 2) <b>Dr. Tariq</b>	8:00 - 9:30am Small Group Discussion	8:00 - 9:00 am Oxygen Transport Carbon Dioxide Transport (Phys) <b>Dr. Tariq</b>
9:00 - 10:00 am Lung and Pleura <b>Dr.Saeed</b>	9:30 – 11:00 am <u>(Practical)</u> History taking & principles of Respiratory examination <u>Group (1)</u> Medical education department, <b>skills lab., level 2 &amp; 3</b>	9:00 - 10:00am Mediastinum <b>Dr.Saeed</b>	9:30 – 10:30am Histology of the Lung (Anatomy)	9:00 - 10:00 am Alveolar-Arterial Equation (Phys) <b>Dr. Tariq</b>
10:00 - 11:00am Fatty acid oxidation <b>Dr.Sherif Salih</b>	11:00 - 12:00 pm Tuberculosis (Micro) <b>Prof . KAMBAL</b>	10:00 - 11:00am Utilization of ketone bodies <b>Dr.Sherif Salih</b>	10:30 - 12:00pm <u>(Practical)</u> History taking & principles of Respiratory examination <u>Group (2)</u> Medical education department, <b>skills lab., level 2 &amp; 3</b>	10:00 - 11:00am Tuberculosis Treatment (Microbiology) <b>Prof . KAMBAL</b>
11:00- 12:00 pm Immunology of T.B (1) <b>Prof.Gad El-Rab</b>		11:00- 12:00pm Gas Transfer (Phys) (2) <b>Dr. Tariq</b>		11:00- 12:00pm Drugs for Treatment of T.B (1) <b>Dr.Saeed</b>
Lunch	Lunch	Lunch	Lunch	Lunch
1:00 - 3:00 pm <u>(Practical)</u> Lung and pleura	1:00 - 3:00 pm Salam	1:00 - 3:00 pm <u>(Practical)</u> Mediastinum	1:00 - 3:00 pm <u>(Practical)</u> Histology of the Lung  <b>Room 122 1<sup>st</sup> Floor</b>	1:00 - 3:00 pm Salam

# KING SAUD UNIVERSITY COLLEGE OF MEDICINE

## WEEK 3 – RESPIRATORY BLOCK A (Male)

Week (3) Starting:

6/3/2010 (20/3/1431H)

CHAIR PERSON : Dr.Sami Al-Nassar

CO-CHAIR: Prof.Abdulmajeed Kambal

Saturday	Sunday	Monday	Tuesday	Wednesday
8:00 - 9:00am Alveolar-Arterial Equation (Phys) <b>Dr. Tariq</b>	8:00 - 9:30 am Small Group Discussion	8:00 - 9:00am Preferential utilization of energy by tissues <b>Dr.Azhar</b>	8:00 - 9:30 am Small Group Discussion	8:00 - 9:00 am Effect of Low and High Gas Pressure on the Body (Physiology) <b>Dr. Tariq</b>
9:00 - 10:00 am Restrictive Lung Diseases (Path) <b>Dr.Ammar AL-Rikabi</b>	9:30 – 10:30 am Independent Learning	9:00 - 11:00am <b>(Practical)</b> Microbiology (Staph and Strep Infections)	9:30 – 11:00am Independent Learning	9:00 - 10:00 am Cancers of the Lung (1) (Path) <b>Dr.Ammar AL-Rikabi</b>
10:00 - 11:00am Viral Infection of the Respiratory Tract(Influenza, Adenoviruses) <b>Dr M. Arif</b>	10:30 - 12:00am Respiratory tract Infections (1) (Pharmacology)  <b>Prof. Al-Humayyd</b>	<b>Dr Ali Somily/ Dr Al-Khattaf</b>	11:00 - 12:00 am Control of Breathing (Phys) <b>Dr. Tariq</b>	10:00 - 11:00am Pulmonary Infections (Path) <b>Dr.Ammar AL-Rikabi</b>
11:00- 12:00pm Bacteria Causing Lower Respiratory Tract Infection <b>Dr Ali Somily</b>		11:00- 12:00pm Bacteria Causing Upper Respiratory Tract Infection <b>Dr. Ali Somily</b>		11:00- 12:00pm Respiratory Tract Infection (2) (Pharma) <b>Prof. Al-Humayyd</b>
<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
1:00 - 3:00 pm <b>(Practical)</b> Restrictive lung Diseases(Path - <b>Dr.Ammar AL-Rikabi</b> <b>Dr.Amer Al-Shafi</b>  Pathology Dept. Student Lab Room 051142	1:00 -3:00 pm Salam	1:00 - 2:00 pm Respiratory Chain <b>Dr.Azhar</b>  2:00 - 3:00 pm Candidiasis (Micro) <b>Prof. Saleh Al- Hedaithy</b>	1:00 - 3:00 pm <b>(Practical)</b> Lung volumes and Capacity Student Spirometry	1:00 -3:00 pm Salam

➤ **Thursday: (11/3/2010) (25/3/1431H)**

Mid-Exam

10:00am-12:00pm

**at the M1 and M2 and L1 and L2 and A Halls and B Halls**

# KING SAUD UNIVERSITY COLLEGE OF MEDICINE

## WEEK 4 – RESPIRATORY BLOCK A (Male)

Week (4) Starting:

13/3/2010 (27/3/1431H)

CHAIR PERSON : Dr.Sami Al-Nassar

CO-CHAIR: Prof.Abdulmajeed Kambal

Saturday	Sunday	Monday	Tuesday	Wednesday
<b>8:00 – 9:00 am</b> Effect of Exercise on the Respiratory System  <b>Dr. Tariq</b>	<b>8:00 ~ 9:30am</b> Small Group Discussion	<b>8:00 ~ 9:00 am</b> Drugs for Treatment of T.B (2) <b>Dr.Saeed</b>	<b>8:00 ~ 9:30am</b> Small Group Discussion	<b>8:00 ~ 9:00 am</b> Pharmacological Treatment of Acute and Chronic Rhinitis and Cough(2) <b>Dr.Saeed</b>
<b>9:00 ~ 10:00 am</b> Cancers of the Lung (2) (Path) <b>Dr.Ammar AL-Rikabi</b>	<b>9:30 – 11:00 am</b> Independent Learning	<b>9:00 ~ 10:00am</b> Radiological Anatomy of the Chest (1) <b>Dr.Essam</b>	<b>9:30 – 11:00am</b> Independent Learning	<b>9:00 ~ 10:00 am</b> Diagnosis of Type I Allergy <b>Prof.Gad El-Rab</b>
<b>10:00 ~ 11:00am</b> Phospholipids of clinical significance(1) <b>Dr.Azhar</b>	<b>11:00~ 12:00 pm</b> Pharmacological Treatment of Acute and Chronic rhinitis and Cough (1)  <b>Dr.Saeed</b>	<b>10:00 ~ 11:00am</b> Globular proteins : hemoglobin and myoglobin (Bio) <b>Dr.Waheed</b>	<b>11:00 ~ 12:00 am</b> Parameters for Measuring Work Capacity (Phys) <b>Dr. Tariq</b>	<b>10:00 ~ 11:00am</b> Globular proteins : hemoglobin and myoglobin 2 (Bio) <b>Dr.Waheed</b>
<b>11:00~ 12:00pm</b> Phosphatidylinositol and phospholipases (2) <b>Dr.Azhar</b>		<b>11:00~ 12:00pm</b> Respiratory Fungal Infection (Aspergillosis) <b>Prof. Saleh Al-Hedaithy</b>		<b>11:00~ 12:00pm</b> Independent Learning
<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
<b>1:00 ~ 3:00 pm</b> <b>(Practical)</b> Cancers of the lung <b>Dr.Ammar AL-Rikabi</b>  <b>Dr.Amer Al-Shafi</b>	<b>1:00 ~ 3:00 pm</b> Salam	<b>1:00 ~ 3:00 pm</b> <b>Skills Lab</b> (System Examination Respiratory)	<b>1:00 ~ 3:00 pm</b> <b>(Practical)</b> Dynamic Spirometry  <b>Room 2149</b> <b>2<sup>nd</sup> Floor</b> <b>Room 3149</b> <b>3<sup>rd</sup> Floor</b>	<b>1:00 ~ 3:00 pm</b> Salam

LECTURE THEATER :

Room No. 2141- Level 2- Seat Cap.153

**KING SAUD UNIVERSITY  
COLLEGE OF MEDICINE**

## **BIOCHEMISTRY**

### Respiratory: (4 weeks)

- 1. ATP production(3)**
  - Fatty acid oxidation
  - Utilization of ketone bodies
  - Preferential utilization of energy by tissues
- 2. Respiratory chain(1)**
- 3. Phospholipids (2)**
  - Phospholipids of clinical significance
  - Phosphatidylinositol and phospholipases
- 4. Globular proteins: Hemoglobin and myoglobin (2)**

## **ANATOMY**

- 1. Muscles involved in respiration**
- 2. Nasal Cavity.Larynx and Trachea**
- 3. Lung and Pleura**
- 4. Meduastinum**

### Topics of Histology

- 1. Histology of the Nasal Cavity, Larynx and Trachea**
- 2. Histology of the Lung**

### Topics of Embryology

- 1. Development of Larynx, Trachea and bronchi**

## PHARMACOLOGY

### Pharmacotherapeutics of Pulmonary Disorders: 8 hours

#### 1. Pharmacological treatment of Asthma and COPD: (4)

Discussion of the ANS Pharmacology of the Respiratory tract is pivotal before starting especially the foundation course is ANS Pharmacology-Free. Histamine and Leukotrienes are two main autacoids which are better briefly explained before starting. Therefore the general objectives would be.

- Adrenergic and Cholinergic Molecular Targets in Respiratory Airway
- Histological and Leukotrienes Pharmacology
- What are the main problems of concern to be pharmacologically targeted?
- Pharmacological Treatment, Strategies and Goals
- Main Treatment Modalities in Asthma:
  - Beta 2 Adrenergic Agonists
  - AntiCholinergic Agents
  - Corticosteroids, Inhalation vs. Systemic
- Alternative Pharmacologic Treatment
  - Methylxanthines
  - Mast Cell Stabilizers
  - Leukotriene Modifiers

Monoclonal Antibody Therapy

Combinations

Future Potential Therapies (PDE-IV Inhibitors?)

At the end, Asthma Classes according to NIH would be briefly discussed and drugs allocated into different categories to make a link with coming therapeutic course

**2. Pharmacological Treatment of acute and Chronic Rhinitis and Cough (2)**

Refer to applied physiology and anatomy of the nose as a start point

What are the main concerns to be pharmacologically targeted?

Pharmacological Treatment Strategies and Goals

Main treatment Modalities in Rhinitis:

- Antihistamine Drugs
- Nasal vs. Oral Antihistamines
- Cromolyn Therapy
- Intranasal Corticosteroids
- Leukotriene Modifiers
- Subcutaneous Immunotherapy (SIT)

Cough Treatment

- Mucokinetic Agent
- Mucolytic therapy
- Opioid and Non-Opioid Antitussives
- Local acting Antitussives; Demulcents, Local Anesthetic and steam Aerosols

**3. Respiratory Tract Infections: (2) (Integrated with Microbiology)**

Bronchial Infections Treatment

Pneumonia Treatment

Different types of Pneumonia

Chemotherapy Treatment in Pneumonia

**4. Tuberculosis Treatment (1)**

## PHYSIOLOGY

### Learning Objectives.

#### **Lecture 1: Functions and Organization of the Respiratory System**

**By the end of this lecture the Students should be able to:-**

- 1- Understand the difference between internal and external respiration.
- 2- Describe the structures and functions of the conductive and respiratory zones.
- 3- Understand functions of the respiratory system, including non- respiratory functions, like clearance mechanism by mucus and cilia, production of surfactant and converting enzyme.

#### **Lecture 2: Mechanics of breathing**

**By the end of this lecture the students should be able to:**

- 1- List the muscles of respiration and describe their roles during inspiration and expiration.
- 2- Understand the importance of the following pressures in respiration:  
Atmospheric, alveolar, intrapleural, and transpulmonary
- 3- Explain why intrapleural pressure is always subatmospheric under normal conditions, and the significance of the thin layer of the intrapleural fluid surrounding the lung.
- 4- Describe pneumothorax.
- 5- Describe the pressure and volume relationships in a single respiratory cycle.
- 6- Define lung compliance and list the determinants of compliance.
- 7- Describe the physiological significance of surfactant and provide an example of abnormal lung function due to a deficiency of surfactant.



**Lectures 3 & 4:    Respiratory ventilation**

**By the end of these lectures the students should be able to: -**

- 1-Define the various Lung Volumes and capacities and provide typical values for each.
- 2-Define ventilation rate, their typical values, and their measurement.
- 3- Describe FEV<sub>1.0</sub> and its role in differentiating obstructive and restrictive lung diseases
- 4- Understand air movement and airway resistance:  
    Definition, determinants, role of autonomic nervous system and mechanical factors
- 5- Describe the types of dead space. State a volume for the anatomical dead space.
- 6- Define the term minute ventilation and state a typical value.
- 7- Distinguish minute ventilation from alveolar ventilation.
- 8-Understand the work of breathing

**Lecture 5:            Gas Transfer**

**By the end of this lecture the students should be able to: -**

- 1-Define partial pressure of a gas. Describe how partial pressure of a gas is influenced by altitude.
- 2- Understand that the pressure exerted by each gas in a mixture of gases is independent of the pressure exerted by the other gases (Dalton's Law)
- 3- Understand that gases in a liquid diffuse from higher partial pressure to lower partial pressure (Henry's Law)
- 4- Describe the factors that determine the concentration of a gas in a liquid.
- 5- Describe the components of the alveolar-capillary membrane (i.e., what does a molecule of gas pass through).
- 6- Knew the various factors determining gas transfer: -  
Surface area, thickness, partial pressure difference, and diffusion coefficient of gas.

7- State the partial pressures of oxygen and Carbon dioxide in the atmosphere, alveolar gas, at the end of the pulmonary capillary, in systemic capillaries, and at the beginning of a pulmonary capillary.

## **Lecture 6:            Oxygen and Carbon dioxide Transport**

**By the end of this lecture the students should be able to: -**

- 1- Understand the forms of oxygen transport in the blood, the importance of each form and,
- 2- Describe: -
  - a- The relationship between  $PO_2$  and % saturation of hemoglobin with oxygen (Oxygen- hemoglobin dissociation curve), and the significance of the shape of this relationship
  - b- How DPG, temperature,  $H^+$  ions and  $PCO_2$  affect affinity of  $O_2$  for Hemoglobin and the physiological importance of these effects.
- 3- Differentiate between  $O_2$  capacity,  $O_2$  content and  $O_2$  saturation.
- 4- Define the  $P_{50}$  and its significance.
- 5- Know the significance of fetal Hb and adult myoglobin.
- 6-Describe the three forms of Carbon dioxide that are transported in the blood, and the chloride shift.
- 7- Describe the role of the enzyme carbonic anhydrase, and the  $CO_2$  dissociation curve.
- 8- Describe how  $H^+$  is transported in the blood.
- 9- Define respiratory acidosis and respiratory alkalosis, and explain how these are related to hypoventilation and hyperventilation respectively.
- 10- Enumerate the differences between the dissociation curves for  $O_2$  and  $CO_2$ .

**Lecture 7:                      Control of breathing**

**By the end of this lecture the students should be able to: -**

- 1- Understand the role of the medulla oblongata in determining the basic pattern of respiratory activity.
- 2- Describe the pacemaker activity of the medullary inspiratory neurons.
- 3- List some factors that can modify the basic breathing pattern like e.g.
  - a- The Hering-Breuer reflexes, b- The proprioceptor reflexes, and c- The protective reflexes, like the irritant, and the J-receptors.
- 4- Understand the respiratory consequences of changing  $PO_2$ ,  $PCO_2$ , and pH.
- 5- Describe the locations and roles of the peripheral and central chemoreceptors.
- 6- Compare and contrast metabolic and respiratory acidosis and metabolic and respiratory alkalosis.

**Lecture 8 & 9:                      Alveolar - Arterial equilibration**

**By the end of this lecture the students should be:-**

- 1-Define hypoxia and list its various causes.
- 2-Define hypo and hyper-ventilation in terms of arterial  $PCO_2$  and  $PO_2$ .
- 3 Define cyanosis
- 4-Understand regional variations in alveolar ventilation and blood flow.
- 5-List causes of abnormal ventilation/perfusion ( $V_t / Q$ ) ratios.

**Lecture 10:                      Effects of low and high gas pressure on the body**

**By the end of this lecture the students should be able to: -**

- 1-Describe the effects of exposure to low and high barometric pressures on the body.
- 2- Describe the body acclimatization to low barometric pressure.
- 3-Define decompression sickness and explain how it can be avoided.
- 4-Understand the effects of high nitrogen pressure, and nitrogen narcosis.

**Lecture 11: Effects of exercise on the respiratory system.**

**By the end of this lecture the students should be able to: -**

- 1-Understand the difference between dynamic and isometric exercise.
- 1- Describe the effects of moderate and severe exercise on oxygen consumption, and ventilation volumes.
- 2-Describe the effects of exercise on arterial  $PO_2$ ,  $PCO_2$  and  $H^+$  ions.
- 3- Define the diffusing capacity of the respiratory membrane, and its typical values at rest, and explain its changes in exercise.
- 4-Explain causes of hyperventilation in exercise.

**Lecture 12: Parameters for measuring work capacity.**

**By the end of this lecture the students should be able to: -**

- 1-Know aerobic and anaerobic energy sources.
- 2-Understand the relationship between exercise intensity and energy sources.
- 3-Know energy expenditure at rest and during exercise.
- 4-Understand the factors determining aerobic fitness.
- 5-Understand the other major components of physical fitness
- 6-Know how to measure total body fat and lean body mass.
- 7-Define oxygen debt, and oxygen deficit, and explain how they differ between athletes and non-athletes.

## **PATHOLOGY**

### **RESPIRATORY SYSTEM BLOCK (six lectures) (4 weeks)**

**1. Lectures 1 and 2:**

- Chronic obstructive airways diseases:
  - \* General manifestations of chronic obstructive airway diseases.
- Bronchial asthma, chronic bronchitis, pulmonary emphysema and bronchiectasis:
  - \* Definitions, classification, pathological findings and pathogenesis with principal complications.

**2. Lecture 3 :**

- Pulmonary infections: pathology of lobar pneumonia, bronchopneumonia, primary atypical (interstitial) pneumonia, pneumocystis Carinii pneumonia and lung abscess.

**3. Lecture 4 :**

- Restrictive lung diseases: pathology of acute respiratory distress syndrome, pneumoconiosis (anthracosis, silicosis and asbestosis), hypersensitivity pneumonitis (extrinsic allergic alveolitis) and idiopathic pulmonary fibrosis.

**4. Lectures 5 and 6 :**

- Cancers of the lung: general considerations regarding primary and metastatic cancers. Pathology of the various types of bronchogenic carcinoma, carcinoid and carcinoma metastatic to the lung.

**5. Lectures 7 :**

- Viral Infection of the Respiratory Tract(Influenza, Adenoviruses)

**6. Lectures 8 :**

- Respiratory Fungal Infection (Aspergillosis)

**7. Diseases of the pleura with special emphasis on mesothelioma.**

## Microbiology

1. Tuberculosis
2. Tuberculosis Treatment
3. Bacteria Causing Lower Respiratory Tract Infection
4. Candidacies
5. Tuberculosis

## Immunology

1. Atopy , Allergic Disease and Anaphylaxis
2. Immunology of T.B (1)
3. Diagnosis of Type I Allergy