4. **Clinical practicum/bed side:** Clinical practicum or clinical teaching is the use of direct patient or client experiences to develop and practice knowledge, skills and attitude required for healthcare delivery or patient care under the supervision of a skilled clinical instructor or preceptor. These skills include generic skills (communication skills, mental and physical examination skills and basic clinical testing and procedural skills), problem- based clinical skills (skills related to patient complaints or diagnoses), discipline-specific clinical skills and continuum of care skills.

   Clinical learning opportunities include placements at a variety of clinical settings for outpatient emergency care, acute care (outpatient and inpatient), Respiratory therapy, chronic care (outpatient and institutional), palliative and end of life care, wellness and preventive care, and population-based healthcare (community, public health). Outpatient departments are appropriate to practice interviewing, interpersonal and counseling skills as well as clinical skills. Inpatient departments are good to teach patient management, practice healthcare delivery skills including documentation of care plan and treatment given and demonstrate management of rarely seen conditions. Clinical teaching and learning uses a variety of techniques including observation, demonstration, role-modeling, practice, coaching, feedback, discussion and reflection.

5. **Laboratory practice:** Students will have opportunities for demonstration, guided practice and coaching in labs to deepen their understanding and apply principles and methods of basic and clinical sciences (gives focus on pulmonary function test and ABG testing and respiratory related sample collection)

6. **Portfolio-based learning:** Portfolio is collection of products collected by the student that provides evidence of learning and achievements related to a learning plan. Portfolio develops self-directed learning and reflective ability. It provides personal and professional educational evidence for student learning, contextualizes learning, links experience with personal interpretation, enhances interactions between students and teachers, allows students to receive feedback, stimulates the use of reflective strategies and expands understanding of professional competence. The basic structure of the portfolio may include:

   a. Title page (giving student's name, year of training and name of the mentor),

b. Contents page (listing what is in the portfolio with page references),

c. List of learning objectives (whose achievement the evidence in the portfolio claims to demonstrate),

d. Short reflective overview (summarizing the learning that has taken place since the last portfolio review, and indicating which items of evidence relate to which learning objectives) and

e. The evidence (probably grouped together into the areas contained in the learning objectives.

Mentoring is crucial for portfolio-based learning to enhance the feedback process and stimulates students' reflections. Students will have one individual mentor until the point of graduation. The aims of the mentoring are to provide feedback, stimulate reflection, support students in compiling portfolio, monitor students' competency development, support students in developing a better awareness and understanding of their strengths and weaknesses, support students in drawing up a learning plan for the coming period and motivate/inspire students, The Mentor will evaluate portfolio of the students per year and hold discussion to provide feedback.

7. **Whole group session:** During the training period, all students and instructors will meet at the end of each course for whole group session. The purpose of the session is to consolidate and reflect on the different learning activities covered during the week. The session is student-centered discussion that will be facilitated by one or more faculty.

8. **Journal club:** A journal club is a group of individuals who meet regularly to discuss the clinical applicability of articles in current respiratory care related journals. It is a popular way to promote the uptake of research evidence into practice. To make it effective, evidence suggests mentoring and brief training of students on how to judge quality of research as well as the use of structured critical appraisal instrument. Journal club is suggested to be implemented during autonomous respiratory practice. This will be implemented after the research methodology lecture.

Assessment methods

Assessment plays a central role in education process: it determines much of the work students undertake affects their approach to learning and is an indication of which aspects of the course are valued most highly. The purposes of assessment are to motivate students to learn, create learning opportunities, to give feedback to students and teachers, grading and quality assurance. There is a formative assessment, which is mainly intended to help the student learn and a summative assessment, which is intended to identify how much has been learned. Formative assessment is most useful part way through the Course and will involve giving students feedback which they can use to improve future performance.

Faculty should conduct at least two formative assessments of each student during a given Course and clinical practice. Summative assessment is used to make a pass/fail or, promotion decision; findings of formative assessment are not used to make pass/fail decisions. Both formative and summative assessments are equally important; however, psychometric rigor is required more from summative assessment strategies. The following principles are considered in selection of assessment strategies and faculty should keep in mind these principles in appraising and revising assessment methods during implementation. Validity and reliability are of utmost importance but it is also recommended to consider feasibility and cost.

a. **Reliability:** Reliability is the reproducibility or consistency or generalizability of assessment scores. An assessment result is said to be reliable if students will get the same score if they re-take the exam. Similarly, for essay type and performance assessment, assessment scores are reliable, if the same results are obtained with different raters. Reliability of assessments can be improved by increasing the number of questions (or cases in clinical performance examination), aiming for middle difficulty questions, writing clear and unambiguous questions and increasing the number of raters.
b. **Validity:** Validity is the ability of an assessment to measure what it is supposed to measure. Validity is not about the method refers to the evidence presented to support or refute the meaning or interpretation assigned to assessment results. Simply put, assessment results are valid if they accurately distinguish competent from incompetent students and if the student who gets "A" grade is actually an "

c. A" student, a student who gets a "B" grade is actually a "B" student; a student who gets an "F" grade is actually an "F" student, etc. Examples of factors that affect validity in

written assessment are too few written questions to sample the content adequately, preparing questions from some chapters, mismatch of assessment questions with content covered in the curriculum, poorly constructed questions, too difficult or too easy questions, rater subjectivity and cheating. For performance (clinical) assessment, too few cases or observations to generalize performance, unrepresentative cases, rater bias, flawed rating scales/checklists and indefensible pass/fail cut off points are threats to validity. Note that reliability is a necessary but not sufficient condition for validity.

Descriptions of the assessment methods

1. **Direct observation of clinical skills (DOCS)**

The purpose of DOCs or mini-clinical evaluation exercise is to assess clinical skills while a student interacts with patients in different settings. Typically, it takes 15-20 minutes and the assessor follows the student with a checklist and gives feedback at the end. The DOCs offers students immediate and ongoing feedback about their observed clinical skill and performance (interviewing skills, physical examination skills, and professionalism, clinical judgment, counseling skills, organization/efficiency and overall clinical competence). At least two DOCs have to be performed by a student in each Course or clinical rotation. This assessment method enables one to follow the progress of the student and will be used for formative assessment.

2. **Objective structured clinical examination (OSCE)**

Objective structured clinical examination (OSCE) is a performance-based exam. During the exam, students are observed and evaluated as they go through a series of 8 or more stations. It allows assessment of multiple competencies. It is **Objective**, because examiners use a checklist for evaluating the trainees; **structured**, because every student sees the same problem and performs the same tasks in the same time frame; **Clinical**, because the tasks are representative of those faced in real clinical situations. These increase the reliability and validity of the assessment. OSCE is a standardized means to assess history taking, physical

examination skill, communication skills, ability to summarize and document findings, ability to make a differential diagnosis or plan treatment, clinical judgment based on patient 's note and procedural skills.

OSCE may use manikins and simulators, standardized patients and real patients. Standardized patients are healthy persons trained to simulate a medical condition. Health science students, health facility staff and faculty may serve as standardized patients. Objective structured practical exam (OSPE) is a variant of OSCE to assess students' knowledge and skill in a non-clinical setting.

3. **Standardized oral exam**

The standardized oral examination is a type of performance assessment using realistic patient cases for questioning the examinee. The examiner begins by presenting a clinical problem in the form of a patient case scenario and asks the examinee to manage the case. Questions probe for requesting clinical findings, interpretation of findings, and treatment plans. In efficiently designed exams each case scenario takes three to five minutes. One or two faculty examines and students are tested on several clinical cases. Oral exam will be part of the summative assessment in final exam at the end of the year.

4. **Written exam**

Written assessments may include different item formats such as multiple-choice questions, matching, true-false, essay and short answer. Written assessment methods will help to evaluate knowledge and understanding of basic, clinical, public health, psychosocial and respiratory therapy sciences and professionalism and ethics. Important point to remember is to ensure written exams assess higher order knowledge in addition to recall and comprehension. Written assessments would be parts of both as formative and summative assessment during the trainings of RT program.

5. **Logbook**

Logbook documentation serves as evidence of scope of patient care and community experience to meet requirements or specific learning outcomes. Maintaining logbook will encourage students to use all learning opportunities for clinical/procedural skills and to fulfill minimum requirement. Regular review of logbook can be used to help the student track what procedures or experiences must be sought to meet requirements. The logbook

document should be counter signed by faculty. The number reported in a logbook may not necessarily indicate competence. Logbook will be part of the formative assessment throughout the respiratory therapy practice.

6. **Portfolio**

Portfolio is collection of papers and other forms of evidence that learning has taken place. It provides evidence for learning and progress towards learning objectives. Reflecting upon what has been learned is an important part of constructing portfolio. In addition to products of learning, the portfolio can include statement about what has been learnt, its application, remaining learning need, how they can be met. Portfolio helps to assess learning outcomes including those that are not easy to assess with other methods like personal growth, self-directed learning, reflective ability, self-assessment of personal growth and professionalism. Portfolio allows assessment of progress towards learning outcomes by using chronological work samples collected at different points in time. Portfolio will be part of the formative assessment throughout the duration of the Respiratory care training and can be used as a summative assessment during professional respiratory care practice.

7. **360° Evaluation**

360° evaluation consists of measurement tools completed by multiple people in a student's sphere of influence. Evaluators usually are faculty, other members of the health care team, peers, patients and family members. Such evaluation can be used to assess interpersonal and communication skills, teamwork ability, management skills, decision-making professional behaviors and some aspects of patient care. It will be used as part of the summative assessment in respiratory therapy care training.

Grading and Promotion

Grading and promotion of students is governed by the university legislation for masters' students.

Grading

- A student should score a minimum make 70 (**B-grade**) to pass a particular course or Course. The grading scale will be used as the table below.

Letter grading	*Grade Equivalent Marks scored*	*Credit Hour Points*	*Remark*
A	≥ 85	4.0	
B+	80-84.9	3.5	
B	70-79.9	3.0	
C+	65-69.9	2.5	
C-	60-64.9	2.0	Not pass mark for major (practicum) Courses and thesis
D	50-59	1.0	Dismissed
F	Below 60	0	

Promotion to next academic semester/year

- Any student who scores a GPA of 3.0 or more than 70 % and above in a semester will be promoted to the next semester.
- Students who score CGPA 2.75-2.99 or 64.9 % both inclusive will be on academic probation. They will be advised to re-take courses with grade of C+ or more .
- Consecutive probations are given for a maximum of two times. A student who has been placed on probation twice shall be dismissed if he/she fails to achieve a CGPA of 3.0. In the next semester, he/she will be at risk for academic dismissal and not be eligible for readmission.
- Any student who scores a GPA below 2.5 in any semesters will be dismissed.
- Only one attempt is allowed for re-exam and retake-course for each course.

Graduation Requirement

Graduation requirement will be according to the rule and regulation of graduate study of **21 September University of Medical & Applied Sciences**. Thus, a student enrolled in this MSc. degree course in respiratory care program is eligible for graduation if and only if he/she:

- Has taken all the required courses for the program and obtained a minimum CGPA of 3.0 or 70 %
- Pass successfully and complete professional practice programs.
- Should successfully defend a ***thesis*** *(a minimum remark of –Good- is required)*
- Present approved and signed log/performance book with a minimum of procedures or cases.

Quality Improvement, Monitoring and Evaluation

Quality assurance will be guided by educational standards and benchmarks defined by the World Federation of Medical Education and the Higher Education Relevance and Quality Agency. The ongoing quality education will be monitored and ensured through:

- Self-review of the educational inputs, processes and outputs (including human resources physical infrastructure, teaching/learning in class, skills lab, clinical settings, student assessment, management and governance and student performance results) semi- annually and taking action. This will be coordinated by the quality assurance committee or team.

- Organizing regular faculty development and support programs on instructional methods, technical updates, leadership, etc. This will be coordinated by the faculty development committee or team.
- Establishment of an assessment committee or team to develop and maintain exam banks and coordinate, review and administer student assessment practices.
- Evaluation of teaching effectiveness by systematic collection of feedback from students midway and at the end of each Course or attachment and use it for program improvement
- Peer and Course/rotation evaluation by instructors at the end of Course delivery
- Assessment of the program by the teaching staff at the end of each semester
- Exit interviews at graduation and for all those who drop out for any reason
- Monitoring students' pass rate in qualification (pre-licensure) exam and comparing it with other respiratory care schools
- Establishing alumni of graduates as a mechanism to assess their career choice and development
- Evaluation of graduates' performance including obtaining feedback from hospital units use the information for program improvement
- Review the curriculum after one batch is graduated

M.Sc. Respiratory Care Employment Areas

- Hospitals (government and private)
- Medical Labs (e.g. Sleep lab, PFT lab)
- Nursing Homes / or Rehabilitation centers
- Colleges & Universities
- Content Writing (medical)
- Clinics (e.g. Asthma clinics, Pulmonology clinics, etc)

Recommended Role of Reparatory Therapist in a Hospital ICU

As a member of the patient care team, RTs assume primary responsibility for all respiratory care including therapeutic and diagnostic procedures. The following are typical roles of a respiratory therapist in a tertiary level setting where there may be Critical care and emergency nurses, ICU nurses, ICU physicians, Intensivist, pulmonologist, anesthetist, etc. just to avoid role conflicts, gaps and overlaps between professional.

- In collaboration with the ICU head nurse and Biomedical engineers, the RT will test and make mechanical ventilators and artificial airway devices ready for application on patients.
- Initiation and follow-up of patients on mechanical ventilation, artificial airways and other respiratory related devices
- Perform airway management procedures including Intubation, weaning from positive pressure supports, and extubation
- ABG puncture and POC blood gas analysis
- Assist with Tracheostomy and Bronchoscopy procedures
- Do Chest physiotherapy and sputum mobilization techniques
- Administer aerosol medications
- Manage and follow-up patient on NIV including nCPAP, NIPPV, nHFOV, etc
- Hemodynamic and pulmonary monitoring of patients in ICU
- Oxygen administration, Humidity therapy, Suctioning and aerosol therapy, theramal regulation procedures, breathing techniques including incentive spirometry, etc
- Assess blood oxygen and CO_2 level of patients
- Assists in maintaining cardiopulmonary stability including dysrhythmia recognition/interpretation, defibrillation, resuscitation, etc.
- Educates patients, families, colleagues, and health care professionals concerning respiratory care
- Member of critical care, blue code and Emergency team of the hospital

NB: Graduates do not have medication prescriptive role.

Resource Profile

Human Resources –Staff Profile

Human Resource	Required	Available	Not Available	Remark / Target Courses
Arab board in Anesthesia or MSc in Critical Care and Emergency, MSc in Respiratory Care	2	>2	0	Mentors, Preceptors and Coordinators
Anesthesiologist	2	>2	0	Respiratory Care Equipment & Techniques , Cardiopulmonary anatomy and Physiology
Pulmonologist	1	>1	0	Pulmonary diseases and Advanced Procedures in Respiratory care, introduction to Respiratory Care,
Cardiologist	1	>1	0	Cardiac diseases.
Intensivist & / or Internists	2	>2	0	Cardiopulmonary diagnostics , Patient Assessment , Respiratory Critical Care , Mechanical Ventilation.
Pharmacologists	1	>1	0	Respiratory Care Pharmacology
Pediatrician	1	>1	0	Neonatal and pediatrics Respiratory Care
Public Health Professionals (MSc/PhD)	2	>2	0	Epidemiology, Biostatistics, Research Methodology, Leadership and Management, Research.
Professional (MSc/PhD)	1	>1	0	Educational methodology
Respiratory Therapist	3	3	0	To be hired on Contract basis. For the core RT profession clinical practice

Simulation or Skill lab

The skill lab will need to have the following equipment and instruments

a. Resuscitation kits including Ambu-bag, masks, defibrillator, etc
b. Mannequin for respiratory system anatomy
c. Mechanical ventilator with accessories including inline suction kits, ET tubes, Trach tubes, etc
d. Portable ventilator x 1
e. In-Exsufflator machine
f. Complete PFT unit items (Spirometery, MIP, DLCO, TLC, etc) x 1
g. Blood gas machine – desktop model with reagent x1
h. Point of care ABG machine with cartridges x1
i. Portable CPAP / BiPAP machine x1
j. Patient monitor with Capnometer, Pulse-oximeter x1
k. Neonatal bubble CPAP unit with accessories
l. Nebulization kits
m. Mucus clearing and chest expansion agents such as chest precursors, incentive spirometers, etc
n. Asthma and COPD Aerosol delivery agents: spacers, peak flow meters, actuators, etc
o. Plethysmography kit (sleep study instruments)

2. Asthma Clinic and Sleep lab are to be established in the university

Course Listings with Credit Hours

Year Semester	Couse code	Course Title / Description	Theory HRs /week	Practice HRs/ week	Credit Hours
First Year - First Semester	RCP-510	Introduction to Respiratory Care	3	-	3
	RCP-511	Cardiopulmonary Anatomy and Physiology	5	-	5
	RCP-512	Cardiac Diseases	4	-	4
	RCP-513	Cardiopulmonary diagnostics	3	-	3
	RCP-514	Respiratory Care Pharmacology	2	-	2
	RCP-515	Patient Assessment	2	-	2
	Semester Total		19		19
First Year - 2nd Semester	RCP-516	Respiratory Care Equipment & Techniques	3	0	3
	RCP-517	Pulmonary Diseases	4	-	4
	RCP-518	Respiratory Critical Care	4	0	4
	MSC -502	Epidemiology	2	-	2
	RCP-519	Mechanical Ventilation	5	-	5
	RCP- 520	Clinical Practicum I	-	12	4
	Semester Total		18	12	22

The 2nd Year					
Year Semester	Couse code	Course Title / Description	Theory HRs /week	Practice HRs/ week	Credit Hours
2nd Year - First Semester	RCP-521	Neonatal and Pediatrics Respiratory Care	3	0	3
	MSC-503	Educational Methodology	2	-	2
	RCP-522	Advanced Procedures in Respiratory Care	3	0	3
	RCP-523	Clinical practice II	-	12	4
	MSC-504	Research Methodology & Project (Starts semester I)	2	12	6
	Semester Total		10	24	18
Second Year - 2nd Semester	RCP-524	Advanced Respiratory Care	2	6	4
	RCP-525	Clinical Practice III	0	12	4
	RCP-527	Sleep Disorders and Polysomnography	4	0	4
	RCP-526	Leadership and Management for Respiratory Care professionals	3	-	3
	Semester Total		9	18	15
Thesis					
Thesis	RCP 600	Thesis in Respiratory care	-	-	6
Total credit hours for the program					80

Courses Specifications

First Year – First Semester

Year / Semester	Course code	Course Title / Description	Theory Hrs / Week	Practice Hrs/ week	Credit Hours
First Year - First Semester	RCP-510	Introduction to Respiratory Care	3	-	3
	RCP-511	Cardiopulmonary Anatomy and Physiology	3	-	5
	RCP-512	Cardiac Diseases	4	-	4
	RCP-513	Cardiopulmonary diagnostics	3	-	3
	RCP-514	Respiratory Care Pharmacology	2	-	2
	RCP-515	Patient Assessment	2	-	2
	Semester Total				19

Course Title: Cardiopulmonary Anatomy and Physiology

Course Code: RCP-511

Credit hours : 5

Course Description:

This course is designed to help students review their knowledge of structure and function of cardio-respiratory tract in detail. It is also prepared to equip students in understanding the physiology of ventilation, gas exchange and transport in a human body. This course provides an in-depth human study of the cardiac, respiratory, and renal systems. Clinical application of pulmonary anatomy and physiology will also be explored

Course Objective

By the end of this Course, students will be able to apply the cardio-respiratory anatomy and physiology towards the patient care for patients with cardio-respiratory and related illnesses.

Learning Objectives

In order to meet the above Course objective, the student will be expected to:

- Describe rationale for the Innovative Respiratory Therapy curriculum
- Explain the normal function of the respiratory tract
- Describe the developmental events in respiratory system
- Identify and describe the detailed anatomy and physiology of respiratory system
- Describe how the pulmonary and bronchial circulations are organized
- Apply the knowledge of Respiratory system structure during patient care
- Describe the anatomy of the heart and vascular system
- Describe how the cardio-respiratory control mechanism
- Describe how the cardio-pulmonary system coordinates its functions under normal and abnormal conditions
- Describe the physiologic functions provided by ventilation
- Describe how the ventilation and oxygenation in our body works

- Identify the factors that affect alveolar ventilation and work of ventilation
- Describe the factors and how oxygen and carbon dioxide is transported between the atmosphere and the tissues
- Describe how to compute, alveolar ventilation, dead space ratio, arterial oxygen content, etc
- Clearly understand the effects of ventilation and perfusion on gas exchange

Teaching and Learning Methods

- Interactive lecture and discussion
- Small group discussion
- Clinical simulation
- Video show
- Demonstration
- Seminar presentation

Teaching and Learning Materials

- Respiratory Care Anatomy & Physiology, *Foundations for Clinical Practice*, Will Beachey
- Foundations of Respiratory Care, Wyka, Mathews, Clark
- EGAN'S Fundamentals of Respiratory Care, 12th edn, Wilkins, Stoller, Kacmarek

Assessment Methods

Formative Assessment

- Essay exams, quizzes, and practical test (direct observation of skills)
- Structured feedback report
- Global rating of performance
- Assessment on given topics and reflection exercise

Summative Assessment

- Progressive/continuous assessment (Quiz, assignment, seminar) (30%)
- End of Course objectively written exam (70%)

Course outlines
1. APPLIED ANATOMY AND PHYSIOLOGY OF RESPIRATORY SYSTEM
Overview of the course –1 HR
RESPIRATORY SYSTEM 8HR
i. Development of Respiratory system
ii. Postnatal lung development
iii. Respiratory system in the adults
iv. Pulmonary, Vascular, Lymphatic, and nervous systems of respiratory relevance
v. Anatomy of the respiratory Tract
CARDIOVASCULAR SYSTEM 8HR
vi. Functional anatomy of the hart and vascular system
vii. Control of the cardiorespiratory system
viii. Events of the Cardiac cycle
VENTILATION 10HR
ix. Mechanics of Ventilation
x. Static versus Dynamic mechanics of ventilation
xi. Exhalation mechanics
xii. Work of breathing
xiii. Distribution of ventilation
xiv. Efficiency and Effectiveness of Ventilation
GAS EXCHANGE AND TRANSPORT 20HR
xv. Gas diffusion
xvi. Normal variations from Ideal gas exchange

xvii. Oxygen Transport
xviii. Carbon dioxide transport
xix. Abnormalities of gas exchange and Transport

Course Title: Cardiac Diseases

Course Code: RCP-512

Credit Hour: 4

Course Description: This course is designed to equip RT students apply knowledge and skills to the assessment, treatment, and pathophysiology of cardiac diseases, this course focuses on the signs, symptoms, etiology, pathophysiology, diagnosis and treatment of selected cardiac and related diseases.

Course Objective

The student will be able to review and understand the pathophysiology of cardiac diseases and critically apply the knowledge gained from this Course during respiratory care.

Learning Objectives

To meet the above Course objective, the student should be able to the epidemiology, etiology, pathogenesis, clinical manifestation, assessment, investigations and management and prognosis of the cardiac diseases listed in the course outline below.

Teaching and Learning Methods

- Classroom teaching
- Case study
- Simulated practice
- Clinical practice

Teaching and Learning Materials

- Foundations of Respiratory Care, Wyka, Mathews, Clark
- EGAN'S Fundamentals of Respiratory Care, 7th Edn, Willkins, Stoller, Kacmarek
- Respiratory Care, Principles and Practices
- Comprehensive Perinatal and Pediatrics Respiratory Care, Kent Whitaker

Assessment Methods

Formative Assessment

- Practical test
- Structured feedback report
- Cases and scenarios
- Logbook

- Portfolio

Summative Assessment

- Progressive/continuous assessment (seminar, project work) (20%)
- Case presentations (10%)
- Written Exam (70%

Course Schedule

Outlines: These outlines include the etiology, pathophysiology, diagnosis, treatment and prognosis of common cardiac and cardiovascular conditions. Respiratory care management of cardiac and cardiovascular disorders, shock, trauma, renal failure, acute G.I. disturbances, and invasive cardiovascular procedures will be reviewed. Additionally, learners will learn to interpret 12-lead ECGs and obtain their ACLS credentials.	hrs
- Introduction to cardiovascular system and investigation - Cardiac Clinical Assessment and Monitoring	4
- Cardiogenic shock	4
- Cardiac arrhythmias and its managements	4
- Acute coronary syndrome	4
- Heart failure	4
Hypertension and Valvoular diseases	4
Pulmonary disease with Heart disease	4
Midterm Exam	4
Myocardial and pericardial wall diseases	4
Congenital heart diseases	4
Severe Sepsis septic shock	4
Coma	4
Hemorrhagic and Ischemic stroke	4
Renal failure	4
Fluids and Electrolytes disturbance	4
Final exam	4

Course Title: Cardiopulmonary Diagnostics

Course Code: RCP-513

Credit hours: 3

Course Description: This Course is designed to help the students to examines the most common cardio-respiratory function tests modalities, their techniques, and the pathophysiology that may be evaluated by each diagnostic study.

Laboratory practice of performing the tests will be provided to develop skills for testing patients.

Course Objective

By the end of this Course, students will be able to apply the knowledge and skills of the respiratory diagnostic studies and modalities for and during patient care.

Learning Objectives

In order to meet the above Course objective the student will be expected to:

- Analyze and monitor gas exchange and respiratory status from the basic monitoring devices including patient monitors, capnometers, pulse-oximeters, etc
- Perform or conduct Pulmonary function tests (spirometry), arterial blood gas test, exercise tests, and ECG tests.
- Interpret the results from PFT, ABG, ECG, X-ray, laboratory and others of respiratory relevant data and apply for patient management.
- Interpret the assessment data of patient with respiratory illness from the various data sources (K3, S3)
- Establish priorities in relation to respiratory response of patients' problems according to severity of illness (K3, S3)
- React to the respiratory & circulatory systems statuses of patient based on diagnosis (K3, S3)
- Apply developed comprehensive individualized and evidence based plan of care for patient with respiratory system disorders (K3, S3)

Teaching and Learning Methods

- Interactive lecture and discussion
- Small group discussion
- Case study
- Bedside teaching
- Portfolio

- Clinical simulation
- Video show
- Demonstration
- Seminar presentation

Teaching and Learning Materials

- Clinical Application of Blood Gases, 5th edn, by Shapiro, Peruzzi, Templin
- EGAN'S Fundamentals of respiratory Care, 12th edn, Wilkins, Stoller, Kacmarek
- Manual of Pulmonary Function Testing, 7th edn, Gregg L. Ruppel
- Foundations of Respiratory Care, by Wyka, Mathews, Clark

Assessment Methods

Formative Assessment

- Drills, essay exams, quizzes, and practical test (direct observation of skills)
- Structured feedback report
- Global rating of performance
- Logbook
- Portfolio
- Assessment on given topics and reflection exercise

Summative Assessment

- Progressive/continuous assessment (Quiz, assignment, seminar) (20%)
- End of Course objectively written exam (60%)
- OSCE (20%)

Course schedule

1. RESPIRATORY DIAGNOSTIC STUDIES AND MODALITIES
a. Bed side Patient Assessment 4HR
i. Patient history
ii. Physical Examination
b. Interpreting Clinical and Laboratory Data 6HR
i. Interpreting clinical lab tests

ii. Application of the clinical lab data for patient management of respiratory relevance
c. Interpreting the Electrocardiogram 6HR
i. Basic Principles of ECG
ii. ECG procedural summary
d. Analysis and Monitoring of Gas Exchange 18HR
i. Invasive Vs Non-invasive procedures
ii. Measuring FiO2 and Oximetry
iii. Sampling and Analyzing Blood gas
iv. Blood gas monitoring
v. Capnometry and Capnography
e. Pulmonary Function Testing 10HR
i. Pulmonary Function Testing
ii. Principles of Measurement and Significance
iii. Interpretation of the PFT test report
f. Review of thoracic Imaging 4HR
i. Overview of Plain Chest radiograph and interpretation

Course Title: Respiratory Care Pharmacology

Course Code: RCP-514

Credit Hour: 2

Course Description: A comprehensive study of pharmacology principles, receptor theory, clinical applications of medications, and historical analysis of first-generation medications will be covered. Current medication trends and recommendations are also examined.

Course Objective

The student will be able to study the principles and administration of respiratory drugs with a special emphasis to aerosol drugs.

Learning Objectives

To meet the above Course objective, the student will be able to:

- Describe classes of drugs that are delivered via aerosol
- Compare modes of action, indications, and adverse effects that characterize each major respiratory related drugs
- Compare available aerosol formulations, brand names and dosages for each specific drug class
- Practice and develop skill on how to properly administer the common respiratory drugs available
- Select the appropriate drug class for a specific patient or clinical situation
- Assess the outcomes for each class of aerosol drug therapy
- Demonstrate skill on patient and family education on how to administer respiratory medications (aerosol drugs) that can be taken without HP supervision.

Teaching and Learning Methods

- Case study
- Simulated practice
- Clinical practice
- Portfolio based learning

Teaching and Learning Materials

- Cardiopulmonary Pharmacology for Respiratory care by Jahangir Moini
- Principles of pharmacology for Respiratory Care, 2nd edn, Authors: Bills and Soderberg
- Basic & Clinical pharmacology by Bertram G. Katzung

Assessment Methods

Formative Assessment

- Drills and practical test
- Structured feedback report
- Cases and scenarios
- Logbook

Summative Assessment

- Progressive/continuous assessment (Quiz) (20%)
- Case presentations (10%)
- Structured and Objective Written Exam (70%)

Course Outline

1. RESPIRATORY CARE PHARMACOLOGY
a. Principles of Pharmacology 4H
i. Drug administration phase
ii. Pharmacokinetic phase
iii. Pharmaco-dynamic phase
iv. Airway receptors and Neural control of the lung
b. Adrenergic and Anticholinergic bronchodilators 5H
i. Assessment of bronchodilator therapy
ii. Adrenergic and anticholinergic bronchodilator agents
iii. Indications, mode of actions, effects of adrenergic and anti- cholinergic bronchodilator agents
c. Mucus controlling agents 1H
d. Inhaled corticosteroids 1H
e. Nonsteroidal antiasthma drugs 1H
f. Aerosolized anti-infective agents 1H
g. Inhaled pulmonary vasodilators 1H

h. Medical gas therapy 1H
i. Other commonly used medications for respiratory illnesses 1H

Course Tittle: Patient Assessment

Course Code: RCP-515

Credit hours: 4

Course description :

The course is designed to Fundamentals of respiratory assessment will be covered to include review of existing data in the patient record, patient history, physical examination, oximetry, blood gases, respiratory monitoring, pulmonary function assessment, laboratory studies, chest and upper airway radiographs, ventilation/perfusion scans, bedside EKG interpretation, and cardiovascular monitoring. Use methods of association in measurement data - correlation analysis

OBJECTIVES :

At the completion of the Course, the successful student will be familiar with the general significance of the common diagnostic techniques and physiological tests, which he is likely to perform or encounter as a respiratory therapy technician/ respiratory care practitioner. He will be able to assess cardiopulmonary status by physical inspection and auscultation and describe techniques for interpreting chest radiographs. In addition, he will be aware of the normal ranges for laboratory data, perform simple bedside pulmonary function tests and describe the significance of patient history. These will be incorporated into many of the tasks, which will be performed by the student during the clinical rotations

Contents: This Course comprises 6 Study Units. The syllabus content, covered by the theoretical elements in the Course, is outlined below:

Unit I: Personal History :

Significance of the patient interview and documentation of personal data. Association of certain diseases with family history, personal habits, hobbies, pets, environment and occupation. Previous illness and medical examinations. History of present illness. Other subjective information, (e.g. dyspnea). Consideration of non-pulmonary systems as a source of respiratory disease.

Unit II: Physical Assessment

Primary symptoms of respiratory disease. Constitutional symptoms. Physical signs and patterns of disease - chest inspection, sound transmission, auscultation, percussion and palpation. Topographic lines and surface anatomy. Breathing patterns and associated pathology. Sputum characteristics. Neurological assessment - level of consciousness, Glasgow coma score.

Unit III: Radiological Assessment

Systematic approach to chest radiographs. Review of radiation physics. Standard positions and techniques of chest radiograph. Density, penetration and contrast appearance. Appearance of normal chest radiographs - systematic inspection of anatomical structures. Lobar anatomy of the lungs. Assessment of technical quality of radiographs. Abnormalities seen on chest radiographs and associated diseases - main stem bronchial intubation, pneumothorax, rib fractures, atelectasis, lobar pneumonia, congestive heart failure, adult respiratory distress syndrome, chronic obstructive lung disease, bullae, solitary nodules, tuberculosis, pleural effusion, pulmonary embolism, carcinoma and interstitial lung disease.

Unit IV: Electrocardiograph

What is an ECG? What is the value of an ECG? When should an ECG be obtained? Cardiac anatomy and electrophysiology. Causes and manifestations of dysrhythmias. Basic ECG waveforms, ECG leads, ECG interpretations. Identification of common dysrhythmias, assessing chest pain, cardiac ischemia, injury or infarction. ECG patterns with chronic lung diseases.

Unit V: Laboratory Assessment:

Introduction to the assessment of laboratory test results and data. Microbiological, histological , immunological and biological techniques and their use in the clinical diagnosis of pulmonary disease. Examination of secretions and fluids obtained from sputum induction, thoracentesis and bronchoscopy procedures. Bacteriological examination - differentiation of gram-positive and gram-negative organisms, viral infections, anaerobes, mycobacteria, fungal infections, protozoa and rickettsia. Histological examination - bronchial, lung, lymph node and pleural biopsy. Tests of immune function. Hematological studies. Biochemical studies - sweat chlorides, serum proteins, serumenzymes, serum electrolytes and other biochemical studies. Urine analysis.

Unit VI : Advanced Assessment Techniques
Physical assessment of the critical patient (airway, breathing and circulation). Respiratory monitoring in the ICUventilatory and oxygenation assessment. Cardiac output assessment- cardiac catheterisation, venous, arterial and intra-cardiac pressures, cardiac outputs and venous return. Invasive monitoring hemodynamic pressures- arterial pressure, CVP, PAP and other invasive procedures used for assessment. Nutritional assessments.