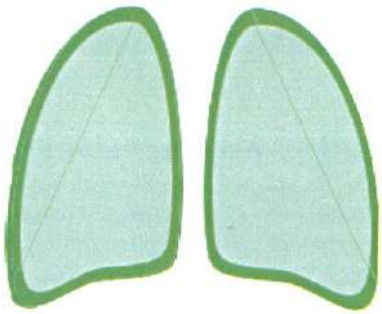
Republic of Yemen

Ministry of Higher Education & Scientific Research

21 September University of Medical & Applied Sciences (21 UMAS)
Vice- Rectorship of Graduate Studies & Scientific Research



CURRICULUM

MASTER OF SCIENCE IN RESPIRATORY CARE

(MsRC)

Academic Program

August 2021

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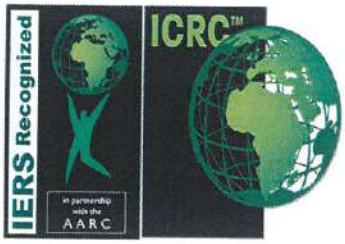
This program will be recognized by IERS-ICRC:



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Abbreviations

ACLS	Advanced Cardiac Life Support
ABG	Arterial Blood Gas
AIDS	Acquired Immunodeficiency Syndrome
CCU	Cardiac care unit
BLS	Basic Life upport
BSC	Bachelor Science
CGPA	Cumulative Grade Point Average
COC	Certificate of Competence
CPR	Cardio Pulmonary Resuscitation
CVS	Cardio Vascular System
DOCS	Direct Observation of Clinical Skills
ECCN	Emergency &Critical Care Medicine
MOH	Ministry of Health
HIS	Health Information System
HMIS	Health Management Information System
ICU	Intensive Care Unit
OSCE	Objective structured clinical examination
OR	Operation rooms
OSPE	Objective structured practical exam
PBL	Problem-Based Learning
PFT	Pulmonary function testing
RT	Respiratory therapy / Respiratory therapist
RCS	Respiratory Care Specialist
YMC	Yemeni Medical Council
TMGH	Thawra Modern General Hospital
RCSA	Respiratory Care Services Administration
YMC	Yemeni Medical Council

Preface

Health of the people is an index of the level of development of a country and achievement of optimum health is the desire of every individual. The success of a country in preventing disease and promoting health depends upon the contribution of all members of the health team. Being able to breath is one of the basic essentials of life and ***respiratory therapists*** are the monitors and guardians of a patient's ability to access this necessity.

21 September University of Medical & Applied Sciences (21 UMAS) was opened in 2016, with the intention to alleviate the severe shortage of medical doctors and allied medical professionals in the country. In line with various encouraging efforts performed by the Ministry of Public Health & Population in this regard, the 21 September University of Medical & Applied Sciences is providing much-needed medical professionals to the people of Yemen. The 21 UMAS will initiate Yemen's first integrated curriculum for its undergraduate medical education, and is currently expanding to postgraduate programs in the postgraduate college and diversifying its undergraduate program offerings.

Respiratory therapists are allied health professionals trained in the skillful use of advanced diagnostic tools to evaluate, diagnose, manage and administer respiratory treatment modalities for a wide variety of breathing disorders in neonatal, pediatric, adult, and geriatric patients. Respiratory therapists cooperate with doctors and nurses and they perform respiratory care modalities that include oxygen therapy, perform breathing techniques and maneuvers including incentive spirometry, humidity-aerosol therapy, pulmonary drainage procedures, Sputum and ABG sample collection procedures, thermal regulation procedures, mechanical ventilation, and cardiopulmonary resuscitation.

Respiratory care practitioners work in acute care hospitals with adults, premature infants and geriatric patients in surgical services, air and ground intra-facility transport, multi-disciplinary nutrition teams, emergency department, neonatal/pediatric intensive care, and medical, cardiac, and surgical intensive care. Practitioners are usually stationed in ICU and /or emergency departments of hospitals. They may also work in environments such as the diagnostic pulmonary laboratory, sleep lab centers, bronchoscopy laboratory, long-term acute care units, hyperbaric oxygen (HBO) units, or they may work as a traveling therapist, home respiratory therapist, or pharmaceutical sales representative. A master's level in

Respiratory Care, in addition to the above areas, will be able to work in management of respiratory and related units of hospitals, conduct research, and engage in teaching of respiratory and critical care students in higher academic institutions.

Rationale

Non-communicable diseases (NCDs) are the leading causes of death and disability globally, killing more than three in five people worldwide and responsible for nearly half of the global burden of disease (1). 80% of NCDs deaths occur in low- and middle-income countries.

According to the MoH and WHO recent reports, Yemen is witnessing an increase in NCD burden and injuries. Today, NCDs account for estimated 57% % of deaths in Yemen. By 2040, they are projected to account for almost 71% of the country's disease burden , up from 20% in 1990. The four main types of non-communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes.

As a result, in addition to the health promotion and preventive activities, the government is highly committed than ever before to improve the quality of therapeutic services in hospitals. Settings for relatively complex surgical and /or invasive procedures which usually require advanced respiratory system support are coming in to operational in our country.

In the meantime, the epidemiologic shift is requiring more intensive care beds in hospitals and also is creating longer patient stays in critical care units. With the advancement of healthcare technology, application of advanced respiratory support medical devices to patients is becoming a standard which then increases the complexity of critical care service delivery. For example, practitioners in TMGH estimate close to half of patients admitted in hospital ICUs requires some type of breathing treatment and artificial breathing (mechanical ventilation) support.

The application of advanced level respiratory support devices requires a dedicated professional who is trained in depth to continuously and closely monitor, understand the patient's condition in response to these devices, process lab diagnostics such as ABG, adjust and manipulate the machines parameter in line with the very dynamic nature of the vital signs of the patients on these supportive devices.

When there is a need for advanced respiratory support for a patient in ICUs or Operation Theaters, there needs to be a dedicated professional (Respiratory Therapist) who can

closely monitor, analyze and do real-time adjustments on the relatively complex parameters of the devices. Preparing the specialized cadre of Respiratory therapists with advanced knowledge, skills and attitudes is highly important to improve hospitals critical care standards.

Not only in tertiary level health care institutions, Respiratory therapists are needed country wide in all regional hospitals, central hospitals running ICUs and specialty medical centers managing critical patients. The new standard for health institutions requires hospitals to run intensive care units. Hence, mechanical ventilators, pulmonary diagnostic machines, and breathing support machines become standard in hospitals in Yemen due to RCSA-MoH regulations . The government by MoH recently is working towards a well-equipped adult ICUs & NICUs. We also believe our country in few years will start to have long-term pulmonary rehab centers, institutionalized home care services, specialized sleep and many pulmonary clinics and so on. All the above trends will need to have a health professional in large number with a special training on respiratory care. It is also to be noted that RT is one of the matured professions in the developed nations like USA and Canada which started the profession some 6 decades ago.

In our context, health professionals working in critical care and emergency units (critical care nurses, anesthetists, emergency physicians, intensivist, pulmonologists, etc.) do have a dual responsibility other than managing the respiratory and related medical devices used in ICUs, emergency departments, pulmonary clinics, etc. Hence, there is a need for a health professional dedicated to closely follow up and manage the respiratory and related component of the management of the critical patients requiring intensive care.

The MSc in Respiratory Care program is to develop leaders in respiratory care, who will be able to influence change, educate other health care providers, conduct research on respiratory and pulmonary illnesses, and develop the respiratory care profession in Yemen. This specialty program is also to be a career advancement program for undergraduates in clinical health science including RT and have been practicing in critical care settings.

Each zonal, regional and referral hospitals need Respiratory therapists but not necessarily at master's level. In few years, undergraduate RT program needs to be launched country wide. For that, we need human resources (educators), contextual evidence based respiratory protocols and practices be developed, respiratory units and clinics are to be set-

up and equipped. This MSc program in RT will be a necessary input to realize the undergraduate program in the country.

Descriptions about the curriculum

Program Mission

To produce competent professional respiratory therapists who are able to provide advanced promotive, preventive, curative and rehabilitative care at all levels of respiratory and respiratory related care system to reduce morbidity and mortality.

Program Aim:

At the end of the training the program will be able to produce respiratory therapists who can provide advanced respiratory care by incorporating evidence-based practice and demonstrate professional, legal and ethical principles using interpersonal relationship and communication skill.

Objectives:

At the end of the training, this program will be able to produce senior respiratory therapists who can;

- Competently give clinical service of the respiratory and related component of the emergency care, intensive care, general wards, and specialized clinics.
- Establish and run the respiratory units of hospitals
- Take part in the administration and organization of respiratory care
- Participate actively in the management of a multidisciplinary team approach
- Promote and maintain optimum standards of allied healthcare and practice in the respiratory environment with respecting patient value, culture, belief and dignity
- Promote safe and healthy environments for patients and staff
- Conduct researches on respiratory care for the provision of evidence based clinical care
- Participate in educational process for the personal and professional development

Manipulate skillfully and maintain instruments and devices used in respiratory therapy and care.

Strategies

- The teaching process will be more of practical and highly integrated.
- Suggested training period will be 24 months
- Training extensively utilizes simulation laboratory
- Trainers are expected to improve clinical service in TMGH and other accredited hospitals
- There must be preceptors at each practicum unit

Hosting institution and department

The program will be hosted and ran by **Deanship of graduate Studies & Scientific Research - 21 September University of Medical & Applied Sciences (21 UMAS),** graduate Section, Program of respiratory care.

Degree Nomenclature

Up on successful completion of this program the graduate will be awarded The Degree of "**Master of Science in Respiratory Care**".

Accreditation of program :

Local accreditation:

Master of Science in Respiratory Care degree accredited by Ministry of Higher Education and Scientific Research.

International Recognition :

Once the program started, the program will be accredited by **IERS -ICRC** (***International Education Recognition System***) that originated from International Council For Respiratory Care.

International academic MsRC programs References :

1. Master of Science in Respiratory Care, Rush University , Chicago , IL , USA.
   Total credit hours = 92 credit hours .
2. Master of Science in Respiratory Care, Texas University , SA , TX , USA.
3. Master of Science in Respiratory Care, Boise State University , Polsi , Idaho , USA.
4. Master of Science in Respiratory Care, Loma Linda University , California , USA
5. Master of Science in Respiratory Care, University of north Carolina , NC, USA.
6. Master of Science in Respiratory Care, Bellarmine University , KY , USA
7. Master of Science in Respiratory Care, University of Mary , North Dakota , USA
8. Master of Science in Respiratory Care, The Ohio state University , Ohio , USA
9. Master of Science in Respiratory Care, Weber state University , Ogden , Utah , USA
10. Master of Science in Respiratory Care, Georgia state University , Atlant , Georgia , USA
11. Master of Science in Respiratory Care, SPHMMC , Addis Ababa , Ethiopia .
12. Master of Science in Respiratory Therapy, Inaya college , Riyadh , Saudi Arabia .
13. Master of Science in Respiratory Therapy, MAHE , Karnataka , India .

Graduates Competencies/ Graduates Profile

After review of existing local and international documents on learning outcomes, the core (essential) competencies respiratory therapy students must demonstrate at the point of graduation are defined. The core competencies are organized in 7 domains:

1. **Basic Clinical Respiratory practice**
2. **Advanced Respiratory Care**
3. **Interpersonal relationships and communication**
4. **Professional, legal, and ethical practice**
5. **Organizational management and leadership skills**
6. **Education and professional development**
7. **Evidence based practice and Respiratory protocol**

1- *Basic Clinical Respiratory Care Practice*

Competency: Respiratory therapists demonstrate respiratory care and practicability in various clinical situations. In order to achieve this outcome, the graduate is expected to:

- Promote and provide family/patient-centered care (K4,S4)

- Demonstrates a holistic approach to patient with respiratory problem while assessing the individual needs when planning patient care and evaluating outcomes (K4,S4)
- Liaises with multidisciplinary teams to plan and implement care based on best practice standards (K4,S4)
- Perform accurate, timely and continuous monitoring of patients, analyzing results and taking appropriate action (K4, S4)
- Implements planned care and ensures accurate and complete documentation of interventions (K4, S4)
- Manages any unforeseen deviations from planned care and records (K, S)
- Employ and initiates appropriate risk management strategies to promote health and safety in the work place (K4,S4)
- Incorporate the principles of aseptic technique towards infection prevention and control in the provision of respiratory care (K4,S4)
- Identify emergency situations and institute corrective actions by being critical thinker and efficient manner (K4.S4)

Below is a detailed clinical competency list in six thematic areas adopted from the competency guidelines of American Association of Respiratory Care (AARC) for Respiratory Therapists:

Area I: Patient Assessment

A. Patient Assessment

1) Complete the assessment through direct contact, chart review, and other means as appropriate and share the information with healthcare team members.
2) Obtain medical, surgical, and family history.
3) Obtain social, behavioral, and occupational history, and other historical information incident to the purpose of the current complaint.

B. Diagnostic Data

1) Review and interpret pulmonary function studies (spirometry) and pulse oximetry.
2) Review and interpret lung volumes and diffusion studies.
3) Review and interpret arterial blood gases, electrolytes, complete blood cell count, and related laboratory tests.

C. Physical Examination

1) Inspect the chest and extremities to detect deformation, cyanosis, edema, clubbing, and other anomalies.

2) Measure vital signs (blood pressure, heart rate, respiratory rate).

3) Evaluate patient breathing effort, ventilatory pattern, and use of accessory muscles.

4) Measure and document oxygen saturation with oximetry under all appropriate conditions (with or without oxygen at rest and during sleep, ambulation, and exercise).

Area II: Collection of Diagnostic Lab Information

A. Pulmonary Function Technology

1) Perform spirometry, including adequate coaching, recognition of improperly performed maneuvers, corrective actions, and interpretation of test results.

2) Compare and evaluate indications and contraindications for advanced pulmonary function tests (plethysmography, diffusion capacity, esophageal pressure, metabolic testing, and diaphragm stimulation) and be able to recognize normal/abnormal results.

3) Sleep Study

4) Compare and evaluate the indications and contraindications for sleep studies.

5) Explain results in relation to types of respiratory sleep disorders.

6) Apply and optimize the use of devices such as CPAP and BiPAP machines to alleviate the sleep disorder related with respiratory system (e.g. OSA management)

B. Invasive Diagnostic Procedures

1) Identify and distinguish the indications, contraindications, and general hazards, complications in preparation, performance, and post care of bronchoscopic procedures.

2) Describe the role of a respiratory therapist in diagnostic bronchoscopy procedures.

3) Monitor and evaluate the patient's clinical condition with pulse oximetry, electrocardiogram, exhaled gas analysis, and other related diagnostic devices.

4) Perform arterial and venous sampling for blood analysis.

Area III: Assessment for Therapeutics

A. Assessment of Need for Therapy – Assesses the need for therapies in all patient settings.

1) Medical gas therapy

2) Humidity therapy

3) Aerosol therapy

4) Lung expansion therapy

5) Airway clearance therapy

6) Airway management

7) Mechanical ventilation

B. Assessment Prior to Therapy

1. Review order and/or implement protocol.
2. Review patient history, laboratory results, and imaging data.
3. Determine indications/contraindications for therapy.
4. Interview and conduct physical examination of patient.
5. Determine appropriateness of order.
6. Determine need for physician intervention.

C. Administration of Therapy

1. Select and assemble equipment.
2. Apply and administer therapy.
3. Monitor patient's response to therapy.
4. Instruct patient on proper technique.
5. Recognize and rectify equipment malfunction (troubleshooting).
6. Follow Standard Precautions for infection control.

D. Evaluation of Therapy

1. Recognize complications and respond to adverse effects.
2. Recommend therapy modifications.
3. Assess therapy effectiveness.
4. Document therapy.

Area IV: Application of Therapeutics to Respiratory Care Practice

A. Medical Gas Therapy – Understanding, application and troubleshooting of the following gas delivery systems but not limited to:

1) compressed gas cylinders.
2) regulators and flow meters.
3) liquid-oxygen systems (stationary and portable).
4) oxygen concentrators (stationary and portable).
5) oxygen conserving devices.
6) high-flow air-entrainment systems.
7) oxygen and air-flow-meter mixing systems.
8) air/oxygen blenders.
9) hyperbaric oxygen systems.
10) sub-ambient oxygen delivery systems (neonatal only)
11) nasal cannulas.
12) high-flow nasal cannulas.
13) non-reservoir masks.
14) reservoir masks.
15) air-entrainment masks.
16) hood/head-enclosures (neonatal only).
17) trans-tracheal oxygen therapy.
18) nitric oxide therapy.

B. helium/oxygen therapy.

C. Humidity Therapy – Understanding, application and troubleshooting of humidity therapy systems in all patient settings.

1) unheated passive humidifiers.
2) active and passive heat-and-moisture exchangers (HMEs).
3) heated humidifiers for medical gas delivery systems via mask, tracheal catheter, and artificial airways.

D. Aerosol Therapy – Understanding, application and troubleshooting of the following aerosol delivery systems.

1) non-medicated, large-volume nebulizers, heated and unheated.

2) Aerosolized medication.

    a) Small-volume nebulizers, including ultrasonic and porous/mesh

    b) Intermittent, breath-actuated, nebulizers for bronchial challenge testing

3) nebulizers for continuous nebulization.

4) pressurized metered-dose inhalers.

5) dry-powder inhalers.

6) competency in pharmacology nomenclature, physiologic action, adverse effects, and doses.

    a) Adrenergics

    b) Anticholinergics,

    c) Cholinergics

    d) Decongestants

    e) Mucolytics

    f) Pulmonary vasodilators

    g) Antimicrobials

7. peak expiratory flow meters and inspiratory flow meters.

8. Calculation and modification of drug dosing.

E. Lung Expansion Therapy – Understanding, application and troubleshooting skills to lung expansion equipment in all patient settings.

1) incentive spirometers (flow-based and volume-based).

2) continuous positive airway pressure (CPAP) devices.

3) expiratory positive airway pressure (EPAP) devices.

4) bi-level positive-pressure breathing.

5) positive expiratory therapy (PEP).

6) oscillatory positive expiratory therapy (OPEP).

7) intermittent positive-breathing devices.

8) bag-valve-mask devices.

F. Airway Clearance Therapy

1) proper positioning for bronchial drainage.

2) chest percussion: manual and mechanical precursors.

3) positive airway pressure adjuncts (vibratory and non-vibratory PEP).

4) expiratory positive airway pressure (EPAP) devices.

5) external chest-wall-vibration devices.

6) Assist the pulmonologist in the therapeutic and diagnostic bronchoscopy.

7) high frequency positive pressures devices.

8) Autogenic drainage systems.

9) Cough-assist devices (insufflator-exsufflator).

G. Airway Management- Apply knowledge, understanding and troubleshooting skills using airway management in all patient settings.

1) Perform the head-tilt chin-lift airway-opening maneuver.

2) Perform the jaw lift without head extension maneuver.

3) the use for an oropharyngeal airway, nasopharyngeal airway, bag-valve-mask resuscitator, laryngeal mask airway (LMA), oral and nasal endotracheal tubes, tracheostomy tube (care and application), tracheostomy "button" or valve.

4) Evaluate, advise and perform the discontinuance or change to alternative airway based on assessment/protocols.

5) tracheostomy tubes care (competency in advising decannulation or change to alternative airway based on assessment/protocols).

6) Evaluate the need and use of tracheostomy "button" or valve

7) Assist physician in placing surgical or percutaneous tracheostomy tube.

8) Suction via artificial airway, operate suction system, select suction catheter.

H. Mechanical Ventilation

1) Incorporate the mechanical ventilation principles listed in critical care.

2) Independently assess the need, initiate and follow up of mechanical ventilation for patients.

3) Evaluate patient on any sort of positive pressure ventilation for weaning and perform weaning trails.

4) Run ABG sampling and tests, interpret the ABG and other lab data and adjust positive pressure ventilation and oxygenation modalities of patients.

5) Perform discontinuation of positive pressure ventilation, decannulation and extubation of patients assisted by the nurse in charge.

6) Apply CPAP devices.

7) Manage the use of bi-level positive airway pressure devices.

8) Manage noninvasive-ventilation interfaces: nasal mask, nasal pillows, oro-nasal mask, full-face mask, and helmet.

I. Post-Acute Care

A. Patient Assessment

a. Assess physical-vital signs, functional capacity.

b. Assess cognitive-level of comprehension, reading level, language barriers.

c. Evaluate social support system-recognition of anxiety, depression, signs of abuse and the knowledge of and ability to access community resources.

B. Environmental Assessment

a. Evaluate the home environment for appropriateness of prescribed therapy and identify risk factors.

b. Educate on oxygen safety to include, but not limited to the presence of fire extinguishers, smoke detectors, smoking cessation, evacuation routes, open flames.

c. Educate on fall safety to include clutter, proper floor surfaces, and adequate lighting.

d. Medication error identification.

e. Educate on infection prevention by disinfecting home medical equipment

f. Identify and discuss electrical safety (e.g., use of power cords/strips, fuses).

g. Identify and discuss structural barriers (e.g., lack of running water, weak floors, and stairs).

C. Therapeutic

a. Evaluate limitations that exist with equipment used in the post-acute care setting.

b. Recommend care plan modifications by recognizing additional needs that exist (e.g., bathroom safety, wheelchairs, electric beds, portable supplemental oxygen delivery systems).

D. Unique Equipment and Monitoring Software

a. Initiate patient monitoring equipment and understand interpretation of data (e.g., infant apnea monitors, pulse oximetry, ETCO2).

b. Apply to practice ventilation modes currently available on ventilators used in the post-acute care setting, invasively and non-invasively.

c. Interpret data available on post-acute care ventilators as well as CPAP/Bi-level devices.

d. Integrate compliance data monitoring respiratory devices remotely.

E. Health Policy

a. Adhere to regulatory requirements (e.g., YMC).

b. Demonstrate knowledge of reimbursement criteria and/or cost allocation for respiratory equipment and supplies based on payer criteria.

Area V: Disease Management

A. Management of Chronic Diseases

1) Understand the etiology, anatomy, pathophysiology, diagnosis, and treatment of cardiopulmonary diseases (e.g., asthma, chronic obstructive pulmonary disease) and comorbidities.

2) Communicate and educate to empower and engage patients.

3) Develop, administer, and re-evaluate patient care plans to

a) establish specific desired goals and objectives.

b) assess level of patient understanding.

c) anticipate the effects of pharmacologic agents on organ systems within scope of respiratory care.

d) identify the patient/caregiver's need for psychosocial, emotional, physical, or spiritual support.

e) educate about nutrition, exercise, wellness.

f) assess and modify the environment.

g) conduct monitoring and follow-up evaluation.

h) develop action plans.

i) apply evidence-based medicine, protocols, and clinical practice guidelines.

j) monitor adherence through patient collaboration and empowerment, including proper and effective device and medication utilization.

k) implement and integrate appropriate patient-education materials and tools.

l) utilize appropriate diagnostic and monitoring tools.

m) document and monitor outcomes (economic, quality, safety, patient satisfaction).

n) communicate, collaborate, and coordinate with physicians, nurses, and other clinicians.

o) assess, implement, and enable patient resources support system (family, services, equipment, personnel).

p) ensure financial/economic support of plan/program and related documentation.

q) educate on dyspnea management and energy conservation.

B. Management of Acute Diseases

1) Develop, administer, evaluate, and modify respiratory care plans in the acute-care setting, using evidence-based medicine, protocols, and clinical practice guidelines.

2) Communicate and educate to empower and engage patients.

3) Develop, administer, and re-evaluate patient care plans to

a. establish specific desired goals and objectives.

b. evaluate the patient.

c. anticipate the effects of pharmacologic agents on organ systems within scope of respiratory care.

d. identify the patient/caregiver's need for psychosocial, emotional, physical, or spiritual support.

e. educate about nutrition, exercise, wellness.

f. assess and modify the environment.

g. conduct monitoring and follow-up evaluation.

h. develop action plans.

i. apply evidence-based medicine, protocols, and clinical practice guidelines.

j. monitor adherence through patient collaboration and empowerment, including proper and effective device and medication utilization.

k. implement and integrate appropriate patient-education materials and tools.

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o. assess, implement, and enable patient resources support system (family, services, equipment, personnel).

p. ensure financial/economic support of plan/program and related documentation.

q. educate on dyspnea management and energy conservation.

Area VI: Emergency and Critical Care

A. Emergency Care

1) Perform advanced cardiovascular life support (ACLS)
2) Perform pediatric advanced life support (PALS) and neonatal resuscitation program (NRP)
3) Perform endotracheal intubation.
4) Perform as a member of the rapid response team (medical emergency team).
5) Participate in mass-casualty staffing to provide airway management, manual and mechanical ventilatory life support, medical gas administration, aerosol delivery of bronchodilators and other agents in the resuscitation of respiratory and cardiovascular failure.
6) Provide intra-hospital transport of critically and chronically ill patients.
7) Provide cardiopulmonary life support and airway control during transport.
8) Apply knowledge of emergency pharmacology.
9) Demonstrate ability to recommend use of pharmacotherapy.

B. Critical Care

1) Apply to practice knowledge and analysis of invasive and noninvasive mechanical ventilators.
2) Apply to practice all ventilation modes currently available on invasive and noninvasive mechanical ventilators, and as adjuncts to the operation of modes.
3) Interpret ventilator data and hemodynamic monitoring data.
4) Manage monitoring system.
5) Manage airway devices.
6) Make treatment recommendations based on waveform graphics, pulmonary mechanics, and imaging studies.
7) Identify therapeutic medical gases.
8) Identify indications for circulatory gas exchange devices.
9) Collaborate with other professionals in care management built upon evidence-based medicine and clinical protocols.
10) Deliver therapeutic interventions based on evidence-based medicine and clinical protocols.

2- ***Advanced Respiratory Care***

In addition to the above clinical competencies, masters level Respiratory therapists are to be competent in understanding, assist the critical care team and or independently perform the following clinical procedures :

- Perform Nutritional Assessment and Treatment of the Critically Ill Patient
- Manage advanced Modes of Mechanical Ventilation
- Actively assist in the diagnosis and management of Cardiopulmonary emergencies e.g pneumothorax, pulmonary embolism, drowning, inhalation injury, ARDS, hemoptysis, bronchopleural fistula, head injury, CVA, etc
- Apply BiLevel Ventilation Theory and Application to ARDS patients
- Apply current Evidences in Ventilator management of Trauma Patients
- Use High Flow Oxygen in Acute Respiratory Failure
- Participate in the mobility of patients on respiratory device in and out of ICU
- Assist in ECMO: Extracorporeal Membrane Oxygenation
- Assist Heart-lung machine application
- Perform Interventions to Optimize Oxygenation During Mechanical Ventilation
- Do Mechanical Ventilation Waveform Analysis
- Assist in the diagnosis and management of Pulmonary Hypertension
- Do Respiratory Care of the Morbidly Obese Patient
- Do Setting the Ventilator for Maximum Patient Comfort
- Perform Cardiopulmonary exercise testing (CPET) and full PFT study
- Organize and participate in Pulmonary rehabilitation including respiratory home care modalities

3- ***Interpersonal Relationships and Communication***

Competency: Respiratory therapists demonstrate inter-personal relationships and communication practice abilities in various situations. In order to achieve this outcome, the graduate is expected to:

- Provide health education which can support for patient and family
- Establish, apply and maintain effective interpersonal relationships with patients and their family
- Establish essential requirements of effective teamwork to achieve desired

patient care outcomes in the respiratory environment

- Utilize communication strategies both verbal and written to ensure accurate recording and transfer of information in the best interest of patient care

4- *Professional, legal, and ethical practice*

Competency: Respiratory therapists demonstrate Professional, legal and ethical practice abilities in various situations. In order to achieve this outcome, the graduate is expected to:

- Function as a patient advocate in support of the patient's right, dignity, privacy and best interest
- Practice in accordance with rules, regulations and professional guidance relevant to respiratory therapy nursing
- Apply professional accountability and responsibility
- Works within the realms of one's own scope of practice and knowledge base

5- *Organizational management and leadership skill*

Competency: Respiratory therapists demonstrate leadership and managerial qualities and decision-making abilities in various situations. In order to achieve this outcome, the graduate is expected to:

- Plan and implement in relation to staff development
- Use analytical and critical problem-solving skill for decision making
- Recognize and manage complexity and uncertainty in medical practice
- Use effective organizational and management skills in the provision of patient care
- Audit practices to ensure quality assurance of care
- Manage resources appropriately to ensure readiness in the delivery of care
- Demonstrate effective leadership skills.
- Carry-out appropriate reporting and giving feedback
- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude
- Facilitate changes and be a change agent
- Ensure learners are supervised as required
- Effectively co-ordinates the supply material resources, ensuring best practice guidelines are adhered while recognizing the scope of economic constraints

6- *Education and professional development*

Competency: Respiratory therapists demonstrate the need for continuing learning for professional and personal enrichment. In order to achieve this outcome, the graduate is expected to:

- Build his/her professional portfolio, in order to personally develop and meet the knowledge and skill needs of a constantly evolving specialization.
- Demonstrates a commitment to personal and professional development of self and others
- Proactively seeks/provides educational opportunities for self and others
- Maintain a current knowledge and seek new learning experience

7- *Evidence-Based Medicine and Respiratory Care Protocols*

Competency: Respiratory therapists will develop an enquiry mind regarding his/her work and profession and adopt a research attitude, in order to meet the knowledge and skill needs of their specialty. In order to achieve this outcome, the graduate is expected to:

- Evidence-Based Medicine
    a) Retrieve credible sources of evidence.
    b) Critique published research.
    c) Explain the meaning of general statistical tests.
    d) Apply evidence-based medicine to clinical practice.
- Explain the use of evidence-based medicine in the development and application of hospital- based respiratory care protocols
- Evaluate and treat patients in a variety of settings, using the appropriate respiratory care protocols.
- Search, collect, organize and interpret health and biomedical information from different databases.
- Retrieve and use patient-specific information from a clinical data system maintaining confidentiality and protection of individual data.
- Formulate hypotheses, collect and critically evaluate data, for the solution of problems.
- Conduct research and disseminate findings.
- Analyze practice experience and perform practice-based improvement activities using systematic methods.
- Use information technology to manage information, access online medical information
- Reflect and analyze professional practice

Curriculum Model

Competency (outcomes)-based

The curriculum model is competency (outcomes)-based with stated learning outcomes considering learning domains (mostly knowledge and skill). It also includes teaching and learning strategies that are aligned with defined learning outcomes and the assessment methods are explained well.

Student-centered

Students are given greater responsibility for their own learning by integrating a more learner- centered teaching and learning and assessment methods such as problem-based learning, whole group discussion, personal research and reflection exercise and portfolio-based learning.

Integrated

Clinical exposure is linked with theory class and it goes along throughout the training period. The advantages of integration are reducing fragmentation of courses and demonstrating unity of courses, motivating students and shaping their attitude towards the profession, improving educational effectiveness of teaching and learning, encouraging development of higher level objectives, longitudinal coverage of all domains of competencies, promoting staff communication and collaboration and bringing about rationalization of teaching resources.

Modular Course

Modular based course administration: for the core professional courses, modular (block courses) may be used to align with the timing of availability of the guest /contract cardio-respiratory care professionals. And yet, the practical (clinical and simulation) and the theoretical part is given hand in hand.

Systematic and planned learning

In this curriculum, simulation and clinical learning activities are planned and all students gain the necessary experiences for developing essential competencies. The schedules of essential learning activities in the skills learning labs and clinical settings are developed, systematic rotations are proposed and lists of essential skills and procedures to be performed by each student are specified.

Admission to the Program

Application for Admission Requirements:

To be eligible for application for admission to the Master of Science degree in respiratory Care (**MsRC**) program one should fulfill the following criteria:

- Graduated from an accredited college/school with post basic BSc in Nursing, or BSc in Anesthesia (***This criteria only applicable for the first batch***) and for the subsequent batch it should be BSc. in Respiratory Care **only**.
- Has been serving in a clinical environment for the last minimum of two years
- Present letter of sponsorship.
- Two letters of recommendation from the previous clinical work place
- letter of recommendation from RCSA at Ministry of Health.
- Scored pass mark (at least 70%) in the total admission evaluation

NB: Those who have experience in hospital ICUs, emergency units, anesthesia/OR, pulmonary and bronchoscopy units will be privileged; only documented official evidences are acceptable.

Procedure for Application

- The applicants should apply to the office of registrar of college
- The office of the registrar will send the applicants to the supervisor of program
- The respiratory care department will give entrance exam
- The department will select the eligible candidates and notify to the office of the registrar and will be approved by academic commission through the office of registrar.
- Candidates should bring sponsorship letter to registrar office during admission.

Evaluation for Admission:

Evaluation of the prospects for admission will be on point system and includes document evaluation, written exam and admission interviews. 70% pass mark is required for admission.

Evaluation Type	Criteria with remark	Max weight
Document review	• 3 % for CGPA of 70-79.9% • 6% for CGPA of 80-89.9% • 10% for BSc CGPA of ≥ 90%	10%
Experience	• 10% for 5 years and above clinical / teaching RC experience in the privileged clinical areas • 6% for the last 2 -5 years' or more clinical/ teaching experience in the privileged clinical areas • 3% for less than 2 years clinical experience in the privileged clinical areas	10%
Written Exam	• Written exam will have 50% weight • (any one will get 70% or more in written exam)	50%
Candidate Interview	• Oral interview out of 30% (template for structured interview will be used)	30%
TOTAL		**100%**
*A candidate should score 70% in the written exam to pass for the final oral exam (interview)		

Teaching and Learning Methods:

The major teaching and learning methods suggested to be used in the implementation of the curriculum are described below when and where.

1. **Interactive lecture:** Lecture is an efficient way to integrate and present information from multiple sources on complex topics. Additional advantage of lectures is that it gives students a chance to follow and model the way an expert thinks, reasons and asks questions. Lecture is appropriate for teaching knowledge objectives. Interactive lecture is to be used in this curriculum by enhancing engagement of learners mentally and physically using questions, brainstorming, discussion, think-pair-share, debate, role play, case study, providing opportunities for reading, talking, listening, writing and reflecting, and other learner activities.

2. **Case study:** Case studies present realistic scenarios/situations that focus on a specific issue or problem, which may be related to diagnosis or treatment of patients, interpersonal skills or any of a wide range of managerial or organizational problems. Learners typically read, study and react to the case study individually or in small groups. Case studies are important to teach higher order knowledge objectives (application, analysis and synthesis) and critical thinking skills.

3. **Simulated practice (clinical skills lab):** Simulated practice is the use of simulated person, device or set of conditions for instructional purpose. The learner is required to respond to the situation as he or she would under natural circumstances. Simulation complements patient-based education and is best employed to prepare learners for real patient contact. Simulations are used to develop psychomotor, procedural and clinical decision-making skills.

   Simulation also aids development of communication and teamwork skills as well as the ability to respond to medical emergencies systematically. Simulated teaching facilitates learning under the right conditions. Learners receive feedback on their performance, learners having the opportunity for repetitive practice and simulation being an integral part of the curriculum. Clinical skills lab is suggested to be used during the training of the respiratory care curriculum.