

RPTH 410
Study Guide

Module 1: Review of Basic Science and It's Application to Respiratory Care

Upon Completion of the module, the student will be able to:

1. Recall specific fundamental concepts of chemistry and physics by:
 - a. describing characteristics of the three states of matter
 - b. state the kinetic theory and it's application to Respiratory Care
 - c. Define the following:
 1. mass
 2. weight
 3. temperature
 4. heat
 5. density
 6. viscosity
 7. pressure
 8. volume
2. State the difference in Fahrenheit, Celcius and Kelvin temperature scales and normal body temperature in Celcius and Fahrenheit.
3. Define the following:
 - a. evaporation
 - b. condensation
 - c. conduction heat loss
 - d. convective heat loss
 - e. radiation heat loss
4. Discuss the factors and perform calculations that determine gas density.
5. State sea level pressure in the following units and perform conversions between them.
 - a. CmH₂O
 - b. torr - mmHg
 - c. atmospheres
 - d. pounds per square inch (psi)
6. Describe devices used to measure pressure.
7. Explain Boyles, Charles and Gay-Lussacs laws by:
 - a. state the gas law
 - b. express the law mathematically
 - c. perform calculations with the gas law
 - d. describe an example of each gas law
8. Perform calculations using the combined gas law.
9. List the principle gases and their percentage of the atmosphere.
10. Explain and perform calculations using Dalton's law as it relates to the atmosphere.

11. Apply humidity to the concept of gas chemistry and physics:
 - a. define the following terms:
 1. relative humidity
 2. absolute humidity
 3. saturation
 4. hygrometer
 5. water vapor pressure
 - b. explain how temperature and pressure effect humidity.
 - c. perform calculations between relative humidity, absolute humidity, water vapor pressure and water content.
 - d. perform calculations with the combined gas laws utilizing water vapor pressure.
12. Apply gas chemistry, physics and humidity to respiratory therapy:
 - a. define the following terms:
 1. ATPS
 2. BTPS
 3. anhydrous
 4. humidity deficit
 5. percent body humidity
 - b. perform calculations converting lung volumes from ATPS to BTPS using both factors and long form combined gas laws
 - c. perform calculations that convert fractional concentrations to partial pressures for various gases.
 - d. read and perform calculations on graphs (x-y axis)
13. Discuss types of solutions and their relationship to respiratory care
14. State the major electrolytes and their relationship to respiratory care

Preparation/Reading:

Egans Fundamentals of Respiratory Care, chapters 6 & 12

Assigned word problems for Math for Respiratory Care

MODULE 2: PATIENT CARE ARTS

Upon completion of this module, the student will be able to:

1. Interpret the following clinical measurements and state their significance:
 - a. Patient temperature
 - b. Pulse
 - c. Respiratory rate
 - d. Blood pressure
2. Perform the above procedures on a fellow student
3. Operate a mechanical hospital bed and properly position a simulated patient on that bed
4. Demonstrate proper body mechanics when given a simulated patient movement situation.
5. State the importance of Body Substance Isolation and Blood Born Pathogen Training
6. State the correct precautions according to OSHA and CDC for handling of body substances.
7. State regulations and safe practices for instituting Respiratory Isolation.
8. Discuss mask fit testing and the use and types of masks available.
9. Perform proper handwashing and donning of isolation equipment
10. Perform proper barrier protection given a simulated situation
11. State the significance of the following to respiratory care:
 - a. intravenous and other intravascular lines
 - b. nasogastric tubes
 - c. restraints and bedrails
 - d. the nursing flowsheeting
 - e. bedside warning cards

Reading/Preparation

Vital signs videotape
Butler pp 7-22 & 31-35
Egan Chapters 3 & 4
CDC Guidelines

Module 2: Terminology List

Asepsis
Sterile
Nosocomial
Infection
Pathogen
Body substance isolation
Febrile
Hypothermic
Oral temperature
Rectal temperature
Axillary temperature
Thermometer
Arrhythmia
Bradycardia
Tachycardia
Bounding pulse
Apnea
Dyspnea
Tachycardia
Hyperpnea
Eupnea
Orthopnea
Sphygmomanometer
Hypertension
Hypotension
Fowlers position
Semi-fowlers position
Sims position
Supine
Prone
Footboard
Decubitus
Universal precautions
Antidecubitus pad
Flotation bed
Egg shell mattress
Draw sheet

Module 3: Introduction to Respiratory Assessment

Upon completion of this module, the student will be able to:

1. Define terms and abbreviations related to history taking and physical examination
2. List and explain the major components of a general history
3. Perform a simulated history on a fellow student
4. List the systems which are assessed in the general history and give one example of a sign/symptom from each which may be indicative of cardiopulmonary disease
5. Compare and contrast types of chest pain
6. Identify characteristics of cough and expectoration
7. Identify structures and landmarks of the chest
8. Inspect the patient for the following
 - a. facial expression
 - b. posture
 - c. nutritional status
 - d. scars
 - e. cyanosis
 - f. pallor
 - g. venous congestion
 - h. digital clubbing
 - i. accessory muscle use
9. Identify characteristics of dyspnea and SOB
10. Palpate the patient for the following
 - a. bilateral chest expansion
 - b. diaphragmatic excursion
 - c. tracheal position
 - d. capillary refill
11. Percuss the patient for normal and abnormal sounds
12. Auscultate the patient for the following
 - a. bronchial breath sounds
 - b. vesicular breath sounds
 - c. crackles
 - d. pleural friction rub
 - e. stridor
 - f. wheezes
11. State the significance of diagnostic findings from history and physical
13. Discuss the principles of pulse oximetry and perform the procedure

READING/PREPARATION

Egan – Fundamentals of Respiratory Care, Chapters 3 & 15

Butler – Laboratory Exercises for Respiratory Care – pp 36-43

Module 3 – Terminology List

Adventitious

Anorexia

Apical cardiac impulse

Atelectasis

Auscultation

Bronchial breath sounds

Chief complaint

Crackles

Cyanosis

Digital clubbing

Dullness to percussion

Dyspepsia

Dysphagia

Dyspnea

Excursion

Expectoration

Family history

Hemoptysis

Malaise

Mucoid sputum

Orthopnea

Palpation

Paroxysmal nocturnal dyspnea

Percussion

Pleural effusion

Pleural friction rub

Pneumothorax

Pulmonary edema

Pulmonary fibrosis

Purulent sputum

Rales

Referred pain

Resonance

Rhonchi

Stridor

Syncope

Venous distention

Vesicular breath sounds

Wheezing