RSP 307 – ADVANCED ADULT CRITICAL CARE

MODULE 1: PATIENT ASSESSMENT WORKSHEET

Directions: Please complete the following worksheet by writing your responses to the questions in the shaded gray areas. Once you are finished, save the file and submit the document in the assignment area in the Blackboard course room.

Student Name:       Date:

1. List the four life functions.
	1.
	2.
	3.
	4.
2. Which of these life functions is the first priority?
3. What assessments would determine how well a patient is ventilating?
4. How would the adult critical care specialist determine if a patient has a problem with oxygenation?
5. What information would help the adult critical care specialist determine if a patient’s circulation is adequate?

1. What changes would indicate that a patient may not have adequate perfusion?
2. Describe the difference between “signs” and “symptoms” and list an example of each.
	1. Signs
3. Example
	1. Symptoms
		1. Example
4. List six (6) items that are important to examine when reviewing a patient’s chart.
	1.
	2.
	3.
	4.
	5.
	6.
5. Define an advanced directive.
6. List and define the four (4) types of advanced directives.
	1.
	2.
	3.
	4.
7. A properly written order for respiratory care should include what four (4) factors?
	1.
	2.
	3.
	4.
8. The adult critical care specialist has just finished administering an aerosol treatment with albuterol to a patient with asthma. How should the treatment be charted?

1. What is the normal for urine output?
2. What findings might indicate that the patient’s fluid intake has exceeded their urine output?
	1.
	2.
	3.
	4.
3. Changes in a patient’s       reading can indicate hypovolemia.
4. Patient interview: Define the following terms:
	1. Semicomatose:
	2. Stuporous:
	3. Obtunded:
5. When assessing a patient orientation to time, place and person, what are the four (4) factors that could affect the patient’s ability to cooperate?
	1.
	2.
	3.
	4.
6. Indicate the appropriate Glasgow Coma Scale sore values in the following table:

|  |  |  |
| --- | --- | --- |
|  |  | Score |
| Eye Opening | Spontaneous opening |       |
|  | To verbal stimuli |       |
|  | To pain |       |
|  | None |       |
|  |  |  |
| Most appropriate verbal response | Oriented |       |
|  | Confused |       |
|  | Inappropriate words |       |
|  | Incoherent |       |
|  | None |       |
|  |  |  |
| Most integrated motor response (arm) | Obeys command |       |
|  | Localizes pain |       |
|  | Withdraws from pain |       |
|  | Flexion to pain |       |
|  | Extension to pain |       |
|  | None |       |

1. Measuring subjective symptoms – define the following terms:
	1. Orthopnea:
	2. General malaise:
	3. Dyspnea:
	4. Dysphagia:
2. Describe the four (4) different types of syncope:
	1.
	2.
	3.
	4.
3. Describe patient learning needs:
4. What criteria is a patient’s ability to learn based upon?
	1.
	2.
	3.
	4.
	5.
	6.
5. What criteria is the patient’s nutritional status based on?
	1. 1.
		2.
		3.
	2.
6. List the four (4) items that would be important to identify in the patient’s past medical history?
	1.
	2.
	3.
	4.
7. State the normal values for each of the following vital signs:
	1. Hear rate:
	2. Respiratory rate:
	3. Temperature:

|  |  |  |
| --- | --- | --- |
| Site | ºF | ºC |
| Oral |       |       |
| Rectal |       |       |
| Tympanic |       |       |

1. Briefly describe the following conditions that may be observed during inspection of a patient and state one pathology that would be associated with each condition:
	1. Hemiparesis:

Pathology:

* 1. Peripheral edema:

Pathology:

* 1. Ascites:

Pathology:

* 1. Clubbing:

Pathology:

* 1. Venous distention:

Pathology:

* 1. Capillary refill:

Pathology:

* 1. Diaphoresis:

Pathology:

1. For each of the following skin color, define the term and then describe what pathology it would indicate:
	1. Ashen/pallor:

Indicates:

* 1. Erythema:

Indicates:

* 1. Cyanosis:

Indicates:

* 1. Ecchymosis:

Indicates:

1. Briefly describe each of the following types of chest configuration.
	1. Kyphosis:
	2. Scoliosis:
	3. Kyphosoliosis:
2. Movement of the chest/diaphragm.
	1. Describe symmetrical chest movement:
	2. List four (4) pathologies that can contribute to a patient displaying asymmetrical chest movement:
		1.
		2.
		3.
		4.
3. Briefly describe each of the following breathing patterns and identify a patient condition that would be associated with it.
	1. Eupnea:

Condition:

* 1. Cheyne-Stokes:

Condition:

* 1. Biot’s:

Condition:

* 1. Kussmaul’s:

Condition:

* 1. Apneustic:

Condition:

1. List the normal muscles of ventilation:
2. What are the accessory muscles of ventilation?
3. What causes hypertrophy of the accessory muscles?
4. Muscle wasting is also referred to as
5. List the four (4) face and/or neck pathologies that would present difficult ventilation or intubation.
	1.
	2.
	3.
	4.
6. Assessment by palpation: Pulse.
	1. What term would be used to describe a heart rate of 130/min?       What would this indicate?
	2. What term would be used to describe a pulse of 44/min?       What would this indicate?
	3. What does paradoxical pulse/pulsus paradoxus indicate?
7. Assessment by palpation: Tracheal deviation.
	1. Complete the chart below:

|  |  |
| --- | --- |
| Pulled to the Abnormal Side(toward pathology) | Pushed to Normal Side(away from pathology) |
| a..      | a..      |
| b..      | b..      |
| c..      | c..      |
| d..      | d..      |

1. What is tactile fremitus?
2. What is meant by tenderness?
3. What condition is crepitus associated with?
4. Describe how to perform chest motion symmetry?
5. Assessment by Percussion: Describe the following terms:
	1. Resonant:
	2. Flat:
	3. Dull:
	4. Tympanic:
	5. Hyperresonant:
6. Assessment by auscultation:
	1. Describe the difference between vesicular and adventitious breath sounds:
	2. Describe how Egophony is identified and what it would indicate.
	3. What breath sounds would be expected in a patient with pneumonia?
7. Write a brief description of the following abnormal breath sounds and the recommended treatment:

|  |  |  |
| --- | --- | --- |
| Breath Sound | Description/Cause | Treatment |
| Course rales/rhonchi |       |       |
| Medium rales |       |       |
| Fine rales/crackles |       |       |
| Wheeze |       |       |
| Stridor |       |       |
| Pleural friction rub |       |       |

1. Describe the following heart sounds and when they would occur during the cardiac cycle.
	1. First sound (S1):
	2. Second sound (S2):
2. Describe what the following abnormal heart sounds may indicate:
	1. Third sound (S3):
	2. Fourth sound (S4):
	3. Murmur:
	4. Bruits:

ASSESSMENT OF VENTILATION

1. State the formula to calculate the Work of Breathing (WOB).
2. What is the normal value of WOB?
3. A patient with pulmonary disease would be expected to have a/an       WOB.
4. What does Capnography measure and how is it accomplished?
5. How does the PETCO2 compare to the arterial PCO2?
6. The normal range for end-tidal CO2 is between       and       %.
7. What would an increase in PECO2 indicate?
8. What would a decrease in PECO2 indicate?
9. Immediately following intubation, the PETCO2 remains at a low level. How should the adult critical care specialist interpret this information?
10. What is an exhaled CO2 detection device used for?
11. What is one indication for the use of an exhaled CO2 detection device?
12. What is another name for an exhaled CO2 detection device?
13. Describe the different types of deadspace listed below:
	1. Anatomic:
	2. Alveolar:
	3. Physiologic:
	4. Mechanical:
14. What is the formula used to calculate minute ventilation (VE)?
15. What is the formula used to calculate alveolar minute ventilation (VA)?
16. What is the normal range for VD/VT ratio?
17. Calculate the VD/VT ratio for a patient that has a PaO2 of 85 torr, PaCO2 of 50 torr, pH of 7.35 and PECO2 is 40 torr.
18. Calculate the VD/VT ratio for a patient that has a PaO2 of 65 torr, PaCO2 of 55 torr, pH of 7.39 and PECO2 is 35 torr.
19. What is the formula used to calculate deadspace ventilation (VD)?

**ASSESSMENT OF OXYGENATION**

1. List two (2) indicators of oxygenation and state the normal value for each.
	1. Indicator:

Normal value:

* 1. Indicator:

Normal value:

1. What device can be used to estimate SaO2?
2. SaO2 is calculated by what device?
3. The relationship of PaO2 and SaO2 is described by using the       .
4. Calculate the alveolar oxygen tension (PAO2) for a patient receiving 45% oxygen with a PaCO2 of 56 torr when the barometric pressure is 760 torr.
5. Calculate the alveolar to arterial gradient (A-a gradient) for a patient receiving oxygen therapy with a PaCO2 of 60 torr and PaO2 of 105 torr when the barometric pressure is 760 torr and PAO2 is 405 torr.

1. What is the significance of an A-a gradient of 50 torr?
2. What is the significance of an A-a gradient of 190 torr?       What treatment should the adult critical care specialist recommend?
3. What is the significance of an A-a gradient of 360 torr?       What treatment should the adult critical care specialist recommend?
4. Calculate the arterial oxygen tension (CaO2) for a patient with a PaO2 of 50 torr, SaO2 of 85% and Hb level of 10 g/100 mL of blood.       What is the normal range for CaO2?
5. Calculate the mixed venous oxygen content (CvO2) for a patient with a PvO2 of 50 torr, SvO2 of 75% and Hb level of 12 g/100 mL of blood.
6. An increase in CvO2 would indicate       .
7. Calculate the arterial-venous oxygen content difference (C[a-v]O2) for a patient with the following blood gas data.

|  |  |  |  |
| --- | --- | --- | --- |
| Arterial |  | Venous |  |
|  |  |  |  |
| pH | 7.45 | pH | 7.32 |
| PaCO2 | 33 torr | PvCO2 | 50 torr |
| PaO2 | 75 torr | PvO2 | 35 torr |
| SaO2 | 91% | SvO2 | 68% |
| Hb | 13 g | Hb | 13 g |

 Answer:

1. A decrease in cardiac output would be evident by a/an       in the C(a-v)O2.
2. Calculate the percent shunt of a patient with an A-a gradient of 200 torr and a C(a-v)O2 of 3.0 vol%.
3. What is the normal range for shunt?
4. If the partial pressure of arterial oxygen is between 40-60 torr, the arterial oxygen saturation can be estimated by
5. If the arterial oxygen tension is 70-90% the PaO2 can be estimated between what values?
6. Define P/F ratio:
7. P/F ratio is used in determination of       .
8. What does the P/F ratio measure?       .
9. What is the normal value of the P/F ratio?
10. Classification of severity: Complete the following table.

|  |  |
| --- | --- |
| **ATS/ERS Criteria (Old School)** | **Berlin Criteria (New School)** |
|  |  |
| **Acute Lung Injury** | **Mild ARDS** |
|       |       |
|  |  |
| **ARDS** | **Moderate ARDS** |
|       |       |
|       |  |
|       | **Severe ARDS** |
|  |       |
|  |       |

**HEMODYNAMIC MONITORING**

1. Define the following hemodynamic terms:
	1. Contractility:
	2. Preload:
	3. Afterload:
	4. Heart rate is usually controlled by the
	5. Hemo:
	6. Dynamics:
	7. Hemodynamics is simply the monitoring of
2. State the normal values for each of the following blood pressures:
	1. Systolic:
	2. Diastolic:
	3. Mean (MAP):
3. List the three factors that control blood pressure:
	1.
	2.
	3.
4. For each of the following, describe how they can increase blood pressure.
	1. Heart:
	2. Blood:
	3. Vessels:
5. For each of the following, describe how they can decrease blood pressure:
	1. Heart:
	2. Blood:
	3. Vessels:
6. Write the formula for calculating mean arterial pressure (MAP):
7. Swan-Ganz Catheter Insertion Procedure:
	1. The catheter is inserted through a       (with the balloon      ) and is advanced into the       and then into the      .
	2. Once the catheter is in the right atrium, the balloon is       to float the catheter into the correct position.
	3. The catheter is directed through the right side of the heart (through the       valve, right       and pulmonary valve) and is positioned in the      .
	4. Once the catheter is positioned in the pulmonary artery, the balloon is      .
	5. The catheter will now use a pressure transducer (strain-guage) to monitor the      .
	6. The transducer should be at the same level as the tip of the catheter. If the transducer is above the catheter, readings are       than actual. If the transducer is below the catheter, readings are       than actual.
	7. When the balloon is inflated (wedged), the catheter will then measure the      .
	8. Mixed venous blood samples are best drawn from the     . The balloon should be       when drawing blood from the pulmonary artery.
	9. Catheters inserted through the jugular or subclavian veins are positioned in the pulmonary artery (PA) when approximately       of the catheter has been inserted. If > 50 cm of the catheter is inserted and no PA waveform is obtained, the catheter is       in the right atrium or right ventricle. If this occurs, the adult critical care specialist should       the balloon and       the catheter.
8. In the diagram below, identify the normal values for the hemodynamic measurements.



1. Complete the following table, filling in the hemodynamic value trends for the pathologies listed and the pathology indicated by each:

|  |  |
| --- | --- |
| Pathologic Problem | Indications |
| Right Hear Failure*
*
 | Elevated CVP*
 |
| Lung Disease*
*
*
 | Elevated PAP*
 |
| Left Hear Failure*
*
 | Elevated PCWP*
*
 |
| Hypervolemia |       |
| Hypovolemia |       |

1. If the patient’s systolic pressure is 120 mm Hg and the pulse pressure is 55 mm Hg, what is the diastolic pressure?
2. List the three (3) methods for determining cardiac output:
	1.
	2.
	3.
3. Normal cardiac output ranges between       and       L/min.
4. A patient has a cardiac output of 6 L/min and a heart rate of 100/min. What is the stroke volume?
5. What is the normal value for cardiac index (CI)?
6. How does the value for CI compare to the value of the cardiac output?
7. Define systemic vascular resistance (SVR):
8. Write the formula for SVR:
9. State the normal value for SVR:
10. What is the factor to convert mm Hg/L/min to dynes?
11. What does the pulmonary vascular resistance (PVR) measure?
12. State the formula used to calculate the PVR:
13. What is the normal range for PVR?
14. List two (2) factors that may cause PVR to increase:
	1.
	2.
15. Calculate the SVR and PVR for a patient with the following parameters:

|  |  |
| --- | --- |
| MAP | 95 torr |
| CVP | 10 torr |
| MPAP | 20 torr |
| PCWP | 8 torr |
| QT | 4 L/min |

 SVR =

 PVR =

**LABORATORY TESTING**

1. What does a CBC measure?
2. For each of the following hematology tests, identify what it stands for, briefly describe it, give the normal value, and the significance of an abnormally low and high value:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test | Term | Description | Normal Value/Range | Significance of Low Values | Significance of High Values |
| RBC |       |       |       |       |       |
| Hb |       |       |       |       |       |
| Hct |       |       |       |       |       |
| WBC |       |       |       |       |       |

1. What are neutrophils?
2. Describe the difference between bands and segs:
	1. Bands:
	2. Segs:
3. What pathology would show an increase in eosinophils?
4. Describe the signs and symptoms of an electrolyte imbalance:
5. What do lactate levels indicate?
6. What is the normal lactate level?
7. Lactate is produced during
8. Falling lactate levels can be useful in determining
9. Define serum glucose:
10. What is the normal value for serum glucose?
11. Hyperglycemia can be the result of
12. Hypoglycemia can be the result of
13. Briefly describe each of the following coagulation studies, identify the normal value, and the significance of the test:

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Description | Normal Value | Significance of Test |
| Clotting Time |       |       |       |
| Platelet Count |       |       |       |
| Activated Partial Thromboplastin Time |       |       |       |
| Prothrombin Time |       |       |       |
| International Normalized Ratio |       |       |       |
| Thrombocytopenia |       |       |       |
| Thrombocytosis |       |       |       |
| D-dimer |       |       |       |

1. Describe the difference between a culture and a sensitivity test:
	1. Culture:
	2. Sensitivity:
2. Culture and sensitivity (C&S) tests are used to identify      .
3. How long does it take to obtain the results of a C&S test?
4. What information is obtained from a gram stain?
5. How long does it take to obtain the results from a gram stain test?
6. What bacteria are identified by an acid fast stain?
7. Hemoximetry directly measures      .
8. Hemoximetry can be used to diagnose      .
9. What is the normal value for COHb?
10. Define creatinine:
11. What does creatinine evaluate?
12. What is the normal value for creatinine?
13. Define Blood Urea Nitrogen (BUN):
14. What does BUN evaluate?
15. What would an increase in BUN level indicate?
16. List the different places from the body that a fluid specimen can be obtained for examination:

**IMAGING STUDIES**

1. Describe the normal appearance of each of the following structures on a chest X-ray:
	1. Hemidiaphragms:
	2. Trachea:
	3. Clavicles:
2. List three (3) possible causes for loss of airway patency:
	1.
	2.
	3.
3. What condition causes obliteration of the costophrenic angles?
4. In what pathology would the diaphragm be flattened bilaterally?
5. Describe each of the following positions used for chest X-ray and when they are indicated.
	1. AP projection:
	2. PA projection:
	3. Lateral position:
	4. Lateral decubitus:
	5. End expiratory image:
6. Where should the tip of a correctly placed endotracheal tube be positioned when viewed on a chest roentgenogram?
7. Describe the proper position of the cuff of an endotracheal or tracheostomy tube on an X-ray:
8. Describe where each of the following should be located when positioned properly.
	1. Pacemaker:
	2. Pulmonary artery catheter:
	3. Central venous catheter:
	4. Chest tube:
	5. Nasogastric and feeding tube:
9. Complete the Radiology Terminology and Interpretation chart below:

|  |  |  |
| --- | --- | --- |
| **TERMINOLOGY** | **DESCRIPTION** | **DIAGNOSIS** |
| Radiolucent |       |       |
| Radiodense/opacity |       |       |
| Infiltrate |       |       |
| Consolidation |       |       |
| Hyperlucency |       |       |
| Vascular markings |       |       |
| Diffuse |       |       |
| Opaque |       |       |

1. Complete the Diagnostic Description and Interpretation chart below:

|  |  |  |
| --- | --- | --- |
| **TERMINOLOGY** | **DESCRIPTION** | **DIAGNOSIS** |
| Fluffy infiltrates |       |       |
| Butterfly/batwing pattern |       |       |
| Patchy infiltrates |       |       |
| Platelike infiltrates |       |       |
| Ground glass appearance |       |       |
| Honeycomb pattern |       |       |
| Diffuse bilateral radiopacity |       |       |
| Air bronchogram |       |       |
| Peripheral wedge-shaped infiltrate |       |       |
| Concave superior interface/border |       |       |
| Basilar infiltrates with meniscus |       |       |
| Cavity formation in upper lobes |       |       |
| Deep sulcus sign |       |       |

1. List five (5) reasons or indications for abdominal radiographs:
	1.
	2.
	3.
	4.
	5.
2. List five (5) reasons or indications for spinal radiographs:
	1.
	2.
	3.
	4.
	5.
3. Describe a CT scan:
4. With what pathologies would a chest CT be indicated? (List two)
	1.
	2.
5. What special type of CT scan is indicated to diagnose a pulmonary embolus?
6. With what pathologies would an abdominal CT be indicated? (List two)
	1.
	2.
7. With what pathologies would a brain CT be indicated? (List two)
	1.
	2.
8. What are two of the advantages of using MRI over a conventional X-ray?
	1.
	2.
9. List the six (6) different types of ultrasound tests and their indications or what they can identify.

|  |  |
| --- | --- |
| Ultrasound | Indication/Identify |
|       |       |
|       |       |
|       |       |
|       |       |
|       |       |
|       |       |

1. What does a V/Q scan evaluate?
2. Describe the following terms:
	1. Mismatch:
	2. “Matching” indicates:
3. Brain scans are commonly used to diagnose      .
4. List two (2) indications for a brain scan:
	1.
	2.
5. List the eight (8) different types of angiography ultrasound tests and their indications or what they can identify:

|  |  |
| --- | --- |
| **Angiography** | **Indications/Identify** |
|       |       |
|       |       |
|       |       |
|       |       |
|       |       |
|       |       |
|       |       |
|       |       |

1. A PET scan would be useful to help diagnose what conditions?

**ARTERIAL BLOOD GAS INTERPRETATION**

1. Complete the table below, identifying the normal arterial, acceptable range and normal venous parameters:

|  |  |  |  |
| --- | --- | --- | --- |
| **PARAMETER** | **NORMAL** **ARTERIAL** | **ACCEPTABLE****RANGE** | **NORMAL****VENOUS** |
| PaCO2 |       |       |       |
| PaO2 |       |       |       |
| pH |       |       |       |
| SaO2 |       |       |       |
| HCO3- |       |       |       |
| BE |       |       |       |
| Hb |       |       |       |
| CaO2 |       |       |  |
| CvO2 |  |       |       |

1. Ventilation: Complete the table below, providing the interpretation and response for each ABG value:

|  |  |  |
| --- | --- | --- |
| **ABG Value****(PaCO2)** | **Interpretation** | **Response** |
| 35-45 torr |       |       |
| Above 45 torr |       |       |
| Below 35 torr |       |       |

1. Oxygenation: (PaO2, FIO2) Complete the table below, providing the interpretation and response for each ABG value:

|  |  |  |  |
| --- | --- | --- | --- |
| ABG Value(PaO2) | FIO2 | Interpretation | Response |
| 80-100 torr | .21 |       |       |
| Below 80 torr(Hypoxemia) | 0.21-0.59 | Hypoxemia due to:1.
2.
 | 1.
2.
 |
| Below 80 torr(Hypoxemia) | 0.60 |       |       |
| Above 100 torr(Hyperoxia) | 0.22-1.0 |       |       |

1. Acid-Base Interpretation: There are three (3) steps to acid-base interpretation.
	1. Acidosis vs. Alkalosis (complete the chart below)

|  |  |
| --- | --- |
| **pH** | **Interpretation** |
| 7.35-7.45 | Acceptable range – compensated |
| <7.35 | Acidosis – non-compensated(due to increased       or low      ) |
| >7.45 | Alkalosis – non-compensated(due to increased       or low      ) |

1. Compensated vs. Non-Compensated (Chronic vs. Acute)
	1. When the pH is inside the acceptable range (7.35-7.45) then it is termed
	2. When the pH is outside of the acceptable range it is termed
2. Respiratory vs. Metabolic
	1. A respiratory acidosis or alkalosis is the diagnosis when the pH is abnormal because of a change in the      .
	2. A metabolic acidosis or alkalosis is the diagnosis when the pH is abnormal because of a change in the      .
3. Partially compensated and mixed blood gases:
	1. A partial compensation occurs when the pH is out of normal range and both CO2 and HCO3- are changing      .
4. Interpret the following ABG by answering the following questions about each:

|  |  |
| --- | --- |
| pH | 7.30 |
| PaCO2 | 62 torr |
| PaO2 | 70 torr |
| FIO2 | 0.21 |

* 1. Is the patient ventilating?
	2. Is the patient oxygenating?

If no, pick one [ ]  Poor ventilation [ ]  V/Q Mismatch [ ]  Shunting

* 1. What is the acid-base status?

[ ] Normal [ ] Acidosis [ ] Alkalosis

[ ] Respiratory [ ] Metabolic

[ ] Compensated (Chronic) [ ] Uncompensated (Acute)

[ ] Partially compensated [ ] Mixed or Combined

* 1. What should be done for this patient?
1. Special pathologies.
	1. Type #1 patients have an ABG that appears       but the patient appears      .
	2. Type #2 patients have an ABG that appears       but the patient appears      .
	3. What patients would be considered type #1 patients?
	4. What patients would be considered type #2 patients?
	5. How could the adult critical care specialist determine if a patient with COPD was suffering from oxygen induced hypoventilation?
	6. What is the recommended treatment for oxygen induced hypoventilation?
	7. What reference point is used to determine if the oxyhemoglobin dissociation curve has shifted?      .

**ELECTROCARDIOGRAPHY (ECG)**

1. Describe two (2) methods used to estimate the heart rate on an ECG tracing:
	1.
	2.
2. Describe how the adult critical care specialist should treat each of the following cardiac arrhythmias:

|  |  |
| --- | --- |
| Rhythm | Treatment |
| Sinus Arrhythmia |       |
| Sinus Tachycardia |       |
| Sinus Bradycardia |       |
| PVC |       |
| Multifocal PVC |       |
| Pulseless V-tach |       |
| V-tach with a pulse |       |
| V-fib |       |
| Asystole |       |
| 1st degree heart block |       |
| 2nd degree heart block(Mobitz I and II) |       |
| 3rd degree heart block |       |

1. What two (2) factors will affect the direction of the axis?
	1.
	2.
2. What is the direction of the normal axis?
3. Briefly describe each term and how it would appear on the ECG tracing:

|  |  |  |
| --- | --- | --- |
| **Term** | **Definition** | **ECG Pattern** |
| Ischemia |       |       |
| Injury |       |       |
| infarction |       |       |

**METABOLIC STUDIES**

1. Write the formula for the ratio of CO2 production to oxygen consumption (RQ):
2. What is the normal range for the RQ?
3. Complete the following table and indicate the RQ for the type of food group metabolized by the patient for energy:

|  |  |
| --- | --- |
| Food Group Metabolized | RQ |
| Carbohydrates |       |
| Fats |       |
| Proteins |       |

1. Assessment of RQ may be helpful in       to adjust their      .
2. List the three (3) types of disorders that affect the endocrine system:
	1.
	2.
	3.

**ETHICAL PRINCIPLES**

1. Define the following ethical principles:
	1. Autonomy:
	2. Veracity:
	3. Nonmaleficence:
	4. Beneficence:
	5. Confidentiality:
	6. Justice:
	7. Role Duty: