SECTION 5

Clinical Practice: Trunk

- **Abdominal**
- **Genitourinary**
- **Pulmonary Issues**
- **Thoracic**

SECTION 5: QUESTIONS

1. **Which of the following structures is not located in the mediastinum?**
   A. The vagus and phrenic nerves
   B. Lymph nodes
   C. Esophagus
   D. Trachea

2. **Which statement below is false with regard to the thoracic duct?**
   A. The duct transports 60–70% of ingested fat into the blood stream
   B. The duct empties into the venous system at the junction of the subclavian and internal jugular veins
   C. The duct empties into the right jugular vein
   D. The duct is protected by the mediastinum anteriorly

3. **Advantages to the utilization of ultrasound when assessing thoracic injuries does not include**
   A. Ultrasound allows for rapid assessment
   B. Ultrasound does not require transport
   C. Ultrasound is noninvasive
   D. No expertise is needed to perform

4. **Immediate life-threatening injuries do not include which of the following situations**
   A. Cardiac tamponade
   B. A tension pneumothorax
   C. A flail chest
   D. An aortic rupture

5. **Which of the following situations is least likely to put a patient at risk for a tension pneumothorax?**
   A. Decreased intrapleural pressure
   B. Barotrauma
   C. Lung parenchyma injury
   D. A clamped chest tube

6. **The chest tube that was inserted in your patient for a pneumothorax became dislodged then fell to the floor. There will be a delay before a new chest tube can be inserted. As a trauma nurse, you know the appropriate emergency action to mitigate this problem is**
   A. Reuse the chest tube that fell to the floor after cleaning it with antiseptic
   B. Apply a three-sided sterile dressing to the wound
   C. Place a sterile, nonporous dressing on the wound
   D. Apply an occlusive dressing to the wound

7. **During the postcardiac arrest phase, titration of inspired oxygen to the lowest level to achieve an arterial oxygen saturation of _____ or greater is recommended.**
   A. 92%
   B. 94%
   C. 96%
   D. 99%

8. **Your patient has a confirmed flail chest. What alteration in acid–base balance would you expect this patient to have with this condition?**
   A. Metabolic alkalosis
   B. Metabolic acidosis
   C. Respiratory acidosis
   D. Respiratory alkalosis

9. **Patients with uncontrolled asthma may receive steroids and neuromuscular blocking agents in an attempt to mitigate their symptoms. These patients are at increased risk for**
   A. Hypertension
   B. Prolonged muscle weakness
   C. Renal failure
   D. Hepatic failure

10. **When assessing the abdomen, it is generally divided into four quadrants. The right upper quadrant (RUQ) is assessed for injuries to the**
   A. Stomach, spleen, splenic flexure of the colon
   B. Ascending colon, appendix, pancreas
   C. Liver, spleen, jejunum
   D. Liver, gall bladder, head of the pancreas

11. **Which of the following statements is true when a patient has a pulmonary embolism?**
   A. Respiratory acidosis occurs
   B. Heparin is used to dissolve clots
   C. Normal D-dimer results can rule out a pulmonary embolism
   D. Metabolic alkalosis develops

12. **Pulmonary embolism is actually considered a complication of deep venous thrombosis. To assess for deep venous thrombosis, which of the following signs should be assessed?**
   A. Moses's
   B. Davis's
   C. Corrigan's
   D. Hamman's

13. **A middle-aged female was admitted to the ED after a fall from a tree. She now complains of stabbing substernal pain each time she changes her position. Her chest X-ray results were just relayed to you by the ED trauma attending. The patient has been diagnosed with a pneumomediastinum. A common significant finding in a patient with a pneumomediastinum is**
   A. Cullen's sign
   B. Grey-Turner's sign
   C. Hamman's sign
   D. Handes's sign

14. **Which of the following drugs is classified as a methylxanthine?**
   A. Morphine
   B. Theophylline
   C. Prednisone
   D. Atropine

15. **While ambulating your patient, he suddenly collapses. During your primary assessment, you discover the patient is in respiratory arrest but does have a perfusing rhythm. Prior to the arrival of additional ED staff, you obtain a bag-valve mask device. According to the 2015 American Heart Association guidelines for CPR and ECC, how often should you squeeze the bag to assist ventilations on this patient?**
   A. Once every 4 seconds
   B. Once every 5 to 6 seconds
   C. 10 to 15 times per minute
   D. 12 to 15 times per minute

16. Interpret the following arterial blood gas values from a patient who was treated in your ED four days ago for a fractured ulna.

pH	7.43
CO_2	37
HCO_3	25

A. Compensated respiratory acidosis
B. Normal
C. Compensated metabolic acidosis
D. Compensated metabolic alkalosis

17. Analyze the following arterial blood gas values from a patient in acute kidney failure:

pH	7.11
CO_2	67
HCO_3	15

A. Uncompensated respiratory acidosis
B. Uncompensated metabolic alkalosis
C. Compensated metabolic acidosis
D. Uncompensated (mixed) respiratory/metabolic acidosis

18. Analyze the following arterial blood gas values for a patient who ingested methanol:

pH	7.39
CO_2	24
HCO_3	16

A. Compensated respiratory alkalosis
B. Compensated metabolic acidosis
C. Uncompensated metabolic acidosis
D. Uncompensated respiratory acidosis

19. Which of the following statements about laryngeal mask airways (LMA) is true?

A. An LMA may be inserted by any nurse
B. An LMA may cause hoarseness after removal
C. The patient must have an absent gag reflex
D. The LMA eliminates the risk of aspiration

20. During a cardiac arrest, your patient aspirated gastric contents. Which of the following statements is true regarding this type of aspiration?

A. If the pH of the material is < 2.5, necrosis will be minimal
B. The patient always develops ARDS
C. Onset of symptoms is gradual
D. There is little danger of atelectasis

21. Your patient was normally a very active skateboarder. Today he slipped and fell, causing several lacerations and a left Colles' fracture. During assessment, you ascertain the patient is dyspneic with a temperature of 101.4 and some trouble swallowing. The patient was subsequently diagnosed with aspiration pneumonitis. As a trauma nurse, you know the most severe pulmonary reaction may occur from the aspiration of

A. A nonacidic liquid
B. Salt water
C. Gastric contents with a pH greater than 2.5
D. Acidic food particles

22. Pulse oximetry should never be used

A. To determine oxygen saturation values
B. During a cardiac arrest
C. As a determinant for predicting hemoglobin affinity for oxygen
D. To help determine a patient's activity tolerance

23. Which of the following statements is true regarding chest tube drainage systems?

A. Drainage of frank blood in amounts $>$ 100 ml/hour is not significant
B. Drainage tubing should be placed horizontally on the bed, then down to the collection chamber
C. All drainage tubing should be dependent to the insertion site
D. Chest tube drainage from a mediastinal tube should bubble in the water seal chamber

24. Ecchymotic splotches sometimes seen on labia, scrotum, and perineum secondary to pelvic fractures are known as

A. Cullen's sign
B. Coopernail's sign
C. Mose's sign
D. Gray-Turner's sign

25. Analyze the following blood gas values from a patient who is suffering from asthma:

pH 7.47
CO_2 29
HCO_3 24

A. Uncompensated respiratory alkalosis
B. Compensated respiratory acidosis
C. Compensated metabolic alkalosis
D. Uncompensated metabolic acidosis

26. Interpret the following arterial blood gas values from a patient with atelectasis:

pH 7.46
CO_2 29
HCO_3 22

A. Uncompensated metabolic alkalosis
B. Uncompensated respiratory alkalosis
C. Compensated respiratory alkalosis
D. Compensated metabolic alkalosis

27. Analyze the following arterial blood gas values from a patient with restrictive lung disease:

pH 7.32
CO_2 67
HCO_3 25

A. Uncompensated metabolic alkalosis
B. Uncompensated respiratory acidosis
C. Compensated metabolic acidosis
D. Compensated respiratory acidosis

28. Review the following arterial blood gas values:

pH 7.37
CO_2 36
HCO_3 24

A. Normal
B. Compensated respiratory acidosis
C. Compensated metabolic acidosis
D. Compensated respiratory alkalosis

29. One of the most effective ways to relieve bronchospasms is

A. To administer adrenalin
B. To administer an antihistamine
C. To administer prednisone
D. To administer a B2 receptor agonist

30. When the emergency department resident attempts to place a central line, air is accidentally introduced into the line when the IV tubing becomes disconnected. The best position in which to place this patient to minimize a venous air embolism is

A. Trendelenburg with left decubitus tilt
B. Right side
C. Reverse Trendelenburg
D. Left side

31. A risk factor for development of thrombotic emboli includes which of the following conditions?

A. A patient who is one week postpartum
B. Carcinoma
C. Long bone fractures
D. Heparin administration

32. Your patient was struck head-on by another car in a parking lot. The impact, though slow speed, caused the airbag to deploy. The powder from the airbag caused an acute exacerbation of reactive airway disease. The patient has a history of asthma. Which of the following signs indicates this patient is suffering from an acute episode of respiratory distress?

A. Expiratory wheezes
B. Grunting
C. Sternocleodomastoid retractions
D. Inspiratory wheezes

33. Your patient has ceased wheezing during his asthma attack. This change in his condition

A. Indicates the patient is improving
B. Only means the nebulizer treatment is working
C. Indicates the patient is in complete respiratory failure
D. Means the patient's anxiety has decreased

34. The American Heart Association has classified acute pulmonary embolisms into three categories: massive, submassive, or low risk. A submassive pulmonary embolism is characterized by

A. An acute PE with evidence of right ventricular dysfunction or myocardial dysfunction
B. A patient without ventricular dysfunction
C. An acute PE with sustained BP $<$ (90 mmHg) for more than 15 minutes
D. An acute PE with redistribution of ventilation to all lung fields

35. Pulse oximetry readings are considered unreliable when oxygen saturation levels fall below

A. 55%
B. 60%
C. 80%
D. 70%

36. The nursing student assigned to you for the day asks you to explain the oxyhemoglobin dissociation curve. You reply that the oxyhemoglobin dissociation curve is

A. A relationship between dissolved oxygen and the affinity for oxygen by the hemoglobin molecule
B. A graphic representation of carbon dioxide content versus oxygen content in arterial blood
C. A measure of methemoglobin
D. A way to calculate gas transport across the alveoli

37. Your patient with COPD has been receiving 600 mg of theophylline daily in divided doses. Which of the following assessment findings should be reported to the physician immediately, as these findings represent potential theophylline toxicity?

A. The patient is lethargic
B. Atrial tachycardia with occasional PVCs has developed
C. The patient's blood glucose is 50
D. The patient has a systolic blood pressure of 160 mmHg

38. Which of the following actions should not be performed initially in the ED when a patient has sustained a pelvic fracture?

A. A FAST examination
B. Placement of a urinary catheter
C. Administration of analgesia
D. Administration of a neuromuscular block

39. A measurement of total oxygen consumption is

A. SvO_2
B. $ETCO_2$
C. $PtCO_2$
D. SjO_2

40. Your patient required endotracheal intubation. Which of the following statements is true regarding the use of capnography to verify endotracheal tube placement?

A. Placement of the device can be difficult to learn initially
B. It is not necessary to auscultate lung sounds when this device is used
C. $ETCO_2$ is a moderately reliable indicator of correct tube placement
D. It is not a substitute for pulse oximetry

41. Your patient had 1,420 ml of pleural effusion removed via thoracentesis and immediately began coughing and was dyspneic. You believe this patient has developed

A. Reexpansion pulmonary edema
B. A pneumothorax
C. A cardiac tamponade
D. A hemothorax

42. Three days ago, during a home renovation, your patient had several sheets of drywall fall on him. The result was two cracked ribs and multiple contusions. In the ED the patient was placed on a 60% nonrebreather mask. The patient was sent home with supplemental oxygen at 2 L/min via nasal cannula. The patient's family gathered personal belongings and the tubing used on the patient in the ED. At home, the patient was placed on the nonrebreather mask at 60% because the family thought it should be the same as what they saw in the hospital.

The patient returned to the ED today suffering substernal chest pain exacerbated when deep breathing. The patient also states his allergies are causing a dry cough, some nasal stuffiness, some pain in both ears, and a sore throat. The chest pain becomes more pronounced and pleuritic in nature. The patient is anxious because he thinks the pain was caused by his actions. This patient has been on a 60% nonrebreather mask for two days. It is likely this patient may be suffering from

A. A pulmonary embolism
B. Hypoxemia
C. Hyperoxia
D. Pneumothorax

43. A student nurse asks you to explain the concept of hypoxemia. Hypoxemia is best defined as

A. A decrease in oxygen at the cellular level
B. A decrease in oxygen at the alveolar level
C. A decrease in oxygen levels in venous blood
D. A decrease in oxygen levels in arterial blood

44. Which of the following conditions is the most probable cause of the acid–base imbalance of uncompensated respiratory alkalosis?

A. Kidney failure
B. A side effect of theophylline
C. Hyperventilation
D. Hypoventilation

45. A renal transplant that results from humoral rejection or acute cellular rejection may be definitively diagnosed only via

A. Ultrasound
B. Nuclear scan
C. Doppler scan
D. Renal biopsy

46. Evaluate the following arterial blood gas values from a patient who has been vomiting the past hour:

pH	7.36
CO_2	27
HCO_3	19

A. Compensated metabolic acidosis
B. Compensated respiratory acidosis
C. Uncompensated metabolic acidosis
D. Uncompensated respiratory acidosis

47. Analyze the following capillary blood gas results for a patient on 21% oxygen who has been ambulating in the hallway:

pH	7.44
CO_2	41
HCO_3	23

A. Compensated respiratory acidosis
B. Compensated respiratory alkalosis
C. Normal
D. Compensated metabolic acidosis

48. Interpret the following arterial blood gas results from a patient with a ventricular septal injury from a stab wound:

pH	7.57
CO_2	22
HCO_3	32

A. Uncompensated (mixed) respiratory/metabolic alkalosis
B. Compensated respiratory acidosis
C. Compensated metabolic alkalosis
D. Uncompensated respiratory alkalosis

49. Which of the following statements is true about agonal gasps?

A. Agonal gasps are an indication of an extra thoracic obstruction
B. Gasping is a sign of cardiac arrest
C. Gasping is an abnormal pattern, but one that will provide ventilation
D. Agonal gasps indicate brain herniation

50. The volume of gas remaining in the lungs at the end of one normal expiration is called

A. Residual volume
B. Capacitance
C. Total lung capacity
D. Functional residual capacity

51. The volume of gas left in the lungs following a maximal respiratory effort is known as the

A. Vital capacity
B. Total lung capacity
C. Residual volume
D. Dead airspace

52. The functional residual capacity is defined as

A. The amount of air in the lungs after normal expiration
B. The amount of gas that can be forcefully exhaled after maximum inspiration
C. The amount of gas normally exhaled after a maximum inhalation
D. The amount of gas left in the lungs after a maximum exhalation

53. Your patient was brought to the ED by ambulance from a rehabilitation center. The patient was evacuated because the kitchen area of the center caught fire. The patient has an indwelling catheter, is in a wheelchair, and has a temperature of 100.4°F. The respiratory therapist who has just drawn an ABG sample asks you if the patient has a fever. The possibility of fever will have what effect on the sample he just collected?

A. The PO_2 will be falsely elevated
B. The pH will rise
C. Fever has no effect
D. The HCO_3 will be elevated

54. The cells responsible for forming a barrier for alveoli are known as

A. Histocytes
B. Type II alveolar epithelial cells
C. Macrophages
D. Type I alveolar epithelial cells

55. Analyze the following arterial blood gas values obtained from a patient who is suffering from pneumonia:

pH	7.37
CO_2	67
HCO_3	36

A. Uncompensated metabolic alkalosis
B. Compensated respiratory acidosis
C. Compensated metabolic acidosis
D. Uncompensated respiratory acidosis

56. Type II alveolar cells produce

A. Surfactant
B. Phagocytes
C. Macrocytes
D. Carbon dioxide

57. The FiO_2 for a nasal cannula set at a flow rate of 6 L/min is

A. 21%
B. 24%
C. 30%
D. 40%

58. A diagnosis of asthma may be made by

A. A PEFR of 100–125
B. A FiO_2 of 80%
C. A decreased FEV_1
D. Wheezing

59. An absolute contraindication for use of rapid sequence intubation is

A. Total loss of facial and/or oropharyngeal landmarks, which requires a surgical airway
B. An airway where intubation may not be successful
C. A "crash" airway where the patient is in arrest
D. There is no absolute contraindication for the use of rapid sequence intubation

60. Which of the following situations is not an indication for the use of rapid sequence intubation?

A. Prolonged respiratory effort that results in fatigue or failure
B. Uncooperative trauma patient with life-threatening injuries
C. Stab wound to neck with expanding hematoma
D. All cervical spine injuries

61. During rapid sequence intubation (RSI), cricoid cartilage pressure is often used to help prevent vomiting and aspiration of gastric contents. The esophagus is obstructed by the pressure to the anterior neck. This maneuver is known as the

A. Hamman's maneuver
B. King maneuver
C. Sellick maneuver
D. Pitt maneuver

62. When performing CPR on a cardiac arrest patient, as a trauma nurse, you know the best, most reliable way to confirm placement of an endotracheal tube is

A. Auscultation of upper and lower lung fields
B. Use of a CO_2 detector
C. Continuous waveform capnography ($PetCO_2$)
D. Pulse oximetry

63. Interpret the following arterial blood gas results from a victim of a gunshot wound to the chest:

pH	7.22
CO_2	63
HCO_3	23

A. Compensated respiratory acidosis
B. Uncompensated metabolic acidosis
C. Uncompensated respiratory acidosis
D. Normal

64. One cause of decreased SvO_2 in a patient is

A. An increased metabolic rate
B. Sedation
C. A decreased metabolic rate
D. Increased cardiac output

65. Which of the following statements about diagnostic peritoneal lavage (DPL) is true?

A. The results of DPL are always accurate
B. A Foley and gastric tube should be placed prior to the DPL
C. If 3 ml of frank blood is readily drawn back, the unstable patient must go to the OR
D. A DPL should be avoided in patients with spinal cord injuries

66. Your patient has a hemothorax. What is the proper location of a chest tube for evacuation of a hemothorax?

A. Second intercostal space, midclavicular line
B. Second intercostal space, midaxillary line
C. Fifth intercostal space, midaxillary line
D. Fifth intercostal space, midclavicular line

67. Where does the hypoxemic drive to breathe originate?

A. The cerebellum
B. The aortic and carotid arteries
C. The hypothalamus
D. The medulla

68. Breathing high concentrations of oxygen may wash out nitrogen that is present in alveoli. The nitrogen helps keep the alveoli open. If oxygen replaces nitrogen in the alveoli, the alveoli will shrink and begin to collapse. This phenomenon is considered an adverse effect and is known as

A. Oxygen toxicity
B. Absorption atelectasis
C. A pulmonary dysplasia
D. Pulmonary hypertension

69. A patient recently admitted from the ED requires immediate intubation. The physician orders succinylcholine. Which of the following conditions is not a side effect of succinylcholine?

A. Malignant hyperthermia
B. Increased intraocular pressure
C. Hypotension
D. Hypokalemia

70. Patients who have sustained crush injuries are susceptible to

A. Hypokalemia
B. Lowered CK levels
C. Rhabdomyolysis
D. Alkalized urine

71. Soon after arriving for your shift, you assume the care of a patient with virtually no report given as to the patient's condition or diagnosis. The ED nurse who transferred your patient to you did report that your patient had been previously intubated by paramedics with a laryngeal mask airway (LMA). The patient is now conscious and is on a nasal cannula at 2 L/min. Which of the following statements is true regarding the use of LMAs?

A. Nurses routinely insert these airways
B. There is a low risk of aspiration
C. It is a temporary airway
D. The vocal cords must be visualized

72. An action of nitric oxide includes which of the following effects?

A. Vascular smooth muscle relaxation
B. To augment prostaglandin synthesis
C. To release macrophages
D. To increase pulmonary vascular resistance

73. Which of the following statements is true regarding the administration of CPAP?

A. CPAP cannot be delivered via an endotracheal tube
B. CPAP allows for a decrease in functional residual capacity
C. CPAP provides decreased pressure to the posterior pharynx
D. CPAP may be administered via nasal prongs

74. An adverse effect of excessive CPAP is

A. Continuous need to increase oxygen over time
B. A rise in intrathoracic pressure
C. Intraventricular hemorrhage
D. A sudden change in cerebral blood flow

75. Your patient is suffering from acute liver failure. The arterial blood gas results from the sample drawn one hour ago show the patient has respiratory alkalosis. Which of the following arterial blood gas results would support that diagnosis?

A. pH 7.27, CO_2 24, HCO_3 24
B. pH 7.47, CO_2 24, HCO_3 24
C. pH 7.57, CO_2 44, HCO_3 32
D. pH 7.37, CO_2 67, HCO_3 26

76. In the ED, patients may be mechanically ventilated by a variety of ventilator modes. Which of the following ventilator modes allows the patient to breathe spontaneously?

A. HFV
B. SIMV
C. CMV
D. Oscillator

77. Your patient will require long-term ventilatory support via a tracheostomy. A disadvantage of using a tracheostomy tube is

A. Subcutaneous emphysema
B. It increases airway resistance
C. The airway is less stable
D. It allows for right mainstem intubation

78. Analyze the following arterial blood gas values from a patient who has been taking large quantities of antacids:

pH	7.53
CO_2	42
HCO_3	37

A. Uncompensated metabolic alkalosis
B. Compensated metabolic acidosis
C. Uncompensated respiratory alkalosis
D. Uncompensated mixed respiratory/metabolic alkalosis

79. Your patient fell down a flight of stairs, breaking several ribs in two or more places and suffering internal injuries. Which of the following injuries would mandate the use of pain control?

A. Flail chest
B. ARDS
C. A splenectomy
D. Hemothorax

80. Your patient has sustained a stab wound to the area of the right anterior axillary line at the fifth intercostal space. The patient is hypotensive, tachypneic, tachycardic, and restless. O_2 at 100% via mask is provided. Two large bore IVs have been placed and crystalloids are infusing. As a trauma nurse, you would expect to prepare for

A. An autotransfusion
B. Immediate surgery
C. A paracentesis
D. Placement of a chest tube

81. A blunt cardiac injury is most likely to affect which of the following chambers of the heart?

A. Right ventricle
B. Left ventricle
C. Right atrium
D. Left atrium

82. Your patient was resting quietly on the gurney, awaiting transport to X-ray to evaluate a possible fractured right tibia and patella. Suddenly the patient complains of right-sided chest pain, tachypnea at rate of 40, cyanosis, and JVD. No breath sounds are now audible over the right lung fields. The trachea is deviated to the left and heart tones are distant. This patient is most likely suffering from

A. A pericardial effusion
B. A tension pneumothorax
C. A Ludwig's angina
D. An inferior wall MI

83. If a projectile strikes the precordium during the vulnerable part of the cardiac cycle, this is known as

A. Mechanical energy
B. Kinetic force
C. Blunt force
D. Commotio cordis

84. The most common location of a sternal fracture is

A. The xiphoid process
B. The manubrium
C. The sternal angle
D. The sternoclavicular joint

85. Which of the following rib fractures are associated with high mortality?

A. The first, second, and third ribs
B. The right lower ribs
C. The left lower ribs
D. Fractures of ribs 4–9

86. Which of the following conditions is not considered a complication of a pulmonary contusion?

A. ARDS
B. Atelectasis
C. Pneumonia
D. Crackles

87. Your patient had a chest tube placed for a pneumothorax. The patient had his motorcycle fall on his chest, and was bruised and cracked rib 4 on the right. Your patient exhibits ST segment depression on his EKG along with moderate, substernal chest pain. These findings indicate a possible

A. Anteroseptal MI
B. Myocardial ischemia episode
C. Lateral wall MI
D. Pericardial tamponade

88. During inspiration your patient has a paradoxical rise in jugular venous pressure. This phenomenon is commonly associated with which of the following cardiac conditions?

A. Mitral stenosis
B. Right heart failure
C. An anterior wall MI
D. Increased ventricular compliance

89. Your patient came to the ED with severe abdominal pain following a blunt force injury suffered during an assault. It was determined that the patient is at extreme risk for peritonitis. The patient had a J-tube placed while waiting for an ICU bed. This patient is at great risk for which of the following electrolyte deficits?

A. Sodium
B. Magnesium
C. Manganese
D. Phosphorus

90. On an EKG, upright QRS in leads V_1 and V_2 indicate which of the following types of bundle branch block?

A. Right
B. Left
C. Dual bundle branch block
D. Only leads aVF and III diagnose bundle branch blocks

91. Structures located in the retro-peritoneum include:

A. Liver, spleen, sigmoid colon
B. Adrenal glands, spleen, transverse colon
C. Small intestine, liver, gall bladder
D. Kidneys, adrenal glands, pancreas

92. Your patient suffered an episode of bradycardia that resulted in a heart rate decreasing to the 20s. The patient had just been deeply suctioned. The low heart rate was unresponsive to oxygen support and a dose of atropine, so assisted ventilation via a bag-valve mask was provided. The heart rate finally improved to prebradycardic levels. Which of the following potential complications of atropine administration may now occur?

A. Diuresis
B. Hypertension
C. Rebound bradycardia
D. Headache

93. A biomarker that is not cardiac-specific but can be elevated by falls, cardiopulmonary resuscitation, and injections is

A. C-reactive protein
B. Myoglobin
C. INR
D. BNP

94. A sign of necrosis seen on an EKG would include

A. Acute ST elevation
B. A right BBB
C. A left BBB
D. A Q wave in Lead III

95. Your patient was observing practice at the local high school when she was struck by a player that overran the sidelines. The patient sustained a blunt chest injury and on assessment you auscultated a pericardial friction rub. A pericardial friction rub would be best heard at

A. The 3rd intercostal space, on the left sternal border
B. The 2nd intercostal space, right sternal border
C. The 5th intercostal space, mid-clavicular line
D. The 5th intercostal space, mid-clavicular line

96. A function of a red blood cell is

A. Cell humoral mediation
B. To function as a macrophage
C. To initiate hemostasis
D. Carbonic acid dissociation

97. Type II HIT patients are at great risk for developing

A. Generalized bleeding
B. Pericarditis
C. Thrombosis
D. Limb amputation

98. How does low-molecular-weight heparin (LMWH) differ from unfractionated heparin?

A. It is more difficult to administer
B. There are more side effects with LMWH
C. LMWH is more stable
D. Unfractionated heparin is easier to administer

99. Hemoglobin is primarily phagocytized in the

A. Liver
B. Gallbladder
C. Spleen
D. Pancreas

100. Which of the following statements about a stable pelvic fracture is true?

A. A stable pelvic fracture results when the posterior elements of the ring are disrupted
B. Stable pelvic fractures are only caused by direct trauma and crush injuries
C. Stable fractures cause large amounts of bleeding
D. Stable fractures do not transect the pelvic ring

101. If a patient has truncal obesity and has sustained a pelvic fracture, it is possible to initially stabilize the fracture via

A. Internal rotation of lower extremities and taping the knees together
B. Closing the fracture under fluoroscopy
C. Surgery only
D. Fluoroscopy

102. The peritoneal cavity contains which of the following structures?

A. The small intestine, pancreas, adrenal glands
B. The ascending and descending colon, aorta, vena cava
C. The spleen, uterus, kidneys
D. The liver, spleen, stomach

103. Which of the following statements is true about an acute rotator cuff tear?

A. Symptoms appear slowly and result in moderate diffuse pain in the arm
B. The patient is unable to adduct the arm and there is severe pain
C. The patient experiences pain in the affected arm for about 6 hours
D. The patient may feel a tearing sensation and exhibit point tenderness over the site

104. A 28 year old male presents with peristernal pain that worsens on inspiration and movement. The patient states the pain began during multiple reps of weightlifting at a local gym. The patient could not maintain the weight and fell to the floor and wrenched his knee. The patient states no pain in the knee at this time, but the mid chest pain is worse. On inspection of the chest, no visual swelling, deformity, or ecchymosis is seen. On palpation the skin temperature is noted to be normal and there is point tenderness over the area. It is likely this patient is suffering from

A. Pericarditis
B. A pleural effusion
C. Costochondritis
D. A fractured rib

105. Your patient was involved in a street fight and sustained multiple lacerations on the anterior chest, forearms and shoulders. The patient requires suturing and tetanus prophylaxis. The patient has a history of malignant hyperthermia. An appropriate local anesthetic agent for this patient is

A. Lidocaine
B. Procaine
C. Mepivacaine
D. Bupivacaine

106. Your patient was driving his car through an intersection when his vehicle was T-boned by another car. The patient suffered a fractured pelvis and left femur and was stabilized in the ED and is awaiting surgical fixation of the fractures. When auscultating lung sounds, you hear what you believe to be bowel sounds in the chest. The patient is experiencing moderate shoulder pain on the left side and he is mildly tachypneic. The probable diagnosis will be

A. A fractured scapula
B. A hemothorax
C. Diaphragmatic rupture
D. Bowel rupture

107. The anatomical borders of the abdomen include:

A. The diaphragm, which forms the posterior border
B. The anterior border, formed by the vertebral column
C. The inferior border, which is formed by the pelvis
D. The superior border, which is formed by the abdominal and iliac muscles

108. The type of vertebral fracture that results from the mechanism of injury known as hyperflexion is called a

A. Wedge fracture
B. Compression fracture
C. Simple fracture
D. Teardrop fracture

109. When palpating the abdomen under the right costal margin near the liver, you note the patient is unable to inhale deeply. This reaction is known as

A. Kernig's sign
B. Rovsing's sign
C. Lentick's Sign
D. Murphy's sign

110. Which of the following organs is not located in the retroperitoneum:

A. Spleen
B. Pancreas
C. Adrenal glands
D. Ureters

111. Your patient has been on a nasal cannula and now requires a nonrebreather mask to maintain his oxygenation saturation at acceptable levels. A nonrebreather mask can deliver what percentage of oxygen when the O_2 flow rate is set at 10–15 L/min?

A. 24–40%
B. 30–40%
C. 50–60%
D. 60–80%

112. You are attempting to draw an arterial blood gas sample from an arterial line. The syringe requires a lot of force to move the cylinder. What effect will this high friction on the syringe have on blood gas results, if any?

A. It will put the artery into spasm
B. The high friction will increase the $PaCO_2$
C. The high friction will decrease the PaO_2
D. There will be no effect on the results

113. One of the factors to be considered when assessing a patient for possible aspiration and chemical/aspiration pneumonitis is

A. The possibility of using syrup of Ipecac
B. The pH of the aspirate
C. The type of infiltrates on CXR
D. ABG results

114. An indication for surgical intervention with a patient who has a hemothorax and required chest tube placement would be

A. An initial return of 900 mL of blood on initial chest tube placement
B. Drainage of 200 mL an hour for two hours
C. An initial return of 1,500 mL of blood on initial chest tube placement
D. Drainage of 150 mL an hour for four hours

115. Which of the following statements about innervation of the heart is true?

A. Beta-1 adrenergic receptors are located only in the atria
B. Beta-2 receptors are located in both the atria and the ventricles
C. Beta-1 receptors cause an increase in conductivity, heart rate, and contractility
D. Alpha-1 adrenergic receptors affect the tone of the ventricular walls

116. The most sensitive cardiac marker is

A. CK-MB
B. Creatine kinease
C. Troponin T
D. Tropinin IIa

117. A biomarker that indicates an inflammation is present is

A. C-reactive protein
B. CK-MB isoenzyme
C. White blood count
D. Troponin 1

118. When auscultating the heart, a common area for hearing murmurs and ectopic beats is

A. Erb's Point
B. Pulmonic area
C. Aortic area
D. Mitral area

119. During insertion of a CVP catheter, your patient has a short run of V-tach and the EKG monitor shows unifocal PVCs. Your immediate response should be to

A. Administer lidocaine 1 mg/kg
B. Hang an amiodarone drip
C. Notify the physician who is inserting the catheter
D. Immediately have the physician completely withdraw the catheter

120. Which of the following statements would be inaccurate when describing classic seat belt injuries?

A. The "seat belt sign" corresponds with an intra-abdominal injury in about 80% of patients
B. Impalement is considered a dirty wound and results in higher mortality rates
C. Seat belt injuries include hollow viscus injuries and abdominal wall disruption
D. Seat belt injuries may result in a flexion-distraction fracture of lumbar vertebrae (Chance fracture)

121. Pelvic fractures are usually classified as stable or unstable. The definition of an unstable pelvic fracture is

A. A fracture where the pelvic ring is broken in one section and no rotational displacement exists
B. A fracture with external rotation, vertical compression, and without shear
C. The pelvic ring is fractured in more than one place with two displacements on the ring
D. A fracture that involves moderate displacement of the ring

122. While assessing a patient for possible splenic involvement and abdominal injury, the patient complains of a sharp pain in the left shoulder, slightly above the collarbone. This phenomenon is known as

A. A symptom indicating a left kidney injury
B. A peritoneal sign
C. Trousseau's sign
D. Kehr's sign

123. Your patient is about to undergo a diagnostic peritoneal lavage (DPL) to provide some information about a suspected hollow viscus injury. As a trauma nurse, you know if the test is performed too early, you may miss injuries on patients with

A. Previous laparotomies
B. Injuries to the pancreas
C. Obesity
D. Third trimester pregnancies

124. Your female patient has a fever, chills, pain on urination, moderate burning at the supra pubic area, and diarrhea. This patient is most likely suffering from

A. Acute renal failure
B. A kidney infection
C. A lower urinary tract infection
D. An upper urinary tract infection

125. Esophageal injuries are usually caused by penetrating trauma, rarely because of a rupture. There is a lack of a serosal layer, which may predispose a patient to a leak after surgical repair. Also, the esophagus narrows at primarily three locations, predisposing it to an injury. These three points of narrowing of the esophagus would not include

A. The arch of the aorta
B. The cricoid cartilage
C. The mediastinum
D. The esophagogastric junction

126. Your patient was riding his bicycle carelessly and T-boned a car. The patient exhibited peritoneal guarding. Duodenal injury is suspected. Which of the following statements about duodenal injuries is true?

A. Compression injuries are rare because the duodenum is protected by the liver
B. The duodenum is primarily a retroperitoneal organ
C. Most duodenal injuries do not have associated intra-abdominal injuries
D. Vertebral column fractures are not associated with duodenal injuries

127. Pelvic fractures may result in significant blood loss. When soft tissues are injured, a systemic inflammatory response is initiated, resulting in the release of chemical mediators. These chemical mediators may result in a depletion of intravascular volume. These chemical mediators are called

A. Histamines
B. Free radicals
C. Cytokines
D. Addressins

128. An appropriate location for an IV in a patient suffering a major abdominal injury would be in which of the following vessels?

A. Femoral
B. Antecubital
C. Tributary of superior vena cava
D. External jugular

129. Contraindications for a pulmonary angiogram would include

A. Perfusion deficits
B. Vascular filling defects
C. Pulmonary thromboembolism
D. Pregnancy

130. Sudden anuria may be due to

A. An embolic event
B. Congestive heart failure
C. Prostate enlargement
D. Azotemia

131. The current definition of acute renal failure is

A. Trauma to one or both kidneys
B. Decrease in renal perfusion from shock or anaphylaxis
C. A sudden or rapid decline in renal filtration function
D. An obstruction to passage of urine

132. Post-renal AKI may be caused by

A. Malignant hypertension
B. Transplant rejection
C. Neurogenic bladder
D. Preeclampsia

133. Hypokalemia may cause significant changes in acid base balance. Which condition below is associated with hypokalemia?

A. Respiratory alkalosis only
B. Metabolic alkalosis only
C. Both respiratory and metabolic alkalosis
D. Metabolic acidosis only

134. The primary site for urea synthesis is in the

A. Kidneys
B. Liver
C. Lungs
D. Pancreas

135. Increased production of urea may be due to

A. GI bleeding
B. Low protein diet
C. Congenital kidney disease
D. Hypothermia

136. You are assessing your patient's existing shunt prior to emergency hemodialysis. You note there is no thrill or bruit at the shunt site. Your next nursing action should be to

A. Call the surgeon to do a new graft
B. Use a Doppler to determine graft patency
C. Administer a bolus of heparin
D. Continue with the hemodialysis, as there is nothing wrong

137. Your patient sustained an injury to a kidney from a fall two days ago. resulting in hyperlipidemia, edema, low albumin in the blood, and proteinuria. These findings are indicative that the patient is suffering from

A. Nephrotic syndrome
B. An abdominal infection
C. A catheter-induced nephrotoxic injury
D. Post-renal failure

138. You suspect your patient is developing a pulmonary embolism. Signs and symptoms of a pulmonary embolus can include

A. Sinus bradycardia or a normal EKG
B. Pleuritic chest pain, decreased cardiac output
C. ABGs show respiratory acidosis, increased respiratory rate
D. Decreased pulmonary artery systolic pressure

SECTION 5: ANSWERS

1. **Correct answer: C**
   The esophagus is not located in the mediastinum. Structures in the mediastinum include the thymus, heart, trachea, thoracic duct, lymph nodes, vagus and phrenic nerves, and the sympathetic trunks.

2. **Correct answer: C**
   The thoracic duct empties into the left internal jugular vein, not the right. The duct does transport 60–70% of ingested fat into the bloodstream, and the duct is protected by the mediastinum anteriorly, and the spine posteriorly.

3. **Correct answer: D**
   Ultrasound does require training and expertise to perform well. Advantages of using ultrasound include that it is noninvasive, requires no transport, and is a rapid assessment tool to help diagnose thoracic and other injuries.

4. **Correct answer: D**
   An aortic rupture is considered a potentially life-threatening injury. Life-threatening injuries include airway obstructions, flail chest, cardiac tamponade, tension pneumothorax, open pneumothorax, and massive hemothorax.

5. **Correct answer: A**
   An increase in intrapleural pressure, not a decrease, is a result of a tension pneumothorax. Situations that place a patient at risk for a tension pneumothorax are rib fractures, barotrauma, clamped or clogged chest tubes, lung parenchyma injury, extension of a simple pneumothorax, and tracheobronchial tree injuries.

6. **Correct answer: B**
   The chest tube that was inserted in your patient for a pneumothorax became dislodged then fell to the floor. There will be a delay before a new chest tube can be inserted. As a trauma nurse, you know the appropriate emergency action to mitigate this problem is to apply a three-sided dressing to the wound. This would allow the untapped side to allow air to exit. This type of dressing helps prevent tension from developing.

7. **Correct answer: B**
   According to the 2015 American Heart Association guidelines for CPR and ECC, during the post-cardiac arrest phase, titration of inspired oxygen to the lowest level to achieve an arterial oxygen saturation of 94% or greater is recommended when feasible. This may help avoid potential complications with oxygen toxicity.

8. **Correct answer: C**
   A flail chest is a very painful condition that limits respiratory effort because of the pain. Analgesia and sedation that may be required may also depress respiratory drive and excursion. The CO_2 will increase, PaO_2 will decrease, and the pH will be below 7.35. The patient will develop respiratory acidosis.

9. **Correct answer: B**
   Patients with uncontrolled asthma may receive steroids and neuromuscular blocking agents in an attempt to mitigate their symptoms. These patients are at increased risk for prolonged muscle weakness. Uncontrolled asthma symptoms during an attack may lead to prolonged and extensive muscle use to maintain independent respirations. Prolonged effort may result in respiratory failure due to respiratory muscle fatigue. Administration of a neuromuscular blocking agent further inhibits the smooth muscle retractions. Long-term steroid use has been linked to muscle wasting. Ventilatory weaning may be prolonged as respiratory muscles recover from both the disease process and pharmacologic intervention.

10. Correct answer: D
When assessing the right upper quadrant of the abdomen, you are assessing injuries to the liver, gall bladder with the biliary tree, hepatic flexure of the colon, head of the pancreas, and duodenum. The left upper quadrant is assessed for injuries to the stomach, spleen, left lobe of the liver, left kidney and adrenal gland, the splenic flexure of the colon, and sections of the transverse and descending colon. Right lower quadrant assessment includes the ascending colon, appendix, secum, the right ovary and fallopian tube, and right ureter. The left lower quadrant assessment for injuries includes the descending and sigmoid colon, the left ovary and fallopian tube, and the left ureter.

11. Correct answer: C
A normal D-dimer rules out a pulmonary embolism. If the D-dimer is elevated, it may be caused by multiple other conditions. Hyperventilation occurs subsequent to hypoxemia caused by the PE, so respiratory alkalosis will be present, not metabolic alkalosis. Heparin does not dissolve existing clots.

12. Correct answer: A
Use Moses's sign to assess for deep venous thrombosis (DVT). Moses's sign is elicited by pressing the calf toward the tibia. This may also elicit pain. These results are not exclusive to DVT but may complement a diagnosis. Traditionally, we were taught to assess Homan's sign: dorsiflexion of the ankle while bending the knee. If that elicited pain, the patient had a problem with circulation and possibly DVT.

13. Correct answer: C
A very common and significant finding in a patient with a pneumomediastinum is Hamman's sign. Hamman's sign is a "crunching" sound or a slight clicking sound with each heart sound auscultated over the apex of the heart.

14. Correct answer: B
Methylxanthines are an important classification of drugs. In addition to theophylline, caffeine, and theobromine are also methylxanthines. Methylxanthines can be found in coffee, tea, and cocoa. Low doses of drugs in this classification can stimulate cortical arousal and in higher doses cause insomnia. They can cause tachycardias and increase production of gastric acid and digestive enzymes. Methylxanthines also inhibit histamine release.

15. Correct answer: B
While ambulating your patient, he suddenly collapses. During your primary assessment, you discover the patient is in respiratory arrest but does have a perfusing rhythm. Prior to the arrival of additional ED staff, you obtain a bag-valve mask device. According to the 2015 American Heart Association guidelines for CPR and ECC, you should squeeze the bag every 5 to 6 seconds to assist ventilations on this patient.

16. Correct answer: B
The pH is between 7.35 and 7.45, the CO_2 is between 35 and 45 mmHg, and the HCO_3 is between 22 and 26 mEq/L. All the results are within normal ranges, so this ABG is considered normal. The distractor was the injury and there is a tendency to believe something must be wrong with a patient if information was included in the stem of a question.

17. Correct answer: D
This is an uncompensated (mixed) respiratory/metabolic acidosis. The pH is less than 7.35, so the value is uncompensated acidosis. To determine whether the acidosis is respiratory or metabolic, find the value that represents acidosis. This would be both the HCO_3 at $<$ 22 mEq/L and the $CO_2 >$ 45 mmHg, meaning the cause of the acidosis is both respiratory and metabolic in nature.

18. Correct answer: B
This blood gas result indicates a compensated metabolic acidosis. The pH is between 7.35 and 7.45, so the gas is compensated, but the value is closer to acidosis, making the value compensated acidosis. Determine which respiratory or metabolic value is acidotic: in this case, the HCO_3 at $<$ 22 mEq/L.

19. Correct answer: C
Prior to insertion of an LMA, the patient must have an absent gag reflex. The laryngeal mask airway cannot be inserted by nurses unless they have specialized training. The LMA does not usually cause hoarseness because it does not pass through the vocal cords. There is a high risk of aspiration with LMA usage.

20. Correct answer: C
Symptoms from aspirated gastric contents have a gradual onset. The patient may develop ARDS, but not always. If the pH is $>$ 2.5, very little necrosis will occur. If the pH is $<$ 2.5, there is probability of pulmonary edema, necrosis, bleeding, and atelectasis.

21. Correct answer: D
The patient you are caring for was diagnosed with aspiration pneumonitis in addition to a Colles' fracture and various lacerations. As a trauma nurse, you know the most severe pulmonary reaction may occur from the aspiration of acidic food particles even if the particles are not obstructive. The pulmonary damage may be extensive. The patient will probably become hypercapneic, hypoxemic, and acidotic if not treated aggressively.

22. Correct answer: B
Pulse oximetry should never be used during a cardiac arrest. During resuscitation, blood pressure and blood flow may vary. The pharmacologic effects of medications such as vasoactive drugs used during resuscitation will compromise SpO_2 values.

23. Correct answer: B
Chest tube drainage tubing should be placed horizontally on the bed then down to the collection chamber. If a mediastinal chest tube is in place, bubbling in the water seal chamber may indicate a communication between the mediastinal space and the pleural space. The physician should be notified immediately. However, some sporadic bubbling will occur when suction is first turned on because fluid must displace air in the collection chamber. Chest tube tubing that is dependent or coiled will allow for the accumulation of drainage. This obstruction may increase pressure in the lung.

24. Correct answer: B
Ecchymotic splotches sometimes seen on labia, scrotum, and perineum secondary to pelvic fractures are known as Coopernail's sign.

25. Correct answer: A
This result signifies an uncompensated respiratory alkalosis. The pH is greater than 7.45, so the value is uncompensated alkalosis. To determine whether the alkalosis is respiratory or metabolic, find the value that represents alkalosis: in this case, the CO_2 at $<$ 35 mmHg.

26. Correct answer: C
This result demonstrates a compensated respiratory alkalosis. The pH is between 7.35 and 7.45, so the value is compensated, but because it is closer to 7.45, the value is considered alkalotic. To determine whether the alkalosis is respiratory or metabolic, find the value that represents alkalosis: in this case, the CO_2 at $<$ 35 mmHg.

27. Correct answer: B
This result is an uncompensated respiratory acidosis. The pH is less than 7.35, so the value is uncompensated. To determine whether the acidosis is respiratory or metabolic, find the value that represents acidosis: in this case, the CO_2 at $>$ 45 mmHg.

28. Correct answer: A
The pH (between 7.35 and 7.45), the CO_2 (between 35 and 45 mmHg), and the HCO_3 (22 and 26mEq/L) are within normal ranges, so the ABG is considered normal. During exams, stress will often make a person look for detailed information and overlook the simplest explanation.

29. Correct answer: D
One of the most effective ways to relieve bronchospasms is to use a B_2 receptor agonist. The B_2 receptor agonists lower cellular calcium levels and relax bronchial smooth muscle. The selective B_2 receptor

agonists do not produce cardiac stimulation. The cardiac stimulation can result in tachycardia and reduced cardiac output.

30. Correct answer: A

When the ED resident attempts to place a central line, air is accidentally introduced into the line when the IV tubing becomes disconnected. The best position to place this patient to minimize the venous air embolism is Trendelenburg with left decubitus tilt. This position minimizes any air from migrating through the heart and into the lungs. Of course, everything depends on the patient's injuries and status.

31. Correct answer: B

Risk factors for thrombotic emboli includes carcinoma. Neoplasms, obesity, trauma, dysrhythmias, congestive heart failure (CHF), and prolonged immobility are additional risk factors.

32. Correct answer: C

Your patient was struck head-on by another car in a parking lot. The impact, though slow speed, caused the airbag to deploy. The powder from the airbag caused an acute exacerbation of reactive airway disease. The patient has a history of asthma. As a trauma nurse, you know that sternocleodomastoid retractions indicate this patient is suffering from an acute episode of respiratory distress.

Sternocleodomastoid retractions indicate that an asthmatic patient is using accessory muscles to facilitate ventilation. Air is trapped in the air passages, so the patient has to create a higher negative pleural pressure by elevating the rib cage.

33. Correct answer: C

Your patient ceased wheezing during his asthma attack. This change in his condition means respiratory failure and intubation are imminent. If the patient is wheezing, it means air is getting through a narrowed opening. Asthmatics undergo air trapping when the inspired air must exit through a narrowed air passage. If the patient stops wheezing, it means no air is able to enter or exit the air passages.

34. Correct answer: A

The American Heart Association has classified acute pulmonary embolisms into three categories: massive, submassive, or low risk. A submassive pulmonary embolism is characterized as an acute PE with evidence of right ventricular dysfunction or myocardial necrosis. A massive PE is defined as an acute PE with sustained BP $<$ (90 mmHg) for more than 15 minutes, use of inotropes not the result of other causes, or signs of shock. A low-risk patient does not have any of the aforementioned conditions.

35. Correct answer: D

Pulse oximetry readings are considered unreliable when oxygen saturation levels fall below 70%. Pulse oximetry accuracy is impacted by patient motion, low perfusion, venous pulsation, light, poor probe positioning, edema, anemia, and carbon monoxide levels. It is important to compare pulse oximetry values against arterial blood gases to validate values below 70% on the pulse oximeter.

36. Correct answer: A

The oxyhemoglobin dissociation curve is a curve that reflects the relationship between dissolved oxygen and the affinity for oxygen by the hemoglobin molecule.

The curve describes the relationship between available oxygen and the amount of oxygen carried by hemoglobin.

- The horizontal axis is PaO_2, or the amount of oxygen available.
- The vertical axis is SaO_2, or the amount of hemoglobin saturation with oxygen.
  - » A PaO_2 of 60 or more is usually adequate.
  - » At less than 60mmHg, the curve is steep and small changes in PaO_2 greatly reduce SaO_2.
- The term, *affinity* is used to describe oxygen's attraction to hemoglobin binding sites. Affinity changes with:
  - » Variation in pH
  - » Temperature

  - » CO_2
  - » 2,3 DPG levels
- In a left shift (alkalosis, hypothermia), Oxygen will have a higher affinity for hemoglobin. Tissue hypoxia can result.
- In a right shift (acidosis, fever), oxygen has a lower affinity for hemoglobin. Blood will release oxygen more readily. More O_2 will be released to the cells, but less oxygen will be carried from the lungs.

37. Correct answer: B

Atrial tachycardia with occasional PVCs is an assessment finding that should be reported to the physician immediately as potential theophylline toxicity. Dosing at 600 mg per day is a high dose and places the patient at risk for toxicity. If diet and/or medications are taken that decrease normal theophylline excretion, the patient may quickly become toxic from the theophylline. Other symptoms to report include insomnia, anxiety, confusion, disorientation, headaches, hypotension, hyperglycemia, and abdominal pain with diarrhea, nausea, and vomiting. Diligently monitor electrolytes.

38. Correct answer: B

When a patient has sustained a pelvic fracture, a urinary catheter should not be placed immediately. Urethral injury should be ruled out either by examination or urethrography. If a urologist is unable to see the patient and a catheter must be placed, consider the use of a suprapubic catheter.

If the nurse obtains vascular access, analgesia and fluids may be given. In addition to a FAST exam, a chest X-ray should be obtained to locate potential injuries and bleeding sites. If the patient is to receive a neuromuscular blockade, it is crucial to stabilize the pelvis first because the muscles may be the only thing maintaining pelvic stability.

39. Correct answer: A

SvO_2 is a measurement of total oxygen consumption.

40. Correct answer: D

The true statement is that capnography ($PetCO_2$) is not a substitute for pulse oximetry. Capnography monitors the concentration or partial pressure of carbon dioxide (CO_2) in the respiratory gases. A pulse oximeter measures the availability of sites on the hemoglobin molecule for oxygen transport versus how many sites are occupied.

41. Correct answer: A

Your patient had 1,420 ml of pleural effusion removed via thoracentesis and immediately began coughing and was dyspneic. This patient has developed reexpansion pulmonary edema. Removal of large amounts of pleural fluid increases negative intrapleural pressure. Edema occurs when the lung does not re-expand. The patient then develops a severe cough and dyspnea. If the symptoms occur during a thoracentesis, the procedure should be stopped.

42. Correct answer: C

Your patient is suffering substernal chest pain exacerbated when deep breathing. The patient also states his allergies are causing a dry cough, some nasal stuffiness, some pain in both ears, and a sore throat. The chest pain becomes more pronounced and pleuritic in nature. This patient has been on a 60% nonrebreather mask for two days. It is likely this patient may be suffering from hyperoxia. When patients receive high concentrations of oxygen for extended periods of time, very high amounts of oxygen free radicals are circulating. These radicals cause damage to the capillary–alveolar membrane. Enzymes are usually available to neutralize the radicals. When a patient suffers from oxygen toxicity, there are not enough enzymes to overcome the free radicals. If the oxygen level is not reduced, the damage to the vessels and parenchyma may lead to ARDS. It is to be noted that all the symptoms listed previously are probably the result of the hyperemic state, not an allergy. Symptoms usually resolve quickly once normal oxygen levels are restored.

43. Correct answer: D

Hypoxemia is a decreased oxygen level in the arterial blood or a $PaO_2 < 80$ mmHg. Hypoxia is a decreased oxygen level at the cellular level.

44. Correct answer: C
Hyperventilating causes respiratory alkalosis because the patient is unable to get enough oxygen, often due to bronchial constriction. Hypoventilation causes a buildup of CO_2, causing respiratory acidosis, not respiratory alkalosis.

45. Correct answer: A
A renal transplant that results from humoral rejection or acute cellular rejection may be definitively diagnosed only via ultrasound. Ultrasound may be difficult to obtain or interpret due to ascites, obesity, or fluid in the retroperitoneal area. Doppler scans measure blood flow, and the flow is diminished due to prerenal and intrinsic AKI. Nuclear scans are of limited value because the excretion rates may be slowed by disease. The renal biopsy is the gold standard for diagnosing rejection.

46. Correct answer: A
This result is compensated metabolic acidosis. The pH is between 7.35 and 7.45, so the value is compensated, but because it is closer to 7.35, the value is considered acidotic. To determine whether the acidosis is respiratory or metabolic, find the value that represents acidosis: in this case, the HCO_3 at $<$ 19 mEq/L.

47. Correct answer: C
The pH is between 7.35 and 7.45, the CO_2 is between 35 and 45 mmHg, and the HCO_3 is between 22 and 26 mEq/L. All the results are within normal ranges, so this ABG is considered normal.

48. Correct answer: A
This result is an uncompensated (mixed) respiratory/metabolic alkalosis. The pH is greater than 7.45, so the value is uncompensated. To determine whether the acidosis is respiratory or metabolic, find the value that represents alkalosis. This would be both the HCO_3 at $>$ 26 mEq/L and the $CO_2 <$ 35 mmHg, meaning the cause of the alkalosis is both respiratory and metabolic in nature.

49. Correct answer: B
According to the 2015 American Heart Association guidelines for CPR and ECC, gasping is in no way normal and is a sign of cardiac arrest.

50. Correct answer: D
Functional residual capacity is the volume of gas remaining in the lungs at the end of one normal expiration.

51. Correct answer: C
Residual volume is the volume of gas left in the lungs following a maximal respiratory effort.

52. Correct answer: A
The functional residual capacity is defined as the amount of air in the lungs after normal expiration. The formula for functional residual capacity is FRC = ERV (expired residual volume) + the RV (residual volume). The normal FRC in healthy lungs is about 2,000–3,000 ml.

53. Correct answer: B
Fever causes the pH to rise. Most ABG machines are calibrated to 37°C. If the patient has a fever, the oxyhemoglobin curve will be shifted to the right. More oxygen will be given off to the tissues, so the machine has to be calibrated to account for the temperature.

54. Correct answer: D
The cells that are responsible for forming a barrier for alveoli are type I epithelial cells. Type I cells line the outside of the alveoli and are easily inflamed by inhaled toxins or heated air. In addition, type I cells maintain the blood–gas interface. Type II cells produce surfactant.

55. Correct answer: B
This ABG result indicates a compensated respiratory acidosis. The pH is between 7.35 and 7.45, so the value is compensated, but because it is closer to 7.35 the value is considered acidotic. To determine whether the acidosis is respiratory or metabolic, find the value that represents acidosis: in this case, the CO_2 at $>$ 45 mmHg.

56. Correct answer: A
Type II alveolar cells produce surfactant. Surfactant is a lipoprotein and functions by increasing surface tension of alveoli and allowing alveoli to expand and contract. We should have some residual pressure in the alveoli at the end of respiration to keep the alveoli open (physiologic PEEP). If surfactant production is impaired, the alveoli's ability to exchange O_2 is compromised.

57. Correct answer: D
The FiO_2 for a nasal cannula set at a flow rate of 6 L/min is 40%. The nasal cannula is generally considered a low-flow oxygen device unless connected to a high-flow system. If using a flow $>$ 4 L/min., the oxygen should be humidified to prevent drying the mucosal membranes.

58. Correct answer: C
A diagnosis of asthma may be made by a decreased FEV1. The forced expiratory volume (FEV) is how much air is exhaled during the first second of effort. This amount should be $\geq$ 75% of the predicted normal value(s). In asthmatics, this value is decreased because of obstruction. The forced vital capacity (FVC) is the total amount of gas exhaled as forcefully and rapidly as possible after taking a maximal inspiration. The result should be above 80%.

59. Correct answer: A
An absolute contraindication for use of rapid sequence intubation (RSI) is a total loss of facial and/or oropharyngeal landmarks, which requires a surgical airway. Another absolute contraindication is a total upper airway obstruction that requires surgical intervention. Relative contraindications for RSI include an airway where intubation may not be successful or an arrest "crash" intubation when there is no time for pre-oxygenation, pretreatment, or induction and paralysis.

60. Correct answer: D
Rapid sequence intubation (RSI) is not necessary to use for all cervical spine-injured patients. It would be appropriate for use if there is edema and loss of airway patency. Prolonged respiratory effort that results in fatigue or failure, a stab wound to the neck with an expanding hematoma, and an uncooperative trauma patient with life-threatening injuries are indications for the use of RSI.

61. Correct answer: C
During rapid sequence intubation (RSI), cricoid cartilage pressure may be used to help prevent vomiting and aspiration of gastric contents. The esophagus is obstructed by the pressure to the anterior neck. This maneuver is known as the Sellick maneuver. The American Heart Association takes the position that the Sellick maneuver not be routinely used unless the person performing the maneuver is well trained and experienced.

62. Correct answer: D
When performing CPR on a cardiac arrest patient, as a trauma nurse you know the best, most reliable way to confirm placement of an endotracheal tube is continuous waveform capnography ($PetCO_2$).

63. Correct answer: C
This blood gas result indicates an uncompensated respiratory acidosis. The pH is $<$ 7.35, so the value indicates an uncompensated acidosis. Next, determine which respiratory or metabolic value represents acidosis: in this case, the CO_2 at $>$ 45 mmHg.

64. Correct answer: A
One cause of decreased SvO_2 is an increased metabolic rate. An increased metabolic rate would increase the O_2 uptake by tissues, resulting in a lower value measured by venous blood gases. The other answers result in a lower tissue oxygen requirement, and thus higher values of oxygen remain in the bloodstream.

65. Correct answer: B
Prior to performing a DPL, a Foley and gastric tube should be placed. If 10 ml of frank blood is pulled back, an unstable patient must go to the OR. A DPL is indicated if a patient has a spinal cord injury, altered mental status, shock, decreased hematocrit, unexplained hypotension, or an unavailable CT or ultrasound.

66. Correct answer: C

To evacuate a hemothorax, the tube is placed in the fifth intercostal space, midaxillary line. The chest tube will be low in the thoracic cavity and uses gravity to help clear the fluid. If a hemothorax is not completely removed, there is a possibility an infection will result, which can lead to empyema. When assessing a patient, it is a good idea to ask (if possible) the origin of any small scars on the thoracic area, as the patient may have had previous problems requiring a chest tube.

67. Correct answer: B

The hypoxemic drive to breathe originates in the aortic and carotid arteries. In the bifurcation of the internal and external carotid arteries, carotid bodies, and aortic bodies (in the carotid arch) are chemoreceptors. When the supply of oxygen decreases, stimulation of the aortic and/or carotid bodies occurs and, in turn, stimulates cortical activity. The result is adrenal gland secretions (epinephrine, norepinephrine), tachycardia, tachypnea, increased respiratory rate, and increased blood pressure.

68. Correct answer: B

Breathing high concentrations of oxygen may wash out nitrogen that is present in alveoli. The nitrogen helps keep the alveoli open, resulting in residual volume. If oxygen replaces nitrogen in the alveoli, the alveoli will shrink and begin to collapse. Oxygen is absorbed into the bloodstream much faster than a replacement is available in the alveoli. The effect is very pronounced in areas of the lung only barely ventilated. This phenomenon is considered an adverse effect and is known as absorption atelectasis.

69. Correct answer: D

Succinylcholine combines with acetylcholine to cause smooth muscle relaxation, not contraction. Prolonged use may cause a change in blocking action and result in potassium-regulated alterations in electrical activity. Side effects of succinylcholine include malignant hyperthermia and hypertension or hypotension, hyperkalemia, anaphylaxis, and increased intraocular pressure.

70. Correct answer: C

Patients who have sustained crush injuries are susceptible to the development of rhabdomyolysis. Creatinine and myoglobin are released from damaged cells. Large amounts of myoglobin are toxic to kidney cells. Often, potassium is released from its normal intracellular compartmental to cause hyperkalemia. To help mitigate the rhabdomyolysis, crystalloids which have been alkalinized by sodium bicarbonate are used, along with the diuretic, mannitol. Use of mannitol increases urine output and helps reduce the excess potassium, and the bicarbonate helps mitigate acidosis.

71. Correct answer: C

The laryngeal mask airway (LMA) was intended as a temporary airway. It requires minimal training to insert, but cannot be placed by RNs as a matter of course. The patient must be unconscious and/or without a gag reflex. The seal around the mask is a low pressure seal, so it cannot be used on patients with high peak ventilator pressures. The LMA has a significant risk of aspiration. Advantages with use of this airway are that it is simply blindly inserted into the hypopharynx, does not require visualization of the vocal cords, and does not traumatize the trachea. Patients will not have hoarseness or lose their voice altogether. At best, patients will complain of a mild sore throat.

72. Correct answer: A

An action of nitric oxide is to cause vascular smooth muscle relaxation. Nitric oxide is the molecule released from the endothelium that enables smooth muscle relaxation. Nitric oxide inhibits platelet aggregation and adherence and is thought to alter vascular permeability. It may also participate in nonspecific immunity because it is generated when macrophages are activated.

73. Correct answer: D

Continuous positive airway pressure (CPAP) may be delivered by nasal prongs, nasopharyngeal tubes, or endotracheal tubes. CPAP provides increased pressure to the posterior pharynx and increases transpulmonary pressure. It can prevent alveolar collapse and helps prevent obstructive apnea.

74. Correct answer: B
Excessive CPAP may increase intrathoracic pressure to the point of compressing the right atrium and vena cava. The preload will be decreased and cardiac output will be reduced.

75. Correct answer: B
The arterial blood gas results that support the diagnosis of respiratory alkalosis are pH 7.47, CO_2 24, HCO_3 24.

76. Correct answer: B
Synchronized intermittent mandatory ventilation (SIMV) still provides a set frequency of breaths and either volume or pressure. The patient is permitted to breathe spontaneously at his or her own volume between mandatory ventilations. If the spontaneous breath occurs at the same time as a mandatory breath, the ventilator will synchronize with the patient, thus preventing "stacked" breaths. The other modes of ventilation listed (CMV, HFV, and oscillation) represent full control of setting by an operator and not the patient's responses.

77. Correct answer: A
A disadvantage of using a tracheostomy tube is subcutaneous emphysema. There are a large number of potential complications with the use of a tracheostomy tube. Some of these complications include tracheal stenosis, tracheal malacia, aspiration, infection, hemorrhage, and pneumothorax.

78. Correct answer: A
This result is an uncompensated metabolic alkalosis. The pH is greater than 7.45, so the value is uncompensated. To determine whether the alkalosis is respiratory or metabolic, find the value that represents alkalosis: in this case, the HCO_3 at $>$ 26 mEq/L.

79. Correct answer: A
A flail chest is a medical emergency and the patient must be intubated immediately. Pain control is absolutely necessary with a flail chest. A flail chest results when two or more adjacent ribs are broken in two or more places. The chest wall is unstable. Usually, during inspiration the chest wall moves outward with an increase in negative intrathoracic pressure. In cases of a flail chest, the opposite movement of the chest wall is seen. This is known as a "paradoxical" movement. Eventually, the result will be atelectasis and alveolar collapse, with possible development of ARDS. To adequately stabilize the fracture, sometimes neuromuscular blockade is used. The patient must be given pain medication and sedation. Also, pain is a priority because the work of breathing (WOB) needs to be reduced.

80. Correct answer: D
Your patient has sustained a stab wound to the area of the right anterior axillary line at the fifth intercostal space. The patient is hypotensive, tachypneic, tachycardic, and restless. O_2 at 100% via mask is provided. Two large bore IVs have been placed and crystalloids are infusing. As a trauma nurse, you would expect to prepare for placement of a chest tube.

The patient appears to have a patent airway, so intubation is not the priority intervention. The patient is, however, exhibiting signs of hypovolemic shock. The mechanism of injury is classic for a hemothorax. A chest tube will help relieve a hemothorax and allow for lung expansion, restore negative pressure, and evacuate the pleural cavity.

81. Correct answer: A
A blunt cardiac injury is most likely to affect the right ventricle because it usually suffers the force of blows to the chest. The right ventricle lies directly behind the sternum and close to the chest wall. The left ventricle is lateral to the sternum and less likely to be injured. Both atria are small and more protected as well.

82. Correct answer: B
The patient is suffering from a tension pneumothorax. This patient had been resting quietly on the gurney, awaiting transport to X-ray to evaluate a possible fractured right tibia and patella. Suddenly the patient complained of right-sided chest pain, tachypnea at a rate of 40, cyanosis, and JVD. No breath sounds are now audible over the right lung fields. The trachea is deviated and heart tones are distant.

83. Correct answer: D
If a projectile strikes the precordium during the vulnerable part of her cardiac cycle, this is known as Commotio cordis. There may be a brief moment of consciousness or the patient will collapse immediately. Even with immediate attempts at resuscitation, survival is extremely rare.

84. Correct answer: B
The most common location of a sternal fracture is the manubrium. Most fractures are caused by either direct or indirect blunt force trauma from contact sports, or assaults. Indirect fractures may occur as a result of deceleration injuries, stress fractures, or osteoporosis. Always look for and treat underlying trauma.

85. Correct answer: A
Fractures of ribs 1–3 are associated with high mortality rates. A lot of force is required to fracture these ribs. Associated injuries may be to the brachial plexus, subclavian artery, cranial and thoracic areas. Other sequelae include, pneumothorax, pneumomediastinum, lacerations to brachiocephalic vessels, and laceration of the aorta.

86. Correct answer: D
Crackles are not considered a complication of a pulmonary contusion. ARDS, atelectasis, pneumonia, and respiratory failure are complications of a pulmonary contusion.

87. Correct answer: B
ST segment depression usually indicates myocardial ischemia. This patient also exhibited substernal chest pain, another finding seen with ischemia. The patient needs a 12-lead EKG immediately to determine if the ischemia is cardiac in origin.

88. Correct answer: B
During inspiration, your patient has a paradoxical rise in jugular venous pressure. This phenomenon is commonly associated with right heart failure. Blood flow to the right ventricle is impaired because of a decrease in compliance or possibly fluid in the pericardial space. Blood backs up into the venous system, causing the increase in jugular venous pressure.

89. Correct answer: A
This patient is at great risk for hyponatremia. Large amounts of extracellular fluids are in the peritoneal cavity. If sodium is lost in here, then the calcium is no longer available to be absorbed into the vasculature.

90. Correct answer: A
Upright QRS in leads V_1 and V_2 show right bundle branch blocks. A simple way to remember which type of bundle branch block with a QRS wider than 0.12 seconds is to think of the turn signals on your car. For a right turn, you must push the lever up; for a left turn the lever must go down. So, looking at V_1 and V_2, if the QRS is upright, then there is a right bundle branch block. If V_1 and V_2 are downward in force, then it is a left bundle branch block.

91. Correct answer: D
The structures found in the retro-peritoneum include: kidneys, adrenal glands, pancreas, ascending and descending colon, small intestine, aorta, vena cava, a section of the duodenum, and major vessels.

92. Correct answer: D
Atropine administration may result in headaches, dizziness, and coma. You should also observe for urinary retention and hypotension and tachycardia due to blocking of parasympathetic receptor sites.

93. Correct answer: B
A biomarker that is not cardiac specific but can be elevated by falls, cardiopulmonary resuscitation, and injections is myoglobin. Serum myoglobin is a test that measures the amount of myoglobin in the blood. Myoglobin is a protein in heart and skeletal muscles. Muscles use up available oxygen. Myoglobin has oxygen attached to it, so additional O_2 is available to muscles. If the muscle is damaged, myoglobin is released and excreted by the kidneys. In large amounts, kidney damage may occur. If the patient has suffered an infarct, myoglobin levels peak about 8 hours after infarct, rapidly returning to normal in about 18–24 hours.

94. Correct answer: A
Along with acute ST elevation, another indicator of necrosis would be an abnormal Q wave. If the Q wave appears within about six hours of a transmural MI, it is an ominous sign. If the Q wave is more than 0.04 seconds long, it is a sign of necrosis. In an inferior MI, the Q wave should not exceed 0.03 seconds or it is indicative of necrosis.

95. Correct answer: A
Your patient was observing practice at the local high school when she was struck by a player who overran the sidelines. The patient sustained a blunt chest injury and on assessment you auscultated a pericardial friction rub. A pericardial friction rub would be best heard at Erb's point, the 3rd intercostal space, on the left sternal border.

96. Correct answer: D
A red blood cell has multiple functions, including carbonic acid dissociation to form bicarbonate ions. The RBC provides oxygen transport via hemoglobin and carbon dioxide transport via carboxyhemoglobin. The RBC buffers protons by binding with hemoglobin to form acid hemoglobin.

97. Correct answer: B
Type II HIT patients are at great risk for developing pericarditis. Type II HIT is sometimes called "white clot syndrome." Thrombi are primarily venous in origin and can lead to DVT, pulmonary emboli, thrombotic stroke, limb ischemia, and myocardial infarction.

98. Correct answer: C
Low-molecular-weight heparin is more stable than unfractionated heparin. LMWH (i.e., Lovenox) is so stable and predictable that PTTs are not required. It is also easy to administer at home.

99. Correct answer: A
Hemoglobin is phagocytized primarily in the liver. Hemoglobin is comprised of two parts. The first part is "heme" that causes the reddish color and contains iron and porphyrin. The second part is a protein called "globin." Hemoglobin combines with oxygen to form oxyhemoglobin. Hemoglobin also binds with CO_2 and carries it to alveoli to be expired. When the hemoglobin is phagocytized in the liver, it breaks down into the heme and globin.

100. Correct answer: D
Stable fractures do not transect the pelvic ring and usually do not cause excessive bleeding. A large percentage of patients with a pelvic injury also have trauma to other areas of the body.

101. Correct answer: A
If a patient has truncal obesity and has sustained a pelvic fracture, it is possible to initially stabilize the fracture via internal rotation of lower extremities and taping the knees together.

102. Correct answer: D
The following structures are located in the peritoneal cavity: liver, spleen, stomach, gall bladder, transverse and sigmoid colon, upper third of the rectum, uterus.

103. Correct answer: D
With an acute rotator cuff tear, the patient may feel a tearing sensation and exhibit point tenderness over the injury site. Pain is usually intense and will last a few days secondary to spasm and bleeding. The patient will not be able to abduct their arm without assistance.

104. Correct answer: C
Costochondritis is often found in persons who engage in repetitive activities such as tennis, in this case, weightlifting. This patient likely has costochondritis, but the trauma nurse should anticipate the patient being evaluated for possible cardiac pathology.

105. Correct answer: B
An appropriate local anesthetic agent for a patient with a history of malignant hyperthermia is procaine.

106. Correct answer: C

When auscultating lung sounds, you heard what you believe to be bowel sounds in the chest. The patient is experiencing moderate shoulder pain on the left side and he is mildly tachypneic. The probable diagnosis will be a diaphragmatic rupture

This patient's abdominal contents have probably entered the thoracic cavity secondary to a diaphragmatic tear. If air also enters the thoracic cavity, it will increase intrathoracic pressure and help to transmit sound. It is usually the left side of the diaphragm that ruptures, and this patient was injured on the left. It is postulated that perhaps the liver, because it is large, protects the right side of the diaphragm. A fractured pelvis usually also results in almost a 50% increased probability of a ruptured diaphragm.

107. Correct answer: C

The inferior border, which is formed by the pelvis. The superior border is defined by the diaphragm, the anterior border by the abdominal and iliac muscles, and the posterior border is bordered by the vertebral column.

108. Correct answer: D

The type of vertebral fracture that results from the mechanism of injury known as hyperflexion is called a teardrop fracture. A small anterior edge of a vertebrae breaks and may impinge on the spinal cord. Sometimes the patient will also have a posterior malalignment of the vertebrae.

109. Correct answer: D

When palpating the abdomen under the right costal margin near the liver, you note the patient is unable to inhale deeply. This reaction is known as Murphy's sign. When the fingers are approximately over the location of the gallbladder, pain is usually most intense. The cause is likely injury from blunt trauma or underlying cholecystitis.

110. Correct answer: A

The spleen is not located in the retropritoneum, but in the peritoneum. Other organs located in the peritoneum are the liver, diaphragm, stomach, some small bowel, and the transverse colon.

111. Correct answer: D

A nonrebreather mask can deliver 60–80% of oxygen when the O_2 flow rate is 10–15 L/min. If both exhalation ports have one-way valves, then near 100% oxygen may be reached. To prevent suffocation in patients where the oxygen is disconnected, nonrebreathing masks now have only one one-way valve to prevent/limit inhalation of room air. This results in decreasing the highest concentration of actual inspired oxygen to 60–80%.

112. Correct answer: C

Using a vacutainer or a high friction syringe creates a vacuum. When that occurs, dissolved gases come out of solution, which decreases PaO_2 and $PaCO_2$. The increased effort to move the cylinder may cause the artery to spasm and impede obtaining the sample but will not directly affect results.

113. Correct answer: B

The pH of the aspirate is very important. If the aspirate is acidic, there is an almost immediate creation of pulmonary edema. This is due to the collapse and breakdown of the alveoli, capillaries, and their interface. Atelectasis, possible intra-alveolar hemorrhage, and some interstitial edema lead to hypoxia. Alkalotic aspirate destroys surfactant, which causes alveolar collapse, leading to hypoxia. Other factors to identify are the type of material aspirated and the amount. Syrup of Ipecac is used for ingestions. ABGs would be considered more of a diagnostic tool.

114. Correct answer: C

An indication for surgical intervention with a patient who has a hemothorax and required chest tube placement would be more than 1,000 mL of blood during initial chest tube placement or more than 200 mL of blood for 2–4 hours.

115. Correct answer: C
Beta-1 receptors cause an increase in conductivity, heart rate, and contractility. They are an integral part of the sympathetic nervous system.

116. Correct answer: C
The most sensitive cardiac markers are troponin T and troponin I. These biomarkers show injury to myocytes, not just cell death. Troponin T can be elevated with skeletal muscle injury. Troponin I is diagnostic of an MI and can be falsely elevated in renal insufficiency.

117. Correct answer: A
A biomarker that indicates an inflammation is present is C-reactive protein. C-reactive protein is produced by the liver. Blood is mixed with an antiserum, which attaches to a specific protein. Levels of CRP may not be increased in people with rheumatoid arthritis and lupus. Some additional causes of elevated C-reactive protein levels are cancer, connective tissue disease, inflammatory bowel disease, rheumatic fever, tuberculosis, the last half of pregnancy or with the use of oral contraceptives, and possible uremia.

118. Correct answer: A
When auscultating the heart, a common area for hearing murmurs and ectopic beats is Erb's point. The location is the 3rd intercostal space, on the left sternal border.

119. Correct answer: C
If the CVP catheter is in the right ventricle and touches the myocardium, PVCs can result. Occasionally, the physician will insert the catheter a bit too far, causing PVCs. In this case, the catheter simply has to be withdrawn to a better position in the right atrium. This is a rare occurrence. If the patient's catheter was left in the right ventricle, the V-tach might continue and the patient might suffer cardiac arrest.

120. Correct answer: A
The "seat belt sign" corresponds with an intra-abdominal injury in about 80% of patients would be *inaccurate* when describing classic seat belt injuries.

121. Correct answer: C
The definition of an unstable pelvic fracture is when the pelvic ring is fractured in more than one place with two displacements on the ring. A rotational displacement is always present and bleeding is likely.

122. Correct answer: D
While assessing a patient for possible splenic involvement and abdominal injury, the patient complains of a sharp pain in the left shoulder, slightly above the collarbone. This phenomenon is known as Kehr's sign. When the spleen is ruptured, blood irritates the underside of the diaphragm and phrenic nerve. The pain is then referred to the area of the left shoulder.

123. Correct answer: B
Injuries to the pancreas and bowel may be missed if a diagnostic peritoneal lavage is performed too early. These injuries may not have had time to become evident. A DPL is difficult to perform on patients in their third trimester of pregnancy, patients who have had previous laparotomies, and patients who have suffered trauma and are obese.

124. Correct answer: C
This patient has fever, chills, pain on urination, moderate burning at the supra pubic area, and diarrhea. This patient is most likely suffering from a lower urinary tract infection. Females are more likely to have urinary tract infections than men because they have shorter urethras and bacteria can easily ascend the tract.

125. Correct answer: C
Three points of narrowing of the esophagus would not include the mediastinum. The esophagus narrows at primarily three locations, predisposing it to an injury. Those locations are the arch of the aorta, the cricoid cartilage, and the esophagogastric junction. In the event of leakage of gastric and

esophageal contents into the mediastinum, the resulting necrotizing tissue damage and inflammation may cause sepsis, MODS, and death.

126. Correct answer: B
Your patient was riding his bicycle carelessly and T-boned a car. The patient exhibited peritoneal guarding. Duodenal injury is suspected. The duodenum is primarily a retroperitoneal organ. Compression fractures are associated with vertebral column fractures of the transverse processes and Chance fractures. Intra-abdominal injuries are almost always associated with duodenal injuries.

127. Correct answer: C
Pelvic fractures may result in significant blood loss. When soft tissues are injured, a systemic inflammatory response is initiated, resulting in the release of cytokines. These chemical mediators may result in a depletion of intravascular volume. Cytokines increase permeability of vascular endothelium, allowing shifting fluid from plasma to intravascular space.

128. Correct answer: C
An appropriate location for an IV in a patient suffering a major abdominal injury would be in a tributary of the superior vena cava as the inferior vena cava may be compromised.

129. Correct answer: D
Pulmonary angiograms require iodine-based radiographic contrast dye to be injected into the antecubital or femoral vein via catheter to the pulmonary artery. The pulmonary vasculature can then be visualized. The radioactive iodine crosses the blood–placental barrier, which is why this procedure is contraindicated in pregnancy. Other contraindications include allergy to shellfish, iodine, radiographic dye, and renal insufficiency.

130. Correct answer: A
Sudden anuria is usually due to post-renal AKI, such as from an embolic event. Mechanical obstruction of the urinary collection system is involved. The collection system is comprised of the renal pelvis, the ureters, the bladder, and the urethra.

131. Correct answer: C
The current definition of acute renal failure is a sudden or rapid decline in renal filtration function. Acute renal failure is now known as acute renal injury (AKI) and can be classified as prerenal, intrinsic, or post-renal. Because material covered on the TCRN exam reflects practice up to about 6 months ago, the new terminology should be added. Some item writers may use this new terminology on the exam.

132. Correct answer: C
Post-renal AKI may be caused by a neurogenic bladder. Other causes include tumor, tricyclic antidepressants, fibrosis, BPH, prostate CA, urethral obstruction, stone disease, and ligation during surgery. Malignant hypertension, transplant rejection, DIC, and preeclampsia are causes of intrinsic failure/injury.

133. Correct answer: C
Potassium and hydrogen move opposite of each other. When a patient is hypokalemic, hydrogen moves into the extracellular fluid, leading to both respiratory and metabolic alkalosis.

134. Correct answer: B
Over 99% of urea synthesis occurs in the liver. Dietary protein is converted into amino acids and peptides. About 90% of these molecules are absorbed and transferred to the liver. Any excess nitrogen is converted into urea.

135. Correct answer: A
Increased production of urea may be due to GI bleeding. Approximately 500 ml of whole blood equals 100 grams of protein. The extra protein must be converted to urea.

136. Correct answer: B

Lack of thrill and/or bruit may indicate that the graft has occluded and dialysis is not possible. It is best to use a Doppler to determine graft patency prior to any calls or administration of any medication. Although you may not hear or feel the thrill and bruit, the graft may still be patent. The surgeon should be notified if the Doppler study is negative. Heparin will not lyse an existing clot.

137. Correct answer: A

Your patient sustained an injury to a kidney from a fall two days ago, resulting in hyperlipidemia, edema, low albumin in the blood, and proteinuria. These findings are indicative that the patient is suffering from nephrotic syndrome. When glomeruli are damaged, proteins such as albumin leak into the bloodstream. In this disease, 3+ grams of protein may leak into the urine over 24 hours (20+ times normal). Hypoalbuminemia occurs because of the high levels of protein leaking via the kidneys. Low albumin causes fluid to move from blood to tissue, causing edema.

138. Correct answer: B

Signs and symptoms of a pulmonary embolus include pleuritic chest pain, tachypnea, anxiety, and tachycardia, and possible bloody frothy sputum.