

## Module 8: Trauma to Head, Neck and Spine

- 1. Messages from the body to the brain are carried by which of the following types of nerves?**
  - a. Sensory
  - b. Skeletal
  - c. Motor
  - d. Cranial
- 2. Which of the following is a function of the autonomic nervous system?**
  - a. Speaking
  - b. Running or walking
  - c. Constriction of blood vessels
  - d. Solving complex math problems
- 3. Which of the following is controlled by the left side of the brain?**
  - a. Sensation in the left arm
  - b. Sensation of the right leg
  - c. Movement of both lower extremities
  - d. Movement of the left arm
- 4. The maxillae form which of the following structures?**
  - a. Lower jaw
  - b. Upper jaw
  - c. Cheek bones
  - d. Forehead
- 5. To which of the following sections of the spine are the ribs attached?**
  - a. Thoracic
  - b. Sacral
  - c. Cervical
  - d. Lumbar
- 6. How many cervical vertebrae are there?**
  - a. 7
  - b. 12
  - c. 5
  - d. 4
- 7. A fracture of which of the following bones would be considered a skull fracture?**
  - a. Temporal bone
  - b. Nasal bones
  - c. Maxilla
  - d. Any of the above
- 8. Which of the following is classified as an open head injury?**
  - a. Contusion without a skull fracture
  - b. Laceration with a skull fracture
  - c. Laceration without a skull fracture
  - d. Both A and B
- 9. Which of the following is a sign of possible brain injury?**
  - a. A deep laceration of the scalp
  - b. Projectile vomiting
  - c. Irregular breathing pattern
  - d. All of the above

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10. **Your patient has been involved in a motor vehicle collision. He has a contusion on his forehead, is confused, and is bleeding from his nose. His heart rate is 90 beats per minute, blood pressure is 80 /58 mmHg, respirations are 20 breaths per minute, and his skin is cool and clammy. Which of the following sets of injuries should you suspect?**
  - a. Head injury, spine injury, and internal bleeding
  - b. Head injury
  - c. Head injury and spine injury
  - d. Head injury and internal bleeding
  
11. **Hyperventilation of a patient with a severe brain injury means that bag-valve-mask ventilations are provided at a rate of \_\_\_\_\_ per minute.**
  - a. 20
  - b. 24
  - c. 30
  - d. 34
  
12. **Which of the following is a potential complication of hyperventilating a patient with a brain injury?**
  - a. Increasing the amount of carbon dioxide in the blood
  - b. Increasing blood flow to the brain
  - c. Decreasing blood flow to the brain
  - d. Decreasing the patient's blood pressure
  
13. **Your patient is a 30-year-old female involved in a motorcycle crash. She was not wearing a helmet and struck her head on the pavement. She is unresponsive and has a blood pressure of 152/110 mmHg. Her pulse is 60 beats per minute and respirations are 8 breaths per minute and shallow. Which of the following is an appropriate intervention?**
  - a. Elevate the legs.
  - b. Provide cervical spine immobilization.
  - c. Hyperventilate at a rate of 24 breaths per minute using supplemental oxygen.
  - d. Apply a pressure dressing to her scalp lacerations.
  
14. **A 44-year-old male involved in a collision at 50 mph struck the windshield of his vehicle with his face. Which of the following injuries should you prepare to treat?**
  - a. Cervical spine trauma
  - b. Brain injury
  - c. Airway obstruction
  - d. All of the above
  
15. **Which of the following statements concerning a concussion is true?**
  - a. It is a bruising of the brain tissue.
  - b. The patient may not have any symptoms of the injury.
  - c. It is accompanied by recurrent episodes of unconsciousness.
  - d. All of the above
  
16. **Which of the following causes worsening of the damage in a brain injury?**
  - a. Allowing seepage of cerebrospinal fluid from the ears or nose
  - b. Administration of 100 percent oxygen
  - c. Failure to keep the patient awake and talking
  - d. Improper management of airway and ventilation
  
17. **Which portions of the spine are the most vulnerable to injury?**
  - a. Thoracic and lumbar
  - b. Cervical and lumbar
  - c. Cervical and sacra
  - d. Thoracic and sacra

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18. **In most cases, which of the following is the correct way to provide initial management of a suspected cervical spine injury?**
  - a. Hold the patient's head still in a neutral, "eyes forward" position.
  - b. Gently apply pressure to the top of the patient's head.
  - c. Maintain the patient's head and neck in the position they are found.
  - d. Provide approximately 15 pounds of upward cervical traction.
  
19. **Which of the following is NOT a common field finding in spinal injuries?**
  - a. Deformity
  - b. Impaired breathing
  - c. Tenderness
  - d. Pain
  
20. **Which of the following observations may the EMT use to rule out a spinal injury in a trauma patient?**
  - a. Patient is able to walk at the scene.
  - b. There is a lack of mechanism of injury.
  - c. There is a lack of numbness and paralysis of the extremities.
  - d. Patient denies pain in his spine.
  
21. **Which of the following is the underlying cause of neurogenic shock?**
  - a. Blood loss from damaged spinal blood vessels
  - b. Failure of the heart to adequately pump blood
  - c. Extreme emotional response to paralysis
  - d. Dilation of blood vessels
  
22. **Which of the following may result from the application of a cervical collar that is too large for the patient?**
  - a. Rotation of the head and neck
  - b. Hyperflexion of the neck
  - c. Hyperextension of the neck
  - d. Excessive lateral movement of the mandible
  
23. **Your patient is pregnant at 20 weeks' gestation and has been thrown from a horse. She is complaining of back pain. Which of the following is the correct procedure for immobilizing her spine?**
  - a. Use a short immobilization device and transport the patient in a sitting position.
  - b. Place the patient supine on the backboard.
  - c. Place the patient on her left side on the backboard.
  - d. Place the patient supine on the backboard, then put a pillow under the right side of the backboard.
  
24. **Which of the following signs is LEAST likely to indicate a traumatic brain injury?**
  - a. Low blood pressure
  - b. Irregular breathing pattern
  - c. Vomiting
  - d. Irrational behavior
  
25. **Your patient is a 10-year-old male whose jacket hood caught on a branch as he jumped out of a tree. He was momentarily suspended about 12 inches off the ground but was immediately lowered to the ground by his brothers. Which of the following injuries should you suspect?**
  - a. Cervical spine injury
  - b. Lumbar spine injury
  - c. Soft-tissue injury of the neck only
  - d. Thoracic spine injury

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26. **Which of the following injuries is considered an indirect brain injury?**
- Cerebral laceration
  - Depressed skull fracture with cerebral penetration by bone fragments
  - Gunshot wound to the head
  - Concussion
27. **Your patient is a 27-year-old male who has been involved in a motorcycle collision in which he was not wearing a helmet. He does not respond when you speak to him, but he makes incomprehensible sounds when you press your knuckles on his sternum. Which of the following BEST describes his level of consciousness?**
- Alert
  - Verbal
  - Painful
  - Unresponsive
28. **Your patient is a 35-year-old woman who was driving a minivan that was struck in the driver's side door by another vehicle. You notice that when you apply pressure to her sternum with your knuckles she extends her legs and flexes her arms and wrists. When giving your radio report, which of the following terms should you use to describe this?**
- Tonic-clonic activity
  - Posturing
  - Cushing's reflex
  - Battle's sign
29. **Your patient is a 16-year-old male who was ejected from an all-terrain vehicle and struck his head on a large rock. He was not wearing a helmet. He is unresponsive with shallow, irregular respirations; a blood pressure of 170/110 mmHg; and a heart rate of 50 beats per minute. Which of the following interventions would be MOST appropriate?**
- Insert an oropharyngeal airway and ventilate via bag-valve mask at 30 breaths per minute.
  - Insert a nasopharyngeal airway and give oxygen by nonrebreather mask at 15 lpm.
  - Insert an oropharyngeal airway and give oxygen by nonrebreather mask at 15 lpm.
  - Insert an oropharyngeal airway and ventilate via bag-valve mask at 20 breaths per minute.
30. **Which of the following measures is NOT appropriate for a patient with a significant isolated head injury?**
- Treat for shock by elevating the foot of the backboard.
  - Keep the patient from becoming overheated.
  - Try to keep the patient from being agitated.
  - Control bleeding from head wounds.
31. **Of the following patients, which injury is the highest priority to receive controlled hyperventilation?**
- A 25-year-old female victim of battery who is awake but complains of a headache and has bloody fluid draining from her nose and left ear
  - A 15-year-old female who was ejected from a vehicle, struck her head on a tree, and displays decerebrate movements in response to painful stimuli
  - A 25-year-old male who regained consciousness one or two minutes after being struck on the head by a baseball bat and is now asking repetitive questions
  - A 70-year-old male who struck his head when he fell in the parking lot, has a large laceration on his forehead, and is disoriented
32. **What is the Glasgow Coma Scale (GCS) of your adult male patient who has fallen off a horse, has his eyes open, can follow your commands to squeeze his hands, but is confused about what happened and his whereabouts?**
- 12
  - 14
  - 15
  - 13

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33. **Your patient is a 30-year-old construction worker who fell from a scaffolding and has been impaled through the right orbit by a 36-inch piece of concrete reinforcement bar. The patient responds to verbal stimuli and appears to have multiple other injuries. Which of the following is the BEST course of action?**
- Remove the reinforcement bar and pack the orbit with sterile moist dressings to keep the scene time under 10 minutes.
  - Transport with the reinforcement bar in place to prevent delay at the scene.
  - Test the reinforcement bar for stability and remove it only if it is loose enough to be easily pulled from the wound.
  - Firmly stabilize the reinforcement bar in place so that the rescue crew can cut it short.
34. **When blood accumulates between the brain and the dura mater, what is the result?**
- Epidural contusion
  - Subdural contusion
  - Epidural hematoma
  - Subdural hematoma
35. **As pressure within the cranium increases, which of the following is the result?**
- Decreased blood pressure, decreased pulse
  - Increased blood pressure, decreased pulse
  - Decreased blood pressure, increased pulse
  - Increased blood pressure, increased pulse
36. **Your patient is a 21-year-old male who slid head-first down a water slide at his fraternity house and impacted the bales of straw that his fraternity brothers had erected as a barrier to keep participants from sliding onto the adjacent highway. The patient is conscious and complaining of neck pain. Which of the following should be included in your assessment?**
- If the patient has no numbness or tingling, ask him to stand and try to walk.
  - Apply painful stimuli to his extremities, starting distally and moving closer and closer to the body.
  - Ask the patient to cautiously touch his chin to his chest to check for range of motion.
  - Ask the patient to grasp and squeeze your hands.
37. **The proper procedure for opening the airway of an unresponsive trauma patient is:**
- head-tilt without chin-lift.
  - jaw-thrust maneuver.
  - Sellick's maneuver.
  - head-tilt, chin-lift maneuver.
38. **Which of the following pieces of equipment is acceptable for use in the prehospital stabilization of suspected cervical spine injuries?**
- Soft cervical collars
  - Five-pound sand bags
  - Rigid cervical collars
  - All of the above
39. **At which point may manual stabilization of the cervical spine be terminated?**
- Only when directed to do so by medical control
  - When the patient is secured to a long backboard
  - After a short immobilization device has been applied
  - After a cervical collar has been applied
40. **Which of the following describes the proper position of the patient's head for spinal immobilization?**
- Chin tilted upward for airway maintenance
  - Neutral, in-line "eyes forward" position
  - Stabilized in position found
  - The "sniffing" position

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41. **Which of the following may be a hazard of an improperly fitting cervical collar?**
- Allows hyperextension of the neck
  - Prevents the patient from opening his mouth
  - Allows flexion of the neck
  - All of the above
42. **When log-rolling a patient with a suspected spinal injury, which of the following EMTs directs the move?**
- The EMT at the head of the patient
  - The EMT with the highest level of training
  - The EMT with the most seniority
  - The EMT at the heaviest portion of the patient
43. **Which of the following is the correct sequence for securing the straps on a long spine board?**
- Legs, torso, head
  - Head, torso, legs
  - Torso, legs, head
  - Head, legs, torso
44. **Your patient is a 38-year-old male driver of a vehicle that left the roadway and struck a bus stop shelter and a tree. He is conscious and alert, he has some abrasions on his forehead, his skin is warm and dry, and he has a strong radial pulse and no difficulty breathing. Which of the following descriptions represents the MOST appropriate way for removing the patient from the vehicle?**
- Apply a cervical collar and perform rapid extrication onto a long backboard.
  - Have the patient stand up and then do a "standing take-down" onto a long backboard.
  - Place the backboard on the stretcher and have the patient stand, turn, and lie down on the backboard while you maintain manual in-line stabilization of the cervical spine.
  - Apply a cervical collar and short spine immobilization device before removing to a long backboard.
45. **For which of the following patients would the use of a short spine immobilization device be appropriate?**
- A 52-year-old female who crashed her vehicle into the front of a convenience store and who is awake, oriented, and complaining of neck pain
  - An unresponsive driver who was found in the driver's seat of a pickup truck that crashed into a tree
  - A 15-year-old male who struck a curb with his motorized scooter and flipped over the handlebars
  - A 77-year-old female who fell down a flight of stairs and is in an awkward position lying on her side on the landing
46. **When using a short spine immobilization device, which part of the body is secured last?**
- Arms
  - Torso
  - Head
  - Legs
47. **In which of the following circumstances should a helmet be removed?**
- If you suspect a skull fracture and need to palpate the head
  - If you want to place a nasal cannula on the patient but cannot because his ears are covered by the helmet
  - If the helmet interferes with airway management
  - If the helmet fits so snugly that you cannot inspect the ears for the presence of blood or fluid
48. **When should the EMT calculate a GCS with a patient who suffered a fall of 20 feet from his apartment building?**
- At the hospital before writing the care report
  - En route to the hospital
  - As he approaches the patient
  - Before departing from the scene

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49. **Which of the following is NOT used to calculate a patient's GCS?**
- Eye movement
  - Verbal response
  - Work of breathing
  - Motor response
50. **Which of the following systems includes the pairs of nerves that enter and exit the spinal cord between each pair of vertebrae?**
- Peripheral nervous system
  - Central nervous system
  - Autonomic nervous system
  - All of the above
51. **What is another name for the zygomatic bone?**
- Malar
  - Maxillae
  - Temporal
  - Mandible
52. **The bony bumps you feel along the center of a person's back are known as which of the following?**
- Vertebrae
  - Foramen magnum
  - Spinous process
  - None of the above
53. **Which of the following is the opening at the base of the skull?**
- Foramen magnum
  - Orbits
  - Spinous process
  - Temporomandibular joint
54. **You are treating a 54-year-old female patient who was involved in a domestic dispute; you notice an abrasion to the side of her head. The patient is unresponsive with a blood pressure of 200/110, a pulse of 60 beats per minute, and slightly irregular breathing. The patient's presentation is most likely caused by which of the following?**
- Increased intracranial pressure
  - Coup-contrecoup injury
  - Closed head injury
  - Increased arterial pressure
55. **You are treating an unresponsive homeless patient found in an alley. During your assessment you notice bruising behind both ears. This is known as what?**
- Fatigue signs
  - Warrior's signs
  - Soldier's signs
  - Battle's signs
56. **You respond to a patient who was hit in the face with a chair. Upon arrival, you notice a patient leaning in the corner and bleeding profusely from the mouth and nose. Your first action should be which of the following?**
- Assure scene safety.
  - Suction the airway and have the patient lean back.
  - Take c-spine precautions.
  - Place the patient on a nonrebreather mask at 15 lpm.

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57. **Glasgow Coma Scale (GCS) is a neurological assessment that looks at which of the following?**
- Eye opening, verbal response, and motor response
  - Grip strength, verbal response, and eye opening
  - Verbal response, motor response, and AVPU
  - Motor response, arm movement, and speech
58. **While assessing a patient with a laceration to the neck, the EMT must be aware that which of the following conditions may develop?**
- Deep vein thrombosis
  - Air embolus
  - Air thrombosis
  - Deep vein embolus
59. **Which of the following is defined as an area of the body surface that is innervated by a single spinal nerve?**
- Spinous process
  - None of the above
  - Malar
  - Dermatome
60. **You are treating a 35-year-old male patient that has been involved in a motorcycle incident. The patient is unresponsive with a blood pressure of 60/40, a pulse of 66 beats per minute, and respirations of 18 breaths per minute. The patient's presentation is most likely caused by which of the following?**
- Cardiogenic shock
  - Septic shock
  - Increased intracranial pressure
  - Neurogenic shock
61. **Your patient is a 16-year-old centerfielder on his high school baseball team. He was injured when he and the left fielder collided trying to catch a fly ball. He is disoriented and is unable to tell you what happened. His vital signs are pulse 88, blood pressure 132/86, respiratory rate 16, and pupils equal. As you assess his head, you do not see any cuts or bleeding, but you feel a spongy, depressed area over his left ear. You should suspect a(n):**
- closed head injury.
  - skull injury.
  - open head injury.
  - direct injury.
62. **A young female was injured in an automobile wreck, striking her head on the windshield. She is unconscious and her breathing is irregular. She is bleeding from a scalp wound, but your assessment shows that her cranium is intact. Her vital signs are pulse 68, blood pressure 148/90, and her pupils are unequal. You should suspect a(n):**
- concussion.
  - closed head injury.
  - contusion.
  - open head injury.
63. **A 65-year-old man was doing some work on his roof when he lost his footing and fell to the ground, approximately 15 feet. He is unconscious but his respirations are normal. You note an obviously angulated left leg. You are more concerned about a possible head injury. Which of the following would indicate a possible head injury?**
- Increased blood pressure
  - Glasgow Coma Scale of 15
  - Constricted pupils
  - Increased pulse rate

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64. **You are called for a man who is not acting right. His wife says he was outside working in the garden but didn't come in for lunch when he was called. She went to check on him and found him sitting next to a stump, confused. Your assessment shows a pulse rate of 58, blood pressure of 186/82, respirations of 16, and one of his pupils is dilated. You are unable to detect any signs of trauma and you don't see any obvious indication that he has fallen. You should suspect a(n):**
- closed head injury.
  - open head injury.
  - insecticide poisoning.
  - nontraumatic brain injury.
65. **You are en route to the trauma center with a patient who was injured when he was thrown from a horse. You suspect multiple trauma injuries including a closed head injury. You will monitor his mental status using the Glasgow Coma Scale per your protocols. Which of the following will you check?**
- Eye-opening, motor response, and verbal response
  - Motor response, verbal response, and attentiveness
  - Speech patterns, motor patterns, and mental status
  - Verbal responses, motor skills, and mental status
66. **Your patient has sustained a serious laceration to his neck. He appears to have lost a lot of blood and you are considering how you will control the bleeding. Your primary treatment should be to place a(n):**
- pressure dressing.
  - occlusive dressing.
  - dry, sterile dressing.
  - bulky dressing.
67. **When a patient has a serious open wound to the neck, you are concerned about the possibility of an air embolism. The reason an air embolism can occur is because of:**
- the higher pressure in the vessels of the neck.
  - the negative pressure in the chest.
  - vessel pressure that is lower than atmospheric pressure.
  - damage to the trachea.
68. **Your patient has had his throat slashed during a robbery attempt. You are concerned since it is apparent that the vessels in his neck have been lacerated. A breach in which of the following vessels would be most likely to lead to an air embolism?**
- Capillaries
  - Arterioles
  - Arteries
  - Veins
69. **Your 38-year-old male patient has been injured in an assault. He has several facial lacerations and a large knot on his head. Bystanders say that he was thrown over a large table and landed on his head and shoulder. As part of your scene size-up and primary assessment, you should:**
- wait for ALS to treat the patient.
  - immobilize his cervical spine.
  - splint any other bone or joint injuries.
  - complete an initial set of vital signs.
70. **Your patient has been injured by a fall down a flight of steps. He is alert and oriented but complains of back and neck pain. You spinal immobilize him on a long spine board with a cervical collar on his neck as a precaution because you know that the:**
- cervical spine is the most vulnerable part of the spine.
  - lumbar area is rarely injured due to the rib support.
  - thoracic spine is especially vulnerable to injury.
  - coccyx is easily dislocated.

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71. **A 17-year-old girl was injured when her car was struck from behind while she was stopped at a red light. She is complaining of a headache with neck and back pain. You suspect she has sustained a(n):**
- distracted injury.
  - compression fracture.
  - extension injury.
  - whiplash injury.
72. **You are called for a young man who was diving head first off a dock into a lake. Bystanders say he struck his head on the bottom because the water was too shallow. They said he was not breathing when they pulled him from the water and they have been performing rescue breathing for him. He is awake, but he is unable to breathe on his own. What type of damage or injury does this indicate?**
- Damage to C-3, C-4, or C5
  - Damage to his thoracic spine
  - A closed head injury
  - An open head injury
73. **Your patient has a suspected cervical spine injury from falling from a rope swing. His vital signs are pulse 62, respirations 20, and blood pressure 90/56. He has no feeling below his mid-chest area but is able to breathe on his own. You should suspect:**
- cardiogenic shock.
  - hypovolemic shock.
  - neurogenic shock.
  - psychogenic shock.
74. **Your patient is a 16-year-old male who ran his truck off of the road and into a ditch. He was driving just fast enough to cause the air bag to deploy when he hit the ditch. He is complaining of some neck and shoulder pain. His vital signs are respirations 20, pulse 110, blood pressure 116/80, and pupils equal and reactive. How should you manage this patient?**
- Perform a rapid extrication and spinal immobilize him on a long spine board.
  - Use a short spine board or vest device, then transfer him to a long spine board.
  - Apply a cervical collar, then rotate him to a long spine board.
  - Place him on oxygen, then slowly move him to the stretcher.
75. **Your patient was ejected from his motorcycle when he struck a deer late at night on a deserted highway. He is drowsy and unable to communicate clearly. As you immobilize him on the long spine board, you find that you are unable to obtain neutral alignment of his spine due to the large helmet he has on. You should:**
- pad under his shoulders to straighten his neck.
  - tip his head back to gain neutral alignment.
  - place towels on either side of the helmet to stabilize it.
  - remove the helmet to better manage proper alignment.

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### Test Name: Mod 8 Trauma to Head Neck Spine

1. a. Sensory
2. c. Constriction of blood vessels
3. b. Sensation of the right leg
4. b. Upper jaw
5. a. Thoracic
6. a. 7
7. d. Any of the above
8. b. Laceration with a skull fracture
9. d. All of the above
10. a. Head injury, spine injury, and internal bleeding
11. a. 20
12. c. Decreasing blood flow to the brain
13. b. Provide cervical spine immobilization.
14. d. All of the above
15. b. The patient may not have any symptoms of the injury.
16. d. Improper management of airway and ventilation
17. b. Cervical and lumbar
18. a. Hold the patient's head still in a neutral, "eyes forward" position.
19. a. Deformity
20. b. There is a lack of mechanism of injury.
21. d. Dilation of blood vessels
22. c. Hyperextension of the neck
23. d. Place the patient supine on the backboard, then put a pillow under the right side of the backboard.
24. a. Low blood pressure
25. a. Cervical spine injury
26. d. Concussion
27. c. Painful
28. b. Posturing
29. d. Insert an oropharyngeal airway and ventilate via bag-valve mask at 20 breaths per minute.
30. a. Treat for shock by elevating the foot of the backboard.
31. b. A 15-year-old female who was ejected from a vehicle, struck her head on a tree, and displays decerebrate movements in response to painful stimuli
32. b. 14
33. d. Firmly stabilize the reinforcement bar in place so that the rescue crew can cut it short.
34. d. Subdural hematoma
35. b. Increased blood pressure, decreased pulse
36. d. Ask the patient to grasp and squeeze your hands.
37. b. jaw-thrust maneuver.
38. c. Rigid cervical collars
39. b. When the patient is secured to a long backboard
40. b. Neutral, in-line "eyes forward" position
41. d. All of the above
42. a. The EMT at the head of the patient
43. c. Torso, legs, head
44. d. Apply a cervical collar and short spine immobilization device before removing to a long backboard.
45. a. A 52-year-old female who crashed her vehicle into the front of a convenience store and who is awake, oriented, and complaining of neck pain
46. c. Head
47. c. If the helmet interferes with airway management
48. b. En route to the hospital
49. c. Work of breathing
50. a. Peripheral nervous system
51. a. Malar
52. c. Spinous process
53. a. Foramen magnum

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54. a. Increased intracranial pressure
55. d. Battle's signs
56. a. Assure scene safety.
57. a. Eye opening, verbal response, and motor response
58. b. Air embolus
59. d. Dermatome
60. d. Neurogenic shock
61. c. open head injury.
62. b. closed head injury.
63. a. Increased blood pressure
64. d. nontraumatic brain injury.
65. a. Eye-opening, motor response, and verbal response
66. b. occlusive dressing.
67. c. vessel pressure that is lower than atmospheric pressure.
68. d. Veins
69. b. immobilize his cervical spine.
70. a. cervical spine is the most vulnerable part of the spine.
71. d. whiplash injury.
72. a. Damage to C-3, C-4, or C5
73. c. neurogenic shock.
74. b. Use a short spine board or vest device, then transfer him to a long spine board.
75. d. remove the helmet to better manage proper alignment.