



Trauma

Single Choice Questions (SCQ) and Extended Match Questions (EMQ)

Emergency Medicine Fellowship Program

Trauma MCQ's

18. Which cranial nerve does not travel through the orbital foramen?
- 2
 - 3
 - 4
 - 5
 - 6
19. Which substance is found in CSF but not in simple rhinorrhea?
- glucose
 - lactate
 - acid
 - base
 - galactose
20. Which facial view x-ray is the best for examining the orbits and midface?
- OPG
 - Waters or occipitomental
 - Caldwell or PA view
 - Submental vertex
 - Towne
21. A tripod fracture involves what?
- it is another word for Le Fort fracture
 - zygomaticotemporal and zygomaticofrontal suture diastasis and inferior orbital rim fracture
 - fracture through maxilla, zygomatic arch and nasal bones
 - fracture through neck angle and body of the mandible
 - superior and inferior orbital rim fracture and diastasis of zygomaticofrontal suture
22. What is the name of the fracture that is clinically detected by tugging on the maxilla/hard palate causing the nose to move.
- Le Fort 5
 - Le Fort 4
 - Le Fort 3
 - Le Fort 2
 - Le Fort 1
23. Which investigation of the abdomen in trauma is described by: rapid, sensitive, not specific, does not examine retroperitoneum, repeatable, non-invasive?
- physical examination
 - CT
 - FAST
 - DPL
 - Plain x-ray
24. What RBC count constitutes a positive DPL?
- >30 000/cm³
 - >60 000/cm³

- c) >100 000/cm³
- d) >200 000/cm³
- e) >500 000/cm³

25. Where is Zone 1 in the Roon and Christensen classification of neck trauma?

- a) clavicles to cricoid cartilage
- b) cricoid cartilage to angle of mandible
- c) angle of mandible to base of skull
- d) Midline to anterior border of sternomastoid
- e) Post border of sternomastoid to ant border of trapezius

26. Which statement is incorrect with regards to penetrating neck injury?

- a) if the platysma muscle is clearly intact local wound repair is all that is required
- b) if the platysma has been violated it must be assumed that significant injury has occurred
- c) in a stable patient with a zone 1 injury angiography and oesophagoscopy are mandatory +/- bronchoscopy
- d) in a stable patient with a zone 3 injury angiography and oesophagoscopy are mandatory +/- bronchoscopy
- e) Zone 2 injuries some people advocate mandatory exploration

27. Which statement is true regarding C spine fracture in hanging?

- a) this is the usual mechanism of death with associated spinal cord transection
- b) it is often seen but is not usually associated with spinal cord injury
- c) it is only seen if the person falls the distance of their height and their feet do not touch the ground
- d) the lower C spine is usually involved when it occurs
- e) spinal cord injury tends to happen without C spine fracture

28. When should thoracotomy be considered in traumatic haemothorax?

- a) if initially drain 800ml
- b) if initially drain 1000ml
- c) if sustained loss of 50ml/hr for 2 hours
- d) if sustained loss of 200ml/hr for 2 hours
- e) always

29. What is the largest size haemothorax that an injury to an intercostal artery can cause?

- a) Negligible-50ml
- b) Small= 200ml
- c) Moderate=600ml
- d) Large = 1200ml
- e) Massive=>1600ml

30. What percentage of rib fractures may not be apparent on CXR?

- a) 10%
- b) 20%
- c) 30%
- d) 40%
- e) 50%

31. Which is incorrect with regards to the use of investigations to investigate myocardial trauma in sternal fractures?
- troponin should be requested in most patients
 - ECG should be done in most patients
 - If ECG normal and normal vital signs, no need to investigate further
 - If abnormal ECG they should be admitted and monitored
 - Transthoracic Echo can be used to assess myocardial wall motion
32. Which part of the heart is most often damaged in blunt cardiac trauma?
- RV
 - LV
 - RA
 - RV
 - Interventricular septum
33. What percentage of pts with blunt trauma to the aorta who survive to hospital will be dead within 24 hours if left untreated?
- 10%
 - 20%
 - 30%
 - 40%
 - 50%
34. What is the next step if you see a stable patient with a good mechanism of injury for traumatic aortic dissection and a widened mediastinum on CXR?
- MRI
 - OT
 - Spiral CT
 - Aortography
 - TOE
35. Which sign on CXR is most specific and sensitive for traumatic aortic dissection?
- widened mediastinum
 - oesophageal deviation of >2cm to right at level of T4
 - obscuration of the aortic knob
 - small left hemithorax
 - depression of the R main bronchus >40 degrees below horizontal
36. Which burn can be treated with calcium gluconate?
- hydrochloric acid
 - acetic acid
 - sulfuric acid
 - hydrofluoric acid
 - nitric acid
37. Which is not seen in hydrofluoric acid burns?
- hyperkalemia
 - hypocalcemia

- c) hypomagnesemia
- d) hypernatremia
- e) severe pain]

38. Which is false about chemical burns?

- a) alkalis cause more damage than acids
- b) irrigation is not the mainstay of treatment in elemental metals
- c) eyes should be irrigated at least 30 mins with 1-2L normal saline
- d) calcium gluconate can be given by intraarterial infusion for hydrofluoric acid burns
- e) alkali burns should be doused in sand prior to irrigation

39. What percentage of a 1 year old child is burnt if their anterior torso and all of R arm are burnt?

- a) 10%
- b) 15%
- c) 24%
- d) 32%
- e) 49%

40. Which is not a feature of lightning strike?

- a) death due to VF
- b) cataracts
- c) keraunoparalysis
- d) feathering burns
- e) perforated ear drum

41. Which is false about a lightning strike?

- a) the patient should not be handled as they are charged and dangerous
- b) flashover is potentially life saving
- c) the likelihood of long term impairment after recovery is low
- d) being struck directly is more dangerous than side flash and step voltage
- e) if caught in a lightning strike you should keep your feet together and crouch down

42. Which is false of electrocution?

- a) death is usually due to VF
- b) delayed fatal arrhythmias are extremely rare
- c) blood vessels, nerves and muscles are the most conductive
- d) dc current is worse than ac
- e) if pregnant the fetus is usually OK

43. How much blood loss is necessary to first show hypotension?

- a) 10%
- b) 20%
- c) 25%
- d) 30%
- e) 40%

ANSWERS

18)C 19)A 20)B 21)B 22)D 23)C 24)C 25)A 26)D 27)C 28)D
29)E
30)E 31)A 32)A 33)E 34)B 35)A 36)D 37)D 38)E 39)C 40)A
41)A
42)D 43)D

7. A 7yr male is involved in a house fire. There are partial thickness burns to both lower limbs, the back and half of the left arm

- a) He has a 30% burn
- b) His fluid requirement is estimated about 7L in the 24hrs from arrival in the ED
- c) As there are no areas of full thickness burn, this fits the American Burn Association criteria for a moderate burn
- d) Analgesia in this case should take a back seat to precise mapping of the burn to determine fluid requirements
- e) A central line in the right IJV should carry no more risk of infection than in any other patient

7) E

TRAUMA MCQs

Q1 Which of the following statements is MOST correct regarding flail chest?

- A) It causes hypoxia because of the paradoxical motion of the isolated chest wall segment during respiration
- B) It causes hypoxia because of the associated contusion of the underlying lung tissue
- C) Patients with it require external stabilization with sandbags or towel clips to minimize paradoxical movement
- D) Patients with it require internal stabilization with intubation and mechanical ventilation to provide adequate oxygenation and ventilation
- E) None of the above

Q2 All of the following types of cervical spine fracture are caused by flexion of the neck EXCEPT?

- A) Jefferson fracture
- B) bilateral facet dislocation
- C) simple wedge (compression) fracture
- D) clay-shoveler (coal-shoveler) fracture
- E) flexion teardrop fracture

Q3 Dislocation of which of the following joints is MOST often associated with an arterial injury?

- A) Elbow
- B) Ankle
- C) Knee
- D) Hip
- E) Shoulder

Q4 With respect to paediatric injuries all of the following are true EXCEPT?

- A) Seizures following traumatic head injury occur in 5 of hospitalised patients
- B) The spleen is the most commonly injured solid organ in children
- C) The duodenum is the part of the intestine most commonly injured in seat belt injuries
- D) Children are more prone to high cervical injuries than adults
- E) Isolated chest trauma carries a 4 – 12 mortality rate

Q5 All of the following statements regarding soft tissue cervical hyperextension injury or “whiplash” are true EXCEPT

- A) during a low-speed motor vehicle accident, sudden acceleration of the head can reach 11.4 G with forces of over 100 pounds applied to the head
- B) about 50% of people in rear-impact accidents sustain neck injury

- C) most patients recover completely within 2–12 weeks
- D) there is a higher incidence in women than men
- E) it can be seen with “shaken baby syndrome”

Q6 All of the following statements concerning thoracolumbar fractures are true EXCEPT?

- A) there are three types
- B) they range from completely stable to highly unstable with paraplegia
- C) treatment varies from analgesia alone to need for acute spinal fusion and intensive care unit admission
- D) wedge compression fractures are most likely at L-1, followed by L-2
- E) none of the above

Q7 A 28-year-old man presents to the emergency department after being hit on the head with baseball bat. As you are examining him, his mental status begins to deteriorate. Which of the following statements is MOST correct regarding intracranial hemorrhage?

- A) Temporal skull fractures more commonly lead to subdural than epidural hematomas.
- B) Contralateral pupillary dilation is seen secondary to cerebral edema from a contrecoup mechanism.
- C) Ipsilateral pupillary dilation is seen secondary to uncal herniation on the side of the injury.
- D) Rupture of bridging veins causes accumulation of blood in the epidural space.
- E) None of the above.

Q8 A 52-year-old restrained driver involved in a motor vehicle accident complains of abdominal pain radiating to both testicles. What injury must be suspected?

- A) Duodenal injury
- B) Hepatic injury
- C) Renal colic
- D) Splenic injury
- E) Testicular torsion

Q9 A 27-year-old man is brought to the emergency department after an unfortunate incident involving a baseball bat, three teenagers, and a bottle of vodka. He is awake, but intoxicated, and fully oriented with intact neurologic function. On examination, the patient is unable to fully open or close his mouth. What area of his mandible is MOST likely to be fractured?

- A) Angle
- B) Molar
- C) Condyle
- D) Symphysis
- E) Mental

Q10 All of the following are causes of compartment syndromes except:

- A) Crush injuries
- B) Electrocutation
- C) Vigorous exercise
- D) Frost bite
- E) Decompression illness

Q11 Zone 2 of the neck contains all of the following structures EXCEPT?

- A) carotid artery
- B) recurrent laryngeal nerve
- C) oesophagus
- D) vertebral artery
- E) trachea

Q12 In spinal Xrays?

- A) In the upper thoracic spine the posterior height is usually 1.5mm less than the anterior height
- B) In a true lateral cervical spine film taken at 1.8m there may be up to 3mm of anterior subluxation in a normal uninjured adult
- C) In a lateral cervical spine film the space between the anterior arch of C1 and the odontoid process of C2 (pre-dental space) should not exceed 2.5mm in adults and 4.5mm in children
- D) A Chance fracture through the lumbar spine is best seen on axial CT scans
- E) Pre-vertebral soft tissue in the lateral cervical spine XRay should not exceed 10mm at C2 and 20mm at C6 in the adult

Q13 Indications for laparotomy after stab wound to the trunk include all of the following EXCEPT

- A) Peritonism on examination
- B) Presence of haemothorax without chest wound
- C) DPL revealing RBC > 1000/mm³
- D) Evisceration of bowel
- E) Hypotension and + FAST scan

Q14 All of the following statements regarding gunshot wounds are true EXCEPT?

- A) injury is proportional to the kinetic energy of the missile
- B) missile velocities are rated as either slow, medium, or high
- C) intraperitoneal injury due to high velocity missiles can occur without penetration of the peritoneum

- D) the intraabdominal organs most commonly injured are the liver, small bowel, and colon
- E) a stable patient with a gunshot wound to the abdomen can be observed in the emergency department with serial hematocrits

Q15 Spinal shock is characterised by?

- A) Flaccid areflexia
- B) Hypotension and bradycardia
- C) Hypovolaemia
- D) Diaphragmatic injury
- E) Priapism

Q16 Which of the following results from peritoneal lavage is considered indicative of intraperitoneal injury following blunt abdominal trauma?

- A) Red blood cell (RBC) count 5000/ml
- B) RBC count 10,000/ml
- C) RBC count 20,000/ml
- D) RBC count 50,000/ml
- E) RBC count 100,000/ml

Q17 All of the following are true except?

- A) Adults with a linear skull fracture and no complications can be safely discharged from the emergency department
- B) Seizures are commonly associated with base of skull fractures, especially in children who should be admitted for overnight observation
- C) Linear skull fractures are the most common skull fracture in children under 5years
- D) CSF otorrhoea or rhinorrhoea requires early and prolonged antibiotic treatment
- E) 25% of patients with a depressed skull fracture have no loss of consciousness

Q18 Which of the following is true regarding tetanus prophylaxis?

- A) Diphtheria-tetanus toxoid should not be administered during pregnancy
- B) Tetanus generally occurs in large or very deep wounds
- C) Excessive administration of diphtheria-tetanus toxoid leads to hypersensitivity to the vaccine
- D) Tetanus is rarely fatal in modern times
- E) Elderly women are the group MOST likely to be underimmunized in the United States

Q19 All of the following statements regarding Salter-Harris type fractures are true EXCEPT?

- A) they are unique to paediatric patients
- B) Type I fractures carry a high risk for permanent growth plate injury

- C) Type II injuries are the most common
- D) Type III and IV fractures are intra-articular
- E) Type V fractures may not be seen on an initial radiograph

Q20 The Ottawa rules for ordering ankle radiographs after trauma would predict a fracture with all the following EXCEPT?

- A) tenderness to palpation at the medial malleolus
- B) patient unable to ambulate four steps in the emergency department
- C) swelling and ecchymosis anterior and inferior to the lateral malleolus
- D) patient unable to ambulate immediately after the injury
- E) tenderness to palpation at the lateral malleolus

Q21 Regarding hangings which occur in the community: all of the following are true EXCEPT:

- A) cervical fractures, such as the Hangman's fracture commonly occur
- B) Patients who have lost consciousness and have had a significant injury should be observed in the hospital for 24 hours even if they appear stable at the time of presentation
- C) the difficult intubation kit should be available when intubating these patients
- D) Cerebral oedema may occur
- E) cervical immobilisation should occur until clinical and/or radiological clearing of the cervical spine has occurred

Q22 All of the following statements regarding penetrating trauma to the posterior abdomen are true EXCEPT?

- A) the posterior abdomen is defined as the area bordered by the midaxillary line anteriorly, the tip of the scapula superiorly, and the iliac crest inferiorly
- B) due to the protection of the spine, back muscles, and pelvis, intraperitoneal organs are less likely to be injured after trauma to this part of the torso
- C) kidneys, colon, and liver are the most likely organs to be injured
- D) shock, evisceration, peritonitis, and intraperitoneal free air are all indications for immediate celiotomy
- E) with missile injuries, blast effect can result in visceral injury without penetration of the peritoneum or retroperitoneum

Q23 All of the following are causes of early death after neck injury EXCEPT?

- A) vascular injury
- B) central nervous system (CNS) injury
- C) airway obstruction
- D) oesophageal injury
- E) air embolism

Q24 Which of the following cervical spine injuries is the MOST unstable?

- A) Fracture of the dens.
- B) Burst fracture with posterior ligamentous disruption (flexion teardrop).
- C) Bilateral facet dislocation.
- D) Burst fracture of vertebral body without posterior ligamentous disruption.
- E) Rupture of transverse atlantal ligament.

Q25 A 33 year old man presents to the Emergency Department after a road traffic crash. He is noted to have a severe head injury with a GCS of 6/15 and multiple wounds. All of the following treatments may be appropriate in this man EXCEPT?

- A) in line traction of the cervical spine
- B) high flow oxygen
- C) rapid sequence intubation
- D) intravenous fluids
- E) tetanus injection

Q26 Which one of the following is true concerning Monteggia fracture-dislocation?

- A) The distal one-third of the ulna is fractured
- B) The radial head is fractured
- C) The radial head is frequently dislocated posteriorly, but may be dislocated anteriorly
- D) Closed reduction is usually sufficient for the pediatric patient, but adults often require open reduction and internal fixation
- E) The radial head is at high risk for avascular necrosis

Q27 Penetrating Neck Injuries, all the following are true EXCEPT:

- A) The patient with hemodynamic instability or obvious aero-digestive injury requires urgent Operating Theatre management
- B) Esophageal injuries are at risk of being missed clinically with subsequent delayed presentation and very high mortality
- C) Zone 3 injuries are best assessed using Angiography
- D) Exploration of penetrating neck injuries beyond the platysma does have a role in the ED
- E) Penetrating neck injuries may present with abnormal neurological function e.g. Horner syndrome, Brown-Sequard syndrome

Q28 A 3-year-old, 17-kg boy fell into a window and sustained multiple lacerations to both hands. Which of the following is important to consider when treating his wounds?

- A) The earliest symptoms of lignocaine toxicity are respiratory cough, tachypnoea, and respiratory alkalosis
- B) The maximum dose of lignocaine without adrenaline is 7 mg/kg

- C) Most toxic reactions secondary to local anaesthetics occur secondary to inadvertent intravenous injection
- D) Bupivacaine is safe in children over the age of 5
- E) None of the above

Q29 Which statement is true regarding head injury?

- A) Persistent impairment of sleep and memory are uncommon following minor head trauma
- B) Epidural hematomas are frequently associated with severe injury to the underlying brain
- C) Patients with brain atrophy are susceptible to subdural hematoma after head trauma
- D) Secondary brain injury is untreatable and non-preventible with current medical technology
- E) Post-traumatic seizures are best controlled with phenobarbital or diazepam

Q30 Which of the following results from central cord syndrome?

- A) Unilateral paralysis with contralateral loss of vibration and position sense
- B) Flaccid areflexic paralysis with intact bulbocavernosus reflex
- C) Progressive centripetal demyelination months to years post-injury
- D) Transient reversal of hot and cold sensation accompanied by paraesthesia
- E) Neurologic impairment worse in the upper than the lower extremities

Q31 Using the Parkland formula in burns management?

- A) skin grafting can be predicted for burns 10 surface area
- B) SSD cream is applied at the rate 2gm/ area burnt
- C) metabolic acidosis is allowed to persist
- D) 4ml/kg/ body surface burn is per day burns replacement
- E) one third the total requirement is given in the first 4 hours

Q32 Which is TRUE in regard to Hydrofluoric acid poisoning?

- A) Hypermagnesaemia is common
- B) Hyperkalaemia responds well to bicarbonate therapy
- C) Calcium Chloride can be used for intra arterial therapy but not for Bier's block
- D) If Calcium gluconate eye drops available, should be used initially in preference to saline irrigation
- E) Intra arterial infusion is the better technique for digital exposure to high concentrations of HF acid

Q33 With respect to treatment with SSD

- A) It can lead to early neutropaenia

- B) Renal impairment is associated with silver toxicity
- C) It is not contraindicated for facial burns
- D) It contains silver sulphadiazine 5%
- E) It causes anaemia commonly seen in burns due to direct marrow suppression

Q34 In comparing the area of burns sustained in adults and children, which is always true

- A) The arms in children are proportionately less than in adults
- B) The palmar surface of the hand is 1% of the total BSA
- C) Neck in children is proportionately the same as in adults
- D) Legs in children each occupy 14%
- E) The head in children is proportionately twice the area of adults

ANSWERS

1. B
2. A
3. C
4. B
5. B
6. A
7. C
8. A
9. A
10. E
11. D
12. C
13. C
14. E
15. A
16. E
17. B
18. E
19. B
20. C
21. A
22. A
23. D
24. E
25. A
26. D
27. D
28. C
29. C
30. E
31. D
32. E
33. A
34. B

558. Which of the following statements is correct regarding trauma during pregnancy?

- (A) Since plasma volume is increased, normal vital signs may be maintained even in the face of significant hemorrhage
- (B) Blood gas analysis usually reveals a respiratory alkalosis secondary to increased respiratory rate
- (C) Mild tachycardia can represent significant volume loss, since the resting pulse is decreased in pregnancy
- (D) Levels of fibrinogen and coagulation factors VII, VIII, IX, and X are decreased, giving pregnant patients a functional coagulopathy
- (E) Pregnant patients with blunt abdominal trauma have a higher incidence of intra-abdominal injury than non-pregnant patients

559. According to 1980 figures, which of the following statements is accurate regarding the incidence of trauma in the United States?

- (A) Half of traumatic fatalities are due to intentional violence (homicide and suicide)
- (B) Trauma is responsible for more deaths in the 1–34 age group than all other diseases combined
- (C) Twenty percent of drivers involved in fatal motor vehicle accidents are legally intoxicated with ethanol
- (D) Over 70% of trauma fatalities occur in urban areas, primarily in the inner city
- (E) The majority of fatal bicycle accidents occur in intoxicated men between 18–25 years of age

560. Which of the following statements is true regarding the incidence of domestic violence in the United States in 1990?

- (A) The incidence of injury to women due to battering is half the incidence of injury to women due to motor vehicle accidents
- (B) Ten percent of murdered women are killed by male domestic partners
- (C) The incidence of domestic violence is lower in pregnant women than in nonpregnant women
- (D) Emergency physicians are good at diagnosing injuries due to domestic violence
- (E) About one third of all emergency department visits by women are due to domestic violence

561. Which of the following is true regarding initial evaluation of an injured patient?

- (A) Obtaining vital signs is a priority and should be accomplished early during the primary survey
- (B) The entire physical examination should be completed prior to performing invasive procedures

- (C) A thorough neurologic examination should be performed prior to administering paralytic agents
- (D) The cervical spine should be evaluated by radiograph prior to performing orotracheal intubation
- (E) A rectal examination should be performed prior to placement of a Foley catheter in a male patient

562. Which of the following statements is true regarding brain physiology?

- (A) Cerebral blood flow is directly related to arterial blood pressure
- (B) Cerebral perfusion pressure is directly related to arterial blood pressure
- (C) Cerebral blood flow is directly related to cerebral perfusion pressure
- (D) Brain metabolism is responsible for 50% of total oxygen utilization
- (E) The brain receives 33% of a patient's cardiac output

563. Which statement is true regarding head injury?

- (A) Persistent impairment of sleep and memory are uncommon following minor head trauma
- (B) Epidural hematomas are frequently associated with severe injury to the underlying brain
- (C) Patients with brain atrophy are susceptible to subdural hematoma after head trauma
- (D) Secondary brain injury is untreatable and non-preventible with current medical technology
- (E) Post-traumatic seizures are best controlled with phenobarbital or diazepam

564. Which of the following best describes neurogenic shock?

- (A) It is a state of vasomotor instability resulting in labile blood pressure and caused by a spinal cord injury
- (B) It is a state of acute paraplegia with preservation of the bulbocavernosus reflex
- (C) It is a transient flaccid paralysis following spinal cord trauma
- (D) It causes tachycardia and hypertension in the face of hypovolemia
- (E) It causes hypertension and paradoxical bradycardia

565. A 45-year-old victim of blunt head trauma is undergoing his initial evaluation in the emergency department. While awaiting CT scan, he develops anisocoria and extensor posturing. He is intubated and hyperventilated. Neurosurgical consultation is requested, but will not be immediately available. The neurosurgeon instructs you over the phone to give mannitol and perform emergency trephination if there is no response. Where should emergency burr holes be placed?

- (A) On the side of the dilated pupil
- (B) On the side of the smaller pupil
- (C) On the side of the scalp laceration
- (D) In the midline when both sides are injured
- (E) On both sides blindly

566. The patient in question number 565 has no eye opening, no verbalization, and extensor posturing to pain. What is his Glasgow Coma Score?

- (A) 0
- (B) 3
- (C) 4
- (D) 5
- (E) 7

567. All of the following are causes of early death after neck injury EXCEPT

- (A) vascular injury
- (B) central nervous system (CNS) injury
- (C) airway obstruction
- (D) esophageal injury
- (E) air embolism

568. Which of the following statements is MOST correct regarding flail chest?

- (A) It causes hypoxia because of the paradoxical motion of the isolated chest wall segment during respiration
- (B) It causes hypoxia because of the associated contusion of the underlying lung tissue
- (C) Patients with it require external stabilization with sandbags or towel clips to minimize paradoxical movement
- (D) Patients with it require internal stabilization with intubation and mechanical ventilation to provide adequate oxygenation and ventilation
- (E) None of the above

569. All of the following are radiographic findings suggestive of acute aortic rupture EXCEPT

- (A) displacement of the esophagus to the right
- (B) presence of a left “apical cap”
- (C) a left pleural effusion
- (D) elevation of the left mainstem bronchus
- (E) widening of the mediastinum

570. Of the following injuries, which is MOST commonly missed on a patient’s initial presentation to the emergency department?

- (A) Pancreatic laceration
- (B) Splenic laceration
- (C) Renal laceration
- (D) Traumatic aortic disruption
- (E) Inferior vena cava injury

571. Which of the following statements is true regarding penetrating abdominal trauma?
- (A) Anterior chest wounds below the nipples should be suspected of traversing the diaphragm into the abdomen
 - (B) 25% of anterior abdominal stab wounds penetrate into the peritoneal cavity
 - (C) More than 75% of stab wounds that enter the peritoneal cavity cause intraperitoneal injury
 - (D) 50% of anterior abdominal gunshot wounds penetrate into the peritoneal cavity
 - (E) Less than 50% of gunshot wounds that enter the peritoneal cavity cause intraperitoneal injury
572. Which of the following would be UNLIKELY to be detected on CT scan following blunt abdominal trauma?
- (A) Retroperitoneal injury
 - (B) Hepatic subcapsular hematoma
 - (C) Renal pedicle injury
 - (D) Perforated viscus
 - (E) Pelvic fracture hematoma
573. Which of the following results from peritoneal lavage is considered indicative of intraperitoneal injury following blunt abdominal trauma?
- (A) Red blood cell (RBC) count > 5000/ml
 - (B) RBC count > 10,000/ml
 - (C) RBC count > 20,000/ml
 - (D) RBC count > 50,000/ml
 - (E) RBC count > 100,000/ml
574. Which of the following conditions is associated with an increased incidence of splenic rupture following blunt abdominal trauma?
- (A) Sickle cell disease
 - (B) Hyperthyroidism
 - (C) Diabetes
 - (D) Malaria
 - (E) Hypertension
575. A 24-year-old man presents to the emergency department with stable vital signs following isolated significant blunt trauma to his right kidney. Which of the following urinary findings MOST accurately describes the indication for a CT scan or intravenous pyelogram (IVP)?
- (A) Gross hematuria is the only indication
 - (B) Microscopic hematuria with > 20 RBC/ml
 - (C) Microscopic hematuria with > 50 RBC/ml
 - (D) Microscopic hematuria with > 100 RBC/ml

(E) Significant blunt trauma to the flank should prompt a study irrespective of urine findings

576. Which of the following statements is true regarding trauma to the bladder?

(A) Intraperitoneal bladder rupture causes dye extravasation on cystography which outlines the pelvic fascia like horns

(B) Extraperitoneal bladder rupture is usually due to compression of a full bladder during deceleration

(C) Cystography and CT scan are often falsely negative in diagnosing bladder rupture

(D) Cystography should be performed using 100 ml of water-soluble iodinated contrast material in the average-weight adult

(E) Extraperitoneal bladder rupture is an indication for exploration and surgical repair

577. Dislocation of which of the following joints is MOST often associated with an arterial injury?

(A) Elbow

(B) Ankle

(C) Knee

(D) Hip

(E) Shoulder

578. What is the probable mechanism for the decrease in intracranial pressure that occurs with hyperventilation?

(A) Hypocarbica from hyperventilation results in cerebral vasoconstriction

(B) Hyperventilation causes alkalemia, which leads to decreased production of vasoactive amines

(C) Hyperoxia induced by hyperventilation causes decreased prostaglandin synthesis

(D) Hyperoxia prevents hypoxic cerebral edema

(E) Alkalemia causes increased cerebral superoxide scavengers

579. Zone 2 of the neck contains all of the following structures EXCEPT

(A) carotid artery

(B) recurrent laryngeal nerve

(C) esophagus

(D) vertebral artery

(E) trachea

580. Which of the following is true regarding tetanus prophylaxis?

(A) Diphtheria-tetanus toxoid should not be administered during pregnancy

(B) Tetanus generally occurs in large or very deep wounds

- (C) Excessive administration of diphtheria-tetanus toxoid leads to hypersensitivity to the vaccine
- (D) Tetanus is rarely fatal in modern times
- (E) Elderly women are the group MOST likely to be underimmunized in the United States

581. Which of the following results from central cord syndrome?

- (A) Unilateral paralysis with contralateral loss of vibration and position sense
- (B) Flaccid areflexic paralysis with intact bulbocavernosus reflex
- (C) Progressive centripetal demyelination months to years post-injury
- (D) Transient reversal of hot and cold sensation accompanied by paresthesias
- (E) Neurologic impairment worse in the upper than the lower extremities

582. Which of the following best describes Brown-Sequard syndrome?

- (A) Hyperesthesia of the upper extremities with hyperreflexia of the lower extremities
- (B) Unilateral paralysis with contralateral sensory loss
- (C) Progressive centripetal demyelination months to years post-injury
- (D) Unilateral paralysis with contralateral loss of vibration and position sense
- (E) Flaccid areflexic paralysis with intact bulbocavernosus reflex

583. A patient suffers a fracture at C-6 with cervical spinal cord transection. Where would you expect to find a sensory level?

- (A) Clavicle
- (B) Thumb
- (C) Small finger
- (D) Nipple
- (E) Umbilicus

584. Which of the following statements is true regarding diagnostic peritoneal lavage (DPL)?

- (A) It is contraindicated in late pregnancy
- (B) It can be performed in patients with previous laparotomy
- (C) It cannot be performed in patients with pelvic fractures
- (D) It has a low incidence of false-positive results compared with CT scan
- (E) 50 ml/kg of fluid should be used in a pediatric patient

585. All of the following statements regarding geriatric trauma patients are true EXCEPT

- (A) vital signs may be pseudonormal in older patients, obscuring significant blood loss

- (B) older patients are more prone to subdural hematoma than younger ones, and may show few symptoms
- (C) older patients are more prone to develop postoperative complications than younger ones
- (D) one should be less aggressive in recommending surgical management of traumatic injuries in older patients with underlying disease
- (E) falls in geriatric patients are a significant cause of death and are often preventable

586. Which of the following pediatric injuries is the MOST suspicious for child abuse?

- (A) Nursemaid's elbow
- (B) Toddlers' fracture
- (C) Metaphyseal corner fracture
- (D) Burns at the corners of the mouth
- (E) Linear skull fracture in 1-year-old

587. All of the following would be expected to be seen as a complication of pelvic fracture EXCEPT

- (A) fatal hemorrhage
- (B) sepsis
- (C) femoral thrombosis
- (D) impotence
- (E) paraplegia

588. Which of the following is true regarding military anti-shock trousers (MAST)?

- (A) They increase blood pressure by decreasing peripheral vascular resistance
- (B) They increase blood pressure by squeezing blood from the extremities to the central viscera
- (C) They are contraindicated in pregnancy
- (D) They may be useful in temporarily stabilizing pelvic fractures
- (E) They increase intracranial pressure, and therefore should not be used in head trauma

589. All of the following are true concerning trauma in the elderly EXCEPT

- (A) extremities are the most frequently injured part of the body
- (B) trauma is the fifth leading cause of death in people over 65 years of age
- (C) falls account for the majority of injuries
- (D) signs and symptoms of abdominal injury may be more subtle than in younger patients
- (E) abdominal viscera are frequently injured without accompanying skeletal fractures

590. Which of the following statements is true concerning missile (bullet) injuries and ballistics?

- (A) The two mechanisms by which missiles cause injury are penetration and stretch
- (B) Hollow-point bullets “mushroom” upon striking their target producing a four-fold increase in their diameter
- (C) Temporary cavitation has the greatest destructive impact on low-density, highly elastic tissues
- (D) A gun with a shorter barrel results in a bullet of slower velocity than one with a longer barrel
- (E) Bullets are sterilized by the heat of firing

591. All of the following statements regarding pediatric trauma as a result of child abuse are true EXCEPT

- (A) more than one million cases of pediatric neglect and abuse are reported annually in the United States
- (B) it is estimated that 6 children per 1000 live births will be victims of child abuse
- (C) sexual abuse is ten times more prevalent in girls than boys
- (D) roughly 10% of all injuries in patients less than 5 years of age are the result of child abuse
- (E) approximately 5% of all abused children will die from repeat trauma and 35% will be seriously injured again

592. The spectrum of child abuse has been broadened by incorporating the idea of child maltreatment. This is defined as harm due to abnormal child-rearing practices. All of the following are included in the definition of child maltreatment EXCEPT

- (A) physical, sexual, or emotional abuse
- (B) physical, emotional, supervisory, or nutritional neglect
- (C) Munchausen by proxy
- (D) parental substance abuse
- (E) disciplinary actions

593. Which of the following is true regarding marine animal attacks?

- (A) 300–400 shark attacks are reported world-wide each year, with a death rate of 10%
- (B) 125 species of shark are known to attack humans
- (C) A shark bite generates a force of up to 10 tons per square inch
- (D) The three major causes of death in shark attacks are hemorrhage, drowning, and hypothermia
- (E) Other marine animals known to bite or attack man include barracudas, moray eels, sea lions, polar bears, needlefish, giant grouper, and crocodiles

594. A 27-year-old man is brought to the emergency department after an unfortunate incident involving a baseball bat, three teenagers, and a bottle of vodka.

He is awake, but intoxicated, and fully oriented with intact neurologic function. On examination, the patient is unable to fully open or close his mouth. What area of his mandible is MOST likely to be fractured?

- (A) Angle
- (B) Molar
- (C) Condyle
- (D) Symphysis
- (E) Mental

595. Just after you have finished evaluating the patient in question number 594, his brother arrives stating that he also encountered the same three youths. He received a blow to the left lateral midface and you notice ipsilateral facial flattening, subconjunctival ecchymosis, and unilateral epistaxis. You suspect a zygomatic-maxillary complex (ZMC) fracture. All of the following sites are involved in a ZMC fracture EXCEPT

- (A) frontal bone
- (B) zygomatic process of the temporal bone
- (C) maxilla
- (D) lateral wall of the maxillary sinus
- (E) medial wall of the orbital floor

596. All of the following types of cervical spine fracture are caused by flexion of the neck EXCEPT

- (A) Jefferson fracture
- (B) bilateral facet dislocation
- (C) simple wedge (compression) fracture
- (D) clay-shoveler (coal-shoveler) fracture
- (E) flexion teardrop fracture

597. Which of the following cervical spine injuries is the MOST unstable?

- (A) Fracture of the dens
- (B) Burst fracture with posterior ligamentous disruption (flexion teardrop)
- (C) Bilateral facet dislocation
- (D) Burst fracture of vertebral body without posterior ligamentous disruption
- (E) Rupture of transverse atlantal ligament

598. All of the following statements concerning thoracolumbar fractures are true EXCEPT

- (A) there are three types
- (B) they range from completely stable to highly unstable with paraplegia
- (C) treatment varies from analgesia alone to need for acute spinal fusion and intensive care unit admission
- (D) wedge compression fractures are most likely at L-1, followed by L-2
- (E) none of the above

599. All of the following statements regarding penetrating trauma to the posterior abdomen are true EXCEPT

- (A) the posterior abdomen is defined as the area bordered by the midaxillary line anteriorly, the tip of the scapula superiorly, and the iliac crest inferiorly
- (B) due to the protection of the spine, back muscles, and pelvis, intraperitoneal organs are less likely to be injured after trauma to this part of the torso
- (C) kidneys, colon, and liver are the most likely organs to be injured
- (D) shock, evisceration, peritonitis, and intraperitoneal free air are all indications for immediate celiotomy
- (E) with missile injuries, blast effect can result in visceral injury without penetration of the peritoneum or retroperitoneum

600. Which of the following best describes Galeazzi's fracture?

- (A) It is an isolated fracture of the ulna with dislocation of the radial head
- (B) It is an isolated fracture of the ulna with dislocation of the radioulnar joint
- (C) It is a fracture of the radius and ulna with dislocation of the radial head
- (D) It is an isolated fracture of the radius with dislocation of the distal radioulnar joint
- (E) It is an isolated fracture of the olecranon with dislocation of the radioulnar joint

601. Which one of the following is true concerning Monteggia fracture-dislocation?

- (A) The distal one-third of the ulna is fractured
- (B) The radial head is fractured
- (C) The radial head is frequently dislocated posteriorly, but may be dislocated anteriorly
- (D) Closed reduction is usually sufficient for the pediatric patient, but adults often require open reduction and internal fixation
- (E) The radial head is at high risk for avascular necrosis

602. According to Kane's adaptation of the Key and Conwell classification of pelvic fractures, all of the following are Type I EXCEPT

- (A) fracture of the pubis or ischium
- (B) Malgaigne fracture
- (C) fracture of the wing of the ischium (Duverney)
- (D) fracture of the sacrum or coccyx
- (E) avulsion fracture without interruption of the pelvic ring

603. Which of the following is true regarding femoral neck fractures?

- (A) They are most commonly seen in older men
- (B) Patients are non-ambulatory

- (C) They are nearly always visible on plain radiograph
- (D) Avascular necrosis of the femoral head occurs in 15–35% of cases
- (E) Nonunion occurs in 20–25% of properly treated patients

604. All of the following statements regarding ligamentous injuries of the ankle are true EXCEPT

- (A) 75% of all ankle injuries are sprains
- (B) isolated medial collateral ligament injury is rare
- (C) the deltoid ligament is on the lateral aspect of the ankle
- (D) 80–90% of sprains involve the lateral ligament
- (E) 90% of lateral ligamentous injuries involve the anterior talofibular ligament

605. Which of the following is true concerning compartment syndrome?

- (A) Normal tissue pressure is about 10–20 mm Hg
- (B) The forearm has a volar and a dorsal compartment
- (C) An open fracture precludes the development of compartment syndrome
- (D) The anterior compartment of the leg is the most frequently involved by this syndrome and contains the tibialis anterior muscle and the flexor muscles of the toes
- (E) The lower leg has three compartments (anterior, lateral, and posterior)

606. All of the following would be expected to result in referred pain to the shoulder EXCEPT

- (A) disorders of the cervical spine
- (B) Pancoast's tumor
- (C) myocardial, gastric, and pancreatic diseases
- (D) diaphragmatic irritation secondary to colonic diverticulitis
- (E) lower-lobe pneumonia

607. Which of the following is true regarding hip dislocations?

- (A) An anterior dislocation is suggested by a shortened, flexed, adducted, and internally rotated leg
- (B) Anterior dislocations are 10–20 times more common than posterior dislocations
- (C) Motor vehicle accidents are the major cause in children over 10 years of age
- (D) There are two varieties of anterior dislocations: superior iliac and inferior obturator
- (E) Femoral head necrosis is a late complication in up to 10% of adults

608. All of the following statements regarding traumatic myositis ossificans (MO) are true EXCEPT

- (A) it is a condition in which muscular trauma results in the formation of bone within the muscle

- (B) thigh and hip muscles are the most common site
- (C) a single severe blow to the muscle may result in myositis ossificans traumatica
- (D) radiograph can reveal calcification within 10–20 days after injury
- (E) myositis ossificans introspecta refers to the second type of MO that occurs after repeated minor trauma

609. All of the following statements regarding soft tissue cervical hyperextension injury or “whiplash” are true EXCEPT

- (A) during a low-speed motor vehicle accident, sudden acceleration of the head can reach 11.4 G with forces of over 100 pounds applied to the head
- (B) about 50% of people in rear-impact accidents sustain neck injury
- (C) most patients recover completely within 2–12 weeks
- (D) there is a higher incidence in women than men
- (E) it can be seen with “shaken baby syndrome”

610. All of the following are characteristic of discogenic back pain EXCEPT

- (A) the pain is dull in nature
- (B) there is leg pain in excess of back pain
- (C) there is leg pain distal to the knee
- (D) there are dermatomal paresthesias with sensory loss
- (E) there are decreased deep tendon reflexes

611. All of the following statements regarding gunshot wounds are true EXCEPT

- (A) injury is proportional to the kinetic energy of the missile
- (B) missile velocities are rated as either slow, medium, or high
- (C) intraperitoneal injury due to high velocity missiles can occur without penetration of the peritoneum
- (D) the intraabdominal organs most commonly injured are the liver, small bowel, and colon
- (E) a stable patient with a gunshot wound to the abdomen can be observed in the emergency department with serial hematocrits

612. Which of the following is true regarding Boerhaave’s syndrome?

- (A) Causes include blunt trauma, seizures, childbirth, laughing, Valsalva during defecation, and heavy lifting
- (B) 95% of cases are in elderly men
- (C) Experimentally, it takes 10–15 psi to generate this injury
- (D) 40% of patients do not give a history of vomiting
- (E) The middle third of the esophagus is the usual site

613. All of the following statements regarding myocardial contusions are true EXCEPT

- (A) in severe closed chest trauma, the reported incidence is between 3 and 75%
- (B) collisions as slow as 5–10 miles per hour have been reported to cause myocardial contusion
- (C) the most common sign is sinus tachycardia
- (D) with significant contusions, 50–75% of patients have a reduction in cardiac output
- (E) in patients with documented myocardial injury, CPK-MB fractions are not consistently elevated

614. All of the following statements concerning severe pulmonary lacerations are true EXCEPT

- (A) they are present in only 3% of patients with thoracic trauma
- (B) they are frequently associated with hemopneumothorax, multiple rib fractures, and hemoptysis
- (C) bronchopulmonary fistula is a common complication
- (D) they are most commonly caused by penetrating trauma
- (E) they frequently require thoracotomy to control bleeding

615. Which of the following is true regarding the classification of open fractures?

- (A) Grade I fractures are the most severe
- (B) Grade II fractures have moderate contamination and soft-tissue crush injury
- (C) Grade III fractures are associated with large lacerations and frequently include a segmental fracture
- (D) Grade IV fractures can be treated with simple irrigation and a single dose of intramuscular antibiotics
- (E) Grade I fractures are most likely to require amputation due to failure of more conservative treatment

616. A 28-year-old man presents to the emergency department after being hit on the head with baseball bat. As you are examining him, his mental status begins to deteriorate. Which of the following statements is MOST correct regarding intracranial hemorrhage?

- (A) Temporal skull fractures more commonly lead to subdural than epidural hematomas
- (B) Contralateral pupillary dilation is seen secondary to cerebral edema from a contrecoup mechanism
- (C) Ipsilateral pupillary dilation is seen secondary to uncal herniation on the side of the injury
- (D) Rupture of bridging veins causes accumulation of blood in the epidural space
- (E) None of the above

617. The patient described in question number 616 now has a Glasgow Coma Score of 5. Which of the following is CONTRAINDICATED in this patient?

- (A) Aggressive treatment of systemic hypertension
- (B) Intravenous mannitol, 1 g/kg
- (C) Elevation of the head of the bed to 30 degrees
- (D) Intubation and hyperventilation
- (E) Neurosurgical consultation

618. A 37-year-old woman is brought to the emergency department after a motor vehicle accident with steering wheel damage noted at the scene. A supine chest radiograph is obtained prior to clearing the cervical spine and a fracture of the left second rib is noted. All of the follow statements are true EXCEPT

- (A) pneumothorax may be missed with initial supine film and an upright radiograph should be obtained as soon as is feasible
- (B) routine arteriography is no longer mandatory for second rib fractures
- (C) mortality increases dramatically when there are multiple rib fractures as opposed to an isolated first rib fracture
- (D) the main cause of hypoxemia in flail chest is due to the ineffective paradoxical movement of the chest wall
- (E) it can be difficult to distinguish between contusion and hemothorax when fluid densities are seen on supine chest films

619. The Ottawa rules for ordering ankle radiographs after trauma would predict a fracture with all the following EXCEPT

- (A) tenderness to palpation at the medial malleolus
- (B) patient unable to ambulate four steps in the emergency department
- (C) swelling and ecchymosis anterior and inferior to the lateral malleolus
- (D) patient unable to ambulate immediately after the injury
- (E) tenderness to palpation at the lateral malleolus

620. All of the following may be seen with acute pericardial tamponade EXCEPT

- (A) a decrease in intrapericardial pressure and volume
- (B) tachycardia
- (C) Beck's triad (distant heart sounds, hypotension, and neck vein distension)
- (D) electrical alternans on ECG
- (E) pulsus paradoxus

558	A	559	B	560	E	561	E
562	B	563	C	564	A	565	A
566	C	567	D	568	B	569	D
570	A	571	A	572	D	573	E
574	D	575	A	576	C	577	C
578	A	579	D	580	E	581	E
582	B	583	B	584	B	585	D
586	C	587	E	588	D	589	E
590	D	591	C	592	E	593	E
594	A	595	E	596	A	597	E
598	A	599	A	600	D	601	D
602	B	603	D	604	C	605	B
606	D	607	C	608	E	609	B
610	A	611	E	612	A	613	B
614	C	615	C	616	C	617	A
618	D	619	C	620	A		

Trauma

Each question below contains five suggested responses. Choose the **ONE BEST** response to each question.

20-563 Which one of the following statements regarding trauma epidemiology is INCORRECT?

- (A) Alcohol is associated with 40 percent of motor vehicle accidents (MVAs)
- (B) In the elderly, fractured hips are the most common injury sustained during a fall
- (C) If involved in a motorcycle accident, you are 35 times more likely to die than if you are involved in an automobile accident
- (D) Most trauma victims in the United States are transported to trauma centers for resuscitation
- (E) Within the United States, trauma is the leading cause of death up to the age of 45 years

[Show Answer](#)

20-564 A 45-year-old male unrestrained driver is brought to the ED with cervical spine precautions by an EMT unit after a high-speed MVA. He has a Glasgow Coma Scale (GCS) score of 6 and no obvious signs of trauma. His shallow respirations are being inadequately assisted with a bag-valve mask. Radial pulse is thready, and the extremities are cool. Which of the following should be performed before rapid sequence intubation (RSI)?

- (A) A brief neurologic examination including a check of rectal tone
- (B) An immediate chin lift to clear the airway from any obstruction
- (C) A full set of vital signs
- (D) A lateral cervical spine x-ray
- (E) Four quick tidal volume breaths with 100 percent oxygen using a bag-valve mask device

[Show Answer](#)

20-565 A 28-year-old male sustains a gunshot wound to the back, just medial to the left scapula. Field blood pressure is 98/p, pulse is 101, and respiratory rate is 38. En route to the ED, he received high-flow oxygen and 1 L normal saline. He is agitated and diaphoretic on arrival. You are unable to hear heart sounds because of ambient noise, but the neck veins appear normal. Blood pressure starts to decrease and respiratory status worsens over the next few minutes, but he is still conscious and oriented. Given that all of the following interventions are available, what is the MOST appropriate next step?

- (A) Emergent bedside cardiac ultrasound
- (B) Emergent thoracotomy
- (C) Immediate needle decompression of the left chest
- (D) Immediate blood transfusion

(E) Immediate chest x-ray

[Show Answer](#)

20-566

Which of the following statements is TRUE regarding pediatric trauma?

- (A) Trauma is the leading cause of death in children younger than 1 year
- (B) Because of their smaller body surface area, hypothermia is less common in children than in adults
- (C) Head injury is the most frequent cause of death
- (D) Initial assessment and management of an injured child differs from that of an adult
- (E) Alcohol use is a factor in most trauma cases associated with MVAs

[Show Answer](#)

20-567

Which of the following statements is INCORRECT regarding the child's airway?

- (A) Children are dependent on diaphragmatic excursion for breathing in order to generate adequate tidal volume
- (B) In children older than 4 years, the narrowest portion of the trachea is no longer subglottic
- (C) The location of the infant's larynx is more cephalad than the location of the adult's larynx
- (D) Cricothyrotomy is contraindicated in small children
- (E) The correct endotracheal tube size for a 4-year-old child is 5.0

[Show Answer](#)

20-568

A 6-month-old child falls and hits his head. Which of the following signs would be the MOST indicative of serious neurological injury?

- (A) The parent states the child was pale and sweaty for a few minutes after the fall
- (B) A single post-fall episode of emesis
- (C) Lethargy immediately after the head injury
- (D) Hypotension
- (E) A single grand mal seizure immediately after the fall

[Show Answer](#)

20-569

Which of the following statements is INCORRECT regarding pediatric spinal cord injury?

- (A) Because of a child's large head, the fulcrum of cervical motion lies at C4-5
- (B) Widening of the prevertebral soft tissue of 8 mm or more anterior to C2 is abnormal
- (C) In most cases, pseudosubluxation resolves if x-rays are repeated with the child in the sniffing position
- (D) More than 50 percent of children with SCIWORA (spinal cord injury without radiographic abnormality) have a delayed onset of paralysis
- (E) A normal spine series can be found in up to two-thirds of children with spinal cord injury

[Show Answer](#)

20-570

Which of the following is TRUE regarding geriatric patients?

- (A) They fall less frequently than younger people because they are more cautious about their balance
- (B) They are likely to sustain multiple orthopedic fractures after a fall
- (C) They are more likely to die from an MVA than from any other traumatic injury
- (D) The increased incidence in violent crimes in the United States has spared the elderly
- (E) Alcohol is less likely to be associated with a fatal assault than it is for a younger person

[Show Answer](#)

20-571

Which of the following statements would be MOST CORRECT regarding evaluation of a head and neck CT of a 75-year-old male after a fall?

- (A) Epidural hematomas occur more frequently in the elderly than in young adults
- (B) There should be 25 to 30 percent more brain atrophy in the normal 75-year-old male than in a 30-year-old male
- (C) Subdural hematomas occur less frequently in the elderly than in young adults
- (D) Increased "dead space" within the skull may delay symptoms of intracranial bleeds
- (E) Compared with young adults, elderly patients have an increased incidence of cervical spine injuries

[Show Answer](#)

20-572

An 83-year-old female fell while walking to the bathroom. She complains of severe pain and will not tolerate any movement of the left leg. The leg is externally rotated and shortened. Which of the following is the MOST likely location for the fracture?

- (A) Intertrochanteric
- (B) Transcervical
- (C) Subcapital
- (D) Subtrochanteric
- (E) Acetabular

[Show Answer](#)

20-573

A 15-year-old male is brought to the ED after being assaulted to the head with a lead pipe. He opens his eyes briefly to deep painful stimuli, mumbles incomprehensible sounds, and withdraws to painful stimuli. What is his initial GCS?

- (A) 10
- (B) 9
- (C) 8
- (D) 7
- (E) 6

[Show Answer](#)

20-574 While in the CT scanner, the patient described in question 573 develops anisocoria. Which of the following statements is INCORRECT regarding uncal herniation?

- (A) Compression of cranial nerve III along the edge of the tentorium incisura causes pupillary dilation
- (B) Constriction of parasympathetic fibers on the surface of cranial nerve III causes unopposed sympathetic dilation of the pupil
- (C) With further compression of cranial nerve III, full oculomotor paralysis develops, causing the eye to deviate inferiorly and medially
- (D) Uncal herniation can compress the corticospinal tract, leading to contralateral hemiplegia
- (E) An emergency burr hole should be placed on the same side as the dilated pupil in the majority of cases

[Show Answer](#)

20-575 A 42-year-old female has a GCS of 6 after an MVA. Which of the following statements is TRUE regarding her care?

- (A) If hypotension is allowed to occur, the mortality risk is more than doubled
- (B) The most critical determinant of outcome in severely head-injured patients is ICP
- (C) The patient should be hyperventilated to a pCO₂ of less than 25 mm Hg
- (D) Hypotension in the severely brain-injured patient is usually due to the primary brain injury
- (E) CT of the abdomen and head should be performed immediately in a hypotensive, severely head-injured patient

[Show Answer](#)

20-576 A 13-year-old male is involved in a water ski boat accident. Which of the following would NOT be indicative of a basilar skull fracture?

- (A) Generalized bruising on the face, most notably around the eyes
- (B) Bluish, dull tympanic membrane on the left side
- (C) A small retroauricular ecchymosis on the left side
- (D) Left-sided facial droop
- (E) Medial deviation of the left eye

[Show Answer](#)

20-577 Which of the following patients does NOT require immediate neurosurgical evaluation?

- (A) A 24-year-old male with a GCS score of 13 and a linear fracture of the temporal bone diagnosed by skull x-ray at an outside hospital
- (B) A comatose 38-year-old female with a depressed linear skull fracture
- (C) A 42-year-old male with a basilar skull fracture diagnosed by bony windows on head CT
- (D) A 19-year-old female with a scalp laceration and clear discharge from the right ear after an unhelmeted fall while rollerblading
- (E) A 58-year-old female with a GCS score of 4 and a negative head CT

[Show Answer](#)

20-578 A homeless, alcoholic male is brought to the ED with a mildly altered level of consciousness. Although there is no history or external signs of trauma, a head CT is obtained and it shows a large collection of blood, with slight midline shift. Which of the following statements is TRUE regarding this patient's most likely diagnosis?

- (A) It is usually caused by tearing of the middle meningeal artery
- (B) The patient should show signs of elevated intracranial pressure immediately after the injury
- (C) Brain atrophy associated with alcoholism makes him less susceptible to this type of bleed
- (D) Immediate surgery may not be necessary
- (E) Morbidity and mortality are much lower than for other intracerebral bleeds

[Show Answer](#)

20-579 A 36-year-old female comes to the ED complaining of headache and nausea. She had a negative head CT 5 days earlier after a brief lapse of consciousness after an MVA. She is amnesic to the event. Which of the following statements is FALSE?

- (A) The mortality rate for patients with head injury and a negative head CT approaches zero
- (B) Retrograde and anterograde amnesia is common with this type of injury
- (C) The patient is not at risk for significant injuries because she is 5 days out from the initial trauma and relatively asymptomatic
- (D) The patient may have alterations in thinking, sleeping, or concentration abilities
- (E) A new sensitivity to alcohol is normal and will probably resolve within a few weeks

[Show Answer](#)

20-580 A young female presents to the ED with a GCS score of 6 after being "t-boned" by a large pickup truck on her side of the vehicle. Initial head CT is negative for bleed. Pupils were initially normal and reactive to light but are now bilaterally dilated and sluggish. Which one of the following therapies would be LEAST beneficial for this patient?

- (A) 1 L normal saline bolus
- (B) Intubation and hyperventilation to keep the pCO₂ less than 25 mm Hg
- (C) Mannitol 1 g/kg intravenous bolus
- (D) Elevation of the head of the bed to 30 degrees
- (E) Furosemide 0.3 to 0.5 mg/kg intravenously

[Show Answer](#)

20-581 Which of the following statements regarding spinal injury is TRUE?

- (A) Twenty percent of patients deteriorate neurologically in the ED
- (B) In a neurologically normal patient, the absence of pain or tenderness along the spine excludes spine injury
- (C) Approximately 75 percent of spinal injuries occur in the cervical region

- (D) Approximately 25 percent of all head-injured patients have associated spinal injuries
- (E) If appropriate precautions are maintained, evaluation of the spine may be safely deferred until after intubation is performed

[Show Answer](#)

20-582

Which of the following statements is INCORRECT regarding spinal shock?

- (A) Distal areflexia can persist for hours to weeks
- (B) After reflexes return, the patient develops spastic paralysis
- (C) Fluid resuscitation alone is generally insufficient to treat hypotension
- (D) Vasomotor instability leads to hypotension and cool, moist skin
- (E) Paradoxical bradycardia can coexist with hypotension

[Show Answer](#)

20-583

A 76-year-old male with severe osteoarthritis falls head first onto the cement. On ED arrival, he is confused and answers "yes" to all questions. You notice that he is not moving the upper extremities or legs. All of the following are characteristic for this type of cord syndrome EXCEPT

- (A) the legs are typically weaker than the arms
- (B) the hands are weaker than the proximal arm muscles
- (C) prognosis is better for this syndrome than for other cord syndromes
- (D) vascular compromise in the pattern of the anterior spinal artery is the cause
- (E) the bladder is occasionally affected

[Show Answer](#)

20-584

Which of the following statements is INCORRECT regarding cervical spine injuries?

- (A) The Jefferson fracture is due to a vertical compression injury
- (B) Hangman's fracture is a bilateral fracture through the pedicles of C2
- (C) A flexion teardrop fracture leaves the posterior ligaments intact
- (D) A unilateral facet dislocation is diagnosed when there is anterior dislocation of 25 to 33 percent of one vertebral body on the next vertebra
- (E) Bilateral interfacetal dislocation is an unstable cervical injury with total ligamentous disruption

[Show Answer](#)

20-585

A 26-year-old intoxicated male driver is involved in a high-speed MVA. Which of the following findings on cervical spine x-ray would NOT be suggestive of serious injury?

- (A) An 8-mm prevertebral soft tissue swelling at C4
- (B) A 4-mm anterior subluxation of C5 on C6
- (C) Fanning of the cervical spinous processes
- (D) A predental space of 3 mm

(E) An 18-degree change in angulation of the cervical column

[Show Answer](#)

20-586 Which of the following patients with penetrating neck trauma is MOST likely to require immediate surgical exploration?

- (A) An 18-year-old asymptomatic male with a stab wound to zone II of the neck that penetrates the platysma
- (B) A 12-year-old female with a BB gunshot wound to zone II of the neck who complains of a minor voice change and occasional nonproductive cough
- (C) A 43-year-old female with a glass shard laceration to zone III of the neck with minimal associated bleeding
- (D) A 21-year-old male with a zone I, II, and III neck laceration from a pocket knife associated with significant hemorrhage that is well controlled with a pressure dressing
- (E) A 33-year-old female with a gunshot wound to zone I of the neck and anisocoria

[Show Answer](#)

20-587 Which of the following is the LEAST appropriate management of a patient with a spinal cord injury?

- (A) Immobilization with a long spine board, semi-rigid cervical collar and bolstering devices
- (B) Low-dose vasopressors to treat neurogenic shock
- (C) Atropine to treat bradycardia
- (D) Methylprednisolone 30 mg intravenous bolus and then 5.4 mg/kg/h for 23 h if administered within the first 12 h of injury
- (E) Transfer to a definitive-care facility once cardiovascular stability has been achieved

[Show Answer](#)

20-588 Which of the following statements is TRUE regarding chest trauma?

- (A) Thoracic injury is the cause of death in 25 percent of all trauma patients
- (B) Most deaths from chest trauma occur before ED arrival
- (C) Mortality is greater than 50 percent for patients who present with a blood pressure less than 80 systolic or who require intubation on arrival
- (D) Twenty-five percent of blunt chest trauma patients are candidates for emergent thoracotomy
- (E) Forty-five percent of penetrating chest trauma patients are candidates for emergent thoracotomy

[Show Answer](#)

20-589 A 24-year-old unrestrained male driver is involved in a high-speed MVA. GCS score is 10, and he has severe chest wall contusions and mild hemoptysis. He is intubated for respiratory distress. Within a few minutes of intubation, he suffers a cardiac arrest. Which of the following therapeutic measures would be LEAST likely to have an immediate life-saving effect?

- (A) Decrease the ventilatory rate
- (B) Needle decompression of the chest

- (C) Pull back the endotracheal tube
- (D) One liter crystalloid fluid bolus
- (E) Immediate Trendelenburg position, left lateral side down

[Show Answer](#)

20-590

Which of the following patients is NOT a candidate for emergent ED thoracotomy?

- (A) A 12-year-old male with a stab wound to the left axilla who loses pulses on ED arrival
- (B) A 29-year-old male with a gunshot wound to the left upper quadrant, with a distending abdomen and a precipitous decrease in GCS score to 3
- (C) A 42-year-old male involved in an MVA, initially alert, who arrives to the ED with pulseless electrical activity after a 6-min transport time
- (D) A 36-year-old female with a stab wound to zone I of the neck who becomes altered and loses radial pulses 4 min before ED arrival
- (E) An 18-year-old male who fell 12 feet from a tree, was alert in the field, but is now altered, bradycardic, hypotensive, and has a distended abdomen

[Show Answer](#)

20-591

Which of the following statements is INCORRECT regarding flail chest?

- (A) The main cause of morbidity and mortality is hypoxia secondary to the patient's inability to generate adequate negative intrathoracic pressure
- (B) Flail chest is characterized by paradoxical movement of the involved portion of the chest wall during respiration
- (C) It may not be apparent immediately after the injury
- (D) Initial therapy is aimed at immediate pain relief, generous pulmonary toilet, and fluid restriction to prevent fluid overload
- (E) Prophylactic intubation decreases mortality in minimally symptomatic patients with large pulmonary contusions

[Show Answer](#)

20-592

After a moderate-speed MVA, a 32-year-old male restrained driver has a normal upright anteroposterior chest x-ray but a 2-mm pneumothorax on CT. Which of the following is the BEST indication for placement of a thoracostomy tube?

- (A) One or more rib fractures
- (B) Need for intubation and mechanical ventilation
- (C) Pulmonary contusion
- (D) Cardiac contusion
- (E) $Pao_2 < 100$

[Show Answer](#)

20-593

Hamman's sign MOST likely suggests which of the following conditions?

- (A) Pneumothorax

- (B) Pneumomediastinum
- (C) Pericarditis
- (D) Pleurisy
- (E) Pericardial tamponade

[Show Answer](#)

20-594 Which of the following is the LEAST reliable sign of Beck's triad in a patient with pericardial tamponade?

- (A) Distended neck veins
- (B) Tracheal deviation
- (C) Tachycardia
- (D) Hypotension
- (E) Muffled heart tones

[Show Answer](#)

20-595 Which of the following statements is CORRECT regarding needle pericardiocentesis for diagnosis and treatment of penetrating cardiac injury?

- (A) The false negative rate is high
- (B) Most of the pericardial blood can usually be removed
- (C) If successful, surgery is rarely needed
- (D) Rapid aspiration of 20 mL of blood without moving the needle usually indicates successful needle placement
- (E) ECG monitoring is more accurate if attached to a plastic catheter

[Show Answer](#)

20-596 Which area of the heart is MOST commonly injured in a myocardial contusion?

- (A) Right ventricle
- (B) Right atrium
- (C) Left ventricle
- (D) Left atrium
- (E) Interventricular septum

[Show Answer](#)

20-597 Which of the following is the MOST common valvular injury in a patient who survives transport to the ED after blunt cardiac trauma?

- (A) Papillary muscle or chordae tendineae of mitral valve
- (B) Mitral valve leaflets
- (C) Aortic valve
- (D) Pulmonic valve

(E) Tricuspid valve

[Show Answer](#)

20-598 What is the MOST likely abnormality that would be seen on chest x-ray in a patient with traumatic rupture of the aorta after blunt injury?

- (A) Superior mediastinal widening
- (B) Obscuration of the aortic knob
- (C) Deviation of esophagus to the left
- (D) Fracture of the first or second rib
- (E) Apical cap

[Show Answer](#)

20-599 Physical findings suggestive of traumatic rupture of the aorta include all of the following EXCEPT

- (A) flail chest
- (B) systolic murmur over the back
- (C) lower extremity hypertension
- (D) difference in pulse amplitudes between the upper and lower extremities
- (E) hoarseness without laryngeal injury

[Show Answer](#)

20-600 Which of the following statements is TRUE regarding blunt tracheobronchial injuries?

- (A) Blunt cervical tracheal injuries usually occur proximal to the tracheal cartilage
- (B) Most lower tracheobronchial injuries occur 5 cm or more from the carina
- (C) Common signs and symptoms include dyspnea, hemoptysis, subcutaneous emphysema, Hamman's sign, and sternal tenderness
- (D) Injuries to the major bronchi are usually caused by elevated intraabdominal pressure
- (E) Concurrent esophageal injuries occur in fewer than 5 percent of cases

[Show Answer](#)

20-601 Approximately how much blood is contained in an acute pericardial tamponade after penetrating cardiac injury?

- (A) 10 mL
- (B) 50 mL
- (C) 200 mL
- (D) 500 mL
- (E) 1000 mL

[Show Answer](#)

20-602 In which of the following cases would a diagnostic peritoneal lavage (DPL) be the MOST useful?

- (A) Blunt abdominal trauma with hypotension and free intraperitoneal fluid on ultrasound
- (B) Multiple trauma with spinal cord injury and normal abdominal examination
- (C) An alert patient involved in a high-speed vehicle collision with no abdominal findings
- (D) Gunshot wound (GSW) to the mid-abdomen with intraabdominal bullet fragments
- (E) Penetrating abdominal injury with diffuse abdominal tenderness and rebound tenderness

[Show Answer](#)

20-603 Which of the following is an indication for surgery in a patient with blunt kidney injury?

- (A) Hematuria with more than 100 red blood cells (RBC)/high-power field (HPF) on an unspun urinalysis
- (B) Severe flank pain unrelieved by analgesics
- (C) Unexplained hypertension
- (D) Flank hematoma
- (E) Laceration through Gerota's fascia

[Show Answer](#)

20-604 Which of the following would NOT be considered a positive DPL in a patient with blunt abdominal trauma?

- (A) > 20 mL gross blood aspirated upon catheter entry
- (B) RBC count in lavage fluid 200,000 cells/ μ L
- (C) WBC count in lavage fluid 100 cells/ μ L
- (D) Amylase level in lavage fluid 500 U/100 mL
- (E) Vegetable matter seen in lavage fluid

[Show Answer](#)

20-605 Which of the following statements regarding diaphragmatic injury after blunt abdominal trauma is MOST correct?

- (A) Diaphragmatic herniation is usually apparent on initial upright chest x-ray
- (B) The right side of the diaphragm is more commonly injured than the left
- (C) CT and DPL are almost never helpful in diagnosis
- (D) The diagnosis is usually made immediately
- (E) Difficulty in passing a nasogastric tube suggests herniation of abdominal viscera into the chest

[Show Answer](#)

20-606 A 25-year-old male driver is brought to the ED by ambulance after a high-speed head-on collision. Physical examination is remarkable for a blood pressure of 70/P, heart rate of 140, abdominal tenderness, and a prominent hematoma across the mid-abdomen. Which of the following organs is MOST likely to be injured?

- (A) Liver
- (B) Spleen
- (C) Kidney
- (D) Lung
- (E) Bladder

[Show Answer](#)

20-607 Which one of the following is NOT associated with penile rupture?

- (A) Blood at the urethral meatus
- (B) Penile pain
- (C) Penile swelling
- (D) Penile discoloration
- (E) Priapism

[Show Answer](#)

20-608 What is the MOST commonly injured structure in the genitourinary (GU) tract?

- (A) Bladder
- (B) Kidney
- (C) Ureter
- (D) Urethra
- (E) Penis

[Show Answer](#)

20-609 A young female presents to the ED with flank pain and abdominal tenderness after a high-speed MVA. Abdominal CT shows a non-enhancing kidney. Which of the following is the MOST likely diagnosis?

- (A) Renal artery thrombosis
- (B) Ureteral disruption
- (C) Renal laceration
- (D) Renal pelvis rupture
- (E) Renal contusion with large subcapsular hematoma

[Show Answer](#)

20-610 All of the following statements regarding bladder injuries are TRUE EXCEPT

- (A) the bony pelvis protects the bladder in adults
- (B) penetrating injuries are more common than blunt injuries
- (C) surgical repair is usually indicated after intraperitoneal ruptures
- (D) extraperitoneal ruptures are usually treated with catheter drainage alone
- (E) contusions rarely require surgical treatment

[Show Answer](#)

20-611 Which of the following is LEAST appropriate in the initial management of a patient with a pelvic fracture and ongoing hemorrhage?

- (A) Placement of an external fixator device
- (B) Crystalloid infusion
- (C) Blood transfusion
- (D) Angiography and vessel embolization
- (E) Laparotomy

[Show Answer](#)

20-612 Which of the following blunt traumatic injuries would be MOST likely to result in a positive DPL?

- (A) Renal pedicle injury
- (B) Small bowel mesenteric tear
- (C) Subcapsular splenic rupture
- (D) Ureteral transection
- (E) Duodenal hematoma

[Show Answer](#)

20-613 In examining a patient with blunt pelvic injury after a 20-foot fall, you find blood at the urethral meatus and a normal prostate examination. What is the MOST appropriate next step to evaluate for the cause of the urethral blood?

- (A) Cystogram
- (B) Intravenous pyelogram (IVP)
- (C) CT with intravenous and oral contrast
- (D) Foley catheter
- (E) Retrograde urethrogram

[Show Answer](#)

20-614 Which of the following statements regarding wound ballistics is CORRECT?

- (A) Tissue surrounding a bullet track should be excised to prevent wound necrosis
- (B) Military bullets are more damaging than civilian bullets of the same size

- (C) Bullets frequently tumble in flight
- (D) Bullets frequently tumble in tissue
- (E) Bullets of the same caliber have the same wounding potential

[Show Answer](#)

20-615 All of the following are considered passive injury countermeasures EXCEPT

- (A) motorcycle helmets
- (B) automobile airbags
- (C) building sprinkler systems
- (D) spring-loaded lawnmower shutoff switches
- (E) spring-loaded circular saw blade covers

[Show Answer](#)

20-616 Which of the following statements regarding injury control is CORRECT?

- (A) Educational programs are almost always valuable in changing behavior
- (B) Enactment of mandatory use laws rarely affects behavior
- (C) States that have repealed mandatory motorcyclist helmet laws have seen little or no increase in fatality rates
- (D) Driver education has been more successful than motor vehicle engineering in reducing death rates from vehicle crashes
- (E) Mandatory-use laws are difficult to enact

[Show Answer](#)

20-617 Which of the following neurological findings would MOST likely result from a nerve injury caused by a mid-shaft humerus fracture?

- (A) Weakness in wrist extension
- (B) Decreased sensation over the dorsum of the little finger
- (C) Decreased sensation to the palmar index finger
- (D) Weakness in wrist flexion
- (E) Weakness in index finger abduction

[Show Answer](#)

20-618 Which of the following statements regarding scapular fractures is CORRECT?

- (A) They are most common in elderly women
- (B) The most common mechanism of injury is a rotational torso movement
- (C) Associated injuries rarely occur
- (D) Common associated injuries involve the ribs and lungs
- (E) Open reduction and internal fixation is usually required

[Show Answer](#)

20-619 Which is the MOST frequently injured solid organ after penetrating trauma?

- (A) Liver
- (B) Spleen
- (C) Pancreas
- (D) Kidney
- (E) Diaphragm

[Show Answer](#)

20-620 Which of the following statements regarding pancreatic injuries is CORRECT?

- (A) Penetrating injuries are more common than blunt injuries
- (B) The serum amylase is almost always elevated
- (C) DPL is highly sensitive
- (D) Complications are infrequent and of little consequence
- (E) Concomitant injuries are rare

[Show Answer](#)

20-621 Which of the following urinalysis results would be an indication for IVP or abdominal CT in an adult after blunt abdominal or flank trauma?

- (A) 0-5 RBC/HPF
- (B) 5-10 RBC/HPF
- (C) 10-20 RBC/HPF
- (D) Gross hematuria
- (E) Dipstick positive for blood

[Show Answer](#)

20-622 An adult patient has abdominal pain, tenderness, and a lap-belt hematoma after a vehicle crash. Which of the following is the LEAST likely to be injured?

- (A) Spleen
- (B) Liver
- (C) Small intestine
- (D) Ureter
- (E) Colon

[Show Answer](#)

20-623 Which of the following knee injuries is MOST likely to be associated with vascular trauma?

- (A) Tibial plateau fracture
- (B) Femoral condyle fracture
- (C) Anterior dislocation
- (D) Posterior dislocation
- (E) Lateral dislocation

[Show Answer](#)

20-624 A fracture at which of the following sites is MOST likely to be associated with a disruption of the midfoot?

- (A) Base of the second metatarsal
- (B) Calcaneus
- (C) Base of the fifth metatarsal
- (D) Navicular
- (E) Cuboid

[Show Answer](#)

20-625 Regarding Achilles tendon rupture, all of the following are TRUE EXCEPT

- (A) Thompson's test is usually positive
- (B) a palpable tendon defect is usually present
- (C) active plantar flexion excludes the diagnosis
- (D) patients frequently report hearing a snap at the time of injury
- (E) this injury usually occurs in middle-aged men

[Show Answer](#)

20-626 What compartment pressure indicates the need for fasciotomy in a patient with suspected compartment syndrome?

- (A) 3 mm Hg
- (B) 10 mm Hg
- (C) 15 mm Hg
- (D) 30 mm Hg
- (E) 60 mm Hg

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(563) The answer is D

Despite the overwhelming advent of sophisticated trauma systems, the majority of trauma victims are first seen in community hospitals. This underscores the need for all emergency physicians to be well versed in trauma management. In 1988, 48,000 people were killed in MVAs. Trauma is the leading cause of death in young adults.

(Chapter 243)

(564) The answer is E

This patient clearly requires immediate intubation and ventilation. Gaining control of the airway must not be delayed to obtain x-rays, perform a neurologic examination, or even measure a full set of vital signs. A "normal" lateral cervical spine x-ray does not rule out an unstable cervical spine injury. Irrespective of x-ray findings, the same precautions (inline stabilization) must be taken during RSI. A jaw-thrust maneuver could help clear an airway obstruction, but a chin lift would be contraindicated because of a possible cervical spine injury.

(Chapter 243)

(565) The answer is A

It is unclear whether this patient has cardiac tamponade, a tension pneumothorax, or hemorrhagic shock. Cardiac tamponade is diagnosed clinically by Beck's triad (hypotension, muffled heart sounds, and elevated neck veins). However, in a hypovolemic patient, clinical assessment may be difficult. Pericardial fluid detected by bedside ultrasound confirms the diagnosis of pericardial tamponade. If present, immediate pericardiocentesis is indicated and can be lifesaving.

(Chapter 251)

(566) The answer is C

Trauma is the most common cause of death in children *older than* 1 year, with head trauma as the primary lethal injury. Infection is the first and trauma is the second leading reason for ED visits in the pediatric age group. In children younger than 1 year, suffocation is the most common cause of death due to injury. Car accidents, drowning, burns, and bicycle accidents are the most frequent reasons for accidental injury. In 25 percent of all pediatric trauma cases secondary to MVAs, alcohol is involved. Although physiologic differences must be considered; initial management of injured children is the same as that for adults. Hypothermia occurs more rapidly in children because their ratio of body surface area to mass is greater.

(Chapter 244)

(567) The answer is B

In addition to the smaller size, the pediatric airway differs from the adult airway in anatomic proportions. The subglottic area is the narrowest portion of the trachea in a child up to age 8. For this reason, uncuffed endotracheal tubes are recommended. Because children are more dependent on diaphragmatic excursion for breathing, abdominal or chest wall impedance can impede adequate oxygenation and ventilation. The infant's larynx is more cephalad than the adult's, the tongue is relatively larger, and the vocal cords are shorter and more concave. The cricoid cartilage is easily damaged, and cricothyrotomy is not recommended. A formula to approximate the endotracheal tube size required for a child up to the age of 12 years old is: internal diameter in millimeters = $(16 + \text{patient's age in years})/4$. Another way to approximate the endotracheal tube size is to use a tube the same size as the child's nares or little finger.

(Chapter 244)

(568) The answer is D

Infrequently, infants become hypotensive from blood loss into either the subgaleal or epidural space after head trauma. Hypovolemia can occur because of open cranial sutures and fontanelles. Transient paleness, lethargy, diaphoresis, and emesis are common after minor head trauma and do not necessarily signify significant neurological injury. Persistence of any of these signs or symptoms, or change in mental status is concerning. Seizures may occur shortly after head injury and are usually self-limited. However, about 50 percent of patients with posttraumatic seizures have positive findings on head computed tomography (CT). Children with two or more seizures or a GCS < 8 should be strongly considered for anticonvulsant therapy.

(Chapter 244)

(569) The answer is A

There are a number of anatomic differences between children and adults with respect to the cervical spine. Because of the large head in children, the fulcrum of the neck becomes C2-3; as a consequence, the majority of cervical injuries occur in this area. About 40 percent of children younger than 7 years and 20 percent of children up to 16 years show anterior displacement of C2 on C3 (pseudosubluxation). In normal children without injury, 3 mm of motion of C2 on C3 is often seen with flexion and extension. Most pseudosubluxation is corrected radiographically by placing the child's head in the neutral, sniffing position. In up to two-thirds of children suffering from spinal cord injuries, a normal radiograph is found (SCIWORA). About 50 percent of children with SCIWORA have a delayed onset of symptoms. Paralysis can present up to 4 days after the initial injury.

(Chapter 244)

(570) The answer is C

Falls are the most common accidental injury in patients older than 75 years. Most elderly patients fall on a level surface and suffer an isolated orthopedic injury. Even though a low-height fall may result in death, MVAs are the most common mechanism of traumatic death in the elderly. In particular, elderly patients are victims of auto/pedestrian accidents more commonly than their younger counterparts. Decreased vision, hearing, and reflexes are all contributing factors. As in younger populations, alcohol is involved in the majority of fatal assaults.

(Chapter 245)

(571) The answer is D

As the brain ages, it undergoes atrophy and decreases in size by about 10 percent between the ages of 30 and 70 years. Atrophy causes stretching of the bridging veins, which in turn leads to an increased incidence of subdural hematomas. As the dura becomes more fibrous, it adheres to the cranium and obliterates the potential space for epidurals. Therefore, although subdural hematomas are more common in the elderly, epidural bleeds are rare. Because of the increased "dead space" in the brains of elderly patients, they often have delayed presentations of significant intracranial hemorrhages. The elderly have a decreased incidence of cervical spine injury and a different pattern of injury. There is a rise in C1-2 fractures, mostly because of the increased incidence of odontoid fractures.

(Chapter 245)

(572) The answer is A

Falls in the elderly are associated with high morbidity and mortality. They are the most common cause of accidental injury in patients older than 75 years and the second most common cause between the ages of 65 and 74 years. The most likely area of hip fracture is the intertrochanteric region. Pain coupled with external rotation of the leg is a classic presentation. The second most likely place for a fracture of the hip is the transcervical region.

(Chapter 245)

(573) The answer is C

The GCS is a standardized scoring system used to predict prognosis after head injury. The scale evaluates three aspects of the patient's responsiveness and can be used to follow changes in these parameters over time. Eye opening, best verbal response, and best motor response are each assigned a numerical value. The maximum score obtainable is 15 and the minimum score is 3. This patient opened his eyes to pain (2), withdrew to pain (4), and mumbled incoherently (2), for a total score of 8. Intubation for airway protection and to facilitate

diagnostic studies should be strongly considered when the GCS score is 8 or less. A score of 8 or less persisting for 6 h or longer indicates severe neurologic injury. Children have a better prognosis than do adults at low GCS levels. The presence of drugs or alcohol may limit the usefulness of the GCS scoring system. (Chapter 247)

(574) The answer is C

Uncal herniation occurs when the uncal portion of the temporal lobe is pushed through the tentorium. Because cranial nerve III lies on the edge of the tentorium, compression causes injury to the superficial parasympathetic nerves. This results in unopposed sympathetic activity and manifests as pupillary dilation on the side of the herniation. In addition, corticospinal tract fibers in the midbrain become compressed. This squeezing through the tentorium causes contralateral hemiplegia. Ipsilateral mydriasis and contralateral hemiplegia is known as *tentorial herniation syndrome*. An intracranial hematoma is most often present on the side of the pupillary dilation, and an emergent burr hole would be placed on that side. In 20 percent of cases, pupillary changes are contralateral, and motor changes are ipsilateral. This occurs when a mass or hematoma pushes the opposite side of the midbrain against the tentorial edge, resulting in a dilated pupil on the opposite side of the lesion. Hence, bilateral emergency burr holes should be placed if trephination on the first side does not improve the patient's clinical condition. (Chapter 247)

(575) The answer is A

Severe head injury is defined by a GCS score lower than 8 in an adult. The most critical determinant of outcome in the head-injured patient is the cerebral perfusion pressure (CPP). The formula for CPP is [MAP (mean arterial pressure) - ICP (intracranial pressure)]. To maintain adequate brain perfusion, hypotension must be avoided. Adequate oxygenation is the other key factor. Hyperventilation to a $p\text{CO}_2$ of less than 25 mm Hg should be avoided because profound vasoconstriction and ischemia can result. Mortality risk is more than doubled if hypotension occurs and increases by 75 percent in severely head-injured patients who experience both hypotension and hypoxemia. Hypotension in adults is not due to the brain injury itself, except in the terminal stages when medullary failure supervenes. This patient requires assessment for internal hemorrhage, but blood pressure must be stable before considering a CT. Although they may provide less specific information, diagnostic peritoneal lavage and abdominal ultrasound have the advantage that they can be performed at the bedside. (Chapter 247)

(576) The answer is E

Basilar skull fractures can occur at any point in the base of the skull, but the typical location is along the petrous

portion of the temporal bone. Clinical signs of a basilar skull fracture include Battle's sign (retroauricular hematoma), raccoon eyes (retroorbital hematoma), cerebrospinal fluid leak, hemotympanum, and cranial nerve VII palsy. The cranial nerve VII palsy may appear immediately or present a few days after injury. Prognosis for recovery is better in the delayed-onset variety. Because of the force needed to cause a basilar skull fracture, a head CT is indicated to look for coexisting intracranial injuries. Palsy of cranial nerve VI has not been described with basilar skull fractures. The use of prophylactic antibiotics in the setting of basilar skull fracture is controversial and should only be initiated after consultation with the consulting neurosurgeon.

(Chapter 247)

(577) The answer is C

Although basilar skull fractures are indicators of significant force during the injury, they do not need immediate neurosurgical evaluation if a head CT is otherwise negative. Given the fracture over the temporal bone, under which the middle meningeal artery lies, patient A has a high likelihood of epidural hematoma. With a slightly depressed GCS, a neurosurgeon should be notified immediately. A comatose patient with a depressed linear skull fracture has a 20 times increased risk of intracranial hematoma. The patient with the rollerblade injury has a communicating, open scalp laceration and a dural tear, as shown by the otorrhea. Dural tears require early surgical repair to decrease the incidence of infection. Patient E is likely to have diffuse axonal injury requiring meticulous control of cardiovascular and neurosurgical parameters.

(Chapter 247)

(578) The answer is D

This patient likely has a subdural hematoma, a collection of blood beneath the dura and overlying the arachnoid and brain. It results from tears of bridging veins that extend from the subarachnoid space to the dural venous sinus. Patients with brain atrophy due to either aging or alcoholism are particularly susceptible to developing subdural hematomas. Acute subdurals are usually symptomatic within 24 h. Subacute subdural hematomas are symptomatic between 24 h and 2 weeks after injury, and chronic subdurals become symptomatic 2 weeks or more after the injury, when the blood clot liquefies. On CT, most acute subdurals appear hyperdense, subacute bleeds are isodense or mixed density, and chronic subdurals are hypodense. Immediate surgery may not be appropriate for chronic subdural bleeds. The morbidity and mortality of subdurals exceeds that of epidurals because of the greater severity of underlying brain injury. Epidural bleeds are associated with a tear of the middle meningeal artery.

(Chapter 247)

(579) The answer is C

This patient is suffering from postconcussive syndrome after minor head injury. Patients with minor head injury represent 80 percent of the population of patients presenting to the ED with head trauma but suffer neurological

deterioration less than 2 percent of the time. Symptoms are subtle and may only be brought out by formal neuropsychological testing. Insomnia, amnesia to the event, sensitivity to alcohol, difficulty concentrating, depression, and visual changes are common. Most symptoms resolve within the first few weeks, but patients should be warned that they can persist for up to 6 months postinjury. No focal motor weakness or sensory loss has been described with this syndrome, and anyone with these signs after an accident should be further evaluated. Intracranial bleeds and posttraumatic seizures can present as late as 1 to 2 weeks after minor head trauma.

(Chapter 247)

(580) The answer is B

This multitrauma patient has a major head injury. Early intubation and maintenance of cerebral perfusion pressure are paramount. Hyperventilation to a $p\text{CO}_2$ of less than 25 mm Hg could cause ischemia, thereby worsening the brain injury. The ideal level of $p\text{CO}_2$ is between 30 and 35 mm Hg. Mannitol, and possibly furosemide, can reduce intracranial pressure but should be avoided in a hypotensive patient. Intravenous fluids should be administered as required to volume resuscitate the patient. Glucose-containing fluids can result in hyperglycemia, which has been shown to be harmful to the brain. Therefore, lactated Ringer's or normal saline solutions are recommended. Management of this critical patient should be coordinated with a neurosurgeon and a trauma surgeon.

(Chapter 247)

(581) The answer is E

Five percent of patients with spinal trauma experience onset or worsening of neurological symptoms after reaching the ED. This is usually due to either spinal cord ischemia or inadequate immobilization. As long as the spine is protected, evaluation may be deferred until the patient has been stabilized. Spinal boards are excellent transportation devices but should be removed as quickly as feasible to prevent complications such as decubitus ulcers or patient discomfort. Fifty-five percent of all spinal injuries occur in the cervical region, and only 5 percent of head-injured patients have an associated spinal injury. Lack of pain or tenderness does not preclude unstable spinal injury, particularly if the patient has a distracting injury or is under the influence of drugs or alcohol.

(Chapter 248)

(582) The answer is D

Neurogenic shock results from impairment of descending sympathetic pathways. Patients lose their vasomotor tone and sympathetic stimulation to the heart. This leads to pooling of blood and hypotension. Other potential manifestations of this autonomic nerve dysfunction include priapism, urinary retention, paralytic ileus, and loss

of temperature control. The unique findings of neurogenic shock are that the skin remains warm, dry, and pink, and adequate urine output is maintained. Atropine is used to treat the paradoxical bradycardia. Hypotension is usually unresponsive to fluids alone and often requires the judicious use of vasopressors. Distal areflexia can last hours to weeks and is followed by spastic paralysis.

(Chapter 248)

(583) The answer is A

Central cord syndrome typically occurs after a hyperextension injury in an elderly patient with congenital stenosis or osteoarthritis. It is characterized by a disproportionately greater loss of motor strength in the proximal extremities than in the lower extremities. Within the upper extremities, the distal aspect is more affected than the proximal aspect. This characteristic pattern is due to disruption of the cord's vascular supply from the anterior spinal artery. Motor tracts on the innermost portion are affected first, and the distal extremities on the outer portion are affected last. The bladder is occasionally involved. Recovery progresses distally to proximally, and the prognosis is better for this syndrome than for other cord syndromes.

(Chapter 248)

(584) The answer is C

A flexion teardrop injury involves displacement of a large triangular fragment from the anterior aspect of the involved vertebral body. This results in extensive anterior and posterior ligamentous disruption. The extension teardrop fracture leaves the posterior ligaments intact. A Jefferson fracture is a burst of the ring of C1, and the hangman's fracture is a bilateral fracture through the pedicles of C2. Bilateral interfacetal dislocation shows 50 percent anterior displacement of one vertebral body on another, and unilateral facet dislocation is diagnosed when there is a 25 to 33 percent anterior dislocation. Cervical spine fractures are considered unstable when two or more columns of the spine are affected.

(Chapter 264)

(585) The answer is D

The combination of the lateral, odontoid, and anteroposterior views of the cervical spine is about 92 percent sensitive for identifying a cervical fracture. If the predental space is greater than 3 mm, there is a high likelihood of cruciform ligament disruption. Prevertebral soft tissue swelling of greater than 5 mm at C3-4 indicates a possible hematoma with associated fracture. Abrupt changes in angulation of vertebral interspaces greater than 11 degrees or anterior subluxation of greater than 3 mm is suspicious for cervical injury. Fanning of the spinous processes suggests possible posterior ligamentous injury. If three views of the cervical spine are unremarkable but clinical suspicion remains high, further studies such as flexion-extension films, CT, or magnetic resonance imaging are warranted.

(Chapter 264)

(586) The answer is E

Zone I of the neck lies below the cricoid cartilage, zone II is between the cricoid cartilage and the angle of the mandible, and zone III is above the angle of the mandible. Although the consulting surgeon might elect to take any of these patients to the operating room, the types of absolute indications for surgery are decreasing. Clear indications for operative repair include the presence of an expanding or pulsatile hematoma, hemoptysis, blood-tinged saliva, or absent pulses. Horner's syndrome (pupillary constriction, eyelid lag, and anhydrosis) indicates sympathetic ganglion injury. Because of the potential for associated carotid injury, these patients require surgical exploration. Indications for imaging (angiography, bronchoscopy, esophagoscopy, or CT) are controversial. Patients with zone I and III penetrating injuries generally undergo angiography, but CT has become a popular alternative, especially in stable patients.

(Chapter 250)

(587) The answer is D

In a patient with spinal cord injury, the primary goal is to prevent further neurologic deterioration. In North America, high-dose steroids are given to patients within 8 h of injury to reduce swelling around the cord. Hypotension and bradycardia must be reversed to prevent further cord ischemia.

(Chapter 248)

(588) The answer is A

Chest trauma carries a significant morbidity and mortality. On ED arrival, one-fifth of patients with chest trauma are hypotensive or require intubation. The majority of deaths from chest trauma occur after arrival to the ED. Mortality for unstable patients is about 20 percent as opposed to 1 percent for patients with stable vital signs on ED arrival. Fewer than 10 percent of blunt trauma patients and 15 to 30 percent of penetrating trauma patients are candidates for emergent thoracotomy.

(Chapter 251)

(589) The answer is D

Cardiac arrest frequently occurs in the peri-intubation period. Aggressive bagging of the intubated patient increases intrathoracic pressure, leading to a decrease in venous return. Therefore, decreasing the ventilatory

rate and volume can augment cardiac output, especially in the hypovolemic patient. Tension pneumothorax is commonly precipitated by positive pressure ventilation in a patient with a visceral pleural injury. In this setting, needle decompression of the chest can reverse the cardiac arrest. Repositioning the endotracheal tube after a right mainstem intubation can also be life-saving. A patient with hemoptysis is at risk for air embolism. Trendelenburg and the left lateral decubitus position may temporarily keep the air bubbles in the venous circulation. If the arrest is secondary to hypovolemia, it is unlikely that a single liter of crystalloid will lead to return of spontaneous circulation.

(Chapter 251)

(590) The answer is C

The role for resuscitative thoracotomy in the ED is limited. Thoracotomy may have a role in selected patients with penetrating injury to the neck, chest, and extremities and signs of life within 5 min of arrival to the ED. A resuscitative thoracotomy is seldom of benefit for patients with cardiac arrest secondary to blunt trauma or head injury, or for those without vital signs on the scene. Blunt trauma patients with pulseless electrical activity on ED arrival have a prognosis of virtually zero and are poor candidates for resuscitative thoracotomy. It is difficult to assess the path of the weapon after blunt abdominal trauma, and emergent thoracotomy may be life-saving. Several therapeutic measures can be accomplished with ED thoracotomy: (1) evacuation of a pericardial tamponade, (2) direct control of thoracic exsanguination, (3) open cardiac massage, and (4) cross clamping of the aorta to increase blood flow to the brain and heart.

(Chapter 251)

(591) The answer is A

Flail chest occurs when a segment of chest wall does not have bony continuity with the rest of the rib cage, usually in the setting of multiple rib fractures. Morbidity is due to hypoxemia associated with the underlying lung injury. If there is a suspicion for a large lung contusion, prophylactic intubation (before signs of respiratory distress) can decrease mortality from 69 percent to 7 percent. The initial presentation of flail chest may be subtle due to rib splinting. The injured lung in flail chest is sensitive to under-resuscitation of shock and to fluid overload. Judicious use of fluids is required to adequately hydrate the patient without worsening the pulmonary contusion.

(Chapter 251)

(592) The answer is B

An "occult pneumothorax" is a small pneumothorax that is seen on CT but not on chest x-ray. Patients with occult pneumothoraces can be observed without a chest tube unless they need to be intubated. Positive pressure ventilation postintubation carries the risk of converting an occult pneumothorax into a tension

pneumothorax if a thoracostomy is not performed.
(Chapter 251)

(593) The answer is B

With pneumomediastinum, a crunching sound known as Hamman's sign can be heard during systole secondary to mediastinal air surrounding the heart. The diagnosis of pneumomediastinum is most easily confirmed on CT but can sometimes be made with plain films. Subcutaneous emphysema in the neck is another suggestive physical finding.
(Chapter 251)

(594) The answer is E

Beck's triad consists of distended neck veins, hypotension, and muffled heart tones. However, even with a large tamponade (200 mL), heart sounds are usually clear. Tachycardia and tracheal deviation are not components of the triad. Beck's triad can be seen with tension pneumothorax, myocardial contusion, acute myocardial infarction, and systemic air embolism.
(Chapter 251)

(595) The answer is A

Pericardiocentesis is a temporizing measure until cardiac surgery is available. The false negative rate in trauma has been reported to be as high as 80 percent. Pericardial blood is difficult to remove because it has clotted. Rapid aspiration of high volumes of blood usually indicates that the needle is in the right ventricle. If it is used, the electrocardiographic (ECG) monitor is always connected to a metal needle.
(Chapter 251)

(596) The answer is A

In both myocardial rupture and contusion, the most commonly injured part of the heart is the anterior right ventricle because of its location immediately below the sternum. Myocardial contusion can be difficult to diagnose, especially in the setting of multisystem trauma. It should be considered in any patient involved in an MVA with speeds greater than 35 miles per hour, especially if the patient's chest strikes the steering wheel.
(Chapter 251)

(597) The answer is C

The aortic valve is the most commonly injured, followed by laceration of the papillary muscle or chordae tendineae of the mitral valve. Patients with bioprosthetic valves are more susceptible. The tricuspid valve is rarely injured. Diagnostic clues for cardiac injury include chest pain, tachycardia, dysrhythmias, heart failure, fractured sternum, widened pericardial silhouette on chest x-ray, and elevated ST segments.

(Chapter 251)

(598) The answer is A

A high index of suspicion must be maintained to diagnose aortic rupture because at least one-third of patients have no external evidence of thoracic injury on initial examination. All the listed findings can be seen on chest x-ray after traumatic rupture of the aorta, but widening of the superior mediastinum is the most frequent abnormality. Mediastinal width is usually greater than 8.0 cm after an aortic rupture. Subadventitial and periadventitial hematomas, secondary to bleeding from small mediastinal vessels, are the primary causes of this radiologic finding.

(Chapter 251)

(599) The answer is C

Upper, not lower, extremity hypertension has been reported in 31 to 43 percent of cases of traumatic aortic rupture. This finding was initially attributed to compression of the aorta by a periaortic hematoma. Recent evidence suggests that it may be due to aortic wall stretching and subsequent receptor stimulation. The systolic murmur is thought to occur as a result of turbulent flow across the injured area. Hoarseness and voice change are less frequent physical findings.

(Chapter 251)

(600) The answer is C

Cervical tracheal injuries occur most frequently at the junction of the cricoid cartilage and the trachea, usually after striking the anterior neck against the dash of a car. Most lower tracheobronchial injuries occur within 2 cm of the carina. Lower tracheobronchial injuries are caused by rapid deceleration and shearing of mobile bronchi from fixed structures. Concurrent esophageal injuries occur in 25 percent of patients.

(Chapter 251)

(601) The answer is C

In a previously normal pericardium, 200 mL of blood will create sufficient intrapericardial pressure to restrict venous filling of the heart and cause tamponade. Although it may be detected by bedside ultrasound, this amount is too small to be reliably visible on chest x-ray. Removal of as little as 5 to 10 mL of blood can be life saving by augmenting venous filling and dramatically improving stroke volume.

(Chapter 251)

(602) The answer is B

DPL is a diagnostic option for a patient with equivocal physical findings after significant trauma. Both GSW to the mid-abdomen and fluid on ultrasound with hypotension necessitate urgent laparotomy, and DPL is not necessary. Similarly, stab wounds with peritoneal irritation require laparotomy. Spinal cord injuries may make physical examination unreliable, and DPL would be one option for evaluation. Hepatic dysfunction with portal hypertension and severe coagulopathies are considered relative contraindications to DPL. With increasing availability of bedside ultrasound and rapid CT scanning, DPL is being used less frequently.

(Chapter 252)

(603) The answer is E

Most renal injuries can be managed nonoperatively. Indications for surgery after blunt kidney injury include evidence of continued blood loss, loss of renal function, and laceration through Gerota's fascia. Hematuria is common and usually self-limited. Pain is unrelated to the necessity for surgery.

(Chapter 254)

(604) The answer is C

Aspiration of more than 5 mL of gross blood upon catheter entry is considered positive. In the lavage fluid, commonly accepted threshold values are RBC > 100,000/ μ L, white blood cell (WBC) count > 500, or amylase > 200. In addition, bile, vegetable matter, or bacteria seen on microscopic examination is considered positive. In many centers, ultrasound is replacing DPL as a less invasive, faster bedside study.

(Chapter 252)

(605) The answer is E

Most cases of diaphragmatic injury do not involve herniation and are difficult to diagnose. The only finding on chest x-ray may be a blurred diaphragm or an effusion, sometimes difficult to detect on a portable, supine film. Diagnosis is frequently delayed; most injuries occur on the left side. CT and DPL frequently provide evidence to suggest or confirm the presence of a ruptured diaphragm.

(Chapter 251)

(606) The answer is B

The spleen is the most commonly injured solid organ after blunt trauma. Clinical findings include Kehr's sign (left shoulder pain), left upper quadrant abdominal tenderness, hypotension, and tachycardia. Solid abdominal organ injury causes morbidity and mortality primarily as a result of hemorrhage. Lung injury with tension pneumothorax is another possibility in this patient, but is less likely than splenic injury.

(Chapter 252)

(607) The answer is E

Penile rupture is the traumatic rupture of the corpus cavernosum. It occurs during an erection but is associated with immediate detumescence. The urethra may also be torn. Management includes immediate surgical evacuation of the blood clot and repair of the torn tunica albuginea.

(Chapter 254)

(608) The answer is B

In one case series, 67 percent of all GU injuries were to the kidney. The bladder is the second most commonly injured structure. Kidney injuries include contusions, lacerations, ruptures, pedicle injuries, and renal pelvis ruptures.

(Chapter 254)

(609) The answer is A

Renal pedicle injuries include lacerations and thrombosis of the renal artery and vein. They commonly occur as a result of high-velocity deceleration forces and are frequently associated with multiple injuries. If the renal artery is occluded or divided, CT demonstrates a non-enhanced kidney with a faint capsular enhancement, known as the *rim sign*. Surgical repair should occur within 12 h to maximize the likelihood of kidney viability. (Chapter 254)

(610) The answer is B

The bladder is more intraabdominal in children and is better protected within the bony pelvis in adults. Blunt injuries to the bladder are more frequent than penetrating injuries and are commonly associated with pelvic fractures. Bladder ruptures are repaired surgically if intraperitoneal and managed conservatively with bladder drainage if extraperitoneal. Contusions can usually be managed by simple observation. (Chapter 254)

(611) The answer is E

Retroperitoneal bleeding can be massive and life-threatening after a pelvic fracture. Up to 4 L of blood can be held in the retroperitoneal space. Resuscitation begins with crystalloid fluid boluses, followed by blood products. The external fixator device is useful, and angiography with embolization can be life-saving in the setting of ongoing bleeding. Laparotomy is used only as a last resort because opening the abdominal cavity can relieve a tamponade and cause fatal hemorrhage. (Chapter 265)

(612) The answer is B

A mesenteric tear would cause sufficient bleeding to result in a positive DPL. Subcapsular splenic injuries do not bleed into the peritoneal cavity. The duodenum and kidney are in the retroperitoneum, and injuries to these structures usually do not cause the DPL to be positive. (Chapters 252, 254)

(613) The answer is E

Before administering intravenous contrast, a Foley catheter should be inserted. However, blood at the meatus indicates a urethral injury, and placement of a urinary catheter can convert a partial urethral tear into a complete

disruption. A retrograde urethrogram should be performed first, and, if positive, a suprapubic catheter should be inserted for bladder drainage.

(Chapter 254)

(614) The answer is D

Clinical experience has shown that missile track excision is not necessary because wound necrosis is not a problem. Hollow and soft-point bullets used in civilian firearms often damage more tissue than military bullets. Bullets almost never tumble in the air because they spiral out of the firearm barrel, but they commonly tumble in tissue. Caliber measures the bullet's diameter. When considering wounding potential, other important characteristics are length, jacket, cartridge case, shape, construction, and composition.

(Chapter 256)

(615) The answer is A

Active countermeasures require the conscious cooperation of the individual to be protected. Passive countermeasures exert their protective effects automatically. The motorcyclist must wear a helmet, whereas all the other measures are permanent parts of the building, automobile, or device. Passive countermeasures are usually more effective in reducing injury because they are more likely to be used.

(Chapter 258)

(616) The answer is E

Education can be valuable but is often shown to be ineffective when evaluated critically. Mandatory-use laws (e.g., seat belt, motorcyclist helmet) are extremely effective in decreasing morbidity and mortality. States that have repealed helmet laws have seen up to a 40 percent increase in fatality rates. Vehicle engineering has resulted in a substantial decrease in death rates, whereas driver education has been largely ineffective. Mandatory-use laws are very difficult to enact (and subject to repeal), usually with the argument that they would compromise "personal freedom."

(Chapter 258)

(617) The answer is A

The radial nerve is the one most commonly injured after a mid-shaft humerus fracture. These fractures are most

often seen in active adults rather than in the elderly, in whom proximal humerus fractures are more likely. Radial nerve injuries are manifested by wrist drop (weakness on wrist extension) and decreased sensation to the dorsum of the first web space. Other complications include injuries to the brachial artery or vein and to the median or ulnar nerves.

(Chapter 259)

(618) The answer is D

Scapular fractures occur most commonly in men age 25 to 40 years. Because the scapula is mobile, the most common mechanism of injury is a direct blow. Considerable force is required to fracture the scapula. As a result, 80 percent of such fractures are associated with injuries to the chest wall and lungs. Treatment is usually conservative, and open repair is rarely indicated.

(Chapter 259)

(619) The answer is A

The spleen is the most commonly injured organ after blunt trauma, and the liver in penetrating trauma. Small and large intestines are also frequently injured. Subcapsular hematomas, commonly seen with stab wounds, may be associated with a negative DPL.

(Chapters 251, 252)

(620) The answer is A

Pancreatic injury is more common with penetrating trauma. It may also occur as a result of a crushing injury that divides the pancreas over the vertebral column. Examples include steering-wheel or bicycle-handlebar injuries. Unrecognized, this injury has considerable morbidity and mortality. DPL is usually negative, and the serum amylase is usually normal.

(Chapter 252)

(621) The answer is D

Indications for radiologic evaluation have changed over the last 10 years. Whereas formerly any degree of hematuria necessitated evaluation, it is now recognized that the yield for significant urologic injury is extremely low unless the patient has gross hematuria, microscopic hematuria with shock, or a penetrating renal injury. Abdominal CT may need to be performed to assess for other injuries but is not indicated strictly on the basis of

microscopic hematuria. Indications for the imaging of pediatric patients are more liberal.
(Chapters 252, 253)

(622) The answer is D

All of the listed structures except the ureters are commonly injured during blunt abdominal trauma. Although the ureter is occasionally injured during penetrating trauma, ureteral injuries are the rarest of all genitourinary injuries from external trauma. During blunt trauma, injury can occur at the ureteropelvic junction as a result of hyperextension of the spine, with the distal ureter fixed at the bladder.

(Chapters 252, 254)

(623) The answer is D

Posterior dislocation (tibia posterior to the femur) has an approximately 50 percent likelihood of associated popliteal artery injury. In addition, the patient must be evaluated for peroneal nerve, ligamentous, and meniscal injuries. Spontaneous reduction of a posterior knee dislocation before evaluation is common. Therefore, a high index of suspicion must be maintained in any patient with a suggestive mechanism of injury and a grossly unstable joint. If not already reduced, early reduction of the dislocation is essential. Orthopedic and sometimes vascular surgery consultation are indicated.

(Chapter 266)

(624) The answer is A

The tarsal-metatarsal joint is referred to as Lisfranc joint. Injuries to this joint are uncommon and result from relatively severe trauma, such as motor vehicle crashes. The keystone of this joint is the second metatarsal, and a fracture at the base of the second metatarsal is almost diagnostic of a disrupted joint. A Lisfranc fracture requires prompt orthopedic consultation.

(Chapter 269)

(625) The answer is C

Achilles tendon rupture most commonly occurs in middle-aged men, more often on the left side, and usually during forceful dorsiflexion of the ankle. Rupture can also occur from a direct blow or secondary to a laceration. The calf squeeze test (Thompson's test) is almost always positive. Active plantar flexion may be maintained,

although it is weaker than on the contralateral ankle. Definitive treatment may be conservative (with casting) or operative. Tendon rupture is commonly misdiagnosed as ankle sprain.

(Chapter 268)

(626) The answer is D

Compartment syndrome occurs when injured muscle within a fascial sheath swells and compresses blood vessels and nerves within the compartment. The most common sites are the four compartments in the leg: peroneal, anterior, deep and superficial posterior. Of these, the anterior compartment is the most often affected, usually secondary to a tibial fracture. Compartment syndromes can also occur in the volar and dorsal compartments of the forearm and the interosseous muscles of the hand. Compartment pressures must be measured if the diagnosis is suspected. Pressures over 30 mm Hg can cause ischemia and are an indication for emergency fasciotomy.

(Chapter 270)