



## SAMPLE QUESTIONS

1. A 19 year old man hiking in the national forest fell 10 feet through a rotten plank in an old wooden bridge to the rocky stream below. He was transported to the ED within 30 minutes complaining chest pain. He is hypotensive on arrival to the ED. What do you do?
  - a. 2L bolus crystalloid
  - b. Send to OR
  - c. Crack the chest
  - d. 1L bolus crystalloid
  - e. CT chest/abd/pelvis
  
2. In a severely injured patient the risk for coagulopathy is high. Which of the following is correct:
  - a. Tranexamic acid should not be redosed after the initial bolus
  - b. Resuscitative measures can increase the risk of coagulopathy
  - c. To decrease the risk of coagulopathy you must keep the patient cool
  - d. Tranexamic acid can be given within the first 4hrs of injury
  - e. Patient's taking anticoagulation are not at any higher risk in a trauma
  
3. Which of the following patient's would not require radiographic evaluation per the Canadian C-spine Rule?
  - a. 12 y/o boy fell from 3 ½ feet
  - b. 68 y/o man who was ambulatory at the scene
  - c. 42 y/o woman rear ended by a city bus
  - d. 35 y/o woman with delayed onset of neck pain who can actively rotate her neck 45 degrees left and right

- e. 23 y/o man with midline cervical spine tenderness
4. In a patient with hemorrhagic shock, a base deficit of -4 would indicate what class of shock:
- a. Class 1
  - b. Class 2
  - c. Class 3
  - d. Class 4
  - e. Base deficit does not correlate with shock
5. At what class of hemorrhagic shock would the GCS decrease:
- a. Class 1
  - b. Class 2
  - c. Class 3
  - d. Class 4
  - e. A change in GCS would indicate neurogenic shock not hemorrhagic shock
6. Mildly hypotensive patient, tachycardic, BP normalizes after 1L fluid bolus but begins to drop again. What do you do?
- a. Give 2<sup>nd</sup> liter bolus of crystalloid
  - b. Start transfusing blood
  - c. Transfer to higher level of care
  - d. Obtain CT to determine source of bleeding
  - e. Place a Swan Gantz catheter for more invasive monitoring
7. Which of the following is true in the management of the potentially coagulopathic patient:
- a. Thromboelastography can take 2-3hrs in some labs and should not be done in patients needing transfer
  - b. Permissive hypothermia allows for a mild level of hypothermia to decrease risk of coagulopathy
  - c. Patients given Tranexamic acid in the field should get a follow up dose of 2g given as a rapid infusion over 30min
  - d. Baseline PLTs PT/INR and PTT should be checked within the first 4hrs following arrival in the ED
  - e. Rotational Thromboelastometry is a point of care test that may be useful in guiding the treatment of this patient

8. 26 year old woman was hit by a van while walking across a busy intersection. She has an obvious broken right femur and 3 broken ribs on the right side. She requires a blood transfusion. Which of the following is true:
- > 4u pRBC in 1hr is considered a massive transfusion
  - Everyone requiring massive transfusion should receive calcium supplementation
  - < 12u pRBC in 24hrs would not be considered a massive transfusion
  - The ACS has developed a universal MTP that should be adopted by all trauma centers
  - Type O plasma is given when uncrossmatched plasma is needed
9. A 48 year old man was beaten in his home, with a wooden bat, in a robbery by two assailants. He is transported to the ED, hemodynamically stable with hemoptysis and cervical subQ emphysema. Which of the following statements are correct:
- This condition is not immediately life-threatening and further evaluation should wait until the secondary survey has been completed.
  - Fiber optic assisted intubation may be indicated
  - Perform immediate needle decompression
  - Bronchoscopy should not be attempted as it may worsen the injury
  - Immediately place a gastric tube to prevent aspiration
10. Which statement regarding treatment of PTX is correct:
- According to the current ATLS recommendations, during needle decompression of tension PTX, the needle should be placed in the 2<sup>nd</sup> intercostal space in the midclavicular line
  - According to the current ATLS recommendations, during needle decompression of tension PTX, the needle should not be longer than 6cm to avoid potential damage to vessels and other structures
  - According to the current ATLS recommendations, during needle decompression of tension PTX, the needle should be placed in the 5<sup>th</sup> intercostal space just anterior to the mid axillary line
  - According to the current ATLS recommendations, selected patients with a small, occult PTX can be safely transported by air without a chest tube

- e. According to the current ATLS recommendations, tension PTX should be confirmed by u/s or a rapid CXR prior to decompression

11. A 61 year old woman driving a 1986 Buick LaSabre was involved in a 4 car accident. Hit from behind, and though wearing her seatbelt, she was propelled forward by the impact, hitting the steering wheel. She complained of chest pain and shortness of breath before losing consciousness in the E.D. Which of the following is true:

- a. In patients with flail chest, the first 12-24hrs are critical with increased risk of hypoxia, after this the risk drops dramatically.
- b. A spontaneously breathing patient in obvious distress with a tension PTX should be intubated first and then decompress the chest.
- c. Drug Assisted Intubation is not indicated in the unconscious patient.
- d. A size 28 – 32 Fr chest tube is adequate for hemothorax
- e. Video-assisted laryngoscopy is useful to allow the novice to safely intubate in challenging situations

12. A 15 year old girl suffers a gunshot wound to the back while attending an open air concert. She is in circulatory arrest at the scene. CPR is in progress when she is brought in by EMS:

- a. Immediately perform ED thoracotomy
- b. If the patient suffered blunt trauma, stop CPR and notify family of time of death
- c. Transfer patient to next highest level of care
- d. Bypass the ED and continue CPR on the way to the OR
- e. After intubation, supplemental O<sub>2</sub> and IV access have been obtained; bilateral chest decompression should be performed

13. A 30 year old man suffers a deceleration injury when one of the rides at the State Fairgrounds malfunctions. A CXR shows depression of the left main-stem bronchus and an apical cap:

- a. The goal MAP for this patient is 60 – 70 mm Hg
- b. This patient should be taken immediately to the OR based on the CXR findings. Do not delay for CT confirmation.
- c. Nitroprusside is the medication of choice
- d. ED thoracotomy should be immediately performed
- e. Upper endoscopy will confirm the diagnosis

14. A 27 year old man is found to have ecchymosis of the scrotum after landing hard on his bike while jumping across rugged terrain in the national forest.

- a. If the prostate exam is normal and there is no blood at the urethral meatus, a Foley catheter may be safely placed
- b. A retrograde urethrogram is indicated
- c. A suprapubic catheter should be immediately placed
- d. Needle aspiration of the hematoma should be done
- e. The patient should be instructed to void to verify or rule out gross blood in the urinary tract

15. A 65 year old man while playing in his church league softball tournament, is hit in the head with a line drive. He was not wearing a helmet. He did not lose consciousness. His vital signs are normal. Upon examination a GCS score of 13 is determined.

- a. This patient would be classified as having a moderate brain injury and can be discharged home with observation
- b. If GCS returns to 15 within 4hrs after injury, the patient does not need CT
- c. Hearing loss raises suspicion of basilar skull fracture
- d. Mannitol should be given prophylactically
- e. If GCS does not return to 15 within 4hrs after injury, emergent bone-flap craniotomy should be considered

## ANSWERS & EXPLANATIONS

### 1. D

In ATLS 10 initial fluid bolus has been decreased to 1L instead of 2L crystalloid because bleeding patients need the bleeding to be stopped and they need blood, so this is now the focus. Start giving blood if no improvement after initial 1L fluid bolus. There is much greater focus on massive transfusion protocols. The other things mentioned may be indicated at some point in this patient's care, but he initially needs fluid resuscitation.

### 2. B

In ATLS 10 Tranexamic acid is being recommended for severely injured patients who will require massive transfusion and are at risk for coagulopathy. The initial bolus needs to be given within the first 3hrs of injury. This may be in the pre-hospital setting. It is then given as an infusion over 8hrs in the hospital setting. As in previous versions, we know that fluid/blood resuscitation can increase the risk of coagulopathy highlighting the need for massive transfusion protocols, and hypothermia increases risk of coagulopathy so warm room, warm blankets and warm blood/fluids are still recommended.

### 3. D

In ATLS 10 The Nexus criteria and the Canadian C-spine Rues are emphasized, so review them both. The 12 y/o boy has the high risk factor of a fall from >3ft; the 68y/o man although he has the low risk factor of being ambulatory at any time, he has the high risk factor of age >65; the 42y/o woman has the low risk factor of a rear end collision but being hit by a bus excludes it from truly being low risk; the 35y/o woman has the low risk factor of delayed onset of neck pain and on ROM testing is able to rotate her neck 45 degrees actively both left and right, so she would not require imaging based on the info given; the 23y/o man has midline cervical spine tenderness and clearly requires imaging.

#### 4. B

In ATLS 10 Base excess and GCS have been added to the hemorrhagic shock table. A base deficit of -2 to -6 would indicate class 2 shock

#### 5. C

In ATLS 10 Base excess and GCS have been added to the hemorrhagic shock table. Instead of looking for anxiousness, you will make note of a change in GCS which will begin to decrease at Class 3. Neurogenic shock deals with spinal injury not head injury, so a change in GCS would not be an indicator of neurogenic shock.

#### 6. B

In ATLS 10 the early administration of blood and blood products is emphasized. Only 1L crystalloid bolus is now given instead of 2L. Simultaneously, you will be treating known sources of bleeding and looking for unknown source(s) of continued bleeding, but while the patient is unstable, this would involve a FAST or DPL not CT scan. You would also be re-checking for tension PTX and other non-hemorrhagic causes of shock. This patient may require transfer and/or invasive monitoring, but your immediate priorities are stabilizing the patient by identifying and stopping the bleeding and replacing lost volume.

#### 7. E

In ATLS 10 the emphasis on coagulopathy has increased including mentioning the use of Tranexamic acid. The initial bolus is typically given over 10min usually in the field, a follow up dose of 1g is then infused over 8hrs. Thromboelastography and Rotational Thromboelastometry are both point of care testing that may be useful in guiding treatment of the potentially coagulopathic patient. Hypothermia increases the risk of coagulopathy. Baseline PLT, PT/INR, PTT should be checked within the first 1hr.

#### 8. A

In ATLS 10 there is emphasis on blood and blood product transfusion. A massive transfusion is considered to be the administration of >10u pRBC in 24hrs or >4u pRBC in 1hr. Most patients requiring blood transfusion do not need calcium supplementation. The ACS has published guidelines for creating a MTP however there is no universal MTP for all trauma centers. Type AB plasma should be given when uncrossmatched plasma is needed. Type O pRBC should be given when uncrossmatched pRBC is needed.

## 9. B

In ATLS 10 tracheobronchial injury is now classified as a life-threatening condition. By the nature of the injury, an extremely difficult airway should be expected if this injury is suspected. Fiber optic intubation with placement of the tube below the level of injury or in the uninjured bronchus may be necessary. Bronchoscopy can confirm the diagnosis and help prevent worsening the injury by blindly intubating the patient. The airway should be secured prior to gastric tube placement. No symptoms of tension PTX were given, so needle decompression would not be indicated, but the patient may need multiple chest tubes placed to control the air leak. Non life-threatening injuries are evaluated during the secondary survey after the primary survey is completed.

## 10. C

In ATLS 10 the recommendation of needle placement in the 2<sup>nd</sup> intercostal space in the midclavicular line has changed due to frequent incorrect placement of the needle to far medial in the field. The current recommendation is to place the needle in the 5<sup>th</sup> intercostal space just anterior to the mid axillary line. An 8cm has a greater likelihood of entering the pleural space than a shorter needle and is recommended. Selected patients with a small, occult PTX can be safely observed unless they are being transported by air or require mechanical ventilation, then a chest tube should be placed. Tension PTX should be diagnosed clinically then treated immediately - don't wait for radiographic confirmation.

## 11. D

In ATLS 10 flail chest and pulmonary contusion is now considered potentially life-threatening, no immediately life-threatening. These patients should be monitored closely because the risk of respiratory collapse can develop subtly over time instead of immediately. Hypoxia can develop after 24hrs in a patient who initially appeared stable. A spontaneously breathing patient with tension PTX should be decompressed first and may not requiring intubation after adequate decompression of the chest. In ATLS 10 the term Rapid Sequence Intubation has been changed to Drug Assisted Intubation and can be indicated in a patient with a gag reflex even if the patient is unconscious. In ATLS 10 the recommended chest tube size for hemothorax has been decreased from 36-40 Fr to 28-32 Fr. Video-assisted laryngoscopy can be very helpful in the challenging intubation, but should be done by a well-trained expert on the team, not a novice.



## 12. E

In ATLS 10 an algorithm for circulatory arrest has been added. The patient should be intubated, supplemental O<sub>2</sub> and IV access obtained, and epinephrine given while CPR continues. If no ROSC, then bilateral chest decompression is recommended. If no ROSC, then proceed to thoracotomy and pericardiotomy if an OR and surgeon are available to receive the patient should ROSC occur. Immediate thoracotomy is not indicated. Both blunt and penetrating injuries follow the same algorithm. Stop CPR after 30min of resuscitation in a patient warmer than 33°C. Patients should have ROSC and be stabilized as best as possible prior to transfer to another facility. The patient is transferred to the OR (if indicated) when and if ROSC occurs.

## 13. A

The suspicion in this patient is a traumatic aortic rupture. CXR is not very accurate for diagnosing or ruling out aortic rupture and even a slight suspicion warrants further investigation. If the patient is stable and can be treated at your facility, proceed with CT. Pain control and control of HR & BP with a short acting Beta blocker are recommended (Esmolol). If beta blockade is contraindicated, then a calcium channel blocker can be used (Nicardipine) and if that doesn't work then Nitroglycerine or Nitroprusside. ED thoracotomy is not indicated in the current scenario. Upper endoscopy will diagnose or r/o an esophageal tear but will not r/o aortic rupture.

## 14. B

In ATLS 10 the prostate exam is no longer used as an indicator of urinary tract injury because it is inaccurate. If there is suspicion of a urethral injury a retrograde urethrogram should be done prior to Foley catheter placement. If a FAST exam is being done, it should also be done before catheter placement or voiding so the bladder won't be empty during the FAST. Needle aspiration of a scrotal hematoma is not indicated or very effective. Even without blood at the urethral meatus or gross blood in the urine, if there are other indicators or urethral injury like scrotal ecchymosis or hematoma then do a retrograde urethrogram.

## 15. C

In ATLS 10 the terminology has changed from minor brain injury to mild brain injury for patients with GCS 15-13. Moderate brain injury would be a GCS of 9-12. In a patient with minor brain injury, if the GCS returns to 15 within 2hrs and no other criteria for scanning is met, then the patient does not need a CT. Hearing loss and facial paralysis are some of the signs that raise suspicion of basilar skull fracture. Mannitol may be

indicated in a patient with severe brain injury (GCS 3-8) who is deteriorating. It is not given prophylactically. A GCS of 13 even after 4hrs is not an indication for craniotomy.

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