1. You are about to intubate a patient with respiratory failure in the ED. What are the reasons for providing preoxygenation before tracheal intubation?
    a. To extend the duration of safe apnea.
    b. To bring the patient's saturation as close to 100% as possible
    c. To denitrogenate the residual capacity of the lungs and thereby maximize oxygen storage in the lungs
    d. To denitrognate and maximally oxygenate the bloodstream.
    e. All of the above.

Answer: E. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. Preoxygenation extends the duration of safe apnea and is recommended for every ED tracheal intubation. Getting the patient to 100% oxygen saturation and denitrogenating the residual capacity of the lungs is imperative. Denitrogenating and oxygenating the blood adds little to the duration of safe apnea because oxygen is poorly soluble in the blood and the bloodstream is a comparatively small oxygen reservoir compared with the lungs.

2. What is the best source of high FIO2 for preoxygenation?
    a. 100% facemask
    b. 10 liters of nasal cannula
    c. 6 liters of nasal cannula and a nebulizer
    d. 100% facemask with an oxygen reservoir (standardly available nonrebreather in the ED)
    e. Bag-valve-mask held over the patient's face

Answer: D. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. The usual source of oxygen during ED preoxygenation is a facemask with an oxygen reservoir, and this device is erroneously referred to as the nonrebreather mask despite an absence of 1-way valves covering all of its ports. Standardly available nonrebreather masks at flow rates of 15 L/minute deliver 60-70% FIO2. BVM devices lacking 1-way inhalation and exhalation ports will deliver close to room air FIO2 when not actively assisting ventilations. A BVM device hovering over the patient's face provides only ambient FIO2.

3. For what period of time should the patient receive preoxygenation?
    a. 3 minutes' worth of tidal volume breathing with a high FIO2 source
    b. 8 vital capacity breaths with maximal inhalation and exhalation
    c. Either of the above

Answer: C. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. Ideally, patients should receive preoxygenation until they denitrogenate the FRC of their lungs to achieve greater than 90% end-tidal oxygen level, but this is rarely measured in the ED. Thus, 3 minutes' worth of tidal volume breathing is thought to be an acceptable duration of preoxygenation. Additionally, cooperative patients can be asked to take 8 vital capacity

breaths (though many ill ED patients can not take viral capacity breaths).

4. Can increasing mean airway pressure augment preoxygenation?
    a. Yes
    b. No
    c. There is no evidence to support using noninvasive positive pressure ventilation.

Answer: A. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. CPAP masks, noninvasive positive-pressure ventilation, or PEEP valves on a bag-valve mask device should be considered for preoxygenation and ventilation during the onset phase of muscle relaxation in patients who cannot achieve saturations greater than 93 to 95% with high FiO2.

5. In what position should the patient receive preoxygnation?
    a. Supine positioning
    b. Sitting upright
    c. 20 to 25 degree head-up position

Answer: C. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. Patients should receive preoxygenation in a head-elevated position whenever possible. For patients immobilized for possible spinal injury, reverse trendelenburg position can be used. An additional benefit of head elevation is better laryngeal exposure during direct laryngoscopy.

6. How long will it take for the patient to desaturate after preoxygenation?
    a. 2 minutes if the patient was otherwise healthy and was breathing room air
    b. 10 minutes if the patient was otherwise healthy and was breathing a high FiO2 level
    c. 5 minutes in an obese adult breathing a high FiO2
    d. It is impossible to predict.

Answer: D. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. Although it has been stated that if the patient is otherwise healthy and was breathing room air, they have 1 minute of safe apnea time; 8 minutes if they were breathing a high FiO2 level, and 2.7 minutes in an obese patient, the effect of shunting, increased metabolic demand, anemia, volume depletion, and decreased cardiac output are synergistic in dramatically reducing oxygen storage in the lungs and shortening safe apnea in critically ill patients. One expert estimated that desaturation to 85% may be as short as 23 seconds in a critically ill adult vs. 502 seconds in a healthy adult. Thus, given the unique variables involved in each ED tracheal intubation, it is impossible to predict the exact duration of safe apnea in a patient. Patients with high saturation levels on room air or after oxygen administration are at lower risk and may maintain adequate oxygen saturation as long as 8 minutes. Critically ill patients and those with values just above the steep edge of the desaturation curve are at high risk of hypoxemia and may desaturate immediately.

7. True or False: a nasal cannula set at 15 L/minute is the most readily available and effective means of providing apneic oxygenation during ED tracheal intubation.

Answer: True. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. Basically, alveoli continue to take oxygen even without diaphragmatic movements or lung expansion. To provide apneic oxygenation during ED tracheal intubations, the nasal cannula is the device of choice. The decreased oxygen demands of the apneic state will allow this device to fill the pharynx with a high level of FiO2 gas. By increasing the flow rate to 15 L/minute, near 100% FiO2 can be obtained. Although providing high flow rates with a conventional, nonhumidified nasal cannula can be uncomfortable because of its dessicating effect on the nasopharynx, after the patient has been sedated it should cause no deleterious effects for the short interval of airway management.

8. What is the benefit of providing manual ventilation during the apneic period?
    a. PaCO2 increases 8 to 16 mm in the first minute of apnea and then 3mm per minute, so by ventilating, you prevent the hypercarbia and acidemia.
    b. Ventilation during the onset phase of muscle relaxation can create alveolar distension and lengthen the duration of safe apnea during tracheal intubation efforts.
    c. Increases venous return and improves blood pressure.
    d. All of the above.

Answer: A and B. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation during emergency airway management. Ann Emerg Med 2012; 59: 165-175. The risk/benefit of active ventilation during the onset phase of muscle relaxation must be carefully assessed in each patient. In patients at low risk for desaturation (> 95% O2 sat), manual ventilation is not necessary. In patients at higher risk (91-95% O2 sat), a risk-benefit assessment should include an estimation of desaturation risk and the presence of pulmonary pathology. In hypoxemic patients, low-pressure low volume, low rate ventilation will be required. Regarding choice A, it is rare that this degree of PaCO2 increase and pH decrease will be clinically significant, but an exception is a profound metabolic acidosis, such as severe salicylate toxicity, in which patients compensate for the acidosis through hyperpnea and tachypnea. Aggressive ventilation is needed for such patients is needed for such patients because cardiovascular collapse with cessation of self-ventilation may occur. A second exception is in situations of increased intracranial pressure, in which the CO2 increase can lead to cerebral vasodilation.

9. Which paralytic agent may be preferred in patients at high risk of desaturation during airway management?
    a. Succinylcholine
    b. Rocuronium
    c. Vecuronium
    d. Pancuronium

Answer: B. Weingart SD, Levitan RM. Preoxygenation and prevention of desaturation

during emergency airway management. Ann Emerg Med 2012; 59: 165-175. The choice of paralytic agent may influence the time to desaturation during airway management. In a study of operative patients, the time to desaturation to 95% was 242 seconds in patients receiving succinylcholine versus 378 seconds in a group given rocuronium. It is hypothesized that the fasciculations induced by succinylcholine may cause increased oxygen use. Thus, in patients at high risk of desaturation, rocuronium may provide a longer duration of safe apnea then succinylcholine.

10. A 5 year old male accidentally had his his head under the water for 10 seconds and comes up without any respiratory impairment. This should be classified as:
    a. Drowning
    b. Near drowning
    c. Delayed onset respiratory distress
    d. Nonfatal drowning
    e. Water rescue

Answer: E. Szpilman D et al. Drowning. N Engl J Med 2012; 366:2102-2110. The WHO defines “drowning as the process of experiencing respiratory impairment from submersion/immersion in liquid. If a person is rescued at any time, the process of drowning is interrupted, and it is termed a nonfatal drowning. If the person dies at any time as a result of drowning, this is termed a fatal drowning. Any submersion or immersion incident without evidence of respiratory impairment should be considered a water rescue and not a drowning. Terms such as “near drowning,” “dry or wet drowning,” “secondary drowning,” etc. should be avoided.

11. You are taking care of a patient who has drowned. The patient appears to be in cardiac arrest. Which of the following steps should be taken?
    a. CPR following the traditional airway-breathing-circulation sequence
    b. CPR following the newly recommended circulation-airway-breathing sequence
    c. CPR with chest compression only
    d. Efforts to expel water from the airway by means of abdominal thrusts or placing the person head down

Answer: A. Szpilman D et al. Drowning. N Engl J Med 2012; 366:2102-2110.Cardiac arrest from downing is due primarily to lack of oxygen, and so CPR should follow the traditional ABC sequence, starting with five initial rescue breaths, followed by 30 chest compressions, and continuing with two rescue breaths and 30 compressions until sings of life appear, the rescuer becomes exhausted, or ALS becomes available. The most frequent complication during a resuscitation attempt is the regurgitation od stomach contents. Active efforts to expel water from the airway should be avoided because they delay the initiation of ventilation and increase the risk of vomiting with an increase in mortality. CPR with chest compression only is NOT advised in persons who have drowned.

12. Which of the following are important predictors of outcome in resuscitation of a person who has drowned?
    a. Age

b. Whether it was fresh or salt water
c. Duration of submersion
d. None of the above

Answer: C. Szpilman D et al. Drowning. N Engl J Med 2012; 366:2102-2110. Important facts and predictors of outcome in resuscitation of a person who has drowned include the following: early basic and advance life support, reduction brain temperature (by 10 degrees decreases ATP consumption by 50% and doubles the duration of time that the brain can survive), duration of submersion (if 0-5 minutes 10% risk of death or severe neurological impairment versus > 25 minutes portends nearly 100% mortality and/or neurological impairment), and signs of brain-stem injury.

13. Which of the following patients after drowning can be discharged home?
    a. Patient with normal oxygenation, lung exam, but with a cough
    b. Patient with rales
    c. Patient with grade 2-4 injury
    d. None of the above

Answer: A. Szpilman D et al. Drowning. N Engl J Med 2012; 366:2102-2110. Persons who have good arterial oxygenation without adjuvant therapy and who have no other associated morbidity can be safely discharged. Hospitalization is recommended for all patients with a presentation of grade 2 (patient B) to 6. For most patients with grade 2 presentation, noninvasive oxygen administration results in normalization of clinical status within 6-8 hours and they can then be sent home. Patients with grade 3-6 usually need intubation and mechanical ventilation and hospitalization in an ICU.

14. Which of the following patients is not at greater risk for sexual assault?
    a. Age between 25-40
    b. Physically or mentally disabled
    c. Homeless
    d. Alcohol and drug users
    e. College students

Answer: A. Linden JA. Care of the adult patient after sexual assault. N Engl J Med 2011; 365: 834-841. The lifetime prevalence of sexual assault is 13 to 39% among women and 3% among men. Certain populations are at increased risk for sexual assault, including the physically of mentally disabled; homeless persons; persons who are gay, lesbian, bisexual, or transgendered; alcohol and drug users; college students; and persons under the age of 24 years.

15. Rape victims often present to the ED but may also present to their PCP. If victims present within the time limit for evidence collection and wish to have evidence collected, they should be referred to a local rape treatment center. The time limits for evidence collection depend on the jurisdiction and range from:
    a. 24-48 hours
    b. 48-72 hours
    c. 72-120 hours
    d. Within one week

Answer: C. Linden JA. Care of the adult patient after sexual assault. N Engl J Med 2011; 365: 834-841. Evaluation and treatment of sexual assault victims are time-intensive and should optimally be provided by a team that includes an emergency physician or other medical provider overseeing care and treating injuries, a trained sexual assault examiner, and a social worker or rape crisis counselor. Maintaining chain of custody requires the documentation of the transfer of the evidence kit from the time it is opened until it is sealed and placed in secure area. Some regions have a sexual assault response team (SART), a coordinated team consisting of representatives from health care, forensivs, the local rape crisis center, law enforcement and the prosecutor's office.

16. Regarding sexual assault victims, which of the following statements is true?
    a. General body trauma is more frequent than genital trauma
    b. If an anogenital injury is not present, then it is unlikely for there to have been an assault.
    c. Both of the above
    d. Neither of the above

Answer: A. Linden JA. Care of the adult patient after sexual assault. N Engl J Med 2011; 365: 834-841. Medical providers should understand that it is not their responsibility to determine whether a sexual assault has occurred. Clinicians should understand that the absence of anogenital injuries does not equate with no assault. Although visual inspection alone identifies anogenital injuries in less than half of victims, use of advance visualization techniques, such as colposcopy and toluidine blue staining increases identification rates to 53-84%. The rate of detection varies according to the age of the victim (more common if young or elderly), virginal status, degree of resistance, time from assault to examination, and the number of assailants.

17. After a sexual assault, who should be offered prophylaxis in the ED for sexually transmitted infections?
    a. Only in those who have a positive test after screening
    b. Only if the assailant is known to be positive for these illnesses
    c. All patients

Answer: C. Linden JA. Care of the adult patient after sexual assault. N Engl J Med 2011; 365: 834-841. The CDC has published recommendations for treatment to prevent STI including GC, Chlamydia, trichomoniasis and hepatitis B. Most experts discourage testing for STI in the ED, with the exception of cases in suspected child abuse (since a positive screening for a STI may be considered proof of abuse). If the assailant is known to be positive for HIV, the CDC recommends HIV postexposure prophylaxis.

18. What is the risk of pregnancy after rape?
    a. <1%
    b. 25%
    c. 50%
    d. 5%

Answer: D. Linden JA. Care of the adult patient after sexual assault. N Engl J Med 2011; 365: 834-841. The risk is 5% and progestin-only emergency contraception, which is

administered within 120 hours after unprotected intercourse has been shown to be 98.5% effective in preventing pregnancy.

19. All jurisdictions require mandatory reporting of which of the following:
    a. Any rape
    b. Weapons-related injuries in the competent adult
    c. Assault of a child
    d. Assault of an elderly person
    e. Assault of a disabled person

Answer: C, D, E. Linden JA. Care of the adult patient after sexual assault. N Engl J Med 2011; 365: 834-841. Although some jurisdictions require mandatory reporting of rape or weapons-related injuries, this is not true for all jurisdictions. However, all jurisdictions require reporting the assault of a child or an elderly or disabled person.

20. Regarding the use of CT, which of the following is true?
    a. It is estimated that 1.5-2% of all cancers in the US are attributable to the radiation from CT.
    b. Patient confidence in the accuracy of a medical evaluation that was limited to a physician-conducted history and physical evaluation was equal to an evaluation that included laboratory testing and CT.
    c. Over 1/3 of patients think that CT delivers less radiation than 2-view chest x-rays.
    d. Of patients who believed that they had never undergone a CT scan, over one-third had received a CT within the last 5 years.

Answer: A, C, and D. Baumann BM, et al. Patient perceptions of computed tomographic imaging and their understanding of radiation risk and exposure. Ann Emerg Med 2011; 58:1-7. Patient confidence was lowest for a medical evaluation that was limited to a physician conducted history and physical examination. The addition of lab testing and imaging resulted in a nearly 4-fold increase in confidence, with the highest confidence level in patients who were presented with the option of a CT.

21. Regarding the use of CT, which of the following is true?
    a. Of patients who reported having had a CT scan documented in the electronic medical record, the mean number of scans in the previous 5 years was 5.4, with a range of 1 to 57 scans.
    b. When study participants were asked about their level of agreement with radiation exposure and cancer risk statements (which were correct), patients had very high levels of agreement.
    c. Both of the above
    d. Neither of the above

Answer: A. Baumann BM, et al. Patient perceptions of computed tomographic imaging and their understanding of radiation risk and exposure. Ann Emerg Med 2011; 58:1-7. When participants were asked about their level of agreement with the 2 radiation exposure and cancer risk statements, patient had a low level of agreement with the

statement “2 to 3 abdominal CTs give the same radiation exposure that survivors of Hiroshima received, but there was a modest level of agreement (of 45/100) with respect to the statement, “2 to 3 abdominal CTs over a person’s lifetime can increase the changes of cancer.” Patients also underestimate their previous imaging experiences, since 39% of patients who reported no previous CT 39% had one documented in the electronic medical record.

22. Regarding subarachnoid hemorrhage, which of the following statements is true?
    a. Overall mortality of SAH is high, with 25-50% dying within six months.
    b. One-third of survivors are left with neurological deficits.
    c. Nearly half of all patients with SAH have a normal neurological examination and normal vital signs.
    d. The sensitivity of modern CT with multi-detector row scanners, performed within six hours of onset had a sensitivity of 90%, and thus an LP is still necessary to exclude a SAH.
    e. It is thought that the sensitivity of older CTs deteriorates over time because of erythrocyte dissipation and lysis.

Answer: A, B, C, and E. Perry HH et al. Sensitivity of computed tomography performed within six hours of onset of headache for diagnosis of subarachnoid hemorrhage: prospective cohort study. BMH 2011; 343: 1-10. For the 953 patients scanned within 6 hours of headache onset, all 121 patients with SAH were identified with CT, yielding a sensitivity of 100% (97-100%) and specificity of 100% (99.5-100%), NPV of 100% (99.5-100%) and PPV of 100% (96.9-100%).

23. Regarding concussion, which of the following statements is false?
    a. Concussion requires loss of consciousness.
    b. Symptoms include headaches, fatigue, mood swings, neck pain, nausea and vomiting, dizziness, blurred vision, balance difficulty, photosensitivity, memory problems, difficulty concentrating, emotional lability, insomnia, depression and anxiety.
    c. Most patients with concussion remain symptomatic for several months to years.

Answer: A and C. Zafonte R. Diagnosis and management of sports-related concussion. A 15 year old athlete with a concussion. JAMA 2011; 306: 79-86. Concussion can be graded by clinical manifestations and does not require LOC. Although most patients with concussion improve rapidly (within 3 weeks), a small percentage (approximately 10-20%) of those with sports-related concussion may remain symptomatic, particularly children and adolescents.

24. Risk of concussion is associated with which of the following?
    a. Male sex
    b. Age
    c. Genetic traits

Answer: B and C. Zafonte R. Diagnosis and management of sports-related concussion. A 15 year old athlete with a concussion. JAMA 2011; 306: 79-86. Risk of concussion is

associated with age, sex, and possibly some genetic traits. High school athletes took longer to recover than college athletes, and female sex is associated with greater risk and symptom severity. The apolipoprotein E e4 allele has been associated with a greater risk of and more severe concussion.

25. Which of the following are true about the management of concussion?
    a. A youth or adolescent player with a concussion may return to play on the day of the injury if he passes a neurological test.
    b. The coach should evaluate players for concussion.
    c. A player with a potential concussion should be evaluated by a health care professional.
    d. Cervical spine injury should be excluded.

Answer: C and D. Zafonte R. Diagnosis and management of sports-related concussion. A 15 year old athlete with a concussion. JAMA 2011; 306: 79-86. According to the Zurich guidelines and the CDC, a player who shows any signs of a concussion should be evaluated by a health care professional on-site using a concussive injury tool such as SCAT2. Cervical spine injury should be excluded. If no healthcare provider is available, the player should be removed from practice or play and urgent follow-up should be arranged. A youth or adolescent player with a concussion should NOT return to play on the day of the injury. Coaches should NOT evaluate players for concussion. The coach's role is to remove the athlete from play, ensure that the athlete is evaluated by a health care professional, and to keep the athlete out of play until a health care professional states that the player is symptom free and may return to play. Neurological exam is usually normal.

26. Regarding the management of treatment after concussion, which of the following statements is true?
    a. Physical rest is important.
    b. Returning to normal scholastic activities is encouraged.
    c. Adequate hydration may be helpful
    d. Normalizing sleep patterns is important

Answer: A, C, and D. Zafonte R. Diagnosis and management of sports-related concussion. A 15 year old athlete with a concussion. JAMA 2011; 306: 79-86. The rest should preclude any stressful school-based or other activities. Additionally, medications that could result in rebound symptoms should also be avoided.

27. Post-cardiac arrest syndrome comprises anoxic brain injury, post-cardiac arrest myocardial dysfunction, and systemic ischemia/reperfusion response. True statements about initial management include which of the following?
    a. Arterial hyperoxia (PaO_2 >300 mm Hg) may be beneficial.
    b. Hypoxia should be avoided.
    c. Hypocarbia should be avoided.
    d. Hyperventilation should be initiated.

Answer: B and C. Stub D et al. Post Cardiac arrest syndrome. A review of therapeutic strategies. Circulation 2011; 12: 1428-1435. Although 100% oxygen is commonly used

during initial resuscitation, hyperoxia was independently associated with increased in-hospital mortality compared with patients with normoxia and hypoxia. Hypocarbia causes cerebral vasoconstriction and should be avoided, and hyperventilation decreases cardiac output and should also be avoided.

28. Regarding therapeutic hypothermia (TH) in the post-ROSC management, which of the following is true?
    a. Of all cooling mechanisms, the General Electric device has been demonstrated to be the most effective.
    b. Possible adverse effects of TH include electrolyte imbalances and altered coagulation profile.
    c. TH increases the heart rate and decreases the systemic vascular resistnace.
    d. Prehospital induction of TH has been found to be more beneficial when compared with cooling patients on arrival to the hospital.

Answer: B. Stub D et al. Post Cardiac arrest syndrome. A review of therapeutic strategies. Circulation 2011; 12: 1428-1435. No available studies have compared different cooling devices with respect to key clinical end points of mortality and morbidity. Prehospital cooling has not shown clinical benefit when compared to cooling patients on arrival to the hospital. TH decreases heart rate and increases SVR. Possible adverse effects of hypothermia include electrolyte and intravascular volume changes, cardiac arrhythmias, immunological impairment, and altered coagulation profile.

29. In terms of poor prognosis after cardiac arrest, the following are predictors of neurological outcome:
    a. patient comorbidities
    b. intra-arrest details, such as initial rhythm, time to ROSC, absence of bystander CPR, and maximal end-tidal CO2
    c. both of the above
    d. neither of the above

Answer: C. Stub D et al. Post Cardiac arrest syndrome. A review of therapeutic strategies. Circulation 2011; 12: 1428-1435. Although all of these factors are associated with patient outcome, no factors are sufficiently reliable to conclude that continued care is futile. Absent papillary and corneal reflexes at day 3 after rewarming remained accurate at predicting hopeless prognosis in the hypothermia setting. Until more is known about the impact of TH, prognostication should probably be delayed until day 3 after rewarming from TH.

30. With respect to nonfatal drowning incidents, the clinical picture is determined predominantly by which of the following?
    a. Whether it was salt or fresh water
    b. The amount of water that has been aspirated and its effects
    c. Both of the above
    d. Neither of the above

Answer: B. Szpilman D, et al. Drowning. NEJM 2012; 366:2102-2110. If the person is rescued alive, the clinical picture is determined predominantly by the amount of water that has

been aspirated and its effects. Water in the alveoli causes surfactant dysfunction and washout. Aspiration of salt water and aspiration of fresh water cause similar degrees of injury, although with difference in osmotic gradients. The combined effects of fluids in the lungs, loss of surfactant, and increased permeability of the alveolar-capillary membrane result in decreased lung compliance, increased regions of low ventilation to perfusion in the lungs, atelectasis, and bronchospasm.

31. Regarding nonfatal drowning incidents, which of the following is true?
    a. Injuries to the cervical spine occur in approximately 10% and so immobilization of the spine is indicated in all patients.
    b. The rate of cerebral oxygen consumption is reduced by approximately 5% for each 1 degree Celsius reduction in temperature within the range of 37 to 20 degrees.
    c. When rescuing a person from the water, rescuers should try to maintain the person in a horizontal position whiled keeping the airway open.

Answer: B. Szpilman D, et al. Drowning. NEJM 2012; 366:2102-2110. If CPR is required, the risk of neurologic damage is similar to that in other instances of cardiac arrest. However, hypothermia associated with drowning can provide a protective mechanism that allows persons to survive prolonged submersion episodes. Injuries to the c-spine occur in less than 0.5% of persons who are drowning, and immobilization of the spine in the water is indicated only in cases in which head or neck injury is strongly suspected. When rescuing a person from the water, the rescuer should try to maintain the person in a vertical position while keeping the airway open, which helps to prevent vomiting and further aspiration of water and stomach contents.

32. Regarding nonfatal drowning, which of the following is true?
    a. If the patient is in cardiac arrest, CPR should follow the circulation-airway-breathing sequence.
    b. CPR should be continued until the patient has been rewarmed and asystole has persisted for > 20 minutes.
    c. Metabolic alkalosis occurs in the majority of patients.
    d. In most persons who have been rescued from drowning, the circulation becomes adequate after oxygenation, rapid crystalloid infusion, and restoration of normal body temperature.
    e. Presenting rhythm in cases of cardiac arrest after drowning is usually ventricular fibrillation.

Answer: B and D. Szpilman D, et al. Drowning. NEJM 2012; 366:2102-2110. Cardiac arrest from drowning is due primarily to lack of oxygen. For this reason, it is important that CPR follow the traditional airway-breathing-circulation (ABC) sequence, rather than the circulation-airway-breathing (CAB) sequence, starting with five initial resuce breaths, followed by 30 chest compressions and continuing with two recue breaths and 30 compressions until signs of life reappear. CPR with chest compression only is not advised in persons who have drowned. Metabolic acidosis occurs in the majority of patients and is usually corrected by the patient's spontaneous effort to increase minute ventilation or by setting a higher minute ventilation or a higher peak inspiratory pressure. The

presenting rhythm in cases of cardiac arrest is usually asystole or pulseless electrical activity.

33. With respect to the adult patient with blunt abdominal trauma, which of the following is true?
    a. In a hemodynamically unstable patient with blunt abdominal trauma, DPL is the diagnostic modality of choice.
    b. Oral contrast is not required in the diagnostic imaging for evaluation of blunt abdominal trauma.
    c. A clinically stable patient with isolated abdominal trauma (blunt) who has had a negative abdominal CT may be safely discharged.

Answer: B and C. Diercks DB et al. Clinical Policy: critical issues in the evaluation of adult patients presenting to the ED with acute blunt abdominal trauma. Ann Emerg Med 2011; 57: 387-404. In hemodynamically unstable patients with blunt abdominal trauma, bedside ultrasound, when available, should be the initial diagnostic modality performed to identify the need for emergent laparotomy. Clinically stable patients with isolated blunt abdominal trauma can be safely discharged after a negative result for abdominal CT with IV contrast. Further observation, close follow-up, and/or imaging may be warranted in select patients based on clinical judgment.

34. You are seeing a patient with blunt abdominal trauma and you are trying to determine if he needs an abdominal CT. In patients with isolated blunt abdominal trauma, which of the following clinical predictors would allow you to forgo an abdominal CT?
    a. Patient has a RLL pneumonia
    b. Patient has a normal mental status
    c. Patient has a hematocrit of 36
    d. Patient has 15 rbcs in ua
    e. Patient has an SBP of 135/75

Answer: B, C, D, and E. Diercks DB et al. Clinical Policy: critical issues in the evaluation of adult patients presenting to the ED with acute blunt abdominal trauma. Ann Emerg Med 2011; 57: 387-404. Patients with isolated abdominal trauma, for whom occult abdominal injury is being considered, are at low risk for adverse outcome and may not need abdominal CT scanning if the following are absent: abdominal tenderness, hypotension, altered mental status (GCS < 14), costal margin tenderness, abdnomal chest radiograph, hematocrit <30%, and hematuria. Hematuria is defined as >/= 25 rbc/hpf.

35. Nontechnical skills are defined as the “cognitive, social and personal resource skills that complement technical skills, and contribute to safe and efficient task performance.” Examples include communication and leadership. Which of the following nontechnical skills are linked to safety and error in the ED?
    a. Supervising and providing feedback
    b. Using assertiveness
    c. Leadership
    d. Communicating

e. Situational awareness

Answer: A, B, C, D, and E. Flowerdew L et al. Identifying nontechnical skills associated with safety in the ED: a scoping review of the literature. Ann Emerg Med 2012; 59: 386-394. All of the above nontechnical skills are associated with error and safety in the ED. Additional ones include anticipating, managing workload, maintaining standards and decision making.

36. Barriers to effective communication in the ED include which of the following?
    a. hierarchy – e.g., a resident is reluctant to question an attending
    b. noise in the department
    c. absence of somewhere to speak in private
    d. all of the above

Answer: D. Flowerdew L et al. Identifying nontechnical skills associated with safety in the ED: a scoping review of the literature. Ann Emerg Med 2012; 59: 386-394. All were barriers to communication. Additionally, closed-loop communication, in which the message is repeated to ensure correct transmission, may reduce errors.

37. Workload management in the ED encompasses which of the following?
    a. lowering the noise level
    b. monitoring handwashing
    c. dealing with interruptions
    d. allocating tasks

Answer: C and D. Flowerdew L et al. Identifying nontechnical skills associated with safety in the ED: a scoping review of the literature. Ann Emerg Med 2012; 59: 386-394. Workload management is a complex skill that covers a wide range of behaviors. Aspects include assigning roles, dealing with interruptions, prioritizing tasks for individual patients and triaging patients, practicing backup behavior, allocating tasks and coordinating team activities, and cross-monitoring actions of team members to manage workload.

38. You are seeing a patient who presents with an episode of syncope following several weeks of fatigue. His blood pressure is 90/60, pulse is 105, and black, foul smelling stool is found on rectal examination. His hemoglobin is 6.5. Which of the following factors increase the likelihood of an upper GI bleed?
    a. Blood clots in the stool
    b. Melena
    c. Serum urea nitrogen:cr of 15:1
    d. Hemoglobin of 10
    e. Nasogastric lavage with blood

Answer: B and E. Srygley FD et al. Does this patient have a severe upper gastrointestinal bleed? JAMA 2012; 307:1072-1079. Melena, NG lavage with blood or coffee grounds, or BUN/Cr ratio of > 30 increase the likelihood of a UGIB. Bloot clots in the stool make a UGIB much less likely.

39. Which of the following factors increase the likelihood for a SEVERE UGI bleed?
    a. hemoglobin < 8
    b. BUN > 90
    c. SBP of 120
    d. Pulse rate of 95
    e. History of diabetes

Answer: A and B. Srygley FD et al. Does this patient have a severe upper gastrointestinal bleed? JAMA 2012; 307:1072-1079. A hemoglobin of < 8, a Bun > 90, WBC > 12 all increase the likelihood of a severe UGI bleed. The Blatchford score, which includes BUN, Hemoglobin, SBP, heart rate, presentation with melena or syncope, underlying hepatic disease and CHF) of 0 occurs in 22% of patients and identifies patients with a low likelihood of a severe GI bleed. Note that the Blatchford score does not require an NG lavage.

40. You are trying to determine if a newly born infant (a woman delivered in the ED parking lot) requires resuscitation. Which of the following questions are important to assess to determine whether resuscitation is required?
    a. Is this a term gestation?
    b. Did the mother use drugs?
    c. Is the baby crying or breathing?
    d. Is the baby male?
    e. Does the baby have good muscle tone?

Answer: A, C, and E. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. If the answer to all 3 of these questions is "yes," then the baby does not need resuscitation and should not be separated from the mother. The baby should be dried, placed skin-to-skin with the mother and covered with dry linen to maintain temperature.

41. Regarding the patient with meconium seen during delivery, which of the following should be done?
    a. Suction the oropharynx before delivery of the shoulders.
    b. Intubate the patient and directly suction all of these babies.
    c. Both of the above
    d. Neither of the above

Answer: D. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. Only depressed infants born to mothers with meconium-stained amniotic fluid are at increased risk to develop meconium aspiration syndrome. If attempted intubation is prolonged and unsuccessful, BVM should be considered.

42. The goal oxygen saturation in babies being resuscitated at birth should be:
    a. 100%
    b. It depends on whether the baby is term or preterm
    c. Saturation value in the interquartile range of preductal saturations measured in healthy term babies following vaginal birth at sea level

Answer: C. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. C is true, and blended oxygen is recommended. If blended oxygen is not available, then resuscitation should be initiated with air. If the baby is bradycardic after 90 seconds of resuscitation with a lower concentration of oxygen, then the concentration should be increased to 100% until recovery of a normal heart rate. If the infant remains apneic or gasping or if the heart rate remains < 100 per minute, then positive pressure ventilations should be started.

43. Which of the following are indications for endotracheal intubation during neonatal resuscitation?
    a. Initial endotracheal suctioning of nonvigorous meconium-stained newborns
    b. If BVM is ineffective or prolonged
    c. If chest compressions are being performed
    d. For special resuscitation circumstances, such as congenital diaphragmatic hernia or extremely low birth weight.

Answer: A, B, C, and D. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. Note that after endotracheal intubation, a prompt increase in heart rate is the best indicator that the tube is in the tracheobronchial tree and providing effective ventilation.

44. Regarding chest compressions in the neonate, which of the following is true?
    a. Chest compressions are indicated if the heart rate is < 60 despite adequate ventilation
    b. Compressions should be delivered in the upper third of the sternum
    c. Either the 2 thumb-encircling hands technique or compression with 2 fingers with a second hand supporting the back may be used.
    d. Compression ratio should be 15:2

Answer: A and C. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. The 2 figner technique may be preferable when access to the umbilicus is required during insertion of a UV Catheter. Compressions to ventilations should be performed at a 3:1 ratio with 90 compressions and 30 breaths. This ratio should be used for neonatal resuscitation where compromise of ventilation is nearly always the primary cause. Only if a primary cardiac etiology is suspected should a 15:2 or 30:2 ratio be used.

45. When should neonatal resuscitation be discontinued?
    a. If the heart rate is undetectable for 3 minutes
    b. If the baby is cold
    c. Both of the above
    d. Neither of the above

Answer: D. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. In a newly born baby with no detectable heart rate, it is appropriate to consider stopping resuscitation if the

heart rate remains undetectable for 10 minutes.

46. Examples of when neonatal resuscitation is not indicated include which of the following?
    a. Gestational age of 26 weeks
    b. Anencephaly
    c. Birth weight of 600g
    d. Trisomy 13

Answer: B and D. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. When gestation, birth weight, or congenital anomalies are associated with almost certain early death or high morbidity, resuscitation is not indicated. Examples include extreme prematurity (age < 23 weeks or birth weight < 400g), anencephaly, and some major chromosomal abnormalities, such as trisomy 13.

47. A neonate appears to have respiratory depression. Which of the following are potential considerations?
    a. Naloxone
    b. BVM
    c. Intubation
    d. LMA

Answer: B, C, and D. Special report – neonatal resuscitation: 2010 AHA guidelines for CPR and emergency cardiovascular care. Pediatrics 2010; 126: e1400-e1413. LMAs are effective for ventilating newborns weighing more than 2000 g or after 34 weeks. Naloxone is not recommended as part of initial resuscitative efforts in the delivery room for newborns with respiratory depression. Heart rate and oxygenation should be restored by supporting ventilation.