CVC Questions
(June 27 2011)

TEST A or PRE-TEST

1. Which of the following is an indication for a tunneled central venous catheter?
   a) Hemodynamic monitoring in the patient whose volume status cannot be otherwise measured.
   b) Pre-operative administration of total parenteral nutrition (TPN).
   c) **Chronic hemodialysis**
   d) IV access in a patient with no other vein sites.

2. Completion of a Central Line Insertion “checklist” to assure “Central Line Bundle” compliance and to help to prevent CLABSI is:
   a) Required for the placement of all elective CVC’s
   b) Required for the placement of CVC’s in all awake patients
   c) **Required for the placement of CVC’s in all patients**
   d) Required for the placement of CVC’s in all ICU patients

3. Which of the following options for long-term (greater than 7 days) iv access has the highest incidence of infection?
   a) **Non-tunneled Central Venous Catheterization**
   b) Tunneled CVC placement
   c) Port
   d) PICC (peripherally inserted central venous catheter)

4. Which Central Venous Catheter site has the lowest rate of infection?
   a) Internal Jugular Triple Lumen Catheter
   b) **Subclavian Triple Lumen Catheter**
   c) Femoral Triple Lumen Catheter
   d) Internal Jugular Introducer (sheath-type) Catheter

5. Which Central Venous Catheter site has the highest rate of pneumothorax?
   a) **Subclavian**
   b) Internal Jugular
   c) Femoral
   d) PICC (peripherally inserted central venous catheter)

6. Which Central Venous Catheter site is the easiest to access in a Trauma code situation?
   a) Subclavian
   b) Internal Jugular
   c) **Femoral**
   d) PICC (peripherally inserted central venous catheter)
7. Which of the following is a relative contraindication to CVC placement?  
   (Multiple answers possible)  
   a) Coagulopathy  
   b) Previous CVC  
   c) Patient on positive pressure ventilation  
   d) Pulmonary hypertension

8. Which of the following CVC types is best suited for short-term administration of multiple, incompatible medications?  
   a) Tunneled Hickman catheter  
   b) Triple-lumen catheter  
   c) Introducer “sheath-type” catheter  
   d) Port

9. Which of the following CVC types is best suited for long-term, infrequent access?  
   a) Tunneled Hickman catheter  
   b) Triple-lumen catheter  
   c) Introducer “sheath-type” catheter  
   d) Tunneled Port

10. Which of the following is not required for CVC placement?  
    a) Initiation of the OHSU checklist  
    b) Notification of primary care provider  
    c) “Pause” verifying patient ID, procedure, and availability of needed equipment and supplies when the procedure is performed in the OR  
    d) Confirmation of patient allergies

11. Preparation of the CVC line kits includes:  
    a) Flushing of catheter with saline  
    b) Unclamping all lumens of catheter to facilitate passage over guidewire  
    c) Removal of guidewire from holder  
    d) Testing catheter by passing guidewire through first

12. Which of the following is the preferred prep agent, as recommended by the Institute for Healthcare Improvement “Central Line Bundle” for adult patients?  
    a) Betadine  
    b) Iodine  
    c) Chlorhexidine  
    d) Isopropyl Alcohol
13. Which of the following is/are true regarding ultrasound identification of the internal jugular vein?
   a) **The surface anatomy can be used to find the approximate location of the vein before using the ultrasound**
   b) The vein is medial to the artery
   c) The vein is less compressible by ultrasound than the artery.
   d) The vein will always be larger than the artery

14. Which of the following is true regarding needle placement in the internal jugular vein?
   a) The vein will be located roughly at the base of the triangle formed by the two heads of the sternocleidomastoid
   b) The vein is non-compressible by the ultrasound probe
   c) **Use of ultrasound has been shown to reduce the complication rate of internal jugular CVCs**
   d) The head should be gently rotated 90° away from the side of insertion

15. On placement of a subclavian CVC, the needle should:
   a) **Be inserted 2/3 of the way from the sternal notch to the end of the clavicle**
   b) Be aimed toward the shoulder
   c) Be inserted 1/4 of the way from the sternal notch to the end of the clavicle
   d) Be aimed toward the contralateral nipple

16. Which of the following suggests placement of the catheter into an arterial system?
   a) Hematoma at site after placement of catheter
   b) **Manometry pressure of > 25 mm Hg or 30 cm H₂O**
   c) Ultrasound image of needle passing into a compressible vessel
   d) Easy filling of syringe with blood upon aspiration

17. During catheter removal of subclavian or internal jugular catheters, all of the following are true **except**:
   a) The patient should be in Trendelenburg (head-down) position
   b) Awake patients should be at maximal expiration
   c) **All line tips should be routinely cultured to examine for signs of colonization**
   d) Intubated patients under positive pressure ventilation should be at maximal lung expansion
18. The needle is advanced under ultrasound guidance, but arterial puncture is suspected. The proper course of action is to:
   a) **Remove the needle and hold pressure 5-10 minutes, before proceeding**
   b) Remove the needle and examine with ultrasound
   c) Remove the needle and immediately continue at the same site.
   d) Leave the needle in place and call attending or vascular surgery for backup

19. An introducer (sheath-type) catheter is placed in the jugular position but pulsatile bright red blood returns from the catheter, raising the suspicion of carotid placement. The proper course of action is to:
   a) Remove the catheter and hold pressure 5-10 minutes, move to another site
   b) Remove the catheter and hold pressure 5-10 minutes, continue at same site
   c) Remove the catheter and immediately continue at same site
   d) **Leave the catheter in place and call attending or vascular surgery for backup**

20. During guidewire placement and catheter advancement the patient has recurrent arrhythmias. All of the following are true except:
   a) The arrhythmias should respond to withdrawal of the line or catheter away from heart
   b) **The CVC insertion should be aborted until the underlying cardiac abnormality can be evaluated.**
   c) ACLS management should be undertaken if persistent hemodynamic effects are noted
   d) Placement under fluoroscopic guidance may be necessary

21. During triple lumen line placement the patient takes a deep breath and appears to suck in a volume of air through an open catheter port. The patient becomes hypoxic. Which of the following is true:
   a) The catheter should be immediately removed
   b) **100% O₂ should be supplied and the patient should be intubated if appropriate**
   c) The patient should be moved into a head-down, right-side down (right lateral decubitus, Trendelenberg) position
   d) The catheter should be passed into the right ventricle to attempt to aspirate the embolus.
22. Using US guidance the needle has been followed down to the vein and blood return verified. Advancing the guidewire meets resistance. Which of the following is true:
   a) The resistance is likely in the soft tissue and the wire should continue to be advanced.
   b) The wire should be removed and turned around so that the stiffer end can be used
   c) **The wire should be withdrawn out of the needle and blood flow re-checked.**
   d) US should be used to guide the wire past the point of obstruction under direct vision.

23. On review of a chest xray obtained after CVC placement the tip of the catheter is noted to be at the atriocaval junction. Which of the following is true:
   a) The catheter should be withdrawn into the superior vena cava
   b) The catheter should be advanced into the atrium
   c) The catheter should be withdrawn into the innominate vein
   d) **The catheter is located in the proper position.**

Circle the correct answer. **T**=True  **F**=False

After multiple attempts, you are unable to achieve a good venous flashback of blood in the syringe despite US guidance. Which of the following are true?

24. A more senior person should attempt the line.  **T**  **F**
25. A different site should be attempted after a chest x ray is obtained  **T**  **F**
26. The US probe should be placed in the longitudinal direction for better visualization.  **T**  **F**

During dilation of the tract, the patient becomes unresponsive and hypotensive. Which of the following are true?

27. A code should be called and ACLS protocol followed  **T**  **F**
28. The line should be quickly placed for access  **T**  **F**
29. If breath sounds are diminished, a 14FR angiocatheter should be placed in the ipsilateral 2nd intercostal space in the midclavicular line  **T**  **F**
30. CXR and ECG should be obtained after airway is secure  **T**  **F**
Use the transverse US image of the right neck shown below to answer the following question:

31. The structure labeled “B” is the:
   a. Common Carotid artery
   b. Internal jugular Vein
   c. Internal carotid artery
   d. External jugular vein