EXERCISE 5: VENIPUNCTURE - WINGED COLLECTION SET (BUTTERFLY)

Skills:  38 Points

Objectives:
1. List four types of patients which would be considered candidates for blood collection using the butterfly (winged collection) equipment.
2. Describe in detail the butterfly winged collection set needle assembly.
3. Describe the proper method of inserting a butterfly needle into a vein.
4. Describe the importance of “breathing” a syringe prior to use.
5. Describe the proper use and precautions for using a syringe for blood collection.
6. Explain why low volume (pediatric) tubes are the tubes of choice for use with winged collection sets compared to standard size vacuum tubes.
7. List three alternative sites that may be used when veins in the antecubital fossa area cannot be located
8. Describe the action which MUST be taken prior to attempting a venipuncture using the veins in a patient's feet or ankles.
9. State the special precautions which should be taken when performing venipuncture on veins of the hands, wrists, ankles, or feet
10. Describe the proper use of the safety transfer device and precautions to follow when filling vacuum tubes using a safety transfer device.
11. Properly perform a venipuncture using the butterfly/syringe and butterfly/vacuum collection equipment in accordance with the objectives listed in Exercise 2.
12. Demonstrate the proper technique to safely transfer blood from a syringe to a vacuum collection tube.
13. State the reason for using a discard tube when collecting a light blue (sodium citrate) tube using a butterfly with vacuum collection

Discussion

The butterfly winged collection set is an intravenous device frequently used for collecting blood from pediatric patients and patients with tiny, fragile veins. Their sleek construction and smaller needle length allows a shallow angle of insertion and easier manipulation. The most common winged collection needle set sizes are ½ to ¾ inches long and are 21 or 23 gauge although other sizes are available. Patient groups who may be candidates for blood collection by this method include pediatric patients, geriatric patients, oncology patients and burn victims.

The butterfly collection set consists of a needle with plastic wings for gripping and plastic tubing. The length of the needle is ½ inch which limits its use to surface veins. Butterfly winged collection needles can adapt to either a syringe or vacuum collection tube holder. When drawing patients with very small or fragile veins, it is best to collect the blood in low volume (pediatric) tubes to decrease the possible collapse of the vein from too much vacuum pressure. No additional adapter is necessary for using the butterfly-winged collection set with the syringe. Proper use of the equipment involves bending the wings together over the needle with the bevel up. The needle is inserted into the vein using a very low angle.
Butterflies are best used with syringes. **It is important to breath the syringe prior to use.** This is accomplished by moving the plunger back and forth in the barrel before using. This breaks the seal on the syringe.

Once the needle is inserted into the vein the plunger should be pulled back gently, yet firmly. **Pulling back on the plunger with excessive force to speed blood coming into the syringe may cause the vein to collapse or, if extreme pressure is applied, may cause hemolysis of the blood sample.**

Transferring Blood into Vacuum Collection Tubes from Syringe

Great care must be taken when transferring blood from the syringe into the appropriate tubes. Safety devices must be used which allow blood to safely be transferred from the syringe into the appropriate tubes. After activation of the safety needle the needle is removed and the transfer device is attached to the syringe. The syringe is then oriented so that the syringe is on top of the transfer device. The phlebotomist hand should be holding the syringe with the fingers around the exposed plunger, which will allow the phlebotomist to control the flow of blood into the vacuum tube. The appropriate tubes are then inserted into the transfer device and allowed to fill by the tube vacuum. Once all the tubes have been filled, the syringe and transfer device are carefully discarded into biohazard sharps container, as the transfer device does contain a needle which pierces the stopper when filling the tubes.

The old method of directly piercing the stopper with the needle to transfer the blood is no longer recommended. This method required that the tube be placed in a rack and then, using one hand, carefully seat the needle into the stopper, the other hand can then safely hold the tube while the stopper is punctured, the blood would then be pulled into the tube by the vacuum. This is a dangerous method as many phlebotomists are tempted to either hold the tubes in the hand while piercing the stopper or, if the tube is in a rack, holding the tube with their free hand while piercing the stopper. If the phlebotomist missed the stopper a needle stick exposure will likely occur.

Venipuncture Butterfly Using Vacuum Collection Tubes

The butterfly usually comes with an adapter that can be used for either vacuum tube collection or for syringe collection. When butterfly needles first became available, the combination of butterfly and vacuum tube was rarely used because the volume of the tubes was larger and required a stronger vacuum. (The amount of vacuum of the tube is directly proportional to the volume of the tube.) The large volume/strong vacuum tube would often cause the vein to collapse if used on small, fragile veins. Today, more tubes are available with a lower draw volume and thus a lower vacuum.

*The use of the winged collection needle is for patients with small or fragile veins.* If a butterfly/vacuum collection is attempted and the vein collapses, the best course of action is to attempt the collection using a butterfly and syringe, as this allows the phlebotomist to control the amount of suction by gentle pulling on the plunger of the syringe.
**Alternative Venipuncture Sites**

Sometime it is very difficult to locate a vein suitable for venipuncture in the antecubital fossa of a patient's arm. The appropriate course of action is to inspect the patient's other arm for a suitable vein. *If neither arm provides a vein in the antecubital fossa suitable for venipuncture, the phlebotomist may then consider using a vein in the patient's top of the hand, top of the wrist, ankle or top of the foot.*

Hand and wrist veins are more difficult to access than veins in the antecubital fossa because they are generally smaller. These veins are also not as well anchored by surrounding tissue as those in the antecubital fossa area. Consequently, they tend to move or "roll" when the needle is inserted. The phlebotomist must use extra care when anchoring a vein in the hand or wrist to prevent it from moving during needle insertion.

If a patient's hands and wrists are evaluated as potential venipuncture sites and no suitable veins are found, some facilities may authorize phlebotomists to use veins in the patient's ankles or feet. *Always check the policy at your facility BEFORE performing venipuncture on a foot or ankle veins. Many facilities require a doctor's written authorization for these sites to be used.*

The concerns related to venipuncture of veins in a patient's hands or wrists also have application for veins in the patient's ankles or feet. Both the hands and the feet have increased amounts of bacteria on their surface, as compared to the antecubital fossa. The phlebotomist should thoroughly cleanse the puncture site prior to venipuncture. If a vein in a patient's hand, wrist, foot or ankle is chosen, a winged collection needle or a syringe should be used because they often will accommodate smaller veins better than a standard evacuated tube assembly.

**Butterfly/Vacuum Collection for Coagulation Testing**

When collecting a sample for coagulation testing using the light blue stopper tube, it is critical to achieve the correct 9:1 ratio of blood to anticoagulant. If a light blue tube is the first tube drawn using a butterfly and vacuum tube collection, a discard tube must be collected before the light blue tube. If a discard tube is not used, the amount of air in the winged infusion set tubing will take the place of some of the blood that should have been collected, thus resulting in a short draw for the light blue tube. This will result in the tube being rejected by the lab. To avoid this situation, a discard tube should be used to prime the tubing with blood. Once blood flow has filled the butterfly tubing, the discard tube is removed and the light blue tube to be used for testing is inserted into the holder and allowed to fill. Most locations simply use another light blue tube for the discard tube.
Precautions:

1. If the hands, wrist, or feet are used for venipuncture, cleanse the area extremely well as these areas have increased bacterial contamination.

2. NEVER depress the plunger when filling evacuated tubes using the safety transfer device, as this could cause the stopper to come out of the tube, resulting in blood splattering in your face and mouth.

3. Use EXTREME caution when handling the butterfly collection set after use. This equipment has been implicated in many accidental needle sticks. Immediately activate the safety device after removing the needle from the vein.

4. Use safety transfer device to fill vacuum tubes with blood. If none are available place the tubes in a test tube rack to fill, and stabilize the tubes at the bottom, well away from the stopper. NEVER hold tubes in hand when piercing the stopper of the tube with the needle.

5. Use extreme caution when disposing of the safety transfer device. Remember that there is a needle inside of the device the punctures the tube stopper during blood transfer. Do not allow your finger to get inside of the device when you are disposing of it.
**Procedure 1: Venipuncture-Winged Collection Set – SYRINGE**
Each student will practice this procedure TWICE on artificial arm.

**Materials:**
1. Butterfly winged collection set with syringe adapter
2. Syringe
3. Safety transfer device
4. Alcohol swabs
5. Tourniquet
6. Biowipe or gauze
7. Evacuated tubes
8. Artificial arm
9. Test tube rack with vacuum collection tubes
10. Sharpie marker
11. Sharps container and trash can

**Procedure:**
1. Approach, greet and properly identify yourself as a student. Ask for verbal permission to proceed. (Observer records time.)
2. Properly identify the patient
3. Wash or sanitize hands. (Role play)
4. Put on gloves
5. Ask about blood drawing history, explain procedure if necessary.
7. Apply tourniquet properly.
8. Asks patient to clench fist.
9. Properly palpate appropriate veins to be used for venipuncture. Evaluate both arms as necessary. Note the size, direction, and depth of the veins.
10. Chose acceptable vein according to the selection criteria.
11. Release tourniquet within one minute of application.
12. Properly clean the site with 70% alcohol swab. Allow to air dry while you prepare the needle.
13. Prepare equipment.
   A) Remove the winged collection needle from its packaging. If the winged collection set has an adaptor for a vacutainer at the other end of the tubing, carefully remove and discard it. Hold the butterfly at the needle end with one hand, and straighten out the tubing with your other hand. Gently pull the tubing straight by running the tubing between your thumb and index finger, starting at the needle and continuing down the length of the tubing. Repeat as necessary so that the tubing is relatively straight.
   B) Remove the syringe from its packaging. Move the plunger back and forth in the barrel of the syringe several times to loosen. Attach the end of the winged collection set to the end of the syringe using a firm, twisting motion. Make sure a transfer device and the appropriate tubes are available.
14. Re-apply the tourniquet.
15. Ask patient to clench fist.
16. With the hand you will use to inset the needle, bend the wings of the butterfly up together with the needle bevel up. Use your other hand to gently twist the cap to loosen it, and then remove the cap from the needle.
17. Briefly inspect the needle for defects.
18. Anchor the vein and position the needle appropriately. Do not re-palpate the site.
19. Insert the needle, with the bevel up, into the vein, using an appropriate low angle. When the needle has entered the vein a “flash” of blood will usually appear in the tubing directly above the needle.
20. Stabilize the needle. This can be done by steadying your drawing hand on the patient’s skin or you can allow the wings of the needle to unbend and hold them on the patient's arm. Do not let go of the wings or ask the patient to secure or hold the wings. (If drawing a large volume of blood, the needle can be taped to the patient. This is usually not necessary in the classroom lab.)
21. Using your other hand, pull back on the plunger until 3 ml of blood has been collected. Use firm but gentle pressure when pulling back on the syringe. You may have to pull and then release the plunger to allow time for the blood to flow into the syringe. If excessive force is used it will cause hemolysis of the blood specimen.
22. After collection release the pressure on the plunger and untie the tourniquet. The tourniquet must be released within 1 minute of application.
23. If the needle was taped down, carefully remove the tape from the wings and bend the wings back up together. Try to move the needle as little as possible while it is in the patient.
24. Place a Biowipe or gauze over or just above the puncture site. Do not apply pressure to the puncture site while the needle is still in the patient’s arm.
25. Carefully withdraw the needle from the patient's arm in one smooth motion and then use the biowipe or gauze to apply pressure to the puncture site while IMMEDIATELY ACTIVATING THE NEEDLE SAFETY DEVICE according to the manufacturer directions.
26. Once the needle safety device is activated, ask the patient to apply pressure to the puncture site.
27. Pull back on the syringe plunger, just enough to draw the remaining blood from the tubing into the syringe. Carefully remove the butterfly needle with tubing from the syringe and discard the needle into a sharps container.
28. Attach the safety transfer device to the syringe and position the syringe with the plunger up. Insert the stopper of an evacuated tube into the bottom of the safety transfer device. Fill the tubes in the proper order.
29. Allow the vacuum in the tube to pull the blood in. DO NOT APPLY PRESSURE ON THE PLUNGER. When the vacuum has been exhausted (the tube is full) withdraw the tube from the syringe. If the tube has an additive gently invert it. Repeat the procedure with the next tube.
30. Once all of the blood is transferred from the syringe to the tubes, remove the last tube, and discard the syringe and attached transfer device into a sharps container.
31. Gently invert all additive tubes several times to mix the blood with the additive. Label the tubes collected IMMEDIATELY after drawing from the stopper down as follows:
   a) Patient’s name (last name first, first name second)
   b) ID number (or date of birth)
   c) Today’s date
   d) Time of collection (some labs require the use of military time)
   e) Your initials
32. Carefully show the correctly labeled tubes to the patient and ask them to verify their name and date of birth. Place all tubes in a test tube rack.
33. Inspect puncture site to verify that bleeding has stopped, apply bandage if needed. If bleeding has not stopped, continue to apply pressure. Recheck site at one minute intervals until bleeding has stopped.
34. Discard materials in appropriate waste receptacle (Sharps, biohazard, or regular trash).
35. Thank the patient. Allow patient to leave if they are an outpatient.
36. Disinfect work area.
37. Remove gloves, immediately wash, or sanitize hands. (Observer records time.)
38. Partner completes evaluation and records total amount of time. The evaluator gives constructive criticism of the phlebotomist's technique. (What was done well, tactfully note what needs improvement)
Exercise 5: Venipuncture Winged Collection Set (Rev Nov7_2016)

Procedure 2: Venipuncture/Winged Collection Needle – EVACUATED TUBE HOLDER
Each student will perform this procedure TWICE on artificial arm plus ONE live draw (THREE tot4-al).

Materials:

1. Butterfly winged collection set with vacuum collection adapter
2. Vacuum collection holder
3. Alcohol swabs
4. Tourniquet
5. Biowipe or gauze
6. Evacuated tubes
7. Artificial arm
8. Test tube rack
9. Sharpie marker
10. Sharps container and trash can

Procedure:

1. Approach, greet and properly identify yourself as a student. Ask for verbal permission to proceed. (Observer records time.)
2. Properly identify the patient
3. Wash or sanitize hands.(Role play)
4. Put on gloves
5. Ask about blood drawing history, explain procedure if necessary.
7. Apply tourniquet properly.
8. Asks patient to clench fist.
9. Properly palpate appropriate veins to be used for venipuncture. Evaluate both arms as necessary. Note the size, direction and depth of the veins.
10. Chose acceptable vein according to selection criteria.
11. Release tourniquet within one minute of application.
12. Properly clean the site with 70% alcohol swab. Allow to air dry while you prepare the needle.
13. Prepare equipment.
   A) Remove the winged collection needle from its packaging. If the winged collection set has an adaptor for a vacutainer at the other end of the tubing, carefully remove and discard it. Hold the butterfly at the needle end with one hand, and straighten out the tubing with your other hand. Gently pull the tubing straight by running the tubing between your thumb and index finger, starting at the needle and continuing down the length of the tubing. Repeat as necessary so that the tubing is relatively straight.
   B) Connect a vacutainer holder to the end of the butterfly tubing. The tubing should have an adaptor that will screw into the holder. If it does not have the correct adaptor, ask your instructor for the correct adaptor. Make sure the appropriate tubes are available.
14. Re-apply the tourniquet.
15. Ask patient to clench fist.
16. With the hand you will use to inset the needle, bend the wings of the butterfly up together with the needle bevel up. Use your other hand to gently twist the cap to loosen it, and then remove the cap from the needle.
Exercise 5: Venipuncture Winged Collection Set (Rev Nov7_2016)

17. Briefly inspect the needle for defects.

18. Anchor the vein with your thumb and position the needle appropriately. Do not re-palpate the site.

19. Insert the needle, with the bevel up, into the vein, using an appropriate low angle. When the needle has entered the vein a "flash" of blood will usually appear in the tubing directly above the needle.

20. Stabilize the needle. This can be done by steadying your drawing hand on the patient's skin or you can allow the wings of the needle to unbend and hold them on the patient's arm. Do not let go of the wings or ask the patient to secure or hold the wings. (If drawing a large volume of blood, the needle can be taped to the patient. This is usually not necessary in the classroom lab.)

21. Using your other hand, insert the first tube into the vacutainer holder and push it onto the needle. Allow the tubes to fill to the correct volume. When the vacuum has been exhausted, blood will no longer enter the tube. (Note: if the first tube to be drawn is a light blue tube, you must use 2 light blue tubes. Allow blood to just enter the first light blue tube, and then change to a second light blue tube. Allow the second light blue tube to fill completely. Discard the first light blue tube. Failure to use this method for light blue tubes drawn with butterfly/vacuum will result in tube rejection and patient re-sticks.)

22. Fill all tubes following the correct order of the draw.

23. Mix blood with additive as necessary after removal of tube from the vacutainer holder.

24. Release the tourniquet once blood begins to enter the last tube and within one minute of application.

25. Remove the last tube from the holder when it has stopped filling and invert at few times.

26. If the needle was taped down, carefully remove the tape from the wings and bend the wings back up together. Try to move the needle as little as possible while it is in the patient.

27. Place a Biowipe or gauze over or just above the puncture site. Do not apply pressure to the puncture site while the needle is still in the patient's arm.

28. Carefully withdraw the needle from the patient's arm in one smooth motion and then use the biowipe or gauze to apply pressure to the puncture site while IMMEDIATELY ACTIVATING THE NEEDLE SAFETY DEVICE according to the manufacturer directions.

29. Immediately discard the needle and holder in a sharps container carefully.

30. Ask the patient to apply pressure to the puncture site.

31. Gently invert all additive tubes several times to mix the blood with the additive. Label the tubes collected IMMEDIATELY after drawing from the stopper down as follows:
   a. Patient’s name (last name first, first name second)
   b. ID number (and/or date of birth)
   c. Today’s date
   d. Time of collection (some labs require the use of military time)
   e. Your initials

32. Carefully show the correctly labeled tubes to the patient and ask them to verify their name and date of birth. Place all tubes in a test tube rack.

33. Inspect puncture site to verify that bleeding has stopped, apply bandage if needed. If bleeding has not stopped, continue to apply pressure. Recheck site at one minute intervals until bleeding has stopped.

34. Discard materials in appropriate waste receptacle (Sharps, biohazard, or regular trash).

35. Thank the patient. Allow patient to leave if they are an outpatient.

36. Disinfect work area.

37. Remove gloves, immediately wash or sanitize hands. (Observer records time.)

38. Partner completes evaluation and records total amount of time. The evaluator gives constructive criticism of the phlebotomist's technique. (What was done well, tactfully note what needs improvement)
EXERCISE 5: VENIPUNCTURE - BUTTERFLY (WINGED COLLECTION SET)  
STUDY QUESTIONS

Name ___________________________________   Date___________________  Points _____/16

Points: 15

1. State four patient groups who may be candidates for blood collection using the winged collection set (2 points).
   A. 
   B. 
   C. 
   D. 

2. State the gauge of needle present on the winged collection set (1 point).

3. Describe the appearance of the winged collection set (2 point).

4. Explain why low volume (pediatric) tubes are the tubes of choice for use with winged collection sets compared to standard size vacuum tubes. (1 point).

5. List four alternative sites that may be used when veins in the antecubital fossa area cannot be located (2 points).
   A. 
   B. 
   C. 
   D.
6. Describe why veins in the hands and feet are more difficult to access than veins in the antecubital fossa area (1 point).

7. Describe the action which should be taken prior to deciding on whether to use the veins in a patient's feet or ankles (1 point).

8. State the special precautions which should be taken when performing venipuncture on veins of the hands, wrists, ankles, or feet (1 point).

9. Describe the needle insertion procedure when using the winged collection set (1 point).

10. Describe what should be done with the syringe after removing it from the package and prior to use (1 point).

11. Explain what might happen if the plunger is pulled back with excessive force when drawing blood with a syringe (1 point).

12. State why pressure must never be applied to the syringe plunger, i.e., pushing blood into the tube using the plunger, when filling vacuum tubes (1 point).

13. State the tube stopper color that will require a discard tube to be drawn first if it is the first sample collected using the butterfly and vacuum collection method AND why this is important. (1 point)
   Tube Stopper Color: