

## EXERCISE 6: VENIPUNCTURE - WINGED INFUSION SET (BUTTERFLY)

Textbook: Chapter 8

Skills: 30 points

- Objectives:
1. State the types of patients which would be considered candidates for blood collection using the butterfly/syringe equipment.
  2. Describe in detail the butterfly winged infusion 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. Properly perform a venipuncture using the butterfly/syringe and butterfly/vacutainer equipment in accordance with the objectives listed in Exercise 2.
  6. Demonstrate the proper technique to safely transfer blood from a syringe to a vacuum collection tube.
  7. State the special precautions to follow to draw blood from ankle/foot.

### Discussion

The butterfly winged infusion set is an intravenous device that phlebotomists sometimes use for collection blood from pediatric patients and patients with tiny, fragile veins. Patient groups who may be candidates for blood collection by this method include pediatric patients, geriatric patients, oncology patients and burn victims.

Winged infusion needles are preferable to standard venipuncture needles when drawing from tiny veins because they are commercially available in very small gauges (23 and 25 gauge). Small needles are easier to insert into tiny veins.

Butterfly winged infusion needles can adapt to both a syringe or a pediatric or adult vacutainer tube holder.



The butterfly infusion set consists of a needle with plastic wings for gripping and plastic tubing. The length of the needle is  $\frac{1}{2}$  inch, which limits its use to surface veins. A special adapter is necessary to attach the tubing to the holder of the Vacutainer system. The use of pediatric sized tubes is less likely to cause small veins to collapse because the exertion of vacuum pressure is significantly lessened as compared to the vacuum in a standard-size evacuated tube. No adapter is necessary for using the butterfly-winged infusion set with the syringe method. 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 “breathe” 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. Failure to breathe the syringe may result in the needle being pulled from the vein when the seal breaks unexpectedly. The phlebotomist will be pulling hard on the plunger and when the seal is suddenly released to much force is being applied in a backward motion resulting in the needle being pulled from the vein.

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 are 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 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.

### **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. In the event that neither arm provides a vein suitable for venipuncture, the phlebotomist may then consider using a vein in the patient's hand or wrist.

Hand veins are more difficult to access than veins in the antecubital fossa because they are generally smaller. In addition, hand veins are not as well anchored by surrounding tissue as those in the antecubital fossa area. Consequently, they have a tendency to more or "roll" when the needle is inserted. The phlebotomist should exercise extra care when anchoring a vein located in the hand or wrist to prevent it from moving during insertion of the needle.

If a patient's hands and wrists are evaluated as potential venipuncture sites, and no suitable veins are found some facilities will 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 infusion needle or a syringe should be used because they often will accommodate smaller veins better than a standard evacuated tube assembly.

### **Precautions:**

1. If the hands, wrist or feet are used cleanse the area extremely well.
2. NEVER depress the plunger when filling evacuated tubes, this could cause the stopper to come out resulting in blood splattering in your face and mouth.
3. Use EXTREME caution when handling the butterfly infusion set after use. This equipment has been implicated in many accidental needle sticks. Immediately activate the safety device after removing needle from vein.
4. Use safety transfer device to fill vacuum tubes with blood. If none are available NEVER hold tubes in hand when piercing the stopper of the tube with the needle.

## Procedure 1: Venipuncture-Winged Infusion Set-Syringe

### Materials:

1. butterfly winged infusion set with syringe adapter
2. needle
3. alcohol swabs
4. tourniquet
5. cotton balls or kimwipes
6. evacuated tubes
7. tape (optional)

### Procedure:

1. Select and organize equipment.
2. Approach, greet and properly identify the patient.
3. Select and prepare venipuncture site.
4. Prepare equipment. Remove the winged infusion needle from its packaging.
5. 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 infusion set to the end of the syringe using a firm, twisting motion.
6. Apply the tourniquet and select the venipuncture site.
7. Release the tourniquet.
8. **Optional:** Tear off 2 pieces of tape and attach one end of each piece of tape on a surface where it is easily accessible.
9. Prepare the site, allow site to dry and reapply the tourniquet.
10. Be sure the plunger of the syringe is entirely depressed into the barrel.
11. Uncap the needle and inspect for manufacturing defects.
12. Anchor the vein and position the needle appropriately.
13. Bend the wings together over the needle and insert the needle, with the bevel up, into the vein. If the needle has entered the vein a "flash" of blood will appear in the tubing directly above the needle.
14. Allow the wings of the needle to unbend and rest on the patient's arm. Place a piece of tape over the wings of the needle to secure it. The second piece of tape is a spare in the event of a misstep with the first piece.
15. Pull back on the plunger (blood should enter the tubing and syringe) until 8 mL of blood has been collected. Use firm gentle pressure. If excessive force is used it will cause hemolysis of the blood specimen.
16. After collection release the pressure on the plunger and untie the tourniquet.
17. Remove the tape from the wings of the needle.
18. Bend the wings of the needle together and withdraw the needle from the patient's arm, placing cotton or a kimwipe over the puncture site - IMMEDIATELY ACTIVATE NEEDLE SAFETY DEVICE
19. Remove needle and attach safety transfer device, insert stopper of evacuated tube. Fill the tubes in the proper order.
20. 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 needle from the tube (If the tube is a lavender top gently invert it). Repeat the procedure with the next tube.
21. Dispose of the needles in the appropriate needle disposal container being **very careful**. This equipment is notorious for its involvement in accidental needle sticks.
22. Label the filled tubes with the patient's name, number, date and time of collection, and your initials.

## Procedure 2: Venipuncture/Winged Infusion Needle/Evacuated Tube Holder

- Materials:**
1. butterfly winged infusion set with vacutainer adapter
  2. vacutainer holder
  3. alcohol swabs
  4. tourniquet
  5. cotton balls or kimwipes
  6. evacuated tubes
  7. tape (optional)

### Procedure:

1. Select and organize equipment.
2. Approach, greet and properly identify the patient.
3. Select and prepare venipuncture site.
4. Prepare equipment. Remove the winged infusion needle from its packaging.
5. Attach the evacuated tube holder onto the adapter at the end of the tubing.
6. Apply the tourniquet and select the venipuncture site.
7. Release the tourniquet.
8. **Optional** : Tear off 2 pieces of tape and attach one end of each piece of tape on a surface where it is easily accessible.
9. Prepare the site, allow site to dry and reapply the tourniquet.
10. Be sure the plunger of the syringe is entirely depressed into the barrel.
11. Uncap the needle and inspect for manufacturing defects.
12. Anchor the vein and position the needle appropriately.
13. Bend the wings together over the needle and insert, with the bevel up, into the vein.
14. Allow the wings of the needle to unbend and rest on the patient's arm. Place a piece of tape over the wings of the needle to secure it. The second piece of tape is a spare in the event of a misstep with the first piece.
15. Push the red-top evacuated tube onto the needle secured by the holder and allow it to fill.
16. Remove the red-top tube and replace it with the lavender-top tube and allow it to fill completely.
17. Remove the tube from the needle.
18. Untie the tourniquet, remove the tape from the winged infusion needle, bend the wings together and withdraw the needle, covering the puncture site with a cotton ball or kimwipe.
19. IMMEDIATELY ACTIVATE NEEDLE SAFETY DEVICE WITH ONE HAND.
20. Dispose of the needles in the appropriate needle disposal container.
21. Label the filled tubes with the patient's name, number, date and time of collection, and your initials.

## EXERCISE 5: VENIPUNCTURE - BUTTERFLY AND SYRINGES

Date \_\_\_\_\_

Phlebotomist \_\_\_\_\_ Patient \_\_\_\_\_

Circle One: **LIVE STICK**    **DUMMY ARM**

For each of the following select the letter which best describes the level of skill.

- (A) Performed**
- (B) Not Performed**
- (C) Needs Improvement**

1.    \_\_\_ Washes hands, dons gloves.
2.    \_\_\_ Role play: Greets and identifies the patient
3.    \_\_\_ Role play: Explains procedure.
4.    \_\_\_ Selects, prepares and organizes equipment including
5.    \_\_\_ **BREATHES THE SYRINGE**
6.    \_\_\_ Positions patient's arm, applies tourniquet and selects the puncture site.
7.    \_\_\_ Loosens the tourniquet, cleanses the site with alcohol, reapplies the tourniquet.
8.    \_\_\_ Anchors vein.
9.    \_\_\_ Ask patient to clench fist.
10.   \_\_\_ Bends the wings of the winged infusion needle together and smoothly inserts the needle, bevel up.
11.   \_\_\_ Optional: Secures the wings of the needle with tape.
12.   \_\_\_ Slowly and steadily pulls back on the plunger of the syringe.
13.   \_\_\_ Ask patient to relax hand.
14.   \_\_\_ When an adequate amount of specimen has been collected, release the tourniquet, places cotton over the puncture site and smoothly withdraws the needle.
15.   \_\_\_ Directs patient to apply pressure to the puncture site.
16.   \_\_\_ **IMMEDIATELY ACTIVATE NEEDLE SAFETY DEVICE WITH ONE HAND**
17.   \_\_\_ Removes needle and attaches safety transfer device.
18.   \_\_\_ Appropriately fills vacuum tubes and inverts as needed.
19.   \_\_\_ Appropriately labels specimens.
20.   \_\_\_ Checks puncture site to ascertain whether bleeding has stopped, applies bandage if needed.
21.   \_\_\_ Discards needles into appropriate needle disposal container.
22.   \_\_\_ Discards used materials appropriately.
23.   \_\_\_ Removes gloves and washes hands.
24.   \_\_\_ Leaves patient courteously.

## EXERCISE 5: VENIPUNCTURE - BUTTERFLY AND VACUUM TUBES

Date \_\_\_\_\_

Phlebotomist \_\_\_\_\_ Patient \_\_\_\_\_

Circle One: **LIVE STICK**    **DUMMY ARM**

For each of the following select the letter which best describes the level of skill.

- (A) Performed**
- (B) Not Performed**
- (C) Needs Improvement**

1.    \_\_\_\_\_ Washes hands, dons gloves.
2.    \_\_\_\_\_ Role play: Greets and identifies the patient
3.    \_\_\_\_\_ Role play: Explains procedure.
4.    \_\_\_\_\_ Selects, prepares and organizes equipment including
5.    \_\_\_\_\_ Positions patient's arm, applies tourniquet and selects the puncture site.
6.    \_\_\_\_\_ Loosens the tourniquet, cleanses the site with alcohol, reapplies the tourniquet.
7.    \_\_\_\_\_ Asks patient to clench fist.
8.    \_\_\_\_\_ Anchors vein.
9.    \_\_\_\_\_ Bends the wings of the winged infusion needle together and smoothly inserts the needle, bevel up.
10.    \_\_\_\_\_ Secures the wings of the needle with tape.
11.    \_\_\_\_\_ Pushes the evacuated tube onto the needle in the holder.
12.    \_\_\_\_\_ Allows tubes to fill, when full removes tube, gently inverting tubes with additives.
13.    \_\_\_\_\_ Ask patient to relax hand.
14.    \_\_\_\_\_ When the appropriate tubes have been collected, releases the tourniquet, places cotton over the puncture site and smoothly withdraws the needle.
15.    \_\_\_\_\_ IMMEDIATELY ACTIVATE NEEDLE SAFETY DEVICE WITH ONE HAND
16.    \_\_\_\_\_ Directs patient to apply pressure to the puncture site.
17.    \_\_\_\_\_ Appropriately labels specimens.
18.    \_\_\_\_\_ Checks puncture site to ascertain whether bleeding has stopped, applies bandage if needed.
19.    \_\_\_\_\_ Dispose of adapter and needle into sharps container.
20.    \_\_\_\_\_ Discards used materials appropriately.
21.    \_\_\_\_\_ Removes gloves and washes hands.
22.    \_\_\_\_\_ Leaves patient courteously.

**EXERCISE 5: VENIPUNCTURE - BUTTERFLY (WINGED INFUSION SET)  
STUDY QUESTIONS**

Name \_\_\_\_\_ Date \_\_\_\_\_

Points: 11

1. State four patient groups who may be candidates for blood collection using the winged infusion set (2 points).
  
  
  
  
  
  
  
  
  
  
2. State the gauge of needle present on the winged infusion set (0.5 point).
  
  
  
  
  
  
  
  
  
  
3. Describe the appearance of the winged infusion set (1 points).
  
  
  
  
  
  
  
  
  
  
4. Explain why pediatric tubes are the tubes of choice for use with winged infusion sets compared to standard size vacuum tubes (1 point).
  
  
  
  
  
  
  
  
  
  
5. List three alternative sites that may be used when veins cannot be located in the antecubital fossa area (1.5 points).
  
  
  
  
  
  
  
  
  
  
6. Describe why veins in the hands and feet are more difficult to access than veins in the antecubital fossa area (0.5 point).

7. Describe the action which should be taken prior to deciding on whether or not to use the veins in a patient's feet or ankles (0.5 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 infusion set (0.5 point).
10. Describe what should be done with the syringe after removing it from the package and prior to use (0.5 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 when filling vacuum tubes(0.5 point).
13. State the purpose of anchoring the butterfly with tape during the blood collection process (0.5 point).