

Collection of Specimen

Purpose

This procedure helps the student nurse to identify different types of specimen and their purposes.

Objectives

At the end of this procedure, the student nurse should be able to:

1. Illustrate purpose of collection of specimen.
2. Identify the different types of specimen collection.
3. Prepare the equipment needed for the procedure.
4. Demonstrate the different method of specimen collection.

Purposes of specimen collection

1. To aid in diagnosis.
2. To determine the progress of patient's condition.

Types of specimen collection

1. Collection of Blood specimen.
2. Collection of Urine Specimen.
3. Collection of Stool Specimen.
4. Collection of Sputum Specimen.
5. Collection of Discharge or pus Using Swabs.

1. Collection of Blood specimen

Methods of blood specimen collection

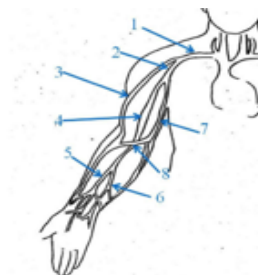
- A. Vein puncture for blood sample.
- B. Capillary Blood Sampling.

A. Vein puncture for blood sample

Definition

Vein puncture sample is a blood sample collected by pricking the superficial vein.

1. Subclavian
2. Axillary
3. Cephalic
4. Brachial
5. Radial Veins
6. Ulnar Veins
7. Basilic Veins
8. Antecubital Vein



Venipuncture sites to avoid:

1. Avoids puncturing through a previous puncture site.
2. Avoid calluses, scars, and lesions areas.
3. Avoid areas of excess tissue fluid (edema).
4. Avoid intravenous (I.V.) sites: go to the other arm, if possible.
5. Avoid the hand with arterio-venous fistula for renal patients

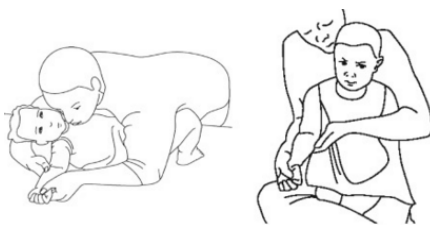
Equipment

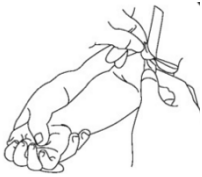


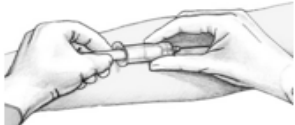
1. Gloves.
2. Tourniquets.
3. Alcohol swabs.
4. Biohazard bag.
5. Appropriate specimen tubes.
6. Requisition form.
7. Patient's labels for specimen tubes.
8. phlebotomy needle attached to vacuum container (*see figure 1*) or butterfly catheter attached to Syringe.
9. Cold pack for specimens that will transported later .





Figure 1

Procedure

| Steps | Ration |
|--|---|
| 1. Identify the patient using two different patient identifiers. | Patient misidentification can lead to incorrect diagnosis, therapy and treatment. The consequences can be serious, even fatal to the patient. |
| 2. Prepare the equipment | |
| 3. Washing hand and wearing gloves | To reduces transmission of microorganisms. |
| 4. Explain the purpose and procedure to the mother and child. | To gain cooperation. To reduce anxiety level. |
| 5. Immobilize the child. <ol style="list-style-type: none"> a. Make the child to be seated comfortably or supine position b. Hold the child by having one nurse place one hand under the child's arm and the other hand on the child's hand. | To facilitates blood flow to the area.  |
| 6. Select the appropriate vein for venipuncture. The antecubital vein is commonly used for venipuncture in children. | * The antecubital vein may not always be visible, but it is usually large and palpable. |

| | |
|---|---|
| <p>7. Applying the tourniquet:</p> <ol style="list-style-type: none"> Apply the tourniquet 3 – 5 cm above the collection site. Never leave the tourniquet over 2 minute.  | <ul style="list-style-type: none"> * To assists in vein distention for older children so that the vein is easier to see and palpate * To prevent hemoconcentration. |
| <p>8. Lightly pat or rub the sample site.</p> | <ul style="list-style-type: none"> * To help the veins become more visible. |
| <p>9. Clean the site with alcohol using a circular motion, and allow drying.</p> | |
| <p>10. Use a thumb of your non-dominant hand to draw the skin tight, about two finger width below the venipuncture site.</p>  | <ul style="list-style-type: none"> * To prevent rolling of vein |
| <p>11. hold the needle bevel side up, 45degree angle over the vein. Puncture the site.</p>  | <ul style="list-style-type: none"> * To allows placement of needle parallel to the vein. |
| <p>12. Obtaining blood by different way :</p> <ol style="list-style-type: none"> Using a needle of butterfly attached to the syringe: <ul style="list-style-type: none"> - Insert the needle of the butterfly into the vein - Wait until the blood reaches the end of the catheter and slowly draw the appropriate amount of blood into the syringe. <p style="text-align: center;">OR</p> Using a phlebotomy needle attached to a vacuum container: <ul style="list-style-type: none"> - Stabilize the vacuum holder and push in on the specimen tube to puncture the stopper, Blood will flow into vacuum sealed tube on its own.  | <ul style="list-style-type: none"> * To avoid venospasm |

| | |
|---|--|
| <p>14. After obtaining the required amount of blood, Release the tourniquet , withdraw the needle, and apply pressure to the puncture site.</p>  | <p>*To stop bleeding.</p> |
| <p>15. Apply small bandages or gauze with tape.</p> | <p>*To prevent further bleeding.</p> |
| <p>16. If using the syringe: fill the appropriate specimen tubes or containers using a needles syringe.</p> | |
| <p>17. Invert all tubes containing additives 8 to 10 times.</p>  | <p>To ensures mixture</p> |
| <p>18. Dispose sharps immediately into an appropriate sharps container.</p> | <p>Standard precautions. To prevents accidental needle-stick injuries with contaminated sharps.</p> |
| <p>19. Label all specimen tubes with the following:</p> <ul style="list-style-type: none"> - Child’s name. - Medical record number. - Date and time of collection. - Initials of person collecting. | <p>To ensures that correct specimens are tested for correct child.</p> |
| <p>20. Place in biohazard bag and transport to the laboratory</p> | <p>Standard precautions. To protects against blood contact</p> |
| <p>21. Dispose of equipment and waste in appropriate receptacle. Remove gloves and washing hand</p> | <p>Standard precautions. To reduces transmission of microorganism.</p> |
| <p>22. Record the date, time, site used for the puncture, reason the blood was drawn and the child’s reaction to the procedure</p> | |

B. Capillary Blood Sampling

Definition


A capillary sample is a blood sample collected by pricking the skin. Site of capillary puncture is either finger or heel stick.


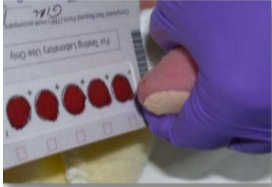
Equipment

1. Gloves.
2. Sterile gauze pads.
3. Alcohol swap.
4. Labels.
5. Requisition forms..
6. Warm wash cloth.
7. Specimen containers or the Specimen Card for screening test (*see figure 2*)
8. Disposable lancets .

Figure 2

Procedure

| Steps | Rational |
|---|---|
| 1. Identify the patient using two different patient identifiers. | * Patient misidentification can lead to incorrect diagnosis, therapy and treatment. The consequences can be serious, even fatal to the |
| 2. Prepare the equipment | |
| 3. Washing hand and wearing gloves | * To reduces transmission of microorganisms. |
| 4. Explain the purpose and procedure to the mother and child. | |
| 5. Warm the site before procedure: a) For infants , warm the heel about 5-10 minutes with a warm washcloth or a commercial warmer. b) For older child wash the hands on warm water. | * Only a limited amount of blood will easily flow from a capillary puncture. Warming the puncture site will increase blood flow up to seven times and is critical for the collection of blood gases |
| 6. Select and identify puncture site: a) For infants younger than 18 months: Heel, the lateral aspect of the heel b) For older than 18 months: Finger, the side of the finger, near the tip for non-dominant hand | * Using appropriate site minimizes the risk for injury (e.g. striking artery, bone, or nerve).  |
| 7. Clean the puncture site with alcohol swap. Then allow to dry for 30 seconds. | * Provides disinfection. * To prevents alcohol contamination of blood sample, which may cause errors in results. |

| | |
|---|--|
| <p>8. Puncture the skin with appropriate size lancet/incision device.</p>  | <p>* Using the wrong size lancet/incision device may result in excessive squeezing, prolonged or incomplete collection, poor specimen quality (hemolysis, clotting) and possible redraws, as well as injury the child.</p> |
| <p>9. Wipe off the first drop of blood with a sterile gauze pad.</p> | <p>* Residual alcohol potentially present in initial drop of blood, which can alter test results.</p> |
| <p>10. Collect the blood sample: a. Gently applying pressure surrounding area; Collect the blood in appropriate container</p> | <p>* To facilitates blood flow. * To avoid incorrect results</p> |
| <p>b. For blood gases sample: Obtain blood gases first, place blood gas sample on ice if analysis will be delayed more than 10 minutes.</p> <p>c. For newborn screening test: Places the Specimen Card close to the drop of blood.</p>  | <p>* To allow a sufficient quantity of blood to soak completely through the paper and fill the preprinted circle.</p> |
| <p>11. Apply pressure with sterile gauze.</p> | <p>* To stop bleeding.</p> |
| <p>12. Label all specimen tubes with the following: Child's name. Medical record number. Date and time of collection. Initials of person collecting.</p> | <p>* Mislabeling can lead to incorrect diagnosis, therapy and treatment. The consequences can be serious, even fatal to the patient</p> |
| <p>13. Place in biohazard bag and transport to the laboratory</p> | <p>* To protects against blood contact</p> |
| <p>14. Place lancing disposal in sharp container. Dispose of equipment and waste in appropriate receptacle. Remove gloves and washing hand</p> | <p>* Standard precautions.</p> |
| <p>15. Record the date, time, site used for the puncture, reason the blood was drawn and the child's reaction to the procedure.</p> | |

2. Collection of Urine Specimen

Types of collecting urine specimen

- A. Random specimen.
- B. First morning specimen or 8-hour specimen.
- C. Timed short-term specimens (2 hours).
- D. Fasting specimen.
- E. Suprapubic bladder aspiration.
- F. Clean-catch (midstream) specimen.
- G. Timed long term specimen or 24 hours specimen.
- H. Catheterized specimen or specimen from an indwelling catheter.



- A. Random specimen:** It may be taken at any time of the day or night. Although there are no specific guidelines for how the collection should be conducted. A random specimen is suitable for most screening purposes.
- B. First morning specimen or 8-hour specimen:** The child should be instructed to collect the specimen immediately upon rising from a night's sleep. It used for urinalysis and microscopic analysis. The first voided morning specimen is particularly valuable **because**:

 - 1. It is more concentrated and abnormalities are easier to detect.
 - 2. Relatively free of dietary influences and changes due to physical activity.
- C. Timed short-term specimens:** The patient should be instructed to void shortly before consuming a routine meal and to collect a specimen 2 hours after eating.
- D. Fasting Specimen:** This differs from a first morning specimen by being the second voided specimen after a period of fasting. it used for test sugar and acetone.

E. Midstream specimen: this method for obtaining urine for urine culture. It can be conducted at any time of day or night.

Equipment

1. Gloves
2. Toilet soap, water and towel.
3. Adhesive label.
4. Biohazard bag.
5. Completed lap form.
6. Age- Appropriate urine collection device: Bedpan , Urinal, Adhesive urine collection bag ,Urine specimen container.
7. Sterile specimen container (if the specimen obtained is to be sent to the laboratory for culture).

Procedure

| Steps | Rational |
|---|---|
| 1. Perform hand hygiene. | * Reduces transmission of microorganisms. |
| 2. Gather the necessary supplies. | * Promotes efficient time management and provides an organized approach to the procedure |
| 3. Explain procedure to the child and parents. | * To gain cooperation. * To reduce anxiety level. |
| 4. Don gloves. | * Standard precaution to reduce transmission of micro-organisms |
| For the child using a specimen container: 5. Instruct to the child and the caregiver to clean the genitalia area by water and soap 6. Give the container to the child and explain how to hold the container while voiding. 7. Instruct the child to void small amount of urine into the toilet. 8. Instruct the child to hold the urine specimen container a few inches from the urethra and urinate into the sterile container, catching the midstream urine until the container is about half full. 9. Instruct the child to finish urinating into the toilet bowl. 10. Ask the child to perform hand hygiene after the specimen has been obtained. | * The voided urine flushes the urethra and urethral meatus of external contaminants. * This is the urine that will yield the most accurate information about the condition of the kidneys and bladder. |
| For the specimen collected by using a urine collection bag: 11. Cleanse the genitalia with soap and water. | * To get adhesive tap stick to the skin. |

| | |
|---|--|
| 22. Record the date, time, methods that used in urine collection, reason the urine was collected and the child's reaction to the procedure. | |
|---|--|

F. 24-hour specimen:

It is extremely important diagnostic test because it reveals how the kidney adjusts to changing physiologic needs over a long period.

Equipment

1. Large collection container (see figure 3)
2. Large basin with ice



Figure 3

Procedure

| Steps | Rationale |
|--|---|
| 1. Instruct the child voids and discards the urine already in the bladder. Then, if an indwelling catheter is in place, discard any urine already in the drainage bag. | |
| 2. Note the time that the first urine was discard. | * This time is the beginning of the 24- hour collection period. |
| 3. Pure urine from each void into the collection container. if an indwelling catheter is in place, empty and add to a collection container. | |
| 4. keep the collection bag in refrigerator or in ice | * To prevent breakdown of urinary components. Result may be altered by urine that is not properly stored. |
| 5. Label the collection container | |
| 6. Send it to the laboratory immediately after the 24- hour period. | * Test result depend on an accurate measurement of the time and quantitative urine. |
| 7. Record the date, time, reason the urine was collected and the child's reaction to the procedure. | |

G. Catheterized specimen or specimen from an indwelling catheter.

This specimen collected by using a syringe, followed by transfer to a specimen tube or cup. Alternatively, urine can be drawn directly from the catheter to an evacuated tube adaptor.

3. Collection of Stool Specimen

Stool specimen

Fasces are collected into container using a spatula from bedpan or diaper

Stool specimen or culture and sensitivity is sent to laboratory in a sterile container.

Equipment

1. Tongue blade.
2. Gloves.
3. Specimen container with cover or culture tube.
4. Adhesive label.
5. Biohazard bag.
6. Completed lap form.

Procedure

| Steps | Rationale |
|---|---|
| 1. Gather the necessary supplies. | * Promotes efficient time management and provides an organized approach to the procedure. |
| 2. Perform hand hygiene. | * Reduces transmission of microorganisms. |
| 3. Explain procedure to the child and parents. | * To gain cooperation. * To reduce anxiety level |
| 4. Provide privacy. | |
| 5. Don gloves. | * Standard precaution to reduce transmission of microorganisms. |
| 6. Transfer stool from diaper by tongue blade to appropriate specimen container and cover it then discard tongue blade. | |
| 7. Label the specimen container and place it in biohazard bag. | |
| 8. Send specimen immediately to the lab or refrigerate it. | * So that stool will not be oxidized. |
| 9. Remove gloves. perform hand hygiene. | |
| 10. Record the date, time, reason the stool was collected. | |

4. Collection of Sputum Specimen

Equipment

1. Gloves
2. Cotton applicator in case of young child.
3. Adhesive label.
4. Biohazard bag.
5. Completed lap form.
6. Sterile specimen container with cover or sterile test tube.

Procedure

| Steps | Rationale |
|---|---|
| 1. Gather the necessary supplies. | * Promotes efficient time management and provides an organized approach to the procedure. |
| 2. Perform hand hygiene. | * Reduces transmission of microorganisms. |
| 3. Provide privacy | |
| 4. Explain procedure to the child and parents. | * To gain cooperation. * To reduce anxiety level. |
| 5. Don gloves. | * Standard precaution to reduce transmission of micro-organisms |
| From a young child: 6. When the sputum is coughed up, wipe the sputum with cotton applicator. 7. Dropped cotton applicator into a clean test tube. 8. Close the test tube with a cotton plug. | |
| From the older child: 9. The child's mouth is rinsed with water early in the morning. 10. Allow child to cough deeply and expectorate his sputum into waxed jar & cover it. Not to get saliva. | |
| 11. Label the specimen container and place it in biohazard bag. | |
| 12. Send specimen immediately to the lab or refrigerate it. | * So that microorganism does not grow up. |
| 13. Remove gloves. perform hand hygiene | |
| 14. Record the date, time, reason of sputum specimen | |

5. Collection of Discharge or pus Using Swab

Swab: Is a sterile dressed applicator in a plugged tube used to collect material for bacteriological examination from the body surface & inside orifices.

Throat swab

Equipment

1. Tongue depressed.
2. Swab.
3. Kidney basin.
4. Laboratory from.
5. Spatula.
6. Adhesive label
7. Biohazard bag.
8. Completed lap form.
9. Torch-light.

Procedure

| Steps | Rationale |
|--|---|
| 1. Gather the necessary supplies. | * Promotes efficient time management and provides an organized approach to the procedure |
| 2. Perform hand hygiene. | * Reduces transmission of microorganisms. |
| 3. Provide privacy | |
| 4. Explain procedure to the child and parents. | * To gain cooperation. * To reduce anxiety level. |
| 5. Don gloves. | * Standard precaution to reduce transmission of microorganisms |
| 6. Restrain the child if needed & make him sit comfortably facing the person who takes the swab. If the child is not cooperative, place the thumb in the chin and gently pressed down to lower the jaw. | |
| 7. The tongue is depressed with a spatula. | |
| 8. Collect specimen from the area using swab. Alert: The swab should not touch anywhere except the area from where swab is collected. Collect swab before any antiseptic are applied | * To prevent contamination of the swap with outside bacteria. * To avoid incorrect results |

| | |
|--|--|
| to the area. | |
| 9. Place the swab in the container. | |
| 10. Sent it to the laboratory immediately. | |
| 11. Record the date, time, reason of specimen swab obtained. | |