

9. Pediatric Procedures

A. Introduction

1. Pediatric blood collection may be by skin puncture or venipuncture.
2. Skill in pediatric phlebotomy is gained by knowledge of special collection equipment, observation of skilled phlebotomists and practice.
3. Very challenging patients due to size and emotional response to blood collection.
4. Skills should be obtained by performing procedures on older children.
5. Recognize limitations, always request help when necessary.

B. Age Specific Care

1. Every person is unique, but each will go through various stages of development.
 - a. Special consideration needs to be given to certain age groups, since not all of our patients are young or middle-aged.
 - b. Children and older adults have different needs than young adults.
 - c. By learning about how people in different stages of development respond to others and their surrounding environment, we can better formulate and implement their care.
2. The following are general guidelines to aid you in dealing with patients based on age:
 - a. **Infancy** - the period between birth and 1 year. They need to be provided with a protective environment, ensure warmth, cuddles and hugs, and protect them from skin abrasions.
 - b. **Pediatric** - the period between 1 and 12 years. They need to have unfamiliar objects explained, should not be left unattended, and may need to be immobilized if necessary. Distraction techniques can also be used.
 - c. **Adolescent** - the period between 12 and 18 year. They need to be included in explanations of procedures, provided privacy, and may need pregnancy addressed.
 - d. **Adult** - the period between 18 and 65 years. They require explanations of procedures, want to ask questions, and be addressed with respect.
 - e. **Older Adult** - 65 years and over. Things to consider include mobility, visual acuity, skin protection, and orientation.
3. Healthcare workers can use this information to help them provide the best care for each individual patient.
4. Study the chart in your textbook which illustrates *age-specific care* considerations which incorporate knowledge of child development, their fears and concerns, and possible parental involvement and tips for the phlebotomist.

C. Preparing Child and Parent

1. Important to develop good interpersonal skills and routine during pediatric blood collection.
 - a. During the introduction be warm, friendly, calm and confident.
 - b. Correctly identify the patient.
 - c. Ask about previous blood drawing experiences the child has had.
 - d. Develop a plan based your impression of the child's and parent's cooperation (or lack of cooperation), involve the child if possible.
 - e. Explain and demonstrate the procedure.
 - f. Establish guidelines.
 - g. Be honest when asked about the amount of discomfort.
 - h. Encourage parental involvement.
2. Children may have an extremely negative psychological response to the needle.
3. It is best for the child psychologically if the procedure can be performed in a treatment room away from the child's bed or play area, especially if the room is shared by another child.
4. Prepare equipment out of site of the child to reduce anxiety.
5. Restraining the Child
 - a. Restraints may be necessary to help assure a successful procedure with no injury to the child.
 - b. Important to restrain the arm during venipuncture to prevent injury to the child.
 - 1) Have the parent hold the child on their lap with one arm around the child's waist the other hand under and clasping the child's elbow.
 - 2) Have the child lay down, the parent leans over the child restraining the near arm with their body while holding the extended arm securely.
 - 3) For small children do not allow full weight of adult to be put on child.
 - b. Infants younger than 3 months usually do not need to be restrained.
7. Combative children
 - a. At times the child may kick and thrash about even while restrained.
 - b. Do not use excessive force to restrain the child, this may result in injury.
 - c. Notify the nurse or physician.
8. Pain alleviation
 - a. If many venipunctures are anticipated during a hospital stay a topical anesthetic *EMLA (eutectic mixture of local anesthetics)* may be applied to intact skin.
 - b. Combination of lidocaine and prilocaine which has minimal side effects.
 - c. The anesthetic affect occurs after 60 minutes and lasts 2 to 3 hours.
 - d. Disadvantages are cost, waiting 60 minutes, and advanced knowledge of vein to use.
 - e. Visit the EMLA web site for additional information: <http://www.emla-us.com/>

9. Sucrose nipples or pacifiers given to infants during phlebotomy do not alleviate pain but may comfort the infant.

D. Prevention of Disease Transmission

1. If isolation notice is posted wear the appropriate PPE.
2. Always follow Standard Precautions.
3. Be aware of the need to protect the child from infection.
 - a. PPE may be required to protect extremely ill children.
 - b. Always wash hands and change gown before going to the next infant or child.
4. Latex allergies are becoming more common, be aware and use non-latex supplies.

E. Pediatric Phlebotomy Procedures

1. For pediatric and neonatal patients documentation of amounts drawn are critical.
2. Micro-capillary skin puncture is the procedure of choice when only a small amount of blood is needed.
 - a. Collect hematology specimens first, then chemistry, then blood bank.
 - b. Sites include the heel or finger.
3. Heelstick is the specimen of choice for infants.
 - a. Avoid bruised areas and sites of previous punctures.
 - b. The size of the lancet must not exceed 2.0 mm to avoid puncturing bones, nerves or tendons.
 - c. Hold the heel gently as infant's bruise easily.
 - d. Avoid excessive milking or squeezing.
 - e. Do not use adhesive bandages.
 - f. Check site before leaving.
4. Warming the site is critical to increase blood flow to the area, commercial heel warmers or warm wash cloth may be used.
5. Complications of heelstick
 - a. Cellulitis
 - b. Osteomyelitis of the calcaneus bone
 - c. Abscess formation
 - d. Tissue loss
 - e. Scarring of the heel

F. Newborn Screening

1. Newborn screening for phenylketonuria (PKU) and hypothyroidism is mandatory by law.
 - a. If these diseases are not caught early can result in mental retardation.
 - b. Collected before the infant is 72 hours old, if infant is less than 24 hours old it must be repeated before the infant is 14 days old.

2. The heel is the most frequently used site, proper procedure is followed and the blood is collected onto circles on special filter paper.
 - a. Each circle must be filled completely.
 - b. The blood should be filled from one large drop, not layered on.
 - c. Excessive squeezing may cause hemolysis.
 - d. A heparinized capillary tube may be filled and used to fill the circles as long as the filter paper is not scratched or dented.
 - e. Visit the Texas Department of Health Web Site for excellent illustrations of the procedure as well as pictures of improperly filled cards:
<http://www.tdh.state.tx.us/newborn/specimen.htm>
http://www.tdh.state.tx.us/newborn/spot_chk.htm

G. Other Blood Collection Techniques

1. Venipuncture
 - a. Routine
 - b. Dorsal vein hand procedure
 - c. Other sites may be used, equipment of choice is the butterfly.
2. Dorsal Hand Vein Procedure
 - a. Infants, children and adults with small difficult veins.
 - b. Use 21 -23 gauge needle, 3/4 to 1" in length, with a clear hub, butterfly is recommended.
 - c. No tourniquet is necessary.
 - d. Position middle and index finger to form a "V" over the vein and apply pressure. Bend babies wrist over middle finger but not to the extent veins collapse.
 - e. Locate the vein, release pressure, cleanse the site.
 - f. Insert the needle, when blood appears in the hub collect in appropriate microtainers.
 - g. Steady flow of blood is sustained by applying gentle, periodic pressure.
 - h. After collection, remove needle, apply pressure until bleeding stops.
 - i. The technique reportedly resulted in decreased hemolysis, decrease sample dilution with tissue fluid, fewer multiple punctures and decrease phlebotomist stress. It also appears to be less painful.
 - j. Only one site in Austin that performs routinely, and even there, not all nurses feel comfortable with it.
3. Scalp vein procedure
 - a. This is usually performed by individuals who have acquired additional specialized training.
 - b. The infants scalp is shaved if necessary.
 - c. Palpate, make sure pulse is not present. If vein cannot be palpated a rubber band can be placed around the upper head.
 - d. The site is disinfected with povidone iodine or alcohol.
4. Blood may be withdrawn from IV lines but also requires additional specialized training.
5. Careful monitoring of the number of times and amount of blood withdrawn is required. A volume of 10 mLs on a premature infant may be 10% of their total blood volume.

6. Heparin locks are special needles that are inserted and left in veins for several hours.
 - a. The line must be flushed with saline prior to drawing the sample.
 - b. The first blood withdrawn is discarded, and the specimen collected.
 - c. The line is then flushed with a heparinized solution.
 - d. In Texas, the flushing can only be performed by a nurse or specially trained personnel.

7. Central venous catheters can be used for blood collection but require special training.