Care of the Circulatory System

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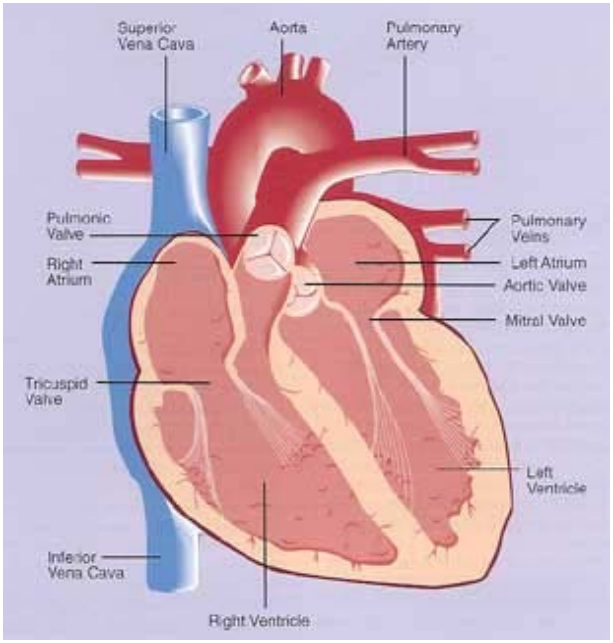
Circulatory System

Overview

The circulatory system is composed of the heart and the blood vessels. The heart acts as a pump to transport blood via blood vessels throughout the body. The blood delivers oxygen and nutrients to all parts of the body and returns carbon dioxide and waste products to the lungs and kidneys to be eliminated. Each day the average heart beats 100,000 times and pumps about 2,000 gallons of blood.



The *heart* is a muscular pump with four chambers and valves that open and close to let blood flow in only one direction. The *right atrium* collects deoxygenated blood from the body. The blood flows through the *tricuspid valve* into the right ventricle. The *right ventricle* then contracts and pumps blood through the *pulmonary valve* into the *pulmonary artery* leading to the lungs.

In the lungs, carbon dioxide is released and oxygen is picked up by the blood. The oxygen-rich blood returns via the *pulmonary vein* into the *left atrium* of the heart. From there, it passes through the *mitral valve* into the left ventricle. The *left ventricle* has the strongest pump because it must pump this oxygenated blood through the *aortic valve* with enough force to push it through the *aorta* to all parts of the body.

The blood is transported to the body through a complex network of vessels. The *arteries* carry oxygen-rich blood away from the heart to the body. These arteries branch into smaller vessels called *arterioles*, which branch into the tiny *capillaries* where cells of the body can exchange their carbon dioxide and wastes for the oxygen and nutrients.

Veins take deoxygenated blood from the capillaries and return it to the heart. Veins are thinner than arteries with some having one-way valves to prevent blood from pooling in the extremities. The veins get larger in size as they return closer to the heart. The large veins inside the chest and abdomen are called *central veins*.

Sources:

American Heart Association. (2004). *Circulatory System*. Available online at www.americanheart.org/presenter.jhtml?identifier=4567

American Heart Association. (2004). *The Normal Heart and How It Works*. Available online at www.americanheart.org/presenter.jhtml?identifier=770.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 934-940.

Texas Heart Institute. (2003). *Anatomy of the Human Heart and Cardiovascular System*. Available online at www.tmc.edu/thi/anatomy1.html.

Illustration Source:
ImageMD. Used with permission. *Anatomy of the cardiac chambers and valves.*

Central Venous Catheter

Overview

A central venous catheter (CVC) is a sterile intravenous catheter inserted into a large "central" vein (e.g., subclavian vein). A student may receive a CVC if there is need for long-term intravenous access, such as the need for chemotherapy, extended antibiotic therapy, total parenteral nutrition (TPN), or frequent venipuncture (blood drawing).

There are three main types of CVCs. The *tunneled catheter* is often called by its manufacturer's name---Hickman, Broviac, or Groshong. It is inserted surgically into the central vein, tunneled under the skin, and then exited from a site on the upper chest. The portion of the catheter that is tunneled under the skin contains a Dacron cuff which helps to hold the catheter in place while it heals and helps prevent infections by stopping bacteria from entering the tunnel and traveling up the vein. The tunneled catheter may have one, two, or three ports (lines), which will normally need to be flushed with heparin each day. Such flushing is usually done at home. The tunneled catheter will also have a sterile dressing covering it to prevent it from becoming infected. This dressing should be changed 2-3 times a week as specified by the health care provider and whenever it becomes wet, soiled, or the edges are no longer intact. Routine dressing changes are usually done at home, but dressing changes may need to be done at school only if the dressing becomes wet, soiled, or loose.

The *non-tunneled catheter* is similar to the tunneled catheter in appearance except that it is inserted directly into a central vein. It is usually a temporary CVC and not seen in the school setting very often because it is not secured as well under the skin. Care for the non-tunneled catheter is the same as that for the tunneled except that extreme care must be taken not to dislodge it. If the student has a non-tunneled catheter, consider a safer environment, i.e., homebound.

The other commonly seen type of CVC is the *totally implanted device* (TID) such as the Port-A-Cath or Infus-A-Port. This CVC consists of a small reservoir that is totally implanted under the skin. When it is not being used, it has no tubing on the outside of the skin, does not need a dressing, and has a lower risk of becoming infected. However, when it needs to be used, the child must be stuck with a needle. Only **non-coring** Huber needles can be used to access the totally implanted CVC to prevent damage to the port. When the TID is being used for intravenous therapy it may also need to be flushed and have its dressing changed.

Potential Settings

Due to the risk for infection and the need for privacy, most CVC dressings are changed at home. CVC dressings may be reinforced at school and should be done in a clean, private room such as the health room. Privacy regarding the student's medical condition and need for a CVC should also be maintained unless the family chooses to disclose it. The student can participate in school activities, but participation in physical education activities must be determined on an individual basis by the student's health care provider.

Staff Preparation

Due to the risk of infection and/or injury, reinforcement of central line dressings should be performed by a registered school nurse using sterile technique. Non-medical school staff should not perform this procedure. Any school personnel who have regular contact with a student who has a CVC must receive general training from a health care provider covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student with a central venous catheter. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student with a central venous catheter, the following elements should receive particular attention:

- The student's underlying condition and potential problems associated with the condition or treatment
- Type of CVC—tunneled, non-tunneled, or implanted
- The need for readily-available additional dressing supplies including a spare clamp
- Informing school staff, including bus drivers, who have regular contact with the student about the CVC and general safety guidelines
- Reporting any fever or site changes to the school nurse, family, and health care provider
- Determination of when and under what conditions the tubing or the dressing should be handled
- Steps to be taken if a complication occurs
- Latex allergy alert
- Standard precautions

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 325-346.

Hockenberry, MJ (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1198-1203.

Houska, AE, Doyle R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 171-181.

National Institutes of Health, Warren Grant Magnuson Clinical Center. (2003). Managing *Your Tunneled Catheter*. NIH: Patient Information Publications. Available online at www.cc.nih.gov/ccc/patient_educaton/pepubs/hickman.pdf.

Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1046-1058.

Possible Problems with Central Venous Catheters

Equipment Needed to be Available at all times for Emergencies (parent supplies equipment):

- Small smooth-edged clamp
- Sterile gauze
- Adhesive Tape
- Gloves
- Mask, if ordered

Assessment	Intervention/Rationale
Temperature elevation; redness, swelling, or drainage at the CVC site; Chills, increased fatigue, irritability or headache	*Notify the school nurse, family, and/or health care provider immediately as these are possible indications of infection. Swelling by itself may indicate infiltration.*
Arm, shoulder, or neck pain	*Infiltration or thrombosis could be developing. Also, if implanted Dacron cuff has not fully healed, catheter migration may be caused by excessive sneezing, coughing, or vomiting. Notify school nurse, family, and/or health care provider immediately.*
Difficulty breathing; chest pain	*Lie student on left side to help prevent an air bubble from entering the heart.* ***Do not let the student walk!*** ***Initiate the school emergency plan. The student should be transported as soon as possible to the appropriate hospital emergency room. If the school nurse is not available, pinch the tubing with a clamp or fingers and call the emergency medical team. Notify the school nurse, family, and health care provider immediately.***
Blood in the tubing or bleeding from the end of the tubing	*Put on gloves. If blood is noted in the line or coming from the end of the line,* ***check to see if the clamp is open or if the cap is off.*** *If so, close the clamp or replace cap. Notify the school nurse and the family.* *If the clamp is not functioning properly, the tubing should be firmly pinched closed and the school nurse, family, and health care provider notified immediately according to the student's emergency plan.*

Assessment	Intervention/Rationale
CVC is pulled or falls out	*Inspect the exterior of the dressing. If the dressing is intact and the tape still holds the looped catheter, it is probable that no significant trauma to the student or the line has occurred. The school nurse, family, and the health care provider should be notified.* *If the tape or dressing has been disrupted, the dressing should be reinforced.* ***If the catheter has fallen out, stay calm**. Reassure the student. The CVC exit site should immediately be covered with sterile gauze or a clean dressing if a sterile one is not readily available. Apply firm pressure to the exit site (bleeding should be minimal).* ***Notify the school nurse, health care provider and family immediately. Activate the school emergency plan.***
Catheter tubing breaks	*Clamp the catheter above the break and wrap the broken end with sterile gauze.* ***Notify the school nurse, family, and health care provider immediately. Initiate the emergency plan.*** *The catheter can often be repaired by the health care provider at the hospital.*

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 325-346.

CDC. (2002). *Guidelines for the prevention of intravascular catheter-related infections*. MMWR Vol. 51, No. 10: 1-26. August 9, 2002. Available at: www.cdc.gov/mmwr /preview/mmwrhtml/rr55110a1.htm

Hockenberry, MJ (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1198-1203.

Houska, AE, Doyle R, Priff, N, & JF Walker, (Eds.). (2003). *Nursing Procedures & Protocols*. Springhouse, Pennsylvania: Lippincott Williams & Wilkins, 171-181.

National Institutes of Health, Warren Grant Magnuson Clinical Center. (2003). Managing *Your Tunneled Catheter*. NIH: Patient Information Publications. Available online at www.cc.nih.gov/ccc/patient_educaton/pepubs/hickman.pdf.

Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1046-1058.

General Information for
Students with Central Venous Catheters

Date: _____

To: _____ (Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a central venous catheter (CVC), a plastic tube that has been placed into a large vein close to the heart. The tube may be used for nutritional support or medications.

The tubing, located on the chest (sometimes on the arm for peripherally inserted central catheters), may or may not be visible and is covered by a bandage to protect the site. No one should routinely touch the tubing or dressing. The CVC should not cause any discomfort if it is secured properly.

The CVC usually is clamped or capped during school or during transport. However, some students may have the tubing connected to an intravenous fluid solution. Usually routine CVC care is done at home.

Most students with CVCs are able to participate in school activities. The student's health care provider and family need to determine, in writing, any physical activity restrictions. Basically, the CVC should not be bumped during activity and the tubing should not be pulled.

This student should have an Emergency Action Care Plan and **all staff** who have contact with this student should be familiar with how to initiate the plan.

Contact _____ at _____ (phone number/pager) for additional information or if the student experiences any problems with the CVC.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Management of PICC Lines

Overview

A peripherally inserted central catheter (PICC) is a long intravenous (IV) line which is inserted into a peripheral vein and threaded (often with a guide wire) to a large, central vein. It is usually used for short to moderate length IV therapy, but has been used longer. It is frequently used for outpatient IV medication therapy lasting 1-6 weeks because it has fewer problems with infiltration and phlebitis than peripheral IVs, yet it costs less (does not need to be inserted in the operating room) and has fewer complications than central venous IVs.

PICC lines are most often inserted into the antecubital fossa (inner aspect of the elbow) and threaded through the basilic or cephalic vein to the superior vena cava (which flows into the heart). PICC lines may have a single or double lumen. For short-term therapy not requiring total parenteral nutrition, they may be trimmed before insertion and only inserted "midline," ending near the axillary vein.

Procedure

PICC lines are generally treated like central venous catheters in catheter care. Dressing changes are usually done at home several times a week and heparin flushes are done at home daily. Dressing changes should not be done at school. If the dressing becomes soiled or damp, the registered school nurse should reinforce the dressing and call the parent.

It is important to remember that **most PICC lines are not sutured into place**. Extra care must be taken not to pull the catheter out of the insertion site. **PICC lines cannot be removed in the same manner as other peripherally inserted catheters or heparin locks**. In general, treat them like central lines. **If problems occur with a PICC line, the school nurse, family, and health care provider must be notified.**

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 319-324.

CDC. (2002). *Guidelines for the prevention of intravascular catheter-related infections.* MMWR Vol. 51, No. 10: 1-26. August 9, 2002. Available at: www.cdc.gov/mmwr /preview/mmwrhtml/rr55110a1.htm

Ellenberger, A. (2002). How to change a PICC dressing. *Nursing 2002* 32(2): 50-52.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1198-1203.

National Institutes of Health, Warren Grant Magnuson Clinical Center. (2003). *Managing Your Non-Tunneled Catheter: PICC, SICC, and JICC.* NIH: Patient Information Publications. Available online at www.cc.nih.gov/ccc/patient_educaton/pepubs/piccsicc.pdf.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1086-1091.

Heparin/Saline Lock--Intermittent Intravenous Device

Overview

Students who do not need continuous intravenous (IV) infusion, yet still require peripheral IV access for intermittent medication or fluids, may have a heparin or saline lock. An intermittent intravenous device such as this permits the student to move around more easily. These IV catheters are used for short-term courses of medication or fluids.

Heparin prevents blood from clotting in the catheter. A "plug" containing heparin or saline is inserted into the hub of the IV catheter. The heparin or saline in the intermittent device is replaced on a regular basis by injecting a prescribed amount of heparin or saline into the plug. Studies indicate either heparin or saline are effective flushes if the IV catheter is larger than 24 gauge. Some studies indicate heparin is more effective in catheters as small as 24 gauge. Heparin flushes may cause more discomfort than saline for some students.

Potential Settings

Procedures such as flushes and dressing changes should be done at home. The student's activity may need to be limited to prevent dislodging the IV catheter. Catheter insertion sites affected by the motion of a joint should be supported (e.g., using an armboard or handboard) to avoid risk of infiltration or mechanical phlebitis from motion of the catheter inside the vein.

Staff Preparation

Due to the risk of infection, reinforcement of the IV catheter dressing should be performed by a registered school nurse using sterile technique. Non-medical school staff should not perform this procedure. Any school personnel with regular contact with a student with a heparin/saline lock or IV catheter should receive training that covers potential problems and implementation of the established emergency plan.

Components of the Individualized Health Care Plan

The student's individualized health care plan must be adapted to individual needs. The following section discusses some possible problems or emergencies that might take place for a student with a peripheral heparin/saline lock. The information should be reviewed prior to developing the individualized health care plan.

A sample individualized health care plan is included in Appendix A. For the student with a peripheral heparin/saline lock, the following elements should receive particular attention:

- Protection of the IV site from bumping or injury
- Signs of IV site infiltration or infection
- Symptoms which require notification of school nurse, family, and/or health care provider
- Latex allergy alert
- Standard precautions

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 544-546.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp.1198-1199.

Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1030-1032.

Wong On Web. (2002). *Saline versus heparin flush for peripheral intermittent IV infusions in children.* Available online at www3.us.elsevierhealth.com/WOW/op049.html.

Possible Problems with a Heparin/Saline Lock

Assessment	Intervention/Rationale
Tender, red, swollen, or warm IV site	*IV catheter may be displaced or infiltrated, causing the intravenous fluid to enter the tissue, or the vein may be inflamed. Notify the school nurse and* ***call the family immediately****.*
Wet or bloody IV dressing	*Male adaptor (cap) may be dislodged. IV catheter itself may have slipped out of the vein or IV site may be infiltrated.* *Reinforce with dry dressing and call family.*
Red streak noted above IV site	*Vein may be inflamed (phlebitis). Notify school nurse, family, and/or health care provider.*

Sources:

Bowden, VA & CS Greenberg. (2003). *Pediatric Nursing Procedures*. Philadelphia: Lippincott William & Williams, 544-546.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, pp.1198-1199.

Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Smith, SF, Duell, DJ, & BC Martin. (2004). *Clinical Nursing Skills*. (6th ed.). New Jersey: Prentice Hall, 1030-1032.

General Information for
Students with Heparin/Saline Locks

Date: _____

To: _____ (Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has an intravenous (IV) catheter (tube) in a vein in his or her arm or hand. The tubing is held in place with tape. This IV tube is used to give the student medication or fluids.

When the student is not receiving medications or fluids, the IV tube is closed with a heparin or saline lock.

The student should not dislodge the tubing.

Contact _____ at _____ (phone number/pager) for additional information or if the student experiences any problems with the IV tubing.

Source: Adapted from: Porter, S, Haynie, M, Bierle, T, Caldwell, TH, & Palfrey, JS (Eds.). (1997). *Children and Youth Assisted by Medical Technology in Educational Settings: Guidelines for Care*. (2nd ed.). Baltimore: Paul H. Brookes Publishing.

Use of Needleless Systems and Safer Medical Devices

Overview

Injuries from contaminated needles expose healthcare workers to a number of diseases, including human immunodeficiency virus (HIV), Hepatitis-B virus, and Hepatitis-C virus. According to the Centers for Disease Control and Prevention (CDC), approximately 600,000-800,000 needlestick accidents occur each year.

The Needlestick Safety and Prevention Act of 2000 was passed in an effort to reduce the risks of disease transmission and injury from needles and other sharps. During 2001, the Occupational Safety and Health Administration (OSHA) revised the Bloodborne Pathogens standard to comply with the new law. As a result, **facilities are *required* to utilize safer medical devices as they become available**. These "safer medical devices" replace sharps with non-needle devices or incorporate safety features designed to reduce the likelihood of injury.

Any facility or organization that employs individuals who might reasonably experience occupational exposure to blood or other potentially infectious materials must comply with the regulation, even if the facility has never had a needlestick injury. In schools, the presence of large numbers of children, as well as the safety of nurses and other health care workers, make the use of needleless systems and safer medical devices a high priority.

A variety of new products have been developed to reduce accidental needlesticks. Some safety products are "passive" and automatically engage the safety mechanism whenever they are used, while "active" products require the user to activate the safety component. There are so many new products available and being developed that it would be impossible to describe the procedure for using each one. Users are directed to follow manufacturer's specific instructions for each device.

The International Health Care Worker Safety Center at the University of Virginia maintains a *List of Safety-Engineered Sharp Devices* and other products designed to prevent occupational exposures to bloodborne pathogens. The list includes the types of safety devices and each device's manufacturer. It also provides a list of all the manufacturers and their contact information, including phone number, fax number, email address, and mailing address. See: www.med.virginia.edu/medcntr/epinet/safetydevice.html.

Types of Safer Medical Devices

Below is an outline and brief description of some of the types of safer medical devices:

A. Injection Equipment
- Needle guards—after injection:
  - user pushes safety cover/sheath forward until it locks
  - user grasps sleeve and twists flanges to loosen sleeve and pull down over retracting needle
- Needle guards—hinged recap

    - Needle has a pre-attached sheath. After injection, user presses sheath against a hard surface, locking it in place over needle.
- Retractable needles
    - When user fully depresses plunger, the needle automatically retracts from patient and is encapsulated within the syringe
    - Safety sheath covers needle when user pushes button on the syringe
    - User rotates plunger to release needle and pull plunger back so needle retracts and becomes encapsulated
- Needleless jet injection
    - Needle-free delivery of intramuscular or subcutaneous injections using CO_2 as a power source to eject medication, which then penetrates the skin
- Pre-Filled syringes
    - Syringes pre-filled with common medications and various needle safety devices

B. IV Medication Delivery Systems (not usually done at school)
- Needleless IV access—blunted cannula
    - Blunt plastic cannula with pre-slit, resealing synthetic injection sites
- Needleless IV access—valve/access ports and connectors
    - Two-way reflux valve activated by standard male luer lock; valve closes automatically when luer is removed
    - Capless valve activated by standard male luer lock
    - Capless valve which uses positive displacement to expel fluid when the luer lock taper is removed, preventing any backflow—becoming increasingly popular because it prevents the retrograde return of blood, thus reducing clotting and contamination risks; this tubing should usually <u>not</u> be clamped until luer lock is removed;
- Prefilled medication cartridge with safety needles/guards—often part of a specific IV product system line
- Recessed/protected needles
    - Recessed needles which lock onto injection ports, usually at Y-sites
- Medication vial adapters

C. IV Insertion Equipment
- Shielded or retracting peripheral IV catheters
    - Needle retracts automatically into a needle shield when the needle is withdrawn from catheter
    - Push button shielding retracts needle into needle shield
    - Telescoping needle shield that covers stylet as it is withdrawn
    - Safety clip automatically engages and covers needle tip as it is withdrawn
- Shielded midline catheters
- Guidewire introducers

D. Lancets
- Laser lancets

- Retracting lancets
- Strip lancets

E. Sharps Disposal Containers—list of manufacturers available on website

F. Other Safer Medical Devices not often used in school settings
   - Blood collection equipment
   - Laboratory devices
   - Blood bank devices
   - Nuclear medicine devices
   - Surgical scalpels
   - Blunted suture needles
   - Alternative skin closure devices
   - Other surgical sharps protection
   - Hemodialysis and apheresis devices
   - Fluid sampling devices
   - Bone marrow collection system
   - Other miscellaneous products

Sources:

Chamblee, J. (2002). Needlestick safety and prevention act. *Plastic Surgical Nursing* 22 (3): 141-145.

Hockenberry, M.J. (2003). *Wong's Nursing Care of Infants and Children*. (7th ed.). St. Louis: Mosby, 1157, 1190-1191.

Hurley, ML. (2001). Safer needle devices: resource review. *RN* 64(10): 24ns15-24ns24.

International Health Care Worker Safety Center. (2002). *List of safety-engineered sharp devices and other products designed to prevent occupational exposures to bloodborne pathogens*. University of Virginia, Charlottesville, VA. http://www.med.virginia.edu/medcntr/centers/epinet/safetydevice.html

Lillis, H. (2002). Sharps safety high on worker safety list. *Healthcare Purchasing News*. December 2002. www.hpnonline.com.

Occupational Safety and Health Administration. (2001). Occupational Exposure to bloodborne pathogens; Needlestick and other sharps injuries; Final Rule. *Federal Register* 66(12), 18 January 2001.

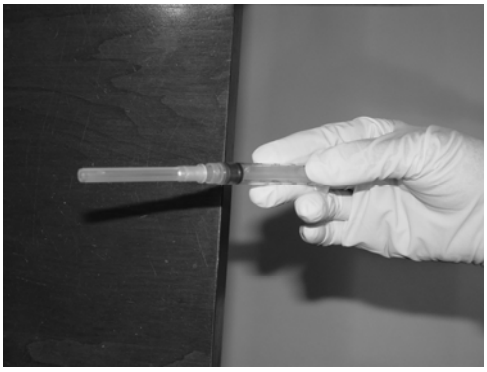
Stachnik J. & Wulff, K. (2002). *Needleless devices—application to patient care in the hemophilia population: an online continuing education course for pharmacy, nursing, and allied healthcare professionals*. Available at www.hemophiliagalaxy.com.

Procedure for One-Handed Needle Recapping

Due to the risk of injury, needles should rarely ever be recapped. Use this procedure only when a sharps disposal box is unavailable or when the needle is used in such a way that it has had **no** chance of becoming contaminated. Needlestick injuries place workers at risk for bloodborne pathogens. After a needle has been used, it should be disposed of in the nearest sharps container. It should never be placed (capped or uncapped) in regular trash.

1. Wash hands and apply gloves.
2. Before using the needle, place the needle cover on a flat, solid, immovable object such as the edge of a table. The open end of the needle cap should face the worker and be within reach of the dominant hand.
3. Give the injection, or use the needle and syringe to draw up solution.
4. Place the tip of the needle inside the open end of the needle cap and gently slide the needle into the cap.

5. Once the needle is inside the cap, gently lift the syringe just off the table with the needle cap pointed upwards.



6. Carefully point the capped needle against the table and use the table's resistance to completely cap the needle.
7. At the first opportunity, dispose of the needle and syringe in an appropriate container.
8. Remove gloves and wash hands.

Source:

Potter, P.A., & Perry, A. G. (2001). *Fundamentals of nursing.* (5th ed.). St. Louis: Mosby, pp. 948-950.

Illustration Source: Vickie H. Southall.