Chapter 8: Care of the Urinary System

Overview

Clean Intermittent Catheterization

Indwelling Urinary Catheter

External Urinary Catheter

Urostomy

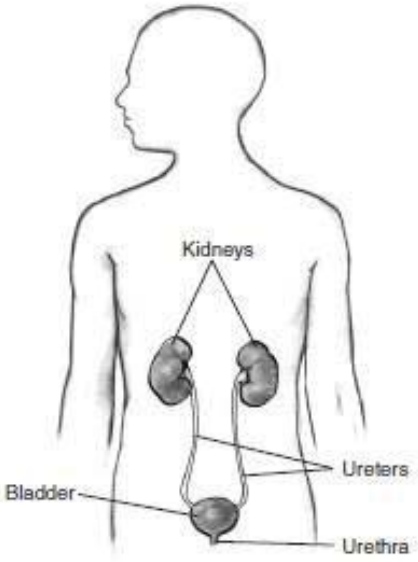
Continent Urostomy, Vesicostomy, or Appendicovesicostomy

Peritoneal Dialysis

Hemodialysis

Urinary System

Overview



The urinary system filters waste material and water from the blood and excretes it from the body as urine.

The *kidneys* are two bean-shaped organs, each about the size of a fist, that are located on either side of the spine, just below the rib cage. They remove a type of waste called urea from the blood and regulate the amount of water in the body. Renal arteries carry blood to the kidneys, where the waste is removed and renal veins take the cleansed blood away from the kidneys. Every day, the kidneys filter about 120-150 quarts of blood to produce about 1-2 quarts of urine. As much as 90% of the water that the kidneys remove from the blood is returned to the bloodstream after the waste is filtered out. The kidneys are also involved in regulating blood pressure, regulating the levels of electrolytes such as potassium and phosphate, the creation of red blood cells, and calcium absorption.

From the kidneys, urine travels down two thin tubes called *ureters* to the bladder.

The *bladder* is a hollow muscular organ, which stores urine until it is ready to be excreted from the body. Circular muscles called *sphincters* close tightly around the opening of the bladder and help keep urine from leaking.

During urination, urine passes from the bladder through the *urethra*, a tube leading from the bladder to the external opening of the body. This opening is called the *meatus* and is located at the tip of the penis in boys and between the labia, immediately above the vagina, in girls.

Sources:

National Institute of Diabetes and Digestive and Kidney Diseases. (May 2014). *The kidneys and how they work*. Bethesda, MD: National Institutes of Health. NIH Publication No. 14-3195. Available online: http://www.niddk.nih.gov/health-information/health-topics/Anatomy/kidneys-how-they-work/Documents/yourkidneys_508.pdf

National Institute of Diabetes and Digestive and Kidney Diseases. (December 2013). *Your urinary system and how it works*. Bethesda, MD: National Institutes of Health. NIH Publication No. 14-3195. Available online: http://www.niddk.nih.gov/health-information/health-topics/Anatomy/urinary-tract-how-it-works/Documents/YourUrinary_508.pdf

Illustration Source:

National Institute of Diabetes and Digestive and Kidney Diseases. (May 2014). *The kidneys and how they work*. Bethesda, MD: National Institutes of Health. NIH Publication No. 14-3195. Available online: http://www.niddk.nih.gov/health-information/health-topics/Anatomy/kidneys-how-they-work/Documents/yourkidneys_508.pdf

Clean Intermittent Catheterization

Overview

Clean intermittent catheterization (CIC) is a clean (not sterile) procedure used to empty the bladder. It is generally performed by/for students who cannot urinate spontaneously or who cannot fully empty their bladder when they urinate. Often children with myelomeningocele (spina bifida) or spinal cord injury have *neurogenic bladders*. When urine sits in the bladder for long periods of time, infection can develop. CIC helps to prevent urinary tract infections by emptying the bladder every few hours and prevents wetting from urine overflowing from a full bladder. The catheter is inserted for just long enough to drain the urine and is then removed.

Depending upon the cognitive status of the child, he/she can be taught to perform the CIC procedure for themselves, often starting around the age of six. For most children, intermittent self-catheterization is a clean procedure and sometimes the same catheter can be used for weeks at a time between washings. Self-catheters are straight tubes without the side balloon inflation ports found on indwelling catheters. They are also more rigid than indwelling catheters to make insertion easier.

Settings and Staff

CIC can be done in a regular bathroom, health office, or any other facility **where the student's privacy is ensured**. Toilet facilities will need to be wheelchair accessible and have bars or supports for the student needing such assistance. Some students may need to lie down on a bed or cot to be catheterized.

A school nurse (RN or LPN) or health assistant with competency-based training in CIC and problem management can safely do this procedure. Students should be encouraged to learn this procedure and do it themselves, if able. However, it is important to note that some of these students may still need some supervision. School personnel who have regular contact with the student requiring CIC should receive general training that covers the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Health care Plan (IHP)

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student requiring clean intermittent catheterization, the following items should be considered:

- Underlying condition and possible problems associated with the condition or treatment
- Health care provider's orders for catheterization and equipment to be used
- Individual baseline status, including urine color, amount, and pattern of continence
- Student’s ability to self-catheterize and how to foster independence in performing the procedure
- Depending upon the technique (clean or sterile), non-latex gloves should be worn
- Frequency of catheterizations
- Flexible timing of catheterization to accommodate classroom schedule, field trips, and other school events
- Position of student during catheterization
- Whether catheters are reused or disposed after each use
- Cleaning procedure for reusable catheters
- Whether gloves are needed and whether they need to be sterile or clean
- Medications that may affect urine color, amount, and odor
- Student’s need for assistance/monitoring with catheterization, clothing and leg braces
- Access to a change of clothing at school
- Student’s need for additional fluids and types of recommended fluids
- Student's history of urinary tract infections
- Access to an additional adult’s presence when school staff perform catheterization
- Avoidance of latex gloves and latex catheters even if student does not have a latex allergy yet
- Standard precautions

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 716-719.

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby, 1636, 1659-1660.

National Library of Medicine Medline Plus. (2012). *Self-catheterization--female*. Available online at http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000144.htm

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Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 280-289.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1042-1044.

Wyndale, J, Brauner, A, Geerlings, S., Koves, B., Peter, T., and Bjerklund-Johanson, T. (2012). Clean intermittent catheterization and urinary tract infection: Review and guide for future research. *British Journal of Urology International*, 110: E910-E917.

Procedure for Clean Intermittent Catheterization—Male

Note: Family provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
3. Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
    - Catheter
    - Wet wipes or cotton balls (nonsterile) plus mild soap and water or student-specific cleansing supplies
    - Storage receptacle for catheter, such as a sealed plastic bag
    - Toilet or container for urine
    - Non-latex gloves, if person other than student does procedure
    - *If the student does the procedure unassisted, gloves may not be needed; however, the student should wash his hands with soap and water before and after performing the procedure.*
4. Have another adult present for the procedure, if possible.
5. *Having two adults present protects both the student and the caregiver.*
6. Explain procedure using explanations the student can understand. Encourage him to do as much of the procedure as he is capable, so as to achieve maximum self-care skills.
7. Position the student.
8. *The student may be catheterized lying down, standing, or sitting. If able, he may stand at or sit on the toilet. If unable to sit or stand, he may lie on his back. A receptacle to catch the flow of urine from the catheter is required.*
9. Wash hands and put on non-latex gloves.
10. Lubricate the first 3 inches of the catheter with a water-soluble lubricant and place on clean surface.
11. Cleanse the penis by washing the glans with soapy cotton balls or cleansing supplies specified in student's IHP. Hold the penis below the glans. Foreskin may be retracted on uncircumcised males. Beginning at the urethra, use circular motions to wash away from the meatus. Do this three times using a clean cotton ball each time you wash the penis.
12. *Starting at the meatus and washing toward the base of the penis helps remove bacteria from the area.*

13. Holding the penis at a 45-90 degree angle from the abdomen, use the dominant hand to gently insert catheter into the urethral opening.
14. *If resistance is met at the bladder sphincter, use gentle but firm pressure until the sphincter relaxes. Encouraging the child to breathe deeply may help to relax the urinary tract.* ***Do not force catheter. If unusual resistance is felt, notify the school nurse and family****. Make sure the other end of the catheter is in a receptacle or over the toilet to catch urine.*
15. Insert the catheter until urine begins to flow. Continue to advance the catheter approximately one inch further and hold in place. When the flow stops, insert catheter slightly more and then withdraw a little to make sure all urine is drained. Rotate the catheter so that catheter openings have reached all areas of the bladder.
16. *It may be helpful to have the student bear down a couple of times while the catheter is in place.*
17. After the bladder is emptied, pinch catheter and withdraw.
18. *This prevents urine still in catheter from flowing back into the bladder during withdrawal.*
19. If the student is uncircumcised, move the foreskin back over the glans when finished.
20. *Failure to return the foreskin can lead to swelling of the penis and impairment of circulation.*
21. Wipe off any excess lubricant or urine.
22. Assist student in dressing, if needed.
23. Measure and record the urine volume, if ordered. Dispose of urine appropriately.
24. If using a one-time use catheter, wrap catheter around gloved palm, pull glove over catheter when de-gloving (to contain it) and dispose of according to school's infection control procedure.
25. If using a reusable catheter, wash, rinse, dry, and store the catheter in appropriate container according to student's IHP.
26. *Examples of storage receptacles include a sealed plastic bag, a urine specimen container, and a clean pencil case. The reusable catheter(s) should be sent home with student to be cleaned. Dispose of catheters when they become brittle upon repeated use.*
27. Remove gloves and wash hands.
28. Document on log sheet that the procedure was done. Report to the school nurse and family any changes such as cloudy urine, mucus, blood, foul odor, color changes, unusual wetting between catheterizations, which may be signs of infection.

Sources:

American Academy of Pediatrics. (2015). *Clean Intermittent Catheterizations*. Available online https://www.healthychildren.org/English/health-issues/conditions/chronic/Pages/Clean-Intermittent-Catheterization.aspx

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 716-719.

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 59-61.

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby, 1636, 1659-1660.

National Library of Medicine Medline Plus. (2012). *Self-catheterization--male*. Available online at http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000143.htm

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 280-289.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1042-1044.

Wisconsin Improving School Health Services Project. (2015). *Clean intermittent catheterization male*. Available online http://www.wishesproject.org/?page_id=119/?tab=4 (Video also available).

Procedure for Clean Intermittent Catheterization—Female

Note: Family provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
    - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
    - Catheter
    - Wet wipes or cotton balls (nonsterile) plus mild soap and water or student-specific cleansing supplies
    - Storage receptacle for catheter, such as a sealed plastic bag
    - Toilet or container for urine
    - Non-latex gloves, if person other than student does procedure

    If the student does the procedure unassisted, gloves may not be needed; however, the student should wash her hands with soap and water before and after performing the procedure.
3. Have another adult present for the procedure, if possible.

    Having two adults present protects both the student and the caregiver.
4. Explain procedure using explanations the student can understand. Encourage her to do as much of the procedure as she is capable, so as to achieve maximum self-care skills.
5. Position the student.

    The student may be catheterized lying down, standing, or sitting. If able, she may stand at or sit on the toilet. If unable to sit or stand, she may lie on her back. A receptacle to catch the flow of urine from the catheter is required.
6. Wash hands and put on non-latex gloves.
7. Lubricate the first 3 inches of the catheter with a water-soluble lubricant and place on clean surface.
8. Separate the labia and hold open with non-dominant hand. Cleanse, starting at the top of the labia and going down toward the rectum. Use a clean cotton ball each time. Wash three times: once down the middle and once down each side.

    *Do **not** cleanse in a circular motion because doing so may move bacteria from the rectal area towards the urethra.*
9. Locate the urinary meatus (opening). Gently insert the catheter until there is urine.

The female urethra is short and straight. Keep the other end of the catheter over the toilet or the receptacle. If no urine is obtained, the catheter may have slipped into the vagina instead of the urethra.

10. When urine flow stops, insert catheter slightly more. If no more urine is obtained, withdraw it slightly and rotate catheter so that catheter openings have reached all areas of the bladder.

    It may be helpful to have the student bear down a couple of times while the catheter is in place to ensure that all urine has been drained completely.

11. After bladder is completely empty, pinch catheter and withdraw.

    This prevents urine still in catheter from flowing back into the bladder during withdrawal.

12. Wipe off any excess lubricant or urine.
13. Assist student in dressing, if needed.
14. Measure and record the urine volume, if ordered. Dispose of urine.
15. If using a one-time use catheter, wrap catheter around gloved palm, pull glove over catheter when de-gloving (to contain it) and dispose of according to school's infection control procedure.
16. If using a reusable catheter, wash, rinse, dry, and store the catheter in appropriate container according to student's IHP.

    Examples of storage receptacles include a sealed plastic bag, a urine specimen container, and a clean pencil case. The reusable catheter(s) should be sent home with student to be cleaned. Dispose of catheters when they become brittle upon repeated use.

17. Remove gloves and wash hands.
18. Document on log sheet that the procedure was done. Report to the school nurse and family any changes such as cloudy urine, mucus, blood, foul odor, color changes, unusual wetting between catheterizations, which may be signs of infection.

Sources:

American Academy of Pediatrics. (2015). *Clean Intermittent Catheterizations*. Available online https://www.healthychildren.org/English/health-issues/conditions/chronic/Pages/Clean-Intermittent-Catheterization.aspx

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 716-719.

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Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby, 1636, 1659-1660.

National Library of Medicine Medline Plus. (2012). *Self-catheterization--female*. Available online at http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000144.htm

Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 280-289.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1042-1044.

Wisconsin Improving School Health Services Project. (2015). *Clean intermittent catheterization female*. Available online http://www.wishesproject.org/?page_id=88/?tab=4 (Video also available).

Possible Problems for Students Using Clean Intermittent Catheterization

- **Cloudy urine, blood in urine, foul odor, color changes, unusual wetting between catheterizations, nausea/vomiting, urgency**
  These may be signs of a urinary tract infection. Always report to school nurse and family any changes in the student's usual pattern or tolerance of procedure.

- **Inability to pass catheter**
  This may be due to increased sphincter tone caused by anxiety or spasm. Encourage the child to relax by breathing slowly and deeply.

  In boys: Reposition the penis and use gentle but firm pressure until the sphincter relaxes. Sometimes it helps to have boys flex at hips to decrease reflex resistance of bladder sphincter.

  In girls: Check catheter placement because the catheter may be in the vagina. If catheter is in the vagina, leave catheter in vagina temporarily as a landmark indicating where not to insert, and insert another clean catheter.

  If still unsuccessful, notify school nurse, family or health care provider for further instructions.

- **No urine obtained during catheterization**
  Check position of catheter. This may be due to improper placement of catheter or the bladder may be empty. Check for wetness. Sometimes the patient is using a catheter that is too small. In this case, urine actually dribbles around the catheter when catheterizing and urine also dribbles out of the bladder intermittently.

- **Bleeding from urethra**
  This may be due to trauma to the urethra or to a urinary tract infection. Contact school nurse, family and health care provider.

Sources:

American Academy of Pediatrics. (2015). *Clean Intermittent Catheterizations*. Available online https://www.healthychildren.org/English/health-issues/conditions/chronic/Pages/Clean-Intermittent-Catheterization.aspx

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 716-719.

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Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 1042-1044.

Wisconsin Improving School Health Services Project. (2015). *Clean intermittent catheterization female*. Available online http://www.wishesproject.org/?page_id=88/?tab=4 (Video also available).

General Information for
Students Who Use Clean Intermittent Catheterization

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student needs to use a urinary catheter to drain urine from the bladder.

Students usually use a catheter every 4-6 hours. This procedure should be done in private in the bathroom or school clinic.

This student should be able to fully participate in physical education classes or other school activities unless he or she has another condition that would interfere with full participation. The student may need time for catheterizations before field trips or other activities when access to a bathroom may be limited.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the catheter.

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.

Indwelling Urinary Catheter

Overview

Indwelling urinary catheters used outside the hospital setting for students are usually used after surgical procedures on the urinary tract. A retention or Foley catheter is introduced through the urethra into the bladder. The retention catheter contains a smaller tube within the larger tube. This smaller tube is connected to a balloon near the insertion tip. After the catheter is inserted, the balloon is inflated with water to hold the catheter in place in the bladder. The Foley catheter has two openings at the end, one to drain the urine, the other to inflate/deflate the balloon.

Catheters are sized by the diameter of the lumen--the larger the number, the larger the lumen (i.e., 8F, 10F, 12F). The balloons of retention catheters are sized by the volume of fluid used to inflate them and usually have a 5-milliliter capacity.

Settings and Staff

As with all health-related conditions, every effort should be made to protect the student's privacy. Procedures such as emptying the urinary collection bag can be done in regular toilet facilities in the school or the nurse's office or any other facility where the student's privacy is ensured.

Care of an indwelling catheter may be managed by the school nurse, family, teacher aide, or other staff person who has received training in care of the indwelling catheter of the student. General training should cover the student's specific health care needs, potential problems, how to obtain assistance should problems occur, and when to activate the emergency plan.

Individualized Health care Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with an indwelling urinary catheter, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition or treatment
- Health Care Provider's order for the catheter and its care
- Type of catheter and volume of retention balloon

- Medications that may affect urine color, amount, and odor
- Student's ability for self-care and fostering independence in performing the procedure
- Individual baseline status, including urine color and amount
- Student's need for additional fluids and type of recommended fluids
- Positioning of catheter tubing and collection device/bag
- Measures to be taken if catheter is dislodged, leaking, or obstructed
- Instructions for maintaining a closed system
- Access to an additional adult's presence when school staff perform catheterization
- Latex allergy precautions
- Standard precautions
- Non-latex gloves should be worn at all times when providing care for the student with an indwelling catheter

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 712-715.

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. Available online http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

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Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 532, 544-548.

Procedure for Monitoring an Indwelling Urinary Catheter

1. To empty the drainage bag:
    - Wash hands and put on non-latex gloves.
    - Open outlet valve or clamp on urinary collection device and allow contents of bag to drain into a urinal or other collection device.
    - Do not allow end of outlet tubing on collection device/bag to touch collection device or floor.

      Bacteria on the collection device could be transferred to the urinary collection system, which could result in urinary tract or kidney infection.
    - Do not lift collection device/bag or tubing above the level of student's bladder.

      Urine can flow back into the bladder if tubing or bag is raised, which could increase risk of infection.
    - Close the clamp of valve on the urinary collection device/bag.
    - Wipe the end of the outlet tubing with alcohol or other disinfectant if specified in student's IHP and replace the end of the tubing into the slot on the collection bag.
    - Do **not** disconnect catheter itself from drainage tubing unless ordered by health care provider.

      Opening the drainage system can allow contaminants to enter, increasing the risk of infection. Catheter-associated urinary tract infections (CAUTI) are a great risk to students with indwelling urinary catheters.
    - Dispose of urine from collection device into toilet.
    - Dispose of gloves and wash hands.
2. Observe and document on student's log the color, amount, sediment buildup, and appearance of urine each time the collection device/bag is emptied.
3. Monitor amount of urine in the urinary collection device/bag every 2 hours.

   Urine output should be at least 1 ml per kg of body weight per hour. A student who weighs 20 kg (44 lbs.) should have at least 20 ml of urine per hour. If less than this amount of urine is noted for the student, the school nurse and/or the family should be notified.
4. Encourage fluid intake to prevent sediment buildup and infection, unless contraindicated.
5. Clamp the tubing whenever the collection device/bag must be lifted higher than the student's bladder. Avoid raising it whenever possible to prevent reflux of urine into the bladder.

6. Keep the catheter and collection tubing free from kinks. Loop tubing so that neither the tubing not the collection bag rests on the floor.
7. Any blood or discharge from the urethra or any change in the student's urine should be immediately reported to the school nurse and/or the family.

   Blood, discharge, change in urine could be a sign of trauma to, or infection of, the urinary system.
8. Indwelling catheters are typically maintained only temporarily so as to avoid CAUTIs. Check with family and student's health care provider if catheter use is maintained.

NOTE: Only qualified persons (i.e., registered or licensed practical nurse) should reinsert or remove an indwelling catheter using sterile technique and only with a physician's order.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 712-715.

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. Available online http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 64-65.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 783-784.

Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 532, 544-548.

Possible Problems with an Indwelling Urinary Catheter

- **Bleeding from urethra**
  This may be due to trauma to the urethra or urinary tract infection. Contact school nurse, family and/or health care provider.

- **Cloudy urine, mucus, blood, foul odor, color changes in the urine**
  This may be due to a urinary tract infection. Always report to the school nurse and family any changes in the student's usual pattern.

- **Urine output less than 1 ml/kg/hr.**
  Notify school nurse, family and /or health care provider.

- **Dark, concentrated urine.**
  Increase fluid intake. Notify school nurse and family if urine does not become lighter in color.

- **Student has chills, fever, or flank pain.**
  This may be due to a urinary tract infection. Report to the school nurse and family.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 712-715.

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. Available online http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

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General Information for Students Who Use Indwelling Urinary Catheters

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student uses an indwelling urinary catheter, or small tube attached to a collection bag, to drain urine from the bladder. The bag should be drained by the student (or by another person) 3 to 4 times a day. This procedure should be done in private in the bathroom or school clinic. The bag should always be kept below the level of the student's bladder, and the tubing should be kept off of the floor.

The student may need modifications to participate in physical education classes.

The student may need time to empty the bag prior to field trips or other activities when access to a bathroom may be a problem.

Contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the catheter.

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.

External Urinary Catheter

Overview

An external urinary catheter is used to keep dry the clothing of incontinent male students or male students with dribbling or poor control of voiding.

Settings and Staff

The removal and application of a condom-type external urinary collection device is usually **not** done during school hours. Procedures such as emptying the urinary collection bag can be done in regular toilet facilities in the school or the nurse's office or any other facility where the student's privacy is ensured. As with all health related conditions, every effort should be made to protect the student's privacy.

Removal and application of an external urinary catheter may be performed by the school nurse, family member, teacher aide, or other staff person who has general training in external urinary catheters. General training should cover the student's specific health care needs, potential problems, and how to obtain assistance should problems occur. If possible, two adults should be present whenever the procedure is done at school.

Individualized Health care Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with an external urinary catheter, the following items should be considered:

- Underlying condition and problems associated with the condition or treatment
- Health care provider's order for external catheter and its care
- Student's ability for self-care and fostering independence in performing the procedure
- Individual baseline status, including urine color and amount
- Type of adhesive used to increase catheter adherence to penis
- Medications that would affect urine color, amount, and odor
- Student's need for additional fluids and type of recommended fluids
- Positioning of catheter tubing and collection device/bag
- Access to a change of clothing in the educational setting

- Access to an additional adult's presence if school staff have to re-apply or adjust external catheter
- Latex allergy precautions
- Standard precautions

Sources:

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. Available online http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 62-63.

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Wilkinson, J.M., Treas, L.S., Barnett, K.L., & Smith, M.H. (2016). *Fundamentals of nursing: Vol. 2: Thinking, doing, and caring.* Philadelphia: F.A.Davis, 548-550.

Procedure for Application and Removal of External Catheter

Note: Family provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
    - Water-soluble lubricant (e.g., K-Y Jelly, Lubrifax, Surgilube)
    - Skin adhesive or tincture of benzoin and cotton tipped applicators
    - Adhesive remover
    - Condom-type urine collection device
    - One-inch wide elastic adhesive
    - Scissors
    - Paper towels
    - Non-latex gloves
3. Explain procedure using explanations the student can understand. Encourage him to do as much of the procedure as he is capable, so as to achieve maximum self-care skills.
4. Have another adult present for the procedure.

    Having two adults present protects both the student and the caregiver.
5. Position the student.

    The external catheter may be applied while the student is lying down, standing, or sitting.
6. Wash hands and put on non-latex gloves.
7. Remove previously applied urinary collection device as follows:
    - Carefully clip condom and tape near junction of the penis.
    - Pull condom and tape off gently.
8. Inspect skin of penis. If it is irritated, **DO NOT** apply collection device until area clears.

    Disposable waterproof undergarments (diapers) can be used until skin clears.
9. If necessary, cleanse shaft of penis with adhesive remover as specified in student IHP.

    Old adhesive must be removed so that new adhesive will adhere well.
10. If necessary, cleanse shaft of penis and perineal area with soap and water. Dry area thoroughly.

Cleansing reduces skin irritation, odor, and possibility of infection. Adhesive remover, if left on the skin, will dry out and irritate the skin of the penis.

11. Make a small hole in the center of the paper towel and place over the shaft of the penis until the towel covers the area below the penis.

    Paper towel must cover pubic hair to protect it from adhesive spray.

12. Roll condom-type collection device onto glans of penis, leaving 1-2 inch space between the end of the tubing and the end of the penis.

    Space is left to prevent irritation from plastic insert rubbing against glans. Space also allows for elongation of penis during an erection.

13. Holding condom in place on glans (condom prevents contact of spray on glans):

    - Spray thin layer of adhesive around entire shaft of penis and allow it to become "tacky" (may take 60 seconds).

      -OR-

    - Apply tincture of benzoin to the shaft of the penis (not on glans) with cotton-tipped applicators and allow the benzoin to dry.

      -OR-

      - Some external catheters require the placement of a special adhesive strip onto the penis before the application of the external catheter.

14. Unroll condom-type collection device to cover shaft of penis.

15. If ordered by health care provider, spiral wrap penile shaft with strip of **elastic** adhesive tape. **Do not overlap the tape**.

    Do not wrap tape completely around the penis*. Strip should be spiral wrapped and not overlap itself. Overlapping tape may cause constriction of blood supply to penis.*

16. Clip and remove ring of condom catheter.

    Ring must be completely removed to prevent pressure damage.

17. Attach condom catheter to leg bag or drainage bag. Be sure condom is not twisted and tubing is not kinked.

    Positioning of leg bag may vary according to student's activity and level of functioning. Twisted condom catheter obstructs urine flow.

18. Empty collection bag before it becomes full. *Full bag puts more tension on the catheter and may contribute to problems keeping the catheter intact.*

19. Remove gloves. Dispose of gloves and used supplies.

20. Wash hands.

21. Document in student record the application and removal of external catheter and condition of student's skin.

    Report to school nurse and family any change in student's usual pattern.

Sources:

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. Available online http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 62-63.

Schauer, B. & Skorin, L. (2012). Tincture of benzoin improves efficacy of medical tape. *Primary Care Optometry News.* Available online: http://www.healio.com/optometry/cornea-external-disease/news/print/primary-care-optometry-news/%7B27caa61a-ded8-4377-9586-7cc7d9dff0b5%7D/tincture-of-benzoin-improves-efficacy-of-medical-tape

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Possible Problems with an External Urinary Catheter

- **Bleeding from the urethra**
  This may be due to trauma to the urethra or urinary tract infection. Contact school nurse, family and health care provider.

- **Cloudy urine, mucus, blood, foul odor, color changes in the urine**
  May indicate a urinary tract infection. Always report to school nurse and family any changes in the student's usual pattern.

- **Skin of penis irritated**
  Remove external catheter and put incontinence garments (diapers) on the student until skin clears. Check with school nurse and family regarding type of adherence used.

- **Leaking of urine around condom catheter**
  Use smaller condom to provide wrinkle-free application. Make sure penis is thoroughly dry before applying condom system. Replace or rewrap adhesive. Contact school nurse and family if this happens frequently.

Sources:

Centers for Disease Control. (2009). *Guideline for prevention of catheter-associated urinary tract infections 2009*. Available online http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Connecticut State Department of Education. (2012). *Clinical procedure guidelines for Connecticut school nurses*. Middlebury, CT: CSDOE, 62-63.

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Ostomies for Urinary Elimination

Overview

An *ostomy* for urinary elimination or diversion uses a surgically-created opening in the urinary tract to allow the elimination of urine. The ostomy can be temporary or permanent.

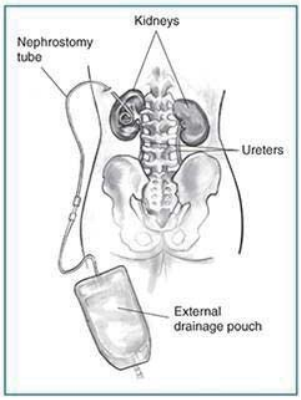
An ostomy may be needed when there is an obstruction or blockage preventing flow of urine through the urinary system. Infection, birth defects, cancer, abnormal motility, or accident or injury may precipitate the need for an ostomy.

A *stoma* is the opening of the ostomy on the skin of the abdomen. A portion of the urinary tract, or a portion of intestine used as a passageway, is brought out to an opening on the surface of the abdomen and folded back onto itself, then stitched in place on the skin. Stomas are usually round, but the size may vary. A healthy stoma is shiny, moist, and dark pink, similar to the inside lining of the mouth. Because stomas are rich in blood supply, they may bleed slightly if irritated or rubbed. However, irritation of the stoma does not cause discomfort because the stoma itself does not have nerve endings. The skin around the stoma does have nerve endings and may be sensitive to manipulation of the stoma or contact with the stoma discharge. Good skin care is important because discharge from the ostomy can be very irritating. A well-fitting barrier and pouch around the ostomy will help protect the skin from any leakage.

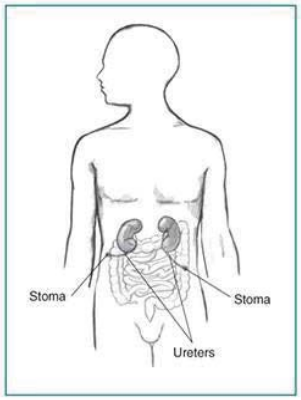
Students may wear a pouch over the stoma to collect urine or they may catheterize a continent ostomy to remove the urine. Ostomies are usually identified by the body part from which they originate; their outside openings may be located anywhere on the abdomen. Common urinary ostomies include:

- Urostomy—a general term used to describe any surgically-created opening from the surface of the abdomen to any part of the urinary tract.
- Nephrostomy—a surgically-created opening leading to the kidney
- Ureterostomy—a surgically-created opening leading to one of the ureters
- Vesicostomy—a surgically-created opening leading to the bladder
- Appendicovesicostomy—a surgically-created opening using the appendix as a passageway to the bladder
- Ileal conduit—a surgically-created opening in the urinary tract using a piece of the ileum as the passageway (conduit) and stoma; drains urine, not stool

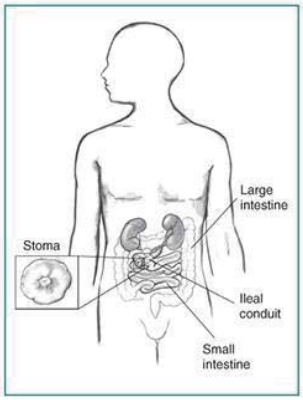
Nephrostomy



Ureterostomy

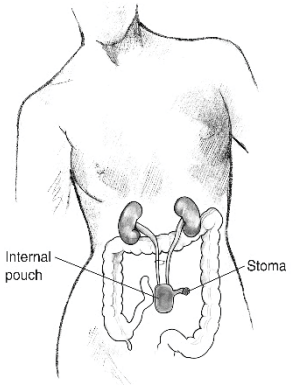


Ileal Conduit



Some urostomies constantly drain urine as it is made. The ostomy appliance should be emptied when it is 1/3 full to prevent leakage. Others are connected to an internally-constructed pouch and designed to remain continent until the stoma is accessed by a catheter.

The continent stoma can be covered with a small bandage or left open depending on the student's preference.



Settings and Staff

Stoma care and catheterization should be done in a private place, such as a bathroom or the health room. The pouch should be emptied when it is 1/3 full or if a leak occurs. Some students may want to keep an extra change of clothes at school in case of leakage. The student should be able to participate in all school activities, including physical education.

The student should be encouraged to perform stoma care and catheterization of the continent stoma, if possible. Care can be done by the school nurse (RN or LPN) with documented competency-based training in appropriate techniques and problem management. School personnel who have regular contact with a student who has an ostomy should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Health care Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student with a urostomy, the following items should be considered:

- Student's underlying condition and possible problems associated with the condition
- Student's ability for self-care and support to accomplish self-care (should have a private bathroom with a sink available)
- Health care provider's order for procedures and treatments
- Type of ostomy and type of pouch system
- What to do if the urostomy has an odor (may indicate infection or leak)
- Student's need for additional fluids and type of recommended fluids
- Additional supplies for use at school, including a spare pouch (if used)
- Access to a change of clothing at school
- Student's baseline status (e.g., urine volume, urine color)
- Latex allergy precautions
- Standard precautions

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

Gray, E, Blackinton, J., & White, G. (2006). Stoma care in the school setting. *The Journal of School Nursing* 22: 74-80.

National Institute of Diabetes and Digestive and Kidney Diseases. (2013). *Urinary diversion*. NIH Publication No. 13-5629. Available online: http://www.niddk.nih.gov/health-information/health-topics/urologic-disease/urinary-diversion/Documents/Urinary_Diversion.pdf

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Illustration Sources:

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National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. NO563_H.. Available online at https://www.catalog.niddk.nih.gov/ImageLibrary

Procedure for Changing a Urostomy Pouch

Note: Family provides equipment and supplies. Urostomy pouches should not routinely be changed at school, but may require changing if leaking.

1. Wash hands.
2. Assemble equipment:
    - Soap and water or student-specific cleanser
    - Soft cloth or gauze
    - Skin prep
    - Skin barrier
    - Replacement pouch and belt
    - Measuring guide, if needed
    - Scissors, if specified
    - Adhesive
    - Non-latex gloves, if pouch is to be changed by someone other than student (make sure that student has washed hands with soap and water prior to and proceeding procedure)
    - Tape, if needed
    - Container to store used pouch
    - Disinfectant solution for cleaning pouch

    Students should keep a complete set of supplies at school including a spare pouch and pouch clip closure. The pouch for ureterostomies must have an antireflux valve to prevent urine from re-entering the stoma.
3. Explain procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
4. Wash hands and put on gloves.
5. Empty contents of used pouch into toilet or appropriate receptacle. Dry drainage port with toilet paper.
6. Gently remove the used pouch and skin barrier. Instead of pulling the bag off the skin, push the skin away from the bag.

7. If the new skin barrier needs fitting, use student-specific guidelines to measure stoma and prepare barrier.

   Opening should be large enough to prevent pressure on the stoma, but small enough to prevent leaking on the skin.

8. Wash the stoma using water alone, soap and water, or cleanser specified in student's IHP with a clean cloth or gauze. **Do not scrub the stoma as this may cause irritation or bleeding**.

   Chemical or perfumed wipes can also irritate delicate skin.

9. Cover the stoma with gauze or cloth to wick leakage, and then clean the skin around the stoma.

10. Inspect skin for redness, rash, bleeding, blistering, or drainage.

    If there is skin irritation, follow guidelines in student's IHP for care. Do not apply medication, ointment, or adhesive to damaged skin because doing so can make it more difficult for the pouch to adhere to the skin. Notify the school nurse and/or family if there is skin irritation.

11. Pat skin dry with dry gauze or cloth.

12. Using instructions in student's IHP to prepare skin, place skin barrier on skin around stoma, starting at the bottom and working up around the stoma.

    Starting at the bottom helps ensure a good seal there, where leaks most commonly occur.

13. Remove used gauze and discard in appropriate receptacle.

14. Peel backing from adhesive on pouch and apply adhesive to pouch.

15. Center the new pouch directly over the stoma.

16. Using fingertips, firmly press adhesive of the pouch to the skin barrier making sure there are no wrinkles and no leaks. Start at the bottom and work up around the stoma.

    The pouch can be opened to allow in a small amount of air. Seal the bottom if the pouch has a bottom drain. If a belt is used to secure pouch, attach to pouch.

17. Dispose of used pouch and supplies in appropriate receptacle.

18. Remove gloves and wash hands.

19. Document completion of the procedure in log, including any significant observations.

    Notify school nurse and family of any change in stoma or urine pattern.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

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Procedure for Catheterizing a Continent Urostomy, Vesicostomy or Appendicovesicostomy

Note: Family provides equipment and supplies.

1. Wash hands.
2. Assemble equipment:
    - Soap and water or alcohol-free wipes or other cleansing agent as specified in student's IHP
    - Non-latex gloves, if catheterization is to be done by someone other than student
    - Catheter
    - Water-soluble lubricant (e.g., KY jelly)
    - Catheter storage bag
    - Container to collect and dispose of urine if unable to perform procedure while student sits on toilet
    - Small adhesive bandage or stoma covering

    Students should maintain adequate supplies at school for multiple catheterizations.
3. Explain procedure using explanations the student can understand. Encourage the student to do as much of the procedure as is capable, so as to achieve maximum self-care skills.
4. Wash hands and put on gloves.
5. Wash the stoma gently using cleansing supplies, if ordered. Do not scrub.

    Cleansing may remove debris and decreases chance of infection.
6. Lubricate catheter tip with water-soluble lubricant.

    Lubrication aids insertion and may prevent tissue trauma.
7. Hold the catheter near the tip and insert into the stoma until a flow of urine is passed.

    Insert the catheter approximately ½-1 inch further.

    Make sure the other end of the catheter is in either a collection container to catch urine or over the toilet. If slight resistance is felt, it may help to twist the catheter or aim it downwards while the student takes a deep breath.
8. Leave the catheter in the stoma until the flow of urine stops.

    In an appendicovesicostomy, the stoma may be higher than the bladder so the catheter needs to be held lower than the level of the bladder to facilitate complete emptying. The

flow of urine can also be impeded by a mucus plug. If this occurs, the catheter should be removed and rinsed, lubricated, and reinserted. Occasionally the continent urostomy may need to be gently irrigated if there is presence of persistent mucus. ***A physician's order is needed for urostomy irrigation****.*

9. Slowly withdraw the catheter.

   Sometimes there is an additional gush of urine. Pinching the catheter can prevent urine still in catheter from flowing back into the stoma during withdrawal.

10. Cover stoma with bandage or stoma covering.
11. Dispose of urine in toilet, noting volume and appearance.
12. Wash and dry equipment. Store in appropriate container, such as a sealed plastic bag.
13. Remove gloves and wash hands.
14. Document procedure in log. Report to the school nurse and family any changes--cloudy urine, mucus, blood, foul odor, color changes, or unusual wetting between catheterizations.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

Gray, E, Blackinton, J., & White, G. (2006). Stoma care in the school setting. *The Journal of School Nursing* 22: 74-80.

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Possible Problems with Urostomies

- **Urine leakage**
  Empty pouch when it is 1/3 full. Check to see if the pouch has a leak, if there are wrinkles in the adhesive attachment, or if the pouch size is correct for the stoma. Apply new pouch if necessary. The continent stoma may be getting too full and need more frequent catheterizations.

- **Irritation or skin breakdown around stoma; raw or weeping skin**
  This may be due to improper stoma care or to inadequate barrier on the skin. In addition, some skin preparations or products can cause a reaction. Notify the school nurse, family or health care provider.

- **Foul odor, cloudy urine**
  If there is an odor, check for a leak around the stoma or in the pouch itself. Urinary tract infections can also cause the urine to have a strong smell. Some foods such as asparagus and B-complex foods may cause a distinctive odor.

- **Change in the flow of urine, especially a decrease**
  This can occur if there is inadequate intake or if the urostomy (especially an ureterostomy) has narrowed. Report any changes in urine flow to the school nurse and family.

- **Bleeding from stoma**
  The stoma becomes irritated very easily. This can happen if it is rubbed too hard during cleaning, an irritating cleanser is used or it is scratched with a fingernail. Usually the bleeding stops quickly, but if it does not, apply gentle pressure and notify the school nurse. If a large area of the stoma is bleeding, notify the school nurse, family or the health care provider.

- **Rash with small red spots on the stoma or skin around the stoma**
  Clean and dry the skin carefully and notify the family. Student may have a yeast infection. Notify school nurse and family.

Sources:

Bowden, V., & Greenberg, C. (2012). *Pediatric nursing procedures* (Third ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 519-525.

Gray, E, Blackinton, J., & White, G. (2006). Stoma care in the school setting. *The Journal of School Nursing* 22: 74-80.

National Institute of Diabetes and Digestive and Kidney Diseases. (2013). *Urinary diversion*. NIH Publication No. 13-5629. Available online: http://www.niddk.nih.gov/health-information/health-topics/urologic-disease/urinary-diversion/Documents/Urinary_Diversion.pdf

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General Information for Students with Urostomies

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a urostomy, or opening into the abdomen, to allow the body to eliminate urine. The opening, or stoma, is covered by a plastic pouch that collects urine.

The student usually empties the pouch and cleans the stoma without assistance. Some students may catheterize the stoma. This procedure should be done in the bathroom. The student's privacy should be assured during the procedure and the student should be allowed to go to the bathroom on an as needed basis.

The student should be able to fully participate in physical education classes unless he or she has another condition that would interfere with full participation. It is very difficult to injure a stoma. The pouch should not come off during normal circumstances.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the urostomy.

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.

Peritoneal Dialysis

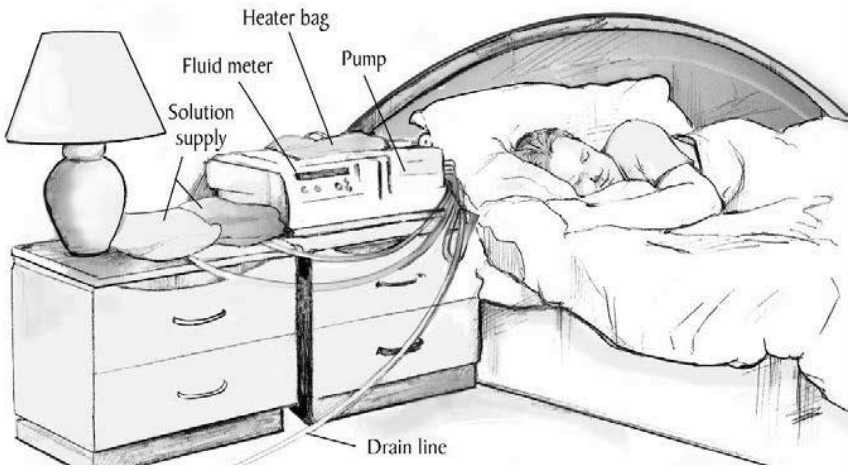
Overview

Healthy kidneys cleanse the blood by removing excess fluid, minerals, and wastes. They also make hormones that keep the bones strong and blood healthy. When kidneys fail, harmful wastes build up in the body, blood pressure may rise, and the body may retain excess fluid and not make enough red blood cells. When kidney failure occurs, a student needs treatment to replace the work of the failed kidneys.

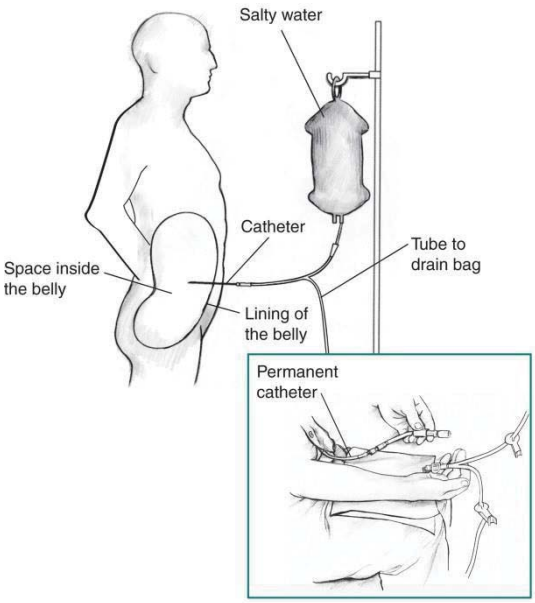
The two methods for treating renal failure are dialysis and kidney transplantation. During dialysis, a filter is used to rid the body of waste products and excess fluid. There are two types of dialysis: peritoneal dialysis and hemodialysis.

Peritoneal dialysis uses the semi-permeable lining of the abdomen, the *peritoneum*, to filter waste products via the processes of osmosis and diffusion. A soft tube called a catheter is used to fill the abdominal cavity with a cleansing solution, or *dialysate*. The peritoneum allows waste products and extra fluid to pass from the blood into the dialysis solution. The solution contains a sugar called dextrose that can pull wastes and extra fluid into the abdominal cavity. These wastes and fluid then leave the body when the dialysis solution is drained. There are two forms of peritoneal dialysis:

- Continuous Cycling Peritoneal Dialysis (CCPD) uses a machine called a *cycler* to instill and drain the dialysate 3-5 times during the night. Depending on the student's comfort, the peritoneal cavity may or may not be left full of dialysate during the 12 hours that he or she is not undergoing CCPD. This is generally the preferred method of peritoneal dialysis for students because it can be done overnight and causes less disruption to the school day.



- Continuous Ambulatory Peritoneal Dialysis (CAPD) doesn't require a machine and is carried out continuously throughout each 24-hour period. The dialysate solution is instilled by gravity through a catheter into the abdominal space and drained out, by gravity, at regular intervals. The process of draining and filling is called an *exchange* and takes about 30-40 minutes. The period the dialysate stays in the abdomen is called the *dwell* time and usually lasts 4-6 hours.



In peritoneal dialysis, a catheter (e.g., Tenckhoff) is placed surgically in the abdomen and tunneled under the skin. One or two cuffs (subcutaneous cuff and peritoneal cuff) help to keep the catheter in place and prevent bacteria from traveling along the catheter from outside into the abdominal cavity. The outside end of the catheter has either a cap or a length of tubing with a rolled-up empty dialysate bag attached, which can be tucked into the student's clothing or in a carrying pouch. The catheter should always be protected and covered by a dressing and clothing to protect it from tugging or pulling because a break in the system or skin tearing could occur.

Infection is the most common complication of peritoneal dialysis. Repeated peritoneal infections, *peritonitis*, can lead to peritoneal membrane failure and the inability to use the peritoneum for further dialysis. Therefore, every effort must be made to prevent infection. Signs of infection include fever, pain, redness, nausea, and a tender, distended abdomen. Any signs of infection require prompt attention and notification of the school nurse, family, and health care provider.

Settings and Staff

Due to the risk for infection and the need for privacy, procedures such as dialysate exchange or dressing changes should take place at home or in a clean, private room such as the health room. 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.

Only the school nurse (RN or LPN) with competency-based training in peritoneal dialysis should perform this procedure due to the high risk for infection or injury. Peritoneal dialysis training usually takes place in a dialysis unit. Simply changing the dressing at the exit site can be performed by a registered nurse using sterile technique. The skin around the catheter site must be kept clean and dry because skin breakdown can also lead to peritonitis.

School personnel who have regular contact with a student who has a peritoneal dialysis catheter should receive general training covering the student's specific needs, potential problems, and implementation of the established emergency plan.

Individualized Health care Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student receiving peritoneal dialysis, the following items should be considered:

- Student's underlying condition and potential problems associated with the condition or treatment
- Health care provider's orders for procedures and treatments
- Observations which need to be reported to the health care provider
- Medication requirements
- Diet restrictions, most significantly, foods with high potassium and protein content
- Requirements for blood pressure monitoring
- Susceptibility to infections, especially peritonitis
- Restrictions about touching the tubing or the dressing
- Activity restrictions
- Provision of supplies by family for emergency care
- Body image concerns
- Latex allergy precautions
- Standard precautions

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby, 1036-1038.

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National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N01699. Available online at https://www.catalog.niddk.nih.gov/ImageLibrary

Possible Problems for the Student Requiring Peritoneal Dialysis

- **Abdominal pain, fever, nausea, vomiting, unusual color or cloudiness of used dialysate, redness or pain around the catheter**. **This is a potential emergency. Be prepared to activate the school emergency plan**. Have student rest. Take vital signs. **Notify school nurse, family or dialysis unit immediately** because peritonitis can develop within a few hours.

- **Catheter is pulled or tugged**
  Examine catheter tubing for any leaks or breaks. Notify the school nurse. Using sterile technique (including wearing a mask and sterile gloves), the school nurse can remove dressing, and check for any trauma or tears in the skin. **If any leaking or trauma has occurred, notify family or dialysis unit immediately.** Cover site with a sterile dressing.

- **Tubing becomes disconnected**
  If the catheter and tubing become disconnected, cover open end with a sterile dressing. Stop the flow of dialysate from the catheter by bending the catheter. Secure the folded, bent catheter to stop dialysate flow. **Call school nurse, family and dialysis unit immediately.**

- **Cover on the end of the catheter comes off**
  Cover the catheter end with sterile gauze. Make sure roller clamp is intact and dialysate not leaking. If clamp is open, close it. Notify school nurse and family.

- **Dressing or skin near catheter becomes dirty or wet**
  Notify the school nurse and family so that skin can be cleaned and sterile dressing applied.

- **Dressing at exit site comes off**
  Using sterile technique (including mask and sterile gloves), place sterile split gauze on the skin around the catheter. Cover both the catheter and gauze with second gauze and secure with specified tape. Notify school nurse and family.

Sources*:*

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby , 1036-1038.

National Institute of Diabetes and Digestive and Kidney Diseases. (April 2006). *Treatment Methods for Kidney Failure: Peritoneal Dialysis*. Bethesda, MD: National Institutes of Health. NIH Publication No. 06-4688. Available online: http://www.niddk.nih.gov/health-information/health-topics/kidney-disease/peritoneal-dialysis/Documents/peritoneal_508.pdf

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Possible Problems for Student with Renal Failure

- **Chest pain, numbness in face or limbs, and generalized weakness**
  Activate the school emergency plan and notify the school nurse, family and health care provider.

  Most students on dialysis need to control the amount of potassium in their diet because too much potassium can interfere with the heart muscle's ability to pump, causing irregular heartbeat and possibly even cardiac arrest. These symptoms may indicate an unsafe potassium level. Potassium is a mineral found in many foods, including salt substitutes, bananas, oranges, dark leafy greens, avocados, potatoes, yogurt, beans, chocolate, and nuts.

- **Shortness of breath**
  Student could be developing fluid in the lungs. Check vital signs and record**.** Have the student sit and rest. **If difficult breathing continues or increases, activate the school emergency plan and notify the school nurse, family and health care provider**. Keep the student in a sitting position while waiting for the ambulance. Leaning forward over a table or chair may facilitate ease of respiration.

- **Sudden onset of localized pain, usually felt while moving or walking**
  Activate the emergency plan and notify the school nurse and family.

  Students with renal failure often lose calcium, causing bones to become brittle and break with even a minor injury. Document location of pain and assess need for immobilizing area of pain.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby, 1036-1038.

National Institute of Diabetes and Digestive and Kidney Diseases. (November 2007). *Kidney Failure: Choosing a Treatment That's Right for You*. Bethesda, MD: National Institutes of Health. NIH Publication No. 08-2412. Available online: http://www.niddk.nih.gov/health-information/health-topics/kidney-disease/kidney-failure-choosing-a-treatment-thats-right-for-you/Documents/choosingtreatment_508.pdf

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Porter, S., Branowicki, P., & Palfrey, J. (2014). *Supporting students with special health care needs: Guidelines and procedures for schools* (3rd ed.). Baltimore: Paul H. Brookes Publishing, 273-278.

Selekman, J. (2013). *School nursing: A comprehensive text*. (2nd ed.). Philadelphia: F.A. Davis, 775-778.

Smith, S., Duell, D. & Martin, B. (2012). *Clinical nursing skills: Basic to advanced skills* (8th ed.). Boston: Pearson, 813-815.

General Information for Students with Peritoneal Dialysis Catheters

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a catheter, or tube, into the abdomen to help remove waste products through a procedure called peritoneal dialysis.

The tube may be closed and covered or it may be attached to a bag of solution. In either case, the bag and tubing are covered by the student's clothing.

The bag and catheter should not be touched except in an emergency.

All staff who have contact with this student should be familiar with the emergency plan and how to initiate it.

The student should be able to participate in school activities.

The student needs permission from his or her health care provider to participate in physical education classes or swimming. The student should avoid bumping the catheter or pulling on the tubing.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the catheter.

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.

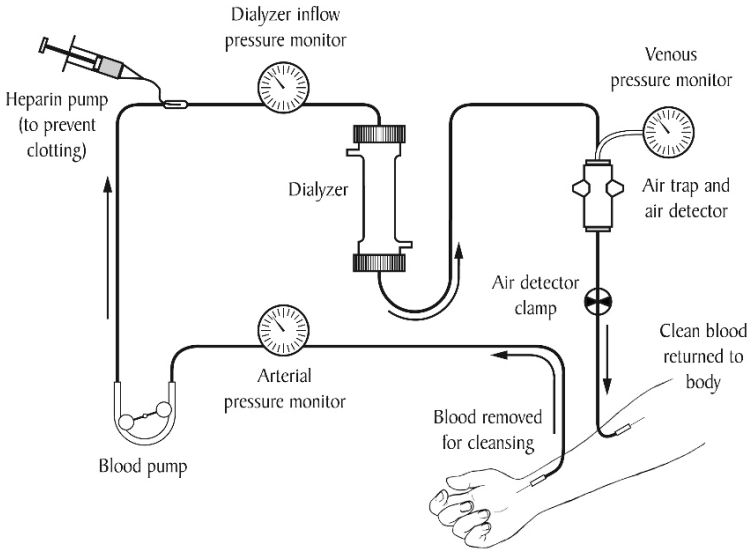
Hemodialysis

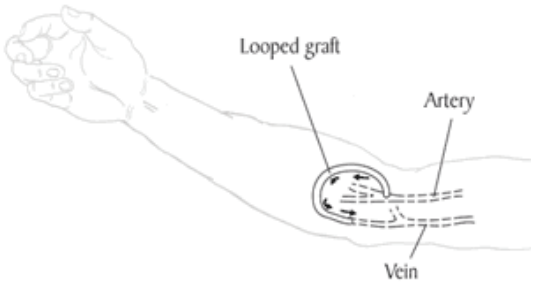
Overview

Healthy kidneys cleanse the blood by removing excess fluid, minerals, and wastes. They also make hormones that keep the bones strong and blood healthy. When kidneys fail, harmful wastes build up in the body, blood pressure may rise, and the body may retain excess fluid and not make enough red blood cells. When kidney failure like this is experienced, a student needs treatment to replace the work of the failed kidneys.

The two methods for treating renal failure are dialysis and kidney transplantation. During dialysis, a filter is used to rid the body of waste products and excess fluid. There are two types of dialysis: peritoneal dialysis and hemodialysis.

Hemodialysis uses a special filter called a *dialyzer* that functions as an artificial kidney to rid blood of harmful wastes, extra salt, and extra water. During treatment, blood travels through tubes into the dialyzer, where a semi-permeable membrane filters out wastes and extra water. Then the cleansed blood flows through another set of tubes back into the body. Hemodialysis is usually done three times a week and each treatment lasts 3-5 hours.

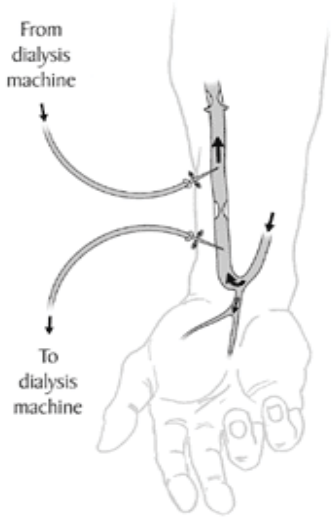




Hemodialysis requires easy access to the student's blood supply. The two main types of access are a fistula and a graft. To create an *arteriovenous fistula*, an artery is connected directly to a vein, usually in the forearm. The increased blood flow makes the vein grow larger

and stronger so that it can be used for repeated needle insertions. However, it may take several weeks before it is ready to be used. A *graft* connects an artery to a vein using a synthetic tube and can be used sooner than a fistula; however, it is more likely to experience infection and clotting so it is not normally used for long-term dialysis. Hemodialysis is performed in the hospital, dialysis unit, or at home by specially-trained health care providers.

Care of the Arteriovenous Fistula



Because vascular access problems are the most common reason for hospitalization among students on hemodialysis, the fistula must receive special care. The fistula can be checked by lightly placing clean fingers over to feel a vibration, the *thrill*, or by placing a clean stethoscope over it and listening for a loud buzzing sound, the *bruit*. This indicates patency of the fistula. The school nurse should become familiar with the bruit. If any changes are noted in the bruit, the student's emergency school plan should be initiated. Anything that causes decreased blood flow to the fistula area should be avoided. ***Do <u>not</u> draw blood or measure blood pressure in the arm or leg on which the fistula is located.*** Lying on the fistula, carrying heavy objects, and wearing watches or bracelets should also be avoided.

Settings and Staff

Every effort should be made to protect the student's privacy. Checking the bruit of a fistula on an arm can be performed in any setting; checking the patency of a thigh fistula requires a more private setting, such as the health room.

A student with an arteriovenous fistula can normally participate in regular school activities. Participation in athletics or activities where the student is around sharp equipment can be decided on an individual basis by the health care provider.

School personnel who have regular contact with a student who has a fistula should receive general training covering the student's specific needs, potential problems, and how to implement the established emergency plan. If the student knows how to check fistula patency, he or she should notify the people identified in the emergency plan if there are any changes in the bruit. Fistula care should be done by a registered school nurse with proven competency-based training in appropriate techniques and problem management.

Individualized Health care Plan

Each student's IHP must be tailored to the individual's needs. A sample plan is included in Appendix A. When preparing an IHP for a student receiving hemodialysis, the following items should be considered:

- Student's underlying condition and potential problems associated with the condition or treatment
- Plans to ensure that school staff who have regular contact with the student are aware that the student has a fistula and be familiar with the baseline appearance of the fistula and vibration of the bruit
- Emergency contact information including dialysis center
- Health care Provider's orders for procedures and treatments
- Location of fistula or graft and any special precautions
- Frequency of checking fistula
- Notifying the school nurse and family or health care provider immediately if student has:
    - fever
    - pain in the fistula
    - loss of bruit or bulging of the fistula
- Medication requirements
- Frequency of blood pressure measurements (should **not** be done on limb with fistula)
- Diet restrictions, especially foods high in potassium, sodium, or phosphorus
- Fluid restrictions
- Activity restrictions
- Susceptibility to infections, especially chicken pox
- Latex allergy precautions
- Standard precautions

The following school issues should be considered when working with a student needing hemodialysis:

- Reducing amount of written homework.
- Using tape recorders and computers if fistula placement affects student's ability to write.

- Dialysis scheduling.
- Using flexibility in scheduling subjects during dialysis time.
- Possibility of frequent hospitalizations.
- Providing textbooks, workbooks, and worksheets for hospital tutor.
- Monitoring student performance, both in class and in the hospital.
- Make-up work and tests.
- Home tutoring when illness prevents student from attending school.
- Evaluation of performance and review work after long absences.
- Making outlines and notes available to student.
- Contracts to modify amount of work and still achieve educational goals.
- Assessing for fatigue.
- Avoiding after-school tutorial sessions.
- Access to school elevator in case of fatigue or bone disease.

Intermediate School District 917
Consent for Administration of Special Health Care Procedures

Student_____ **Birth Date**_____ **School Year** _____

Primary Diagnosis_____ **ICD-10** _____

Diagnosis_____ **ICD-10**_____ **Diagnosis**_____ **ICD-10** _____

This form is used for specialized procedures which may include, but not be limited to administration of oxygen, urinary catheterization or wound care procedures which may be needed and provided for a student while he/she attends school. The procedure(s) may be performed by school personnel trained and supervised by a Licensed School Nurse.

Parent/Guardian Authorization

I authorize the school nurse to contact the licensed provider as needed concerning this medication(s).

Provider/Clinic_____ Phone #_____ Fax # _____

- I understand that parent/guardian authorization is required for any prescription medication to be given at school. Prescription medications must have a physician or licensed provider authorization.
- I understand that I must provide all medication(s) and equipment for the procedure(s) below.
- I understand all medications must be provided with an accurately labeled prescription container. (Please ask your health provider for the medication to be divided into two containers-one for school, & one for home) Nonprescription medications must be in an original container with label and directions.
- I will notify the school immediately if my child s health status changes or there is a cancellation of the procedure(s).
- The medication may not necessarily be administered by a school nurse. The medications may be administered by school personnel trained and supervised by a licensed school nurse.
- I have read this *Parent/Guardian Authorization* section and agree to the instructions it provides.

Parent/Guardian Signature_____ **Date** _____

Physician's Orders

Procedure _____

Instruction _____

_____

Time/interval procedure is to be done _____

Amount (if applicable) _____

Precautions and/or adverse reactions _____

_____

_____

Physician's Signature_____ **Date** _____

For office use only:
LSN Signature_____Date _____

Name of Staff Routing_____Date _____

Please check off who was routed this form ___Student File IEP Manager _ 917 LSN _Building Nurse

Consent for Administration of Special Health Care Procedures 1/20/2016

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby , 1036-1036.

National Institute of Diabetes and Digestive and Kidney Diseases. (November 2007). *Kidney failure: Choosing a treatment that's right for you*. Bethesda, MD: National Institutes of Health. NIH Publication No. 08-2412. Available online: http://www.niddk.nih.gov/health-information/health-topics/kidney-disease/kidney-failure-choosing-a-treatment-thats-right-for-you/Documents/choosingtreatment_508.pdf

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National Library of Medicine Medline Plus. (2014). *Taking care of your vascular access for hemodialysis*. Available online: http://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000591.htm

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National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N00550. Available online at https://www.catalog.niddk.nih.gov/ImageLibrary

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National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (2014). Image Library. N01725. Available online at https://www.catalog.niddk.nih.gov/ImageLibrary

Possible Problems for the Student Requiring Hemodialysis

- **Oozing or bleeding**
  Usually due to the scab from the last needle puncture coming off. Put on sterile gloves and apply direct pressure to the oozing site using folded gauze. Apply only enough pressure to stop the oozing of blood yet still feel the bruit. Once bleeding has stopped apply a small band aid. If bleeding continues for more than 10 minutes, notify school nurse, family and dialysis center.

- **Injury or trauma to the fistula**
  Arterial blood has been rerouted to the fistula so **the student could lose a large quantity of blood in a very short period of time if there is damage to the fistula.** A cut into the fistula will cause the blood to spurt out. **Activate the school emergency plan**. Put on sterile gloves, a face shield (if available) and apply pressure with sterile gauze directly to the bleeding site.

- **No bruit detected when fistula is palpated or auscultated with a stethoscope**
  Try both palpation and auscultation to assess bruit. Palpate distal pulses and observe capillary refill in extremity digits to check circulation. Have the student lie down and check blood pressure. **If blood pressure is low or bruit still cannot be felt, call the school nurse, dialysis unit and the family.** If clotting has occurred, success of de-clotting depends on how quickly treatment is initiated.

Sources:

Hockenberry, M., & Wilson, D. (2015). *Wong's nursing care of infants and children*. (10th ed.). St. Louis: Elsevier Mosby , 1036-1036.

National Institute of Diabetes and Digestive and Kidney Diseases. (November 2007). *Kidney failure: Choosing a treatment that's right for you*. Bethesda, MD: National Institutes of Health. NIH Publication No. 08-2412. Available online: http://www.niddk.nih.gov/health-information/health-topics/kidney-disease/kidney-failure-choosing-a-treatment-thats-right-for-you/Documents/choosingtreatment_508.pdf

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General Information for Students Receiving Hemodialysis

Date: _____

To: _____

(Teachers, Instructional assistants, Bus drivers, etc)

Name of Student: _____

This student has a fistula, or a surgical joining of an artery and vein, located in his or her _____. The fistula is used to help remove waste products through a procedure called hemodialysis.

The fistula often is covered by the student's clothing.

No tight-fitting objects (i.e., watch, elastic band) should be worn on an arm with a fistula. The student also should not bump the area around the fistula.

Fistula care is usually done at home or in the dialysis unit.

The student should be able to participate in school activities.

The student needs permission from his or her health care provider to participate in physical education activities and classes with any limitations noted: _____

_____

All staff who have contact with this student should be familiar with the school emergency plan and how to initiate it.

Please contact_____at_____(phone number/pager) for additional information or if the student experiences any problems with the fistula.

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.