## Chronic Health Conditions

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Chronic Health Conditions

In 1975, Congress passed legislation mandating that all children, including those with special healthcare needs, be educated with their peers. Case management for medically fragile and special needs children involves coordination of multiple health and education services. The school nurse functions as a case manager by interpreting health information to school personnel, providing direct services, advocating for needed accommodations, and educating staff. Students with chronic health conditions can experience difficulties with learning related to medications or treatments, frequent or prolonged absences, or effects of the condition itself. The school nurse can also help to promote a psychologically supportive learning atmosphere and help students with chronic health conditions develop strategies to attain personal success in school.

Sometimes the nurse may be the one to notice that a student is exhibiting some early symptoms of illness. If the nurse observes a student coming to the clinic with the same complaint several times or a new complaint that seems more serious, he/she should alert the parent to the problem. Ensure that the family has a primary care provider (PCP) or other referral information if they need it. The nurse should always be able to provide this information for families and work with the school social worker if possible to help the family obtain the needed care. Refer to this chapter for information on general management of specific chronic health conditions, but always get individual instructions and guidance from the child’s family and healthcare provider.

Information is also included in this chapter on the Individuals with Disabilities Education Act (I.D.E.A.), Individualized Education Plans (IEPs) and Section 504 plans that may involve the school nurse. Samples of an Individualized Health Plan (IHP) form and 504 plan are included as well. The school nurse’s commitment to maintaining confidentiality and obtaining parent permission before sharing health information is very important.

The school nurse’s position as an advocate for these children in the educational setting also will depend on good communication with parents, teachers and staff. Remember that the school-age siblings of these students probably have feelings and issues with which they may be dealing when one child in the family is sick and requiring extra attention. School nurses can also model for staff and students their commitment that the illnesses are part of these children, but do not define them. Teasing should not be tolerated, and the natural compassion of other students can be brought out by honest, open communication.

A web resource for Georgia Resources for Children with Special Needs can be found at:
pediatrics.emory.edu/divisions/neonatology/dpc/georgia.html

A web resource for Children with Special Healthcare Needs: Provider Manual can be found at:
dph.georgia.gov/children-and-youth-special-healthcare-needs-cyshn
Asthma

Condition

Asthma is a chronic lung disease in which an individual’s airways are inflamed (irritated) and overactive. This condition is sometimes known as reactive airway disease. During an episode, the lining of the airway swells which causes mucus production, then the muscles which surround the airway contract. As a result, the airway is partially blocked and asthmatic symptoms such as wheezing, chest tightness, coughing and shortness of breath begin.

It is estimated that over 10 percent of school-age children in Georgia have asthma. Asthma is the most common chronic disease of childhood and the leading cause of school absence from chronic illness. Exercise-induced asthma (EIA) occurs when physical activity causes bronchoconstriction, which can lead to wheezing, coughing, chest tightness or shortness of breath during and after exercise. Most children with asthma will also have EIA, and some children can have EIA without having chronic asthma.

Asthma education in schools can help to improve self-management skills and lead to decreased absenteeism. The school nurse plays a key role in monitoring and assessing asthma control in the student. Indicators of poor asthma control in the student need to be identified and communicated to the parent, including advising medical follow-up. In addition, the school nurse should be alert to children who have signs and symptoms of asthma but have not been diagnosed; nurses should educate and encourage families to seek medical attention.

Guidelines for the care and management of asthma were released in August 2007 by the National Heart Lung and Blood Institute (NHLBI) (nhlbi.nih.gov/guidelines/asthma/asthgdln.htm). These guidelines emphasize the importance of asthma control and introduce recommendations for managing asthma in three age groups (0-4 years of age, 5-11 years of age and youths >12 years of age). The classification of asthma severity is determined at the time of diagnosis with the goals of asthma therapy aimed at reducing impairment caused by symptoms and risk of future exacerbations from poor control. The classifications of asthma severity are as follows:

- **Intermittent asthma** – Daytime symptoms less than or equal to two times a week; brief exacerbations requiring the use of quick relief medication less than or equal to two times a week; nighttime symptoms less than or equal to two times a month; no interference of normal activity.
- **Mild persistent asthma** – Symptoms greater than twice a week, but not daily; nighttime symptoms three to four times a month; need for quick relief medication more than two times a week but not daily; minor limitation of normal activity.
- **Moderate persistent asthma** – Daily symptoms; daily use of quick relief medicine; exacerbations affect activity; exacerbations occur twice a week and may last days; nighttime symptoms greater than once a week.
- **Severe persistent asthma** – Continual symptoms; frequent exacerbations; frequent nighttime symptoms; limited physical activity.

The presence of one clinical feature of severity is sufficient to place a student in that category and initiate treatment accordingly. The ultimate goal of treatment is to enable the student to live free of limitations. Ongoing monitoring is essential to this end as asthma is a highly variable disease.

Causes

The cause of asthma is a sensitive and over-reactive airway. The airway of an individual with asthma can be triggered by a variety of factors. The airway can be triggered by allergens such as molds, dustmites, pollen or weeds; irritants like smoke, air pollution or strong odors; or other factors such as exercise, weather changes or cold air.
Management at School

Controlling asthma requires a comprehensive approach including consistent and appropriate medical treatment, comprehensive patient and family education, patient and family compliance, and environmental risk factor evaluation and reduction. Asthma attacks may be frightening, but they are treatable. Early recognition of symptoms and prompt treatment can shorten the course of an asthma episode and prevent hospitalization. A written asthma action plan is a necessary tool that includes instruction for daily management, as well as recognizing and handling worsening asthma with appropriate dosages of medication.

Early warning signs may include one or more of the following:

• Coughing
• Runny or stuffy nose
• Mild wheezing
• Itchy, watery eyes
• Itchy or sore throat
• Lethargy or fatigue
• Irritability or headache
• Waking at night with symptoms (per report)
• Activity intolerance
• Complaint of chest tightness or stomach ache (for younger kids)

These early warning signs are indicative of the child’s “yellow zone” in their asthma action plan and may indicate that an asthma episode is imminent and treatment with a quick relief medication is necessary. It is important to note that all asthma flare-ups are not accompanied by wheezing on auscultation. Assess for any of the symptoms of an asthma exacerbation and treat accordingly.

More severe symptoms that require prompt action are:

• Persistent coughing or wheezing
• Rapid breathing rate
• Extreme shortness of breath
• Increased work of breathing
• Chest tightness or pressure
• Change in behavior (anxiety)
• Difficulty speaking without stopping to breathe
• Skin around chest and neck pulled in with breathing (retractions)
• Pale/blue color of skin, lips or nail beds

These symptoms are indicative of a child’s “red zone” from the asthma action plan and necessitate immediate treatment with a quick relief inhaler. Emergency help (9-1-1 call) may be necessary if these symptoms are noted and/or there is no improvement in symptoms 15-20 minutes after treatment.

A bill, passed in 2015 in the Georgia legislature (HB 362), states that schools may stock albuterol for use in identified respiratory distress. School personnel may administer albuterol to a student or staff member with respiratory distress regardless of prescription. Any school personnel who acts in good faith is immune from civil liability.

A bill, passed in 2002 in the Georgia legislature (SB 472), provides for self-administration of prescribed asthma medications by minor children in school settings. Supportive school policies are necessary to assure that students with asthma have access to their quick relief medication.
Asthma cannot be cured, but it can be controlled. Signs that may indicate that asthma is poorly controlled include:

- Persistent cough
- Coughing, wheezing, chest tightness, shortness of breath after physical activity
- Low level of stamina during physical activity
- Reluctance to participate in school activities or physical activity
- Excessive (more than one day/month) absences from school due to asthma.
- Frequent visits to the clinic for respiratory symptoms
- Frequent use of quick relief medication for symptom relief (more than two times/week or more than two nights/month).

**Treatment**

Effective treatment of asthma will allow a student to participate in school activities. Avoiding known asthma triggers and treating symptoms early are the keys to control. Medications that are used in the treatment of asthma are categorized into two general classes according to their mechanism of action – quick relief and long-term control medicines.

**Quick relief medications** work rapidly to relax the tight muscles around the airways, increasing airflow into the lungs and reducing asthma symptoms. Usually these medications are the ones used at school.

Examples include:

- Albuterol (also called Proventil®, Ventolin®, ProAir®) available as a metered dose inhaler (MDI) or solution for the nebulizer
- Xopenex® (available in MDI or nebulizer solution)
- Maxair® (inhaler)

There may be circumstances when an asthmatic child needs his/her quick relief inhaler and may not be experiencing acute symptoms. This can happen if pre-treating before exercise or play, or if experiencing symptoms of an early exacerbation and he/she needs to take a short-acting beta agonist (quick relief medication) every four hours as part of their yellow zone regimen.

**Long-term control medications** are given on a regular basis, even in the absence of symptoms, to reduce inflammation of the airways. These may be ordered once or twice a day to prevent symptoms, either year-round or seasonally. It is important for the school nurse to know about controller medicines the child takes at home, even though these usually are not needed during school hours. This information will help the nurse educate the student and family on the important role that controller medications play in the student’s asthma control. Examples include:

- Inhaled corticosteroid (Examples: Aerobid®, Asmanex®, Azmacort®, Flovent®, Pulmicort® and Qvar®)
- Long acting bronchodilator (Serevent®, Foradil®)
- Leukotriene modifier (Singulair®, Accolate®)
- Inhaled non-steroid (Tilade®)
- Combination drugs: inhaled corticosteroid and long-acting bronchodilator (Advair®, Symbicort® and Dulera).

**Asthma Equipment**

- Asthma medications are delivered by metered dose inhalers (MDI), dry powdered inhalers (DPI) or nebulizer treatments. The nebulizer or compressor is used to aerosolize liquid medication for breathing treatments.
- Children who use metered dose inhalers (MDIs) should use a “spacer” or holding chamber (example: Aerochamber®, InspireEase®) which assists them to use the inhaler correctly. Medications that are supplied in a discus, dry powder inhaler (DPI) or breath-actuated inhaler form do not require a reservoir device.
- The peak flow meter is a small device that measures how well air moves out of the lungs. It also helps a student or caregiver determine changes in their asthma and identify appropriate actions to take.
Inhaler Procedure with Spacer

Spacers or holding chambers are necessary since they increase medication delivery when using a MDI. The holding chambers are available with either a mouthpiece or a mask. Generally, younger children (under age 4) will need to use a mask. The child’s healthcare provider determines the medication dosage as well as how often to give. Dosages will vary with each child and should be stated clearly on the medication label as well as in the Asthma Action Plan.

The spacer is a hollow tube, which traps the medicine. It can hold the medicine so that the child can take more than one deep breath from it (six breaths may be required if used with a mask for younger or special needs students). If using a spacer with a mask, the mask should fit tightly against the child's face. If using a spacer with a mouthpiece, it is best if the child takes a slow deep breath and holds his breath for up to 10 seconds to allow the medicine to reach all the parts of his lungs. When more than one puff is prescribed, it is best to wait one full minute between puffs to allow maximum absorption of medication. Coughing after medication administration with a bronchodilator is normal.

Inhaler Procedures Without Spacer

Although using a MDI without a spacer is not recommended, there may be circumstances when an aerochamber is not available. In that case, it is important to use proper technique. A school nurse should recommend a spacer for children who take MDI medication in order for them to receive proper benefit from their medication. Closed mouth technique is the proper method when using an inhaler without a spacer.

Diskus Procedure (DPI-Dry Powder Inhaler)

Using a DPI requires a rapid deep inhalation and is not recommended for children less than 4 years old because they generally cannot generate a deep enough inspiration to activate the device. In addition, a dose is lost if the child exhales through the device after actuating.

See attachment for the proper use of a diskus (see page 15).

Aerosol Therapy by Nebulizer

The student may use an air compressor with a nebulizer medication cup to receive his breathing treatment. The air compressor provides the air for the treatment. The nebulizer is the part that holds the medicine. When the air from the compressor goes through the tubing and meets the medicine inside the nebulizer, it forms the mist. The child inhales the mist until it is gone (which usually takes about 10 minutes). Prescribed medicine is usually pre-measured (unit-dosed) and placed into the medication cup. The medicine from the nebulizer is inhaled through a mask or a mouthpiece using slow tidal breathing. A tight-fitting face mask is necessary for those unable to use a mouthpiece. This medication delivery system is less dependent on a child’s coordination or cooperation. The disadvantages to its use are its decreased portability and need for a power source, increase in time needed for a treatment, and potential for bacterial infections if not cleaned properly.
Using a Peak Flow Meter

The peak flow meter is a small device that measures how well air moves out of the lungs. Peak flow monitoring can be a useful tool in the long-term management of asthma. However, early symptom recognition is a better indicator of uncontrolled asthma or an asthma flare-up. Also, the peak flow maneuver may be difficult for the child to perform during an acute exacerbation. It should not be used as a substitute for clinical assessment of symptoms during an acute asthma attack. The peak flow meter can detect narrowing of the airways hours, sometimes even days, before the onset of any asthma symptoms. The peak flow measurement is dependent upon user technique and effort, and all results need to be compared with the individual’s personal best. This information may be incorporated into the child’s asthma action plan.

How to Clean Asthma Devices

HFA inhalers need to be kept clean. After use, excess medication can accumulate around the exit hole where the medication comes out. When dried medication accumulates around the exit hole of the actuator, less medication can be delivered to the airways. It is also important to prime the inhaler if it is not used on a regular basis. It is important to follow the manufacturer’s instructions, but generally, the actuator needs to be washed on a weekly basis.

In addition, regular care needs to be given to the devices used in the administration of asthma medications. It is recommended that the device be cleaned and stored according to manufacturer’s instructions. Most devices can be cleaned by soaking for 15 minutes in warm water with mild dishwashing detergent. Never wipe the inside of a spacer as it can damage the lining and inhibit medication delivery. The device is then rinsed with clean water and allowed to air dry.

The parts that need to be washed regularly are: spacers, nebulizer medication cups, masks and mouthpieces. Never wash the nebulizer tubing as it never dries completely.

To disinfect, soak parts for 20 minutes in a solution of one part white vinegar to three parts water. Rinse with clean water and allow to air dry. The disinfection process should be done every third day if used frequently.

Spacers should never be stored in a plastic bag as this can increase static electricity in the device and lead to decreased medication delivery.

See attachments “Metered Dose Inhaler with Holding Chamber (Spacer) and Mouthpiece” for how to clean a spacer and mouthpiece and “Metered Dose Inhaler with Holding Chamber (Spacer) and Mask” for how to clean a spacer and mask.

Educational Considerations

• Develop IHP/504/IEP and emergency plans; request asthma action plan from healthcare provider.
• Educate faculty and staff on early and late warning signs and triggers.
• Adapt activity level for recess, physical education if needed.
• When exercise-induced asthma is a concern: pre-treatment with bronchodilator if ordered, hydration, adequate warm-up time, avoiding exercise during hottest part of the day, avoiding outside exercise when air quality is bad.
• Provide inhalant therapy assistance; educate student and staff in proper medication administration.
• Remove allergen triggers from child’s classroom areas.
• Avoid pets in classroom, including fish (tanks may have mold growth).
• Promote attention to indoor air quality of the school.
• Accommodate medical absences, with make-up work, etc. as needed.
• Decrease absenteeism due to asthma by assuring asthma action plan is followed during yellow zone, even in the absence of clinical symptoms (i.e., student reports night awakenings due to symptoms the previous night).
• Provide access to water to ensure adequate hydration.
• Make healthcare needs known to appropriate staff.
• Provide indoor space for before and after school activities, recess and PE when outdoor air quality is bad.
• Be aware of the outdoor air quality index and inform staff to make adjustments in schedule and/or location as needed for more information). Make arrangements for self-administration of medications in consultation with family and student, as per school district policy.

Resources

American Academy of Asthma Allergy and Immunology
aaaai.org

American Lung Association
lung.org

Asthma and Allergy Foundation of America
aafa.org

Asthma and Allergy Network
allergyasthmanetwork.org/main

Asthma – Centers for Disease Control and Prevention
cdc.gov/asthma

Asthma Center – Children’s at Hughes Spalding
choa.org/asthma

Asthma-Friendly Schools Initiative
lungusa.org/lung-disease/asthma/in-schools/asthma-friendly-schools

Asthma Guidelines and Strategies
cdc.gov/HealthyYouth/asthma/strategies.htm

At School with Asthma – Asthma and Allergy Foundation of America
aafa.org/display.cfm?id=8&sub=104&cont=710

“How Asthma-Friendly is Your School?” – National Asthma Education and Prevention Program
nhlbi.nih.gov/health/public/lung/asthma/friendly.pdf

Managing Asthma in the School Environment – Environmental Protection Agency
epa.gov/iaq/schools/managingasthma.html
The following asthma resources are included in this chapter:
1. Asthma Action Plan – CHOA version
2. How to use a metered dose inhaler (MDI)
3. Metered Dose Inhaler with Holding Chamber (Spacer) and Mouthpiece
4. Metered Dose Inhaler with Holding Chamber (Spacer) and Mask
5. Proper Use of a Diskus
6. How to Use a Peak Flow Meter
7. Asthma Georgia State Bill – For self-carrying asthma emergency medications
8. Asthma Georgia State Bill – Allowing stock albuterol
9. Form to inform parent/guardian of albuterol use at school for symptoms
10. Form to inform primary care physician of albuterol use at school for symptoms more than twice in one week
11. Outdoor Air Quality Fact Sheet
My asthma action plan

Patient name: ___________________ DOB: ____________

Doctor’s name: ___________________ Signature: ___________________

Doctor’s phone #: ___________________ Date: ____________

<table>
<thead>
<tr>
<th>Controller medicines</th>
<th>How much to take</th>
<th>How often</th>
<th>Other instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EVERY DAY</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 times per day</td>
<td>Gargle or rinse mouth after use</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quick-relief medicines</th>
<th>How much to take</th>
<th>How often</th>
<th>Other instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 puffs</td>
<td>EVERY DAY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-6 puffs</td>
<td>EVERY DAY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 nebulizer treatment</td>
<td>EVERY DAY</td>
<td></td>
</tr>
</tbody>
</table>

Prevent asthma symptoms every day:

- Take my controller medicines (above) every day
- Before exercise, take ______ puff(s) of ________________________
- Avoid triggers that make my asthma worse (See above)

NOTE: If you need this medicine more than 2 days a week, call your doctor.

Asthma triggers (check all that apply):

- Exercise
- Change in temperature
- Molds
- Animals
- Strong odors or fumes
- Smoke
- Pollens
- Respiratory infections
- Dust
- Strong emotions
- Food/Other_________

Special instructions when I am

- Doing well
- Be careful
- Ask for help

Doing well.

- No coughing, wheezing, chest tightness, shortness of breath during the day or night
- Can go to school and play

Be careful.

- Coughing, wheezing, chest tightness, shortness of breath
- Waking at night due to asthma symptoms
- Can do some, but not all, usual activities
- Runny nose, watery eyes

Ask for help.

- Very short of breath
- Continual coughing
- Skin between ribs is pulling inwards
- Difficulty speaking without running out of breath
- Quick-relief medicines have not helped
- Symptoms same or worse after 48 hours in Yellow Zone

Medical Alert! Get help!

- Take quick-relief medicine: ______ puffs every ______ minutes and get help immediately.

If skin, fingernail or lip color is blue at any time:

Call 911 for help or go to the nearest Emergency Department

Always consult your child’s doctor or other healthcare provider if you have any questions or concerns about the care or health of your child.
What Is a metered dose Inhaler (MDI)?
A MDI, or inhaler, is a device that contains asthma medicine. It delivers the medicine into the lungs. The MDI needs to be used in a certain way or it will not work.

What Is a spacer?
A spacer is a plastic tube with a mouthpiece that connects to the MDI. The spacer helps more of the medicine get into the lungs to help your child.

• If your child uses the MDI without a spacer, a lot of the asthma medicine can stick to the tongue and throat instead of going to the lungs.
• This “wastes” the medicine and decreases its usefulness.

How should my child use an MDI with spacer?
Follow the directions from your child’s therapist, nurse or doctor closely. Read the directions on the medicine, MDI and spacer labels carefully before use. Some general guidelines to follow include:
1. Wash your hands well.
2. Have your child sit up straight or stand to use the MDI.
3. Remove the caps from the spacer and inhaler.
4. Shake the inhaler well before using it each time. If it is a new inhaler or has not been used in several days, follow the manufacturer instructions for priming the inhaler.
5. Attach the inhaler to the spacer.
6. Have your child breathe out fully.
7. Place the mouthpiece of the spacer in your child’s mouth.
8. Press the inhaler to spray the medicine into the spacer.

In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.
9. Have your child take a slow, deep breath from the mouthpiece. Hold it for 5 to 10 seconds, and then, breathe out. Repeat.

10. If your child’s doctor has told you to give more than 1 puff, wait at least 1 minute between puffs. Shake the MDI before each puff, and repeat steps 6 thru 9.

NOTE: If your child breathes through his nose when he inhales, have him pinch his nose shut. If he still has trouble, ask his therapist, nurse or doctor about using a spacer with a mask.

**How can I keep track of how much medicine is left in the canister?**

Many inhalers come with a dose counter. If yours does not have one, be sure to keep track of how much you use. Here are a few ways that may help:

- The best way is to count the number of doses your child uses each day, and mark it on the calendar.
  - Mark what day that you start using a new inhaler on the calendar so you can keep track of the number of doses left.
  - Compare the number of doses used with the number of doses on the canister. Most canisters tell you how many doses it contains.
  - For example, if your child uses 4 puffs each day from a 20-puff canister, get it refilled in 45 to 50 days.
- Place a blank label on the inhaler. Place a “✓” on the label after each puff until you reach the number of puffs listed on the canister label.
- Write a refill date on the canister each time you get a new MDI at the drug store. If your child uses about the same number of doses each day, you’ll know to get a refill at the same time each month. This only works if your child does not use the inhaler for extra rescue doses.
- Do NOT float your canister in water to see if it sinks or floats. This is NOT accurate and may lead to not having medicine when your child needs it.
- Be sure to refill your prescription before the canister runs out. An inhaler never feels like it is getting empty. You must keep up with the number of puffs used, including puffs used to prime the inhaler.

**How should I clean the spacer and mouthpiece?**

Rinse the spacer and mouthpiece as needed with warm, running water. Clean them once a week with warm water and soap. Allow the spacer and mouthpiece to air dry between uses.

- Do not clean or dry the inside of the spacer with a cloth or fabric. This can create an electric charge on the inside of the spacer. The charge will decrease the amount of medicine that goes to your child’s lungs.
- Once a week, rinse the mouthpiece (boot) that holds the canister with warm running water, do not soak it. When placing the canister back into the dried boot, it must be primed with 1 puff.

See the manufacturer’s instructions for more information.

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In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.
Metered Dose Inhaler with Holding Chamber (Spacer) and Mask

Patient and Family Education

This teaching sheet contains general information only. Talk with your child’s doctor or a member of your child’s healthcare team about specific care of your child.

What Is a Metered Dose Inhaler (MDI)?
A MDI, or inhaler, is a device that contains asthma medicine. It delivers the medicine into the lungs. The MDI needs to be used in a certain way, or it will not work.

What Is a spacer?
A spacer is a plastic tube with a mask that connects to the MDI. The spacer helps more of the medicine get into the lungs to help your child.

- If your child uses the MDI without a spacer, a lot of the asthma medicine can stick to the tongue and throat instead of going to the lungs.
- This “wastes” the medicine and decreases its usefulness.

How should my child use an MDI with spacer and mask?
Follow the directions from your child’s therapist, nurse or doctor closely. Read the directions on the medicine, MDI and spacer labels carefully before use. Some general guidelines to follow include:

1. Wash your hands well.
2. Have your child sit up straight or stand to use the MDI.
3. Remove the cap from the inhaler.
4. Shake the inhaler well before using it each time. If it is a new inhaler or has not been used in several days, follow the manufacturer instructions for priming the inhaler.
5. Attach the inhaler to the spacer.
6. Cover your child’s mouth and nose with the mask. If your child fights the mask, have another person gently hold his arms.
7. Press the inhaler to spray the medicine into the spacer.
8. Keep the mask in place until your child takes 6 or 7 deep breaths. If counting breaths is a problem, slowly count to 10. The number of breaths needed to remove all the medicine can vary based on the size of the child. Small babies may need to take 6 to 10 breaths to empty the spacer.
9. Remove the mask.

In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.
10. If your child’s doctor has told you to give more than 1 puff, wait at least one minute between puffs. Shake the MDI before each puff and repeat steps 6 thru 9.
11. If the MDI contains a steroid, wipe your child’s face with soap and water to remove any remaining medicine after using the device. If possible, also rinse your child’s mouth with water. Infants and children who are too young to rinse their mouths can drink a liquid of their choice after using the MDI.

**How should I use the mask with my child?**

Giving asthma medicine should be a positive time for you and your child. Here are some ideas you can use to help get your child used to the mask:

- Explain the purpose of the mask and spacer to your child.
- Make a game of it. One idea is to have your child pretend he is an astronaut on a space ship.
- Give your child lots of praise when he does use the mask, even for a short time.
- Almost all children, even toddlers, can learn to use a spacer and mask. If you find your child always fights the mask as it is placed over the nose and mouth – stop and do not force the treatment.

If your child still cannot use the mask, let your doctor know right away. Your child may be able to use a nebulizer instead to give the asthma medicines.

**How can I keep track of how much medicine is left?**

Many inhalers come with a dose counter. If yours does not have one, be sure to keep track of how much you use. Here are a few ways that may help:

- The best way is to count the number of doses your child uses each day, and mark it on the calendar.
  - Mark what day that you start using a new inhaler on the calendar, so you can keep track of the number of doses left.
  - Compare the number of doses used with the number of doses on the canister. Most canisters tell you how many doses it contains.
  - For example, if your child uses 4 puffs each day from a 200-puff canister, get it refilled in 45 to 50 days.
- Place a blank label on the inhaler. Place a “✓” on the label after each puff until you reach the number of puffs listed on the canister label.
- Write a refill date on the canister each time you get a new MDI at the drugstore. If your child uses about the same number of doses each day, you will know to get a refill at the same time each month. This only works if your child does not use the inhaler for extra rescue doses.
- Do NOT float your canister in water to see if it sinks or floats. This is NOT accurate and may lead to not having medicine when your child needs it.
- Be sure to refill your prescription before the canister runs out. An inhaler never feels like it is getting empty. You must keep up with the number of puffs used, including puffs used to prime the inhaler.

**How should I clean the spacer and mask?**

Rinse the spacer and mask as needed with warm, running water. Clean them once a week with warm water and soap. Allow the spacer and mask to air dry between uses.

- Do not clean or dry the inside of the spacer with a cloth or fabric. This can create an electric charge on the inside of the spacer. The charge will decrease the amount of medicine that goes to your child’s lungs.
- Once a week, rinse the mouthpiece (boot) that holds the canister with warm running water. Do not soak it. When placing the canister back into the dried boot, prime it with 1 puff.

See the manufacturer’s instructions for more information.

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In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.
Proper Use of a Diskus

Open: Hold the diskus in one hand and put the thumb of your other hand on the thumb grip. Push the thumb grip away from you as far as it will go, until the mouthpiece appears and snaps in position.

Click: Hold the diskus in a level, horizontal position with the mouthpiece toward you. Slide the lever away from you as far as it will go until you hear a click. It is now ready to use. Exhale away from device, then put mouthpiece to lips.

Inhale: Breathe in quickly and deeply through the device. Airflow through the device ensures the dose is inhaled. Hold your breath for about 10 seconds.

Exhale: Breathe out.

Close diskus: After use, rinse mouth to remove the small amounts of coarse particles that may deposit in the back of the throat. Never wash any part of the diskus. Store the diskus in a dry place.

How to Use a Peak Flow Meter

- Make sure that the device reads zero or is at base level.
- Stand up.
- Take as deep a breath as possible.
- Place the mouthpiece in your mouth and close your lips around it.
- Blow out as hard and as fast as possible (one to two seconds).
- Do not cough, spit, or let your tongue block the mouthpiece.
- Write down the number that you get.
- Repeat these steps two more times and record the best of the three blows in your chart.

Establishing your “personal best” peak flow number

- Your personal best peak flow number is the highest peak flow number that you can achieve over a two-week period when your asthma is under control.
- Good control is when you feel good and do not have any asthma symptoms.
- Take peak flow readings twice a day for two to three weeks (when you wake up and early evening).
- Once your personal best is established, your healthcare provider will determine a peak flow zone system specific to you. The zones are set up similar to a traffic light that can serve as a guide for how well your asthma is under control.

Green Zone - 80-100% of your personal best signals good control
Yellow Zone - 50-79% of personal best indicates asthma is worsening; adjust medications according to your asthma plan.
Red Zone - < 50% of personal best signals medical alert, GET HELP NOW!

Record your personal best peak flow number and peak flow zones in your asthma diary.
To amend Part 3 of Article 16 of Chapter 2 of Title 20 of the Official Code of Georgia Annotated, relating to student health, so as to provide for self-administration of asthma medication by students; to provide an exemption from liability related thereto; to provide a short title; to repeal conflicting laws; and for other purposes.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.

This Act shall be known and may be cited as the "Kellen Edwin Bolden Act."

SECTION 2.

Part 3 of Article 16 of Chapter 2 of Title 20 of the Official Code of Georgia Annotated, relating to student health, is amended by adding a new Code section to read as follows:

"20-2-774. As used in this Code section, the term:

(a) 'Medication' means a medicine prescribed by

(A) A physician licensed under Chapter 34 of Title 43; or

(B) A physician’s assistant licensed under Chapter 34 of Title 43 who is authorized to prescribe medicine for the treatment of asthma in accordance with said chapter.

(b) 'Self-administration of asthma medication' means a student’s discretionary use of asthma medication prescribed for him or her.

Each local board of education shall adopt a policy authorizing the self-administration of asthma medication by a student who has asthma, provided that any student who is authorized for self-administration of asthma medication under such policy may possess and use his or her asthma medication:

(1) While in school;

(2) At a school sponsored activity;

(3) While under the supervision of school personnel; or
(4) While in before-school or after-school care on school operated property.

(c) Each public school in this state shall permit the self-administration of asthma medication by a student who has asthma, subject to the local policy adopted pursuant to subsection (b) of this Code section; and the school district and its employees and agents shall incur no liability other than for willful or wanton misconduct for any injury to a student caused by his or her self-administration of asthma medication."

SECTION 3.

All laws and parts of laws in conflict with this Act are repealed.
House Bill 362 (COMMITTEE SUBSTITUTE)
By: Representatives Clark of the 101st, Cooper of the 43rd, Fleming of the 121st, Coleman of
the 97th, Carter of the 175th, and others

A BILL TO BE ENTITLED
AN ACT

To amend Part 3 of Article 16 of Chapter 2 of Title 20 of the Official Code of Georgia Annotated, relating to student health in elementary and secondary education, so as to authorize public and private schools to stock a supply of levalbuterol sulfate; to provide for definitions; to provide for requirements and reporting; to provide for arrangements with manufacturers; to provide for rules and regulations; to provide for local board of education policies authorizing school personnel to administer levalbuterol sulfate to students who are in perceived respiratory distress; to provide for information for school personnel; to provide for limited liability; to amend Chapter 4 of Title 26 of the Official Code of Georgia Annotated, relating to pharmacists and pharmacies, so as to authorize licensed health practitioners to prescribe levalbuterol sulfate for schools; to authorize pharmacists to fill such prescriptions; to provide for related matters; to repeal conflicting laws; and for other purposes.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.
Part 3 of Article 16 of Chapter 2 of Title 20 of the Official Code of Georgia Annotated, relating to student health in elementary and secondary education, is amended by adding a new Code section to read as follows:

"20-2-776.3.
(a) As used in this Code section, the term:
(1) 'Levalbuterol sulfate' means an orally inhaled medication that contains a premeasured single dose of levalbuterol sulfate or albuterol sulfate delivered by a nebulizer or compressor device or by a pressurized metered dose inhaler used to treat perceived respiratory distress including, but not limited to, wheezing, shortness of breath, and difficulty breathing.
(2) 'Licensed practitioner' means a physician licensed to practice medicine in this state, an advanced practice registered nurse acting pursuant to the authority of Code Section

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43-34-25, and a physician assistant acting pursuant to the authority of subsection (e.1) of Code Section 43-34-103.

(b) A public or private school in this state may acquire and stock a supply of levalbuterol sulfate pursuant to a prescription issued in accordance with Code Section 26-4-116.3. A public or private school may designate an employee or agent trained in the possession and administration of levalbuterol sulfate to be responsible for the storage, maintenance, and distribution of the levalbuterol sulfate stocked by the school.

(c) Any school employee or agent of a public or private school who has completed training or received information pursuant to subsection (c) of Code Section 20-2-776.4 in recognizing the symptoms of respiratory distress and the correct method of administering the levalbuterol sulfate may:

(1) Provide levalbuterol sulfate to any student such employee or agent believes in good faith is experiencing a perceived respiratory distress for immediate self-administration; or

(2) Administer levalbuterol sulfate to any student such employee or agent believes in good faith is experiencing a perceived respiratory distress, regardless of whether the student has a prescription for levalbuterol sulfate.

(d) A public or private school may enter into arrangements with manufacturers of approved levalbuterol sulfate or third-party suppliers of levalbuterol sulfate to obtain the products free of charge or at fair market or reduced prices.

(e) No later than July 1, 2015, the State Board of Education, in consultation with the Department of Public Health, shall adopt regulations as necessary to implement the provisions of this Code section.

(f)(1) Any school personnel who in good faith administers or chooses not to administer levalbuterol sulfate to a student pursuant to this Code section shall be immune from civil liability for any act or omission to act related to the administration of levalbuterol sulfate, except that such immunity shall not apply to an act of willful or wanton misconduct.

(2) Any licensed practitioner who prescribes levalbuterol sulfate pursuant to Code Section 26-4-116.3 for use by a school in accordance with this Code section shall be immune from civil liability for any act or omission to act related to the administration of such levalbuterol sulfate, except that such immunity shall not apply to an act of willful or wanton misconduct.

20-2-776.4.

(a) As used in this Code section, the term 'levalbuterol sulfate' means an orally inhaled medication that contains a premeasured single dose of levalbuterol sulfate or albuterol sulfate delivered by a nebulizer or compressor device or by a pressurized metered dose...
inhaler used to treat perceived respiratory distress including, but not limited to, wheezing, shortness of breath, and difficulty breathing.

(b) Each local board of education shall adopt a policy authorizing school personnel to administer levalbuterol sulfate, if available, to a student upon the occurrence of perceived respiratory distress by the student, whether or not such student has a prescription for levalbuterol sulfate.

(c) Each local board of education shall provide information to school personnel on how to recognize the symptoms of respiratory distress and the correct method of administering the levalbuterol sulfate.

(d) Any school personnel who in good faith administers or chooses not to administer levalbuterol sulfate to a student pursuant to this Code section shall be immune from civil liability for any act or omission to act related to the administration of levalbuterol sulfate, except that such immunity shall not apply to an act of willful or wanton misconduct.

SECTION 2.
Chapter 4 of Title 26 of the Official Code of Georgia Annotated, relating to pharmacists and pharmacies, is amended by adding a new Code section to read as follows:

"26-4-116.3. (a) A physician licensed to practice medicine in this state, an advanced practice registered nurse acting pursuant to the authority of Code Section 43-34-25, and a physician assistant acting pursuant to the authority of subsection (e.1) of Code Section 43-34-103 may prescribe levalbuterol sulfate or albuterol sulfate in the name of a public or private school for use in accordance with Code Section 20-2-776.3.

(b) A pharmacist may dispense levalbuterol sulfate or albuterol sulfate pursuant to a prescription issued in accordance with subsection (a) of this Code section."

SECTION 3.
All laws and parts of laws in conflict with this Act are repealed.
Asthma Clinic Report to Parent

School: ___________________________ Date: ______________________
Student Name: __________________ Teacher: __________________ Grade: ______

Your child has been seen in our clinic ____ (#) of times in the past week for albuterol for symptom relief.
We also noticed the following: ______________________________________________
___________________________________________________________________________
___________________________________________________________________________

According to the NIH guidelines, your patient may not be in control of his/her asthma (use of albuterol for symptom relief > 2 times per week). You may want to schedule an appointment with his/her primary care provider to reevaluate his/her medications and symptoms. Please feel free to bring this report to your visit and have your doctor call us if needed.

Please feel free to call the school if you have any further questions or concerns relating to this visit. I can be reached at: _______________________________ (Phone #)

Sincerely,

__________________________________________  ______________________________
Reported by             Title

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Asthma Clinic Report to Primary Care Provider

School: ___________________________ Date: _______________________

Student Name: ___________________ Teacher: ___________________ Grade: ______

Your patient has been seen in our clinic ___ (#) of times in the past week for albuterol for symptom relief.

We also noticed the following: _____________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

According to the NIH guidelines, your patient may not be in control of their asthma (use of albuterol for symptom relief > 2 times per week).

Please feel free to call the school if you have any further questions or concerns relating to this visit. I can be reached at: _______________________________ (Phone #)

Sincerely,

______________________________    ___________________  
Reported by                        Title
Outdoor air quality and physical activity

Guidance for Georgia’s childcare professionals

Air pollution can make you sick. Breathing polluted air can cause serious health problems—from asthma attacks to heart trouble. Health risks rise when outdoor air pollution is at its worst, especially for those most vulnerable—children, the elderly, and people with heart or lung disease.

Why are children more vulnerable to poor air quality than adults?

• Their lungs are still growing.
• They breathe more air in relation to body weight than adults.
• Children spend more time being active outside than adults.

How do you know when the air is unhealthy?

If you care for a child or someone with asthma, it is very important to know when the outdoor air is unhealthy. A measure called the Air Quality Index (AQI) rates daily air quality on a scale of 0 (the cleanest) to 500 (the most polluted). Health warnings are set according to health risks associated with different amounts of air pollution.

Resources

• The Georgia Environmental Protection Division (EPD) issues a smog alert when the AQI is predicted to be more than 100.
• Visit CleanAirCampaign.org to register for air quality email alerts.
• Call the EPD Air Quality hotline at 404-362-4909.
• Visit georgiaair.org/smogforecast to get an air quality forecast to help plan outdoor activities.

Where and when is air pollution a problem in Georgia?

There are two kinds of outdoor air pollution in Georgia: ground-level ozone and fine particles. When these pollutants occur at the same time, smog develops. The air is usually unhealthy during much of the spring and summer in larger cities like Atlanta and Macon. Mid-sized Georgia cities like Athens, Augusta and Columbus also have their share of bad air days, while rural areas of the state have high-particle pollution, usually from open burning, diesel engines and wildfires.

The Air Quality Index (AQI) Flag program is administrated by the Captain Planet Foundation. Please contact Kathy Lively at kathy@captainplanetfdn.org or 404-522-4159 to adopt a flag program or for more information.
Though air pollution can be a problem any time of year, most smog forms during warmer months. Early May through late September is considered smog season. It is important to pay attention to air quality during these months.

### Recommended changes in outdoor activities based on the AQI

<table>
<thead>
<tr>
<th>AQI</th>
<th>Health concern</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN 0-50</td>
<td>The air is considered healthy for everyone.</td>
<td>Outdoor activities are recommended for all children and adults.</td>
</tr>
<tr>
<td>YELLOW 51-100</td>
<td>The air is unhealthy mainly for very sensitive children and adults.</td>
<td>Outdoor activities are recommended for most children and adults except those known to react to air pollution at this level.*</td>
</tr>
<tr>
<td>ORANGE 101-150</td>
<td>The air is unhealthy for sensitive individuals, including all children under the age of 18, the elderly and those with heart or lung conditions.</td>
<td>Children, the elderly and sensitive adults should limit outdoor activity to times of the day when pollutant concerns are lowest.</td>
</tr>
<tr>
<td>RED 151-200</td>
<td>The air is unhealthy for everyone.</td>
<td>Children and adults should avoid outdoor activities completely. Some times during the day may be safe for outdoor activity (see information below).</td>
</tr>
<tr>
<td>PURPLE 201-400</td>
<td>The air is unhealthy or even hazardous for everyone.</td>
<td>All children and adults should avoid outdoor activities completely throughout the day.</td>
</tr>
</tbody>
</table>

*Parents and other caregivers should watch children and the elderly carefully for signs of distress to find out if they are particularly sensitive to air pollution. Always have asthma medication on hand if you care for people with asthma.

### Ozone and particle pollution fluctuates in patterns:

- Ozone pollution is usually at its worst between 2 p.m. and 7 p.m. Plan outdoor activities for the morning and limit time outdoors after 2 p.m. when possible.
- Particle pollution may peak during morning and evening rush hour but can stay high all day. Limit outdoor time during the day and in the evening.
- If both ozone and particle pollution are high, limit outdoor activity all day and in the evening.
- If an air-conditioned, indoor space is not available, reduce the time and force of outdoor activities. The harder the breathing, the more air pollution goes into the lungs.

Visit [georgiaair.org/tmp/today/amp_AQI.html](http://georgiaair.org/tmp/today/amp_AQI.html) to check the AQI for locations in Georgia.

Some physicians and affiliated healthcare professionals on the Children’s Healthcare of Atlanta team are independent providers and are not our employees.
Autism Spectrum Disorder (ASD)

Autism spectrum disorder (ASD) is a group of developmental disabilities that can cause significant social, communication and behavioral challenges. There is often nothing about how people with ASD look that sets them apart from other people, but people with ASD may communicate, interact, behave, and learn in ways that are different from most other people. The learning, thinking, and problem-solving abilities of people with ASD can range from gifted to severely challenged. Autism spectrum disorder is a life-long condition; some people with ASD need a lot of help in their daily lives; others need less and this need can change over time. A diagnosis of ASD now includes several conditions that used to be diagnosed separately: autistic disorder, pervasive developmental disorder not otherwise specified (PDD-NOS), and Asperger syndrome. These conditions are now all called autism spectrum disorder.

Signs and Symptoms

People with ASD often have difficulties with social, emotional, and communication skills. They might repeat certain behaviors and might not want change in their daily activities. Many people with ASD also have different ways of learning, paying attention, or reacting to things. Signs of ASD begin during early childhood and typically last throughout a person’s life.

Children or adults with ASD might:
• Not point at objects to show interest (for example, not point at an airplane flying over)
• Not look at objects when another person points at them
• Have trouble relating to others or not have an interest in other people at all
• Avoid eye contact and want to be alone
• Have trouble understanding other people’s feelings or talking about their own feelings
• Prefer not to be held or cuddled, or might cuddle only when they want to
• Appear to be unaware when people talk to them, but respond to other sounds
• Be very interested in people, but not know how to talk, play, or relate to them
• Repeat or echo words or phrases said to them, or repeat words or phrases in place of normal language
• Have trouble expressing their needs using typical words or motions
• Not play “pretend” games (for example, not pretend to “feed” a doll)
• Repeat actions over and over again
• Have trouble adapting when a routine changes
• Have unusual reactions to the way things smell, taste, look, feel, or sound
• Lose skills they once had (for example, stop saying words they were using)

Diagnosis

Diagnosing ASD can be difficult since there is no medical test, like a blood test, to easily get a yes/no answer. In addition, the same person with ASD will change over time, so professional evaluation is needed. Doctors look at the child’s behavior and development to make a diagnosis. ASD can sometimes be detected at 18 months or younger. Research has shown that by age 2, a diagnosis by an experienced professional can be considered reliable, valid and stable. Studies have shown that parents of children with ASD notice a developmental problem before their child’s first birthday. Concerns about vision and hearing were more often reported in the first year, and differences in social, communication, and fine motor skills were evident from 6 months of age. Unfortunately, many children do not receive a final diagnosis until much older. CDC prevalence studies found that children identified with ASD were not diagnosed until after age 4. This delay means that children with ASD might not get the early help they need. Studies suggest that starting treatment early, ages 2-3 could save $1.28M over the lifetime of a child, when compared to starting treatments at 5-6 years old. These costs primarily occur in non-medical costs like housing and employment supports.
Treatment

Research shows that early intervention treatment services can improve a child’s development. Early intervention services help children from birth to 3 years old (36 months) learn important skills. Services can include therapy to help the child talk, walk, and interact with others. Children under the age of 3 years (36 months) who are at risk of having developmental delays may be eligible for services under Individual with Disabilities Education Act (IDEA) Part C. These services are provided through an early intervention system in every state. Through this system, parents can request an evaluation. In addition, treatment for particular symptoms, such as speech therapy for language delays, often does not need to wait for a formal ASD diagnosis.

The American Academy of Pediatrics is currently revising their Clinical Report on Management of Children with Autism Spectrum Disorders. The new report is expected to be released in 2016 and will include updated information on medical management of seizures, GI problems, sleep disturbances and medication option.

Prevalence

ASD occurs in all racial, ethnic, and socioeconomic groups. More people than ever before are being diagnosed with ASD. Scientists believe that the increase in ASD diagnosis is likely due to a combination of factors: broader definition of ASD, removing the stigma from receiving a diagnosis, and better efforts in standardizing criteria for ASD. However, a true increase in the number of people with an ASD cannot be ruled out.

• About 1 in 68 children in the US are estimated to meet the criteria for diagnosis of autism spectrum disorder (ASD) according to estimates from CDC’s Autism and Developmental Disabilities Monitoring (ADDM) Network.
• ASD is over 4 times more common among boys (1 in 42) than among girls (1 in 189).
• Studies in Asia, Europe, and North America have identified individuals with ASD with an average prevalence of about 1%. A study in South Korea reported a prevalence of 2.6%.

Causes

While not all of the causes of ASD are known, there is some evidence that the critical period for developing ASD occurs before, during, and immediately after birth. In addition, we have learned that many different factors interact in complex ways to make a child more likely to be diagnosed with ASD, including environmental, biologic and genetic factors. Right now, scientists’ best estimates are that about half of a person’s risk for developing ASD comes from genes, and about half from environmental factors.

Risk Factors and Characteristics
• Parents who have a child with ASD have a 7-20% chance of having a second child who is also affected.
• Children born to older parents are at greater risk for having ASD.
• A small percentage of children who are born prematurely or with low birth weight are at greater risk for having ASD.
• Studies have shown that among identical twins, if one child has ASD, then the other will be affected about 36-95% of the time. In non-identical twins, if one child has ASD, then the other is affected about 0-31% of the time.
• ASD tends to occur more often in people who have certain genetic or chromosomal conditions. About 10% of children with autism are also identified as having Down syndrome, fragile X syndrome, tuberous sclerosis, or other genetic and chromosomal disorders.
• Almost half (46%) of children identified with ASD has average to above average intellectual ability.
• ASD commonly co-occurs with other developmental, psychiatric, neurologic, chromosomal, and genetic diagnoses. The co-occurrence of one or more non-ASD developmental diagnoses is 83%. The co-occurrence of one or more psychiatric diagnoses is 10%.
• About 20-30% of children with autism have seizures, and children with ASD are four times more likely to report gastrointestinal issues. They can also have feeding disorders or food selectivity, which can lead to serious nutritional deficits.
Resources

American Academy of Pediatrics Clinical Report
pediatrics.org/cgi/doi/10.1542/peds.2007-2362

American Psychiatric Association Fact Sheet
Autism Spectrum Disorder (DSM-5 revised diagnosis)
dsm5.org/Documents/Autism%20Spectrum%20Disorder%20Fact%20Sheet.pdf

Centers for Disease Control and Prevention
National Center on Birth Defects and Developmental Disabilities
cdc.gov/ncbddd/autism/index.html
cdc.gov/ncbddd/autism/facts.html#ref

Marcus Autism Center
marcus.org

References

Brain Injury/Concussion

Acquired Brain Injury

Acquired brain injury (ABI) is broadly defined and includes brain injuries from internal and external causes. According to the BIA (Brain Injury Association; biausa.org), acquired brain injury is an “injury to the brain which is not hereditary, not congenital (present at birth) or not degenerative (progressively worsening).” Acquired brain injury (ABI) is the leading cause of death and disability in children and young adults. ABI is an injury to the brain secondary to trauma (external) or internal causes including brain tumors, stroke, aneurysm, anoxia, infections or ingestion of toxic substances.

Traumatic Brain Injury

Traumatic brain injury (TBI) is the single most common cause of brain injury in the young child. TBI is the most common cause of death from 1 to 18 years of age. TBI results when a mechanical force is applied to the brain and disrupts normal function. Common injuries include motor vehicle accidents and falls. TBIs are categorized as “severe” (e.g. deep coma), “moderate” or “mild” (e.g. temporary confusion or disorientation), based on the degree of coma (or unconsciousness) sustained immediately after injury. This is assessed by the Glasgow Coma Score (GCS) which is universally used to evaluate the patient’s degree of unconsciousness. TBIs may be further categorized as “open” or “closed.” Open TBIs occur when the skull is breached such as occurs with wounds such as a gunshot injury. Closed TBIs occur when the scalp and skull remain intact, for example, after a fall. More than two million TBIs occur annually in this country. TBIs occur in all ages, with the highest rate in children under 5 years of age.

Concussion

A concussion is a type of TBI that produces a physiologic change to the brain rather than an anatomic change. Symptoms can be manifested with a relatively minor concussive injury and vary between individuals. Symptoms of a concussion may include but are not limited to headache, dizziness, nausea, vomiting, feeling dazed or confused, a brief loss of consciousness less than 30 minutes, difficulties with memory or concentration, changes in sleep patterns and feeling mentally foggy. These symptoms may present immediately, intermittently, or be delayed. There can be significant consequences such as poor cognition with subsequent academic decline for several weeks, months or longer. These symptoms usually resolve in time, but the student needs recognition and medical evaluation during this time to avoid further problems such as missed learning opportunities, loss of self-esteem and inappropriate labeling by peers and school staff. A school nurse may be the first one a student approaches with symptoms from a concussion or mild brain injury, and a child may only experience problems once back in school or playing sports.

School nurses can provide coaches, teachers, parents and players with educational materials from the Centers for Disease Control and Prevention: cdc.gov/concussion/HeadsUp/schools.html and from Children’s Healthcare of Atlanta at choa.org/concussion (refer to Chapter 12, For Families, for parent and patient teaching sheets).

Brain Injury / Concussion and the School Nurse Role

Regardless of the degree of TBI, children need medical evaluation at some point following the injury. Patients who are comatose (moderate to severe TBI) are almost always triaged and evaluated medically in an emergency room.

Depending on the injury, they may be transferred to the operating room, intensive care unit or a regular hospital floor. Inpatient and outpatient rehabilitation may be needed. School nurses usually encounter individuals who are discharged from the hospital.

For those that are not acute, a visit to their pediatrician or community clinic within days may be appropriate. In some cases, no evaluation is done, and the child may present to the school nurse first. Therefore it is important to ask if the student has experienced a recent TBI, in sports or recreational activities.
The younger the age at injury, the more at risk the child is for lifelong effects of the injury. This is especially true if two or more TBIs occur within a short period of time. This is known as the “second impact syndrome” which refers to potentially life-threatening brain swelling that occurs with a second head injury, before the first TBI has had time to heal.

Each brain injury, whether from internal or external causes, is unique and the signs and symptoms can vary depending on the severity and the specific area injured. Possible symptoms may include:

**Physical Disabilities such as:**
- Vision, hearing and other sensory difficulties
- Headaches, fatigue and sleep disturbances
- Muscle spasticity or paralysis
- Seizures
- Chronic pain
- Speech impairments
- Receptive and/or expressive language difficulty
- Difficulty with balance, mobility and normal physical activity
- Difficulty with fine motor skills, eye-hand coordination, such as writing or drawing.

**Cognitive Learning Problems such as:**
- Short and/or long-term memory
- Concentration and attention
- Comprehension, processing and problem-solving
- Reading, writing, math, sequencing and judgment
- Time management
- Understanding cause and effect
- Inability to prioritize thoughts and determine the main idea
- Misperception of abstract or complex information.

**Social, Behavioral and Emotional Difficulties such as:**
- Mood swings, anxiety and depression
- Difficulty with relationships
- Difficulty with monitoring impulsive reactions
- Difficulty with interpreting social gestures and body language
- Loss of self-esteem and confidence
- Restlessness
- Loneliness and isolation
- Inability to manage stress or cope with change
- Lack of motivation
- Frustration and embarrassment with life changes
- Emotional liability or anger, with loss of self-control.
Management during School

During healing it is important to reduce the risk of another subsequent concussion or brain injury soon after the initial injury. We know that cognitive abilities can be exponentially affected if another injury occurs before the first has adequately healed. Investigators do not know the exact time it takes for the brain to heal from a TBI, but it is reasonable to assume that healing has occurred when the child is asymptomatic. Thus, the symptomatic child should return to school, play and sports gradually and under supervision.

As the student grows and develops, parents and teachers also may notice new problems when new tasks and curricula are introduced, as the earlier injury can make it hard for the student to learn new skills. Planning for the child’s return to school after a brain injury is very important. “Brain function is highly interconnected, and an injury can sever or disrupt established pathways, requiring time to heal and new connections to form. Erratic academic performance should not be interpreted as failure or a sign that the student lacks intelligence. With the support of the school staff, the optimal combination of accommodations, student support strategies and medical interventions can be put in place to enable success.” (The Student with a Brain Injury: Achieving Goals for Higher Education, American Council on Education, 2002; brainline.org/content/2008/10/student-brain-injury-achieving-goals-higher-education_pageall.html)

Educational Considerations

For students who are returning to school after a brain injury, treatment for ABI/TBI/Concussion may be lengthy. Students can make rapid advances in academic skills and knowledge, especially in the first six to 12 months after an injury. There may also be plateaus and regressions. The education plan must therefore be extremely flexible. Open communication with the family and the student must be ongoing. Formal special education with an IEP and related services will be necessary in many cases. When only minimal support is needed in the regular education program, modifications and accommodations should be developed in a 504 Plan. It is also important to obtain an adequate assessment of current functioning with which appropriate expectations and goals can be developed.

Students who have a concussion or mild brain injury need “brain rest” or “cognitive rest” following the injury, which will also affect their school performance (refer to Chapter 2 for table of information on “cognitive rest”). Listed below are possible modifications for students:

- Student support team or guidance counselor intervention.
- Develop an IHP/504/IEP, including emergency plan.
- Provide staff education/training for specific brain injury information.
- IEP may need much more frequent review than some other IEPs.
- Promote frequent and ongoing communication between parents, rehabilitation staff, teachers and related service providers.
- Educational accommodations may include:
  - **VERY IMPORTANT**: Give directions both verbally and visually.
  - Reduce length of school day on initial transition into school, increase length of day as much as possible depending on child’s progress.
  - Provide multiple choice responses due to memory or retrieval difficulty.
  - Break up large tasks into smaller sections.
  - Modify amount of homework due to continued fatigue.
  - Permit modification for written output due to reduced handwriting speed/endurance.
  - Provide copy of a peer’s and/or teacher notes for student with reduced endurance in handwriting.
  - Allow extra time to finish assignments and tests.
  - Give directions one step at a time for tasks with many steps, verbally and in writing.
- Demonstrate new tasks, and provide opportunities to practice.
- Give concrete examples of new ideas and concepts whenever possible.
- Keep consistent routines, discuss changes ahead of time.
- Help student with assignment book and daily schedule for organization.
- Allow rest periods as needed.
- Reduce distractions as much as possible, with seat placement, etc.
- Behavior modification plans should be concrete and short-term.

**Management during Sports**

Students with symptoms of concussion or mild brain injury need medical attention and should not return to playing sports until they have medical clearance from a physician. Students who are not fully recovered from a concussion are at high risk for cumulative and even catastrophic effects if a second concussion occurs soon after the initial injury.

New methods to detect the effect of concussions are available for athletes. A computerized pre-and post-concussion test, available through the Children's Healthcare of Atlanta Sports Medicine program, called ImPACT determines if the blow to the head affects cognitive skills, such as concentration and reflexes. Tests of this type add to the information that physicians use in the determination of safe return to play. Many schools now require baseline testing at the beginning of the sports season for student athletes as part of their required pre-participation physical examination. Students who receive a blow to the head during a game or practice are then re-evaluated using the ImPACT post-test to determine any changes that would determine return to play.

**Returning to Regular Activities**

Allow time for each stage of healing to occur. It is important to follow guidelines set for the student to slowly progress back into full schoolwork and full play/sports. A student should be able to return to full schoolwork before returning to full game play in sports. A medical clearance will be needed from a doctor before returning to sports.
Benefits of Strict Rest After Acute Concussion: A Randomized Controlled Trial

Danny George Thomas, MD, MPH\textsuperscript{a}, Jennifer N. Apps, PhD\textsuperscript{b}, Raymond G. Hoffmann, PhD\textsuperscript{a}, Michael McCrea, PhD\textsuperscript{c}, Thomas Hammeke, PhD\textsuperscript{d}

OBJECTIVES: To determine if recommending strict rest improved concussion recovery and outcome after discharge from the pediatric emergency department (ED).

METHODS: Patients aged 11 to 22 years presenting to a pediatric ED within 24 hours of concussion were recruited. Participants underwent neurocognitive, balance, and symptom assessment in the ED and were randomized to strict rest for 5 days versus usual care (1–2 days rest, followed by stepwise return to activity). Patients completed a diary used to record physical and mental activity level, calculate energy exertion, and record daily postconcussive symptoms. Neurocognitive and balance assessments were performed at 3 and 10 days postinjury. Sample size calculations were powered to detect clinically meaningful differences in postconcussive symptom, neurocognitive, and balance scores between treatment groups. Linear mixed modeling was used to detect contributions of group assignment to individual recovery trajectory.

RESULTS: Ninety-nine patients were enrolled; 88 completed all study procedures (45 intervention, 43 control). Postdischarge, both groups reported a 20% decrease in energy exertion and physical activity levels. As expected, the intervention group reported less school and after-school attendance for days 2 to 5 postconcussion (3.8 vs 6.7 hours total, \( P < .05 \)). There was no clinically significant difference in neurocognitive or balance outcomes. However, the intervention group reported more daily postconcussive symptoms (total symptom score over 10 days, 187.9 vs 131.9, \( P < .03 \)) and slower symptom resolution.

CONCLUSIONS: Recommending strict rest for adolescents immediately after concussion offered no added benefit over the usual care. Adolescents’ symptom reporting was influenced by recommending strict rest.

WHAT’S KNOWN ON THIS SUBJECT: Expert consensus recommends rest after concussion with stepwise return to activity. Animal and retrospective human data suggest that early mental and physical activity may worsen outcome. There are no pediatric studies testing the efficacy of recommending strict rest after concussion.

WHAT THIS STUDY ADDS: Recommending strict rest postinjury did not improve outcome and may have contributed to increased symptom reporting. Usual care (rest for 1–2 days with stepwise return to activity) is currently the best discharge strategy for pediatric mild traumatic brain injury/concussion.
Pediatric head trauma represents a significant injury burden for children, and emergency department (ED) visits for sports-related traumatic brain injury (TBI) have increased 60% over the previous 10 years. Most of these patients are discharged from the ED with a diagnosis of concussion and are instructed to rest. Rest recommendations are motivated by a concern for reinjury during recovery from a concussion. Additionally, retrospective studies and animal models demonstrate that early physical and mental activity can impair recovery. Because human data on postinjury exertion is limited, expert consensus recommends 24 to 48 hours of rest before beginning a stepwise return to activity. Many clinicians recommend a longer period of rest, and some clinicians have advocated "cocoon therapy," which restricts patients to several days in a darkened room before slowly returning to activity. To date, the optimal period of rest after concussion remains unknown.

We sought to investigate the effectiveness of recommending 5 days of strict rest compared with the usual care of 24 to 48 hours of rest on outcomes after discharge from the ED with acute concussion. We hypothesized that patients who were recommended strict rest after injury would have a greater decrease in physical and mental activity and improved mean neurocognitive, balance, and symptom outcomes compared with patients who were recommended the usual care.

**METHODS**

**Design and Procedures**

The study was a prospective randomized controlled trial of patients presenting to the Children's Hospital of Wisconsin Emergency Department and Trauma Center with mild TBI/concussion (mTBI) between May 2010 and December 2012 (see study overview, Fig 1). mTBI was defined by using the Acute Concussion Evaluation (ACE) form, a standardized tool endorsed by the Centers for Disease Control (CDC). The study was approved by the Children's Hospital of Wisconsin Institutional Review Board and registered with ClinicalTrials.gov (NCT01101724).

**Study Participants**

Patients were screened for eligibility if they presented with a chief complaint of an injury to the head (eg, head injury, scalp laceration), including any associated mechanism with the potential to have sustained direct force or transmitted force to the head (eg, motor vehicle collision, fall). Children were eligible if they were 11 to 22 years of age and presented to the ED within 24 hours of injury and were diagnosed with a concussion. Patients were excluded if they were non-English speaking or if their guardian could not consent in English, were diagnosed with intellectual disability (IQ <70) or a previous mental defect or disease (eg, attention-deficit/hyperactivity disorder or learning disability), were diagnosed with an intracranial injury (eg, intracranial bleeding, cerebral contusion), had no legal guardian present, were being admitted, or had conditions that interfered with valid assessment of signs and symptoms, neurocognitive, or balance testing. In addition, patients were excluded if their clinician was uncomfortable with study procedures (eg, randomization or time needed for ED assessments) or if the patient lived >1 hour from the Medical College of Wisconsin. Imaging, not necessary for study participation, was obtained at the discretion of the treating clinician. Assent was obtained from patients, and informed consent was obtained from caregivers.

**Procedures**

Adolescents underwent initial screening to gather demographic information, injury details, initial symptoms, and risk factors for prolonged recovery (eg, history of previous concussion or migraine). Participants also received computerized neurocognitive testing and a standardized balance assessment in private rooms in the ED. Attempts were made to minimize distractions and interruptions during testing (eg, turning off the TV, sending younger siblings to the waiting room, placing a sign on the door notifying staff that testing was in progress). Participants were then randomized to 1 of 2 groups using randomization in blocks of 4 with sealed envelopes (a random number generator to assign groups). Participants, parents, and health care providers were notified immediately of the results of the randomization.

**FIGURE 1**

Study overview.
A trained research assistant arranged follow-up appointments with the participants for 3 and 10 days after their ED visit, at which time repeat neurocognitive tests and balance assessments were administered. For the majority of patients, follow-up measures were administered by a research assistant in the patient’s home in a quiet environment. A small number of patients returned to the hospital for testing in our Translational Research Unit, a corporate of a stepwise return to activity. Because of the majority of patients, follow-up measures were administered by a research assistant in the patient’s home in a quiet environment. A small number of patients returned to the hospital for testing in our Translational Research Unit, a corporate office suite, or an ED room. The principal investigator (DT) and coinvestigator (JA) reviewed follow-up test results within 48 hours of completion and consulted with the family by phone within 24 to 48 hours to communicate any concerning test results or symptom scores. They remained available for questions throughout the study period. If clinically indicated, patients were referred to the ED, their primary care physician, or a concussion specialist for follow-up.

Interventions
Participants were randomized either to the strict rest (intervention) group or the usual care (control) group. To accurately represent the usual care for mTBI, the treating attending physician was free to verbally recommend activity restrictions as they saw fit in the usual care group. A survey found that a majority of ED physicians at our institution instruct patients to rest for 1 or 2 days and then return to school and a stepwise return to physical activity only after the patient’s symptoms have resolved, consistent with best practices outlined by the CDC. The strict rest group received recommendations from the treating physician and discharge instructions to maintain 5 days of strict rest at home (specifically, no school, work, or physical activity) followed by a stepwise return to activity. Because no optimal time of postinjury rest has been determined, this 5-day interval was chosen to maximize differences between usual care and strict rest groups while minimizing the burden placed on the subject and family. The strict rest group was provided school and work excuses for the 5 days postinjury. Both groups received the Ace—Emergency Department (ACE-ED) Care plan, endorsed by the CDC, as discharge instructions and were encouraged to follow up with their primary medical doctor or the Concussion Clinic. Forms differed only in the duration of time for which rest was recommended. Research assistants observed and documented the discharge instruction information provided to each patient to ensure clinician compliance with group allocation.

Assessment and Outcome Measures
Outcome measures were selected to measure both compliance with discharge instructions as well as the effect of those instructions on short-term outcomes (first 10 days).

Compliance: Physical and Mental Activity
The Three-Day Activity Diary has been validated as a measure of activity level and energy expenditure compared with accelerometers and doubly labeled water measurements. Participants record activity levels in 15-minute intervals over the first 3 days. Weight and gender were used to calculate basal metabolic rate, and reported activity levels were used to calculate total energy expenditure. While in the ED, participants retrospectively completed the diary for the day before and the day of the ED visit under the guidance of a research assistant. Participants were instructed to complete the diary several times a day, report the time in hours spent on specific mental activities, and note any effects on symptoms. Reportable mental activities were taken from the list of activities participants were advised to limit on the ACE-ED Care form (see Table 1).

A research assistant collected, reviewed, and discussed the Three-Day Activity Diary with the participants at the 3-day follow-up appointment. The research assistant then instructed participants on the use of a Seven-Day Activity Diary, which is modeled after the Three-Day Activity Diary and assesses activity level and energy expenditure between days 4 and 10, with activities recorded in 1-hour intervals. Participants were instructed to complete this diary before bed each night. At the 10-day follow-up appointment, the research assistant collected, reviewed, and discussed the Seven-Day Activity Diary with the participants. Data from both diaries was used to calculate daily total energy expenditure, activity-related energy expenditure, physical activity level, and mental activity.

Efficacy: Symptom Survey
A standard 19-symptom Post-Concussive Symptoms Scale (PCSS) assessing symptoms in 4 domains (physical, cognitive, emotional, and sleep) was included in the diaries. Each symptom was graded by the subject from none (0) to severe (6) and was obtained daily for the first 10 days. Data were analyzed for total PCSS score, total number of individual symptoms reported, and subtotal scores for each PCSS domain.

Efficacy: Neurocognitive Assessment
Our primary neurocognitive assessment was the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) computerized test battery. ImPACT V2.0 (ImPACT Applications, Inc, Pittsburgh, PA) is a widely used commercial computer-based neurocognitive test platform. This measure has been validated for use in the ED setting and reliably detects neurocognitive deficits after concussion. ImPACT administers 6 neuropsychological test modules, the composite scores of which are reported in 5 fields: Verbal Memory,
Visual Memory, Reaction Time, Processing Speed, and Impulse Control.\textsuperscript{19–29} Scores are assessed based on age- and gender-matched percentiles for 11 to 13 years, 14 to 18 years, and >19 years using existing ImPACT normative data. This test was administered in the ED and at both follow-up visits. In addition to ImPACT, during follow-up visits, subjects completed a paper ancillary neuropsychological test battery. The battery comprised tests demonstrated to be sensitive, valid, and reliable in the assessment of mild traumatic brain injury. The battery included Hopkins Verbal Learning Test, Trail Making Test Parts A & B, Symbol Digit Modalities Test, Letter-Number Sequencing from the Wechsler scales, and Controlled Oral Word Association Test (verbal fluency).\textsuperscript{30–34}

**Efficacy: Balance Assessment**

The Balance Error Scoring System (BESS) objectively assesses balance.\textsuperscript{35,36} The test consists of 3 stance conditions (double leg, single leg, tandem); each stance is performed with eyes closed on both normal firm flooring and a medium-density foam surface. Inability to maintain stance or eye opening is deemed an error and is recorded as a quantitative measurement of postural instability. Performance is scored by adding the error points for each of 6 trials. BESS was performed in the ED and at 3 and 10 days. Because of time constraints, patients

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### TABLE 1 Physical and Mental Activity Diary Metrics

<table>
<thead>
<tr>
<th>PAR</th>
<th>Intervals Recorded</th>
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<tbody>
<tr>
<td>1–3 d</td>
<td>4–10 d</td>
</tr>
<tr>
<td>Physical activity scale</td>
<td></td>
</tr>
<tr>
<td>A. Sleeping (resting in bed)</td>
<td>0.95</td>
</tr>
<tr>
<td>B. Sitting (eating, writing, using the computer, etc)</td>
<td>1.5</td>
</tr>
<tr>
<td>C. Standing (washing, combing, shaving, cooking, etc)</td>
<td>2</td>
</tr>
<tr>
<td>D. Walking indoors (light home activities)</td>
<td>2.8</td>
</tr>
<tr>
<td>E. Walking outdoors (light manual work)</td>
<td>3.5</td>
</tr>
<tr>
<td>F. Low intensity Activity (golf, gardening, biking [&lt;8 mph], table tennis, etc)</td>
<td>4.4</td>
</tr>
<tr>
<td>G. Moderate-intensity activity (jogging, biking 7–12 mph, hiking, horseback riding, dancing, snow shoveling, loading and unloading goods, etc)</td>
<td>6.5</td>
</tr>
<tr>
<td>H. High-intensity activity (running [&lt;8 mph], bicycling (&gt;12 mph), swimming, tennis, basketball, football, soccer, wt training, carrying heavy load upstairs, etc)</td>
<td>10.0</td>
</tr>
<tr>
<td>I. Maximum-intensity activity (very high to maximal intensity: competitive running (&gt;6 mph), cross-country skiing, etc)</td>
<td>15.0</td>
</tr>
</tbody>
</table>

**Mental activity**

- **(Low) Listening to music/radio or reading**
  
- **(Low) Watching TV, surfing the internet, or playing video games**
  
- **(Moderate) In the classroom during school**
  
- **(Moderate) After-school activities, clubs or job**
  
- **(High) Working on homework or studying**
  
- **(High) Taking quizzes, tests, and or giving presentations**

Calculations were as follows. Basal Metabolic Rate (BMR) calculated by using Schofield equation: Male, BMR = 0.074 \* wt (kg) + 2.754 MJ/d; female, BMR = 0.056 \* wt (kg) + 2.898 MJ/d. Total energy expenditure (TEE) calculated by summing the number of 15-min periods for each categorical value (A–I). Each result was then multiplied by its respective PAR and the subjects predicted BMR. Totals were then added to determine 24-h exertion. Activity-related energy expenditure calculated by subtracting BMR from TEE. Physical activity level (PAL) calculated by dividing TEE by BMR. PAR, physical activity ratio.
in the ED were only tested on firm flooring and scores assessed for only 3 trials.

**Statistical Analysis**

To investigate whether treatment led to improved symptom, neurocognitive, and balance outcomes and whether there was a significant difference in recovery trajectory based on treatment group assignment, linear mixed-model analyses were used. Linear mixed modeling demonstrates a mean group response as well as random effects and allows each subject to have a different recovery trajectory. It also accounts for correlations over time induced by multiple observations on the same subject. If data are not normally distributed, then a general linear mixed model is used. In addition to these analyses, time to symptom resolution (defined as PCSS ≤ 7) was analyzed by using a proportional hazards model. The total number of symptoms reported, neurocognitive and balance outcome differences from ED (day 0) to day 3 and day 10, and differences in activity and symptoms in the first 5 days and over the course of the study were compared by using t tests or Wilcoxon rank sum tests when the data were not normal. Data analysis was conducted by using SAS (V9.3) and Stata (V13.0). The intention-to-treat principle was used for all analyses. Statistical significance was P < .05. The Bonferroni multiple comparisons adjustment for comparison of changes at days 3 and 10 was P < .025. A subgroup analysis was planned a priori to assess how preinjury risk factors and initial presentation influence treatment effects.

**Calculation of Sample Size**

A priori we determined that a sample size of 44 subjects in each group was sufficient to detect a 12-point difference (a moderate effect size) in total PCSS (based on an estimated SD of 22) for a power of 0.80 and type I error (α) of .05. For the computerized neurocognitive assessment, we were powered to detect minimal clinically significant differences (a difference of 9% in Verbal Memory, 17% in Visual Memory, 15% in Reaction Time, and 14% in Processing Speed).23

**RESULTS**

**Demographics**

Three-hundred and seventy patients with mTBI met inclusion criteria during the study period (see Fig 2); 178 met exclusion criterion, and an additional 93 patients declined to participate, leaving a sample of 99 participants who were randomized. The strict rest group was slightly older (mean 14.7 vs 13.1 years), and this was associated with slight differences in weight and basal metabolic rate (see Table 2). One-third of participants in each group were female. There were no significant differences between treatment groups at time of ED evaluation including mechanism of injury, symptoms at ED presentation, history of migraine, previous mTBI, ED evaluation, and ED treatment. The

<table>
<thead>
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<th>TABLE 2 Demographic Table</th>
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<tr>
<td>Demographics</td>
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<tr>
<td></td>
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<tr>
<td>Age, y, median (IQR)</td>
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<tr>
<td>Wt, kg, median (IQR)</td>
</tr>
<tr>
<td>Basal metabolic rate, MJ/d, median (IQR)</td>
</tr>
<tr>
<td>Preinjury activity (day before injury)</td>
</tr>
<tr>
<td>TEE, MJ/d, median (IQR)</td>
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<tr>
<td>PAL, median (IQR)</td>
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<tr>
<td>AEE, MJ/d, median (IQR)</td>
</tr>
<tr>
<td>Risk factors of prolonged recovery</td>
</tr>
<tr>
<td>Female gender, n (%)</td>
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<tr>
<td>Previous mTBI, n (%)</td>
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<tr>
<td>History of migraine, n (%)</td>
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<tr>
<td>Mechanism of injury</td>
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<tr>
<td>Sports, n (%)</td>
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<tr>
<td>Football</td>
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<tr>
<td>Basketball</td>
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<td>Soccer</td>
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<td>Baseball</td>
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<td>Cheerleading</td>
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<td>Biking</td>
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<td>Other</td>
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<tr>
<td>MVC n (%)</td>
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<tr>
<td>Fall, n (%)</td>
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<tr>
<td>Assault, n (%)</td>
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<tr>
<td>Other, n (%)</td>
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<tr>
<td>ED reported signs/symptoms</td>
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<tr>
<td>Postconcussive symptoms, n (%)</td>
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<tr>
<td>Immediate symptoms, n (%)</td>
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<tr>
<td>Loss of consciousness, n (%)</td>
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<tr>
<td>Anterograde amnesia, n (%)</td>
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<tr>
<td>Retrograde amnesia, n (%)</td>
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<tr>
<td>ED evaluation</td>
</tr>
<tr>
<td>Head computed tomography obtained, n (%)</td>
</tr>
<tr>
<td>ED treatment</td>
</tr>
<tr>
<td>Analgesic, n (%)</td>
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<tr>
<td>Antiemetic, n (%)</td>
</tr>
</tbody>
</table>

AEE, activity-related energy expenditure; IQR, interquartile range; MVC, motor vehicle collision; PAL, physical activity level; TEE, total energy expenditure.

For the calculation of sample size, the following assumptions were made: P = .05, α = .01.

Symptoms include dazed or stunned, confused about events, answers questions slowly, and repeats questions.
most common mechanism of injury was sports, specifically football. Nearly all participants reported some symptoms in the ED and approximately one-third reported a loss of consciousness. Only one-third of the patients in the usual care group were observed verbally receiving a specific duration to restrict activity. Of those who did receive instructions, the median duration of strict activity restriction was 2 days. In the strict rest group, 94% were observed verbally receiving a specific duration to restrict activity with a median duration of 5 days. Follow-up procedures were completed for 88 participants (43 usual care control [C] vs 45 strict rest intervention [I]).

Compliance: Physical and Mental Activity Level
Both groups exhibited an ~20% decrease in energy expenditure and physical activity level in the first 5 days postinjury. The usual care group reported more total hours in high and moderate mental activity on days 2 to 5 than the strict rest group (8.33 [C] vs 4.86 [I] hours, \( P = .03 \)), including more school and after school mental activity (6.66 [C] vs 3.77 [I] hours, \( P = .03 \)) (see Fig 3).

Efficacy: Symptom, Neurocognitive, and Balance Outcomes
In both groups, >60% of patients experienced symptom resolution (defined as PCSS ≤7) during the follow-up period (67% [C] vs 63% [I], \( P = .82 \)). However, it took 3 days longer for 50% of patients in the strict rest group to report symptom resolution compared with the usual care group (see Time to Symptom Resolution, Fig 4). Moreover, the strict rest group reported greater total PCSS scores over the course of the 10-day follow-up period (187.9 [I] vs 131.9 [C], \( P < .03 \)), a higher total number of postconcussive symptoms reported during follow-up period (70.4 [I] vs 50.2 [C], \( P < .03 \); data not shown) and higher mean daily PCSS clustered around day 4 (see Fig 5). We found no significant differences between groups in computer-based neurocognitive tests and balance scores at 3 or 10 days (see Table 3). Although most paper neuropsychological assessments did not demonstrate a significant difference, the strict rest group performed better at day 3 (59.9 [C] vs 67.6 [I], \( P < .01 \)) and worse at day 10 (71.5[C] vs 67.6[I], \( P = .04 \)) than the usual care group on the Symbol Digit Modalities Test.

Factors Associated With Recovery and Outcome
Linear mixed modeling did not find significant treatment effects over time based on group assignment for total PCSS and neurocognitive test measures. However, when PCSS was analyzed by domain, assignment to the strict rest group contributed to higher physical symptom scores on days 2 and 3 and a trajectory of higher emotional symptoms throughout follow-up. Additional factors were found in both groups to be associated with longitudinal outcomes. We found that female patients reported higher PCSS scores and lower energy expenditure. As expected during the follow-up period, total daily energy expenditure, physical activity level, and mental activity level significantly increased over time, and PCSS, visual memory, reaction

**FIGURE 3**
Compliance with physical and cognitive rest recommendations. A, Mean daily total energy expenditure (TEE) with 95% confidence interval. No difference seen in total energy expenditure. B, Mean hours of moderate or high mental activity with 95% confidence interval. The usual care group reported more total hours in high and moderate mental activity on days 2 through 5 than the strict rest group (8.33 vs 4.86 hours, \( P = .03 \)).
time, and motor processing improved over time.

**Subgroup Analysis**

A subgroup analysis suggests a more nuanced relationship between rest and outcomes. Patients diagnosed with concussion based on postconcussive symptoms alone (eg, headache, dizziness) reported a higher postconcussive symptom score at day 10 when randomized to strict rest (15.2 [I] vs 7.7 [C], \( P = .04 \)). Similarly, patients with a past history of concussion reported greater symptoms at day 10 when randomized to strict rest (15.1 [I] vs 5.6 [C], \( P < .05 \)). However, patients who presented with their first concussion showed no difference in symptoms at day 10 based on group assignment. Additionally, although patients with a history of migraines reported higher symptoms at day 10, no differences could be seen based on group assignment. We were not powered to detect differences between specific mechanisms of injury. However, when comparing sport to nonsport mechanisms, we found no differences in outcomes based on mechanism or treatment group assignment.

**DISCUSSION**

Recommending strict rest from the ED did not improve symptom, neurocognitive, and balance outcomes in youth diagnosed with concussion. Surprisingly, adolescents who were recommended strict rest after injury reported more symptoms over the course of this study. Although recommending strict rest ultimately did not significantly alter the amount of physical activity between groups, it did change the amount of mental activity (eg, school attendance).

This is the first randomized controlled trial of rest strategies in pediatric patients after acute concussion. Although poor compliance with strict physical rest may have contributed to a lack of efficacy, previous adult studies that have assessed strict rest after concussion found similar results. Relander et al (1972) randomized admitted adult patients with mTBI to bedrest or active therapy and found that subjects in the active group were able to return to work 14 days earlier than the bedrest group.\(^{37}\) de Kruijk et al (2002) randomized adults discharged with acute mTBI to usual care or strict bedrest and found that both treatments resulted in no significant differences in actual amounts of outpatient bedrest and no differences in outcomes at 2 weeks, 3 months, and 6 months.\(^{38}\) Given that these previous studies of more stringent rest in concussed adults similarly failed to demonstrate...
In patients seen in a concussion clinic, they did not demonstrate the same association between moderate and low levels of cognitive exertion and symptom duration. These studies recruited patients from the clinic setting days after injury, and thus may not generalize to the acute care setting. This current study found that patients in an acute care setting experienced symptoms longer than those in the strict rest group. However, both the strict rest and usual care groups reported lower levels of cognitive activity in the first 5 days after a concussion. Taken together, these studies show that our current usual care endorsing modest physical and cognitive rest after injury is an effective strategy for recovery.

Patients in our strict rest group reported more symptoms than those in the usual care group. This effect of group allocation contributed to these symptom differences. Furthermore, these data do not determine whether these high symptoms represented a greater severity of illness or were simply a reporting bias. There are many potential explanations for the difference in symptom reporting. It is possible that discharge instructions influenced the perception of illness, augmenting symptom reporting. The strict rest group may have been better able to articulate their symptoms because they were slightly older. Lishman et al (1988) suggested that physiologic and psychological factors both contribute to the development of postconcussive syndrome, with psychological factors contributing more to symptoms over time. The deleterious effects of strict rest may have more to do with emotional distress caused by school and activity restriction. Missing social interactions and falling behind academically may contribute to situational depression increasing physical and emotional symptoms. Similarly, activity restrictions and lack of exercise may contribute to sleep problems.
abnormalities and adversely affect mood. Alternatively, attending less school may have resulted in more time and fewer distractions to thoughtfully complete symptom diaries or perseverate on symptoms.

Limitations

This study had several limitations. The study focused on patients who were discharged. Because admitted patients are more likely to have significant immediate signs, they likely represent a group of interest that may have benefited from a strict rest protocol. Despite randomization, the strict rest group was older, which may have affected results. As a convenience sample of patients, our study may have favored athletes and other motivated subjects. We used diaries to record activity levels and symptom scales, which has been well validated but is subject to recall bias. Findings focus only on short-term outcomes because the majority of concussions improve within the first 7 to 10 days; however, as a result, we were unable to detect differences in subjects that recovered after the follow-up period and could not evaluate long-term outcomes.

Future Directions

More information is needed to determine the optimal discharge instructions for mTBI from the ED. Research has shown that active rehabilitation (eg, low-level physical activity) can improve outcomes in later phases of mTBI. Further research is needed to test the safety and efficacy of active rehabilitation in the acute postinjury period. Given the heterogeneity of mTBI, this question can only be answered with a large randomized controlled trial powered to detect effects on subgroups (eg, athletes, patients with previous concussions or migraines, mechanism of injury) using patient-centered outcome measures and objective neurocognitive assessments.

CONCLUSIONS

This is the first study to test recommending strict rest as an intervention to improve acute concussion outcomes in pediatric patients. In the acute care setting, we found that strict rest immediately after mTBI offers no benefit over current usual care. We also found that adolescents’ symptom reporting may be influenced by restricting activity. Further research is needed to determine the optimal ED discharge recommendations for adolescents after mTBI.

ACKNOWLEDGMENTS

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NEW LIFE FOR AN OLD BOX: I first visited London many, many years ago. At that time nobody owned a cell phone, texting had not been invented, and public telephone booths were incredibly important. I can still remember making sure I had a pocket of coins before calling my family back in the States. Today, in London as elsewhere, there is little use for the public telephone. Iconic red telephone booths (or ‘boxes’ as they are called in London) have been decommissioned and either scrapped or converted into all sorts of things – including small libraries, aquariums, and storage for emergency defibrillators. I have a friend in Vermont who has two phone boxes and uses them for a unique garden. Now a pair of English entrepreneurs has found a new use for the phone boxes: as charging stations for mobile devices. As reported in The New York Times (World: October 4, 2014), the pair won a Low Carbon Entrepreneur competition to help finance the project. The first charging station was unveiled in October 2014. The boxes were repainted green and have a solar panel on the roof. The solar panel produces enough energy to charge up to 100 phones or other mobile devices a day. There is no fee for the charging service; revenue comes from advertising displayed on a screen inside.

Knowing how stressed my children become when their phones are low on power, I suspect the charging stations will be a welcome site in London. Given that there are thousands of unused telephone booths in London, the future looks bright for those short on power for their phones.

Noted by WVR, MD
Protective Equipment and Player Characteristics Associated With the Incidence of Sport-Related Concussion in High School Football Players: A Multifactorial Prospective Study
Timothy A. McGuine, Scott Hetzel, Michael McCrea and M. Alison Brooks
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What is This?
Protective Equipment and Player Characteristics Associated With the Incidence of Sport-Related Concussion in High School Football Players

A Multifactorial Prospective Study

Timothy A. McGuine,*† PhD, ATC, Scott Hetzel,‡ MS, Michael McCrea,§ PhD, and M. Alison Brooks,‖ MD, MPH

Investigation performed at the University of Wisconsin–Madison, Madison, Wisconsin, USA

Background: The incidence of sport-related concussion (SRC) in high school football is well documented. However, limited prospective data are available regarding how player characteristics and protective equipment affect the incidence of SRC.

Purpose: To determine whether the type of protective equipment (helmet and mouth guard) and player characteristics affect the incidence of SRC in high school football players.

Design: Cohort study; Level of evidence, 2.

Methods: Certified athletic trainers (ATs) at each high school recorded the type of helmet worn (brand, model, purchase year, and recondition status) by each player as well as information regarding players’ demographics, type of mouth guard used, and history of SRC. The ATs also recorded the incidence and days lost from participation for each SRC. Incidence of SRC was compared for various helmets, type of mouth guard, history of SRC, and player demographics.

Results: A total of 2081 players (grades 9-12) enrolled during the 2012 and/or 2013 football seasons (2287 player-seasons) and participated in 134,437 football (practice or competition) exposures. Of these players, 206 (9%) sustained a total of 211 SRCs (1.56/1000 exposures). There was no difference in the incidence of SRC (number of helmets, % SRC [95% CI]) for players wearing Riddell (1171, 9.1% [7.6%-11.0%]), Schutt (680, 8.7% [6.7%-11.1%]), or Xenith (436, 9.2% [6.7%-12.4%]) helmets. Helmet age and recondition status did not affect the incidence of SRC. The rate of SRC (hazard ratio [HR]) was higher in players who wore a custom mouth guard (HR = 1.69 [95% CI, 1.20-2.37], P < .001) than in players who wore a generic mouth guard. The rate of SRC was also higher (HR = 1.96 [95% CI, 1.40-2.73], P < .001) in players who had sustained an SRC within the previous 12 months (15.1% of the 259 players [95% CI, 11.0%-20.1%]) than in players without a previous SRC (8.2% of the 2028 players [95% CI, 7.1%-9.5%]).

Conclusion: Incidence of SRC was similar regardless of the helmet brand (manufacturer) worn by high school football players. Players who had sustained an SRC within the previous 12 months were more likely to sustain an SRC than were players without a history of SRC. Sports medicine providers who work with high school football players need to realize that factors other than the type of protective equipment worn affect the risk of SRC in high school players.

Keywords: football helmet; concussion; high school

Sport related-concussion (SRC) is a growing concern in the United States, and an estimated 300,000 SRCs occur annually.6,11,17 Football is the most popular high school sport in the United States, with 1.1 million participants during the 2012 school year.24 Almost half of the SRCs sustained during high school sports take place in football,18,28 and many are treated in emergency departments.25 While the incidence of concussion in high school athletes is relatively well established, the specific risk factors for this injury in high school football1,3,6,16,28 are less well understood. Possible risk factors for concussion in football include the history of concussion, characteristics unique to the individual (age, competition level, body mass index [BMI]), and type of protective equipment worn by the player.1,2,15,21,22,26,28

The football helmet is the primary piece of equipment used to protect a player from head-related injury and in recent years has been identified as a device that may reduce a player’s risk of sustaining a concussion.5,31 Football helmets have evolved a great deal over the past 50 years.32 Current football helmets are heavier and larger and are designed to absorb and dissipate impact forces to
a greater extent than earlier models. The most popular helmet brands used by high school football players in the United States are manufactured by a limited number of companies. The helmets currently in use are similar, with slight differences noted in exterior shell designs, interior padding, and fitting methods. These manufacturers do state that their helmets cannot prevent concussions or eliminate the risk for serious injury. However, in recent years the manufacturers have modified existing helmets and introduced new helmets with claims from laboratory testing that their helmets are the best and offer the maximum protection. In addition, manufacturers recommend that coaches and schools purchase newer helmets as opposed to using helmets that are several years old that have not been reconditioned recently. Reconditioning a helmet consists of removing the face mask and exterior hardware, inspecting the shell for cracks, removing and replacing any worn interior components, disinfecting and painting the helmet, and testing the helmet with drop tests. However, few prospective data are available on the incidence of SRC in football players actually wearing different makes and models of helmets. In addition, laboratory-based studies have suggested that mouth guards may attenuate the forces applied to the head from specific impact locations. With football helmets, there is limited evidence from prospective clinical studies supporting the claim that any specific type of mouth guard will reduce the incidence of SRC in high school football players.

As with football helmets, there is evidence from prospective clinical studies supporting the claim that any specific type of mouth guard will reduce the incidence of SRC in high school football players.

Experts have stated that concussion susceptibility in various sport settings is often multifactorial. Previous research has not been able to fully account for or quantify the role of specific player variables in regard to concussion susceptibility. This issue is paramount since concussions are being reported with increasing frequency in high school athletes. To date, limited prospective research has been conducted in actual sport settings to examine the role of protective equipment in reducing the risk of SRC. The primary specific aim of this study was to determine whether the brand, age, or recondition status of the helmet worn by high school football players affects the incidence of SRC. The secondary aim was to determine whether other factors such as type of mouthguard worn and the player’s age, grade (year) in school, BMI, previous tackle football playing experience, competition level, or history of concussion are associated with risk of SRC.

MATERIALS AND METHODS

The study was approved by the University of Wisconsin’s Health Sciences Institutional Review Board. Before the start of the study, instructions for player recruitment, enrollment, and data collection were provided to ensure that all of the athletic trainers (ATs) at participating schools used standardized data collection and reporting methods. Special attention was paid to accurately identify and record the characteristics of various helmet brands (Riddell, Schutt, and Xenith) and models as well as the type of mouth guard (generic, that is, provided by the school; specialized, sold individually and marketed to provide more protection than generic mouth guards; or custom fitted, fitted specifically for the athlete by a dental professional or company) All ATs had to undergo institutional research training and certification before taking part in any research-related activities.

Data were collected in Wisconsin during the 2012 (34 schools) and 2013 (18 schools) seasons. The sample size was calculated based on (1) the incidence of SRC from pilot data obtained in high schools during the 2011 football season and (2) the expected number of each specific brand of helmet at participating schools. Based on these assumptions, the goal was to enroll a minimum of 1500 subjects (500 each who wore helmets by Riddell Inc, Schutt Inc, and Xenith Inc) to detect significant differences, with \( \beta = 0.80 \) and \( P < 0.05 \). While this sample size would allow us to detect differences between helmet brands, it was assumed that we would not be able to detect differences in SRC rates for each of specific helmet model produced by each manufacturer.

To be included in the study, each player had to be on the roster of the interscholastic football team for one of the participating schools (freshman, junior varsity, or varsity) and able to fully participate (no disabling injuries) in team activities on the first day of practice.

Data Collection

Before the start of the season, demographic information was collected from each player regarding his grade in school, level of competition (freshman, junior varsity, or varsity), expected offensive and defensive playing positions, number of years playing full-contact tackle football, and history of SRC that he and his parents could recall. The ATs at each school administered the Concussion Symptom Index (CSI) before the start of the season.

The ATs recorded the helmet brand (Riddell, Schutt, or Xenith) as well as the specific model, purchase year, and recondition year (if available) worn by each subject. In newer helmets, this information is readily available on the back of the helmet. In older helmet models, this information is located inside the shell underneath the interior padding. If the purchase year or recondition year was not visible on the helmet, the information was recorded as unknown. ATs checked each player’s helmet during the
first 3 days of practice (no contact allowed) to ensure that the helmet was properly fitted per the manufacturer’s instructions. Mouth guards were classified as being generic (moldable plastic provided by the school), specialized (sold online and in sporting goods stores with marketing that emphasizes the ability to reduce impact forces to the brain), or custom fitted (fitted specifically for the player by a dental professional or through an online service).

During the season, the ATs and coaches kept daily attendance logs to record all football-related practice and competition exposures. Practice exposures were classified as being full contact or no contact. During the season, if a player changed his helmet or mouth guard, this information was recorded and all subsequent exposure data reflected this change.

Definition of Sport-Related Concussion

A sport-related concussion was defined according to the American Academy of Neurology guideline for diagnosis and management of sport-related concussion as “an injury resulting from a blow to the head or other applied forces (linear or rotational) causing an alteration in mental status and 1 or more of the following symptoms: headache, nausea, vomiting, dizziness/balance problems, fatigue, difficulty sleeping, drowsiness, sensitivity to light/noise, blurred vision, memory difficulty, and difficulty concentrating.” This definition was used as part of other clinical research studies being conducted by the authors concurrent with this study.

Assessment of Sport-Related Concussion

Wisconsin state law requires that any athlete suspected of sustaining an SRC be removed from practice or competition immediately and not be allowed to return to sport activities until examined and cleared by a credentialed medical professional (physician or licensed athletic trainer). An AT administered the CSI instrument as soon as an SRC was suspected or reported by the player. Additional data were recorded for each SRC, including the type of exposure, playing surface, mechanism of injury (eg, tackled, tackling, blocking), duration of symptoms (days), referral to other medical providers, and use of post-injury assessments.

Each player with an SRC was allowed to return to football activities only under the direct supervision of his school AT and/or primary care provider (physician) by use of a statewide mandated stepwise protocol with provisions for delayed return to play based on the return of any signs or symptoms. Concussion severity was determined for delayed return to play based on the return of any signs or symptoms. Concussion severity was determined for delayed return to play based on the return of any signs or symptoms.

Data Analyses

All regression models accounted for school as a cluster random effect. Approximately 9% of players were reenrolled in 2013 after participating in 2012. To assess the effect of this repeated data on estimated regression coefficients, we analyzed the data in 3 ways: (1) treating repeated players as independent data, (2) eliminating repeated data by randomly selecting 2012 or 2013 as the only year included in the analysis for each repeated player, and (3) treating repeated players as dependent data and having player as a random effect. All methods produced very similar coefficients, 95% CIs, and statistical results. To ultimately have the most player-seasons reported and to have the most generalizable data to any 1 year of football for a player, we reported all data as if the repeated player's 2 years of data were independent of each other.

Baseline player and equipment characteristics were compared between players who sustained an SRC and those who did not by use of t tests and logistic regression. Concussion rates and 95% CIs were calculated by cluster adjusted Poisson regression, with number of exposures as an offset. All injury rates are reported per 1000 exposures.

The time to first SRC was compared based on player and equipment characteristics by use of a univariate, cluster adjusted Cox proportional hazards (Cox PH) model. A multivariate cluster adjusted Cox PH was used to examine the relationships between player and equipment characteristics while controlling for several variables (age, BMI, football experience, previous SRC, mouth guard type, helmet brand, and helmet recondition status). The assumption of proportionality of the hazards was verified as sufficient for most of the models. For those models in which the assumption was violated, a time-dependent Cox PH model with an interaction term between the violating variable and time was fit. The results from the models with and without an interaction term were quantitatively similar. Therefore, the simpler model with proportional hazards violation is reported for ease of interpretation.

RESULTS

A summary of player demographic and equipment information is found in Table 1. A total of 2081 players enrolled in the study. Of these players, 206 (9%) enrolled in both the 2012 and 2013 seasons for a total of 2287 player-seasons during the study period. Players participated in 134,437 football exposures, including 21,525 in competition and 112,912 in practice (17% no contact allowed, 83% full contact allowed). The distribution of players by grade in school was similar, although almost half participated in varsity-level competition. Fifty-two (2.3%) of the subjects were participating in their first year of tackle (full contact) football, while 351 (15.4%) had previously played tackle football for 7 or more years. Overall, 438 players (19.2%) reported a history of SRC, including 259 (11.3%) players who had sustained an SRC within the previous 12 months.

More players wore helmets by Riddell (n = 1171, 51%) compared with those by Schutt (n = 680, 30%) or Xenith (n = 436, 19%). The most commonly worn helmet models by brand were the Riddell Revolution Speed (n = 617), Schutt DNA Pro+ (n = 420), and Xenith X1 (n = 272). Four hundred sixty-five (26%) of the helmets were being used during their initial purchase year, while 745 (33%)
TABLE 1
High School Football Player Demographics, Helmet or Mouth Guard Worn, Tackle Football Experience, and Concussion History

<table>
<thead>
<tr>
<th>Player Characteristics</th>
<th>No. of Subjects</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helmet brand worn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riddell</td>
<td>1171</td>
<td>51.2</td>
</tr>
<tr>
<td>Schutt</td>
<td>680</td>
<td>29.7</td>
</tr>
<tr>
<td>Xenith</td>
<td>436</td>
<td>19.1</td>
</tr>
<tr>
<td>Helmet age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>695</td>
<td>30.4</td>
</tr>
<tr>
<td>3-4</td>
<td>830</td>
<td>36.3</td>
</tr>
<tr>
<td>5-6</td>
<td>399</td>
<td>17.4</td>
</tr>
<tr>
<td>7+</td>
<td>348</td>
<td>15.2</td>
</tr>
<tr>
<td>Helmet condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New</td>
<td>463</td>
<td>20.2</td>
</tr>
<tr>
<td>Reconditioned same year of the study</td>
<td>330</td>
<td>14.4</td>
</tr>
<tr>
<td>All other helmetsc</td>
<td>1477</td>
<td>64.5</td>
</tr>
<tr>
<td>Mouth guard type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generic</td>
<td>1386</td>
<td>60.6</td>
</tr>
<tr>
<td>Custom</td>
<td>199</td>
<td>8.7</td>
</tr>
<tr>
<td>Specialized</td>
<td>702</td>
<td>30.7</td>
</tr>
<tr>
<td>Grade (year) in school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td>625</td>
<td>27.3</td>
</tr>
<tr>
<td>10th</td>
<td>598</td>
<td>26.1</td>
</tr>
<tr>
<td>11th</td>
<td>544</td>
<td>23.8</td>
</tr>
<tr>
<td>12th</td>
<td>512</td>
<td>22.4</td>
</tr>
<tr>
<td>Competition level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>567</td>
<td>24.8</td>
</tr>
<tr>
<td>Junior varsity</td>
<td>627</td>
<td>27.4</td>
</tr>
<tr>
<td>Varsity</td>
<td>1093</td>
<td>47.8</td>
</tr>
<tr>
<td>Previous tackle football experience, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1</td>
<td>256</td>
<td>11.2</td>
</tr>
<tr>
<td>2-3</td>
<td>406</td>
<td>17.8</td>
</tr>
<tr>
<td>4-5</td>
<td>856</td>
<td>37.4</td>
</tr>
<tr>
<td>6+</td>
<td>767</td>
<td>33.5</td>
</tr>
<tr>
<td>Previous SRC (within 12 mo)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1928</td>
<td>84.3</td>
</tr>
<tr>
<td>Yes</td>
<td>259</td>
<td>11.3</td>
</tr>
<tr>
<td>Previous SRC (ever)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1849</td>
<td>80.8</td>
</tr>
<tr>
<td>Yes</td>
<td>438</td>
<td>19.2</td>
</tr>
</tbody>
</table>

*Table 1: Helmet or Mouth Guard Worn, Tackle Football Experience, and Concussion History*

This study demonstrated that helmet brand, age, and recondition status were not associated with lower risk of SRC in high school football players. Further, the use of a generic mouth guard was associated with lower risk of SRC in this population. This is the largest prospective study to have reported the brand of helmets worn by high school football players in the United States. All football helmets are designed to limit the force of impact on
the head by dispersing and attenuating the blow, which reduces transmission of the force to the skull and brain tissue and subsequently reduces the risk of skull fracture and intracranial hemorrhage.\textsuperscript{36,37} All football helmets currently in use in high school football must meet the National Operating Committee on Standards in Athletic Equipment (NOCSAE) helmet standard and pass a threshold of standard performance criteria from multiple impact tests.\textsuperscript{25}

Our results show that no particular helmet brand provides superior protection against sustaining an SRC compared with other helmet brand or models.

Our results are in contrast with a study in high school players by Collins et al\textsuperscript{5} in 2006, which reported that new Riddell Revolution helmets reduced the risk of SRC by 31% compared with other “standard” helmets. This study was limited, however, by fact that the age of the other helmets was not reported and, more important, the exposure data for each player were not recorded. More recent research\textsuperscript{38} has reported that certain helmet brands and models perform better on specific laboratory-based impact testing, leading the authors to conclude that these helmets provide greater protection against concussion. Expanding on this research, Rowson et al\textsuperscript{31} reported that the incidence of SRC was lower in Riddell Revolution helmets compared with Riddell VSR-4 helmets in a study that recorded the incidence of SRC and subconcussive head impacts with a helmet-mounted accelerometer. The difference in our findings from the previous research may be due to several factors. First, we conducted a prospective epidemiologic study on the performance of helmets in a large sample of high school players actually participating in football rather than a laboratory study that documented helmet dynamics to determine how protective a helmet might be. Further, we recorded data from a much larger variety of new and older helmets currently being used in high school settings. Finally, we controlled for multiple variables in our analyses, including history of concussion, which has been widely reported as a significant risk factor for concussion in athletic populations.\textsuperscript{1,3,15} These previous studies compared a small number of specific helmet models, while our study grouped all models by their manufacturer (brand). We thought it was most appropriate to group the helmets by their manufacturer since each manufacturer often used similar exterior shell designs and interior padding systems for helmets produced in the same year. Furthermore, comparing the incidence of SRC across every specific model would be difficult due to the small numbers for some models; the newest helmet models (Riddell 360, Schutt Vengeance, and Xenith X2) were worn by less than 10% of players in our study.

While it is widely reported that newer helmets perform better on laboratory tests than older helmets no longer sold, less well studied is whether the age of newer helmets (less than 3-4 years old) affects the incidence of SRC. This is important because helmet manufacturers stress that helmets should be replaced on a regular schedule and that coaches should purchase a number of new helmets each season. Older helmets should be used only if they have been reconditioned and certified to meet the same NOCSAE impact standards as new helmets.\textsuperscript{25} It is less

<table>
<thead>
<tr>
<th>Football session</th>
<th>No. of Exposures</th>
<th>SRC</th>
<th>SRC Rate, % (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition</td>
<td>21,525</td>
<td>125</td>
<td>5.81 (4.86-6.94)</td>
<td>.001</td>
</tr>
<tr>
<td>Practice: full contact</td>
<td>94,022</td>
<td>82</td>
<td>0.87 (0.61-0.95)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Practice: no contact</td>
<td>18,890</td>
<td>4</td>
<td>0.21 (0.07-0.58)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanism of injury, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tackling</td>
</tr>
<tr>
<td>Contact with opponent</td>
</tr>
<tr>
<td>Being tackled</td>
</tr>
<tr>
<td>Contact with ground</td>
</tr>
<tr>
<td>Blocking</td>
</tr>
<tr>
<td>Contact with teammate</td>
</tr>
<tr>
<td>Being blocked</td>
</tr>
<tr>
<td>Unknown</td>
</tr>
</tbody>
</table>

| Football Exposures and Rate of Sport-Related Concussion, Mechanism of Injury, Postinjury Assessment, and Days Lost From Sport\textsuperscript{a} |
|---|---|---|
| No. of Exposures SRC SRC Rate, % (95% CI) P Value |
| Football session | Competition | 21,525 | 125 | 5.81 (4.86-6.94) | .001 |
| Practice: full contact | 94,022 | 82 | 0.87 (0.61-0.95) | <.001 |
| Practice: no contact | 18,890 | 4 | 0.21 (0.07-0.58) | <.001 |

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<td>4</td>
<td>0.21 (0.07-0.58)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

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\textsuperscript{a}BESS, Balance Error Scoring System; IQR, interquartile range; SAC, Standardized Assessment of Concussion; SCAT, Sport Concussion Assessment Tool; SRC, sport related-concussion.

\textsuperscript{b}Percentages may total more than 100 because some subjects had more than 1 assessment.

\textsuperscript{c}25th-75th percentile.
expensive to recondition a helmet than to purchase a new helmet; the manufacturers we contacted stated that the costs to recondition a helmet can be as low as US$30 to $40 or as high as one-third the purchase price for a new helmet. For this reason we examined whether helmet age or recondition status was associated with incidence of SRC. In our sample, 66% of the helmets were purchased within the previous 4 years, and we found that the incidence of SRC in newly purchased helmets was similar to that in older helmets that had already been in service multiple seasons. Previously, specific guidelines by manufacturers regarding helmet reconditioning were limited, although it was widely accepted that helmets should be reconditioned every several years or when recommended by a helmet manufacturer representative. In 2013, however, manufacturers began recommending that helmets be reconditioned yearly. We found that the risk of SRC was similar regardless of whether the helmet was new, used in the same year it was reconditioned, or reconditioned in previous years.

Our finding that the incidence of SRC was lower for students wearing a custom fitted mouth guard was unexpected. The ability of a mouth guard to reduce the risk of dental injury was well established. Further evidence that a mouth guard can reduce risk of concussion remains inconsistent. Proponents of using mouth guards to reduce the incidence of SRC cite potential protective mechanisms that include absorbing the force of a blow to the jaw, teeth, and surrounding structures.
increasing separation of the head of the condyle and mandibular fossa, and limiting muscle activation of the neck musculature. While previous laboratory studies have shown that mouth guards can dissipate impact forces sustained to the mandible, well-controlled prospective studies in athlete populations have not shown that this translates into a decreased risk of SRC. One explanation for our finding is that we did not assess the type of impact (blow to the head vs struck on the chin or jaw) that resulted in the SRC. A second explanation may be that players wearing custom mouth guards might have had additional player characteristics and risk factors we did not assess. In addition, the increase in the rate of SRC may be due to the fact that players with custom mouth guards feel they have greater protection against an SCR and play with less regard or fear for sustaining an injury. Only 9% of the players in our sample wore these custom mouth guards, and the difference in concussion rate may have occurred by chance or may have not been found if the sample of these players had been larger.

Intrinsic factors may play a greater role in SRC susceptibility than the type of protective equipment worn by the player. Limited retrospective data suggest that the risk of SRC increases in older players who are competing at a high level. It has been suggested that older players competing at the varsity level are more likely to sustain an SRC than younger players competing at lower levels (freshmen or junior varsity team) because of the impact forces they sustain with body-to-body contact on the football field. We did not find a relationship between the player's age, size, or competition level and the incidence of SRC.

Interestingly, the number of years of tackle football experience was not associated with an increased or decreased risk of SRC. To our knowledge, this is the first study to examine players’ tackle football experience and the risk of SRC in older (high school) players. Previous research has shown that the risk of concussion in youth sports is significant and also is affected by the league parameters related to the amount of contact that is allowed. Emery et al noted that Canadian youth playing in hockey leagues that allowed full body checking had a 70% increased risk for concussion compared with players in leagues without body checking. Further, Guskiewicz and Valovich McLeod reported that players who participate in sports at a younger age have a longer window of vulnerability and are more likely to sustain multiple concussions during their sport career.

Our finding that players with a history of sport-related concussion were at higher risk of sustaining another concussion is consistent with previous studies of high school athletes. What is novel about our results is that this increased risk exists even when controlling for the players' use of protective equipment, years of football experience, and player characteristics such as their grade in school and competition level. This further highlights the need for medical providers to document a history of SRC in young football players. In addition, players, parents, and coaches need to be educated about the increased concussion risk in these individuals.

The type of exposure (practice vs competition) had a substantial effect on the incidence of SRC in this study. The rate of SRC was nearly 7 times higher during competition than practice and 4 times higher during full-contact practice sessions than sessions where no contact was allowed. Broglio et al recently reported that head impact magnitude was significantly higher during competitions and that limiting contact during practice sessions could reduce the number of impacts up to 39% over the course of the season. Our data may support these findings that limiting the number of full-contact practices may be an effective method to reduce the overall incidence of SRC in high school football.

Limitations

Several limitations should be acknowledged with regard to our findings. First, this is not a randomized controlled study but rather a cohort study with data obtained from a convenience sample of schools that agreed to take part in the study. As such, it is susceptible to the effect of the unknown or unmeasured confounders. Schools in Wisconsin without access to a full-time AT throughout the season (38%) were not recruited to take part. Thus, despite the large size of our sample, the participating coaches and medical staff may not be representative of the football programs in Wisconsin or schools throughout the United States. In addition, all players and ATs who participated in the study were not blinded and may have reporting bias. Unfortunately, truly randomized and blinded research studies in high school settings are not feasible due to the requirements of obtaining administrative school approval, informed consent for minors, and the data reporting required by onsite ATs. To minimize this bias, our sample included both public and private schools and a broad range of small, medium, and large student enrollments, located in urban, suburban, and rural settings. In addition, a large cohort study such as this requires that sports injury diagnoses, reporting, and treatment be dependent upon multiple medical providers in numerous communities and schools rather than a single medical provider. We also recognize that proper helmet fit may play a role in SRC susceptibility. While we provided helmet fitting instructions for each helmet brand and instructed each school AT to check each helmet during the first week of practice, we did not measure the helmet fit (and how it may have changed) throughout the season. Finally, as in nearly all prospective studies of SRC, our methods relied on reporting of athlete exposures to calculate the incidence of SRC and assess the performance of various helmets. Using force accelerometers in each helmet to measure head impact exposure, as has been done in collegiate and high school settings, may be a more sensitive method to understand the protective characteristics of different helmets. However, the costs and staffing to use instrumented helmets in a large high school cohort were prohibitive in our situation.

CONCLUSION

In the current study, different types of football helmets (brand, age, recondition status) worn by high school...
football players offered similar protection against SRC regardless of player age, grade in school, or competition level. The rate of SRC was higher for players with a history of SRC as well as for players who wore custom-fitted mouth guards compared with generic mouth guards. A significant proportion of concussions occurred during full-contact practices, suggesting that limiting the number of full-contact practice sessions may have the potential to reduce the incidence of SRC in high school football settings.

The relationship of the type of protective equipment and incidence of SRC warrants further study, especially in actual athlete populations. Future researchers may want to evaluate the incidence of SRC in a large sample of high school players who wear different helmet brands, using models instrumented to measure head impact data while controlling for various player characteristics. In addition, to further study the role of mouth guards and SRC, researchers could look at the incidence of SRC for athletes who wear different types of mouth guards but have sustained blows only to the chin and jaw that resulted in SRC.

ACKNOWLEDGMENT
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REFERENCES

Additional Resources in this Manual include:

1. Concussion Signs and Symptoms Checklist – CDC, Chapter 2
2. Mild Head Injury and Concussion Teaching Sheet – Children's Healthcare of Atlanta, Chapter 12. This sheet includes information on the following:
   - Cognitive Rest
   - Return to School, Book work, Studies Guidelines
   - Return to Sports, Play, Activities Guidelines
3. Know Your Concussion ABCs, Fact Sheet for School Nurses – CDC, Chapter 2

Brain Injury Resources

Brain Injury Association of America
biausa.org

Brain Injury Association of Georgia (BIAG)
800-444-6443
info@braininjurygeorgia.org
braininjurygeorgia.org

Brain and Spinal Injury Trust Fund Commission
bsitf.state.ga.us

Brain Injury Recovery Network
tbirecovery.org

Centre for Neuro Skills®
neuroskills.com


Lash and Associates: Books on Brain Injury
lapublishing.com

Rainbow Rehabilitation Centers for Brain and Spinal Cord Injury
rainbowrehab.com

Spinal Cord Injury Information
sci-info-pages.com
Concussion Resources
Concussion and Mild TBI - CDC
cdc.gov/headsup/index.html

Concussion Program - Children’s Healthcare of Atlanta
choa.org/concussion

Heads Up to Schools: Know Your Concussion ABCs
cdc.gov/concussion/HeadsUp/schools.html

ImPACT
impacttest.com
Celiac Disease

Celiac disease is an autoimmune inflammatory condition caused by ingestion of gluten-containing grains—wheat, barley, and rye. The gluten protein in these grains is toxic to people with celiac disease. When children or adults with celiac disease are exposed to gluten, there is an immune reaction that damages the lining of the small intestine where nutrients are normally absorbed. When the intestine lining is damaged, digestion of many nutrients may be abnormal (malabsorption).

In the past, children were diagnosed with celiac disease only if they presented with diarrhea and abdominal distension. They would be underweight and might have muscle wasting. In the last 10 years with better tools to diagnose celiac disease, many more children and adults are being diagnosed without having diarrhea and malnutrition. Often people may have subtle or no symptoms. Common symptoms include abdominal pain, loose stools, gassiness, delayed puberty or growth failure. However, many people are being diagnosed with constipation, nausea or just bloating. Up to 20 percent of people now diagnosed with celiac may have very few symptoms but have a family member with celiac or another risk factor such as type 1 diabetes or Hashimoto’s thyroiditis.

Other organ systems may be affected in celiac disease besides the digestive system. These include the skin (rashes), bones (osteoporosis), teeth (enamel defects), liver (elevated liver enzymes) and the nervous system (rarely seizures but also headaches and fatigue). Patients may also have iron deficiency anemia and weak bones.

It is important to think of celiac disease in children who have a close family member with celiac or in children with certain other medical conditions. Celiac disease may occur in about five percent of children with type 1 diabetes, five percent of children with Down syndrome or Williams syndrome and five to 10 percent of children with IgA (Immunglobulin A) deficiency.

**Diagnosis**

If a doctor suspects celiac disease in a child, the first tests might include blood tests to look for anemia (low blood counts) or evidence of malnutrition. Stool studies might be ordered to look for evidence of malabsorption. The most useful initial test for celiac disease involves special antibodies found in the blood of patients with celiac disease. Currently, testing based on antibodies in the stool or in the saliva is not felt to be accurate. Remember, testing for a serious lifelong disease like celiac disease is best completed in conjunction with your medical providers. Finally, if screening tests are positive or if suspicion is strong, the definitive way to make the diagnosis is with an upper endoscopy. During this procedure, which usually takes just 10 minutes or so, a gastroenterologist (GI doctor) will pass a scope down the mouth into the stomach and intestine. Typically patients are sedated for the procedure by an anesthesiologist. The scope allows the doctor to look at the small intestine lining and take tiny pieces of tissue (biopsies) to examine under the microscope for signs of intestinal damage caused by celiac disease.

**Treatment**

The treatment of celiac disease is avoidance of wheat, barley and rye for life. Since these grains are found in many foods, it is very important to meet with an experienced nutritionist to learn what foods to avoid and which are safe. Many products may not be clearly labeled as containing gluten. The FDA has completed guidelines and foods labeled gluten-free should be safe with less than 20 ppm of gluten—the threshold considered safe for celiac disease. Many new products are available that use corn, rice or other grains as substitutes for wheat. These foods may be found in many grocery stores and in some health food stores. Many restaurants also are now offering gluten-free items on their menus, even pizza places! Your nutritionist will have resources to help find foods that will be healthy and enjoyable on the gluten-free diet.

**Management at School**

Children with celiac disease will need encouragement and support at school. Mealtimes with peers can be particularly challenging for children with celiac disease who may not want to appear “different” and may be tempted to eat foods that have gluten. Many kids
may not understand the complications of “cheating” on the diet or may not yet be fully aware of all the foods that need to be avoided. It will be helpful to speak with teachers and cafeteria staff about the dietary restrictions that are so important to the treatment of this condition. Handouts are available, and below are web links to resources which can help educate school staff and friends.

**Educational Considerations**

- Develop IHP/504/IEP and emergency plans:
  - Model 504 Plan from the American Celiac Disease Alliance
    americanceliac.org/wp-content/uploads/docs/ACDA-DRED%20Model%20504%20plan.pdf
  
- The school nurse may want to:
  - Set up a meeting for the family with the nutrition director in the district or the cafeteria manager to make available gluten-free options for the child in the cafeteria, or to make the parent aware that gluten-free options are available.
  - Inform the classroom teacher to let parents know when bringing birthday treats or snacks in those younger grades, that a child in the class has gluten intolerance and can become very ill if given gluten-containing products. A child’s parent can make a list of snack options for the other parents to choose from, or the parent can volunteer to provide snacks for the child with celiac themselves.

**Resources**

American Celiac Disease Alliance
americanceliac.org/celiac-disease

American Dietetic Association
eatright.org/Public/content.aspx?id=5542

Celiac Central
celiaccentral.org

Celiac Disease Awareness Campaign - National Institutes of Health
celiac.nih.gov

Celiac Disease Foundation - CDF
celiac.org

Celiac Sprue Association
csaceliacs.org

GI Kids – Celiac Disease
gikids.org

National Foundation for Celiac Awareness
celiaccentral.org

William. K. Warren Medical Research Center for Celiac Disease
celiaccenter.ucsd.edu
**Camp Information**

Camp Weekaneatit is held in collaboration with Georgia’s Chapter of Raising Our Celiac Kids and the Georgia Celiac Foundation. Raising our Celiac Kids is a support group for parents, families and friends of children with celiac disease and gluten intolerance.

giorgiarock.org
Cerebral Palsy

Cerebral palsy includes a group of nonprogressive disorders of movement and posture caused by a perinatal brain insult or injury. Thus, the insult may occur prenatal or postnatal in the period of early cerebral development before a child is two years of age. The conditions causing cerebral palsy do not worsen over time.

Conditions associated with cerebral palsy include:

Prenatal period (the majority of children)
- congenital brain defects
- Intrauterine infections
- Rh and ABO hemolytic conditions of the fetus
- Fetal anoxia
- Hemostatic abnormalities
- Maternal disorders
- Maternal substance abuse
- Metabolic abnormalities
- Chromosomal abnormalities

Perinatal
- Prematurity
- Trauma
- Hypoxic-ischemic encephalopathy
- Infection
- High bilirubin

Postnatal
- Hypoxia and acidosis in the child
- Meningitis and sepsis
- Trauma – brain injury including nonaccidental trauma
- Toxic exposures including lead

The incidence of cerebral palsy is two to three per 1000 live births. Cerebral palsy is characterized by abnormal muscle tone and function. Spastic cerebral palsy involves 70 percent of individuals with cerebral palsy. Spasticity is characterized by tight muscles and exaggerated reflexes. Diplegia is spasticity mainly involving the legs; hemiplegic is spasticity involving one side. Quadriplegic cerebral palsy is involvement of all four extremities. Ten (10) to 20 percent of those diagnosed with cerebral palsy are described as dyskinetic, having difficulty with movement control. Dyskinetic includes dyskinesia, athetosis, ataxia and rigidity. Cerebral palsy is usually diagnosed before a child is age 3 years. Cerebral palsy is usually diagnosed by the time children should begin to walk.

A child with mild cerebral palsy is able to walk independently; a child with moderate cerebral palsy is able to sit independently; and a child with severe cerebral palsy is unable to do either.
A Gross Motor Function Classification Scale (GMFCS) classifies Cerebral Palsy

<table>
<thead>
<tr>
<th>GMFCS</th>
<th>Measure of Gross Motor Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels</td>
<td>Mobility</td>
</tr>
<tr>
<td>I</td>
<td>Walks without limitations.</td>
</tr>
<tr>
<td>II</td>
<td>Walks with limitations.</td>
</tr>
<tr>
<td>III</td>
<td>Walks using a hand-held mobility device.</td>
</tr>
<tr>
<td>IV</td>
<td>Self-mobility with limitations; May use powered mobility</td>
</tr>
<tr>
<td>V</td>
<td>Transported in a manual wheelchair.</td>
</tr>
</tbody>
</table>


**Treatment**

There is no cure for cerebral palsy, only therapies aimed at improving a child's function and minimizing the movement disorder.

- The foundation of therapy includes: physical therapy, occupational therapy and speech therapy.
- These therapies should be initiated as soon as possible and focus on functional goals.
- Other therapies include: aquatic therapy, hippo therapy (use of horses in therapy) and using a neoprene suit called theratogs.
- Children may undergo orthopedic procedures to improve function and correct deformities including scoliosis and contractures.

**Medications**

- Baclofen® (lioresal)
- Klonopin® (clonazepam)
- Zanaflex® (tizanidine)

**Other Medications**

- Sinemint® (dopamine/carbidopa) to control tone and movement.
- Baclofen® may be administered by an intrathecal pump for better control in delivery of this medication.
- Children may receive injections of toxins to muscles or phenol to nerves to reduce spasticity.

**Management at School**

Children with cerebral palsy often rely upon the therapy resources available at school. During the day, the child needs to be upright as much as possible. Since the child needs to be able to use the walker and/or stander at school to accomplish this, he will require extra time for mobility in the classroom or in moving between classrooms.

The educator needs to be aware of potential sedation and other side effects from the medications used to control tone. Children with cerebral palsy also often need assistance with toileting skills. The spasticity may affect bladder function. In addition, sometimes a child’s spasms may look like seizures. It is important for the educator to observe the movement and touch the child to help assess if the movement is a seizure. **The movement is not a seizure if it stops when the child is touched and repositioned.**

Finally, if the child has a Baclofen® pump, the educator needs to be aware of the pump’s alarm and signs of Baclofen® withdrawal or overdose in the child.
Signs of Baclofen® withdrawal include:
- High fever
- Exaggerated rebound spasticity
- Altered mental status
- Muscle rigidity

Signs of Baclofen® overdose include:
- Signs of drowsiness
- Lightheadedness
- Dizziness
- Somnolence
- Loss of consciousness progressing to coma
- Respiratory depression
- Low muscle tone

Educational Considerations
Children with cerebral palsy are limited by their motor responses and thus may require more time to complete a task and respond to a request. More affected children may rely on assistive technology to maximize their communication and academic performance. Therefore children with cerebral palsy should be assessed for assistive technology early in their academic careers.

Children with cerebral palsy also may have associated learning disabilities. Many of them have visuomotor difficulties or attention problems. The possibility of associated learning difficulties should be investigated with psychological testing. Using the results of the testing, the student support team should implement a plan to maximize the student's educational performance.

Resources
American Academy for Cerebral Palsy and Developmental Medicine
aacpdm.org

Cerebral Palsy – Healthy Children, American Academy of Pediatrics
healthychildren.org/English/health-issues/conditions/developmental-disabilities/Pages/Cerebral-Palsy.aspx

Cerebral Palsy – National Institute of Neurological Disorders and Stroke
ninds.nih.gov/disorders/cerebral_palsy/cerebral_palsy.htm

Easter Seals
easterseals.com

FOCUS
focus-ga.org

March of Dimes
marchofdimes.com/baby/birthdefects_cerebralpalsy.html
Pedal with Pete [For Research on Cerebral Palsy]
pedalwithpete.com

Reach for the Stars
reachingforthestars.org

United Cerebral Palsy
ucp.org
Childhood Cancers and Transplants

Successful treatment of childhood cancers has increased dramatically, and children with cancer are returning to normal school activities. A child who has received an organ transplant will also return to school, and school reentry issues will need to be addressed. Both of these types of students will probably be on medication to suppress the immune system. Risk of infection, body image concerns, fatigue, absenteeism due to treatment and possible late effects of treatment are the main considerations. Communication with parents is the key to a smooth transition for these students.

Childhood cancers affect about 15 children in 100,000, but the prognosis for these children is improving each year. Cancers are usually treated by one (or a combination) of the following: surgery, radiation and/or chemotherapy. Each type of cancer is different, and the treatment regimens vary according to the type. There are two main types: those involving the blood-forming tissues (lymphomas and leukemias) and those affecting bone, brain or internal organs (solid tumors). About one third of childhood cancers are leukemias. The most common solid tumors are brain tumors (e.g. gliomas and medulloblastomas), followed by the other solid tumors (e.g. neuroblastomas, Wilms’ tumors and rhabdomyosarcomas).

A child may receive a kidney, heart, liver, bone marrow or heart-lung transplant for a variety of reasons, including: congenital malformations and illnesses, acquired organ failures or cancer. For these students, anti-rejection drugs will cause the same concerns with immunosuppression and body image.

**Management at School**

A child’s resistance to infection is usually reduced significantly by treatment (immunosuppression). Thus, even one case of chicken pox, shingles or measles, as well as any widespread outbreaks of infectious diseases, becomes a particular concern and should be reported immediately to parents. Symptoms include fever above 100°F, lethargy and rashes. Emergency intervention may be required, as infection in these children can be life-threatening. When a child is known to have a medical history of cancer and/or transplant, school personnel should react quickly to these symptoms, notifying parents immediately.

If parents cannot be reached, a plan should be in place to obtain emergency care without delay. If the child is exposed to chicken pox in the school, notify the parents immediately. **Medicine can be administered to prevent or lessen the severity of the chicken pox if given to the child within 48 to 72 hours after exposure.** During outbreaks of certain diseases, a doctor may suggest that the child remain at home as a preventive measure against infections.

Children who are receiving chemotherapy will often have a central venous access line implanted for chemotherapy and lab monitoring. This line may be an implanted port (surgically placed under the skin) or a central venous line that is usually placed through the chest wall. The latter would be capped off during school hours and covered by clothing. The school nurse can assist in monitoring, to observe for early signs of infection. Students undergoing chemotherapy and radiation also will often experience a decreased energy level due to the effects of treatments, producing such symptoms as anemia. School schedules may need to be modified and made flexible to accommodate the student’s treatment. The schedule of treatment, and the student’s response to it, will necessitate frequent absences of varying lengths.

Homebound teaching may be needed from time to time. Bleeding and bruising may be problems as well since treatment can affect the body’s ability to control bleeding. These incidents should also be promptly reported to parents. Issues of body image changes (hair loss, growth retardation, consequences of surgery such as amputation) are of utmost importance for children of all ages. With family and student permission, classmates should be prepared honestly for these changes and given concrete ideas for how to treat their friend when he or she returns. Ongoing communication with parents is always important, and school staff should never make assumptions about the child’s knowledge and understanding about the disease.
Educational Considerations

“School is an essential part of a child's life and well-being. It's important to maintain the continuity of education even if the type of schooling varies. To promote a sense of normalcy…education should continue as smoothly as possible, both for learning and for social reasons, such as maintaining friendships…Not all of the changes a child undergoes as a result of this diagnosis are negative. By getting support from parents, teachers, school nurses and classmates, and by facing and overcoming obstacles, and by learning to accept and process difficult news, many children can grow and mature socially and emotionally far beyond their years.”


Students may be unable to attend school for periods of time during treatments. Hospital school programs and homebound instruction may be ordered if the child can tolerate these. “Late effects” can be associated even with successful cancer treatment, some of which can influence a child's ability to process, learn and retain new information. School staff should be aware of these possibilities and evaluate with parents the child's progress and the need for learning support services, during and after this critical period.

When the child returns to school, there may need to be:
• Development of an IHP/504/IEP and emergency plan
• Adaptations in the length of the day or schedule of classes and activities
• Support of increased dietary supplement needs
• Medications or treatments needed during school hours (central lines, etc.)
• Parent/student permission, education of staff and peers. Anticipated peer questions include:
  - What's wrong with _________?
  - Is this disease contagious?
  - Will _________ die from it?
  - Should we talk about it or should we ignore it?
  - Should we treat _________ differently?
  - Why did _________ lose his hair?
• Set of textbooks at home or hospital
• Adaptation of physical education
• Access to professional school health services
• Peer tutoring
• Heightened awareness of potential problems from minor infectious illnesses of classmates.

Resources
Aflac Cancer and Blood Disorders Center
choa.org/childrens-hospital-services/cancer-and-blood-disorders

American Cancer Society
cancer.org or call your local chapter

Band-aides and Blackboards
lehman.cuny.edu/faculty/jfleitas/bandaides
Cells Alive (instructional site on cells)
cellsalive.com/toc.htm

Children’s Brain Tumor Foundation
cbtf.org

CURE Childhood Cancer
curechildhoodcancer.org

Heart Transplant Handbook – Children’s Healthcare of Atlanta
choa.org/Menus/Documents/OurServices/HeartTransplantGuide.pdf

Kidney Transplant Handbook – Children’s Healthcare of Atlanta
choa.org/Menus/Documents/OurServices/KidneyTransplantManual.pdf

Liver Transplant Guide – Children’s Healthcare of Atlanta
choa.org/Menus/Documents/OurServices/LiverTransplantGuide.pdf

National Cancer Institute
cancer.gov/cancertopics/types/childhoodcancers

**Camp Information**
Camp Sunshine
mycampsunshine.com
Crohn’s Disease and Ulcerative Colitis

Crohn’s disease and ulcerative colitis (UC) are the primary sub-types of the group of diseases called inflammatory bowel disease (IBD). The underlying cause(s) of IBD is not known. However, researchers believe that Crohn’s and UC may be the result of an inappropriate and “over” active immune system in the affected patient. The overactive immune system attacks itself, particularly the intestines, but also other organ systems. This type of inappropriate immune system in which the body’s immune cells attacks itself is called “auto” immunity or an auto-immune disease. Many people with IBD also have inflammatory arthritis, liver disease, eye involvement and skin rashes.

At present, research indicates that IBD, including both Crohn’s and UC, are the result of an environmental trigger(s) in the genetically susceptible host. The specific environmental triggers are not yet known, but compelling research indicates that microbes may be the underlying catalyst. Whether diet or other environmental exposures also play a role in triggering the disease is not clear. It is also important to note that IBD (Crohn’s or UC) is not an infectious disease. A child without the condition cannot “catch” IBD from an affected friend or classmate. In addition, exciting research over the past decade into the genetics of IBD has identified a number of candidate genes which may influence disease development.

Crohn’s disease is a chronic condition in which the entire wall of the gastrointestinal tract can become irritated, inflamed and swollen. Unlike UC, Crohn’s disease may occur in any section of the GI tract from mouth to anus. The most common area of the GI tract that is affected by Crohn’s disease is the end part of the small bowel, called the ileum. When a part of bowel is inflamed, the term “-itis” is attached to the area involved. Hence, Crohn’s disease is referred to as “ileitis” when it involves the ileum; “colitis” when the colon is involved; and “ileocolitis” when both regions are involved. In Crohn’s disease, all layers of the intestine may be involved. When the entire bowel wall becomes involved, some patients can develop scarring and narrowed areas—called strictures—and other patients can actually develop holes or connections from one piece of bowel to the other or one piece of bowel to the skin, muscle or other organ systems, and these connections are called fistulae. In addition, Crohn’s disease is not continuous through the bowel—normal healthy bowel can exist between patches of diseased bowel, and these are called skip lesions.

UC causes inflammation in the large intestine primarily. Other areas of the GI tract are generally not involved. In addition, UC affects only the superficial layers (lining of the mucosa) of the colon. UC tends to affect the person’s colon in a more even and continuous distribution. UC generally progresses proximally—involves bowel from the very end of the colon, at the level of the anus and moves back towards the beginning of the large bowel, the cecum.

Both Crohn’s disease and UC can involve other organ systems in varying percentages. These other organ systems involved in IBD are called extra-intestinal manifestations. Common extra-intestinal sites are the liver, a condition called sclerosing cholangitis; the joints—where involvement can range from arthralgias or simple pain on moving to frank arthritis – where the joint is swollen, painful, hot and tender to touch; and eyes—iritis, uveitis. Interestingly, extra-intestinal manifestations of IBD can actually precede the involvement of the gastrointestinal tract by weeks, months to years. Treatment of the extra-intestinal manifestations requires treatment of the underlying IBD whether Crohn’s or ulcerative colitis.

The symptoms of Crohn’s disease and ulcerative colitis can be very similar and distinct. The differentiation between the two types of IBD however cannot be made by symptoms alone. The symptoms generally reflect the area of the bowel involved. For example, in Crohn’s disease if the upper GI tract is involved, symptoms such as nausea, vomiting, loss of appetite, heart burn and early satiety can be observed. If the lower GI tract is involved, the most common symptoms are abdominal pain; diarrhea, which is quite frequently mucus-like and bloody; urgency to have a bowel movement; feeling of not having evacuated the bowel movement after going (called tenesmus); frequent stools which often occur at night time; and fever. When there is a need to use the toilet, cramps can become severe and the urgency may be so great as to result in incontinence if there is any delay in reaching the bathroom. In addition, loss of appetite and weight loss may occur. During periods of active symptoms, the child may also experience fatigue, joint pains and skin problems. Children often become delayed in their progression into or through puberty and can have overall growth delay.

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It is estimated that 1-2 million Americans have IBD, either Crohn’s or UC. Crohn’s occurs more commonly than UC with about two persons out of every three new cases of IBD being diagnosed with Crohn’s disease. Moreover, children are being affected by IBD at younger and younger ages. Now a great number of cases of IBD are reported to have been diagnosed below two years of age, with some children even being diagnosed before their first birthday. However, IBD may occur in children of any age with an increased number of new cases being diagnosed in pre-adolescence and teenagers. An estimated 30 percent of IBD cases are diagnosed in children, i.e., before the patient’s 18th birthday. Another 15-20 percent of adults diagnosed with IBD had symptom onset well before 21 years of age. Males and females appear to be affected equally. Studies have shown that about 20 to 25 percent of patients have a close relative with either Crohn’s or UC.

**Diagnosis and Treatment**

The diagnosis of IBD, either Crohn’s or UC, involves a thorough evaluation by the pediatrician and the pediatric gastroenterologist. At present, unfortunately, not one single diagnostic test can be performed to tell the physician and the patient/parents that a particular individual has IBD. Instead, the definitive diagnosis is made by a combination of the following: thorough history, including family history, and physical examination, blood tests (CBC with differential, C-reactive protein, sedimentation rate (ESR), comprehensive metabolic panel, and “IBD serologies”), x-ray studies (upper gastrointestinal series with barium) and endoscopy (both upper and lower) with biopsies of the gastrointestinal tract lining. The physician after putting together all of the information obtained from the evaluation then can make the diagnosis of IBD.

Crohn’s disease and UC are lifelong illnesses. Medications are given to alleviate the discomfort, “quiet” and resolve the inflammation, facilitate growth, and improve quality of life by helping the patient’s disease into remission—but do not cure the disease. Once symptoms are controlled, maintenance medical therapy is used to decrease the frequency of flare-ups and to maintain remission.

Several groups or classes of drugs are used to treat IBD. At present, physicians tend to use what is called the “step up” approach with medical therapy. This treatment approach uses medications with increasing potency in their immunosuppression effects with the least powerful drugs, often the more generalized in their treatment effects, utilized first. The medications used are in the following categories:

- **Aminosalicylates (5-ASA agents)** – aspirin-like drugs, which include sulfasalazine and mesalamine, given both orally and rectally. Some of these agents have more efficacy in the colon; some have both small and large bowel effects. These medications are typically used to treat mild to moderate symptoms.

- **Corticosteroids** – prednisone and methylprednisolone, and budesonide, available orally and rectally. Corticosteroids nonspecifically suppress the immune system and are used to treat moderate to severe active systems. Often steroids are used to treat acute inflammation or “flares,” or they may be used as “bridge therapy” until other immunomodulators have time to work. These drugs have significant short- and long-term side effects and should not be used as maintenance medications. More recently, budesonide has been shown to be efficacious for maintenance of disease remission in more steroid refractory patients with less overall side effects observed.

- **Immune modifiers or immunomodulators** – azathioprine, (Imuran®), 6-MP (Purinethol®), methotrexate. Immune modifiers are used to help decrease corticosteroid dosage and can facilitate achieving remission in patients, particularly those with Crohn’s disease; and can heal fistulas. In addition, the immune modulators have been very successful in maintainance of disease remission.

- **Biologics** – infliximab (Remicade®), natalizumab (Humira®). These agents given by intravenous infusion are medications targeted at a specific component of the inflammatory cascade which happens once Crohn’s or UC is active. These drugs have been highly successful in quieting very active, refractory disease, achieving remission and maintaining a patient in remission.

- **Antibiotics** – metronidazole, ampicillin, ciprofloxacin and others. As mentioned above, microbial organisms have been felt to act as a trigger in the development and propagation of IBD. Research has shown in some patients that antibiotics, either as a part of the overall therapeutic regimen or alone, have been helpful in achieving some disease resolution and in the maintenance of remission.
Finally, surgery becomes necessary when medications can no longer control the symptoms, or complications of the disease occur, e.g., when an intestinal obstruction, unresolved fistulae or other complication such as an intestinal abscess develop. At times, surgery can be used in the Crohn’s patient with limited disease to help achieve even years of remission on no medication and help the patient through adolescence and puberty. Surgery for the patient with UC can be curative and is done in stages where the entire colon is first removed and an ostomy is created. At some point, depending on the surgeon, the bowel is reconnected (i.e., staging operation over 3-6 months), and these patients once connected can have bowel movements in a regular fashion.

Management at School

Being aware of IBD, the symptoms, signs and complications, the medications used and the potential recurrences and flares is critical for the education system to help these patients maintain as normal and high quality of life as possible. Children with IBD must be able to leave the classroom quickly while attracting minimal attention when attacks of pain and diarrhea occur suddenly and without warning. Questions should be avoided about the need to use the toilet especially in front of classmates, which will only cause further embarrassment and shame. Even a short delay may cause a humiliating accident. Any accommodation a school can provide to reduce anxiety in finding a toilet quickly for the child can be a great help. Providing a private bathroom in the nurse’s or faculty’s area is often beneficial.

Feeling different from everybody else is a major concern for the child with IBD. Children must deal with attacks of abdominal pain and diarrhea. They may be unable to eat, because eating causes even more pain and diarrhea. Poor dietary intake can often slow growth, making an affected child look younger and smaller than their classmates. These problems can cause a child to withdraw, causing depression and anger.

Drug treatment, such as use of cortisone-type drugs, can cause problems due to the side effects as well. These medications can cause the child to gain weight, to develop a rounded puffy face (moon face), to have an increase in acne, and to become moody and restless. These changes can isolate the child even further from classmates. Excessive intake of salty and high-caloric foods should be avoided in order to minimize the disfiguring effects of cortisone-type drugs. Children with IBD often need to take medication during the school day to help control their diarrhea, pain and other symptoms. Arrangements should be made to dispense the drugs in a timely manner so the affected child will not be late for class and stand out as being different.

It should be noted that children with IBD may appear to be well superficially, but may actually be quite ill. Many may require hospitalization from time to time, sometimes for several weeks. Surgery may be necessary to remove diseased intestines or to alleviate a particular complication. School nurses and teachers can help the child keep in touch with classmates and keep up with their schoolwork.

Children can participate in sports whenever their illness allows. A child may require a modified PE program, so that he or she can maintain at least some physical activity and not become inactive.

Educational Considerations

• Develop an IHP/504/IEP.
• Educate staff and peers.
• Promote good communication with parents, healthcare providers and school.
• Provide easy access to bathroom with privacy.
• Provide any needed accommodations in physical education and school schedules.
• Provide for proper administration of medications.
• Help child maintain individualized dietary needs.
• Support educational and emotional needs during absences and hospitalizations.
Resources

A Guide for Teachers and Other School Personnel – Crohn’s and Colitis Foundation of America
cdfa.org/assets/pdfs/teachersguide.pdf

Caring for Your Child with an Ostomy – Hollister

Children’s Digestive Health and Nutrition Foundation
cdhnf.org

Colostomy: A Guide – American Cancer Society
cancer.org/acs/groups/cid/documents/webcontent/002823-pdf.pdf

Crohn’s and Colitis Foundation of America
cdfa.org

Crohn’s Disease – HealingWell.com
healingwell.com/ibd

North American Society for Pediatric Gastroenterology, Hepatology and Nutrition
naspghan.org

Ulcerative Colitis and Crohn’s – A Site for Teens
ucandcrohns.org/printHtml/teachers_guide.html

IBD U – A Site for Older Teens Transitioning into College
ibdu.org

Camp Information

Camp Oasis
cdfa.org/get-involved/camp-oasis
Cystic Fibrosis

Cystic fibrosis is a chronic, congenital disease. It causes a widespread change in the mucus-secreting glands of the body. These include the pancreas, lungs, salivary and sweat glands. Symptoms of the disease include respiratory difficulties and problems maintaining adequate nutritional status due to the production of abnormally thick mucus by these organs. This mucus can clog bronchial passages and block ducts that deliver pancreatic enzymes needed in the intestines for digestion.

Treatment

Treatment involves maintenance of good nutrition and prevention of infection. High caloric, high protein foods are essential because a child with cystic fibrosis can lose up to 50 percent of all calories through bowel movements. Prevention of upper respiratory infections is imperative, and school personnel should notify a parent if the student has been exposed to an infectious disease. A child with cystic fibrosis requires the following to reach and maintain optimum health:

• Good hygiene practices geared toward prevention of infection
• Well-balanced, high caloric diet, tailored to meet special needs
• Pancreatic enzymes before meals or snacks, if needed
• Adequate rest
• Regular medical checkups.

Limitations: If all of the above needs are met, this child can usually participate in regular activities. In some cases, lack of stamina may restrict playground and PE activities. Make attempts to include the child in group activities to prevent feelings of being different or “left out” because of limitations caused by the condition.

Management at School

It is important to recognize the first sign of an impending infection. Such signs may be:

• Listlessness or fatigue
• Fever
• Loss of appetite or weight
• Cough with more mucus production
• Shortness of breath
• Pallor.

Parents should be notified immediately if any of these symptoms arise. Before any medications are administered, be certain that you have on file the required authorization medication form with parent and/or legal guardian signature. Be sure to document information concerning precipitating factors and/or complications, medications administered and reaction, on the clinic card and medication record.

Educational Considerations

• Train necessary school staff in proper medication administration, including medications commonly used for asthma.
• Develop an IHP/504/IEP, including emergency plan.
• Promote good communication with parents, hospital, home and school.
• Adapt physical education activities as needed.
• Recognize need for privacy and encourage “good coughing,” as students often suppress cough for better peer acceptance.
• Recognize need for extra hydration, frequent bathroom breaks.
• Educate staff and peers, per family’s request.
• Support educational needs during hospitalizations, absences.

**Resources**

CF Living  
cfliving.com

Cystic Fibrosis, Children’s Healthcare of Atlanta  
choa.org/cf

Cystic Fibrosis Foundation (click on “Living with Cystic Fibrosis” then click on “At School”)  
cff.org

Cystic Fibrosis Worldwide (worldwide information)  
cfww.org
Diabetes Type 1 and Type 2

Approximately 18.8 million Americans have diabetes—a condition in which the body is unable to use food properly. When food is digested, it breaks down into a sugar called glucose. Glucose is absorbed into the blood and is carried by the bloodstream to body cells, where it will be used for energy. Glucose requires the assistance of a hormone called “insulin” to enter into the cell. The pancreas, a gland behind the stomach, produces insulin. The production or utilization of insulin is decreased or absent in diabetes. Without sufficient insulin, the body cannot use glucose for energy, and high blood sugars (hyperglycemia) result.

Currently, diabetes cannot be cured, but it can be managed. The goals of diabetes self-management include promoting normal growth and development, maintaining overall health and emotional well-being, and normalizing blood sugar levels.

Two main types of Diabetes

Type 1 Diabetes (insulin dependent)
The pancreas stops producing insulin. Type 1 diabetes requires daily insulin injections for survival. Although type 1 diabetes typically starts in children or young adults (previously known as juvenile-onset diabetes), it can occur at any age.

The cause of type 1 diabetes is not known, but research indicates it may involve a disorder in the functioning of the body’s immune system. The immune system protects the body against disease. When this system malfunctions, the body can destroy one of its own parts. This is called an autoimmune response. In type 1 diabetes, the body destroys its own insulin-producing beta cells. Genetics and the environment may also play a part. At this point, type 1 diabetes cannot be prevented and onset is not related to poor diet.

Type 2 Diabetes
In type 2 diabetes, the pancreas still makes insulin, but the body does not use the insulin normally (insulin resistance). This type of diabetes typically develops in adults over 40 years of age, but there is an increasing incidence of newly diagnosed type 2 diabetes in youth in the United States.

Students at greatest risk for developing type 2 diabetes have one or more of these factors:
• Obesity
• Physical inactivity
• Family history of type 2 diabetes
• Exposure to diabetes in utero
• Non-European origin (Hispanic, African-American, Native American)
• Signs of insulin resistance called acanthosis nigricans (dark, velvety patches on the skin around the neck or armpits)

Obesity is a growing epidemic in the school-age population and should be addressed as a public health issue by healthcare providers and school health personnel. “Teaching a healthy lifestyle—one that includes good nutrition and physical activity—can reduce the risk of type 2 diabetes more effectively than medication designed to decrease the risk of diabetes.” (from Health in Action: Diabetes and the School Community, a 2002 publication of the American School Health Association)
Schools can focus on:

• Supporting increased physical activity in the school setting and promoting activities which can be maintained throughout the lifespan by individuals.
• Offering healthy food choices in school for breakfast, lunch and vending machines, especially removing sugared soft drinks, sports drinks or vitamin waters with sugar, and containers of juice more than 4-6 ounces.
• Reducing school-based social stigma associated with weight issues.
• Offering health education on health risks associated with obesity and inactivity.
• Encouraging students and families to turn off TV, video and computer games to allow more time for an active lifestyle.
• Offering counseling as needed to address the impact of negative body image, social development and personal health challenges.

Symptoms of Hyperglycemia (High Blood Sugar)

• Frequent Urination
  Decreased insulin production causes the blood sugar (glucose) level to rise (hyperglycemia) and spill into the urine. The glucose pulls body fluid along with it into the urine, resulting in the formation of large volumes of urine and frequent trips to the bathroom. This is the body’s way of attempting to remove excess sugar.

• Excessive Thirst
  Due to the body fluid loss caused by frequent urination, the body becomes dehydrated. The brain signals its thirst center for additional fluid.

• Increased Hunger
  Since the body is unable to utilize the glucose circulating in the blood for energy, the brain sends out a signal for more food.

• Weight Loss
  The body, unable to use blood sugar for energy, utilizes stored body fat and muscle, which decreases body weight. As the body uses fat, ketones (a waste product of fat utilization) accumulate in the blood and urine. Ketones cause diabetic ketoacidosis (DKA), a serious condition, which can be life-threatening.

• Fatigue
  The pancreas does not produce enough insulin to allow glucose to be used for energy.

• Blurry Vision

• Dry Skin

• Slow Wound Healing

Managing Diabetes at School

A written Diabetes Management Plan should be provided by the parent and child’s healthcare provider for each individual child. It should be reviewed at least quarterly. The diabetes management components outlined here are guidelines only.

It is important to allow the student with diabetes to participate fully in all school and extracurricular activities. Treatment for students diagnosed with type 1 diabetes is primarily insulin. They will need regular monitoring of blood sugar levels, as well as ketone testing when necessary. The only restrictions to diet are usually no sugared drinks or fruit juices, unless treating a low blood sugar. See Diabetes Management Plan for specifics.

Treatment of students diagnosed with type 2 diabetes includes regular monitoring of blood sugar levels, eating reasonably and on schedule, exercising regularly, ketone testing and adjusting diabetes medication as needed. Students can be treated with behavioral lifestyle changes, but they often need oral medications and occasionally insulin.

Students with type 2 diabetes are often on a “fixed carb” diet, where the grams of carbohydrates per meal are specified. They may also have other restrictions for fat or sodium. See Diabetes Management Plan for specifics.
In summary, the management components of type 1 and type 2 diabetes are:

- **Blood sugar testing**
  Before meals, before and after physical activity, whenever symptoms of high or low blood sugar levels are noted, student is “not acting right” or feels ill. A student will also need to check blood sugar levels before and after PE until a pattern in how their body responds and a plan for adjusting their regimen can be established. This will need to be done in collaboration with their endocrinologist.

- **Insulin administration**
  According to the Diabetes Management Plan

- **Oral diabetes medications**
  According to the Diabetes Management Plan (type 2)

- **Regularly scheduled meals and snacks**
  Allow at least two hours between foods with carbs and the pre-meal blood sugar test.

- **Ketone testing**
  When blood sugar level is over 300 or student is ill.

- **Identifying and quick response to low blood sugar levels**
  All school personnel that come in contact with a student who has diabetes need to know signs and symptoms of hypoglycemia and what actions to take.

**Nutrition Management**

A diet with a variety of nutrient-rich foods is recommended for children with diabetes and their families. Following the USDA Dietary Guidelines, below, is one way to meet your nutrient needs:

- Make half of your plate fruits and vegetables
- Enjoy your food, but eat less
- Drink water instead of sugary drinks
- Make at least half of your grains whole grains
- Avoid oversized portions
- Compare sodium in foods and choose foods with lower sodium
- Switch to fat-free or low-fat (1%) milk
- Limit solid fats such as butter, margarine, shortening and lard, as well as foods that contain solid fats.
- Find your balance between food and physical activity to maintain a healthy weight.

**Balancing children’s plates** will help them receive the nutrients they need for growth and maintaining optimal blood sugar levels: ¼ with starch or grain; ¼ with lean meat, poultry or fish; ¼ with non-starchy vegetables or salad; ¼ with fruit. These nutrients are carbohydrates, protein, fats, vitamins, minerals and fiber. Three of these nutrients, carbohydrates, proteins and fats, have the greatest impact on blood sugars.

**Carbohydrate** foods, such as grains, pasta, bread, cereal, starchy vegetables (like potatoes, beans, corn, peas and butternut and acorn squash), fruit, milk, yogurt, snack foods, desserts and sweets raise blood sugar levels, so the child needs to pay attention to how much of these foods they eat. However, carbohydrates also provide energy needed to grow and to do everyday activities, so it is important for children with diabetes to eat foods that contain carbohydrates.
**Protein** is found in meats, cheese, fish, poultry, eggs and nuts. Protein helps grow and repair body tissue such as muscle and bones, but it does not affect blood sugar levels. Many foods high in protein are also high in fat.

**Fats** are foods such as margarine, butter, oils, salad dressings, nuts, cheese and meat. Fat does not affect blood sugar levels, but that does not mean a child can eat all they want. Too much fat can cause weight gain and other problems like elevated cholesterol. The healthiest fats are monounsaturated or polyunsaturated fats that protect the heart. Some examples of monounsaturated fats include: canola and olive oils, nuts, avocado and seeds. Examples of polyunsaturated fats include: corn oil, soybean oil and sunflower oils, as well as Omega-3 (fish) oils.

Since carbohydrates affect (raise) blood sugar levels, accurately estimating how much a student eats is a required skill of nurses.

**There are two ways to count carbohydrates:**

1. Carbohydrate Serving List
2. Reading Food Labels

**Carbohydrate Serving List**

The school nutrition director or coordinator can provide the school nurse with the nutrition information including the grams of carbohydrates in the individual foods served at their cafeteria.

**EXAMPLE OF A CARBOHYDRATE SERVING LIST**

<table>
<thead>
<tr>
<th>Food</th>
<th>kcal</th>
<th>Protein</th>
<th>*CHO</th>
<th>Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 oz. orange juice, Ocean Spray</td>
<td>60</td>
<td>0</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>1 sandwich bun, Flowers Foods</td>
<td>120</td>
<td>5</td>
<td>24</td>
<td>1.5</td>
</tr>
<tr>
<td>1 slice white bread, Sunbeam</td>
<td>55</td>
<td>2</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Baked french fries, 10 pieces</td>
<td>100</td>
<td>1.5</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>1 medium fresh apple</td>
<td>72</td>
<td>0.4</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>1 medium fresh orange</td>
<td>62</td>
<td>1</td>
<td>15</td>
<td>0.16</td>
</tr>
<tr>
<td>8 oz. 2% milk</td>
<td>130</td>
<td>8</td>
<td>12</td>
<td>5</td>
</tr>
</tbody>
</table>

*CHO = carbohydrates

**EXAMPLE OF A SAMPLE SCHOOL LUNCH AND AN ESTIMATE OF THE GRAMS OF CARBOHYDRATES**

<table>
<thead>
<tr>
<th>Food</th>
<th>Grams of carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>One medium apple</td>
<td>19 grams</td>
</tr>
<tr>
<td>Hamburger on bun</td>
<td>24 grams</td>
</tr>
<tr>
<td>Lettuce and tomato</td>
<td>do not count-negligible carbohydrate</td>
</tr>
<tr>
<td>Baked fries (serving of 10 shoestring fries)</td>
<td>17 grams</td>
</tr>
<tr>
<td>Milk, 2%, 1 carton</td>
<td>12 grams</td>
</tr>
<tr>
<td><strong>Total CHO</strong></td>
<td><strong>72 grams</strong></td>
</tr>
</tbody>
</table>
Reading Food Labels

Food labels found on containers give the carbohydrate content information listed under the Nutrition Facts. So if a nutrition analysis is not available, but a food label is, the nurse can refer to it.

There are three steps to reading the “Nutrition Facts” on a food label:

1. Determine the serving size of the product.
2. Find the servings per container.
3. Look at the total grams of carbohydrate (in one serving).

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size 1 Cup (228g)</td>
</tr>
<tr>
<td>Servings per Container 2</td>
</tr>
</tbody>
</table>

The above food label shows that one cup is the serving size and there are 31 grams of total carbohydrate in that amount. If the child chose to eat the entire container (2 servings), the student would have eaten two cups and 62 grams of carbohydrates.

A child’s appetite and intake may vary greatly depending on his or her activity level. Therefore, the daily carbohydrate intake can vary as well. School-age children should use their dietitian/healthcare provider’s recommended range for grams of carbohydrate per meal. This will allow adequate growth and development.

Other resources for carbohydrate counting include:

Diabetic Exchange List for Meal Planning
mayoclinic.com/health/diabetes-diet/DA00077

CalorieKing
calorieking.com

Nutri-Café
nutri-cafe.com


USDA Nutrient Database Web site
ndb.nal.usda.gov
Blood sugar level monitoring

• Target blood sugar levels
  Although it differs among individuals, a general blood sugar target range is 70-150 (may be higher for younger children). Healthcare providers set target ranges. When the blood sugar level is over 180, glucose begins to spill into the urine. When the blood sugar level is greater than 300 or during illness, ketones can accumulate in the blood and urine.

• Procedure
  Testing the blood sugar level provides information needed to continually adjust the management program and prevent complications. Testing is done by obtaining a blood sample by performing a finger stick. A drop of blood is placed on a test strip and read by the blood sugar monitor. Blood sugar monitors and strips require a quality control system to ensure accuracy. It is necessary to test the first strip from each strip container using a control solution. Some monitors also require coding of the monitor with each new vial of strips. Parents are responsible for teaching school personnel the method of quality control. It is also the responsibility of the parent to provide all equipment and supplies.

• When to test
  Testing is usually done before meals, whenever symptoms of hypoglycemia or hyperglycemia occur, and as directed by the physician and/or parent. When children have symptoms of high or low blood sugar, they should always have an adult accompany them to the health clinic who can call for help in case they become sick on the way. It is recommended that monitoring and treatment be completed with as little loss of class time as possible. Treatment of a low blood sugar level requires supervision for all children. Results can be sent home or called to the parent daily or before follow-up appointments are scheduled.

Note: Wherever glucose monitoring or insulin administration is done, there should be provision for disposal of the sharps in an appropriate container.

To minimize learning disruption, blood sugar checks should be allowed in the classroom for students who can demonstrate the ability to check independently. Students who demonstrate accurate technique, appropriate infection control, disposal of sharps, and ability to interpret results and seek appropriate treatment can be considered for self-testing without constant supervision.

To facilitate this, a meeting with the family, classroom teacher, principal and clinic personnel should be held. A letter from the student's physician requesting that this procedure be done in the classroom may be presented at this meeting. It is a good idea for parents to demonstrate monitoring with their child for school personnel. This helps school personnel observe the child's reaction and ability. Most students will need some supervision to ensure upkeep of adequate supplies and compliance with their diabetes management. The pre-lunch blood sugar may be done in the school clinic to facilitate correct lunchtime insulin dose if the child is receiving insulin for carbs eaten and/or for correcting elevated blood sugar levels.

Ketone Monitoring

Urine ketones are usually monitored any time the blood sugar level is over 300 or when a child with diabetes is sick. Testing is done by obtaining a urine sample and using a test strip visually matched with a color guide. In addition to urine samples, there are blood sugar monitors that can test for blood ketones.

Parents need to review the procedure with school personnel and provide the needed supplies:

• When the blood sugar level is over 300 or the student is sick, they will need access to water and sugar free fluids.
• Students with trace or small ketones should be allowed to stay in class.
• Ketone testing should be repeated in three to four hours.
• Moderate to large ketones results should be called immediately to parents first and doctor if parents cannot be reached.
• If ketones are positive, the student should not participate in PE or other physical activity.
Exercise

Regular exercise is important. Children will need to check their blood sugar levels and may need a carbohydrate snack before and/or after exercising. Refer to student’s health care plan for specifics on blood sugar testing and snacks with exercise.

Insulin

There are four types of insulin:

1. Rapid acting insulin (Humalog®, Novolog®, Apidra®)
   - Used to help move glucose into the cells after eating
   - Used to fix high blood sugars
   - Usually given with meals or right before

2. Short acting insulin (Regular)
   - Used to help move glucose into the cells after eating
   - Used to fix a high blood sugar
   - Less expensive alternative to rapid acting insulins
   - Usually taken 30 minutes prior to meals

3. Intermediate acting insulin (NPH, 70/30, 75/25)
   - Usually taken twice a day, at breakfast and dinner
   - A “cloudy” insulin that can be mixed with a clear fast-acting insulin
   - Because the peak action is delayed, regular timing of meals and snacks is important when using intermediate acting insulin.
   - Usually used in combination with a rapid acting insulin

NOTE: Intermediate acting insulins also require a consistent amount of carbohydrates be eaten at meals and snacks. Students on this insulin regimen may not “skip” lunch, or they will be at risk for severe low blood sugar levels. They may only need rapid acting insulin to correct a high blood sugar level at lunch. If blood sugar level is in range, the student will not need an insulin injection with lunch.

4. Long acting insulin (Lantus®, Levemir®)
   - Is usually given once a day
   - Is considered a “peakless” insulin
   - Cannot be mixed in a syringe with other insulins

<table>
<thead>
<tr>
<th>Insulin</th>
<th>Begins Working</th>
<th>Peaks At</th>
<th>Stops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novolog®, Humalog®, Apidra®</td>
<td>5 - 15 minutes</td>
<td>30 - 90 minutes</td>
<td>3 - 4 hours</td>
</tr>
<tr>
<td>Regular</td>
<td>30 - 60 minutes</td>
<td>2 - 4 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>Lantus®, Levemir®</td>
<td>1 - 3 hours</td>
<td>almost or no peak</td>
<td>18 - 26 hours</td>
</tr>
<tr>
<td>NPH, 70/30, 75/25*</td>
<td>30 - 60 minutes</td>
<td>1 hour, 6 - 8 hours*</td>
<td>1 hour, 6 - 8 hours*</td>
</tr>
</tbody>
</table>

*70/30 and 75/25 have two “peaks” of insulin action.

Note: Different types of insulin have different peak action times which may dictate timing of insulin and meals. It is ideal to give rapid acting insulin right before meals so that its action is peaking simultaneously with food digestion.
Insulin administration

Insulin is usually given in two to six injections per day, prior to breakfast, lunch, dinner, snacks and sometimes bedtime. At times, insulin may not be required prior to lunch and snacks. Refer to student’s Diabetes Management Plan for specific instructions on insulin administration.

Insulin may be given with a pre loaded insulin pen, with the dose “dialed” in, or with a regular syringe. Insulin may also be administered continuously by the use of a battery-operated portable infusion pump. See Medication Administration, Chapter 3.

Insulin storage and expiration

After opening, insulin generally may be stored 30 days at room temperature, or under refrigeration. Label insulin vials with the date it will expire. Expiration dates need to be checked regularly. If allowed to reach 85 degrees or higher, insulin should be considered as spoiled and replaced.

Insulin dosing

Dosing insulin is different for each student. Based on the type of insulin that is prescribed, students will have different dosing schedules. The students’ diet is determined by their insulin regimen. Some students may have a set or “fixed” number of carbohydrates allowed for each meal, and others may have a flexible number of carbohydrates allowed at meals.

For instance, a student using intermediate and rapid acting insulins, will take intermediate acting insulin at breakfast and dinner that will provide coverage for the food that is eaten at meals and snacks. These students are usually on a “fixed” carbohydrate diet, meaning they should only eat the number of carbohydrates at meals and snacks that is in their carbohydrate range (for example: 60-75 grams of carbohydrates at lunch). These students will also require rapid-acting insulin for correcting a high blood sugar level at meals.

A student using rapid and long acting insulins will take rapid acting insulin at each meal based on the number of carbohydrates eaten (flexible) and for correcting a high blood sugar level. These students do not have a limit on the number of carbohydrates allowed because they take insulin based on advanced carbohydrate counting. Meals and snacks should be scheduled at least two hours apart.

Students will require insulin at meals and snacks as directed by the Diabetes Management Plan.

Insulin for food

Advanced carbohydrate counting is a method used to dose rapid acting insulin based on the amount of carbohydrates eaten at a meal or snack. Students that require advanced carbohydrate counting methods are those that are on a pump (it uses rapid acting insulin) and those that take both rapid and long acting insulins. Students that take intermediate acting insulin do not require advanced carbohydrate counting insulin dosing. If short acting insulin is prescribed, see Diabetes Management Plan in regards to advanced carbohydrate counting.

First, the student/nurse will determine what food items will be eaten and what the carbohydrate content of each food is by referring to the school cafeteria nutrition analysis or food labels. Once the “total carbohydrates” in the meal or snack have been determined, the nurse will divide this total by the insulin-to-carbohydrate ratio prescribed by the physician. For example, a ratio of 1:15 means for every 15 grams of carbohydrates eaten, the student will receive 1 unit of rapid acting insulin.
Example:
1 wheat bagel = 38 grams
2 tbsp. cream cheese = 0 grams
Crystal Light = 0 grams
4 oz. apple = 15 grams
----------------------------------------------
Total carbs (grams) = 53 grams

Insulin: Carbohydrate ratio = 1:15 (1 unit per 15 grams carbohydrates)

If your meal has 53 grams of carbohydrates, then $53 \div 15 = 3.5$ units of rapid acting insulin such as Humalog® or Novolog® (doctors usually advise to round up dosages that end in a 0.5 decimal point or higher, upward to the nearest whole).

**Insulin for high blood sugar levels**

**THE CORRECTION FORMULA**

A doctor monitoring a diabetes patient will prescribe a number called the “correction factor” to correct a high blood sugar. It is usually a number such as 20, 25, 30, 50 or 100. When using the correction formula, the student and nurse will subtract 100 (or another number assigned by the doctor) from their current blood sugar level. Then the difference is divided by the correction factor assigned to them.

For example, if the student’s pre-meal blood sugar level is 200 and their correction factor is 20, he would take five units of insulin (in addition to the insulin for the carbohydrates eaten if practicing advanced carbohydrate counting) to bring his blood sugar level back down to his target:

\[
\text{Student's blood sugar level} - 100 = 200 - 100 = 100 = \frac{100}{20} = 5 \text{ units of insulin}
\]

**THE SLIDING SCALE FORMULA**

Some physicians prefer to prescribe this method to manage a student's high blood sugar level instead of using a correction factor. The sliding scale formula is based on blood sugar ranges.

If your blood sugar level is between: You will take this many units:

- 200 – 299: 4 units
- 300 – 399: 6 units
- Over 400: 8 units

For example, if your blood sugar level is 200, you would take four units of rapid acting insulin.

For students that require advanced carbohydrate counting, insulin for high blood sugar levels is given in addition to the required units needed for the total carbohydrates at meals. Corrections to high blood sugar levels should be performed no more than every four hours unless otherwise directed in the Diabetes Management Plan.

Note: Before any medications are administered, be certain that the required Medication Authorization Form with required signature is on file stating the type of medication, dosage and time it is to be given (according to school policy). Be sure to document on the clinic record and student medication record, information concerning precipitating factors and/or complications, medications administered and reaction.
Insulin pumps in a school setting

Continuous Subcutaneous Insulin Infusion (CSII) also known as Insulin Pump Therapy is an alternative method of insulin delivery. The goal of insulin pump therapy is to mimic what normally happens physiologically in the body. The pump, a microcomputer, is about the size and weight of a pager and uses batteries. It is worn outside the body. It holds a reservoir of insulin inside the pump and is programmed to deliver the insulin through a small plastic catheter or cannula. The cannula is inserted into the subcutaneous fat and stays in place for two to three days.

How the pump works

The pump uses only rapid acting insulin. Insulin pumps combine a continuous basal rate of insulin with insulin boluses given at meals, snacks and at times of increased blood sugar levels.

**Basal insulin** – Basal insulin is a continual dose of insulin that the body requires. The basal rate is given 24 hours a day and is programmed as units per hour. Basal rates are programmed by the child’s doctor, parent or even the student himself depending on his age. The basal rate also can be changed temporarily for alterations in schedule, activity, illness or food.

**Bolus Insulin** – The pancreas releases insulin when higher blood sugar levels are sensed such as after meals or during times of illness. An insulin pump mimics this release when the user programs a bolus dose at meals, snacks or other times that insulin may be needed. Each child wearing an insulin pump should have a plan that determines how much insulin he should take for the amount of food that is being eaten, high blood sugar and planning for exercise. Most pumps, now called “smart pumps,” allow the insulin to carbohydrate ratios and correction formulas to be pre-programmed into them.

Teenagers using an insulin pump should be well educated in its use and about diabetes. Younger children with a pump will require more assistance.

Troubleshooting the insulin pump

The following companies make or sell insulin pumps in the United States:

- Animas® Corporation 1-877-767-7373
- Medtronic MiniMed Paradigm® 1-800-826-2099
- OmniPod® (Insulet) 1-800-591-3455
- Roche ACCU-CHEK® Spirit (formerly Disetronic) 1-800-688-4578

The child’s parents should instruct the school staff on programming the pump and what to do if any alarms should occur. If the parent cannot be reached at the time a problem arises or a trained staff member is not available, school staff can call the 800 number on the back of the pump designated as the “24-Hour Pump HelpLine.” This number directs the caller to trained professionals who can answer any questions about the pump. A student can rapidly deteriorate if a pump malfunctions. There should be no delay in dealing with this situation.

Every student wearing an insulin pump at school should have a supplement to their Diabetes Management Plan that addresses the management of the Insulin Pump (see Diabetes Management Plan at the end of this section).

Stress Management

Stress, good or bad, may increase blood sugar levels. Other factors that increase blood sugar levels are growth, hormones and illness. Sometimes there is no identifiable reason for a high blood sugar level. It is important to refrain from showing a negative reaction to a high blood sugar level.
Complications and Treatment

Of utmost importance to school personnel is the ability to recognize the two most serious emergencies for diabetic children: low blood sugar level (insulin reaction or hypoglycemia) and high blood sugar level with moderate to large ketones (diabetic ketoacidosis). It is necessary to distinguish between the two because each condition requires completely different, but immediate actions. Always treat for low blood sugar levels if unable to distinguish between the two. The target blood sugar level is individualized; children generally are treated when the blood sugar level is below 70 or 80 or if they are symptomatic.

Treatment of high and low blood sugar levels is addressed in the student’s Diabetes Management Plan. See also the Hypoglycemia and Hyperglycemia chart at the end of this Diabetes section.

Educational Considerations

Communicating with parents through an annual conference at the beginning of the school year is usually necessary to formulate or review the student’s Diabetes Management Plan. This plan should include:

- Meal plan, snacks, eating lunch at an appropriate time with enough time to finish eating
- Current medications/formulas for dosing, assistance as needed/appropriate for age
- Blood sugar level monitoring schedule
- Access to water and bathroom privileges as needed
- Exercise management
- Stress management (testing accommodations, etc.)
- Participating fully in all school and extracurricular activities, planning for field trips
- Accommodations related to absences for medical visits and illness
- Emergency care plan that includes:
  - recognizing symptoms and treatment of low blood sugars, including the administration of glucagon if authorized
  - recognizing symptoms and treatment of high blood sugars
  - checking for ketones when the blood sugar level is over 300 or if the student is sick
  - ensuring insulin and medication supplies and supplies to treat low blood sugars including glucagon is on hand in case of an emergency evacuation.

Ongoing dialogue is needed as changes occur in lunch schedules or PE activity/schedules. Ideally, all school personnel (including the bus driver) involved with the student should receive diabetes education annually from the school nurse.

Other matters that can benefit from education and awareness

Parties

Notify parents ahead of time in order for them to decide if the child may eat the same food or if an alternative should be provided.

Field Trips

Trips may change meal times, which can affect blood sugar levels. Notify parents of changes so they can decide if an additional snack is needed and determine the timing of that snack.

Psychological Issues

School personnel’s awareness of the possible impact of diabetes on personality development is essential. Children with diabetes should be perceived as normal and fully able to participate in all school activities. Both factors are critical for developing and maintaining self-esteem and peer acceptance. At the elementary level, at student and parent request, classmates may be oriented to diabetes and reassured that diabetes is not contagious.
At the middle and high school levels, teenagers are sometimes less comfortable disclosing a chronic disease for fear of being perceived as being different than their peers.

**Manipulation**
When a student's frequent requests for food or bathroom trips are questioned, blood sugar testing will usually resolve the issue. High blood sugar levels will increase the frequency of urination. They may need to urinate several times in an hour.

**School Protocols**
Refer to individual school protocols for the administration of medication and standard precautions. Remember that syringes and lancets for blood sugar testing require proper disposal in an approved sharps container. Gloves should be worn when assisting a child with blood sugar or ketone monitoring.

**Resources**
American Diabetes Association – Georgia Affiliate, Inc.
404-320-7100
diabetes.org

Children with Diabetes – Diabetes at School
childrenwithdiabetes.com/d_0q_000.htm

Children with Diabetes: a resource guide for families and schools – New York State Department of Health
health.state.ny.us/publications/0944.pdf

Diabetes Association of Atlanta
diabetesatlanta.org

Diabetes Care Tasks at School: What Key Personnel Need to Know

Diabetes Center – Children’s Healthcare of Atlanta (See Diabetes Education Handbook)
cha.org/Childrens-Hospital-Services/Diabetes/Diabetes-Resources

Dial Program, Diabetes Information Action Line
1-800-DIABETES

Georgia Affiliate Juvenile Diabetes Research Foundation
jdrfgeorgia.org

Helping the Student with Diabetes Succeed: A Guide for School Personnel; A Joint Program of the National Institutes of Health and the Centers for Disease Control and Prevention, September 2010
ndep.nih.gov/media/NDEP61_SchoolGuide_4c_508.pdf

Juvenile Diabetes Research Foundation International
jdrf.org
Publications
Countdown, quarterly magazine
1-800-JDF-CURE (Subscription rates subject to change)

Diabetes Forecast, monthly magazine
1-800-DIABETES (Subscription rates subject to change)


Camp Information
Camp Kudzu
campkudzu.org

The following resources are included in this section:
1. School Supply Box
2. Diabetes Checklist for School Nurses
3. Algorithm for Managing Blood Glucose Results
4. Procedure for Blood Glucose Monitoring
5. Procedure for Insulin Pump Therapy with Supervision
6. Diabetes Checklist for Teachers
7. Diabetes Monitoring Form
8. Diabetes Reference Images
9. Hypoglycemia and Hyperglycemia Chart
10. Hypoglycemia Fact Sheet
11. Improving Diabetes Management in Adolescence
12. Diabetes Management in the School Setting
14. Georgia House Bill 879
SCHOOL SUPPLY BOX

It is recommended that a diabetes supply/emergency kit be brought to school and maintained weekly by family:

- Insulin, syringes and alcohol swabs
- Blood glucose monitor, test strips, lancet device and lancets
- Ketone strips
- Other medication taken on a regular basis
- Fast acting and slow acting carbohydrate foods for treatment of low blood sugar (non-perishable emergency snacks)
- Glucose tablets
- Glucose gel in case of a minor emergency
- Glucagon Kit (If school will allow someone to be trained on the use of glucagon. Some schools will only allow a RN to administer glucagon.) Be sure to include directions for use and dose.
- Logbook
- List of emergency contact numbers

**Communicate with your school nurse weekly. Supplies may need to be restocked. Remember to run controls on your blood sugar meter periodically and to check for expiration dates on supplies including insulin, ketone strips and Glucagon Kit.**
Diabetes Checklist for School Nurses

☐ Arrange meeting between nurse, parent(s)/guardian and student, if appropriate.
☐ Discuss parent expectations of diabetes care while at school.
☐ Discuss school’s policies, nurse staffing, expectations of parents.
☐ Determine equipment and supplies needed (including hypoglycemia treatment supplies, ketone sticks, sharps container, blood sugar meter and strips) and where supplies will be kept (hypoglycemia supplies may be kept in multiple locations for easy access).
☐ Discuss plans for communication of daily levels/issues.
☐ Have parents sign release of information form and other forms as needed/obtain school care plan from healthcare provider.
☐ Review school day schedule and assess student’s level of independence.
☐ Identify potential issues requiring accommodations.
☐ Clarify specifics of treatment plan.
☐ Arrange meeting with appropriate educational team members.
☐ Provide education and training as necessary for other staff members.
☐ Provide classroom education if requested by parent or child.
☐ Possible accommodation issues:
  ☐ blood sugar monitoring: when, where, who, what to do with results
  ☐ recognition and management of low blood sugar levels (including someone to accompany student if symptomatic)
  ☐ recognition and management of high blood sugar levels
  ☐ insulin injections: who, where, when and how to communicate with parents
  ☐ meals and snacks: timing, monitoring, carb counting, menu selection, special occasions (parties, field trips)
  ☐ access to drinking water/ bathroom privileges
  ☐ transportation issues
  ☐ after school activities, field trips, etc.
  ☐ plan for school absences/ make-up work.
☐ Review the Diabetes Management Plan at least annually or when changes occur. Revise as needed.
SAMPLE ALGORITHM FOR MANAGING BLOOD GLUCOSE

Obtain Blood Glucose Reading

Below 70
1. Give Fast acting sugar source*.
2. Observe for 10-15 minutes.
3. Retest blood glucose, if less than 70 repeat sugar source according to procedure. If ordered, give carbohydrate and protein snack (e.g., crackers and cheese) or send to lunch early.
4. Notify parent/guardian
5. Notify school nurse if two or more episodes in one week
6. If Student Becomes Unconscious, Seizures, or is Unable to Swallow:
   a. Call 911
   b. Turn student on side to ensure open airway.
   c. Administer glucagon as prescribed.
   d. Notify school nurse and parent/guardian
7. If Student Feels OK Ketones Negative or Trace Small
   1. If 70 or above the student feels OK, may resume school activities. Provide treatment according to orders.
   2. If 70 or above and student is feeling “low”, retest immediately. Give fast acting sugar source. Wait 10-15 minutes. Retest blood glucose. If ordered, give carbohydrate and protein snack.
   3. Provide water if student is thirsty and/or has dry mucous membranes.
   4. Provide free access to the bathroom
   5. Document action and provide copy to school nurse.
   6. Inform parent/guardian
   7. If pump, additional attention required, (e.g., filling of reservoir, changing set, insulin administration.)
   8. Recheck blood glucose and ketones if symptoms persist.

70-__

Above

If Student Does Not Feel OK Ketones Moderate to Large
1. Call parent/guardian.
2. Provide water if student is thirsty and/or has dry mucous membranes.
3. Provide free access to the bathroom
4. Provide additional treatment per IHP (e.g., insulin administration, ketone check, activity restriction.)
5. If pump, additional attention required, (e.g., filling of reservoir, changing set, insulin administration.)
6. Notify school nurse if there are further immediate concerns or questions. Document action and provide copy to school nurse.
7. Recheck blood glucose and ketones if symptoms change while waiting for parent/guardian or 911
8. FOR VOMITING WITH CONFUSION, LABORED BREATHING AND/OR COMA
   ● Call 911
   ● Notify parent/guardian
   ● Contact school nurse

* Fast Acting Sugar Sources
- 3-4 glucose tablets
- 15 grams glucose gel
- 6 oz regular soda
- 4 oz juice (unsweetened)
- 3 tsp. sugar in water
- 3 tsp. jelly, syrup, or honey

Adapted with permission from National Association of School Nurses, 2011
# PROCEDURE FOR BLOOD GLUCOSE MONITORING

<table>
<thead>
<tr>
<th>Equipment and Supplies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Alcohol prep pad (optional)</td>
<td>• Tissue or cotton balls</td>
</tr>
<tr>
<td>• Finger lancing device</td>
<td>• Gloves</td>
</tr>
<tr>
<td>• Blood glucose meter</td>
<td>• Sharps container</td>
</tr>
<tr>
<td>• Blood testing strips for specific meter</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Essential Steps</th>
<th>Key Points &amp; Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash hands and area to be tested with soap and water. Put on gloves. Student’s hands must be washed as well. This is sufficient for prepping the site; however, alcohol may be used if soap and water are not available. (The site selected must be dry before pricking.)</td>
<td>Alcohol may cause toughening of the skin or burning sensation. If moisture (water or alcohol) remains on the skin it may alter test results.</td>
</tr>
<tr>
<td>2. Place glucose test strip into meter according to manufacturer’s instructions. Verify correct code for strip.</td>
<td></td>
</tr>
<tr>
<td>3. Prepare lancing device according to manufacturer’s instructions.</td>
<td></td>
</tr>
<tr>
<td>4. Select a site. If using finger, use the sides of fingertips. Hang the arm below the level of the heart for 30 seconds to increase blood flow.</td>
<td>The tips and pads of the fingertips are more sensitive. The sides of the fingers should be used. Other sites can be used such as the forearm if approved by manufacturer, but should not be used if suspected hypoglycemia.</td>
</tr>
<tr>
<td>5. Puncture the site with the lancing device. Gently squeeze the finger so that blood can be absorbed into test strip with wicking motion.</td>
<td></td>
</tr>
<tr>
<td>6. Place blood on test strip and complete instructions according to manufacturer’s instructions.</td>
<td></td>
</tr>
<tr>
<td>7. Dispose of test strip and tissue or cotton ball in lined wastebasket. Dispose of lancet in Sharps container.</td>
<td>Compress lanced area with tissue or cotton ball until bleeding stops.</td>
</tr>
<tr>
<td>8. Remove and dispose of gloves, wash hands.</td>
<td></td>
</tr>
<tr>
<td>9. Record results per school policy.</td>
<td>Refer to student’s IHP for management of blood glucose results.</td>
</tr>
</tbody>
</table>

*Adapted with permission from National Association of School Nurses, 2011*
### Procedures for Insulin Pump Therapy

#### For the Student Who Requires Supervision to Manage their Care

#### Procedure for Hyperglycemia with Pump Therapy

<table>
<thead>
<tr>
<th>Essential Steps</th>
<th>Key Points &amp; Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check site for leakage, cannula dislodgement, redness and/or tenderness. If any of these are present, follow IHP regarding site changes.</td>
<td>Redness and/or tenderness at the site may indicate infection. The blood glucose can rise quickly since the delivery of rapid acting insulin has been interrupted and there is no long acting insulin in the body. If site is unable to be changed, a back up plan for removing the infusion set and insulin administration must be followed (IHP). The school nurse may contact the health care provider for insulin administration instructions.</td>
</tr>
<tr>
<td>2. Follow Emergency Care Plan for Hyperglycemia.</td>
<td>Blood glucose should be checked 30 minutes — 2 hours after a correction dose to ensure that the blood glucose is responding to insulin. It may be necessary to continue checking blood glucose levels periodically to prevent hypoglycemia.</td>
</tr>
</tbody>
</table>

#### Procedure for Hyperglycemia with Pump Therapy

<table>
<thead>
<tr>
<th>Essential Steps</th>
<th>Key Points &amp; Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Follow Emergency Care Plan for Hypoglycemia.</td>
<td>Student may need assistance.</td>
</tr>
<tr>
<td>2. Follow IHP for activity/exercise.</td>
<td>Hypoglycemia cannot always be avoided although a plan should be in place regarding actions to prevent hypoglycemia during planned activity/exercise. If vigorous activity is anticipated a lower basal rate or intake of extra carbohydrates before, during and/or after activity may avoid hypoglycemia. Accommodations must be addressed in the IHP. School nurse will notify parents and confer with health care provider.</td>
</tr>
<tr>
<td>3. Notify the school nurse.</td>
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</tr>
</tbody>
</table>

#### Procedure for Pump Alarms

<table>
<thead>
<tr>
<th>Essential Steps</th>
<th>Key Points &amp; Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trouble shoot alarms.</td>
<td>Follow manufacturer’s instructions for alarm indication. School nurse must be knowledgeable regarding pump alarms. A reference card can assist with troubleshooting steps or the manufacturer’s 800 number can be called (listed on the back of the pump).</td>
</tr>
<tr>
<td>a. LOW BATTERY:</td>
<td>Insert new batteries per instructions.</td>
</tr>
<tr>
<td>b. NO DELIVERY. Check reservoir, check cannula.</td>
<td>Cannula may be obstructed or kinked requiring a new infusion set. Check insulin reservoir; if it is empty follow IHP regarding refilling plan.</td>
</tr>
<tr>
<td>c. LOW CARTRIDGE: Check reservoir.</td>
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<tr>
<td>2. Call school nurse immediately.</td>
<td>School nurse will notify parents of above and may contact health care provider for further orders. An injection of rapid-acting insulin may be ordered.</td>
</tr>
</tbody>
</table>

Adapted with permission from National Association of School Nurses, 2011
Diabetes Checklist for Teachers

- Participate in the healthcare planning meeting and training.
- Understand basic information about diabetes:
  - signs and symptoms of low and high blood sugar levels
  - how to treat low and high blood sugar levels
  - food and snack requirements and routines/importance of timing
  - daily blood sugar level monitoring
  - respect for privacy
  - safety procedures
  - communication with school nurse, parents and other students
# Diabetes Monitoring Form

Name: ___________________________ Grade: ___________________________

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Blood Glucose</th>
<th>Carb Count</th>
<th>Insulin Dose</th>
<th>Other Treatment / Comments (note any unusual circumstances such as extra food intake, exercise, change in routine, hypoglycemic or hyperglycemic reactions, etc.)</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Signature/Initials: ___________________________ Signature/Initials: ___________________________ Signature/Initials: ___________________________

Signature/Initials: ___________________________ Signature/Initials: ___________________________ Signature/Initials: ___________________________
Diabetes Reference Images

Where Insulin is Made

Pancreas
Insulin and glucose are both carried by the blood stream and released into tissues.

Insulin "unlocks" the cell channels so sugar can go inside.
Subcutaneous injection of insulin

Skin
Subcutaneous fat
Muscle
Hypoglycemia

Sweating
Tired
Anxious
Shaky

Drink 4 oz. juice OR eat 4 glucose tablets

OR

15 minutes after having the juice OR taking glucose tablets and re-checking blood glucose.
Hyperglycemia and Ketones

Check urine ketones if:
- Child is sick
- Blood glucose is >300 mg/dL
- Nausea or vomiting

Call doctor if ketones are present
How different foods affect blood sugar

**Foods that raise blood sugar**
- Fruits
- Starch and grains
- Milk and yogurt
- Sweets

**Foods that do not raise blood sugar**
- Non-starchy vegetables
- Meats and proteins (cheese, soy, eggs)
- Fats and oils
### Measuring Carbohydrates

<table>
<thead>
<tr>
<th>Servings</th>
<th>Grams of Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 slice of bread</th>
<th>1/3 cup of rice</th>
<th>2 hard shell tacos</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 slices of bread</td>
<td>2/3 cup of rice</td>
<td>one 12 inch tortilla</td>
</tr>
<tr>
<td>1 cup of pasta</td>
<td>1 cup of rice</td>
<td>1 slice of bread + 2/3 cup of rice</td>
</tr>
</tbody>
</table>
Hypoglycemia

**Causes**
- Too much insulin
- Not enough food
- Increased physical activity
- Late or skipped meals (if on NPH, Novolog 70/30 or Humalog 75/25)

**Symptoms**
- Sweating
- Shaky
- Headache
- Hunger
- Irritable
- Weakness or Fatigue, Sleepy
- Anxious
- Numb lip/tongue
- Poor coordination
- Slurred speech
- Pale
- Clammy skin
- Confusion
- Blurry vision
- Change in behavior
- Dizzy
- Poor concentration

**Treatment - Check blood sugar level**
Treat if blood sugar is below 70/80 or symptoms of low blood sugar are present as outlined in students’ Diabetes Management Plan.

**Do not leave student alone**
Do not allow the student to return to class until blood sugar is greater than 70/80.
Notify parents of low blood sugar.

**Severe Symptoms - Call 911**
- Unconscious
- Unable to swallow
- Combative
- Seizure

**Do not leave student alone**
Do not allow the student to return to class until blood sugar is greater than 70/80.
Notify parents of low blood sugar.

**Recheck blood sugar in 10-15 minutes.** If blood sugar level is not greater than 70/80, give another 15 grams of fast-acting carbohydrates and recheck blood sugar every 10-15 minutes until the parent/doctor returns the call.

Be prepared to give glucagon* and call 911 if student is not responsive, seizing or if their condition deteriorates.

**Once the blood sugar is above 70/80**
- If the student is on intermediate acting insulin (ex: Novolog 70/30 or Humalog 75/25), after the above treatment follow with a snack like cheese and crackers or half of a sandwich.
- If the student takes rapid acting insulin (Novolog or Humalog) at meals and snacks and they will not be having a meal or snack within the next hour, follow the treatment for a low blood sugar with a small snack (15 grams of slow-acting carbohydrates such as crackers and peanut butter or half a sandwich).
- If student is taking insulin using an insulin pump, follow Diabetes Management Plan for specific instructions on managing the pump.

**Glucagon Emergency Kit**
*Glucagon Emergency Kit*

If a severe low occurs (loss of consciousness, seizures or inability to safely eat or drink), Glucagon** should be administered if authorized by the Diabetes Management Plan.

A glucagon injection may be given for severe low blood sugars (unconsciousness, unresponsiveness, seizures or the inability to safely eat or drink). Refer to package insert and the Diabetes Management Plan for use and dose.

**Glucagon is a naturally occurring hormone made in the pancreas. It raises blood sugar levels by stimulating the liver to release stored glucose.**
## Hyperglycemia

### Causes
- Not enough insulin
- Missed doses
- Too much food (carbohydrates)
- Infection, fever, illness
- Stress
- Growth and/or hormonal changes
- Spoiled or expired insulin (most insulin expires a month after opening)

### Symptoms
<table>
<thead>
<tr>
<th>Emotional stress</th>
<th>Poor Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blurry vision</td>
<td>Dry skin</td>
</tr>
<tr>
<td>Thirst</td>
<td>Face flushed</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>Nausea</td>
</tr>
<tr>
<td>Frequent urination</td>
<td>Lethargic</td>
</tr>
<tr>
<td>Hunger</td>
<td>Sweet and fruity breath odor</td>
</tr>
<tr>
<td>Drowsiness / Sleepy</td>
<td></td>
</tr>
</tbody>
</table>

### Do not leave student alone
- Extra insulin may be needed.
- Follow instructions on **Diabetes Management Plan**.
- When blood sugar level is high, students may need more frequent bathroom breaks and free access to water or sugar free fluids (if fully conscious and not vomiting).

### Severe Symptoms – Call 911
- Labored breathing
- Confusion
- Decreased consciousness - monitor airway

### Treatment - Check blood sugar level
**If blood sugar is greater than 300, check for ketones:**
- If ketones are trace to small, encourage the student to drink water and recheck in 3-4 hours.
- If ketones are moderate to large, call the parent as the student needs medical attention.
  – **Call the doctor if parent cannot be reached.**
- If any ketones are present, students should refrain from any physical activity.
- Notify the parent if hyperglycemia does not respond to treatment as outlined in Diabetes Management Plan.

**If student is taking insulin using an insulin pump, follow Diabetes Management Plan carefully.**

**One should always suspect that the pump/tubing may not be working correctly:**
- Check site and have student change site, tubing and reservoir using new vial of insulin if there is any leaking, redness, tenderness or the cannula is dislodged.
- Check for ketones if blood sugar level is over 250.

**IF NO ketones or ketones are TRACE to SMALL:**
- Bolus with pump ONE TIME per school plan.
- Recheck blood sugar level in one hour; if blood sugars have not decreased, give a second bolus by INJECTION of FAST-ACTING INSULIN using a SYRINGE per Diabetes Management Plan.
- Change the site, tubing and reservoir of the pump using a new vial of insulin to refill the reservoir.

**IF ketones are MODERATE to LARGE:**
- Call the parent.
- Give a bolus by INJECTION of FAST ACTING INSULIN using a syringe per Diabetes Management Plan.
- Change the site, tubing and reservoir of the pump using a new vial of insulin to refill the reservoir.
- Offer sugar-free liquids every 30 minutes until parent arrives.
HYPOGLYCEMIA FACT SHEET

A. Hypoglycemia is a potential medical emergency at school.

B. Hypoglycemia means the student’s blood glucose is below normal. The exact blood glucose number, and when and how to treat a student’s low blood glucose will be in the student’s Emergency Care Plan (ECP) and/or Individualized Healthcare Plan (IHP), and explained to you by the school nurse.

C. Causes of hypoglycemia include:
   - Getting too much insulin
   - Not eating enough food
   - Meals or snacks that are missed, off schedule or delayed
   - Increased amounts of exercising without eating extra food
   - Illnesses that causes a lack of appetite or vomiting
   - Taking certain medications
   - Drinking alcohol, which may be a concern with adolescents

D. Signs of hypoglycemia will depend on the student and how low the blood glucose is. The school nurse will explain signs unique to each student. In general, signs of hypoglycemia include:
   - None at all – this can happen with a student who has become used to having episodes of low blood glucose. A reading from a blood glucose monitor may be the only indication that the student has hypoglycemia.
   - Headache
   - Sweating
   - Shaking
   - Change in behavior – including irritability, confusion, slurred speech, combativeness, uncooperativeness
   - Decreased ability to concentrate and do school work
   - Seizures
   - Passing out

E. Treatment of hypoglycemia will be outlined on the student’s ECP and/or IHP and explained by the school nurse. In general, plan on:
   - Taking prompt action
   - Allowing the student to eat foods that provide quick sugar such as fruit juice, sugared soda, or candy. The food options and exact amount will be outlined in the student’s ECP and/or IHP and explained by the school nurse.
   - Allowing the student to use a blood sugar monitor to test his/her blood.

F. Never allow a student to walk alone to the health office check if you suspect hypoglycemia!

G. With severe hypoglycemia the student may become unconscious or have seizures. This is an emergency medical situation.
   - Call 911.
   - If a student is unconscious, never give them something to eat or drink.
   - Give Glucagon, if ordered on the Diabetes Medical Management Plan (DMMP) and you have been trained.
   - If a student is having a seizure, protect them from injury & keep them on their side.
   - Follow instructions previously given by the school nurse on what to do next.

H. Prevention is key. Allow the student with diabetes to follow his/her diabetes management plan at school as described by the school nurse.

I. Other: ____________________________________________________________

Adapted with permission from National Association of School Nurses, 2011
Improving Diabetes Management in Adolescence

**Myth**
A pre-teen/teen should be able to check blood sugar and give insulin without constant reminders.

**Fact**
Teens are developmentally incapable of managing diabetes on a day-to-day basis and need the support of peers, school and most importantly FAMILY.

**Suggestions**

- **Check the meter daily.** Record blood sugars for at least seven days/month especially under times of stress and/or growth as insulin needs increase rapidly during this time. Be sure to accurately set the date and time.

- **Observe** them as much as possible. Do not ask: observe. Be confident the glucose has been checked. Blood sugars are not a private matter. If they are insisting on privacy, they are hiding numbers or not doing them.

- **Avoid the use of judgmental language when referring to your teen’s numbers.** Do not refer to blood sugars as “good” or “bad.” Use terms such as in/above/below “range” or “target.” Do not praise numbers that are in the desirable range nor punish numbers that are elevated.

- **Hold your teen accountable to an achievable goal.** Tell him or her what the expectations are: four checks/day, all injections given/communication if he or she needs help. Tell him or her that you do not expect perfection. Establish clear and succinct consequences such as restricting cell phone usage or internet or video game time if the teen does not meet the expectations.

- **Thank your teen for checking his or her blood sugars each time they do it.** This may sound silly but the simple act of thanking him or her acknowledges that diabetes is not easy. It is a very kind and compassionate way to reinforce a very important and necessary task.

- **Take on diabetes for a day.** Mimic all the things that your teen has to do for one day. Check your blood sugar before every meal, count your carbs and give “insulin” for what you eat. This very act of trying to be empathetic will gain favor with your teen. Your teen will truly appreciate this even if he or she doesn’t let you know.

- **Positively reinforce the actual self care behaviors (i.e. checking sugar/giving insulin), NOT the results!**

Created by Maureen McGrath; 7/7/09
**Diabetes Management in the School Setting**

*Position Statement*

**SUMMARY**

It is the position of the National Association of School Nurses that the registered professional school nurse (hereinafter referred to as school nurse) is the only school staff member who has the skills, knowledge base, and statutory authority to fully meet the healthcare needs of students with diabetes in the school setting. Diabetes management in children and adolescents requires complex daily management skills (American Association of Diabetes Educators [AADE], 2008) and health services must be provided to students with diabetes to ensure their safety in the school setting and to meet requirements of federal laws.

**HISTORY**

For children and youth younger than 20 years, diabetes is on the rise with an estimated 215,000 children and adolescents with type 1 or type 2, or approximately 0.26% of this age group. Annually, from 2002 to 2005 -- 15,600 youth were newly diagnosed with type 1 diabetes and 3,600 youth were newly diagnosed with type 2 diabetes (Centers for Disease Control and Prevention [CDC], 2011).

Advancing diabetes technology and management have changed the way students manage their diabetes at school. Children are monitoring their blood glucose levels several times a day, calculating carbohydrate content of meals, and dosing insulin via syringe, pen and pump to achieve a blood glucose within a target range (Bobo, Kaup, McCarty & Carlson, 2011). These intensive resources and consistent evidenced-based efforts will achieve the long-term health benefits of optimal diabetes control according to the landmark study from the Diabetes Control and Complications Trial Research Group (DCCT, 1996).

**DESCRIPTION OF THE ISSUE**

Each student with diabetes is unique in his or her disease process, developmental and intellectual abilities and levels of assistance required for disease management. The goals of the Diabetes Medical Management Plan (DMMP) and Individual Health Plan (IHP) are to promote normal or near normal blood glucose with minimal episodes of hypoglycemia or hyperglycemia, normal growth and development, positive mental health, and academic success (Kaufman, 2009).

The school nurse develops the IHP from the DMMP (medical orders) by collaborating with the child’s family, obtaining additional assessment findings, and outlining the diabetes management strategies and personnel needed to meet the student’s health goals in school (NDEP, 2010). The IHP identifies the student’s daily needs and management strategies for that student while in the school setting. The school nurse also coordinates the development and staff education of the Emergency Care Plan (ECP) which directs the actions to be taken by school personnel for symptoms of hypoglycemia and hyperglycemia.

Throughout childhood and adolescence, the student with diabetes is continuously moving through transitions toward more independence and self-management (Silverstein et al., 2005). They will require various levels of supervision or assistance to perform diabetes care tasks in school. Students who lack diabetes management experience or cognitive and developmental skills must have assistance with their diabetes management during the school day as determined by the nursing assessment and as outlined in the IHP.

Hypoglycemia (low blood glucose) is the greatest immediate danger to the student with diabetes. During hypoglycemic incidents, the student may not be able to self-manage due to impaired cognitive and motor function. A student experiencing hypoglycemia should never be left alone or sent anywhere alone. Communication systems and trained school staff should be in place to assist the student. Treatment for hypoglycemia should be readily available in the classroom and administered immediately (American Diabetes Association [ADA], 2011).
Hyperglycemia (high blood glucose) can develop over several hours or days, and untreated can lead to the life-threatening condition, diabetic ketoacidosis (DKA). For students using insulin infusion pumps, lack of insulin may rapidly lead to DKA (ADA, 2011). The school nurse may utilize one or more of the model National Diabetes Education Program’s (NDEP) three levels of staff training, to facilitate prompt, safe and appropriate care for students with diabetes (NDEP, 2010).

Students with disabilities, which include students with diabetes, must be given an equal opportunity to participate in academic, nonacademic, and extracurricular activities. Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 prohibit recipients of federal financial assistance from discriminating against people on the basis of disability (NDEP, 2010). These laws are enforced for schools, by the Office for Civil Rights (OCR) in the U.S. Department of Education. Schools are required to identify all students with disabilities and to provide them with a free appropriate public education (FAPE) (NDEP, 2010).

Changes in science and technology related to diabetes management require the school nurse to maintain current knowledge and skills to fully implement a student’s DMMP in the school setting (NDEP, 2010; ADA, 2011).

RATIONAL

Managing diabetes at school is most effective when there is a partnership among students, parents, school nurse, health care providers, teachers, counselors, coaches, transportation, food service employees, and administrators. The school nurse provides the health expertise and coordination needed to ensure cooperation from all partners in assisting the student toward self-management of diabetes.

A school nurse is required to develop an IHP for each student with diabetes and to provide continued oversight for the implementation and evaluation of the effectiveness of the plan in the school setting (American Nurses Association /National Association of School Nurses [ANA/NASN], 2011). Individualized healthcare planning is a function of the nursing process and cannot be delegated to unlicensed individuals (American Nurses Association / National Council of State Boards of Nursing Association of School Nurses [ANA/NCSBN ], 2006). State laws and nurse practice acts determine the extent to which school nurses can delegate nursing tasks to other school personnel in the absence of the nurse (ANA/ NASN, 2011).

Research suggests that school nurse supervision of students’ blood glucose monitoring and insulin dose adjustment significantly improves blood glucose control in children with poorly controlled type 1 diabetes (Nguyen et al., 2008). Poorly controlled diabetes and fluctuating blood glucose levels not only affect academic performance but can lead to long-term complications such as retinopathy, cardiovascular disease, and nephropathy. Maintaining blood glucose levels within a target range can prevent, reduce, and reverse long-term complications of diabetes (DDCT, 1996).

The school nurse’s role is critical in the case management and coordination of care for recognition and treatment of the student experiencing hypoglycemia in school (Butler, 2007). The school nurse fosters independent decision making, promotes healthy life-style choices and diabetes self-care ensuring a smooth transition between high school and adult diabetes medical care (Bobo & Butler, 2010). Every student with diabetes is entitled to a school nurse with the knowledge and capacity to effectively provide care and communicate with school staff, healthcare providers and families (Bobo et al., 2011).

REFERENCES


Acknowledgement of Authors:

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Susan Zacharski, MEd, BSN, RN

Adopted: January 2012

This document combines and replaces the following Position Statements:
Blood Sugar Monitoring in the School Setting (Adopted: June 2001)
School Nurse Role in Care and Management of the Child with Diabetes (Adopted: November 2001; Revised: June 2006)
BLOOD GLUCOSE (BG) MONITORING: (Treat BG below ___mg/dl or above ___mg/dl as outlined below.)
- Before meals
- 2 hours after correction
- Midmorning
- Mid-afternoon

INSULIN ADMINISTRATION: Dose determined by:
- Student
- Parent
- School nurse or Trained Diabetes Personnel

Insulin delivery system:
- Syringe
- Pen
- Pump

MEAL INSULIN: (It is best if given right before eating. For small children, can give within 15-30 minutes of the first bite of food or right after meal)

- Insulin Type: Humalog Novolog Apidra
- Insulin to Carbohydrate Ratio: ___ unit per __________ grams carbohydrate
- Set Doses: Give _______ units (Eat __________ grams of carbohydrates)

CORRECTION INSULIN: (For high blood sugar. Add before meal insulin to correction/sliding scale insulin for total meal time insulin dose.)

- Use the following correction formula
- (for pre lunch blood sugar over ___):

  \[ \frac{\text{BG} - ___}{____} = \text{extra units insulin to provide} \]

MILD low sugar: Alert and cooperative student (BG below 70)

- Never leave student alone
- Give 15 grams glucose; recheck in 15 minutes
- If BG remains below 70, retreat and recheck in 15 minutes
- Notify parent if not resolved
- If no meal is scheduled in the next hour, provide an additional snack with carbohydrate, fat, protein.

SEVERE low sugar: Loss of consciousness or seizure

- Call 911. Open airway. Turn to side.
- Glucagon injection 0.25 mg 0.50 mg 1.0 mg IM/SQ
- Notify parent.
- For students using insulin pump, stop pump by placing in "suspend" or stop mode, disconnecting at pigtail or clip, and/or removing an attached pump. If pump was removed, send with EMS to hospital.

MANAGEMENT OF HIGH BLOOD GLUCOSE (above 200 mg/dl)

- Sugar-free fluids/frequent bathroom privileges.
- If BG is greater than 300, and it’s been 2 hours since last dose, give HALF/FULL correction formula noted above.
- If BG is greater than 300, and it’s been 4 hours since last dose, give FULL correction formula noted above.
- If BG is greater than 300 check for ketones. Notify parent if ketones are present.
- Note and document changes in status.
- Child should be allowed to stay in school unless vomiting and moderate or large ketones are present.

MANAGEMENT DURING PHYSICAL ACTIVITY:
Student shall have easy access to fast-acting carbohydrates, snacks, and blood glucose monitoring equipment during activities. Child should NOT exercise if blood glucose levels are below 70 mg/dl or above 300 mg/dl and urine contains moderate or large ketones.

- Check blood sugar right before physical education to determine need for additional snack.
- If BG is less than 70 mg/dl, eat 15-45 grams carbohydrate before, depending on intensity and length of exercise.
- Student may disconnect insulin pump for 1 hour or decrease basal rate by ________.
- At the beginning of a new activity check blood sugar before and after exercise only until a pattern for management is established.
- A snack is required prior to participation in physical education.

MEAL PLAN:
- A snack will be provided each day at:
- If regularly scheduled meal plan is disrupted: call parent for care instructions

SPECIAL MANAGEMENT OF INSULIN PUMP:

- Contact Parent in event of: pump alarms or malfunctions
- detachment of dressing / infusion set out of place
- Leakage of insulin
- Student must give insulin injection
- Student has to change site
- Soreness or redness at site
- Corrective measures do not return blood glucose to target range within ___ hrs.

- Parents will provide extra supplies including infusion sets, reservoirs, batteries, pump insulin, and syringes.
This student requires assistance by the School Nurse or Trained Diabetes Personnel with the following aspects of diabetes management:

- Monitor and record blood glucose levels
- Respond to elevated or low blood glucose levels
- Administer glucagon when required
- Administer insulin or oral medication
- Monitor blood or urine ketones
- Follow instructions regarding meals and snacks
- Follow instructions as related to physical activity
- Insulin pump management: administer insulin, inspect infusion site, contact parent for problems
- Provide other specified assistance:

This student may independently perform the following aspects of diabetes management:

- Monitor blood glucose:
  - in the classroom
  - in the designated clinic office
  - in any area of the school and at any school related activity
- Monitor urine or blood ketones
- Administer insulin
- Treat hypoglycemia (low blood sugar)
- Treat hyperglycemia (elevated blood sugar)
- Carry supplies for blood glucose monitoring
- Carry supplies for insulin administration
- Determine own snack/meal content
- Manage insulin pump
- Replace insulin pump infusion set

LOCATION OF SUPPLIES/EQUIPMENT: (To be completed by school personnel and parent. Parent to provide and restock snacks and low blood sugar supplies box.)

<table>
<thead>
<tr>
<th>Blood glucose equipment</th>
<th>Clinic room</th>
<th>With student</th>
<th>Glucagon kit</th>
<th>Clinic room</th>
<th>With student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin administration supplies</td>
<td>❑</td>
<td>❑</td>
<td>Glucose gel</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Ketone supplies</td>
<td>❑</td>
<td>❑</td>
<td>Juice / low blood glucose snacks</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>

EMERGENCY NOTIFICATION: Notify parents of the following conditions:

a. Loss of consciousness or seizure (convulsion) immediately after calling 911 and administering glucagon.

b. Blood sugars in excess of 300 mg/dl, when ketones present.

c. Abdominal pain, nausea/vomiting, fever, diarrhea, altered breathing, altered level of consciousness.

Parent/Guardian: ___________________ Phone at Home: ___________ Work: ___________ Cell/Pager: ___________

Parent/Guardian: ___________________ Phone at Home: ___________ Work: ___________ Cell/Pager: ___________

Other emergency contact: ___________________ Phone #: __________________ Relationship: ___________________

Insurance Carrier: ___________________________________________ Preferred Hospital: ____________________________

SIGNATURES: I understand that all treatments and procedures may be performed by the student and/or Trained Diabetes Personnel within the school, or by EMS in the event of loss of consciousness or seizure. I also understand that the school is not responsible for damage, loss of equipment, or expenses utilized in these treatments and procedures. I give permission for school personnel to contact my child’s diabetes provider for guidance and recommendations. I have reviewed this information form and agree with the indicated information. This document serves as the Diabetes Medical Management Plan as specified by Georgia state law.

PARENT SIGNATURE: ___________________________ DATE: __________________

SCHOOL NURSE SIGNATURE: ___________________________ DATE: __________________

My signature provides authorization for the above Diabetes Mellitus Medical Management Plan. I understand that all procedures must be implemented within state laws and regulations. This authorization is valid for one year.

❑ Dose/treatment changes may be relayed through parent.
❑ Student is due for medical appointment for review of diabetes management plan.

HEALTHCARE PROVIDER SIGNATURE: ___________________________ Date: __________________

Diabetes Care Provider: ___________________________ Phone #: __________________

Address: ___________________________
House Bill 879 (AS PASSED HOUSE AND SENATE)
By: Representatives Ramsey of the 72nd, Cooper of the 41st, Watson of the 163rd, Coleman of the 97th, Sheldon of the 105th, and others

A BILL TO BE ENTITLED
AN ACT

To amend Part 3 of Article 16 of Chapter 2 of Title 20 of the Official Code of Georgia Annotated, relating to student health in elementary and secondary education, so as to provide for the care of students with diabetes in school; to provide for legislative findings; to provide for definitions; to provide for the training of designated school personnel; to provide for the submission of a diabetes medical management plan by parents or guardians for a student; to delineate the functions that may be performed by school nurses or trained diabetes personnel; to authorize a student to perform independent monitoring and treatment; to provide for immunity from civil liability; to provide for related matters; to repeal conflicting laws; and for other purposes.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.

The General Assembly finds that:
(1) Diabetes is a serious, chronic disease that impairs the body's ability to use food. Diabetes must be managed 24 hours a day in order to avoid the potentially life-threatening consequences of blood glucose levels that are either too high (hyperglycemia) or too low (hypoglycemia), and to avoid or delay the serious long-term complications of high blood glucose levels which include blindness, amputation, heart disease, and kidney failure.
(2) In order to manage their disease, students with diabetes must have access to the means to balance food, medications, and physical activity levels while at school and at school related activities;
(3) Diabetes is generally a self-managed disease, and many students with diabetes are able to perform most of their own diabetes care tasks. Such students should be permitted to do so in the school setting. However, some students, because of age, inexperience, or other factors, need help with some or all of diabetes care tasks, and all students will need help in the event of a diabetes emergency;
(4) The school nurse is the preferred person in the school setting to provide or facilitate care for a student with diabetes. Many schools in Georgia, however, do not have a full-time nurse, or a school nurse may not always be available on site. Thus, even when a nurse is assigned to a school full time, he or she will not always be available to provide direct care during the school day;

(5) Diabetes management is needed at all times. Additional school personnel, who have completed training coordinated by the school nurse or other health care professional and who provide care under the supervision of the school nurse or other health care professional, need to be prepared to perform diabetes care tasks at school when a school nurse or other health care professional is not available. Preparations are needed to ensure that students with diabetes will be medically safe and have the same access to educational opportunities as all students in Georgia; and

(6) Due to the significant number of students with diabetes, the effect of diabetes upon a student's ability to learn, and the risk for serious long-term and short-term medical complications, legislation in this state is necessary to address this issue.

SECTION 2.

Part 3 of Article 16 of Chapter 2 of Title 20 of the Official Code of Georgia Annotated, relating to student health in elementary and secondary education, is amended by adding a new Code section to read as follows:

"20-2-779.

(a) As used in this Code section, the term:

(1) 'Diabetes medical management plan' means a document developed by the student's physician or other health care provider that sets out the health services, including the student's target range for blood glucose levels, needed by the student at school and is signed by the student's parent or guardian.

(2) 'School' means any primary or secondary public school located within this state.

(3) 'School employee' means any person employed by a local board of education or state chartered special school or any person employed by a local health department who is assigned to a public school.

(4) 'Trained diabetes personnel' means a school employee who volunteers to be trained in accordance with this Code section. Such employee shall not be required to be a health care professional.

(b)(1) No later than August 1, 2012, the Department of Education, in conjunction with the Georgia Association of School Nurses, shall develop guidelines for the training of school employees in the care needed for students with diabetes. The training guidelines shall include instruction in:
(A) Recognition and treatment of hypoglycemia and hyperglycemia;
(B) Understanding the appropriate actions to take when blood glucose levels are outside of the target ranges indicated by a student's diabetes medical management plan;
(C) Understanding physician instructions concerning diabetes medication dosage, frequency, and the manner of administration;
(D) Performance of finger-stick blood glucose checking, ketone checking, and recording the results;
(E) Administration of insulin and glucagon, an injectable used to raise blood glucose levels immediately for severe hypoglycemia, and the recording of results;
(F) Performance of basic insulin pump functions;
(G) Recognizing complications that require emergency assistance; and
(H) Recommended schedules and food intake for meals and snacks, the effect of physical activity upon blood glucose levels, and actions to be implemented in the case of schedule disruption.

(2) Each local board of education and state chartered special school shall ensure that the training outlined in paragraph (1) of this subsection is provided to a minimum of two school employees at each school attended by a student with diabetes.

(3) A school employee shall not be subject to any penalty or disciplinary action for refusing to serve as trained diabetes personnel.

(4) The training outlined in paragraph (1) of this subsection shall be coordinated and provided by a school nurse or may be contracted out to be provided by another health care professional with expertise in diabetes. Such training shall take place prior to the commencement of each school year, or as needed when a student with diabetes is newly enrolled at a school or a student is newly diagnosed with diabetes. The school nurse or other contracted health care professional shall provide follow-up training and supervision.

(5) Each local school system and state chartered special school shall provide information in the recognition of diabetes related emergency situations to all bus drivers responsible for the transportation of a student with diabetes.

(c) The parent or guardian of each student with diabetes who seeks diabetes care while at school shall submit to the school a diabetes medical management plan which upon receipt shall be reviewed and implemented by the school.

(d)(1) In accordance with the request of a parent or guardian of a student with diabetes and the student's diabetes medical management plan, the school nurse or, in the absence of the school nurse, trained diabetes personnel shall perform functions including, but not limited to, responding to blood glucose levels that are outside of the student's target range; administering glucagon; administering insulin, or assisting a student in administering insulin through the insulin delivery system the student uses; providing oral
(2) The school nurse or at least one trained diabetes personnel shall be on site at each school and available during regular school hours to provide care to each student with diabetes as identified pursuant to subsection (c) of this Code section. For purposes of field trips, the parent or guardian, or designee of such parent or guardian, of a student with diabetes may accompany such student on a field trip.

(3) There shall be trained diabetes personnel at each school where a student with diabetes is enrolled, and a student's school choice shall in no way be restricted because the student has diabetes.

(4) The activities set forth in paragraph (1) of this subsection shall not constitute the practice of nursing and shall be exempted from all applicable statutory and regulatory provisions that restrict what activities can be delegated to or performed by a person who is not a licensed health care professional.

(e) Upon written request of a student's parent or guardian and if authorized by the student's diabetes medical management plan, a student with diabetes shall be permitted to perform blood glucose checks, administer insulin through the insulin delivery system the student uses, treat hypoglycemia and hyperglycemia, and otherwise attend to the monitoring and treatment of his or her diabetes in the classroom, in any area of the school or school grounds, and at any school related activity, and he or she shall be permitted to possess on his or her person at all times all necessary supplies and equipment to perform such monitoring and treatment functions.

(f) No physician, nurse, school employee, local school system, or state chartered special school shall be liable for civil damages or subject to disciplinary action under professional licensing regulations or school disciplinary policies as a result of the activities authorized or required by this Code section when such acts are committed as an ordinarily reasonably prudent physician, nurse, school employee, local school system, or state chartered special school would have acted under the same or similar circumstances.

(g) A private school which complies with the requirements of this Code section shall have the same limited liability for such school and its employees in the same manner as for public schools as provided for in subsection (f) of this Code section."

SECTION 3.

All laws and parts of laws in conflict with this Act are repealed.
Eczema

Eczema is a form of dermatitis or inflammation of the upper layer of the skin called epidermis. The term eczema is applied to a range of persistent skin conditions which include dryness, recurring skin rashes, itching, redness, skin swelling, flaking, blistering, cracking, oozing or bleeding.

One type of eczema, atopic dermatitis, is a chronic, inflammatory skin condition that begins in early childhood due to a skin barrier defect. Atopic dermatitis affects about 10-15 percent of the population and is becoming more common for reasons that are not well understood. It affects up to 20 percent of children worldwide. Children with atopic dermatitis often have a family or personal history of asthma and hay fever. Atopic dermatitis is not contagious to others, but it is often runs in families. However, the psychological impact of this disease is significant, especially feelings of embarrassment.

Itch is the main clinical feature of eczema and can cause sleep disturbance and stress for the student and their family. Sleep disruption is common (80 percent), and 60 percent report the condition affecting their daily activities. Although there is no cure, most students can expect to gain good control of their eczema through proper management with support from their parent/caregiver, schools and community.

<table>
<thead>
<tr>
<th>Types of Eczema</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atopic eczema or atopic dermatitis</td>
<td>Hereditary component; particularly noticeable on the face, scalp, neck, inside of elbows, behind knees, flexural area of the arms and buttocks, and starts before the age of two.</td>
</tr>
<tr>
<td>Contact dermatitis</td>
<td>Allergy resulting from a direct reaction to nickel or poison ivy or other topical agents.</td>
</tr>
<tr>
<td>Seborrheic dermatitis</td>
<td>Causes dry or greasy scaling of the scalp (dandruff or cradle cap), eyebrows, inside of ears, behind the ears, sides of nose, mid-chest, axilla or suprapubic region.</td>
</tr>
<tr>
<td>Dyshidrotic hand/foot eczema</td>
<td>Only occurs on the palms, soles, sides of fingers or toes; tiny bumps or vesicles appear on the affected areas; this type of eczema is extremely itchy.</td>
</tr>
<tr>
<td>Nummular eczema</td>
<td>Characterized by round spots that are dry, scaly, red, flaking and sometimes cracking, oozing, or bleeding; can often be confused with fungal infections.</td>
</tr>
<tr>
<td>Eczema herpeticum</td>
<td>Herpes infection of the skin in children with eczema.</td>
</tr>
<tr>
<td>Perioral dermatitis</td>
<td>This skin condition is common and is really an acne/rosacea type eruption. It responds well to both topical and systemic antibiotics. Topical steroids are not an effective treatment because rash returns often worse than before when the topical steroid is discontinued.</td>
</tr>
</tbody>
</table>
Diagnosis of Eczema

The diagnosis of eczema/atopic dermatitis is largely done on the basis of history and physical examination. To specifically diagnose a rash as atopic dermatitis, at least three major features and three minor features should be present. (See chart below):

<table>
<thead>
<tr>
<th>Major Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching (that can be severe at times)</td>
</tr>
<tr>
<td>Chronic and recurring (repeatedly occurring symptoms)</td>
</tr>
<tr>
<td>Typical distribution of the atopic dermatitis rash:</td>
</tr>
<tr>
<td>• Infants and young children – scalp, face (chin and cheeks) and extensor surfaces of extremities</td>
</tr>
<tr>
<td>• Older children and adults – flexor surface of elbow and knee (inside creases), neck, wrist and ankles</td>
</tr>
<tr>
<td>Past/Family history of atopic diseases like asthma, rhinitis (hay fever), etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryness of skin</td>
</tr>
<tr>
<td>Thickening of palm skin with increase in skin lines</td>
</tr>
<tr>
<td>Small and pointed rough bumps</td>
</tr>
<tr>
<td>Elevated serum IgE (Immunoglobulin E) levels</td>
</tr>
<tr>
<td>Facial pallor (around the mouth)</td>
</tr>
<tr>
<td>Food intolerance often wheat, eggs, peanuts</td>
</tr>
<tr>
<td>Impaired immunity (trouble fighting infection)</td>
</tr>
<tr>
<td>Eyes: cataracts, cone-shaped cornea (keratoconus), prominent skin folds below the eyes (Morgan Dennie lines)</td>
</tr>
</tbody>
</table>

Prevention of Eczema

Eczema outbreaks can usually be minimized with some simple precautions. The following suggestions may help to reduce the severity and frequency of flare-ups:

- Moisturize frequently (emollients such as petrolatum are best). Avoid scented lotions.
- Avoid sudden changes in temperature or humidity.
- Avoid sweating or overheating.
- Reduce stress.
- Avoid scratchy materials (e.g., wool or synthetics, just use cotton).
- Avoid harsh soaps, detergents and solvents.
- Avoid environmental factors that trigger allergies (e.g., pollens, molds, mites and animal dander).
- Be aware of any foods that may cause an outbreak and avoid those foods.
Eczema and Skin Cleansers

Recommendations in choosing soap generally include:

- Avoid harsh detergents or drying soaps
  - Use Cetaphil® or CeraVe™ or Dove®.
- Patch test your soap choice, by using it only on a small area until you are sure of its results.
- Use non-soap based cleanser – Cetaphil®.
- Instructions for using soap:
  - Use soap sparingly.
  - Avoid using washcloths, sponges or loofahs, or anything that will abrade the skin.
  - Use soap only on areas where it is necessary – intertriginous areas.
  - Soap up only at the very end of the bath.
  - Use a fragrance-free barrier-type moisturizer such as petroleum jelly before drying off—other moisturizers include Aquaphor®, Eucerin®, CeraVe™, Cetaphil®, Aveeno®, Cutemol®
  - Use care when selecting lotion, soap or perfumes to avoid possible allergens.

Treatment

Treatment focuses on reducing inflammation and associated skin abnormalities such as itch, dryness, heat, redness and secondary infection. Secondary infection can present as broken, bleeding or oozing skin. Parents and patients should be educated about the chronic nature of the disease and the need for continued adherence to proper skin care. There is no cure for atopic dermatitis but often the condition improves with age.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Reasonable recommendation for bathing is once daily with warm water for approximately 5-10 minutes; cleansers should be mild; immediately after bathing and before the skin is completely dry, patients/parents should apply a moisturizer liberally; ointments are superior to creams and lotions, but they are greasy and therefore poorly tolerated; creams are effective and better tolerated than ointments; lotions are the least effective.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathing and Moisturizers</td>
<td></td>
</tr>
<tr>
<td>Antihistamines</td>
<td>Pruritus (itch) that is refractory to moisturizers and conservative treatment can be treated with antihistamines. The sedating agents such as hydroxyzine and diphenhydramine are more effective in controlling pruritus than the newer non-sedating histamines—Claritin®, Clarinex®, XYZAL®, Zyrtec®.</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Antibiotics should be used to treat secondary bacterial infections. If skin infections are not treated, the eczema will not improve.</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>Systemic corticosteroids should be avoided and only sparingly used in patients with severe treatment-resistant disease. Topical corticosteroids are effective in patients with eczema, but therapy with these agents should not replace the frequent use of moisturizers. Local side effects of topical steroids include skin atrophy (thinning), striae (stretch marks), telangiectasias, hypopigmentation, rosacea, perioral dermatitis and acne. Systemic side effects from topical steroids include adrenal suppression, cataracts, glaucoma and growth retardation in children. The greatest penetration occurs with topical steroid use in the groin and face application on the palms and soles.</td>
</tr>
<tr>
<td>Immunomodulators</td>
<td>Topical immunomodulators like Elidel® and Protopic® can be very effective in treating eczema and atopic dermatitis and do not have the side effects of topical steroids. The US Food and Drug Administration has issued a public health advisory about the possible risk of lymph node or skin cancer from use of these products, but many professional medical organizations disagree with the FDA’s black box warning because the FDA used data from monkeys force-fed with immunomodulators and extremely large doses.</td>
</tr>
</tbody>
</table>
Management at School

The difficulties faced by children with eczema at school are often underestimated. Problems include time away from school, impaired performance because of disturbed sleep at night, social restrictions, teasing and bullying. Eczema can also cause practical problems relating to handwashing, writing, physical education and swimming. Some children may need to bring milder soaps to wash hands (avoiding harsh antibacterial soaps) and apply emollients and topical medications while at school. Other children may require additional treatment with dressings or bandages. Application of these dressings should be done at home, but school staff should be aware and support children, helping them to overcome feelings of embarrassment. Children with severe eczema may be regarded as having special educational needs if the condition affects their education.

Students with eczema may present with behaviors and characteristics that impact their education and social well-being. Students may benefit from assistance and support with additional issues. These may include:

- fatigue
- poor concentration
- body image
- self-esteem
- social connectedness
- attendance.

Communication

School nurses play a key role in communicating between the child, the family and the school and in educating school staff about eczema and its effects.

The school, health professionals, family and student should work together to ensure comfort with the provision of information to school and peers, as well as discuss other related health concerns such as dietary requirements and allergies if relevant. Parents should take the time to fully explain their child's eczema problem to administrators and classroom teachers. Eczema is not just a rash, and symptoms should be taken seriously by educators. Establish a key contact person with whom the family and student can communicate with regard to eczema and school issues such as the school nurse and/or clinic aide.

Stress or Anxiety

Stress or anxiety can cause flare-ups in children with eczema. Schools are encouraged to explore support mechanisms available to students with a chronic health condition, as required. There should be a key contact person who can monitor, explore and assist with stress-related issues. School-related stress can be a major source of anxiety for students, from fears of other students’ comments about the rash or the scabbing that goes with it, to dealing with the general discomfort of the condition. Parents and educators should work together to reduce a student's stress and to ease any concerns that could contribute to flare-ups.

Environment

- Sit on a chair rather than the carpet.
- Children should wear 100 percent cotton clothing and loose cotton clothes where possible.
- Put a cotton cloth or towel over plastic chairs before sitting.

Medications and Other Related Medical Issues

- Lack of moisture is a major symptom of eczema. Be sure the student has constant access to his or her emollients for immediate relief of itchy, dry skin that can cause bouts of scratching and interfere with concentration. Pump action dispensers for emollients are easier, more hygienic and less “messy” for use in a classroom.
• Child should have predetermined spaces for moisturizing, cool compressing and changing clothes if necessary. Arrange for children with eczema to have somewhere private to apply emollients and for young children to receive help to apply emollients.
• Children should have access to their soap substitute at all times.
• Children should avoid use of alcohol-based hand sanitizer gels and sprays.
• Monitor attendance. Students who are unable to attend school due to eczema should seek medical attention.
• If required, notice should be distributed requiring parents/guardians to notify the school of measles and chickenpox on school letterhead.
• As with all students, discuss medication needs with student/parent/guardian and use as directed. Be aware that some types of sunscreens may act as a trigger.
  – Discuss a discreet signal/sign to encourage student to apply cool compress or moisturizer to minimize itch. Students can find it extremely difficult to refrain from itching, so adopting strategies that help to distract children from scratching would be beneficial.
  – Develop IHP and update at least once at the beginning of each school year or more frequently as needed.

Education for staff & students on eczema

Each year, the school nurse, teacher, bus drivers and before/after school care providers should be given updates on the condition of a child with eczema. These updates should include current triggers, new allergies and current medications and dosages. Students and families may benefit from discussions on the educational, social and future implications of school attendance. Class education about eczema in consultation with the student may assist with possible adverse reactions from peers.

The National Eczema Society provides information packs for schools at eczema.org/eczema-at-school

Exercise

Negotiate maximum participation in physical activities with consideration of eczema; students may need to apply moisturizer before and after swimming. Involvement in extracurricular activities is important, keeping in mind that changes in temperature can aggravate eczema. Be aware of the problems caused by temperature changes in PE lessons and allow either long-sleeved shirt or being excused in extremes of temperature.

Other Accommodations

• Allow students to have a drink bottle on desk.
• Remind students not to sit near a heater or in direct sunlight; keep cool, avoiding radiators and sunny windows.
• Ensure access to wet towels/wipes to apply directly to affected skin.
• Keep the student active to divert their attention from the itch.
• Consider requiring short rest breaks to assist with issues of concentration and fatigue that may result from disrupted sleep patterns.
• Use non-irritant gloves to protect hands during Art, Pottery and Food Technology activities. Students may benefit from wearing gloves when working or playing with various mediums such as paint, glue or sand. If a child has been playing in sand, ensure sand is washed off gently and not left under clothing such as socks.
• Allow the child to watch, rather than handle chemicals, in science class.
Headaches

Headaches in children are common and can be divided into two categories - primary and secondary. Primary headaches occur without any underlying health problem and include tension-type, migraine (with or without aura) and cluster headaches.

Secondary headaches result from another condition or cause, including:

- Concussion
- Brain tumor
- Blood vessel problems
- Education side effects
- Infections such as strep throat, sinusitis and meningitis
- Hypoglycemia
- Caffeine dependence
- Visual impairment (refractive error)
- High blood pressure.

A sudden, severe headache, or a headache accompanied by stiff neck, fever and/or rash, should be evaluated immediately.

Medical attention to address the cause of headaches is important if they are frequent, severe or accompanied by symptoms such as fever, nausea, vomiting, neck pain, light or sound sensitivity, auras or warnings, or if there is a family history of headaches. A pattern of headaches that occur early in the morning and then improve as the day goes on is particularly worrisome and requires prompt attention. In the case of early morning headaches, the cause for concern is a tumor. Other issues may also cause AM headaches, but generally not when right at the time of awakening in the morning.

Headaches secondary to hypoglycemia are fairly easily recognized by timing in relation to food intake (or lack thereof) and response to food (juice is usually used). Specifically, these might present in the AM if breakfast was skipped or later in the day if lunch was skipped. They are always associated with other symptoms such as dizziness, sweating, confusion and – if severe – loss of consciousness.

Disability from headaches can be significant, causing absenteeism and lost learning opportunities while the student is feeling pain. Headaches can also manifest when there is undiagnosed vision impairment. Vision screening should always be considered when recurrent headaches are occurring and can easily help to identify a refraction error. Caffeine dependence is becoming a problem in older children and teens because of energy drinks.

Finally, post-concussion headaches, as part of post-concussion syndrome, have become more common with increasing participation in contact sports. Post-concussion syndrome can cause significant decrease in school performance. Controlled return to normal classroom work, as well as a controlled return to normal physical activity, is necessary for the child who has suffered a concussion.

Most children with recurrent headache have migraines. Migraines are estimated to occur in four to five percent of children, often beginning before age 10. Before puberty, boys and girls are affected equally. After puberty, girls with migraines outnumber boys 3:1. The cause of migraine is considered to be genetic. However, these headaches are often triggered by changes in the environment such as bright lights, changing weather patterns, allergies, certain foods or strong odors.
Some children with migraines will experience an aura before the headache starts, such as visual loss or a sensation of flashing lights. These headaches are usually described as throbbing, may be felt in the frontal area or unilaterally, and often are accompanied by intolerance for light and noise as well as nausea and sometimes vomiting. Stress is probably the strongest trigger factor for migraine headaches.

Tension-type headaches can occur anywhere on the head, and are usually bilateral and constant.

**Treatment**

The frequency and severity of migraine may be decreased by adequate sleep, balanced meals at regular times, and avoidance of identified triggers and stressful situations. Hydration is very important with avoidance of sugar and caffeine-containing beverages. Ibuprofen at 10-15mg/kg body weight (maximum 600mg) is the recommended pain medication for children with headache. Several additional types of medication may be ordered by the child’s healthcare provider to be used either prophylactically or at the onset of a headache.

The school nurse can help a student and family by keeping track of headaches that occur at school (frequency, precipitating factors, timing, medications and their effects) and reporting this data back to parents. The nurse can also educate teachers and help the child identify early symptoms so that medication may be taken as soon as possible for optimum effectiveness. An adequate rest period (30-60 minutes) in a quiet environment, if combined with very early use of prescribed medication, may enable the child to return to classes for the rest of the day.

Use of a pain scale (Wong-Baker FACES Pain Rating Scale, Chapter 2) is helpful to the nurse, both to assess the child and to educate the child in self-care skills. Children may also benefit from being taught how and when to use relaxation techniques. Finally, any child with a headache should have his/her blood pressure taken.

**Educational Considerations**

- Develop IHP/504/IEP as needed.
- Provide any needed accommodations in physical education and/or school schedule.
- Provide for proper administration of all prescribed treatments, medications.
- Provide staff education for needed educational support during school absences.

**Resources**

Headaches in Children – American Council for Headache Education
[achenet.org/resources/headaches_in_children](achenet.org/resources/headaches_in_children)

Headaches in Kids, What Parents Can Do to Help – American Council for Headache Education
[achenet.org/resources/headaches_in_kids_what_parents_can_do_to_help](achenet.org/resources/headaches_in_kids_what_parents_can_do_to_help)

Kids Help – American Council for Headache Education
[achenet.org/news/Kids_Help](achenet.org/news/Kids_Help)

School Instruction Form – American Council for Headache Education
[achenet.org/assets/1/7/School_Nurse_Instruction_Form.pdf](achenet.org/assets/1/7/School_Nurse_Instruction_Form.pdf)
Heart Disease

Heart disease in children can be either congenital or acquired. Each year over 10,000 newborns in the U.S. have congenital heart disease that requires surgery before age 1. These defects range in severity from septal defects between chambers to complete absence of one chamber or valve. Advances in medical and surgical treatments have improved survival rates for even the most complex conditions and are often completed before the child reaches school age. The most common cardiac surgeries during school age include repair of septal defects, valve replacements, revisions to a previous surgery and pacemaker or internal defibrillator implants. More information on individual congenital anomalies can be seen at choa.org/heart.

Other types of congenital heart conditions are inherited structural or electrical anomalies that increase the child’s risk of arrhythmias and sudden cardiac arrest. These include hypertrophic and dilated cardiomyopathy and long QT syndrome. These conditions often remain undiagnosed until the child is noticed to have some of the early warning signs such as fainting during exercise or a sudden cardiac arrest occurs. An explanation of these risk conditions for sudden cardiac arrest can be seen on choa.org/projectsave and sads.org.

Acquired heart diseases that can develop during childhood include Kawasaki disease, rheumatic fever, bacterial endocarditis, cardiomyopathy and myocarditis. Kawasaki disease occurs primarily in children ages 1 to 5 and is characterized by fever, rash, swelling of the hands and feet, swollen lymph glands, reddened eyes and inflammation of the mouth, lips and throat. Long-term heart complications such as myocarditis, valvulitis and aneurysms. Rheumatic fever is caused by a strep infection and can result in heart valve damage. Viral heart infections are a major cause of cardiomyopathy, a progressive disease that causes the heart to lose its ability to pump effectively, can cause arrhythmias and is the leading reason for heart transplantation in children. Long QT syndrome can also be acquired by taking certain prescription or OTC drugs such as adrenaline, Elavil, Propulsid, Bactrim, erythromycin and compazine (see complete list at sads.org/living-with-sads/drugs-to-avoid or qtdrugs.org).

Other arrhythmias that can be seen in school-age children include Wolff-Parkinson-White (WPW) syndrome and supraventricular tachycardia (SVT). In WPW, an extra conduction pathway causes the ventricles to contract early, resulting in tachycardia, palpitations, dizziness and fainting. In SVT, children may describe their heart as “racing” or may complain of chest pain, dizziness or fainting. The heart rate can be too fast to count (200-300/min). These two conditions may be treated with medication or catheter ablation. Children can also experience sudden cardiac arrest from trauma to the chest (commotio cordis) and drugs such as ephedra and cocaine.

The most common heart conditions developing in school-age children today are lifelong cardiovascular diseases such as hypertension and atherosclerosis which often begin with risk factors that develop during early childhood and adolescence. These risks include high blood pressure, high cholesterol, smoking, obesity, physical inactivity and type 2 diabetes. Controlling these risk factors during childhood will help reduce the child’s chances of developing heart disease, the major cause of death as an adult. School nurses are crucial to advocating for and promoting heart-healthy behaviors among children and youth. This task can be accomplished through encouraging parents and school communities to provide a heart-healthy environment through improved nutrition and increased physical activity and teaching students to eat a healthful diet (including less saturated fats), exercise and not smoke.

Cardiac Surgery

After cardiac surgery, a student can usually return to school seven to 10 days after discharge (as directed by their surgeon). The incision (median sternotomy or left lateral thoracotomy) and chest tube sites will be healing. The surgical incision have steri-strips. Keep incision uncovered. Clean with soap and water only. Do not use Neosporin® or lotions. The nurse can expect the student to fatigue easily. Students may need frequent rest periods. Physical education class and contact sports are
restricted by their physician for a period of six weeks post surgery to allow complete healing of the sternum. Avoid activities that may cause a direct blow to the chest while the sternum is healing. There may be some discomfort and decreased appetite, and the student may be on diuretics and possibly other medications. Parents may have high anxiety when the child first returns to school and can be reassured, especially on the first day or two, by a phone call from the nurse letting them know how the child is doing.

Medications

• **Diuretics** – side effects include photosensitivity and excessive thirst; liberal use of sunscreen, provide frequent bathroom breaks and water bottle.

• **Analgesics** – may need a dose at school, as ordered.

• **Captopril** (ACE inhibitor used for post-op hypertension or heart function) – administer on empty stomach, no need to monitor BP, may develop “dry, non-productive cough.”

• **Beta-blockers** (used for many arrhythmias) – common side effects are cold hands and feet, fatigue and sleep disturbances, wheezing, dizziness.

Post-operative Complications

• Possible wound infection if incision line is erythematous and fever is over 101°F.

• Post-pericardiotomy syndrome (PPS) usually occurs about the seventh day after surgery. Look for fever, irritability, fatigue, poor appetite, pale gray skin color or cyanosis and chest pain radiating to left shoulder that is worse when supine. Child complains of body aches similar to influenza.

• Pleural effusion includes increased work of breathing, increased respiratory rate, grunting and intercostal or sternal retractions, fatigue and pale grey skin color, duskeness or cyanosis.

• Broken sternal wire will involve pain and tenderness. You will be able to palpate something hard under skin surface along incision line, or a wire will be visibly poking through the skin. Call the parent to make an appointment with surgeon.

Cardiac Catheterization

Many children with heart disease will undergo a cardiac catheterization (cardiac cath). A cardiac cath may be done to assist with diagnosing heart disease, evaluating current cardiac health in patients with known cardiac disease, pre-operative planning or even for the treatment of some congenital heart defects.

Cardiac catheterizations are performed through blood vessels via a puncture or very small incision. For pediatric patients, the most common vessels used for vascular access are in the groin or neck. A cardiac cath may be done in the vein and or artery. Most often the procedure is done as an outpatient and the child may go home the same day. Sometimes he/she will stay overnight for observation.

After a cardiac cath, the patient can often return to school the next day after he/she is discharged from the hospital. Each patient will have post cath instructions from the doctor that will have any specific instructions or limitations specific to the procedure performed. In general, for a diagnostic cath the patient should avoid excessive physical activity (running, lifting anything over 10 lbs, contact sports) for about a week post procedure to reduce the chance of having bleeding at the cath site. If bleeding at the cath site does occur, have the patient lie down and apply pressure at the site with clean gauze for 15 minutes. Physical activity restrictions may be extended for up to six weeks if an intervention was performed during the cardiac cath. This will be specified in the instruction given to the families. All cath patients should also avoid submerging the cath site in water for a week after the cath (no swimming/bath). A shower is fine after 24 hours.
When to call the cardiologist

- Bleeding that does not stop after holding pressure for 15 minutes
- Difficulty breathing or shortness of breath
- Chest pain
- Irregular heartbeat
- Fever over 101°F
- Redness, swelling, pain and or drainage at catheterization site
- New onset fatigue
- If the extremity below the cath side becomes cold, numb, painful.

**Pacemakers and Implanted Cardioverter-Defibrillators (ICD)**

Approximately 400 students are being followed in Georgia, and 60 more are implanted with pacemakers and five with ICDs annually. The most common reason for pacemaker implants is surgical heart block. Defibrillators are usually implanted for aborted sudden cardiac death or family history of sudden cardiac death with a diagnosed genetic condition such as long QT syndrome, Brugada syndrome or congenital heart disease leading to arrhythmias.

When these devices have been implanted, the school nurse should observe for the following complications:

- Wound infection
- Fever
- Hiccoughing (due to phrenic nerve stimulation)
- Dizziness
- Syncope
- Palpitations.

The care plan should be individualized by physician orders, which may include:

- Avoid lifting the arm on the side of the implant (or carrying backpack with that arm).
- Physical education is recommended.
- Time to rest should be allowed when needed.
- Contact or collision sports should generally be avoided.
- Do not wear music headphones around the neck.
- Be sure to keep music headphones at least one and a half inches from the device.
- Activate EMS and use the AED for unresponsiveness without breathing, as you would for any student.
Management at School for Cardiac Surgery

School Schedule
Sometimes half-days are recommended at first. Student may need to use elevators and be allowed extra time to change classes.

Activity and PE
Carrying and lifting is limited to less than four pounds; avoid picking child up under the arms or pulling to a sitting position by their arms; the child should not carry a backpack for six weeks after surgery; no contact sports for six weeks after surgery.

Emergency Plans
Children with known arrhythmias and other risk factors for sudden cardiac arrest should have a comprehensive emergency care plan, and an AED (automatic external defibrillator) in the building is recommended for some students if ordered by the physician.

Educational Considerations
The school nurse should ask for the following information for the IHP (Individualized Healthcare Plan):

- Diagnosis
- Date of surgery
- Type of surgery
- Location of incision
- Activity level/restrictions
- Diet restrictions
- Medications taken at home and needed at school
- Emotional needs
- Parent’s expectations
- Contact information
- Has a neuropsychological evaluation been done with the child? (please see article in Resources below, Supporting Development in Children with Congenital Heart Disease, Brosig, C. et al. (2014) Circulation; 130: e175-e176.

Possible actions to take include:

- Develop IHP/504/IEP, emergency plan as needed.
- Make needed accommodations with school schedule and physical education.
- Provide for proper administration of all prescribed treatments and medications.
- Extra set of books for use at home
- Work with parents for a referral to a Neuropsychologist. Visit choa.org/neuropsych or call 404-785-2849 to schedule a visit.

Resources
American Heart Association
heart.org/children

Be the Beat
betthebeat.heart.org

Children’s Cardiomyopathy Association
childrenscardiomyopathy.org
Heart Disease Risk Factors for Children and Teenagers – Texas Heart Institute
texasheartinstitute.org/HIC/Topics/HSmart/children_risk_factors.cfm

Hypertrophic Cardiomyopathy Association
4hcm.org

Information on ICDs
sads.org/living-with-sads/ICDs

National Association for Children's Heart Disorders
kidswithheart.org

Pediatric Cardiovascular Surgery – Nicklaus Children's Hospital Miami Children's Health System

Project ADAM – Children’s Hospital of Wisconsin
projectadam.com

Project S.A.V.E. – Children's Healthcare of Atlanta
choa.org/projectsave

Sudden Arrhythmia Death Syndromes – Information for School Personnel
sads.org/library/school-materials
sads.org/Medical-Professional-Education/Information-for-School-Personnel

Supporting Development in Children with Congenital Heart Disease
circ.ahajournals.org/content/130/20/e175

The Heart Center at Cincinnati Children's
cincinnatichildrens.org/heart

Medline Plus
.nlm.nih.gov/medlineplus/ency/patientinstructions/000096.htm

Camp Information
Camp Braveheart
choa.org/campbraveheart
Hemophilia is typically an inherited blood disorder in which a vital blood-clotting factor is missing or decreased, causing prolonged bleeding. The most common type of hemophilia is Hemophilia A, a deficiency of clotting factor VIII. Hemophilia B, also known as Christmas disease, is a deficiency of clotting factor IX. Hemophilia can also be classified as mild (6-45 percent), moderate (1-5 percent) or severe (<1 percent). Hemophilia classifications (mild, moderate, or severe) describe the amount of factor that the person’s body makes, not necessarily the severity of the bleeding symptoms. The majority of people with hemophilia have severe hemophilia (60 percent). The prevalence of hemophilia is 1:5000 males in the U.S. Although males are primarily affected, female carriers may experience bleeding problems as well.

Another inherited bleeding disorder is von Willebrand disease (vWD), a deficiency of or defect in another clotting protein (von Willebrand protein). Von Willebrand proteins carry factor VIII and interact with platelets to form a plug at the site of injury to promote clotting and allow healing. There are many different types of von Willebrand disease (1, 2A, 2B, 2M, 2N, 3…). The type of vWD is determined by the amount, structure, and function of von Willebrand protein. The most common type of vWD is type 1, where there are a low number of von Willebrand proteins that are normally shaped and function well. In type 3 vWD, von Willebrand proteins and factor VIII are low or absent. vWD is thought to occur in 1-2 percent of the population.

Other bleeding conditions include platelet function defects and other clotting factor deficiencies (I, II, V, VII, X, XI, XII, XIII). Platelets promote clotting by accumulating at the site of injury, sticking to von Willebrand protein, and sticking to each other. Platelets form the surface where other clotting factors interact to make a fibrin covering to secure the clot and facilitate healing. Other clotting factor deficiencies are rare.

**Bleeding Problems**

People with bleeding disorders may experience bleeding from a variety of sites. Mucosal bleeding (nose, gums, bruising, soft tissue hematomas) is common in many bleeding disorders. Women with bleeding disorders may experience heavy or prolonged menstrual periods. Bleeding into joints or muscles occurs more frequently in people with hemophilia. Common joint bleeding sites include knees, ankles and elbows. Early signs of joint bleeding are tingling, stiffness, decreased range of motion, swelling or a decreased ability to use the limb/joint. Blood, outside of blood vessels, is an irritant. Blood inside a joint causes pain, warmth and swelling. The blood inside a joint can damage the cartilage and joint surfaces over time, producing arthritis and disabling joint function. Blood in the gastrointestinal tract can result in nausea, vomiting, and diarrhea. Bleeding may be spontaneous or occur after an injury. Bleeding from lip or tongue lacerations can be persistent. Bleeding may be intermittent and mild or life-threatening.

People with bleeding disorders are at risk for developing bleeding inside their head (intracranial hemorrhage). While most intracranial hemorrhages are the result of trauma to the head, some bleeding disorder patients bleed into their head spontaneously (without trauma). Signs of intracranial hemorrhage include: headaches, changes in consciousness, change in vision, nausea/vomiting and/or neurological changes (inability to move or function normally). Bleeding inside the head can be life-threatening and have long-term consequences.

**Treatment**

Bleeding from hemophilia is commonly treated by giving intravenous doses of the missing clotting factors. The most commonly used factors today do not rely on human plasma donors but are recombinant factors (manufactured in the cleanest method possible). In the past, receiving factor products derived from human plasma donors resulted in an increased risk of hepatitis and HIV for people receiving factor products. This risk no longer exists for most factor products. Blood products are sometimes needed for bleeding that does not respond to other bleeding medications or for which no manufactured clotting protein is available. Students, usually around the age of 7 years, and their families are frequently taught how to self-administer intravenous factor infusions.
Students with mild hemophilia and those with vWD may use desmopressin acetate nasal spray (Stimate®) outside of the hospital to manage bleeding. An intravenous form of desmopressin acetate (DDAVP®) is frequently used in the healthcare setting. Students who use Stimate® must avoid chocolate, caffeine and drinking plain water for 24 hours after Stimate® use. Stimate® causes the body’s salt or sodium level to fall. In order to avoid seizures and other symptoms of hyponatremia (low blood sodium), students are instructed by their medical team to drink a prescribed limited amount of salt-containing beverages (Gatorade® preferred) for 24 hours after using stimate. The Stimate® fluid restriction amount is calculated based on the student’s weight. Amicar® (liquid or tablets) or tranexamic acid also may be given by mouth to slow the breakdown of clots once they are formed and encourage healing. Both Stimate® and Amicar® may be taken routinely to manage menstruation or other mucosal bleeding (nose, gastrointestinal, or gum).

Bleeding medications may be used intermittently in response to an injury or routinely to prevent or treat a significant bleeding episode. There is also current research into gene therapy treatment for hemophilia. Regular exercise, an important adjunct to treatment, strengthens muscles and protects joints. However, temporary physical limitations may be placed on students who are recovering from a joint or muscle injury in order to promote complete healing and prevent early recurrent bleeding. Students who are physically fit and toned experience fewer bleeding episodes and improved psychological and emotional development. Students with bleeding disorders are encouraged to receive the standard childhood vaccinations recommended by the CDC.

Management at School

Close communication with parents will assist in planning care. Small cuts and scrapes can usually be treated with normal first aid measures. Management of nosebleeds includes: sitting up with the head straight or leaning slightly forward, application of pressure for 20 minutes without interruption, and application of topical nasal moisturizer in addition to administration of bleeding medications. Deep lacerations and internal bleeding require prompt administration of bleeding medications in addition to initiation of first aid. Any moderate or severe trauma to the head, abdomen or bones warrants immediate attention.

Early and adequate treatment can prevent serious complications such as joint and muscle damage, intracranial hemorrhage and vision damage. Care considerations include:

- Listen to the student for early signs of bleeding that may not be obvious.
- Even apparently minor episodes of trauma, such as a sprained ankle, require prompt treatment.
- Follow the individual student’s IHP and emergency care plan.
- Treat bleeding episodes promptly with gentle direct pressure and elevation.
- Older students may be able to self-administer clotting factor intravenously as needed.
- Keep the student at rest.
- Apply lightweight ice pack to the area.
- Notify parents or guardian immediately.
- If parents cannot be reached, call 911.

Maintaining up-to-date emergency contact information and authorization for emergency treatment is critical. Documentation of any precipitating factors, complications, medications administered and reactions is also important. Sports and PE participation are encouraged in most cases, although there may be limitation of some contact sports.
Educational Considerations

- Develop IHP/504/IEP, emergency plans as needed.
- Provide any needed accommodations in physical education and/or school schedule.
- Provide for proper administration of all prescribed treatments and medications.
- Provide for adequate hydration and bathroom breaks.
- Provide needed support during hospitalizations and school absences.

Resources

Hemophilia of Georgia
hog.org

hemophilia.org/NHFWeb/Resource/StaticPages/menu0/menu8/menu123/Back%20to%20School.pdf

National Hemophilia Foundation
hemophilia.org

National Hemophilia Foundation Resources
hemophilia.org/resources

Camp Information

Camp Wannaklot
hog.org/camp
Acquired immunodeficiency syndrome (AIDS) is caused by the Human Immunodeficiency Virus (HIV). Most young children with HIV have contracted the disease during birth or through contact with infected blood or blood products. Although HIV has been isolated in saliva and tears, transmission by exposure to these sources has not been documented. None of the pediatric AIDS cases in the United States have been transmitted in the school, day care or foster care setting; and indirect casual person-to-person contact poses no risk for viral transmission. There are also no medical or legal reasons to restrict a child who is infected with HIV or has a parent infected with HIV from attending school.

Protecting an HIV-positive child's confidentiality is extremely important, and written parental permission should be required before sharing any health information. Clinic personnel, required under HIPAA regulations, should not discuss any child’s HIV-status or test results to any other person. Georgia statutory law (O.C.G.A. 24-9-47) defines AIDS Confidential Information (ACI) and makes the confidentiality requirements for the disclosure of ACI more stringent than for other medical conditions. Therefore it does not require parents to disclose their child’s HIV status to the school, in order to protect the confidentiality of the child. However, sometimes parents will decide to disclose the child’s HIV status to the school system in order for the appropriate personnel to respond should the child fall ill while on school property.

A patient's written consent (or a parent or guardian in the case of a minor) is required to disclose ACI unless the disclosure is otherwise authorized or required by law. According to state law, any person or legal entity intentionally or knowingly disclosing ACI in violation of the law will be guilty of a criminal offense and subject to criminal penalties and civil liability. Unintentional disclosure due to gross negligence or wanton and willful misconduct is also a criminal offense subject to criminal penalties and civil liability (O.C.G.A. 24-9-47).

Go to the following web sites for more information:

Summary of Georgia HIV and STD Laws
hiveis.com/Forms/GeorgiaHIVandSTDLaws.pdf

Georgia Code (search: Georgia Code: 24-9-47)
lexis-nexis.com/hottopics/gacode/default.asp

Children with HIV infection should not receive live virus vaccinations, depending on the severity of their immunodeficiency. Eligibility should be determined by the child’s primary HIV physician. Those with severely compromised immune systems should not receive live virus vaccinations and should be excused from regulations requiring them. Any student, including an HIV-infected child, who has contracted a potentially serious contagious disease, should not be allowed to attend school without clearance from the public health department or private physician.

The treatment of HIV infection requires several different daily medications. If there is any question regarding the patient's medications, then the primary HIV physician should be contacted. A resource for these medications can be found at aidsinfo.nih.gov/drugs.

Standard precautions should be followed with HIV-positive children just as with any other child. The key elements include:

• Hand hygiene proper handling and disposal of sharps

• Cleaning and disinfecting patient equipment and environment to prevent transmission of infectious agents, personal protection equipment (gloves, gowns, masks, goggles, etc.) when handling infectious fluids (i.e. blood or body fluids).
**Educational Considerations**

- Administer medications/treatments as prescribed.
- Adjust attendance policy, adjust schedule or shorten day, if needed.
- Provide rest periods, if needed.
- Adapt physical education curriculum.
- Develop IHP/S04/IEP and emergency plan.
- Know child's primary care physician, and who to contact if there is an emergency during school hours.
- Arrange for home tutoring, homebound teacher, if needed.
- Provide staff training on confidentiality, peer education per family request.

The section in this chapter on Childhood Cancers and Transplants has additional information on the immunosuppressed child, which is also applicable to the child being treated for HIV/AIDS.

**Resources**

AIDS Info  
aidsinfo.nih.gov

Guidelines for the Prevention and Treatment of Opportunistic Infections among HIV-Exposed and HIV-Infected Children  

H.E.R.O for Children  
heroforchildren.org

HIV among Youth  
cdc.gov/hiv/risk/age/youth/index.html

HIV – Georgia Department of Public Health  
dph.georgia.gov/hiv-prevention-program

HIV/AIDS – Opportunistic infections and other conditions  
womenshealth.gov/hiv-aids/opportunistic-infections-and-other-conditions

Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection  
aidsinfo.nih.gov/contentfiles/PediatricGuidelines.pdf

Parenting a child with HIV  

**Camp Information**

Camp High Five  
heroforchildren.org/camphighfive.php
Hypertension

Fewer than five percent of children in the U.S. have high blood pressure, but that number is on the rise with the increase in risk factors for cardiovascular disease in the pediatric age group, and may be higher in some minority populations. There can be a genetic link for high blood pressure in children, and heart, kidney or sickle cell disease can cause secondary hypertension. Hypertension in children is classified based on age, sex and height. Multiple blood pressure checks with high readings are needed to refer for or diagnose hypertension. The following table is adapted from the National Heart Lung and Blood Institutes Blood Pressure Tables for Children and Adolescents. It does not provide the detailed breakdowns, which vary by a child’s height. The cut-off points are listed for general information.

<table>
<thead>
<tr>
<th>Age</th>
<th>Boys</th>
<th></th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>High</td>
<td>Normal</td>
</tr>
<tr>
<td>4-5 yrs</td>
<td>&lt;112/70</td>
<td>&gt;=116/74</td>
<td>&lt;109/70</td>
</tr>
<tr>
<td>6-7 yrs</td>
<td>&lt;115/74</td>
<td>&gt;=119/78</td>
<td>&lt;113/73</td>
</tr>
<tr>
<td>8-10 yrs</td>
<td>&lt;119/78</td>
<td>&gt;=123/82</td>
<td>&lt;118/76</td>
</tr>
<tr>
<td>11-12 yrs</td>
<td>&lt;123/79</td>
<td>&gt;=127/83</td>
<td>&lt;122/78</td>
</tr>
<tr>
<td>13-14 yrs</td>
<td>&lt;128/80</td>
<td>&gt;=132/84</td>
<td>&lt;125/80</td>
</tr>
<tr>
<td>15-17 yrs</td>
<td>&lt;136/84</td>
<td>&gt;=140/89</td>
<td>&lt;128/82</td>
</tr>
<tr>
<td>Over 18 yrs</td>
<td>Same as adults</td>
<td></td>
<td>Same as adults</td>
</tr>
</tbody>
</table>

(For more complete information see nhlbi.nih.gov/health/resources/heart/hbp-child-pocket-guide-html)

Treatment

Treatment usually consists of correcting the underlying condition. A low salt diet may be recommended. Most hypertensive children can be treated with lifestyle modifications such as achieving and maintaining a healthy weight, controlling fat and salt in the diet, regular aerobic exercise, controlling stress and avoiding caffeine, tobacco and illicit drugs. For primary or essential hypertension, a few children may require daily medications to control high blood pressure, particularly if there are signs of organ damage. Children with hypertension may need to be monitored regularly at school per physician’s order.

Management at School

Children with high blood pressure can benefit from family education in reducing risk factors such as

- Achieving and maintaining a healthy weight
- Controlling diet, lowering intake of fats and salt, and increasing fruits and vegetables
- Exercising regularly and aerobically and avoiding weight lifting
- Controlling stress (children can benefit from learning relaxation techniques)
- Avoiding caffeine
- Avoiding smoking and exposure to secondhand smoke
- Controlling diabetes.
Screening

Current recommendations by the American Academy of Pediatrics are for annual blood pressure screenings for all children and adolescents over age 3. Some schools routinely screen blood pressure with weights. An appropriate size cuff is the most important factor in the measurement. Cuff size refers to the internal bladder, not the cloth covering. The cuff bladder width should be about 40 percent of the arm circumference between the shoulder and elbow (should cover 80-100 percent of the arm circumference). A cuff that is too narrow may give a falsely high reading. A low reading may result when a cuff that is too large is used. Also be sure to have the student sitting with both feet on the floor and his or her arm at heart level.

Stabilize the limb during deflation, as movement of the arm interferes with an accurate reading. Whenever a high reading is obtained (above the 95th percentile), recheck the reading later in the day and repeat measurements at least three times on different days. Significant hypertension is a persistent blood pressure between the 95th and 99th percentile for age, gender and height on each of these readings. Severe hypertension is persistently at or above the 99th percentile for age, gender and height on each reading. Notify parents and refer students with consistently high blood pressure readings in these ranges to their primary care provider.

Resources

Complete Pediatric Blood Pressure Tables
nhlbi.nih.gov/guidelines/hypertension/child_tbl.htm

High Blood Pressure in Children
heart.org/HEARTORG/Conditions/HighBloodPressure/UnderstandYourRiskforHighBloodPressure/High-Blood-Pressure-in-Children_UCM_301868_Article.jsp

International Pediatric Hypertension Association
pediatrichypertension.org
Juvenile Idiopathic Arthritis (JIA) was previously termed juvenile rheumatoid arthritis, but the name was changed to distinguish it from adult rheumatoid arthritis. JIA is the most common form of arthritis in children and is characterized by varying levels of joint inflammation with pain and swelling and sometimes by joint contracture, joint damage and altered growth. Joint stiffening after decreased activity and muscle weakness is also commonly seen. An estimated 300,000 children and adolescents in the U.S. are affected by JIA and related conditions. In the first six months, if the arthritis affects five or more joints, it is termed polyarticular; if less than five joints, it is called oligoarticular; and when arthritis occurs in addition to fever and rash, it is classified as systemic JIA. Other JIA categories include enthesitis related arthritis (which affects boys more commonly, and can cause inflammation of sacroiliac joints and tendons), psoriatic arthritis (psoriasis rash with joint pain and swelling). JIA affects girls twice as often as boys and can occur at any age, with a peak at age 2 years. In addition to JIA, other pediatric rheumatic conditions that are often referred to as juvenile arthritis include lupus, dermatomyositis, vasculitis and scleroderma.

Juvenile arthritis can affect the student’s mobility, strength and endurance. However, there may not be any visible signs of the disease. The major symptoms in children with arthritis are pain, fatigue, swelling and stiffness of joints. Children may be irritable and listless, as well as experience decreased appetite and extreme fatigue. They often avoid movements that cause pain. The disease symptoms come and go, and medication side effects can complicate care as well. For example, non-steroidal anti-inflammatory drugs can cause stomach upsets and steroids can affect mood.

Arthritis education is very important for the child and family. The Arthritis Foundation offers educational brochures and pamphlets, as well as rheumatologist referrals and ways to become more active in arthritis management. To obtain more information, call the Georgia Arthritis Foundation chapter at 800-933-7023. The Juvenile Arthritis Alliance (JAA) is a virtual community connected through the Arthritis Foundation web site. It provides educational opportunities through an annual conference and assists with educating teachers and school administrators to ensure that the educational needs of children with arthritis are met. For more information, call the Georgia chapter, listed above.

**Treatment**

The goal of treatment is to control the disease and maximize the child’s quality of life. Treatment may include one or more medications; rest; exercises (PT and OT); splinting as needed; frequent eye exams for iritis, a common complication; and sometimes surgery. Depending on the treatment plan, possible medications to be used in children are:

- Prednisone (also called steroids given as pills or sometimes by intravenous injections),
- Methotrexate (given weekly as tablets or subcutaneous injections),
- Anakinra® (daily injections)
- Enbrel® (weekly injection)
- Humira® (biweekly injection)
- Tocilizumab® (intravenous infusions at two to four week intervals)
- Abatacept® (intravenous infusions at four week intervals)
- Remicade® (intravenous infusions at four to eight week intervals)
- Ilaris (subcutaneous injections every four weeks).
Management at School

It is important to openly communicate with parents and the child and be aware of any limitations. Discuss activity guidelines and restrictions with parents and modify the child's schedule as necessary. Allow the child to move as needed to avoid stiffness and pain. Watch for both verbal and nonverbal signs that the child is in pain. Assist the child to stay on her/his medication, to see the school physical therapist if needed, and to participate in physical and academic activities as fully as possible with appropriate modifications. Learn the side effects of the medications.

Attendance may be an issue because of pain, medical appointments or associated illnesses, so the child may need time and assistance with make-up work. Often morning stiffness can delay the child getting to school. Exercise is important in the therapeutic regimen to keep joints mobile and muscles strong and to give the child a psychological lift. Physical therapy may be required to preserve range of motion.

Children should be free to participate in everything they are able to, and the child usually can be the judge of how much she/he can do on a particular day. Encourage students to look at their strengths, rather than their limitations.

Sports and recreational activities are important to help the students develop confidence in their physical abilities but may need to be modified. Frequent communication between the coach, nurse, teacher and family will help everyone understand the current symptoms.

Accommodations that may be needed include planning stretch breaks to alleviate stiffness, giving extra time to change classes, and allowing adaptive equipment, such as foam shells to build up pencils and computers for writing assignments. Another helpful tactic might be to recruit a “buddy” to help with carrying heavy items and cafeteria trays, opening milk cartons, etc.

Educational Considerations

• Train school personnel in proper medication administration if a school nurse is not available at all times.
• Develop a specific 504 Plan to better address academic and physical needs.
• Promote good communication with parents, healthcare providers and school personnel.
• Adapt activities and hours of instruction as needed.
• Educate staff and peers, especially that significant symptoms may not be visible.
• Plan stretch breaks to relieve stiffness.
• Modify PE activities to allow student to participate (using pinch runners, softer balls, etc.).
• Support educational needs during absences and hospitalizations.
• Adjust student's schedule to limit fatigue (i.e. classes closer together, on one floor).
• Supply second set of text books if needed to avoid heavy backpacks.
• Allow adaptations for writing, sitting, as needed.
• Encourage students to look at strengths, not limitations.
• Observe for body language that may indicate pain or fatigue.
• Encourage acceptance of diversity and individual differences in the classroom.
Resources
Arthritis Foundation
arthritis.org

Kids Get Arthritis, Too
kidsgetarthritistoo.org

The Basics of Juvenile Arthritis
kidsgetarthritistoo.org/about-ja/the-basics

Your School Action Plan
kidsgetarthritistoo.org/kids-and-teens/teens/every-day-with-ja/your-school-action-plan.php

WebMD - Juvenile Arthritis at School: 504 Plans, IEPs, and Pain Issues
webmd.com/rheumatoid-arthritis/features/juvenile-arthritis-at-school-504-plans-ieps-and-pain-issues

Camp Information
Camp AcheAway
arthritis.org/georgia/juvenile-arthritis/camp-acheaway-georgia.php
Kidney Disease

There are a variety of kidney diseases that may affect children in the classroom.

Glomerular diseases may cause the child to have swelling of the legs, belly or arms. In addition, these diseases are often treated with prednisone and other powerful medications. Some names of glomerular diseases are nephrotic syndrome, minimal change disease and focal segmental glomerulosclerosis (FSGS). Lupus can cause a glomerular disease of the kidneys. Complications of glomerular diseases can include abdominal infections and formation of blood clots. Symptoms requiring immediate attention include fever, severe abdominal pain, pain and swelling in an arm or leg. Parents should be notified.

Kidney failure occurs when the kidneys don’t remove toxins from the body. In children, congenital diseases are the most common cause of chronic kidney failure, but acquired diseases also cause chronic kidney failure. In partial chronic kidney failure, children may need to take medications and limit their diet. When the kidney failure becomes severe, the child needs to receive dialysis or a kidney transplant. Children with chronic kidney disease often have growth-retardation and may be teased by classmates if staff is not vigilant and does not teach students to value individual differences.

Treatment

A child with kidney disease may require medications, some of which may need to be given during the school day. In some circumstances, it is extremely important that these medications be given at the exact time ordered by the physician. Prednisone, usually given for glomerular diseases, has many side effects including: increased appetite, weight gain, mood swings, overactivity, immunosuppression, cataracts, acne, decreased growth rate and high blood pressure. Kidney disease patients often have high blood pressure. Blood pressure monitoring at school may be requested to assist in the treatment regimen, and school nutrition services may need to address dietary restrictions.

Artificial Kidney Treatment (Renal Dialysis) is used for patients whose kidneys have failed.

There are two types of dialysis:

1. Hemodialysis
   The patient’s blood is pumped through a tube to an artificial kidney machine. This machine removes excess fluid and waste and returns the clean blood to the body through a second tube. During treatment, the patient can read, sleep, watch TV, etc. The treatment is usually done three times a week for three or more hours at a time. Patients may go to the dialysis center for treatment or may learn how to perform dialysis at home if their medical condition allows it.

2. Peritoneal Dialysis
   A solution called dialysate flows from a bag through a tube into the abdomen (the membrane that lines the abdominal cavity). Waste products and excess fluids pass from the blood into the dialysate. The used solution is then removed from the body through a tube—by gravity or by a machine. If done by a machine, peritoneal dialysis is performed each night. The patient connects the tube to the machine before going to bed and disconnects it in the morning.

   If it is done by gravity, the patient usually changes the bag of solution four times a day. Each exchange takes about half an hour. Patients who perform dialysis at home must receive special training and follow instructions exactly.

   Children who are on hemodialysis usually have to miss school at least three half-days per week. Homebound teaching may be needed, or students may be able to attend school in the morning and have dialysis in the afternoon.
Management at School

As with most chronic diseases, it is important to attempt to include students with chronic kidney disease in the mainstream of student activities including physical education. Occasionally physical education will be limited, and the physician should prescribe limitations on an individual basis.

It is important to notify the parents if children with kidney disease have fatigue, decreased mental alertness, nausea or vomiting.

If medications are required, school personnel should follow current policies regarding administering medications to children at school. The student who is on hemodialysis will have a venous access device such as a fistula or dialysis catheter, which will need to be monitored for safety and signs of infection. Some children with bladder problems may need to periodically use a catheter to urinate. In some cases, the child may urinate through a stoma (hole) in the abdomen. Other children may need to urinate more frequently, and thus need more frequent bathroom privileges. In addition, some children may need to drink more than other children and should be provided with increased access to water or carry a water bottle at school.

Educational Considerations

• Develop IHP/504/IEP, emergency plans as needed.
• Provide any needed accommodations in physical education and/or school schedule.
• Provide for proper administration of all prescribed treatments, medications.
• Provide for adequate hydration, bathroom breaks.
• Provide for nutritional support as needed.
• Provide needed support during hospitalizations, school absences.

Resources

Kidney School
kidneyschool.org

National Kidney Foundation
kidney.org

Patient and Family Resources
kidney.org/patients/resources

Camp Information

Camp Independence
choa.org/campindependence
Duchenne Muscular Dystrophy

Muscular dystrophy is the general designation for a group of progressive muscle conditions with the prominent characteristic of progressive degeneration of the skeletal (voluntary) musculature. These conditions are hereditary. There are approximately 40 different types of muscular dystrophy, and accordingly they may vary in severity. Each type has various characteristics, and what you see below may not fit all types of muscular dystrophy. For details on each disorder, you may go to the Muscular Dystrophy Association (MDA) web site mdausa.org/disease/40list.html.

Duchenne Muscular dystrophy (DMD) is the most common muscular dystrophy condition that significantly affects boys as compared to girls, who are mostly asymptomatic. The onset of symptoms is usually in toddler age range and is most noticeable at the age of 4-5 years old. Initial signs of DMD include enlargement of the calves, frequent falls and difficulty arising from a sitting position. When a child enters the early teens, around 10-12 years of age, walking become laborous and results in a hyperlordotic gait, which is often described as “sway back.” On average, by the age of 12 years old, a child with DMD will be relying on a wheelchair for transportation. As this condition progresses, the arms and hands muscles, as well as the breathing muscles, will become increasingly weak, making simple daily activities such as feeding, dressing and other personal care tasks insurmountable. Medical complications such as lung infections can be due to weakness of respiratory muscles. Additionally, as this condition progresses, cardiac dysfunction ensues and ultimately heart failure is often expected. These severe respiratory or cardiac problems mark the final stages of the disease, often in the person's 20s.

Treatment

Medical therapy is aimed at slowing the progression of the disease. At the current time, prednisone—a form of steroid—is the only proven treatment that will allow for children to keep their ability to walk as they age. However, side effect of this medication should closely be monitored.

Daily physical therapy for stretching and range of motion also are important to increase flexibility which will allow for continued ambulatory capability. Additionally, bracing or splinting the legs can also maintain joint flexibility and prevent contractures which often hinder a child’s ability to walk.

Surgical intervention may be necessary at the later stages of the condition including spine surgery to lessen scoliosis. Environmental adaptations will be needed to maintain as much independence as possible (i.e. raised toilet seats, special desktops, ramps). Annual flu shots and pneumonia vaccine will probably be given, and prevention of respiratory infections with careful handwashing is important.

Management at School

The student should be encouraged to live as normal and full a life as possible. Assistive devices can help him to reach a greater degree of independence. The small muscles of the hand are often the last to be affected, so the child can continue to use his fingers. Encourage participation in as many activities as the child's condition will allow. As the muscles become weaker, the children may tire easier and require more time for completion of activities and schoolwork.

It is important to recognize the first sign of an impending infection. Such signs may include listlessness, loss of appetite, fever or cough. Parents should be notified immediately if an infection is suspected.

Educational Considerations

- Develop IHP/504/IEP, emergency plans as needed.
- Provide any needed accommodations in physical education and/or school schedule.
• Provide for proper administration of all prescribed treatments and medications.
• Provide needed support during school absences.
• Ensure that bathroom facilities, water fountains, sinks, etc., are readily accessible.
• Practice emergency exit from school building.
• Provide extra time to get to class if needed.
• Provide extra time to complete assignments, or exams. May need adaptive equipment for note-taking (computer, or note-taker).

**Resources**

A Teacher’s Guide to Neuromuscular Disease
[mda.org/publications/PDFs/TeachersGuideNMD.pdf](mda.org/publications/PDFs/TeachersGuideNMD.pdf)

Duchenne/Becker Muscular Dystrophy
[cdc.gov/ncbddd/musculardystrophy/treatments.html](cdc.gov/ncbddd/musculardystrophy/treatments.html)

Keep New IDEA in Mind
[mda.org/Publications/Quest/q132iep.html](mda.org/Publications/Quest/q132iep.html)

Muscular Dystrophy Association
[mda.org/disease](mda.org/disease)

Parent Project Muscular Dystrophy (PPMD), Education Matters – A Teachers Guide to Duchenne Muscular Dystrophy

**Camp Information**

MDA Summer Camp
[mda.org/summer-camp](mda.org/summer-camp)
Weight Management

Overweight and obesity have become one of the fastest growing epidemics in public health today. Obesity rates have risen 300 percent in the last 30 years. According to the 2011-2012 NHANES (National Health and Nutrition Examination Survey) report, overweight and obesity prevalence was 31.8 percent among children and adolescents ages 2 to 19 in the United States. In Georgia, 37.5 percent of our children are overweight or obese. Although we are starting to see some stabilization of the rate, particularly in the 2 to 4 year old age group, the overall level of obesity is extremely high.

Studies show that children who are overweight are at a high risk of becoming overweight or obese adults. This characteristic puts them at greater risk for all of the health problems associated with obesity, such as increased incidence of heart disease, type 2 diabetes, obstructive sleep apnea, hyperlipidemias, hypertension, polycystic ovary syndrome, joint pain and strokes. These conditions are recognized now—not only in adulthood, but as problems starting during the childhood and adolescent years—and conditions, such as type 2 diabetes and sleep apnea have been shown to have a definite effect on a student’s ability to learn. A child’s quality of life, social interactions and self-esteem also can be critically affected by being overweight.

Causes

The causes of a child being overweight are multifactorial and include genetic, behavioral, environmental, cultural and socioeconomic factors. Public health researchers agree that the principal reasons for the increase in obesity in the school-aged population are lack of physical activity and unhealthy eating habits. According to the Institute of Medicine, many factors have influenced this development in our society, including:

- Urban and suburban designs that discourage walking and other physical activities
- Pressures on families to reduce food costs and less home prepared meals, resulting in frequent consumption of convenience foods that are high in empty calories, added sugars, added fats and sodium
- Reduced access and affordability in some communities to fruits, vegetables and other nutritious food (see Chapter 9 for information on addressing Hunger and Student Health)
- Decreased opportunities for physical activity at school and after school as well as reduced walking or biking to and from school
- Replacement of free time, that was once spent playing outdoors, with sedentary activities like screen time, including using smartphones/tablets/computers, watching TV or playing video games.
First Do No Harm

The goal should be to help children maintain a healthy body weight by adopting healthy lifestyle habits, including healthy eating and daily physical activity. Children come in all shapes and sizes, and health and fitness can be achieved for all children. The National Institutes of Health (NIH) have provided the following recommendations for parents and all adults who interact with children:

- Be supportive. Children know if they are overweight and don’t need to be reminded or singled out. They need acceptance, encouragement and love.
- Set guidelines for the amount of time your children can spend watching TV or playing video games.
- Plan family activities that involve exercise. Instead of watching TV; hike, bike, wash the car or walk around a mall.
- Offer multiple healthy food choices and let your children decide which to enjoy.
- Be sensitive. Find activities your children will enjoy that aren’t difficult or could cause embarrassment.
- Eat meals together as a family, and eat at the table—not in front of the TV. Eat slowly and enjoy the food.
- Don’t use food as a reward or punishment.
- Children should not be placed on restrictive diets unless done so by a doctor (for medical reasons). Children need food for growth, development and energy.
- Caregivers should avoid overly restrictive feeding practices and allow the child to self-regulate his or her own meals.
- Involve your children in meal planning and grocery shopping. This helps them learn and gives them a role in the decision-making.
- Keep healthy snacks on hand. Good options include those that incorporate vegetables, fruits, low-fat dairy, whole grains, legumes, nuts/nut butters and seeds. Below are some healthy snack ideas:
  - Sliced fruit or veggies with nut butter
  - Healthy trail-mix (whole grain cereal, raisins and nuts)
  - Part skim mozzarella strong cheese or reduced fat cheese stick and baby carrots
  - Hummus and celery sticks
  - Plain yogurt with fresh, frozen or canned fruit (no added sugar).

Weight Status Assessment

Children 2 to 19 years old should have their weight status assessed yearly at well-child visits. Screening of height and weight and Body Mass Index (BMI) in schools provide an opportunity for weight status assessment (see Chapter 8 for instructions on Height and Weight Screening and BMI calculation).

BMI Evaluation

The BMI (Body Mass Index) measurement for children and adolescents 2 to 20 years of age is an important tool for overweight and obesity assessment. BMI is an indirect estimate of body fatness. Since June of 2000, the BMI measurement has been included in the Centers for Disease Control and Prevention and the National Center for Health Statistics Growth Charts. The BMI measurement involves an accurate measurement of height and weight and application of a formula, to determine the BMI number. This number is then plotted on the growth chart/BMI percentile graph for girls or boys. Established cut-off points are used to identify underweight, overweight and obese children and adolescents. The following (excluding normal weight) are extremes in BMI-for-age that raise concern in the pediatric population:

<table>
<thead>
<tr>
<th>Weight Status</th>
<th>BMI-for-age</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>BMI-for-age</td>
<td>&lt; 5th percentile</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>BMI-for-age</td>
<td>5th to 84th percentile</td>
</tr>
<tr>
<td>Overweight</td>
<td>BMI-for-age</td>
<td>85th to 94th percentile</td>
</tr>
<tr>
<td>Obese</td>
<td>BMI-for-age</td>
<td>&gt; 95th percentile</td>
</tr>
</tbody>
</table>

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Georgia Shape

The Governor’s Childhood Obesity Initiative, Georgia Shape, aims to encourage healthy behaviors and promote individual health through coordinated statewide policy and school/community efforts. It includes the statewide implementation of Fitnessgram, a comprehensive physical fitness and health assessment for children in grades one through 12. Fitnessgram is implemented in all public schools with a certified PE teacher. Fitnessgram assesses children in several areas (aerobic capacity, muscular strength, muscular endurance, flexibility) and it also includes a BMI measurement component. By law, families receive a copy of the results either electronically or a hard copy. Results should not be shared with students while at school. The school nurse is encouraged to collaborate with PE teachers and request Fitnessgram reports—results may be used in their assessment of students, particularly BMI status. You can find out more about the Fitnessgram on the Shape Act web site (georgiashape.org/).

Treatment

Treatment programs targeted for overweight and obese children and adolescents are now being offered in healthcare systems, and school nurses need to be aware of what is available in their community.

Children’s Healthcare of Atlanta Strong4Life℠

Children’s Healthcare of Atlanta launched Strong4Life to help parents inspire their kids to eat right and get moving with easy, doable tips and advice from our doctors, nutritionists and wellness experts. Strong4Life makes improving family nutrition and physical activity habits fun and provides parents and caregivers the support they need to accomplish their goals. Visit Strong4Life.com for tips on how to make simple changes at home, and at school, to encourage healthy lifestyle habits.

Guide to One-on-One Encounters

1. Assess Weight Status
   • Obtain weight status from Fitnessgram or height and weight screening.
   • School nurse may communicate with parents about student’s Fitnessgram results via the Fitnessgram letter provided at the end of this chapter.
   • Avoid using terms such as “fat,” “overweight” or “obese” in your conversations with students and/or parents.
   • To help facilitate discussions about student BMI with parents, you may use the Strong4Life BMI chart, which displays color-coded BMI “zones.” You may use language such as, “unhealthy red zone” to describe a child’s BMI status that is above the 95th percentile.
   (The Strong4Life BMI chart is available as a resource at the end of this chapter.)

2. Assess Health Behaviors
   • Key health behaviors to review include:
     - Sugary beverage consumption
     - Vegetable and fruit intake
     - Screen time (TV, computers, video games, smartphones, etc.)
     - Physical activity
     - Fast food consumption
   • You may assess student health behaviors via the Strong4Life Healthy Habits Assessment. This assessment evaluates key health behaviors identified by childhood obesity experts and assesses student readiness to adopt healthy habits. The Fitnessgram assessment may also serve as a conversation starter for behavior change and goal setting.
   (The Strong4Life Healthy Habits Assessment is available as a resource at the end of this chapter).
3. Set Health Behavior Goal

- Behavioral goals, not weight loss goals, should be the focus:
  - Motivational Interviewing techniques may be used to help facilitate goal setting with students and/or parents.
    - Ask open-ended questions instead of questions that can be answered with a “yes” or “no.” For example, you may ask a student “Which beverages do you like to drink?” instead of “Do you like to drink soda?”
    - Use reflective listening to let the student and/or parent know you understand what they are telling you. For example, you may reflect back to them what they’ve shared with you: “So it sounds like you’re saying…”
  - Collaborate with students to set health behavior goals that are S.M.A.R.T. (Specific, Measurable, Attainable, Realistic and Timely). For example, “I will have water instead of juice during lunchtime at school four days a week starting Monday.”
  - Goals may be based off of student’s health behavior assessment but should be limited to no more than two to promote success and sustainability.
    - Key health behaviors to promote:
      - Make half your plate vegetables and fruits.
      - Limit screen time and no TV in the room where the child sleeps.
      - Be physically active each day.
      - Drink more water.
      - Limit sugary drinks.
      - Limit meals outside the home (this includes fast food, etc., not meals served at school).
    - To help guide, record and monitor health behavior goals, the school nurse may provide students with the Strong4Life Goal Sheet. Students can fill out the goal sheet and the school nurse can make a copy for the student’s file. (The Strong4Life Goal Sheet is available as a resource at the end of this chapter).
    - The school nurse may provide the student and/or parent with educational handouts, tip sheets, healthy recipes, etc., to help support the adoption of healthy behavior (the Strong4Life Healthy Habits handouts are available at the end of this chapter).

4. Follow-Up and Document

- Follow-up with students and/or parents on progress with goals. Follow-up time frame will vary based on the student, the nature of their goal(s) and school structure and schedule.
- During follow-ups, praise students for all successes—big and small. Talk with students about any barriers faced and provide practical solutions. Be sure to document.
- Collaborate with students to maintain and/or build upon goal(s) once success is attained.

Underweight

Some children are naturally thin, while others may be thin as a result of inadequate food intake, food insecurity, restrictive dieting or chronic disease. Children with a BMI below the fifth percentile should be referred to their primary healthcare provider for further assessment (see Chapter 9 for information on Hunger and Student Health for ways to address student food insecurity).
Referral

Referral parameters should be established prior to the initiation of height and weight screening and one-on-one encounters, and they should be focused on giving information to the parents. The first step for all families concerned about weight issues is with their pediatrician. Children who fit the established criteria for being overweight, obese or underweight should be referred to their primary healthcare providers for further evaluation. The treatment of obesity is complex and involves both the student and his family. Pediatricians, dietitians and other health professionals work with families to overcome these issues. School nurses can be part of the solution by using appropriate opportunities to talk to students and parents about healthy food and beverage choices and the benefits of physical activity over sedentary activities.

Educational Considerations

Accommodations are not usually needed, but if sleep apnea is a concern, a child's learning may be affected. Appropriate physical activity and healthy food choices should be encouraged.

Normal Weight Students

All children (normal weight, overweight and underweight) should be offered information on healthy habits and encouraged to make small, simple changes to be healthier. All students should be taught acceptance of different body types, and teasing should not be tolerated.

See Chapter 9 for information on general health promotion for all students (School-Wide Health Promotion) and refer to Chapter 7 for information on addressing bullying.

Prevention

Prevention is the key to approaching the bullying issue, and increasing public awareness of healthy lifestyle habits through media campaigns and public health education efforts is necessary. A combined family, community and school-based effort are essential as well. Again, Children’s Healthcare of Atlanta Strong4Life makes improving family nutrition and physical activity habits fun and provides parents and caregivers the support they need to accomplish their goals.

References


Resources

Children's Healthcare of Atlanta
choa.org

CDC Growth Charts
cdc.gov/growthcharts

Strong4Life
strong4life.com

Georgia Shape
georgiashape.org

Physical Activity

Walk Georgia
walkgeorgia.org

American Heart Association: Start Walking Now Program
startwalkingnow.org

Bike-ability Checklist to Audit Your Community
pedbikeinfo.org/pdf/bikeability_checklist.pdf

Body and Mind - Centers for Disease Control and Prevention
bam.gov

Fun Fitness Videos for Young Children
theactivators.net

Kids Health

kidshhealth.org/kid/stay_healthy/index.html
kidsshealth.org/teen/food_fitness
kidsshealth.org/parent/nutrition_center/index.html

Organize a Walk to School Day Event
walkbiketoschool.org/get-set/plan-the-event

Physical Activity Guide for Parents
pbrc.edu/pdf/pns-physicalactivity.pdf

10,000 Steps a Day
pbs.org/americaswalking/health/health20percentboost.html

Walkability Checklist to Audit Your Community
walkinginfo.org/problems/audits.cfm
General

Alliance for a Healthier Generation
healthiergeneration.org/about.aspx

Division of Nutrition, Physical Activity and Obesity, CDC
cdc.gov/nccdphp/dnpao/index.html

Fun Site for School-Age Children to Learn Healthy Behaviors
kidnetic.com

Healthy Weight – It’s Not a Diet, It’s a Lifestyle!
cdc.gov/nccdphp/dnpa/healthyweight/index.htm

"Measuring Progress in Obesity – Workshop Report" from the Committee on Accelerating Progress in Obesity Prevention
nap.edu/catalog.php?record_id=13287

School Health Guidelines to Promote Healthy Eating and Physical Activity
cdc.gov/healthyyouth/npao/strategies.htm

Ways to Enhance Children’s Activity & Nutrition, We Can
nhlbi.nih.gov/health/public/heart/obesity/wecan/index.htm

Youth Physical Activity Guidelines Toolkit
cdc.gov/Healthyyouth/physicalactivity/guidelines.htm#1

Nutrition

Choose My Plate, United States Department of Agriculture
choosemyplate.gov

Georgia Department of Public Health Nutrition Web site
dph.georgia.gov/nutrition-program

Georgia Organics
gorgiaorganics.org

Have You Heard the Term “Community Supported Agriculture”?
localharvest.org/csa

Kids Health Topics for Parents/Kids/Teens
kidshealth.org

National Nutrition web site
nutrition.gov

Nutrition for Everyone – CDC
cdc.gov/nutrition/everyone/index.html
Taking the Fizz Out of Soda Contracts: A Guide to Community Action

cspinet.org/nutritionpolicy/fizz_out.pdf

Books

Preventing Childhood Obesity in Early Care and Education Programs, 2nd Ed. (2012). American Academy of Pediatrics, American Public Health Association, and National Resource Center for Health and Safety in Child Care and Early Education.


Helpful Apps for Cell Phones
• Fooducate
• Monumental Stair Climbing Game
• KIDFIT

Camp Information
Camp Strong4Life
choa.org/campstrong4life

The following resources are included in this section:
1. Strong4Life Eat Right Handout
2. Strong4Life Healthy Choices for Healthy Kids
3. Strong4Life BMI Chart
4. Strong4Life Healthy Habits Assessment
5. Strong4Life Goal Sheet
6. FitnessGram Letter to Parents
Smart foods help your body and mind grow strong.

Be STRONG4LIFE
Healthy Choices for Healthy Kids

- Make half your plate veggies & fruits
- Be active
- Drink more water & limit sugary drinks
- Limit screen time
Bring Healthy Habits Home!

A habit is something you do over and over again, sometimes without even thinking about it. Healthy habits keep you and your family feeling good—now and in the future!

Here are some ways to help your family use the Strong4Life™ Healthy Habits:

Get Your Whole Family to Join In – Set goals, like eating right or moving more, with your whole family. Then, work on them together to help everybody get healthier, faster!

Be Their Healthy Hero – Kids love to copy adults! Show them just how important healthy habits are by using them yourself. Nobody's perfect, but try to make healthy choices whenever you can.

Make One Small Change at a Time – The best way to make big changes with your family is to make one smaller change at a time. It’s a lot easier and more likely to work than trying to change everything at once.

Ask for Help – Start by visiting Strong4Life.com/getstarted. We give you easy ideas you can use right away.

Ready, Set, Go! – Ready to set your first goal? Explain the idea of goals to your family. Pick a goal that works for everyone in the family (like drinking water or 1% (low-fat) or fat-free milk instead of sugary drinks)—then, go for it! Tip: write down the goal and tape it to the fridge as a reminder.

Use these ideas to make your family’s habits healthier:

Make half your plate veggies and fruits
- Try to include several different colors.
- Make sure to eat breakfast every day.
- Eat meals together as a family.

Be active
- Try to be active for at least 60 minutes during the day (it doesn’t have to be all at once!).
- Remind kids to go outside and play as often as you can.
- Take a family walk around the neighborhood or play at a park.
- Play sports, dance, play tag...the choice is yours, just have fun!

Drink more water and limit sugary drinks
- Carry a water bottle with you.
- Drink water or 1% (low-fat) or fat-free milk at meal and snack time.
- Choose water (instead of sports drinks or soda) at sports activities and playtime.

Limit screen time
- After 30 minutes of screen time (phones, computers, TV), get 30 minutes of activity.
- Turn TV and video games off and play!
Is Your Student’s Weight Healthy?

Body Mass Index (BMI) Chart

8 years old
102 pounds; 4 feet, 9 inches
BMI and weight in the unhealthy red zone

8 years old
70 pounds; 4 feet, 9 inches
BMI and weight in the healthy green zone

8 years old
103 pounds; 4 feet, 3 inches
BMI and weight in the unhealthy red zone

8 years old
60 pounds; 4 feet, 3 inches
BMI and weight in the healthy green zone
Healthy Habits Assessment

Circle the answer that best describes your family’s average eating and activity habits.

My child eats veggies and fruits:
- 0-1 times a day
- 1-2 times a day
- 3-4 times a day
- More than 4 times a day

My child eats out:
- More than 4 times a week
- 3-4 times a week
- 1-2 times a week
- 0-1 times a week

My child is active:
- Not very often
- Less than 30 minutes a day
- 30-60 minutes a day
- More than 60 minutes a day

My child has sweet drinks (cola, sweet tea, sports drinks, fruit drinks, other juice drinks):
- More than 3 cups a day
- 2 cups a day
- 1 cup a day
- Not very often

My child has 100% fruit juice:
- More than 3 cups a day
- 2 cups a day
- 1 cup a day
- Not very often

My child watches television, spends time on the computer or plays video games:
- More than 2 hours a day
- 1-2 hours a day
- 30-60 minutes a day
- Not very often

Have you thought about trying a new healthy habit for your child?
- Not at all
- Just thinking about it
- I’ve tried to make healthy changes
- I’ve been making healthy changes

If you could work on one Healthy Habit, which would it be?
- Fill half your plate with veggies and fruits
- Be active
- Limit screen time
- Drink more water and limit sugary drinks
Goal Sheet

My Child’s Healthy Habit Goal: (circle one)

- Make half your plate veggies and fruits
- Be active
- Drink more water & limit sugary drinks
- Limit screen time

How will you work with your child on his goal? (e.g., He will ride his bike.)

When will you work with your child on his goal? (e.g., After school.)

How often will you work with your child on his goal? (e.g., 20 minutes, 3 days a week.)

Who can support your child? (e.g., Me, his grandmother, etc.)

When will you start working on your child’s goal? (e.g., Today, when I go to the grocery store, etc.)

Strong4Life.com
FITNESSGRAM LETTER TO PARENTS

Today's Date

Dear ___________________________________________________________,

Each school year, your child takes the Fitnessgram assessment in PE class. This fitness assessment provides information about your child's body composition and fitness levels; which, in turn, tell us a lot about your child's health.

Attached, you will find your child's Fitnessgram results. These results are confidential, meaning they are not shared publicly. Please look at your child's results carefully. Check to see if your child scored in the green “Healthy Fitness Zone” (HFZ) on all of the Fitnessgram sections. Read the messages along the side for more information about each piece of the assessment.

If you have questions or concerns about your child's Fitnessgram results, please contact myself or ____________________, your child's PE teacher. We will be happy to talk to you about your child's results. If you have questions about any other part of your child's health and wellness, please contact me.

I look forward to working with you to keep your student healthy and well. Thank you.

Sincerely,

__________________________

[Signatures here]

__________________________  ____________________________
School Nurse Name          PE Teacher Name

__________________________  ____________________________
School Nurse               PE teacher

__________________________  ____________________________
Your School’s Name          Your School’s Name

__________________________  ____________________________
XXX-XXX-XXXX               XXX-XXX-XXXX

__________________________  ____________________________
Your email address          Your email address
A seizure is an involuntary sudden change in sensation, behavior, muscle activity or level of consciousness, caused by a disruption of normal electrical activity in the brain. Seizures may be caused by medical conditions such as high fever, central nervous system infections, poisoning, hypoglycemia, electrolyte imbalance, head injury and structural brain lesion. Epilepsy is a condition of the brain characterized by a susceptibility to recurrent seizures. Someone is considered to have epilepsy if they have had more than two unprovoked seizures.

**Seizure Recognition**

Teachers and school nurses may be the first to detect possible seizure activity. Commonly seen signs of possible seizure activity include: brief staring spells (5-10 sec.) when the child is unresponsive; periods of confusion; head dropping; sudden loss of muscle tone; episodes of rapid blinking or eyes rolling upwards; rhythmic twitching of the mouth or face; aimless, dazed behavior including walking around or repetitive behavior; involuntary stiffening and/or jerking of arm or leg. A pattern of behaviors such as these should be reported to parents.

Important things to observe and document about a seizure:

- Precipitating events
- Student's behavior prior to seizure
- Type of seizure and duration
- Description and duration of post-seizure sleep or drowsiness.

**Groups of Seizures/Description**

**Group 1 - Generalized Seizures; Absence Seizures, Tonic Clonic Seizures (affects both sides of the brain)**

**Absence seizures (petit mal)**

Characterized by:

- A staring spell, lasting a few seconds
- Momentary loss of awareness, interrupting ongoing activity
- Movements of face/arms
- Return to full awareness after episode

**Generalized tonic-clonic seizures (grand mal)**

May include some or all of the following:

- Body stiffens and/or jerks
- May cry out
- Becomes unconscious or unresponsive
- Loses bowel/bladder control
- Usually lasts one to two minutes
- Shallow breathing and turning blue around lips or mouth
- Confused, sleepy or belligerent after the seizure
- Grinding motion of teeth or jaw
Group 2 – Focal Seizures; (affects one area of the brain) Simple Focal Seizure, Complex Focal Seizure, Secondary Generalized Seizures

Simple focal seizures
The student may:
• Remain conscious, but may not be able to control body movements
• Have distorted senses of sight, smell, hearing, touch
• Be confused and frightened afterwards

Complex focal seizures
The student may:
• Exhibit automatic behaviors in which consciousness is clouded, lasts one to two minutes
• Get up and walk around, as if sleepwalking
• Be unresponsive to spoken direction, or respond inappropriately
• Be fearful
• Exhibit repetitive behaviors
• Be confused and have no memory of the event afterwards

Treatment
Almost all seizures are self-limited events, and the abnormal activity will abate with time, usually in five minutes. In some instances, the administration of medication per rectum, intranasally, intramuscularly or intravenously is necessary to stop the seizure activity.

Emergency medications may be used for children who have prolonged or cluster seizures. One medication is called Diastat®, rectal Valium®, which is ordered now for many children who have prolonged or cluster seizures. See Diastat® in Chapter 3. More information on this drug can be found at: diastat.com. An additional medication being used is Intranasal or IN Versed. See teaching sheet in Chapter 3, page 24 for information regarding the use of this medication.

The seizure disorder, epilepsy, can be partially or completely controlled with the use of anticonvulsant medications in most individuals. These medications must be taken on a routine basis each day. Some children may also be on a special Ketogenic Diet, which would require accommodations from school nutrition services.

Another treatment being used for some children involves vagal nerve stimulation (VNS, Vagal Nerve Stimulator) by an electrical pulse generator that is surgically implanted (most often under the skin on the chest). Vagus nerve stimulation uses regular pulses of electrical energy to prevent or interrupt the electrical disturbances in the brain of the child with epilepsy. In these children, a magnet the child wears can be used to deliver extra stimulation when the child senses a seizure coming on (an aura). For some, the magnet can be used when a seizure occurs to shorten or lessen the severity, stop the seizure, or reduce recovery time.

Management at School

Follow Seizure Action Plan for each individual child

ABSENCE SEIZURE:
• Repeat key parts of the class that may have been missed.
• Note and report to parents if seizures are increasing in frequency.
GENERALIZED TONIC-CLONIC SEIZURES:
• Note the time when it starts and ends.
• Remain calm and remove other students from the area if possible.
• Stay with student until seizure ends.
• Ease the student to the floor, cushioning the head.
• Remove dangerous objects from the area.
• Do not restrain the child or put anything into the mouth.
• Loosen clothing, remove eyeglasses.
• Turn the student on his side to allow fluids to escape out the side of the mouth and to keep the airway clear (choking hazard may not only be vomit, but sometimes a build-up of excess saliva can cause a child to choke.).
• Maintain open airway.
• Ensure school nurse has rescue medication readily available to avoid any delay in administration if indicated.
• Give Diastat® or other rescue medication as ordered if seizure is prolonged.
• Provide a change of clothes if incontinence occurs.
• Allow student to rest quietly after seizure stops.
• Notify parent.

SIMPLE FOCAL SEIZURE:
• Comfort and reassure after seizure.
• Maintain student’s safety

COMPLEX FOCAL SEIZURE:
• Ignore automatic behaviors.
• Speak calmly and gently return child to his seat if able.
• Do not force a child to do anything because they may act out and could hurt themselves or others.
• Keep the child in the classroom to provide for safety.
• Reorient the child if confused after the seizure.

When to Call 911
• If there is no past history of seizures
• If the seizure lasts more than five minutes, unless the student’s typical seizure is longer as noted in the seizure action plan
• If consciousness does not return after seizure has stopped
• As designated by student’s healthcare provider
• If the child turns blue or vomits
• If seizures occur in clusters (back-to-back seizures)
• If pregnant or has diabetes
• If seizure is a different type than is noted in the seizure action plan.
Educational Considerations

• Develop IHP/504/IEP and emergency plans (seizure action plan).
• Communicate with parents about seizures.
• Monitor breathing during and after seizure.
• Provide proper and timely administration of medications.
• Provide in-service education for staff.
• Anticipate need for recovery time after a seizure, provide place to rest.
• Plan for academic make-up work during school absences.
• Observe for consistent triggers as identified by parent or physician.
• May need modified PE schedule/activities, although most students can participate without restrictions.
• Encourage acceptance of diversity and individual differences in the classroom.

Provide education for classmates with parent and student permission, so that they understand and can support their friend.

Key points you may want to cover:
– Explain what happened to the child and what the condition is called.
– It is not contagious.
– Medication can help control seizures.
– What they can do during and after a seizure to help their classmate.

Resources
American Epilepsy Society
aesnet.org

Education of Kids with Epilepsy
epilepsy.com/info/family_kids_education

Epilepsy Foundation of America
epilepsyfoundation.org

Epilepsy Foundation of Georgia
epilepsyga.org

Epilepsy Foundation – Spanish language Web site
fundacionparalaepilepsia.org

Kids Health (type “seizures” in search box)
Kidshealth.com

Merck (type “seizures” in search box)
merck.com
Neurosciences Program – Children’s Healthcare of Atlanta
choa.org/neurosciences

Vagus Nerve Stimulation (VNS Therapy)
neurologychannel.com/vagus

**Camp Information**

Camp Carpe Diem
choa.org/campcarpediem

The following resources are included in this section:
1. Seizure Parent Questionnaire
2. Seizure Action Plan
3. Seizure Observation Record
QUESTIONNAIRE FOR PARENT OF A STUDENT WITH SEIZURES

Please complete all questions. This information is essential for the school nurse and school staff in determining your student’s special needs and providing a positive and supportive learning environment. If you have any questions about how to complete this form, please contact your child’s school nurse.

CONTACT INFORMATION:

Student’s Name: ___________________________ School Year: ___________________________ Date of Birth: ___________________________

School: ___________________________ Grade: ___________________________ Classroom: ___________________________

Parent/Guardian Name: ___________________________ Tel. (H): ___________________________ (W): ___________________________ (C): ___________________________

Other Emergency Contact: ___________________________ Tel. (H): ___________________________ (W): ___________________________ (C): ___________________________

Child’s Neurologist: ___________________________ Tel: ___________________________ Location: ___________________________

Child’s Primary Care Dr.: ___________________________ Tel: ___________________________ Location: ___________________________

Significant medical history or conditions: ____________________________________________________________

SEIZURE INFORMATION:

1. When was your child diagnosed with seizures or epilepsy? __________________________________________

2. Seizure type(s):

<table>
<thead>
<tr>
<th>Seizure Type</th>
<th>Length</th>
<th>Frequency</th>
<th>Description</th>
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</table>

3. What might trigger a seizure in your child? ______________________________________________________

4. Are there any warnings and/or behavior changes before the seizure occurs? YES NO

   If YES, please explain: ______________________________________________________________________

5. When was your child’s last seizure? ____________________________________________________________

6. Has there been any recent change in your child’s seizure patterns? YES NO

   If YES, please explain: ______________________________________________________________________

7. How does your child react after a seizure is over? ______________________________________________

8. How do other illnesses affect your child’s seizure control? ______________________________________

BASIC FIRST AID: Care and Comfort Measures

9. What basic first aid procedures should be taken when your child has a seizure in school? ______________________________________________________________________

Basic Seizure First Aid:

- Stay calm & track time
- Keep child safe
- Do not restrain
- Do not put anything in mouth
- Stay with child until fully conscious
- Record seizure in log

For tonic-clonic (grand mal) seizure:

- Protect head
- Keep airway open/watch breathing
- Turn child on side

10. Will your child need to leave the classroom after a seizure? YES NO

   If YES, What process would you recommend for returning your child to classroom: ______________________________________________________________________
SEIZURE EMERGENCIES

11. Please describe what constitutes an emergency for your child? (Answer may require consultation with treating physician and school nurse.)

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

12. Has child ever been hospitalized for continuous seizures? YES NO
If YES, please explain: _______________________________________________________

__________________________________________________________________________

SEIZURE MEDICATION AND TREATMENT INFORMATION

13. What medication(s) does your child take?

<table>
<thead>
<tr>
<th>Medication</th>
<th>Date Started</th>
<th>Dosage</th>
<th>Frequency and time of day taken</th>
<th>Possible side effects</th>
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</table>

14. What emergency/rescue medications needed medications are prescribed for your child?

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage</th>
<th>Administration Instructions (timing* &amp; method**)</th>
<th>What to do after administration:</th>
</tr>
</thead>
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* After 2nd or 3rd seizure, for cluster of seizure, etc. ** Orally, under tongue, rectally, etc.

15. What medication(s) will your child need to take during school hours?

__________________________________________________________________________

16. Should any of these medications be administered in a special way? YES NO
If YES, please explain: _______________________________________________________

__________________________________________________________________________

17. Should any particular reaction be watched for? YES NO
If YES, please explain: _______________________________________________________

__________________________________________________________________________

18. What should be done when your child misses a dose?

__________________________________________________________________________

19. Should the school have backup medication available to give your child for missed dose? YES NO

20. Do you wish to be called before backup medication is given for a missed dose? YES NO

__________________________________________________________________________

__________________________________________________________________________

21. Does your child have a Vagus Nerve Stimulator? YES NO
If YES, please describe instructions for appropriate magnet use:____________________

__________________________________________________________________________

SPECIAL CONSIDERATIONS & PRECAUTIONS

22. Check all that apply and describe any considerations or precautions that should be taken

☐ General health
☐ Physical functioning
☐ Learning:
☐ Behavior:
☐ Mood/coping:
☐ Other:

☐ Physical education (gym)/sports:
☐ Recess:
☐ Field trips:
☐ Bus transportation:

GENERAL COMMUNICATION ISSUES

23. What is the best way for us to communicate with you about your child’s seizure(s)?

__________________________________________________________________________

24. Can this information be shared with classroom teacher(s) and other appropriate school personnel? YES NO

Parent/Guardian Signature: __________________________ Date: ______ Dates Updated: _______
SEIZURE ACTION PLAN

Effective Date

THIS STUDENT IS BEING TREATED FOR A SEIZURE DISORDER. THE INFORMATION BELOW SHOULD ASSIST YOU IF A SEIZURE OCCURS DURING SCHOOL HOURS.

Student’s Name: ___________________________ Date of Birth: __________
Parent/Guardian: ___________________________ Phone: __________ Cell: __________
Treating Physician: ___________________________ Phone: __________
Significant medical history: _______________________________________________

SEIZURE INFORMATION:

<table>
<thead>
<tr>
<th>Seizure Type</th>
<th>Length</th>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seizure triggers or warning signs:

Student’s reaction to seizure: ____________________________________________

BASIC FIRST AID: CARE & COMFORT:

(Please describe basic first aid procedures)

Does student need to leave the classroom after a seizure? YES NO
If YES, describe process for returning student to classroom

EMERGENCY RESPONSE:

A “seizure emergency” for this student is defined as:

Seizure Emergency Protocol: (Check all that apply and clarify below)
☐ Contact school nurse at ___________________________
☐ Call 911 for transport to ___________________________
☐ Notify parent or emergency contact
☐ Notify doctor
☐ Administer emergency medications as indicated below
☐ Other ___________________________________________________________________

TREATMENT PROTOCOL DURING SCHOOL HOURS: (include daily and emergency medications)

<table>
<thead>
<tr>
<th>Daily Medication</th>
<th>Dosage &amp; Time of Day Given</th>
<th>Common Side Effects &amp; Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Emergency/Rescue Medication

Does student have a Vagus Nerve Stimulator (VNS)? YES NO
If YES, Describe magnet use

SPECIAL CONSIDERATIONS & SAFETY PRECAUTIONS: (regarding school activities, sports, trips, etc.)

Physician Signature: ___________________________ Date: __________
Parent Signature: _______________________________ Date: __________
# Seizure Observation Record

<table>
<thead>
<tr>
<th>Student Name:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date &amp; Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizure Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Seizure Observation (Briefly list behaviors, triggering events, activities)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conscious (yes/no/altered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injuries (briefly describe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle Tone/Body Movements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rigid/clenching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fell down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wandering around</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole body jerking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremity Movements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(R) arm jerking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(L) arm jerking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(R) leg jerking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(L) leg jerking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random Movement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blush</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pupils dilated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turned (R or L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolled up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staring or blinking (clarify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salivating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chewing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lip smacking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Sounds (gagging, talking, throat clearing, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breathing (normal, labored, stopped, noisy, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incontinent (urine or feces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Seizure Observation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confused</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleepy/tired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech slurring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length to Orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents Notified? (time of call)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMS Called? (call time &amp; arrival time)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observer’s Name</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please put additional notes on back as necessary.*
Sickle Cell Disease

Sickle cell disease is a group of inherited red cell disorders. Normal red blood cells are round like doughnuts, and they move through small blood vessels in the body to deliver oxygen. Sickle red blood cells become hard, sticky and crescent or sickle-shaped. When these hard and sticky sickle-shaped cells pass through the blood vessels, they clog the flow and break apart. This process results in pain, organ damage, low blood count or anemia, and many other problems. Sickle cell disorders occur in all racial and ethnic groups, but are most common in people of African, Mediterranean, Indian and Middle Eastern heritage. In the United States, these disorders are commonly observed in African Americans and Hispanics from the Caribbean, Central America and parts of South America.

In sickle cell disease, hemoglobin (the substance that carries oxygen and gives blood its red color) is abnormal and polymerizes, causing cells to assume a crescent or sickle shape. There are three common types of sickle cell disease in the U.S.—Hemoglobin SS or sickle cell anemia, Hemoglobin SC disease and Hemoglobin S-Beta thalassemia. All 50 States screen all newborns for sickle cell disease. The confirmatory test for the disease is a simple blood test called the hemoglobin electrophoresis.

Complications from sickle cell disease include:

- Episodes of severe, sometimes excruciating pain that can occur in any part of the body
- Acute chest syndrome (like pneumonia)
- Stroke
- Anemia and fatigue
- Delayed growth and pubertal development
- Decreased resistance to bacterial infections (due to abnormal splenic functional)
- Bone damage (avascular necrosis of femur or humerus)
- Eye damage (retinopathy)
- Kidney damage and proteinuria
- Gallstones
- Priapism, a painful and sustained erection of the penis, that lasts for hours or days
- Neurocognitive defects, secondary to “silent strokes”
- Depression, secondary to recurrent pain and other symptoms

* The severity of SCD is highly variable among individuals. Some patients have more frequent and severe complications than others. It is important to appreciate that some children with SCD also have asthma which, if poorly controlled, can increase the risk of SCD complications

Signs and symptoms requiring emergency treatment include:

- Fever 101° or greater, regardless of whether other signs of illness are present
- Severe pain not relieved by rest and oral pain medications
- Neurological – signs including severe headache, weakness on one side, facial asymmetry, difficulty swallowing, slurred speech or seizure
- Extreme pallor and fatigue due to an acute worsening of anemia from splenic or liver sequestration—when blood becomes blocked and pools in these organs, or aplastic crises in the bone marrow
- Significant respiratory symptoms such as severe cough, difficulty breathing, chest pain with or without fever
**Sickle Cell Pain Crises**

Acute episodes of severe pain can be precipitated by cold temperatures, decreased oxygen saturation (due to sleep apnea, asthma), acidosis, dehydration, physical or emotional stress, infection, pregnancy and menses.

The most common symptoms of sickle cell crises and other conditions requiring medical attention are:

- Sudden onset of acute, severe abdominal pain
- Sudden, acute, severe onset of joint or bone pain
- Fever (do not give acetaminophen/ibuprofen for fever but give for pain)
- Unusual headache
- Chest pain, breathing difficulty
- Abdominal swelling
- Sudden weakness or loss of feeling
- Sudden vision changes
- Priapism.

**Treatment**

Treatment of symptoms as soon they occur is crucial. Pain management should be aggressive and given quickly. Lortab (or other opioid) and Motrin® may be alternated as often as every three hours, and stronger pain medications, including opioids, are often needed and prescribed. Infections are treated aggressively with antibiotics after blood cultures are obtained. Packed Red Blood Cell (pRBC) transfusions are often necessary to treat different complications from the disease. Newer treatments include hydroxyurea, which increases fetal hemoglobin and decreases symptoms and complications in some patients. Bone marrow transplants are available for patients who meet the criteria and are the only cure for sickle cell disease.

**Management at School**

Adequate fluids are essential to help prevent sickling of the red cells. Students should be allowed and encouraged to carry water bottles at all times and drink plenty of fluids. Patients with sickle cell disease do not concentrate their urine normally, and frequent bathroom breaks are necessary. Anemia can cause extreme fatigue, and students’ schedules may have to be adjusted. These students have difficulty fighting certain infections, so report school outbreaks to parents. Students may also be on prophylactic antibiotics. Many students with SCD can participate in PE, but should avoid overexertion or becoming chilled or overheated. Information about the student’s treatment, medications and any activity limitations should be provided and updated annually by the child’s physician. All students with SCD should have a 504 plan that is shared with teachers, staff, bus drivers and other appropriate personnel. Some may require an IEP.

Report crisis-like symptoms to the school nurse and parents. If any of these symptoms occur, have the child lie down or make him comfortable, and notify a parent or guardian immediately. Know your student, his capabilities and limits. Believe what he or she tells you about pain. Use a pain scale (Wong-Baker FACES Pain Rating Scale, Chapter 2). Parents are an excellent source of knowledge about their children, and should be consulted whenever questions arise about the plan or treatment. Also remember that not all pain is associated with sickle cell disease. These students can have fractures, appendicitis and other illnesses as well. Do NOT use ice with a suspected orthopedic injury because exposure to cold can precipitate pain. Students should always be encouraged to get plenty of rest and eat well.
Resources
Georgia Comprehensive Sickle Cell Center dwb.unl.edu/Teacher/NSF/C10/C10Links/
emory.edu/PEDS/SICKLE/serv01.htm

Medline Plus web site
.nlm.nih.gov/medlineplus/sicklecellanemia.html

Sickle Cell – current research (in search bar, type sickle cell)
clinicaltrials.gov

National Coordinating and Evaluation Center – Sickle Cell Disease and Newborn Screening Program
sicklecelldisease.net

Sickle Cell Disease Association of America
sicklecelldisease.org

Sickle Cell Foundation of Georgia
sicklecellga.org

Sickle Cell Kids
sicklecellkids.org

A Counseling Handbook for Sickle Cell and Other Hemoglobinopathies
vdh.virginia.gov/ofhs/childandfamily/childhealth/cshcn/sickleCell/publications.htm

What is Sickle Cell Disease? – National Institutes of Health
nhlbi.nih.gov/health/health-topics/topics/sca

Camp Information
Camp New Hope
sicklecellga.org
Skin Rash Resources

Acne
Acne Assassins
acenassasins.com

American Academy of Dermatology
aad.org/public/publications/pamphlets/common_acne.html

MedicineNet.com
medicinenet.com/acne/article.htm

Childhood Skin Rashes/Problems
Cutaneous Conditions in Febrile Patients
fpnotebook.com/mobile/id/derm/ctnsndtnsinfbrlptnts.htm

Dermatology Image Atlas
dermatlas.net/atlas/index.cfm

Family Doctor.Org – Seborrheic dermatitis
familydoctor.org/familydoctor/en/diseases-conditions/seborrheic-dermatitis.html

Index of photos and Illustrations
dermatologyinfo.net/english/chapters/index_of_pics.htm

Mayo Clinic – Slideshow: Common Skin Rashes
mayoclinic.com/health/skin-rash/SN00016

Medline Plus: Rashes
nlm.nih.gov/medlineplus/rashes.html

Rashes in Children: Types, Causes, Diagnosis and Treatment
emedicinehealth.com/skin_rashes_in_children/article_em.htm

Skin Condition Finder
skinsight.com/skinConditionFinder.htm

Skin Rashes - LoveToKnow Skincare
skincare.lovetoknow.com/Skin_Rashes
Skin Rashes and Other Changes: algorithm chart on different rashes
familydoctor.org/online/famdocen/home/tools/symptom/545.html

Slideshow: Childhood Skin Problems on eMedicineHealth.com
emedicinehealth.com/script/main/art.asp?articlekey=90497

Dermatitis

**Atopic Dermatitis**
A.D.A.M. Multimedia Encyclopedia – Atopic Dermatitis
pennstatehershey.adam.com/content.aspx?productId=117&pid=1&gid=000853

Atopic Dermatitis – MedicineNet.com
medicinenet.com/atopic_dermatitis/article.htm

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
niams.nih.gov/Health_Info/Atopic_Dermatitis/default.asp

**Contact Dermatitis**
Contact Dermatitis – Emedicine Health
emedicinehealth.com/contact_dermatitis/article_em.htm

Contact Dermatitis – Mayo Clinic
mayoclinic.com/health/contact-dermatitis/DS00985

**Dyshidrotic Dermatitis**
Dyshidrosis – Mayo Clinic
mayoclinic.com/health/dyshidrosis/DS00804

Dyshidrosis – Skin Sight.com
skinsight.com/adult/dyshidroticDermatitis.htm

Mayo Clinic
mayoclinic.com/health/seborrheic-dermatitis/DS00984
Seborrheic Dermatitis
Seborrheic Dermatitis – American Academy of Dermatology
aad.org/public/publications/pamphlets/common_seb_dermatitis.html

Seborrhoeic dermatitis – Derm Net NZ
dermnetnz.org/dermatitis/seborrhoeic-dermatitis.html

Skinsight – Information for Adults
visualdxhealth.com/adult/seborrheicDermatitis.htm

Treatment of Seborrhoeic Dermatitis – American Academy of Family Physicians
aafp.org/afp/20000501/2703.html

Drug Eruption
Drug Eruption in Adults
skinsight.com/adult/drugEruption.htm

Drug Eruption in Pediatrics
skinsight.com/child/drugEruptionPediatric.htm

Erythema Multiforme
Erythema Multiforme – Dermatology Info Net
dermatologyinfo.net/english/chapters/chapter29.htm#221

Herpes
Genital Warts – CDC Treatment Guidelines 2010
cdc.gov/std/treatment/2010/genital-warts.htm

Genital Warts – WebMD slideshow
webmd.com/sexual-conditions/ss/slideshow-std-pictures-and-facts

Herpes Zoster
Viral Skin Infections – Herpes Zoster
dermatologyinfo.net/english/chapters/chapter11.htm#90

Hookworms
Hookworms – Life Tree
parasitecleanse.com/hookworms.htm
Molluscum
The Society for Pediatric Dermatology
pedsderm.net/site/assets/files/1028/6_spd_molluscum_web_final.pdf

MRSA
Methicillin-Resistant Staphylococcus aureus (MRSA) – Georgia Department of Public Health
health.state.ga.us/mrsa

MRSA Toolkit for Middle and High Schools – Georgia Department of Public Health
dph.georgia.gov/mrsa

Staph Infection Resources
staph-infection-resources.com/mrsa-pictures.html

Nevus Sebaceous
Nevus Sebaceous – Medscape Reference
emedicine.com/DERM/topic296.htm

Psoriasis
National Psoriasis Foundation
psoriasis.org/home

Psoriasis – Mayo Clinic
mayoclinic.com/health/psoriasis/DS00193/DSECTION=treatments-and-drugs

Psoriasis Net
skincarephysicians.com/psoriasisnet/whatis.html

Psoriasis Pictures
dermatology.about.com/od/dermphotos/ig/Psoriasis-Pictures

Treatment of Psoriasis: An Algorithm-Based Approach for Primary Care Physicians – American Academy of Family Physicians
aafp.org/afp/20000201/725.html
Lyme Disease
American Lyme Disease Association (Go to the bottom of the page for a great video on how to remove ticks.)
aldf.com

Dermatology Information System
dermis.net/dermisroot/en/home/index.htm

Sun Protection
American Academy of Dermatology
aad.org/media-resources/stats-and-facts/prevention-and-care/sunscreens/sunscreens

Skin Cancer – CDC
cdc.gov/cancer/skin

Sun Safety at Schools – What You Can Do
cdc.gov/cancer/skin/pdf/sunsafety_y0908.pdf

Topical Steroids
Topical Steroids – DermNet NZ
dermnetnz.org/treatments/topical-steroids.html

Viral Exanthem
Exanthems – DermNet NZ
dermnetnz.org/viral/exanthem.html

Wounds
Emergency Wound Care after a Natural Disaster
bt.cdc.gov/disasters\woundcare.asp

Wounds and Wound Care – Emedicinehealth
emedicinehealth.com\wound_care\article_em.htm

Wound Care Information Network
medicaledu.com
Resources
American Academy of Dermatology
aad.org
aad.org/skin-conditions/dermatology-a-to-z

DermNet
dermnet.com/menuCasePhotos.html

Eczema Guide-Eczema Image
eczemaguide.com/eczema_basics/images/eczema_2.html

Life-Threatening Skin Rashes
evermicinehealth.com/life-threatening_skin_rashes/article_em.htm

National Eczema Association
nationaleczema.org

Rash, Rashes, and the Art of Skin Diagnosis - Self-paced online dermatology course
skinsight.com/info/for_professionals/rash-rashes

Spina Bifida

Spina bifida is a congenital condition in which the vertebral bones fail to fuse, leaving the enclosed spinal cord unprotected. In the most severe form of spina bifida, myelomeningocele, a portion of the spinal cord protrudes through the vertebral bones. This occurs in about 1:1250 births. The effects of myelomeningocele include muscle weakness or paralysis below the level of the spine where the incomplete closure occurred, loss of sensation below that level, and loss of bowel and bladder control. In 70-90 percent of the children, fluid may build up and cause an accumulation of fluid in the brain called hydrocephalus. The hydrocephalus can be controlled by implanting a shunt in the ventricles of the brain to drain the fluid into the abdomen.

Treatment

Primary treatment of spina bifida is surgical, and is often started in the neonatal period (or even prenatally). Treatment can include the following procedures, which will have been done by the time the child starts school:

- repair of the skin defect in lower back
- shunt type procedures in the brain to prevent or arrest hydrocephalus (for those children who have a shunt; not all children with spina bifida have shunts)
- orthopedic procedures to the legs to enable the child to walk with braces and crutches at an appropriate time
- urological evaluation to determine the best method of bladder management.

Management at School

Most children with spina bifida can be mainstreamed into regular classes with adaptations made to accommodate their wheelchair, walkers or braces. Special scheduling may also be necessary to meet their toileting needs. To promote personal growth, families and teachers should encourage children, within the limits of safety and health, to be independent and to participate in activities with their classmates.

Children are usually on an intermittent catheterization schedule for bladder control. If bowel control is a problem, they may need diaper changes. The school must provide space and privacy to perform these procedures. The principal is responsible for designating personnel to assist the child or to perform these procedures if the child is unable to do so himself. School personnel should be aware of possible pressure sores from braces and wheelchairs, and observe the child for any signs of skin breakdown. The child should also be observed for signs of infection such as fever, loss of appetite or listlessness, and parents should be notified if an infection is suspected.

At times the shunt may malfunction (become clogged or break), indicating a need for replacement. Signs of shunt failure include:

- Headache
- Changes in vision
- Irritability
- Vomiting or loss of appetite
- Seizures
- Lethargy
- Deterioration in school performance
- Decrease in sensory or motor function
- Swelling along the shunt tract
- Increasing head size
- Personality changes.
Anyone observing any of these symptoms should report it to the school nurse and parents. Since students have a loss of sensation below the level of the lesion, they do not experience normal skin sensitivity to pain, touch or temperature. Because of this, they are at risk of injury from sources such as hot water, heaters, hot metal surfaces in the summer and prolonged exposure to cold in the winter. Students must also shift their weight at least every 20 minutes to prevent pressure sores. When they are involved in classwork, they may need to be reminded to do this by doing wheelchair push-ups. Areas of pressure from the braces or shoes also need to be monitored.

Many students with spina bifida are also latex allergic, from repeated exposures to surgeries, catheters, etc. In these children, serious reactions can occur when exposed to latex, and some do not even have to touch the latex. The reaction can occur just from being in the same room with a latex object and can be life-threatening. Obviously latex gloves cannot be used around these children. An article and list of latex-containing objects that may be found in schools is included on the next page. Some students with spina bifida also have learning disabilities that impact their success in school.

**Educational Considerations**

- Develop IHP/504/IEP, emergency plans as needed.
- Provide any needed accommodations in PE and/or school schedule.
- Provide for proper administration of all prescribed treatments and medications.
- Provide for privacy, support for intermittent catheterizations.
- Provide needed support during school absences.
- Ensure that bathroom facilities, water fountains, sinks, etc., are readily accessible.
- Practice emergency exit from school building.
- Provide extra time to get to class if needed.
- Arrange for in-service to other students and staff with parent/student permission.
- Assist with Bowel and Bladder Training Program and schedule.

**Resources**

Spina Bifida Association  
spinabifidaassociation.org

Spina Bifida Association of Georgia  
spinabifidaofgeorgia.org

**Camp Information**

Camp Krazy Legs  
choa.org/campkrazylegs

The following handouts are included at the end of this section for your reference:

1. Teachers Need to Know: The ABCs of Spina Bifida
2. List from the Spina Bifida Association - 2011
What Teachers Need to Know: The ABC’s of Spina Bifida

By Amy N. Romanczuk, RN, MSN

Although it’s one of the most common birth defects in America, spina bifida may be relatively unknown to many teachers, and even the school nurse may not know much about it. To ensure children with spina bifida do their best in school, educators must know how the student’s medical needs may affect his or her participation and goals. Important issues that school administrators, teachers and nurses need to be aware of include mobility, skin sensation, bladder/bowel management, neurologic concerns and social/interpersonal skills.

Getting Around

Teachers and other involved school personnel need to know and understand the child’s means of mobility in advance, so that they can prepare accordingly. Any problems or concerns should be immediately discussed. Teachers must appear on a child’s individualized education plan (IEP). Teachers, parents and students may need to do a bit of problem solving, after asking the following questions:

- Can he or she get in and out of the classroom and building easily?
- Are doorways to the classroom and other important areas (bathroom, lunchroom, etc.) wide enough to accommodate a wheelchair?
- Can he or she reach classroom materials easily and independently?

Emergency Procedures

Schools must establish safety procedures in the event of fire or emergency. Students must be able to get out quickly, easily and safely. The safety plan must identify exactly what help is required and who will provide it (including a backup responsible adult, just in case) so that the children can evacuate the building quickly and efficiently. The safety plan should be practiced so that it will run smoothly in an actual emergency.

Assistive Devices and Assistance

The use of assistive devices, such as braces, walkers or wheelchairs must appear on the IEP. Although it may seem silly, parents and teachers should review together how to lock a wheelchair, put braces on and take them off, and even which shoe goes on which foot. Teachers need to be told to allow students to get out of the wheelchair at certain times each day (to prevent pressure sores), as well as what assistance is necessary in transferring to and from the chair. Parents should discuss with the school what a child’s abilities are without braces or a wheelchair. Can he or she crawl or drag themselves along at all? Does he or she need help getting in and out of the chair, or are wheelchair transfers smooth and independent? How does the child manage if he or she falls? How does he or she get back up? The school needs to know a child’s baseline level of self-care so that progress can be encouraged and independence can be maintained.

Adaptive Physical Education

Children with spina bifida often lack opportunities to physically explore their environment. Their lifestyle may be much more sedentary, which makes their muscle development different from their classmates, and many have a propensity to obesity. PI 54 142 in the Individuals with Disabilities Education Act (IDEA) specifically notes that adaptive physical education (PE) should be included in the curriculum. This is not the same thing as physical therapy, and should take place with classmates under the supervision of a teacher or physical education personnel. Sometimes PE teachers tend to assign children with disabilities an inactive “easy” role, such as scorekeeper. Even if this ensures participation in the group activity, it does not qualify as adaptive PE. Teachers may need input from a physical therapist to help the child participate as fully as possible. Children with spina bifida should not be excluded from group sports and activities; they should be encouraged to participate and play to the best of their abilities. Creative solutions, such as designated runners in softball, can help a child with a disability be a true part of the team.

The teacher may notice changes in a child’s body position in terms of scoliosis, kyphosis or leg and foot position. Encourage the school to alert you if they notice a change, since it could warrant checking by a specialist.

Preventing Pressure Sores and Other Injuries

Children with spina bifida often lack sensation and have poor circulation, which can affect school attendance. If a serious pressure sore, wound or infection develops, a child may have to miss school. Wheelchair “push-ups” may need to be done to release pressure on the buttocks, sacrum and back, in order to avoid pressure sores. Time on a mat, out of the wheelchair and braces, also affords protection. Even time allotted for bowel and bladder management can be used to check the buttocks and perineal area, with the help of a small hand mirror to help visualization of areas difficult to see, for skin breakdown.

Innate skin (that lacks normal sensation of feeling) also requires a different approach to safety. A child with innate skin cannot feel pain or discomfort as warning signals. Children who burn themselves on a hot slide or fall off a swing set are still hurt, even though they don’t feel pain. Parents and teachers must teach safety a little differently, teaching the child to be alert to warning signals, such as redness or blanching of the skin, or how to test the temperature of metal with sensitive skin before touching it with innate skin. Swelling, warmth, redness of an area, misalignment, abrasion or fever may also indicate a fracture in an innate limb. This kind of safety information, along with how to check for pressure sores or perform wheelchair push-up pressure releases, definitely belongs on the IEP.

Managing Bowel/Bladder

Parents and older students should discuss hygiene with teachers, and it is a must on the IEP. This includes what a child can do for him or herself, normal patterns and short and long-term goals. For instance, if the long-term goal is self-catheterization, the short-term goals might include gathering supplies, removing and cleaning the catheter or changing soiled garments. If a child is on a bowel management program, it is essential to work with the family to maintain consistency in approach and adhere to toileting times.

Both regular and special education teachers, school nurses and aides should be familiar with catheterization. One person needs to assist a child if necessary and a back-up person should be formally identified for each child (the parents should be informed, too). Every effort must be made to promote privacy and modesty and limit the number of people who perform this sensitive job. In addition, as it is known that young people with disabilities are at higher risk for sexual abuse, for the safety of both your child and the school, people able to assist your child with personal hygiene needs should be clearly identified.

Although catheterization is not viewed as a special procedure that requires medical training, many schools will need written instructions from a physician.

Teachers and aides need to be briefed on signs and symptoms of urinary tract infections (UTIs), which can be life threatening. Symptoms of a UTI include fever, stomachache, back or flank pain, cloudy and/or foul smelling urine or blood in the urine. Again, skin care management is crucial. A child sitting in steel or urine will get skin breakdown more rapidly than one who is dry. If it is at all possible, a child should use the toilet before leaving school to ensure he arrives home dry—it can be a long bus ride home. Parents should try to keep the school up-to-date regarding any sores or areas of breakdown that require treatment (cleaning, application of moisture barrier, topical ointment, etc.).

Taking Medications and Latex Allergy

Schools also need a list of all medications a child is taking, including the name, doses that must be given at school, what the medication is for and potential side effects. Most schools require a doctor’s authorization to administer medication to a child. Parents can help both the schools and physicians by requesting this information at the end of the previous school year rather than just before school starts. If you haven’t already discussed latex allergy, this is a good opportunity to do so. Often clinic nurses are available to do training sessions on catheterization and latex allergy with the school.

Continued on page 8A...
ABC’s of Spina Bifida

...Continued from page 5A

Neurological Concerns

Most (but not all) children with spina bifida have hydrocephalus that has been corrected by placement of a shunt. Signs and symptoms of shunt malfunction or infection should be thoroughly discussed with the school. These include headache, vomiting, lethargy, swelling along the shunt, seizures, personality change, deterioration in school performance and a decrease in sensory or motor functions.

A teacher may often be the first to spot subtle differences in a child’s performance or behavior, but doesn’t have the information to determine if the problems relate to hydrocephalus. One parent recommends asking the school to report any concerns immediately, since in the past she had found some teachers were reluctant to report what they felt might be insignificant observations.

Visual problems also can affect how children do at school. Clumsiness or trouble climbing may be related to depth perception. Even handwriting can be affected by vision. A yearly visual screening is recommended, as well as careful consideration as to where the child sits in the classroom.

Not all children with spina bifida have seizures, but for those who do, the effect on classroom perception and performance can be devastating. Since not all seizures are ominous, they are often missed or misinterpreted. A child who can’t follow instructions, daydreams, won’t stay “on task,” doesn’t pay attention or just “doesn’t listen” may be having memory interruptions resulting from seizures.

Symptoms related to Chiari II may affect school performance. For instance, ease and skill with handwriting can be affected if there is head or arm involvement. This becomes particularly significant since much testing and schoolwork requires writing. Using a computer or calculator can help keep writing clear and may be faster than struggling to keep up while writing manually.

Developing Appropriate Social and Academic Skills

Families and health professionals who work with children with spina bifida are very aware of how different their early childhood experiences may be. These children have spent much more time in health care settings than other children. They have also missed opportunities that their classmates have grown up with. They lack a “shared history” with their classmates or may have never been exposed to some information that teachers expect to be common knowledge for a child their age.

Each child should be evaluated on an individual basis for learning abilities and aptitudes. Parents often comment that their child with spina bifida seems to have more difficulty solving problems or making decisions than their other children. The “cocktail party syndrome” (extraordinary verbal skills) so often referred to in the literature can actually set a child up for failure; although verbal skills and memory- ization ability are good, there can be a tendency to over-assess the child’s ability. A teacher may put the child at a level the child can’t handle. Assessment by the school psychologist will help in placement and should be done periodically.

Summary

The effects of spina bifida and how it affects students vary enormously, but it’s important that schools be aware of common medical and social issues and concerns. Parents should keep in mind that too much information all at once may initially be overwhelming. Remember, your family has had the years since birth to familiarize yourself with spina bifida. This may be a teacher’s first exposure to a child with a disability. Patience, consideration and reiteration go a long way toward building relationships that will make your child’s school experience a positive one. National organizations, such as SBAA, local services through SBAA chapters, children’s rehabilitative services and services offered by hospitals/clinics exist to help families and professionals seek information about spina bifida.

Provide teachers with resources to help them understand spina bifida. Give them copies of SBAA fact sheets to read. Learning in schools need not be limited to the children. An individual approach, built on understanding some of the common needs of students with spina bifida, will help make your child’s school experience a positive one. -

An In-Service Model for Non-verbal Learning Disabilities

...Continued from page 3A

keep up with the laws. Another tactic schools sometimes use is to suggest that parents must choose either intervention or inclusion. Actually, our students have a right to both.

It’s a lot of effort, keeping up with the laws, sometimes challenging the schools, but it really pays off. Research shows that interventions work. You can compensate for neuropsychological deficits. Students can learn to problem-solve, memorize and initiate appropriate behaviors more effectively. Tally’s accommodations include:

• modified assignments
• not having to copy problems
• keeping written requirements to a minimum
• monitoring organizational skills
• extra preparations for transition and changes
• social skills reinforcement
• opportunity to learn verbally
• supplemental aids and study guides
• oral testing
• extra time for tests
• limiting multiple-choice tests to three options rather than four

There are two publications that have helped us enormously. One is Splilabilities: A Young Person’s Guide to Spina Bifida. It offers helpful, practical advice for living with spina bifida, including skin care, bowel and bladder management and relationships. It is available through SBAA’s bookstore. Another helpful publication is My Choice, published by the Minnesota Governor’s Council on Developmental Disabilities. It addresses all aspects of independent living in a very usable workbook format. You may request a copy of the booklet by calling (877) 348-0505, e-mailing admin@sfstate.org or visiting their website at www.mndelc.org.

Where Will You Be June 23-25, 2003?

In San Antonio Helping Us Celebrate Our 30th Year at SBAA’s Annual Conference!

It seems like we just left Orlando, but it’s not too early to start thinking about next year’s conference. And it will be spectacular!

Not only will we be celebrating being together to learn and share, but this year we’ll be celebrating SBAA’s 30th Anniversary. We’re already planning some wonderful things to get us all in the mood for this very special occasion!

Remember, in Texas they always do things BIG!
Keeping Your Child Latex-Safe at School

By Elli Meeropol, RN, MS, PNP
Shriners Hospitals

Avoidance of natural latex rubber is now an accepted standard of care for people with spina bifida. In order to be effective, latex must be avoided in all spheres of life—in medical settings, at home, in school and in the community. Latex avoidance not only prevents allergic reactions in children who already have a clinical latex allergy; it also minimizes the risk of creating new sensitization in children at high risk for developing this allergy. In general, avoidance strategies in the school must balance two potentially contradictory needs: maximum inclusion of the child in school life and activities, and safety from potentially life-threatening exposure to latex. Designing an individual school latex-safety strategy for each child with spina bifida requires cooperation between the child and parents, the school nurse, teachers and administrators.

Identifying areas of potential latex exposure is crucial to designing a safe school for your child. This article reviews four important components of this cooperative effort: working with the school, surveying the environment for potential exposures, designing emergency protocols and promoting self-care behaviors in the child. For basic information about latex allergy—what it is, how it occurs, and how to prevent it—families are referred to the SBAA Spotlight “Latex (Natural Rubber) Allergy in Spina Bifida” available via the SBAA website at www.sbaa.org.

Working with the School

Discussion with school staff is the first step in creating a latex-safe school environment. Articles about latex allergy have been published in the specialty health care literature and in school health journals and many schools are knowledgeable about latex avoidance. If your child is entering a school that has not had prior experience with latex allergy, it is important for the family to keep in mind how unbelievable and overwhelming this information can be at first. It may help to:

1. Begin working with the school several months before your child enters. If possible, give school personnel time to understand and accept the new material.
2. Find an ally at the school, whether it is the school nurse, teacher, counselor or administrator. This person can help communicate both specific information about latex allergy prevention and a positive attitude about this new challenge to other school personnel.
3. Provide the school with a well-organized packet of written material about latex allergy. This packet could include:

   - the SBAA Spotlight on latex allergy
   - the most recent SBAA latex list
   - this SBAA Insights pullout
   - a letter from the child’s health care provider describing the allergy and the importance of avoidance, as this may increase school acceptance

If the school doesn’t already have resource materials that include information on latex allergy, such as Children and Youth Assisted by Medical Technology in Educational Settings (from Project School Care, Children’s Hospital, Boston), they may be interested in obtaining it. Latex allergy resources are also available on the web at www.sbaa.org, www.latealexergyresources.org/, latealexergylinks.tripod.com and www.exeppc.com/-alert/schoolprod.html.

Identifying Potential Exposures

Identifying areas of potential latex exposure is crucial to designing a safe school for your child. This second step, best performed in cooperation with school personnel, involves becoming a latex detective. Armed with the latex list and a recent review of likely areas of exposure, the detectives look for clues in high-risk areas and activities:

   - Classroom: Items like erasers and rubber bands, art supplies, science and lab equipment may contain latex. Many of these will cause no problem if they do not come in contact with your child.
   - Cafeteria: Food preparation with latex gloves can cause latex-powder contamination. In addition, it is important for school personnel to understand the possible cross-sensitization between latex and certain foods such as bananas, kiwi and avocado.
   - Gym and playground: Check for rubber mats and reconditioned tire flooring, balls and racquet handles.
   - Housekeeping supplies: Latex gloves are often used to protect hands during cleaning and their use in hallways, classrooms or bathrooms may leave allergic powder on surfaces or in the air. Vinyl gloves can easily be substituted.
   - Nurse’s office: Take a very close look. Even if a child has a separate supply of nitrile gloves and other first aid items, protein laden powder from latex gloves used with other children can easily contaminate surfaces and remain airborne long enough to trigger a respiratory reaction.

• Gloves: These require special attention because of the powder issue. Some schools will agree to use nitrile gloves for everything (including food preparation and housecleaning). Others may compromise by routinely using a low-protein, nonpowdered glove to eliminate the particles of latex in the air, and to reduce exposure for all children and staff. Nonlatex gloves, however, must still be used for children with latex allergy, and, in the author’s opinion, for all children with spina bifida due to their high-risk status.

• School buses: Floor mats may be latex, and airborne natural latex rubber from tires in areas of heavy traffic may be a potential exposure. First aid kits in school buses may be pre-packaged with latex gloves.

• Field trips can be particularly challenging. Safety checklists for trips should include emergency medications and specify that portable first-aid kits have nonlatex gloves, tape and bandages. Parents may want to volunteer to be a chaperone and pack a picnic lunch for parent and child if there are concerns about possible latex contamination of prepared food.

• Birthday parties in school are also potential problems. Talk to the school about what decorations are allowed at school celebrations. Common issues arise with balloons and with cross-reactive foods such as bananas.

The social and emotional aspects of being part of the group—or of being different—may be magnified by a unusual condition like latex allergy.

Designing a latex-safe school environment can seem like an overwhelming task, and parents may experience some resentment from school personnel. It sometimes helps to point out to school staff that children with spina bifida are not the only children at risk for latex allergy. Over the past few years increased rates of latex allergy have been reported in children with asthma, with other allergies (eczema, food allergies), with cerebral palsy and with ventriculoperitoneal shunts, as well as in children who have had multiple or early surgeries. So the school is likely to have other children at risk for latex allergy.

Developing Emergency Protocols

The third step in developing a latex-safe school is developing emergency protocols. These protocols should include specific plans.

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Latex-Safe

...Continued from page 34

for recognizing and treating a reaction in each child, when to call for help and facilitating ambulance and emergency-room preparedness and latex-safety. These plans should be documented in the child’s individual education/health plan and a practice drill may help parents and staff feel more secure. The Children and Youth Assisted by Medical Technology in Educational Settings manual referenced earlier includes suggestions for developing emergency plans. Easily accessible latex-free first aid supplies are an important part of any emergency plan.

Promoting Self-Care and Independence

The fourth step is developing each child’s latex allergy knowledge, avoidance and self-advocacy skills. While the medical aspects of latex allergy prevention are an important part of the child’s individual health plan, the educational and advocacy skills should be written into the child’s Individualized Education Program (IEP) to help him or her develop important skills and plan transition to adult responsibility.

Making school latex-safe for the child with spina bifida takes careful preparation, patience and more than a little creativity.

School is, of course, about more than books and classes. The social and emotional aspects of being part of the group—or of being different—may be magnified by an unusual condition like latex allergy. An example is balloons—balloons are almost synonymous with childhood fun and parties. This is true even though latex-sensitive children cannot attend dances or proms decorated with latex balloons, and several children die each year from choking on balloons. With thoughtful planning, safer alternatives such as child-inflatable mylar balloons can provide the same fun and party atmosphere.

Making school latex-safe for the child with spina bifida takes careful preparation, patience and more than a little creativity. But the family and the school can work together to create a safe environment to maximize the child’s academic and social learning.*
This list provides a guide to some of the most common objects containing latex and offers some alternatives. It is not meant to be a comprehensive listing. **It is required by law that manufacturers must label any medical items that contain natural rubber latex.** ALWAYS CHECK THE PRODUCTS PACKAGING. If in doubt regarding the safety of an item, call the manufacturer.

<table>
<thead>
<tr>
<th>Frequently contains LATEX</th>
<th>LATEX-Safe Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesia: circuits, bags, oxygen masks</td>
<td>Neoprene (Anesthesia Associates, Ohmeda adult), some Vital Signs</td>
</tr>
<tr>
<td>Bandages</td>
<td>Active Strip (3M), CURAD Neon, Readi-Bandages, NHP, Coverlet, some Airstrip, Advanced Healing</td>
</tr>
<tr>
<td>Blood pressure cuff and tubing (J&amp;J)</td>
<td>Cleen Cuff (Vital Signs), nylon, some Trimline</td>
</tr>
<tr>
<td>Bulb syringe</td>
<td>Some Davol, Medline, RÜSCH, Premium, Baxter</td>
</tr>
<tr>
<td>Casts: Delta-Lite Podiatry, Orthoflex (J&amp;J)</td>
<td>Scotchcast soft, Delta-Lites, recent Conformable Caraglas Ultra (J&amp;J), liners (Gore)</td>
</tr>
<tr>
<td>Catheters: condom</td>
<td>Clear Advantage, ProSys NL, selected Coloplast, Rochester, PolyTech (Hollister)</td>
</tr>
<tr>
<td>Catheters: cardiac, vascular, pulmonary</td>
<td>Some World Medical, Am BioMed</td>
</tr>
<tr>
<td>Catheters: straight, coude, foley</td>
<td>Selected RobNel (Sherwood), Coloplast, Bard, RÜSCH, Hollister, AstraTech, or Rochester catheters</td>
</tr>
<tr>
<td>Catheters: feeding</td>
<td>Accumark feeding catheter (Sims Portex)</td>
</tr>
<tr>
<td>Dressings: Dyna-flex, butterfly closures (J&amp;J), Tensoplast (formerly Elastoplast), Action Wrap, Lyofoam (Acme), Spandage (Medi-tech), Telfa</td>
<td>Duoderm, Reston foam (3M), Opsite, Venigard, Comfeel, Sorbaview, Telfa (some) Xeroform, PinCare, Bicluosive, Montgomery strap (J&amp;I), Webril, Metalline, Selopor, Opraflex, Centurion brief, some Airstrips, Rainbow Net (Surgilast), VAC, Warm-up</td>
</tr>
<tr>
<td>Ear Plugs</td>
<td>Grainger (SF767)</td>
</tr>
<tr>
<td>Elastic wrap: ACE, Esmarch, Zimmer Dyna-flex, Dyna-flex, Elastikon (J&amp;J), Coban (3M)</td>
<td>E-Cotton, CEB elastic (coNco), Champ (Carolon), Adban Adhesive, X-Mark (Avcor), Co-Flex (Tetra), PowerFlex (Andover), Comprim (Jobst), Esmark (DeRoyal, NHP), 3M™ Coban™ LF Latex Free Self-Adherent Wrap, “CoFlex-AFD” and “Co-Flex NL” by Andover Healthcare</td>
</tr>
<tr>
<td>Electrode bulbs, pads, grounding</td>
<td>Some Baxter, Dantec EMG, Conmed, ValleyLab, Vermont Med, Staodyn, Neotrode</td>
</tr>
<tr>
<td>Endotracheal tubes, airways</td>
<td>Selected Berman, Mallinckrodt, Polamedco, Portex, RÜSCH, Sheridin, Shiley</td>
</tr>
<tr>
<td>Enemas</td>
<td>BabyLax, Enemeez, Bowel Management Tube (MIC), Pharmaseal set, all Fleet Ready-to-Use, cone irrigation set (Convatec), silicone retention cuff tip (Lafayette), Coloplast Cone Tip enema set</td>
</tr>
<tr>
<td>G-tubes, buttons</td>
<td>Silicone (Bard, Flexifo, MIC, RÜSCH, Stomate)</td>
</tr>
<tr>
<td>Gloves: sterile, clean, surgical, orthodontic</td>
<td>Allergard (J&amp;I), dermaprene (Ansell), N-DEX (Best), Safeskin Nitrile, Neolon, SensiCare, Tru-touch (Maximm), Nitrex, Tactyl 1,2 (SmartPractice), Duraprene, (Allegiances Healthcare), Elastyn (Hermal, Center Labs), Boston Medical, Masel, NeoTech, Biogel Skin Sense (Regent Medical)</td>
</tr>
<tr>
<td>Incentive deep breathing exerciser</td>
<td>Voldyne 5000 (Sherwood David &amp; Geck), Triflo II</td>
</tr>
<tr>
<td>IV access: injection ports, Y-sites, bags, pumps, buretrol ports, PRN adapters, needleless systems</td>
<td>Polymer injection caps, burettes and Safisite (Braun), Abbot Systems, Walrus, Gemini (IMED), selected Baxter (InterLink), Statlock, Ready Med, ComMed, Clave, Alaris, Hudson, selected Sims, IV boards (Avcor), Terumo Pumps: Mach II, ADS 100, Clic-Open (vial top remover–Sepha Pharm)</td>
</tr>
</tbody>
</table>

**NOTE:** latex in package only: Steri-strip wound closure system, Tegasorb, Active Strips (3M), Nu-Derm (J&I), CURAD
<table>
<thead>
<tr>
<th>Frequently contains LATEX</th>
<th>LATEX-Safe Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR/Infection Control masks, hats, shoe covers</td>
<td>Some by Kimberly Clark, TECNOL, OR and sterile packs (CML, DeRoyal) twill ties</td>
</tr>
<tr>
<td>Ostomy supplies</td>
<td>Check with individual companies regarding latex content of products</td>
</tr>
<tr>
<td>Miscellaneous items</td>
<td>Soft-Grip fabric clamp covers (Scanlan), Precision Dynamics ID bracelets</td>
</tr>
<tr>
<td>Penrose drains</td>
<td>Jackson-Pratt, Zimmer Hemovac</td>
</tr>
<tr>
<td>Pulse oximeters, thermometer probes</td>
<td>Nonin oximeters, selected Nellcor sensors, Diatec probe covers</td>
</tr>
<tr>
<td>Reflex hammers</td>
<td>Cover with plastic bag, Pedipals</td>
</tr>
<tr>
<td>Respirators</td>
<td>Advantage (MSA), HEPA-Tech (Uvex), PFR 95 (Tecnol), 3M 1860</td>
</tr>
<tr>
<td>Resuscitators, manual</td>
<td>Certain Ambu, Armstrong, Laerdal, Puriton Bennett, Vital Blue, Respironics, RÜSCH</td>
</tr>
<tr>
<td>Skin Adhesives</td>
<td>Mastisol (Ferndale)</td>
</tr>
<tr>
<td>Spacer (for metered dose inhalers)</td>
<td>ACE spacer (Center Labs), OptiHaler (HealthScan)</td>
</tr>
<tr>
<td>Stethoscope tubing</td>
<td>PVC (some Littman) cover with ScopeCoat or latex-free stockinette (Albahealth)</td>
</tr>
<tr>
<td>Suction tubing</td>
<td>PVC (Davol, Laerdal, Mallinckrodt, Superior, Yankauer) Medline, Ballard</td>
</tr>
<tr>
<td>Syringes, disposable</td>
<td>Terumo Medical, Abbott PCA Abboject, Norm-Ject (Air-Tite), EpiPen, selected BD syringes, AdvantaJet (Activa)</td>
</tr>
<tr>
<td>Tapes: pink, Waterproof (3M), Zonas, Moleskin cloth</td>
<td>Dermicel (J&amp;J), Durapore, Microfoam, Micropore, Transpore (3M) Cath-Strip Molepad, Hytape Pink, STATtape</td>
</tr>
<tr>
<td>Waterproof (J&amp;J), adhesive felt (Acme)</td>
<td>(Genetic Labs), Ice Tape (P.O.Pak), All-Felt (Universal Foot Care), Hypafix</td>
</tr>
<tr>
<td>Tonopen disposable covers (glaucoma tester)</td>
<td>None</td>
</tr>
<tr>
<td>Tourniquets</td>
<td>Children’s Medical, Grafco, VelcroPedic, X-Tourn straps (Avcor), FreeBand (Kent)</td>
</tr>
<tr>
<td>Theraband (also strip, tube), other OT supplies</td>
<td>REP Bands and Cords (OPTP), Exercise putty (Rolyan), new Thera-Band Exercisers</td>
</tr>
<tr>
<td>Tubing, sheeting</td>
<td>Plastic tubing—Tygon LR-40 (Norton), elastic thread, sheets (JPS Elastomerics)</td>
</tr>
<tr>
<td>Vascular/Compression stockings</td>
<td>Compriform Custom (Jobst), Latex Free TEDs, some varieties of Sigvaris</td>
</tr>
</tbody>
</table>
This list provides a guide to some of the most common objects containing latex and offers some alternatives. It is not meant to be a comprehensive listing. Manufacturers are not required to label home and community products which contain natural rubber. **ALWAYS CHECK THE PRODUCTS PACKAGING.** If in doubt regarding the safety of an item, call the manufacturer.

<table>
<thead>
<tr>
<th>Frequently contains LATEX</th>
<th>LATEX-Safe Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>School/Office/Art supplies: paints, glue, erasers, fabric paints, grips for writing utensils, duct tape</td>
<td>Elmers (School Glue, Glue-All, GluColors, Carpenter's Wood Glue, Sno-Drift paste) FaberCastel erasers, Crayola (except stamps, erasers), Liquitex paints, DickBlick tempera, acrylic paints and soap erasers, Play-Doh, Pro-Craft, Clic Eraser, Pentel erasers, pens, and pencils, 3M Post-it Notes, Staedtler Mars Plastic Eraser, masking tape, STATtape, Dixon/ Ticonderoga Company (Erasers, Wooden Pencils and Art Supplies)</td>
</tr>
<tr>
<td>Balloons</td>
<td>Mylar balloons, Mister Balloon, plastic ballons</td>
</tr>
<tr>
<td>Balls: Koosh balls, tennis balls, bowling balls, ball pits</td>
<td>PVC (Hedstrom Sports Ball), Nerf Foam Balls, Gertie Balls, Googlie Imperial Toys, AMF Bowling balls</td>
</tr>
<tr>
<td>Carpet backing, gym floor, gym mats</td>
<td>Broadloom carpets contain no NRL. For other products, provide barrier cloth or mat.</td>
</tr>
<tr>
<td>Chewing gum</td>
<td>Bubblicious, Trident (Warner-Lambert), Wrigley gums (check new products), Bazooka gum, Bubble Yum, Ice Breakers gum</td>
</tr>
<tr>
<td>Clothes: liquid appliques on tee-shirts, elastic on socks, underwear, sneakers, sandals</td>
<td>Cloth-covered elastic, neoprene (Decent Exposures, NOLATEX Industries), Buster Brown elastic-free socks (Vermont Country Store)</td>
</tr>
<tr>
<td>Condoms, contraceptive sponges, diaphragm</td>
<td>Polyurethane (Avanti), female condom (Reality), Widesense Silicone Diaphragms (Milex), Trojan Supra Condom, FemCaps</td>
</tr>
<tr>
<td>Costumes: masks, face paint, nail polish, etc.</td>
<td>Check all products</td>
</tr>
<tr>
<td>CPR manikins and medical training aids</td>
<td>Most Laerdal products</td>
</tr>
<tr>
<td>Crutches: tips, axillary pads, hand grips</td>
<td>Cover with cloth or tape</td>
</tr>
<tr>
<td>Dental dams, cups, bands, root canal material, orthodontic rubber bands</td>
<td>PUR0/M27 intraoral elastics (Midwest Orthodontic), wire springs, sealant (Delton) dams (Meer Dental, Hygenic Corp), John O Butler, Earloop masks (Richmond)</td>
</tr>
<tr>
<td>Diapers, incontinence pads, rubber pants</td>
<td>Huggies, First Quality, Gold Seal, Tranquility, Always, Attends, Drypers Diapers (not training pants), Confidence (Paper-Pak), Pampers, Luvs, Seventh Generation Diapers</td>
</tr>
<tr>
<td>Feeding nipples</td>
<td>Silicone, vinyl (selected Gerber, Evenflo, MAM, Ross, Mead Johnson)</td>
</tr>
<tr>
<td>Food handled with latex gloves</td>
<td>Synthetic gloves for food handling</td>
</tr>
<tr>
<td>Handles on racquets, tools, bicycles</td>
<td>Vinyl, leather handles or cover with cloth or tape</td>
</tr>
<tr>
<td>Kitchen cleaning gloves</td>
<td>PVC MYPLEX (Magla), cotton liners (Allerderm)</td>
</tr>
<tr>
<td>Mattress / pressure relief</td>
<td>Check each one for latex content</td>
</tr>
<tr>
<td>Miscellaneous items</td>
<td>Some medical stickers by MediBadge, UAL, Cushie Tushie Potty Seat, Bumbo Seat, Water Pik shower head and hose</td>
</tr>
<tr>
<td>Newsprint, ads, coupons, lottery scratch tickets</td>
<td>None</td>
</tr>
<tr>
<td>Pacifiers</td>
<td>Soothies (Children's Med Ventures), selected Binky, Gerber, Infa, Kip, MAM</td>
</tr>
<tr>
<td>Paints, sealants, stains, etc.</td>
<td>There is NO NATURAL RUBBER in latex paint, though it may be present in some waterproof paints and sealants</td>
</tr>
<tr>
<td>Playpits, playground surfaces</td>
<td>Natural rubber latex may be a component of surfaces, Boundless Playgrounds</td>
</tr>
<tr>
<td>Rubber bands, bungee cords</td>
<td>Plasti bands</td>
</tr>
<tr>
<td>Toothbrushes / infant massager</td>
<td>Soft bristle brush or cloth, Gerber/NUK, all Oral B products</td>
</tr>
<tr>
<td>Toys: Stretch Armstrong, old Barbies</td>
<td>Jurassic Park figures (Kenner), 1993 Barbie, Disney dolls (Mattel), many toys by Fisher Price, Little Tikes, Playschool, Discovery, Trolls (Norfin), Silly-putty</td>
</tr>
</tbody>
</table>
Frequently contains LATEX | LATEX-Safe Alternatives
--- | ---
Water toys and equipment: beach thongs, masks, bathing suits, caps, scuba gear, goggles | PVC, plastic, nylon, Suits Me Swimwear
Wheelchair cushions | Jay, ROHO cushions, Sof Care bed/chair cushions (Gaymar)
Wheelchair tires | Recommend using leather gloves
Zippered plastic storage bags | Waxed paper, plain plastic bags, Ziploc bags, Glad Press N’ Seal

**Associated Allergies**
Foods include: banana, avocado, chestnut, kiwi, pear. Plants include: Poinsettia and milk weed pods.

**About These Lists**
These lists are offered by the Latex Committee of the Nursing and Healthcare Professionals Council of the Spina Bifida Association as a guideline to individuals, families, and professionals. It is updated annually.

The information contained in these lists is constantly changing as manufacturers improve their products and as we learn more about latex allergy.

**PLEASE NOTE:** The latex content of products may vary between companies and product series. Companies that offer “alternatives” may ALSO make many LATEX products. We recommend that you check with suppliers before exposing individuals with latex allergies to the product.

**REMEMBER:** Always check the label—even if the product is on this list. If a product has recently replaced latex, many institutions will continue to use the old stock before they replace it with the new.

**For More Information**
For the most current version of this list, visit the SBA Web site at www.spinabifidaassociation.org.

**Online Resources**
- Spina Bifida Association
  www.spinabifidaassociation.org
- American Latex Allergy Association/ALERT
  www.latexallergyresources.org
  - Type I Versus Type IV Allergic Reactions: How do they Differ?
    www.latexallergyresources.org/Newsletter/newsletterArticle.cfm?NewsletterID=16
- Centers for Disease Control and Prevention—latex in vaccine packaging
- Decent Exposures
  (latex free undergarments)
  1-800-524-4949
  www.decentexposures.com
- OSHA
  www.osha.gov/SLTC/latexallergy
- American College of Allergy, Asthma & Immunology
  www.acaai.org
- Center for Disease Control Latex in Vaccine Packaging
IDEA and Section 504

Professional school nurses can be included as related service providers under the Individuals with Disabilities Education Act (IDEA). Including the professional school nurse on the multidisciplinary IEP or Student Support team will help ensure that the specialized health services and adaptations needed for eligible children with disabilities to participate fully in their educational program are safely and appropriately provided (adapted from the National Association of School Nurses-Issue Brief: School Nurses and the Individuals with Disabilities Act). The nurse’s role with advocacy, planning and provision of needed services for children eligible under the Rehabilitation Act of 1973, Section 504 (www2.ed.gov/about/offices/list/ocr/504faq.html) is also important.

The IDEA was enacted in 1975, and amended in 1986, 1990, 1997 and 2004 (idea.ed.gov/explore/home%20). It guarantees that eligible children with disabilities have the right to receive a free appropriate public education in the least restrictive setting possible. IDEA provides federal funding to school districts to support special education and related services.

IDEA provides for special education services for those students who meet the criteria for eligibility in at least one of 13 areas of disability:

- Hearing impairments
- Vision impairments
- Speech and language impairments
- Intellectual disabilities
- Specific learning disabilities
- Orthopedic impairments
- Serious emotional disturbance
- Traumatic brain injury
- Autism
- Significant developmental delay
- Multiple disabilities
- Deaf-blindness
- Other health impairments.

If the child meets the criteria listed under one or more of these categories, his disabling condition adversely affects educational performance, and he requires special education, the child may be eligible to receive services under this law. An Individualized Education Plan (IEP) will then be written after a meeting of a multidisciplinary team of regular and special educators, parents, other service providers (such as the school nurse, PT, OT, speech therapists) and, sometimes, the child. Educational goals and short-term, measurable objectives are developed with the participation of the parents and reviewed annually. Children eligible under IDEA will also be covered legally under Section 504.

Section 504 of the Rehabilitation Act was enacted as a civil rights act, to eliminate barriers to full participation by persons with disabilities. There is no federal funding attached to these requirements and services. Another difference between the two laws is the definition of disability. Section 504 covers a disability (permanent or temporary) that substantially limits one or more major life activity: caring for oneself, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning or working. For the school-age child, a limitation of learning related to the disability can usually qualify him under Section 504. Students who can be protected under Section 504 (and not necessarily IDEA) may include students with:

- Communicable diseases (i.e. hepatitis, AIDS)
- Temporary disabilities arising from an accident or medical treatment
- Allergies or asthma
- Diabetes
• Environmental illnesses
• ADD and ADHD
• Cosmetic disfiguration
• Anatomical loss
• Neurological problems, such as seizures
• Cancer
• Dyslexia
• Special medical procedures such as catheterizations, injections, and administration of some medications.

Under Section 504, schools are required to identify students, but evaluation is less structured. A 504 accommodation plan can be written to meet the needs of the identified student as they relate to his educational experience. A parent or school professional may refer a student for services and planning under Section 504. The evaluation is determined by the type of disability present and must accurately assess the extent of the disability and the recommended services.

The 504 plan should include all modifications and services required to ensure a student's right to free and appropriate education. The plan may include:

• Environmental strategies – changing student seating; adapting non-academic times such as lunch, recess and PE; altering location of personal or classroom supplies for easier access or to minimize distractions; rescheduling of classes to one floor of the building; more frequent water and bathroom breaks.
• Organizational strategies – modeling organizational systems like color-coding, adaptation of time expectations for assignments, checking a student's recording of homework assignments, providing a second set of texts—one for home and one for class.
• Behavioral strategies – behavioral/academic contracts, logical consequences, parent conferences, daily or weekly progress reports.
• Presentation strategies – allow students to tape lessons, use computer-aided instruction, and/or school provides alternative textbooks and workbooks, teacher simplifies and repeats instructions about assignments.
• Evaluation strategies – provide for oral testing, segment testing, practice testing, blood-glucose monitoring prior to tests.

The National Association of School Nurses (nasn.org) has defined the role of the school nurse, as a member of the multidisciplinary educational team to include the following responsibilities:

• Assists in identifying children who may need special educational or health-related services.
• Assesses the child's sensory and physical health status in collaboration with the child, parent/guardian and healthcare providers.
• Develops individualized health and emergency care plans.
• Assists in development of the IEP or 504 plan.
• Assists the parents and child to identify and utilize community resources.
• Assists the parent and teachers to identify and remove health-related barriers to learning.
• Provides in-service training for teachers and staff regarding the individual health needs of the child.
• Provides and/or supervises assistive personnel to provide specialized healthcare services in the school setting.
• Evaluates the effectiveness of the health-related components of the IEP with the child, parents and other team members, and suggests revisions to the plan as needed.

(Adapted from the NASN Issue Brief on School Nurses and the Individuals with Disabilities Education Act, 1996, nasn.org/PolicyAdvocacy/PositionPapersandReports/NASNPositionStatementsFullView/tabid/462/smid/824/ArticleID/491/Default.aspx).
The school nurse’s involvement in this process will vary with each child and his or her health needs as they relate to the educational success of the child. This chapter of this manual includes some educational considerations for the chronic conditions included. A sample 504 plan is included here as well, although your school system may already have a form to use.

**Americans with Disability Act (A.D.A) Amendment of 2008**

S. 3406 was signed by President George W. Bush on September 25, 2008 and took effect on January 1, 2009, which clarifies and broadens the definition of disability and expands the population eligible for protections under the Americans with Disabilities Act of 1990. It includes major changes to when impairment is considered a disability. To view the bill, go to [govtrack.us/congress/billtext.xpd?bill=s110-3406](http://govtrack.us/congress/billtext.xpd?bill=s110-3406).

New changes: major life activities include, but are not limited to, caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, lifting, bending, speaking, breathing, learning, reading, concentrating, thinking, communicating and working.

**Resources**

Bravekids
[bravekids.org](http://bravekids.org)


Protecting Students with Disabilities - U.S. Department of Education-Office of Civil Rights (OCR)
ed.gov/about/offices/list/ocr/504faq.html

Sevier County School System Section 504 Plans - Examples of Program Accommodations and Adjustments
[heartlandaea.org/](http://heartlandaea.org/)

Special Education Information for Teachers

The following resources are included in this section:
1. Individual Health Care Plan Form
2. Section 504 Plan Form
3. Medical Report Form for Schools
Individual Health Care Plan

Student: ___________________________ Date of Birth: _______________________

Date: ______________________________

Health Information to Teacher:

________________________________ has a health condition which you as his teacher need to be aware of. The description of this problem, as well as emergency care and individual considerations, are listed below:

Medical Diagnosis/Condition: ______________________________________________________

________________________________

________________________________

________________________________

Actions: ________________________________________________________________

________________________________

________________________________

________________________________

Individual Considerations/Accommodations Needed: _________________________________

________________________________

________________________________

________________________________

________________________________

________________________________

Parent Signature ____________________________________________________________ Date ____________

Physician or School Nurse Signature ____________________________________________ Date ____________
Section 504 Plan

Student’s Name: __________________________  DOB: ______ Date developed/reviewed: __________________________

School: __________________________  Grade: ______ School year: __________________________

Multidisciplinary team: ____________________________________________ _______________________________

_______________________________________________________________ _______________________________

Type of referral:  Initial __________  Reevaluation __________  Modification __________

Disability(s) identified (i.e. medical condition, communicable disease, physical or learning disability—temporary or permanent): __________________________________________

Life Activity(s) substantially limited/ Educational impact: __________________________________________

Necessary academic accommodations: __________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

Necessary non-academic accommodations: ________________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

_______________________________________________________________________________________________

Location of accommodations: ( ) Regular class ( ) Other __________________________

Reevaluation date: ________________ or earlier, if deemed appropriate.

Committee signatures  Title  Date  Committee signatures  Title  Date

________________________  ______  ______  ________________________  _____  ________

________________________  ______  ________  ________________________  _____  ________

________________________  ______  ________  ________________________  _____  ________

________________________  ______  ________  ________________________  _____  ________

I have participated ____ or was invited to participate ___ in the development of this plan and have received a copy of the Section 504 Parental Rights form.

Parent/ Legal Guardian Signature __________________________  Date ________________

Reviewed 2012
Medical Report Form for Schools

This form may be attached to the district form.

The student named below is a patient at ____________________. This report provides important medical information for school personnel.

Check one:
Release of Medical information completed: ____/____/____
No release – Gave/Mailed directly to parent on _____/____/____

I. Identifying Information

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Grade:</th>
<th>Date of Birth:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent Name:</th>
<th>School System:</th>
<th>School Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence Street Address:</th>
<th>City, ST:</th>
<th>Zip:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Home Phone:</th>
<th>Work Phone:</th>
<th>Cell Phone:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. Medical Information

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Date of Onset</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mild moderate severe</td>
<td>acute, expected duration:____________</td>
</tr>
<tr>
<td></td>
<td>mild moderate severe</td>
<td>chronic</td>
</tr>
<tr>
<td></td>
<td>mild moderate severe</td>
<td>acute, expected duration:____________</td>
</tr>
<tr>
<td></td>
<td>mild moderate severe</td>
<td>chronic</td>
</tr>
<tr>
<td></td>
<td>mild moderate severe</td>
<td>acute, expected duration:____________</td>
</tr>
<tr>
<td></td>
<td>mild moderate severe</td>
<td>chronic</td>
</tr>
</tbody>
</table>

Reviewed 2012
Medical Report Form for Schools

This form may be attached to the district form.

III. Recent Surgeries

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Modifications required during recuperation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. Medications that MAY BE ADMINISTERED AT SCHOOL

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Dosage/Frequency</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V. Other medications with side effects that may affect school performance:

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VI. Medical condition may adversely affect the student in the following areas:

Attendance:
- extended absences
- intermittent absences
- inability to attend a full academic schedule
- other comments regarding attendance:

Alertness:
- normal
- heightened alertness to environmental stimuli
- decreased alertness
- other:

Attention:
- normal
- decreased ability to attend to tasks
- other:

Other areas adversely affected by medical condition, please explain:
- strength:
- vitality:
Medical Report Form for Schools

This form may be attached to the district form.

daily living activities:

academics:

communication abilities:

ability to sit/move/manipulate materials:

other:

Physical Function/Ambulation:

normal

other:

Physical Education:

may participate in regular P.E. without restriction

may participate in regular P.E. with the following modifications:

requires adaptive P.E. with the following modifications:

may not participate in P.E. until ___/____/____

VII. Medical needs during the school day (other than medication):

VIII. Symptoms that may indicate potential medical problems, and action required:

<table>
<thead>
<tr>
<th>Symptom(s)</th>
<th>Required Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reviewed 2012
### Medical Report Form for Schools

This form may be attached to the district form.

<table>
<thead>
<tr>
<th>Physician Signature:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physician Name:</th>
<th>GA License #:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physician Address:</th>
<th>M.D. Phone:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hospital Social Worker Contact:**

<table>
<thead>
<tr>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Note:** School nurses may receive a medical report such as this from Children’s Healthcare of Atlanta as a communication tool used between medical staff (including hospital school teachers) and the child’s school system. This form has been helpful in communications during the planning of the IEP.