Diabetes in School-aged Children

Presented by
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- The presenter has no conflicts of interest.

Objectives

- The learner will identify the types of diabetes and symptoms of hypo and hyperglycemia
- The learner will better understand the treatment goals for students with diabetes
- The learner will better understand his or her role in helping students implement a school plan

Diabetes is one of the most common diseases of school-aged children. (American Diabetes Association, 2013)

215,000 under age 20 are affected

1 in 400 school-aged children have diabetes*

American Diabetes Association

What Is Diabetes?

Definition

- Diabetes mellitus is a chronic condition in which the pancreas no longer produces enough insulin or cells stop responding to the insulin that is produced
- Cells of body are then unable to absorb glucose in the blood
- Resulting in elevated blood glucose (BG) levels

Diabetes

- Diabetes mellitus can lead to complications such as renal failure, heart disease, stroke, nerve problems, and blindness—all related to high blood glucose levels

- Approximately 17 million Americans have diabetes

(American Diabetes Association)

Symptoms of High Blood Glucose Include:

- Frequent urination
- Lethargy
- Excessive thirst
- Hunger

Diabetes Types

Type 1

- Autoimmune disorder that destroys insulin-producing cells of pancreas
- “Insulin Dependent”—requires insulin
- Rapid onset

Type 2

- Inefficient usage of insulin
- “Insulin Resistant”
- Gradual onset
- Meal plan/exercise/orals/insulin-- may be needed to reduce blood glucose

Prediabetes

- Blood glucose levels higher than normal
- At risk for developing Type 2 diabetes
- Lifestyle change needed—weight loss, healthy food choices, regular exercise
- Waist size is #1 predictor of developing Type 2 diabetes

  women > 35”

  men > 40”

How is Diabetes Diagnosed?

Normal	Prediabetes	Diabetes Mellitus
Fasting < 100 mg/dl	FPG 100-125 mg/dl	FPG ≥ 126 mg/dl
2h PG < 140 mg/dl	2h PG 140-199 mg/dl	2h PG ≥ 200 mg/dl
A1c ≤ 5.6%	A1c 5.7-6.4%	Random PG ≥ 200mg with symptoms A1c ≥ 6.5%

Blood Sugar and A1c Goals per Age

AGE	Before Meals	Bedtime	A1c	Rationale
0-6 years	100-180	110-200	< 8.5%	• Vulnerable to hypoglycemia • Insulin Sensitivity • Unpredictability in dietary intake and physical activity
6-12 years (School-age)	90-180	100-180	<8%	Vulnerable to hypoglycemia
13-19 Teens	90-130	90-150	<7.5%	Developmental and Psychological issues
				American Diabetes Association Clinical Practice Recommendation 2013

Blood Sugar and A1c Goals per Age

However:

Lower goals are reasonable if they can be achieved without excessive hypoglycemia- individualize!

American Diabetes Association
Clinical Practice Recommendation 2013

Treatment Goals for Children

- Goals should be individualized based on benefit-risk assessment
- BG goals should be higher in children with frequent hypoglycemia or hypoglycemia unawareness
- Normal height and weight
- Normal lipid panel
- Minimal hypoglycemia
- Normal pubertal development
- Age-appropriate knowledge and self-care skills

A1c level compared to estimated average blood glucose

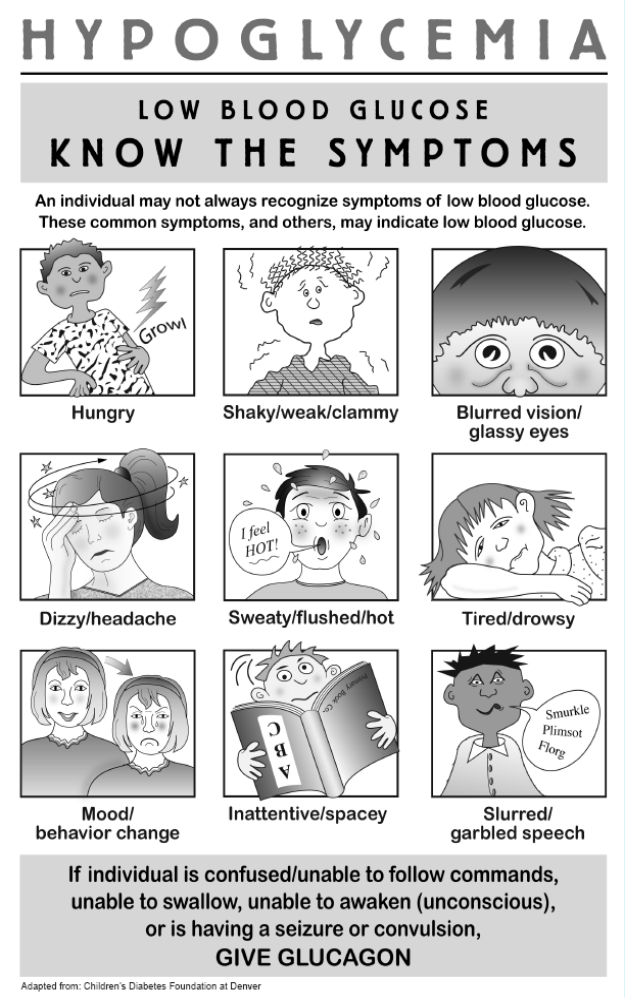
A1c	eAG
5%	97
6%	126
7%	154
8%	183
9%	212
10%	240
11%	269
12%	298

Blood Glucose Testing

- Routinely done prior to meals/snacks
- May be done before/after gym, recess, or any time
- Make sure student washes their hands before checking
- Dose adjustments are determined by blood glucose patterns and trends, or A1c levels
- Communicate with family/health care practitioners if you identify a problem pattern/trend

Signs & Symptoms of Hypoglycemia

- Cool, clammy, shaky
- Fast heartbeat
- Dizziness, weakness, fatigue
- Hunger
- Blurred vision, headache
- Change in personality, irritability
- Inability to concentrate



Hypoglycemia-LOW blood glucose (< 70 mg/dl)

"Rule of 15"

- ✓ Test blood sugar
- ✓ If low, give 15 gm. fast-acting carb (milk, juice, soda, glucose tabs or gel)
- ✓ Recheck BS in 15"
- ✓ If still < 70, retreat until BS > 70
- ✓ When > 70, give snack to prevent rebound hypoglycemia

Hypoglycemia-LOW blood glucose(< 70 mg/dl)

- ✓If BS 50-70 give 15 gm. of fast-acting sugar
- ✓If BS < 50 treat with 30 gm. fast-acting sugar
- ✓If student symptomatic and feels like they are having a low blood sugar, but their blood sugar is within normal limits, may still need to treat

When in doubt, treat for low sugar

Hypoglycemia-LOW blood glucose (< 70 mg/dl)

For severe hypoglycemia—child not able to eat or drink, being uncooperative, unresponsive

--give Glucagon and position on side

--call 911

--call student's parent/guardian

--stay with student until emergency medical services arrive

Signs & Symptoms of Hyperglycemia

- Thirst, dry mouth
- Increased urination
- Tiredness, fatigue
- Lack of concentration
- Blurred vision

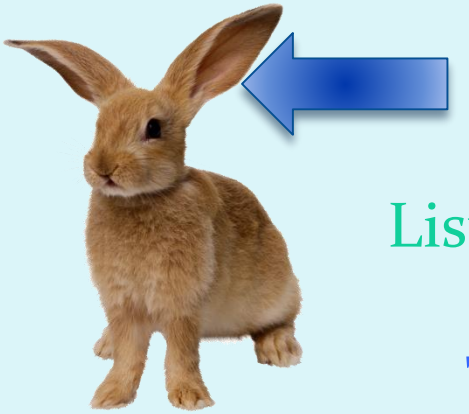
Hyperglycemia-HIGH blood sugar (in excess of 250)

- Check blood sugar
- Check urine for ketones, if ordered
- Give water
- Treat student according to their individual health plan—may need to have supplemental insulin given to bring down blood sugar
- Almost all children may experience daily spikes of high blood sugar

Potential causes of hypoglycemia or hyperglycemia

- Too much/too little insulin
- Missing or delaying meals/snacks
- Not eating enough or too much food/carbohydrates
- Getting extra, intense, or unplanned physical activity
- Sickness, stress, pain----(multiple homes)
- Timing of food and meals
- Menstrual cycle—may be higher the week before due to increase levels of hormones
- Multiple homes

Exercise



Beginning exercise

Listen to Your Body--what do I hear?

Target Heart Rate (bullseye).....

WORKOUT (vs. in)

Warm up & Cool Down

S t r e t c h i n g....

Building Your Exercise Program....

Continuous Glucose Monitoring (CGM)

- A device that records BS levels throughout the day
- Works through a glucose sensor placed just under the skin
- Measures interstitial glucose levels
- Glucose reading every 1 or 5”
- Worn for 3 or 7 days, or may be part of the insulin pump
- CGM can be programed to set off an alarm when BG levels are too low or too high
- Sensor BG levels should be confirmed with BG meter
- Can be used to “fine tune” diabetes management by helping identify problems, trends, patterns

Adherence-challenged student

- Depression/anxiety
- ADD/ADHD
- School avoidance
- Sense of invincibility
- Desire to be carefree like peers
- Lack of knowledge/family support
- Cost/insurance constraints

Administering Insulin

Insulin is classified in four types by how it works:

-rapid-acting
-short-acting
-intermediate-acting
-long-acting

Insulin has three characteristics:

--**Onset** is the length of time before insulin begins to lower blood glucose levels
--**Peak** is time when insulin is working its hardest
--**Duration** is number of hours it continues to work

Insulin	Onset of action	Peak	Duration
Lispro (Humalog)	5- 15 minutes	1-2 hours	3-6 hours
Aspart (Novolog)	10-20 minutes	1-3 hours	3-6 hours
Glulisine (Apidra)	5- 15 minutes	1-2 hours	3-6 hours
Regular (Novolin R, Humulin R)	30 minutes	2-4 hours	3-8 hours
NPH (Novolin N, Humulin N)	1-2 hours	4-10 hours	10-18 hours
Glargine (Lantus)	1-2 hours	Usually no peak	Up to 24 hours
Detemir (Levemir)	1-3 hours	Usually no peak	Up to 24 hours

Promoting Good Nutrition

- Good nutrition is fundamental
- Encourage veggies, fruit, low-fat milk, low-fat protein, healthy fats
- There are NO forbidden foods--
- All foods in moderation
- Some kids have prescribed meal plans (such as 15 grams of carb for am snack, 60-75 gm. at lunch)
- Some kids have flexible carb intake based on appetite (carbs vary each day or meal)
- Use carb counting resources for accuracy
  - * Internet resources
  - * School food service has carb counting lists

Carbohydrate Counting

- Carbohydrates provide energy and have the biggest effect on BS
- Carb choices must be regulated to control BS
- Calculate the number of grams of carbohydrate, or carb choices the student eats
- One carb choice = 15 grams of carbohydrate
- Sources of carbs include:
  - * grains (bread, pasta, cereal, crackers, rice, tortillas)
  - * fruit/fruit juices
  - * "starchy vegetables" (potatoes, non-green/dried beans and squash, peas, corn)
  - * desserts/ candies
  - * milk, yogurt, sugar-sweetened beverages

What to Look for on a Food Label

*Serving size

*Total carbohydrate

*Ignore the grams of sugar!

Nutrition Facts

Serving Size 172 g

Amount Per Serving	
Calories 200	Calories from Fat 8
	% Daily Value*
Total Fat 1g	1%
Saturated Fat 0g	1%
Trans Fat	
Cholesterol 0mg	0%
Sodium 7mg	0%
Total Carbohydrate 36g	12%
Dietary Fiber 11g	45%
Sugars 6g	
Protein 13g	

Vitamin A	1%	• Vitamin C	1%
Calcium	4%	• Iron	24%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

NutritionData.com

(Sugar is included in the grams of total carbohydrates)

Nutrition Facts

Serving Size ¾ cup (55g)
Servings Per Container 5

Amount Per Serving

Calories 250 Calories from Fat 50

	% Daily Value*
Total Fat 6g	**9%**
Saturated Fat 0.5g	**3%**
Cholesterol <5mg	**<2%**
Sodium 200mg	**8%**
Total Carbohydrate 40g	**13%**
Dietary Fiber 4g	**16%**
Sugars 18g	
Protein 9g	**18%**

Vitamin A 25% • Vitamin C 50% • Calcium 30% • Iron 25%
*Percent Daily Values based on a 2,000 Calorie diet.

How Does a School Plan and Implement Effective Diabetes Management?

1. Assemble a school health team:
   the student with diabetes, the parents/ guardian, school nurse, and other health care personnel, the principal, the student's teacher(s) guidance counselor, and other school staff

2. Review the Federal laws:
   -section 504 of the Rehabilitation Act of 1973
   -Americans with Disabilities Act of 1990
   -Individuals with Disabilities Education Act (IDEA)
   -FERPA—Family & Educational Rights & Privacy Act

How Does a School Plan and Implement Effective Diabetes Management?

3. Prepare an education plan (as needed)
   -504 Plan
   -Other education plans
   -Individualized education program
   -Emergency Care Plans for Hypo/Hyper

4. Train appropriate school personnel

Information in the Diabetes Medical Management Plan/Health Plan may include:

- ✓ Date of diagnosis
- ✓ Current health status
- ✓ Emergency contact information
- ✓ Specific medical orders
- ✓ Assessment of student's self-care skills for performing diabetes care tasks
- ✓ List of diabetes equipment and supplies
- ✓ BG monitoring requirements

Information in the Diabetes Medical Management Plan/Health Plan may include:

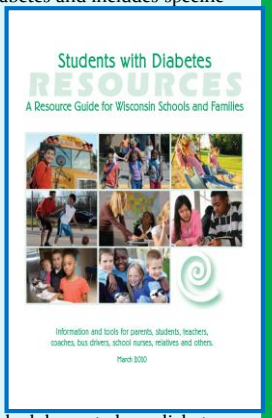
- ✓ Supplies needed and where they are kept
- ✓ Insulin, glucagon and other medications to be given at school
- ✓ Meal and snack plan
- ✓ Physical activity requirements
- ✓ Additional monitoring (e.g., for ketones)
- ✓ Typical signs, symptoms, and prescribed treatment for hypo/hyperglycemia

A Comprehensive Diabetes Resource for Wisconsin Schools, Families and Others

Wisconsin Diabetes Prevention and Control Program, Department of Health Services, Division of Public Health

objective and background

The updated 2010 *Students with Diabetes: A Resource Guide for Wisconsin Schools and Families* provides a comprehensive resource with current information for those who care for students with diabetes and includes specific tools and resources for parents or guardians, school nurses, school personnel, and others. The first publication of *Children with Diabetes: A Resource Guide for Wisconsin Schools and Families was* in 2002. An evaluation of the 2002 Guide provided information leading to improvements in this Guide.



Diabetes is one of the most common chronic diseases among children/adolescents in the United States. In Wisconsin, 6,000 children and adolescents have diabetes. Students with diabetes, especially when young, require assistance in monitoring and managing their diabetes, not only to possibly prevent complications and medical emergencies, but also to maintain normal growth and development.

It is important to have a basic understanding of diabetes and know how to help a student manage diabetes safely at school. Tasks required to take care of diabetes at times will require school personnel assistance to help keep the student safe. This document is not meant to teach the user how to manage diabetes, only to provide clarity and consistency regarding the care of students with diabetes during school and all school-sponsored activities.

comprehensive in scope

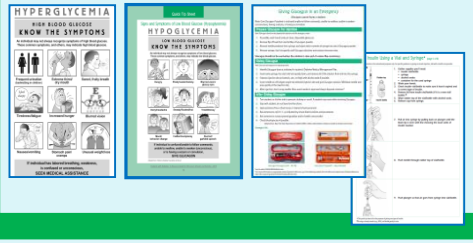
sections on:

- Quick Tip Sheets
- Diabetes Overview
- Type 1 Diabetes
- Type 2 Diabetes
- Diabetes Emergencies
- Nutrition for Students with Diabetes
- Physical Activity for Students with Diabetes
- Special Circumstances for Students with Diabetes
- Life at School
- Roles and Responsibilities of School Personnel
- Student Rights
- Forms
- Tools
- Prevention of/Screening for Type 2 Diabetes in Students
- Resources
- Question and Answers
- School Nurses

practical in planning care

Diabetes Medical Management Plan (DMMP)	Also referred to as	▪ Health care provider order ▪ Diabetes care plan
Section 504 Plan	Also referred to as	▪ 504 Accommodations Plan
Individualized Education Program (IEP)	Also referred to as	▪ Individualized Education Plan
Healthcare Plan	Also referred to as	▪ Individual Care Plan ▪ Individual Health Care Plan ▪ Nursing Health Care Plan ▪ other health care plan
Emergency Action Plan	Also referred to as	▪ Emergency Plan ▪ Quick Reference Emergency Plan

practical in providing care



To View the Student Guide Online

www.WisconsinDiabetesInfo.org

Wisconsin Diabetes Prevention and Control Program

Summary

- Diabetes should neither define nor limit kids
- Diabetes should not stop kids from participating in ANY school activity
- Keep kids in classroom as much as possible
- Each student must be treated with respect & confidentiality
- Must have adequate diabetes management plan that is updated as needed
- Family first
- Contact health care provider if additional assistance needed
- Collaboration, cooperation and communication are key elements in planning and implementing successful diabetes management at school!

Resources

- American Diabetes Association
  www.diabetes.org
- Center for Disease Control and Prevention
  http://www.cdc.gov/diabetes/
- Insulin Pump Users Website
  www.insulin-pumpers.org
- Juvenile Diabetes Research Foundation
  http://jdrf.org/
- National Diabetes Education Program
  www.ndep.nih.gov
- U.S. Department of Health & Human Services
  http://diabetes.niddk.nih.gov/
- WI Department of Health Services
  http://www.dhs.wisconsin.gov/diabetes/

Frequently asked questions:

- Can a Registered Nurse take orders from a parent regarding their diabetic child's care?

- Answer:
  - The RN cannot take an order from a parent that is not within the set of written guidelines from the prescribing health care provider. Certainly working with the parent and the prescriber to maximize the child's diabetic management is best. Effective communication between the provider, the parent, and the school nurse is important.
    - (WI Stat. ch. 441; N6, Nurse Practice Act)

Frequently asked questions:

- Does every diabetic child need to have a 504 Plan?

- Answer:
  - No, every diabetic student does not need a 504 Plan. Both diabetes management plans (Individualized Health Care Plan-IHCP) and 504 Plans are individualized, based on the needs of the student. In many cases it may be necessary to develop a 504 Plan to ensure that accommodations for the student are implemented and followed. Students with diabetes should be able to participate in afterschool activities and have access to any needed care.

Frequently asked questions:

- At what age can a child perform self-care at their locker or in the classroom?

- Answer:
  - There is no magic age at which a child can become self-sufficient in diabetes management. Each plan must be individualized—with the long-term goal being independent self-care. The RN should develop a plan that is based on the child's strengths and needs, with the family and health care provider's input. Some students may be ready to perform self-care at fourth grade, others at a later age. The safety of the student, the maturity of the student, and the desire of the family to have the child perform diabetic activities outside the health office, as well as the other students' safety, must all be considered.

Frequently asked questions:

- Can a Registered Nurse delegate diabetic care to others?

- Answer:
  - An RN may delegate diabetic care but should consider the following:
    - An assessment of the child's needed care should be done first by the RN
    - Is the child newly diagnosed?
    - Is the care needed basic or complex?
    - Who will be the school's authorized caregiver (Unlicensed assistive personnel—UAP)? Are they competent? Are they willing? Will they understand when to call the RN or the parent?
    - How frequently will monitoring and supervision of the person giving care be done?
    - Am I able to delegate if I'm not available for questions/monitoring?