Diabetes in the School Age Child

Presented by:
Lynne Wentz, RN, MHS, CDE
Diabetes Educator Holy Cross Hospital
Diabetes in Illinois

Illinois Diabetes Facts

9.5 percent of current population

CDC estimates 20 percent of population in 2025

Highest Incidence in the country Humboldt Park
Diabetes Statistics

• The prevalence of diabetes in the United States is 25.8 million children & adults. 8.3% of the population has diabetes
• Diagnosed diabetes affects 18.8 million
• Undiagnosed diabetes affects 7.0 million
• Pre-diabetes affects 79 million
• 1.9 million new cases of diabetes were diagnosed in people aged 20 and older in 2010
Diabetes Statistics continued

- 215,000 individuals under 20 years of age have diabetes. Approximately 1 in every 400 children and teens have diabetes.
- The incidence of diabetes is higher in non-Hispanic whites, Asian Americans, non-Hispanic Blacks and Hispanics.
Illinois Care of Students With Diabetes Act

• Care of Students with Diabetes Act became law in Illinois. This critical legislation, lets students who are able to do so self-manage their disease. It allows trained school personnel to volunteer to help children with diabetes, and prohibits segregation based on diabetes. It is designed to insure that:

– All children with diabetes are medically safe at school and
– All children with diabetes have the same educational opportunities as their classmates.
Why the Care Act?

 ✓ An individual with diabetes either cannot produce insulin or cannot properly use insulin
 ✓ Diabetes must be managed 24/7
 ✓ Serious life threatening short term and long term complications are associated with diabetes
 ✓ “Because appropriate and consistent diabetes care decreases the risks of serious short-term and long-term complications, increases a student’s learning opportunities, and promotes individual and public health benefits, the General Assembly deems it in the public interest to enact this act.”
School nurses may be the most appropriate. Illinois has one of the worst nurse-to-student ratio’s in the country and was ranked 40th by the National Association for School Nurses. There is only 1 nurse in Illinois for every 2,023 students. Most schools in Illinois do not have adequate school nurses on staff.
Compliance with Federal Law


Federal laws enforced consistently in schools provide students with diabetes equal educational opportunities and a healthy and safe environment”
Designated Care Aides

• “A school employee who has agreed to receive training in diabetes care and to assist students in implementing their diabetes care plan and has entered into an agreement with a parent or guardian and the school district or private school.”
Self-Management

- Fewer restrictions on self-care behaviors associated with better diabetes management
- Lack of flexibility in self-care correlates with poor diabetes maintenance and anxiety
- Care Act encourages students self-management and permits students to carry diabetes supplies
Emergencies

- Glucagon is a life-saving, easy to use, emergency medication.
- Waiting for 911 or a school nurse from another school could mean the difference between life and death.
- At least 33 states permit the administration of glucagon by non-nurse school employees.
• Two tiered training:
  – Delegated Care Aides
  – General training for teachers and other school employees
Liability

• “(a) A school or a school employee is not liable for civil or other damages as a result of conduct, other than willful or wanton misconduct, related to the care of a student with diabetes.

• (b) A school employee must not be subject to any disciplinary proceeding resulting from an action taken in compliance with this Act, unless the action constitutes willful or wanton misconduct, as long as the provisions of this Act are met.”
REMEMBER:

- The Care Act makes it easier for schools to comply with federal law.
- The Care Act is consistent with the laws of many states around the country.
- The Care Act does not increase the liability of schools.
- The medical community at large supports a strategy similar to that set forth in the Care Act.
- **The Care Act allows students to attend school without jeopardizing their health.**
Goal: Optimal Student Health and Learning

All school staff members should have basic knowledge of diabetes and know who to contact for help.
Type 1 Diabetes

ONSET: relatively quick

SYMPTOMS:
- increased urination
- tiredness
- weight loss
- increased thirst
- hunger
- dry skin
- blurred vision

CAUSE: uncertain, both genetic and environmental factors
Type 2 Diabetes

Insulin resistance – first step

Age at onset:

- Most common in adults
- Increasingly common in youth
  - overweight
  - inactivity
  - genes
  - ethnicity
Type 2 Diabetes

ONSET: variable timeframe for children

SYMPTOMS: tired, thirsty, hunger, increased urination
- some children show no symptoms at diagnosis
- others are symptomatic with very high blood glucose levels
Childhood & Adolescent Growth and Development Patterns

• Diabetes does not affect normal growth and development providing nutrition is routinely provided and sufficient for normal growth

• During growth spurts children may be more vulnerable to the development of diabetes

• The hormones of teens and pre-teens can make them more susceptible to developing diabetes
Gestational Diabetes

• This is diabetes during pregnancy and is generally diagnosed in the 24-26th week of pregnancy. This condition requires insulin for the safety of the mother and child.
• Individuals with gestational diabetes generally experience a disappearance of diabetes post delivery, but often find that later in life they will be diagnosed with Type 2 Diabetes
Acanthosis Nigricans
Symptom of Type 2 Diabetes

Possible Sign of Diabetes-Insulin Resistance or Prediabetes
Diabetes is Managed,
But it Does Not Go Away.

**GOAL:**
Maintain target blood glucose
Diabetes Management
Constant Juggling - 24/7

Insulin/medication

with:

Physical activity

and

Food intake
Diabetes Management

Routine Care:

- Many students will be able to handle all or almost all routine diabetes care by themselves
- Some students will need school staff to perform or assist with routine diabetes care

Emergency Care:

- ALL students with diabetes will need help in the event of an emergency situation
Care in the Schools:
School Nurses and Others

A School nurse is most appropriate to:

- Coordinate diabetes care
- Supervise diabetes care
- Provide direct care (when available)
- Communicate about health concerns to parent/guardian and health care team

However, a school nurse is not always available.

Non-medical school staff can be trained to assist students:

- For both routine and emergency care
- Including insulin and glucagon administration
Diabetes Medical Management Plan (504 or DMMP)

- Basis for all school-based diabetes care plans
- Developed by student’s personal health care team and parent/guardian
- Signed by a member of student’s personal health care team
- Individualized

- Implemented collaboratively by the school diabetes team:
  - School nurse
  - Student
  - Parent/guardian
  - Other school personnel
Basic Meal Plans

**Key:** Balance insulin/medications with carb intake

- Most students have flexibility in WHAT to eat
  - *Basic Carbohydrate Counting*
  - *Advanced Carbohydrate Counting*

- Many students have flexibility in WHEN to eat
  - *More precise insulin delivery (pumps, pens)*
  - *Rapid-acting insulins (food insulin)*
  - *Time dosing of insulin according to DMMP (504)*
Basic Carbohydrate Counting

- Calories from:
  - carbohydrate
  - protein
  - fat

- Each nutrient type affects blood glucose differently
- Carbohydrate has the biggest effect on blood glucose
- TOTAL carbohydrate matters more than the source (sugar or starch)
Advanced Carbohydrate Counting

**USING THE INSULIN-TO-CARB RATIO**

**Basal Bolus Treatment**

The insulin-to-carb ratio:
- Varies from student to student
- Is determined by the student’s health care team
- Should be included in the DMMP
- Usually stated as a ratio of 1 unit of insulin to x grams carbohydrate
- May vary from meal to meal for a student
School Meals & Snacks

- Provide school menus and nutrition information to student/parent/guardian in advance.
- Provide sufficient time for eating.
- Monitor actual food intake per DMMP
  - young or newly diagnosed
  - picky eaters
- Respect, encourage independence.
Beyond the Routine: School Parties

- Provide parent/guardian with advance notice of parties/special events
- **Follow the student’s DMMP, 504 Plan or IEP**
- Some may prefer to bring their own foods, but may eat what is available.
- Provide nutritious party snacks or non-food treats for all
- Limit use of food as reward
Beyond the Routine: Field Trips

• Notify school nurse as soon as trip is scheduled to allow for consultation with parent/guardian about food and/or insulin adjustments

• Bring plenty of quick-acting sugar sources to treat hypoglycemia

• Bring lunch as appropriate

• Bring diabetes equipment and supplies, **including glucagon**, if specified in DMMP

• Bring list of emergency contacts, copy of emergency care plan
Activity & Blood Glucose Monitoring

Check before, during, and after physical activity per DMMP-504 plan:

• Especially when trying a new activity or sport

• If blood glucose starts to fall, student should stop and have a snack or quick-acting source of sugar

• Students with pumps may disconnect or adjust the basal rate downward temporarily, prior to physical activity
HYPOglycemia = LOW Glucose (sugar)

Onset:
- sudden, must be treated immediately
- may progress to unconsciousness if not treated
- can result in brain damage or death

DMMP should specify signs and action steps at each level of severity:
- mild
- moderate
- severe
Hypoglycemia: Risks & Complications

• Early recognition and intervention can prevent an emergency
• Greatest immediate danger
• Not always preventable
• Impairs cognitive and motor functioning
Hypoglycemia: Possible Causes

- Too much insulin
- Too little food or delayed meal or snack
- Extra/unanticipated physical activity
- Illness
- Medications
- Stress
- Ask your student, what symptoms are unique to them!
Hypoglycemia: Possible Signs & Symptoms

**Mild Symptoms**
- Hunger
- Shakiness
- Weakness
- Paleness
- Blurry vision
- Increase heart rate or palpitations
- Sleepiness
- Changed behavior
- Sweating
- Anxiety
- Dilated pupils

**Moderate to Severe Symptoms**
- Yawning
- Irritability/frustration
- Extreme tiredness/fatigue
- Inability to swallow
- Sudden crying
- Confusion
- Restlessness
- Dazed appearance
- Unconsciousness/coma
- Seizures
HYPOGLYCEMIA
(Low Blood Glucose)

Causes: Too little food or skip a meal; too much insulin or diabetes pills; more active than usual.

Onset: Often sudden; may pass out if untreated.

SYMPTOMS:

- Shaky
- Fast heartbeat
- Sweating
- Dizzy
- Anxious
- Hungry
- Blurry vision
- Weakness or fatigue
- Headache
- Irritable

WHAT CAN YOU DO?

Check your blood glucose, right away. If you can’t check, treat anyway.

Treat by eating 3 to 4 glucose tablets or 3 to 5 hard candies you can chew quickly (such as peppermints), or by drinking 4-ounces of fruit juice, or 1/2 can of regular soda pop.

Check your blood glucose again after 15 minutes. If it is still low, treat again. If symptoms don’t stop, call your healthcare provider.
Mild/Moderate Hypoglycemia: What to do

Intervene promptly; follow DMMP:

• Check blood glucose if meter is available.

• **If no meter is available, treat immediately, on the spot.**

• **NEVER** send a student with suspected low blood glucose anywhere alone

• When in doubt, always treat. If untreated may progress to more serious events.

• Consider “Rule of 15”
“Rule of 15”

General guidelines, follow DMMP for each student:

- Have student eat or drink fast acting carbs (15g)
- Check blood glucose 10-15 minutes after treatment
- Repeat treatment if blood glucose level remains low or if symptoms persist
- If symptoms continue, call parent/guardian per DMMP
Quick Acting Glucose for Mild/Moderate Hypoglycemia

Treatment for Lows: 15 g Carbohydrate

- 4 oz. fruit juice
- **15 g. glucose tablets (3-4 tablets)**
- 1 tube of glucose gel
- 4-6 small hard candies
- 1-2 tablespoons of honey
- 6 oz. regular (not diet) soda (about half a can)
- 3 tsp. table sugar
- One-half tube of cake mate
Severe Hypoglycemia Symptoms

- Convulsions (seizures)
- Loss of consciousness
- Inability to swallow
Hypoglycemia: Prevention

• Consult with parent/guardian or school nurse when snack, meal or physical activity times must be changed.

• Monitor blood glucose variations on gym days. An extra snack may be required ½ hour before gym or during prolonged vigorous physical activity per DMMP(504).

• A student should never be unattended when a low blood glucose is suspected. Maintain adult supervision.
HYPERglycemia = HIGH Glucose (Sugar)

Onset:
- Usually slow to develop to severe levels
- More rapid with pump failure/malfunction, illness, infection
- Can mimic flu-like symptoms
- Greatest danger: may lead to diabetic ketoacidosis (DKA) if not treated

DMMP (504) will specify signs and action steps at each level of severity:
- Mild
- Moderate
- Severe
Hyperglycemia: Possible Signs & Symptoms

- **Severe Symptoms**
  - Labored breathing
  - Confusion
  - Profound weakness
  - Unconscious

- **Moderate Symptoms**
  - Dry mouth
  - Vomiting
  - Stomach cramps
  - Nausea

- **Mild Symptoms**
  - Lack of concentration
  - Thirst
  - Frequent urination
  - Flushing of skin
  - Sweet, fruity breath
  - Blurred vision
  - Weight loss
  - Increased hunger
  - Stomach pains
  - Fatigue/sleepiness
HYPERGLYCEMIA
(High Blood Glucose)

Causes: Too much food, too little insulin or diabetes pills, illness, or stress.

Onset: Often starts slowly. May lead to a medical emergency if not treated.

SYMPTOMS:
- Extreme thirst
- Need to urinate often
- Dry skin
- Hungry
- Blurry vision
- Drowsy
- Slow-healing wounds

WHAT CAN YOU DO?
- Check blood glucose
- Call your healthcare provider

If your blood glucose levels are higher than your goal for 3 days and you don’t know why,

Concept developed by Rhoda Rogers, RN, BSN, CDE.
Novo Nordisk® Pharmaceuticals, Inc. grants permission to reproduce this piece for non-profit educational purposes only on condition that the piece is maintained in its original format and that the copyright notice is displayed. Novo Nordisk® Pharmaceuticals, Inc. reserves the right to revoke this permission at any time.

©2003 Novo Nordisk Pharmaceuticals, Inc.
Hyperglycemia: Risks & Complications

- Hyperglycemia, which if untreated can lead to DKA and potentially to coma and/or death (mainly in type 1)

- Interferes with a student’s ability to learn and participate

- Serious long-term complications develop when glucose levels remain above target range over time or are recurring
Hyperglycemia: What to do

Goal: lower the blood glucose to target range.

Action steps, following DMMP
- Verify with blood glucose check
- Check ketones
- Allow free use of bathroom and access to water
- Administer insulin
- Recheck blood glucose
- Call parent/guardian
- Note any patterns, communicate with school nurse and/or parent/guardian
Hyperglycemia: Possible Causes

- Late, missed or too little insulin
- Food intake exceeds insulin coverage
- Decreased physical activity
- Expired or improperly stored insulin
- Illness, injury
- Stress
- Other hormones or medications
- Hormone fluctuations, including menstrual periods
- Any combination of the above
Hyperglycemia: Prevention

- **Timing** is very important – stick to the schedules:
  - Meal time, insulin administration, physical activity

- **Accuracy** is very important
  - Insulin dose, monitoring the amount and type of food eaten

- **Changes** should only be made after consultation with the parent/guardian and/or school nurse
  - Snack, meal, or insulin or physical activity times or amounts
Information for Teachers

• Students with hyperglycemia or hypoglycemia often do not concentrate well

• Students should have adequate time for taking medication, checking blood glucose, and eating

• During academic testing, provide accommodations as per 504 plan
  – Check blood glucose before and during testing, per plan
  – Access to food/drink and restroom
  – If a serious high or low blood glucose episode occurs, students should be excused with an opportunity for retake
RESOURCES

• American Association of Diabetes Educators:  www.diabeteseducator.org
• American Diabetes Association: www.diabetes.org
• Academy of Nutrition and Dietetics: www.eatright.org
• Juvenile Diabetes Research Foundation: https://jdrf.org/
Discussion

Questions ?