

# Educating School staff about Diabetes

What you need to know for diabetic  
students to be safe and to thrive at  
school

# What is diabetes?

**Diabetes is a chronic disease in which blood glucose (sugar) levels are above normal.**

- People with diabetes have problems converting food to energy.
- After a meal, food is broken down into a sugar called glucose, which is carried by the blood to cells throughout the body.
- Insulin, a hormone made in the pancreas, allows glucose to enter the cells of the body where it is used for energy.

# What is Diabetes (continued)?

- People develop diabetes because the pancreas produces little or no insulin (Type 1) or because the cells in the muscles, liver, and fat do not use insulin properly (Type 2).
- As a result, the glucose builds up in the blood, is transported into the urine, and passes out of the body.
- Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose.

# Why do diabetics need insulin?

- When insulin is no longer made, it must be obtained from another source such as insulin injections or an insulin pump.
- When the body does not use insulin properly, people with diabetes may take insulin or other glucose-lowering medications.
- **Neither insulin nor other medications are cures for diabetes; they only help to control the disease.**

# What are the long term consequences of the disease?

- Diabetes is the sixth leading cause of death by disease in the United States.
- Over the years, ongoing high blood glucose, also called hyperglycemia, can lead to serious health problems.
- Long-term complications of diabetes include heart disease, stroke, blindness, kidney failure, nerve disease, gum disease, and amputation of the foot or leg.
- Although there is no cure, diabetes can be managed and complications can be delayed or prevented.

# Why should school personnel be concerned?

- **Diabetes must be managed 24 hours a day, 7 days a week.**
- For students with type 1 diabetes, and for some with type 2 diabetes, that means careful monitoring of their blood glucose levels throughout the school day and administering multiple doses of insulin by injection or with an insulin pump to control their blood glucose and minimize complications.

# Effective diabetes management is crucial:

- For the immediate safety of students with diabetes.
- For the long-term health of students with diabetes.
- To ensure that students with diabetes are ready to learn and participate fully in school activities.
- To minimize the possibility that diabetes-related emergencies will disrupt classroom activities.

# What Is Effective Diabetes Management at School?

- Maintaining optimal blood glucose control.
- Assisting the student with performing diabetes care tasks.
- Designating trained diabetes personnel.



# Maintaining Optimal Blood Glucose Control

- The goal of effective diabetes management is to control blood glucose levels by keeping them within a target range determined by the student's personal diabetes health care team.
- Optimal blood glucose control helps to promote normal growth and development and to prevent the immediate dangers of glucose levels that are too high or too low.
- Maintaining blood glucose levels within the target range also can help prevent or delay the long-term complications of diabetes.
- The key to maintaining optimal blood glucose control is to balance carefully food intake, physical activity, insulin, and/or medication.

# What affects the blood sugar level?

- As a general rule, food makes blood glucose levels go up.
- Physical activity, insulin, and diabetes medications make blood glucose levels go down.
- Several other factors, such as growth and puberty, physical and emotional stress, illness, or injury, also can affect blood glucose levels.
- With all of these factors coming into play, maintaining optimal blood glucose control is a constant juggling act, 24 hours a day, 7 days a week.

# How do we know what the blood sugar is?

- Students with diabetes should check their blood glucose levels throughout the day using a blood glucose meter and/or a sensor if prescribed.
- The meter gives a reading of the level of glucose in the blood at the time it is being monitored.
- Some students with an insulin pump may have a continuous monitor on their pump which can indicate an approximate blood sugar level and show trends up or down.
- When blood glucose levels are too low (hypoglycemia) or too high (hyperglycemia), students need to take corrective actions.
- **Low blood glucose levels (hypoglycemia), which can be life-threatening, present the greatest immediate danger to people with diabetes.**

# What will diabetic students need from the school?

- Where and when blood glucose monitoring and treatment will take place.
- Identity of trained diabetes personnel, the staff members who are trained to perform diabetes care tasks such as monitoring blood glucose, administering insulin and glucagon, and treating hypoglycemia and hyperglycemia.
- Location of the student's diabetes management supplies.
- Need for free access to the restroom and water.
- Nutritional needs, including provisions for meals and snacks.
- Full participation in all school-sponsored activities and field trips, with coverage provided by trained diabetes personnel or a parent.
- Alternative times and arrangements for academic exams if the student is experiencing hypoglycemia or hyperglycemia.
- Permission for absences without penalty for health care appointments and prolonged illness.
- Maintenance of confidentiality and the student's right to privacy.

# What Are the Elements of Effective Diabetes Management in School?

- Checking glucose levels
- Planning for disposal of sharps and materials that come in contact with blood
- Recognizing and treating hypoglycemia (low blood glucose)
- Recognizing and treating hyperglycemia (high blood glucose)
- Administering insulin
- Planning for disasters and emergencies
- Following an individualized meal plan
- Getting regular physical activity
- Maintaining a healthy weight
- Planning for special events, field trips, and extracurricular activities
- Dealing with emotional and social issues

# Checking Glucose Levels

- One of the most important diabetes management tasks is regular checking (or monitoring) of blood glucose levels, which is done with a blood glucose meter.
- Some students use a meter in combination with a continuous glucose monitor.



# Blood Glucose Meter

- A blood glucose meter is a small portable machine used to check blood glucose levels.
- After pricking the skin with a lancet (a small needle inserted in a spring-loaded device), one places a drop of blood on a test strip that is inserted in the machine.
- The meter then gives the blood glucose level as a number on the meter's digital display.
- The skin may be pricked at the fingertip (called a finger prick).
- Before using the blood glucose meter, wash and dry hands and the test site.

# Continuous Glucose Monitor

- Some students use a continuous glucose monitor (CGM), a device that records blood glucose levels throughout the day.
- The CGM works through a sensor inserted under the skin that measures interstitial glucose (the glucose found in the fluid between cells) levels at regular intervals and sends the current glucose level wirelessly to a monitor.
- The monitor may be part of the insulin pump or a separate device that is carried or worn by the student in a pocket, a backpack, or a purse.
- The CGM sets off an alarm when glucose levels are too high or too low.
- **Treatment decisions and diabetes care plan adjustments should not be based solely on CGM results.**
- The sensor blood glucose levels should be confirmed with a blood glucose meter.



# Checking Glucose During the School Day

- Blood glucose levels may need to be checked before and after eating snacks and meals, before physical activity, or when there are symptoms of hypoglycemia or hyperglycemia.
- In some children, symptoms may be subtle; blood glucose should be checked whenever symptoms are suspected.
- Many students can check their own blood glucose level. Other students need supervision. Still others need to have this task performed by a school nurse or trained diabetes personnel.
- **All students, even those who can independently perform blood glucose monitoring, may need assistance when experiencing low blood glucose.**

# Checking Glucose During the School Day (continued)

- Students must be able to check their blood glucose levels and respond to levels that are too high or too low as quickly as possible.
- If recommended by the student's personal diabetes health care team, **it is medically preferable to permit students to check blood glucose levels and respond to the results in the classroom, at every campus location, or at any school activity.**
- When in doubt, taking immediate action is important to prevent symptoms of severe hypoglycemia such as coma or seizures and to prevent the student from missing class time.

# Advantages of Checking Blood Glucose Levels Any Time and Any Place

- The student can confirm a low blood glucose level immediately. As a result, the student is less likely to develop seizures or a coma.
- The student is safer when he or she does not have to go to a designated place and does not have to delay treatment for low or high blood glucose levels.
- The student spends less time out of class.
- The student gains independence in diabetes management when the blood glucose meter is easily accessible and monitoring can be conducted as needed.
- The student can achieve better blood glucose control to prevent onset of severe symptoms of high and low blood glucose levels and decrease the risk of long-term complications of diabetes.
- When the student can check at any time and in any place, blood glucose monitoring is handled as a normal part of the school day.

# Recognizing and Treating Hypoglycemia (Low Blood Glucose)

- Hypoglycemia, also called “low blood glucose” or “low blood sugar,” is a serious condition associated with diabetes that can happen very suddenly and requires immediate treatment.
- Hypoglycemia can impair a student’s cognitive abilities and adversely affect academic performance.
- Sometimes, its symptoms are mistaken for misbehavior.

# Hypoglycemia (continued)

**Hypoglycemia, which is not always preventable, is the greatest immediate danger to students with diabetes.**

# Hypoglycemia (continued)

- Hypoglycemia occurs when a student's blood glucose level falls too low, usually as a result of too much insulin, missing or delaying meals or snacks, not eating enough food (carbohydrates), or participating in extra, intense, or unplanned physical activity.
- Low blood glucose levels are more likely to occur before lunch, at the end of the school day, during or after physical education classes, or in the event of unanticipated physical activities.
- Hypoglycemia may occur due to illness, particularly gastrointestinal illness, or it may occur for no obvious reason.
- Hypoglycemia usually can be treated easily and effectively.
- If it is not treated promptly, however, hypoglycemia can lead to loss of consciousness and seizures and can be life threatening.

# Hypoglycemia (continued)

- Early recognition of hypoglycemia symptoms and prompt treatment, in accordance with the student's DMMP, are necessary to prevent the onset of severe symptoms that may place the student in danger.
- Some older children and adolescents may have "hypoglycemia unawareness." In other words, they do not experience early physical warning signs such as shaking or jitteriness, or sweating, and the only clue that their blood glucose levels are low is sudden behavior change.
- Even students who usually recognize when their blood glucose is low may sometimes have a sudden "low" without symptoms.
- Although symptoms of hypoglycemia may vary from student to student, each student will tend to have the same symptoms each time hypoglycemia occurs.
- **Therefore, all school personnel should know how to recognize hypoglycemia and know what to do if they observe its onset.**

# What do I do if I suspect hypoglycemia?

- In the event of suspected or actual hypoglycemia, treat the student immediately.
- Do not leave the student alone or send the student to another location.
- No student should ever be charged with accompanying another student who is experiencing hypoglycemia to another location.
- As soon as the student exhibits symptoms treat the situation as a hypoglycemic emergency.
- Immediately contact the school nurse or trained diabetes personnel who will check the student's blood glucose level and treat the student for hypoglycemia.
- If the school nurse or trained diabetes personnel are not available, or if the blood glucose level cannot be checked, school personnel should treat the student for hypoglycemia as outlined in the student's Emergency Care Plan.
- Symptoms will progress if not treated immediately.
- When in doubt, always treat for hypoglycemia.



# Hypoglycemia Symptoms

## Mild to Moderate

- Shaky or jittery
- Sweaty
- Hungry
- Pale
- Headache
- Blurry vision
- Sleepy
- Dizzy
- Confused
- Disoriented
- Uncoordinated
- Irritable or nervous
- Argumentative
- Combative
- Changed personality
- Changed behavior
- Inability to concentrate
- Weak
- Lethargic

# Hypoglycemia Symptoms

## Severe

- Inability to eat or drink
- Unconsciousness
- Unresponsiveness
- Seizure activity or Convulsions (jerking movements)

# Treatment for Mild to Moderate Hypoglycemia

- As soon as symptoms are observed, notify the school nurse or trained diabetes personnel.
- Check the student's blood glucose level to determine if it is low.
- If the blood glucose level is below the level in the Hypoglycemia Emergency Care Plan or if the student has symptoms, give the student a quick-acting glucose product equal to 15 grams of carbohydrate (or the amount specified in the Emergency Care Plan) such as:
  - 3 or 4 glucose tablets or
  - 1 tube of glucose gel or
  - 4 ounces of fruit juice (not low-calorie or reduced sugar) or
  - 6 ounces (half a can) of soda (not low-calorie or reduced sugar)
- Wait 10 to 15 minutes.
- Recheck the blood glucose level.
- Repeat the quick-acting glucose product if the blood glucose level is below the level indicated in the Hypoglycemia Emergency Care Plan.
- Contact the student's parents/guardian.

# Treatment for Severe Hypoglycemia

- Severe hypoglycemia is rare at school and generally can be prevented with prompt treatment of mild to moderate symptoms of low blood glucose.
- When hypoglycemia symptoms are severe, the school nurse or trained diabetes personnel must be notified and must respond immediately.
- Symptoms of severe hypoglycemia may include inability to eat food or drink fluids, unconsciousness, unresponsiveness, and seizure activity or convulsions (jerking movements).
- At this point, school personnel should never attempt to give the student food or a drink or to put anything in the mouth because it could cause choking.

# Glucagon

- Severe hypoglycemia is treated by administering glucagon by injection.
- Glucagon is a hormone that raises blood glucose levels by causing the release of glycogen (a form of stored carbohydrate) from the liver.
- In schools, glucagon is given by the school nurse or trained diabetes personnel.
- Although it may cause nausea and vomiting when the student regains consciousness, glucagon is a potentially life-saving treatment that cannot harm a student.
- When a student has severe hypoglycemia, school personnel should position the student on his or her side to prevent choking.
- While the glucagon is being administered, another school staff member should call for emergency medical assistance (911) and notify the parents/guardian.
- If administration of glucagon is not authorized by the student's Diabetes Medical Management Plan or Emergency Care Plan, or it is not available, staff should call 911 immediately.

# Glucagon Emergency Kit

- The parents/guardian should supply the school with a glucagon emergency kit.
- The kit usually contains a bottle (vial) of glucagon in powder form and a prefilled syringe with special liquid;
- the two ingredients should only be mixed just before a glucagon injection is given.
- The glucagon emergency kit may be stored at room temperature.
- The school nurse and/or trained diabetes personnel must know where the kit is stored and have access to it at all times.
- They also should be aware of the expiration date on the kit and notify the student's parents/guardian when a new kit is needed.

# Recognizing and Treating Hyperglycemia(High Blood Glucose)

- Hyperglycemia means blood glucose levels are above the target range, as specified in the student's DMMP.
- Almost all children with diabetes will experience blood glucose levels above their target range at times throughout the day.
- For many children, these elevations in blood glucose will be only minimally above the target range (less than 250 mg/dL) and are short in duration.
- Other children may experience daily spikes of the blood glucose level that are high (in excess of 250 mg/dL) and of longer duration.
- Hyperglycemia may be caused by too little insulin or other glucose-lowering medications, food intake that has not been covered by insulin, or decreased physical activity.
- Other causes include illness, infection, injury, or severe physical or emotional stress.

# Recognizing and Treating Hyperglycemia(High Blood Glucose)

- Onset of hyperglycemia may occur over several hours or days.
- Symptoms of hyperglycemia include increased thirst, dry mouth, frequent or increased urination, change in appetite and nausea, blurry vision, and fatigue.
- In the short term, hyperglycemia can impair cognitive abilities and adversely affect academic performance.
- In the long term, moderately high blood glucose levels can increase risk for serious complications such as heart disease, stroke, blindness, kidney failure, nerve disease, gum disease, and amputations.
- Hyperglycemia needs to be recognized and treated in accordance with the student's DMMP.



# Hyperglycemia Symptoms

- Increased thirst and/or dry mouth
- Frequent or increased urination
- Change in appetite and nausea
- Blurry vision
- Fatigue

# Hyperglycemia Treatment

- Check the student's blood glucose level.
- Check the student's urine or blood for ketones.
- If the student uses an insulin pump, check the pump to see if it is connected and functioning properly.
- Administer supplemental insulin to bring down the blood glucose.
- Give the student extra water or non-sugar-containing drinks.
- Provide free and unrestricted access to the restroom.
- Modify physical activity, as specified in the Diabetes Medical Management Plan.
- Notify the parents/guardian if ketones are present.

# Diabetic Ketoacidosis

- Hyperglycemia does not usually result in a medical emergency.
- The following situations, however, may lead to a breakdown of fat causing ketones to form along with the hyperglycemia:
  - Significant or prolonged insulin deficiency from failure to take any insulin or the correct amount of insulin.
  - A pump malfunction causing an interruption in insulin delivery.
  - Physical or emotional stress that causes the insulin not to work effectively.
- Ketones are usually associated with high blood glucose, but also may occur when a student is ill and blood glucose levels fall below the student's target range.
- At first, ketones will be cleared by the kidneys into the urine but as their production increases, they build up in the bloodstream causing diabetic ketoacidosis (DKA), a potential medical emergency.

# Diabetic Ketoacidosis

- Diabetic ketoacidosis develops over hours to days and is associated with hyperglycemia, a buildup of ketones (ketosis) in the blood, and dehydration.
- As a result of these conditions, the classic signs of diabetic ketoacidosis include severe abdominal pain with vomiting, dry mouth and extreme thirst, fruity breath, heavy breathing and shortness of breath, chest pain, increasing sleepiness or lethargy, and depressed level of consciousness.
- As soon as these symptoms are observed, the school nurse or trained diabetes personnel should call 911, the parents/guardian, and the student's health care provider.

# Administering Insulin

- Students with type 1 diabetes, and some students with type 2 diabetes, need to administer or be given insulin at regular times during the school day.
- Students may need to take insulin to cover meals and/or snacks and may need additional or corrective dosages of insulin to treat hyperglycemia or to cover a rise in blood glucose levels.
- It is medically preferable that the student be allowed to self administer insulin in the classroom, at every campus location, or at any school activity, if indicated in the DMMP.
- The DMMP, which will be different for each student, specifies the dosage, delivery system, and schedule for insulin administration.
- The Individualized Health Care Plan and the student's education plan, based on the DMMP, should specify who will administer prescribed insulin and under what circumstances.

# Administering Insulin during the School Day

- Some students who need insulin during the school day are able to administer it on their own, others will need supervision, and yet others will need someone to administer the insulin for them.
- The school nurse and/or trained diabetes personnel should assist with insulin administration in accordance with the student's health care plans and education plans.
- Trained diabetes personnel who assist with the student's diabetes care tasks should be knowledgeable about and trained in using and operating each student's insulin delivery system in the event that a school nurse is not available to administer insulin.

# A little about Insulin

- **Insulin is classified in four types by how it works:**
  - Rapid-acting
  - Short-acting
  - Intermediate-acting
  - Long-acting
- **Basal insulin** is long-acting or intermediate-acting insulin delivered once or twice a day. This type of insulin is used to control blood glucose levels overnight and between meals.
- **Bolus insulin** refers to a dose of rapid-acting or short-acting insulin that is given to cover the carbohydrate in a meal or snack and to lower blood glucose levels that are above target.

# Basal/Bolus Insulin Plan (Adjustable Insulin Therapy)

- Most students with type 1 diabetes use a basal/bolus insulin plan.
- This type of insulin plan, sometimes referred to as adjustable insulin therapy, reproduces or mimics the way a normally functioning pancreas produces insulin.
- A coordinated combination of different types of insulin is used to achieve target blood glucose levels at meals, snacks, during periods of physical activity, and through the night.
- Students using a basal/bolus insulin plan require multiple injections during the school day, or they receive their insulin through a programmable insulin pump.



# Fixed Insulin Therapy

- Other students may take the same dose of insulin each day with rapid-acting or short-acting insulin and intermediate-acting insulin.
- This type of plan is sometimes referred to as fixed insulin therapy.

# Insulin Delivery-3 common ways

- **Insulin syringes**- available in several sizes, make it easy to draw up the proper dosage.
- **Insulin pen**-holds a cartridge of insulin. A needle is screwed onto its tip just before use. The user dials the pen to the prescribed dose and injects the insulin. Insulin pens are convenient and appropriate when children need a single type of insulin. During the school day, pens are used most often with rapid-acting insulin to cover a meal or to treat a high blood glucose level.
- **Insulin pump**-is a computerized device that is programmed to deliver small, steady doses of insulin throughout the day; additional doses are given to cover food intake and to lower high blood glucose levels. Pump users must test their blood glucose frequently to figure out the dose they need.

# Insulin Pumps-2 types

- **The first type of pump looks like a pager**, and students usually wear it on their waistband, belt, or in their pocket. The pump holds a reservoir of insulin attached to an infusion set that leaves a very small needle or plastic cannula (a tiny, flexible plastic tube) under the skin). Infusion sets are started with a guide needle, then the cannula is left in place, taped with dressing, and the needle is removed. The cannula usually is changed every 2 or 3 days or when blood glucose levels remain above the target range or ketones are present. Routine site changes are a responsibility of the family and generally are done at home.
- **The second type of pump, the pod or patch**, is attached directly to the skin and a guide needle inserts the cannula under the skin automatically. The student usually wears the pod on his or her abdomen, buttocks, leg, or arm. The pod contains the insulin (there is no tubing). The pod type pump is controlled by a small hand-held computer device that is kept nearby. This type of insulin pump needs to be changed every 2 to 3 days.

# Why Do Many Children Like Insulin Pump Therapy?

- Users are freed from multiple daily insulin injections.
- The pump delivers insulin in a way that is similar to what the body does naturally.
- Users may achieve improved blood glucose control.
- The pump uses frequent pulses of rapid-acting insulin, allowing for more consistent action on blood glucose than with intermediate- or long-acting insulin.
- The pump gives users more flexibility about when and what they eat.
- Users may be able to participate in unplanned physical activity without eating extra food.
- The pump is durable and contains many child safeguards.
- The pump can be preprogrammed with insulin-to carbohydrate ratios and blood glucose correction factors.
- When additional insulin, called a bolus, is needed to balance the carbohydrates in a meal or snack, or when blood glucose levels are high, the pump calculates the bolus dosage after the student enters the number of grams of carbohydrate to be eaten and his or her blood glucose level.

# Planning for Disasters and Emergencies

- The parents/guardian must provide an emergency supply kit for use in the event of natural disasters or emergencies when students need to stay at school. This kit should contain enough supplies for at least 72 hours to carry out the medical orders in the DMMP.
  - Blood glucose meter, testing strips, lancets, • and batteries for the meter.
  - Urine and/or blood ketone test strips and meter.
  - Insulin, syringes, and/or insulin pens and supplies.
  - Insulin pump and supplies, including syringes, pens, and insulin in case of pump failure.
  - Antiseptic wipes or wet wipes.
  - Quick-acting source of glucose.
  - Water.
  - Carbohydrate-containing snacks with protein.
  - Hypoglycemia treatment supplies (enough for three episodes): quick-acting glucose and carbohydrate snacks with protein.
  - Glucagon emergency kit.

# Following an Individualized Meal Plan

- Current nutrition recommendations for children with diabetes are designed to provide maximum flexibility to meet each child's nutritional needs, appetite, eating habits, and schedules.
- Insulin regimens are then individualized to fit each child's lifestyle.
- The nutritional needs of students with diabetes do not differ from the needs of students without diabetes.
- All students need a variety of healthy foods to maintain normal growth and development.
- The meal plan recommended for students with diabetes is usually healthy for everyone.
- The major difference is that the timing, amount, and content of the food that students with diabetes eat, especially the carbohydrates (or carbs), are carefully matched to balance the action of the insulin and other medications that they take.
- Although there usually are no forbidden foods for people with diabetes, students are advised to avoid "liquid carbs" such as sugar-containing soda and juices (including 100 percent fruit juice) and regular pancake syrup. The "liquid carbs" raise blood glucose rapidly, contain large amounts of carbs in small volumes, are hard to balance with insulin, and provide little or no nutrition.

# Meal Planning Approaches for Children and Youth

- Most students with diabetes have an individualized meal plan using a method of carbohydrate counting.
- The meal plan takes into account the student's nutritional needs, insulin plan, oral medications, and physical activity level.

# Carbohydrate Counting

- Carbohydrate (carb) counting is the most popular meal planning approach for children and youth.
- It involves calculating the number of grams of carbohydrate, or choices of carbohydrate, the student eats.
- Sources of carbs include starches (breads, crackers, cereal, pasta, rice), fruits and vegetables, dried beans and peas, milk, yogurt and sweets.
- The food service manager or staff and/or the school nurse should provide the carb content of foods to the parents/guardian and the student.
- There are two methods of meal planning using carb counting: following a consistent carb intake meal plan and adjusting insulin for changing carb intake.



# Following a Consistent Carb Intake Meal Plan

- **Students** who follow a consistent carb meal plan aim for a set amount of carb grams at each meal and snack and do not adjust their mealtime insulin for the amount of carb intake.
- This method of meal planning is often used by students who take an intermediate-acting insulin in the morning or students who receive a preset amount of rapid- or short-acting insulin at lunch.
- Students who follow a consistent carb meal plan need to maintain consistency in the timing and content of meals and snacks.
- The student should eat lunch at the same time each day.
- Snacks often are necessary to achieve a balance with the peak times of insulin action and with physical activity.

# Adjusting Insulin for Changing Carb Intake

- Students who use multiple daily injections or an insulin pump usually use this method of meal planning.
- This method requires adjusting insulin doses to cover the amount of carbs consumed using an insulin-to-carb ratio.
- The insulin-to-carb ratio is used to determine the number of units of insulin needed to cover the number of grams of carb in the food the student plans to eat.
- In addition to the amount of insulin needed to cover the carbs (called the carb dosage), extra insulin might be needed if the student's blood glucose is above the target range before a meal or snack.
- The blood glucose correction factor—also known as the insulin sensitivity factor—is used to determine the amount of insulin the student needs to lower blood glucose to target level.
- The insulin-to-carb ratio and the blood glucose correction factor are individualized and determined by the student's personal diabetes health care team.

# Compute the Insulin Dose

- **Step 1: Insulin-to-carb ratio**

- Determine how much rapid-acting insulin is needed for carbs.
- Divide the total number of grams of carbs in the meal by the insulin-to-carb ratio:

## **Step 2: Blood Glucose Correction Factor**

- Determine how much rapid-acting insulin is needed to lower blood glucose to target level.

- **Step 3: Total Dose**

- Add the number of units from **Step 1 + Step 2** together to get the total dose.

# Getting Regular Physical Activity

- Physical activity is a critical element of effective diabetes management.
- Everyone can benefit from regular physical activity, but it is even more important for students with diabetes.
- In addition to maintaining cardiovascular fitness and controlling weight, physical activity can help to lower blood glucose levels.
- Students with diabetes should participate fully in physical education classes and team or individual sports.
- To maintain blood glucose levels within the target range during extra physical activity, students will need to adjust their insulin and food intake.
- Physical education teachers and sports coaches must be able to recognize the symptoms of hypoglycemia and be prepared to call for help with a hypoglycemia emergency.
- The student's Emergency Care Plans, a quick-acting source of glucose, and the student's blood glucose meter should always be available, along with plenty of water.
- Students using pager-type pumps may disconnect from the pump for sports activities; the pod type pump remains attached. If students keep the pump on, they may set a temporary, reduced insulin delivery rate or suspend use of insulin while they are playing.

# Planning for Special Events, Field Trips, and Extracurricular Activities

- Meeting the needs of students with diabetes requires advance planning for special events such as classroom parties, field trips, and school-sponsored extracurricular activities held before or after school.
- With proper planning for coverage by the school nurse or trained diabetes personnel and possible adjustments to insulin dosage and meal plans, students with diabetes can participate fully in all school-related activities.
- Although there usually are no forbidden foods in a meal plan for students with diabetes, school parties often include foods high in carbohydrates and fats.
- Serving more nutritious snacks will be healthier for all students and will encourage good eating habits.
- The parents/guardian should decide whether the student with diabetes should be served the same food as other students or food provided by the parents/guardian
- If possible, give the parents/guardian advance notice about parties so they can incorporate special foods in the student's meal plan or adjust the insulin dosage.

# Dealing with Emotional and Social Issues

- Students with diabetes must not only deal with the usual developmental issues of growing up but also with learning to manage this complex chronic disease.
- Diabetes can affect every facet of life, complicating the task of mastering normal developmental challenges.
- For the most part, children do not want to be singled out or made to feel different from their peers.
- Diabetes care tasks, however, can set them apart and make them feel angry or resentful about having diabetes.
- Diabetes can be a focal point for conflict within families. One of the biggest tasks for children and adolescents is to become increasingly independent from their parents/guardian.
- Yet, diabetes may compromise independence because the parents/guardian are concerned about their children's ability to perform self-care tasks and take responsibility for their diabetes.
- The parents/guardian, who are ultimately responsible for their child's well-being, may be reluctant to allow normal independence in children or teens who have not been able to take care of themselves properly.
- This parental concern can lead to increasing struggles with dependence, oppositional behavior, and rebellion.

# Why Is Diabetes Self-Management Important?

- **Diabetes care depends upon self-management.**
- The students' competence and capability for performing diabetes-related care tasks should be specified in the Diabetes Medical Management Plan and then applied to the school setting by the school health team, as outlined in the student's Individualized Health Care Plan and any education plan.
- Although students must receive assistance with and supervision of their diabetes care when needed, it is equally important to enable students to take on the responsibility of diabetes self-management with ongoing guidance and support from the parents/guardian, the student's personal diabetes care team, and the school health team.
- The age for transfer of responsibility from caregiver to child varies from student to student and from task to task because children develop and mature at different rates.
- Students' abilities to participate in self-care also depend upon their willingness to do so.
- It is medically preferable that students be permitted to perform diabetes care tasks in the classroom, at every campus location, or at any school activity.

# Source

- National Diabetes Education Program, US Department of Health and Human Services, 2010, Helping the Student With Diabetes Succeed A Guide for School Personnel, Retrieved on 11/28/2012 from [http://ndep.nih.gov/media/youth\\_schoolguide.pdf](http://ndep.nih.gov/media/youth_schoolguide.pdf)