



Section 2: Quick Tip Sheets

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SECTION OVERVIEW

- Diabetes: The Basic Facts
 - Blood Glucose Monitor Use
 - Signs and Symptoms of Low Blood Glucose (Hypoglycemia)
 - Low Blood Glucose (Hypoglycemia) Action Plan
 - Signs and Symptoms of High Blood Glucose (Hyperglycemia)
 - High Blood Glucose (Hyperglycemia) Action Plan
 - Giving Insulin Using a Vial and Syringe
 - Giving Insulin Using an Insulin Pen
 - Giving Glucagon in an Emergency
 - Checking for Urine Ketones and Tips for Understanding Results
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Quick Tip Sheets are only intended to provide a brief overview of important information. Use the Table of Contents to locate the detailed information on each of these topics.

Diabetes: The Basic Facts (page 1 of 3)

What is diabetes?

Diabetes is a chronic disease that causes high blood glucose (sometimes referred to as high blood sugar) because a person's body does not produce enough insulin or the insulin does not work properly.

What are the different types of diabetes?

There are four main types of diabetes: type 1 diabetes, type 2 diabetes, gestational diabetes, and pre-diabetes. Type 1 diabetes and type 2 diabetes are explained in brief below.

What is type 1 diabetes?

Type 1 diabetes (formerly known as insulin-dependent or juvenile-onset diabetes) occurs when the pancreas produces little or no insulin. The body needs insulin to control the amount of glucose in the blood. People with type 1 diabetes must receive insulin to survive.

How is type 1 diabetes managed?

Type 1 diabetes is managed by taking insulin, monitoring blood glucose levels, eating healthy foods, and engaging in regular physical activity to help maintain and control blood glucose levels.

What is type 2 diabetes?

Type 2 diabetes (formerly known as non-insulin-dependent or adult-onset diabetes) occurs when the body makes some – but not enough – insulin, or the body is not able to use the insulin properly. Type 2 diabetes is becoming more common among younger people.

How is type 2 diabetes managed?

Type 2 diabetes is managed by eating healthy foods, engaging in regular physical activity, and often taking oral medications and/or insulin to help maintain and control blood glucose levels.

What is insulin?

Insulin is a hormone that is produced by the pancreas. Insulin is responsible for promoting growth and regulating blood glucose levels in the body. Insulin is used to treat diabetes.

How is insulin given?

Insulin can be given (delivered) three ways: injection using a vial and syringe, insulin pen, or insulin pump.

Why do students monitor their blood glucose levels?

Self-monitoring blood glucose levels is the best method available for checking the level of glucose in the blood. Checking glucose levels helps students know how to treat and manage their diabetes.

What are common diabetes emergencies?

Four common diabetes emergencies may occur at school:

- Low blood glucose (hypoglycemia)
- Severe low blood glucose, requiring Glucagon administration
- High blood glucose (hyperglycemia)
- Diabetic ketoacidosis (DKA)

Diabetes emergencies can happen at school for students with type 1 diabetes and type 2 diabetes. Preventing these emergencies is ideal, but not always possible.

What is low blood glucose (hypoglycemia)?

Low blood glucose (hypoglycemia) – also sometimes called an insulin reaction – occurs when a blood glucose level drops below 70 mg/dL. Low blood glucose episodes may happen in spite of careful attention to maintaining and controlling blood glucose levels. Low blood glucose can occur any time a student takes insulin and/or oral medication.

What are the signs and symptoms of low blood glucose (hypoglycemia)?

Common signs and symptoms of **mild** low blood glucose include: hunger, shakiness/weakness, blurred vision/glassy eyes, dizziness/headache, sweatiness/clamminess, tiredness/drowsiness, feeling flushed/hot, and fast heartbeat. Common signs and symptoms of **moderate** low blood glucose include the above symptoms, mood or behavior change, anxiousness/irritability, numbness or tingling around the lips, slurred/garbled speech, inattentiveness/acting spacey, poor coordination, inability to concentrate, and personality change. Common signs and symptoms if **severe** low blood glucose include: inability to swallow, confusion, not following commands or directions, inability to wake up, loss of consciousness, seizures, and convulsions.

Diabetes: The Basic Facts (page 2 of 3)

How is low blood glucose (hypoglycemia) treated?

Mild and moderate low blood glucose is treated by giving a student food or liquid containing carbohydrates. Fast-acting carbohydrate sources include: milk, fruit juice, glucose gel, and glucose tablets. For severe low blood glucose (i.e., confusion, inability to swallow, seizures, or convulsions), Glucagon must be injected.

What is Glucagon?

Glucagon is a hormone that causes the liver to release stored glucose into the bloodstream. Glucagon is used to raise blood glucose quickly in someone with diabetes who is unconscious or unresponsive. Glucagon is only administered by injection. Glucagon is a life-saving treatment for severe hypoglycemia.

An injection of Glucagon cannot harm a student.

Glucagon is a necessary emergency treatment for any student with type 1 or type 2 diabetes who takes insulin and has a severe low blood sugar episode and is found unconscious and/or is unresponsive. In Wisconsin, (non-health care) school personnel can give Glucagon.

What is high blood glucose (hyperglycemia)?

High blood glucose (hyperglycemia) is typically defined as a blood glucose level of > 250 mg/dL. Students may have symptoms of high blood glucose (e.g., thirst, tiredness, headache), but they may also have no symptoms. Blood glucose levels change frequently; however, when blood glucose levels are consistently > 250 mg/dL, health care provider notification is recommended.

What are the signs and symptoms of high blood glucose (hyperglycemia)?

Common signs and symptoms of **mild** high blood glucose include: thirst/dry mouth; frequent urination/bedwetting; tiredness/fatigue; increased hunger; blurred vision; sweet, fruity breath; flushed skin; and lack of concentration. Common symptoms of **moderate** high blood glucose include the above symptoms, nausea/vomiting, and stomach pain. Common symptoms of **severe** high blood glucose include: labored breathing, weakness, and confusion.

How is high blood glucose (hyperglycemia) treated?

For students with type 1 diabetes, insulin is required. Some students with type 2 diabetes may need oral medication and/or insulin to lower blood glucose levels.

What is diabetic ketoacidosis?

Diabetic ketoacidosis (DKA) is a dangerous, life-threatening condition that may occur when blood glucose levels are high (usually > 250 mg/dL) and ketones are detected. DKA is a medical emergency. The most common cause of DKA is not taking insulin or not taking enough insulin. DKA can also occur with undiagnosed diabetes or late diagnosis of type 1 diabetes (and in rare occasions, type 2 diabetes).

What are ketones?

Ketones are produced in the body when fat is used for energy. The most common cause of ketone production is not enough insulin. A lack of insulin leads to the breakdown of fat. When this occurs, ketones form in the body and they can be detected either in the blood or more commonly in the urine.

What can a student with diabetes eat?

Students with diabetes do not require any special diet. There are no forbidden foods. Healthy eating habits are recommended for all students. Students with diabetes need to pay more attention to balancing the types and amounts of food they eat.

What is a meal plan for a student with diabetes?

A healthy meal plan is recommended for all students with or without diabetes; this includes balancing carbohydrates, proteins, and good fats eaten throughout the day. Carbohydrates are the main source of energy for the body and will cause blood sugar to rise quickly; therefore, students with diabetes must balance the amount of carbohydrates they eat. A student's meal plan is determined by considering current activity level, insulin regimen/oral medication, and weight goals.

Diabetes: The Basic Facts (page 3 of 3)

What is carbohydrate counting?

Carbohydrate counting is a specific method used to balance the amount of foods containing carbohydrates that are eaten throughout the day.

Why do students with diabetes use carbohydrate counting?

Students with diabetes use carbohydrate counting to help match the amount of insulin they need to give to maintain and control blood glucose levels.

Why does a student with diabetes need to eat at certain times?

It is important for students with diabetes to eat at the designated times indicated in their Diabetes Medical Management Plan (DMMP). Eating at scheduled times can reduce the risk of low blood glucose. Eating at certain times is most important for students giving insulin by injection. Students using an insulin pump can have more flexibility with regard to eating because of the technology used to deliver insulin.

What about physical activity for students with diabetes?

Physical activity is a fundamental part of a healthy lifestyle. For students with diabetes, physical activity can reduce insulin/oral medication needs, improve cardiovascular fitness, assist with long-term weight control, increase social interaction, and can promote self-esteem. For all students, physical activity should be enjoyable and integrated into the day.

Can physical activity cause low blood glucose (hypoglycemia)?

Physical activity can lower blood glucose levels and increase risk for hypoglycemia especially if a student takes insulin and/or oral medication to control blood glucose levels.

What are long-term complications of diabetes?

Long-term complications of diabetes usually develop gradually and are usually the result of persistent, long-term high blood glucose levels. The most common complications are:

- Cardiovascular disease
- Nerve damage (neuropathy)
- Kidney damage (nephropathy)
- Eye complications
- Foot complications

Quick Tip Sheet

Blood Glucose Monitor Use

When a student is not able to check his/her own blood glucose level trained school personnel may need to perform and/or assist the student with blood glucose monitoring.

Below are key points to remember:

- Blood glucose monitor brand/name is: _____.
- The sides of fingers are commonly used; although, alternate sites (e.g., forearm, upper arm, base of the thumb, or thigh) are an option.
- Never use an alternate site if low blood glucose is suspected, low blood glucose symptoms are present, within two hours after a meal, after physical activity, during illness or stress, or if alternative site results don't match how student is feeling. Use a finger stick reading instead.
- Hand washing is recommended before and after testing.
- A toll-free number is commonly listed on every meter for problems or questions.

Steps for Checking a Student's Blood Glucose

1. Gather testing supplies (blood glucose monitor, test strip container, lancet, and lancet device). Encourage student to wash hands. ♦
2. Insert new lancet into the lancet device and "cock" or load it. (Note: Students may choose to use a lancet more than once, but this is not recommended.)
3. Remove one test strip from container and recap container.
4. Insert test strip into blood glucose monitor to turn monitor on. Some monitors must be turned on manually.
5. Verify code displayed on monitor to ensure it matches code on test strip bottle (if required).
6. Put on clean, disposable gloves.
7. Poke side of finger (or alternate site) with lancet device (avoid using the fingertips).
8. Apply adequate drop of blood on top or to end of test strip (many test strips pull in the required amount of blood).
9. Use cotton ball or tissue to cover finger or alternate site and apply slight pressure if needed to stop bleeding.
10. Read blood glucose result displayed in monitor window.
11. Record blood glucose result and any other information requested per school policy/protocol.
12. Dispose of lancet, along with used test strip, in approved sharps disposal container.*
13. Clean testing area per school district policy.
14. Follow student's Diabetes Medical Management Plan and/or Emergency Action Plan for next action steps.

♦ Alcohol wipes are sometimes used by an individual; if they are used, allow the alcohol to thoroughly dry prior to testing blood glucose.

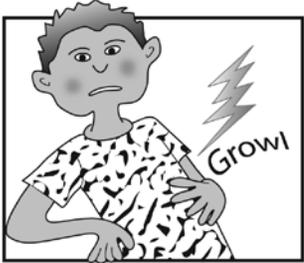
* For more information on appropriate sharps disposal in Wisconsin, go to the following website from the Wisconsin Department of Natural Resources: <http://dnr.wi.gov/org/aw/wm/medinf/sharpscollection.htm>.

Signs and Symptoms of Low Blood Glucose (Hypoglycemia)

HYPOGLYCEMIA

LOW BLOOD GLUCOSE KNOW THE SYMPTOMS

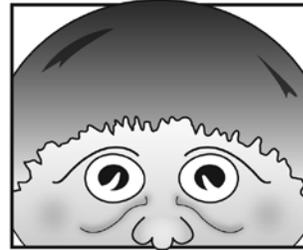
An individual may not always recognize symptoms of low blood glucose. These common symptoms, and others, may indicate low blood glucose.



Hungry



Shaky/weak/clammy



**Blurred vision/
glassy eyes**



Dizzy/headache



Sweaty/flushed/hot



Tired/drowsy



**Mood/
behavior change**



Inattentive/spacey



**Slurred/
garbled speech**

**If individual is confused/unable to follow commands,
unable to swallow, unable to awaken (unconscious),
or is having a seizure or convulsion,
GIVE GLUCAGON**

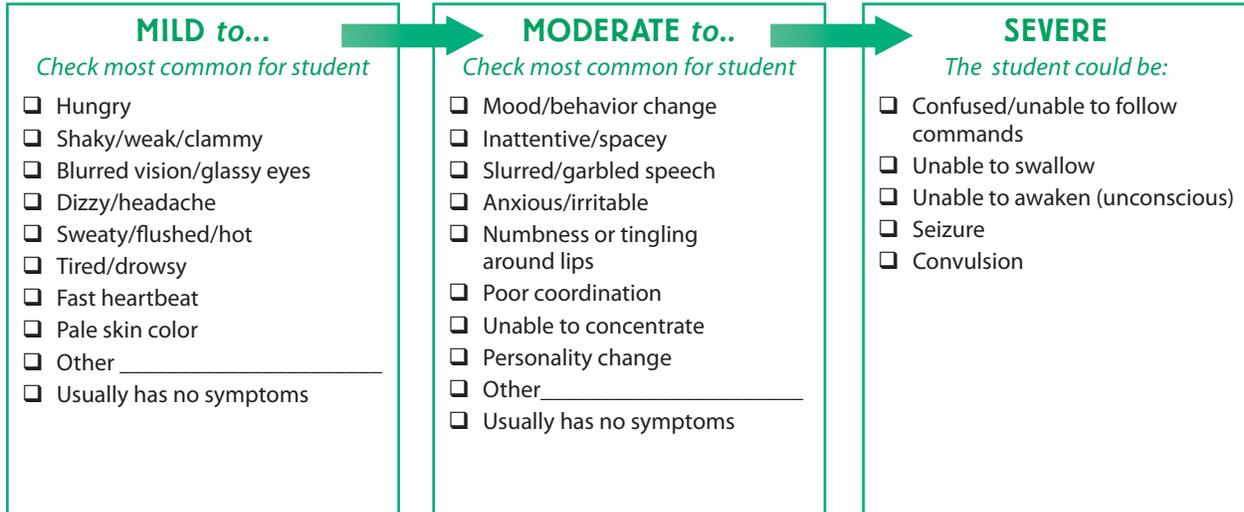
Adapted from: Children's Diabetes Foundation at Denver

Quick Tip Sheet

Low Blood Glucose (Hypoglycemia) Action Plan

Hypoglycemia is a blood glucose less than 70 mg/dL
Symptoms may develop suddenly and/or get worse quickly

SYMPTOMS OF LOW BLOOD GLUCOSE



- Notify school nurse or trained school personnel
- Follow student's Diabetes Medical Management Plan and/or Emergency Action Plan
- Check blood glucose if possible
- When in doubt, **TREAT low blood glucose**
- Intervening early may keep symptoms from getting worse

TAKE ACTION

1. Give _____ grams carbohydrate of one of the following (*check*):
 - _____ oz milk
 - _____ oz fruit juice
 - _____ grams of glucose gel
 - _____ glucose tablets
 - Other _____
2. Recheck blood glucose in 15 minutes
3. If blood glucose is less than _____ mg/dL, give another _____ grams of carbohydrate food or liquid
4. Repeat above steps as needed
5. Troubleshoot cause(s) if possible

TAKE ACTION

1. **Do not** give anything by mouth
2. GIVE **Glucagon**
Dose (*check*)
 0.5 mg or 1 mg
3. Position student on side, as there is risk of vomiting
4. Stay with student; do not leave student alone
5. Contact school nurse/trained school personnel
6. Call **9-1-1** per school district policies and procedures
7. Contact parents/guardian and/or health care provider
8. Check blood glucose if possible
9. Troubleshoot cause(s) if possible

Possible Causes of Low Blood Glucose (Hypoglycemia)

- Mistakenly took too much insulin or oral medication
- Injected insulin and waited too long to eat
- Miscalculated carbohydrate intake
- Skipped or delayed meals and/or snacks
- Ate less than usual
- Increased emotions (e.g., anger, anxiety, excitement)
- Increased physical activity (planned or unplanned)
- Low blood sugar before eating
- Hormone fluctuations/growth spurts

Signs and Symptoms of High Blood Glucose (Hyperglycemia)

HYPERGLYCEMIA

HIGH BLOOD GLUCOSE KNOW THE SYMPTOMS

An individual may not always recognize symptoms of high blood glucose. These common symptoms, and others, may indicate high blood glucose.



Frequent urination
(bedwetting in children)



**Extreme thirst/
dry mouth**



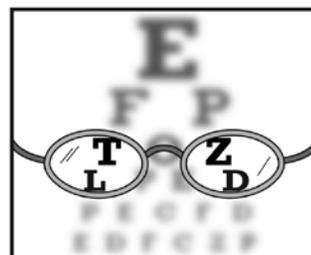
Sweet, fruity breath



Tiredness/fatigue



Increased hunger



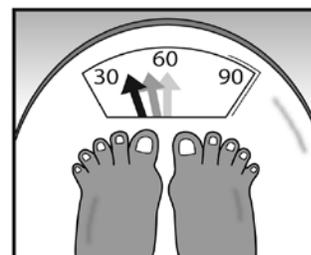
Blurred vision



Nausea/vomiting



**Stomach pain/
cramps**



Unusual weight loss

**If individual has labored breathing, weakness,
is confused or unconscious,
SEEK MEDICAL ASSISTANCE**

Adapted from: Children's Diabetes Foundation at Denver

Quick Tip Sheet

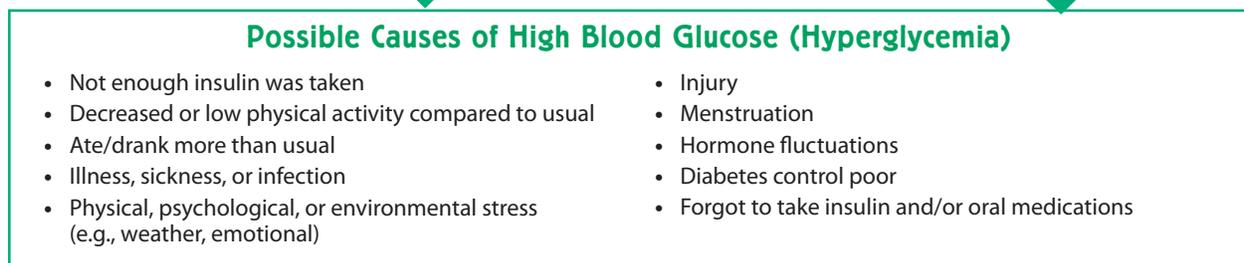
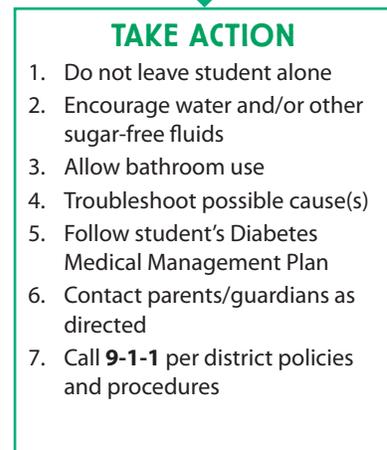
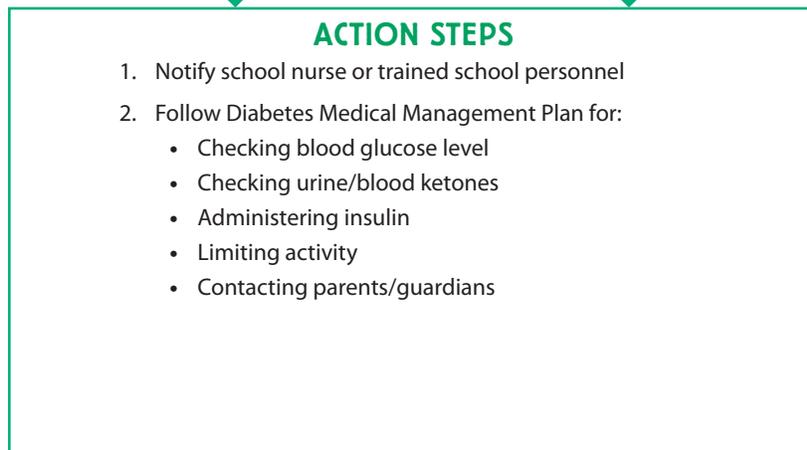
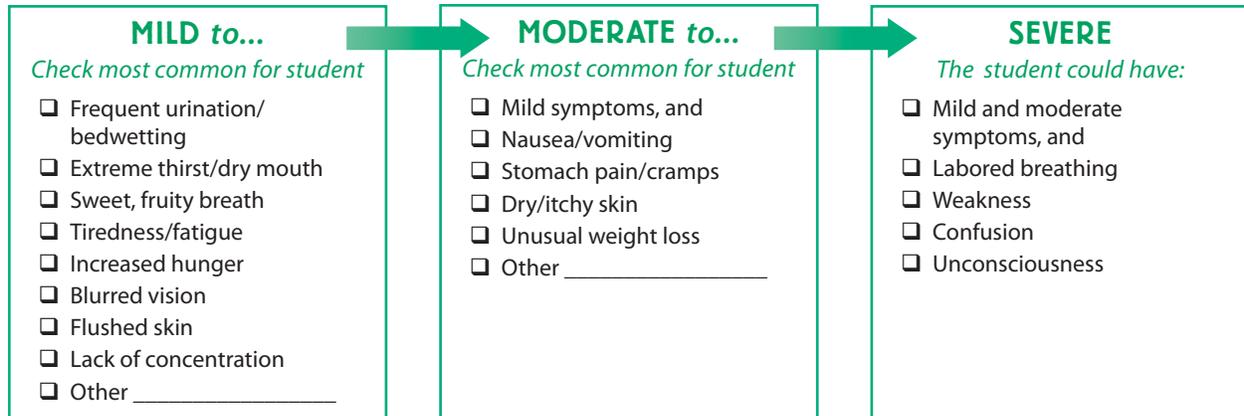
High Blood Glucose (Hyperglycemia) Action Plan

Hyperglycemia is a blood glucose greater than 250 mg/dL

Symptoms may develop over days, within hours, and/or get worse if not treated

Note: Diabetic Ketoacidosis (DKA) is an emergency. High blood glucose and positive ketones can lead to DKA. Early intervention and treatment can slow progression of or prevent DKA.

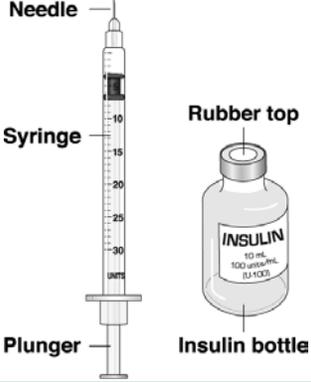
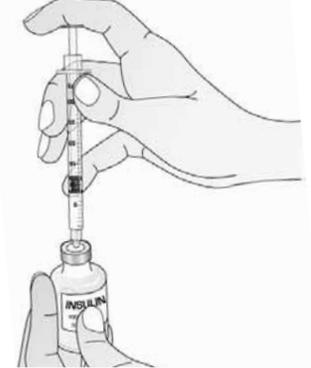
SYMPTOMS OF HIGH BLOOD GLUCOSE



Quick Tip Sheet

Giving Insulin Using a Vial and Syringe* (page 1 of 2)

Note: This information is for educational purposes only. For specific guidance on giving an insulin injection, talk with a health care provider.

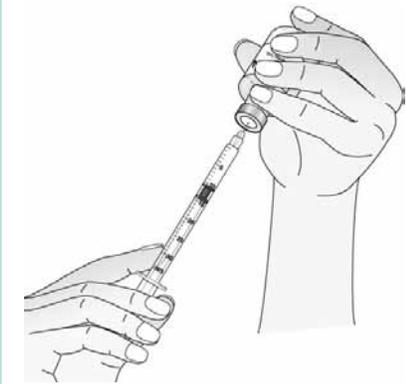
 <p>The diagram shows a syringe with a needle attached, a plunger, a rubber stopper, and an insulin vial. The syringe has markings from 0 to 30 units. The vial is labeled 'INSULIN 100 units/mL (U-100)'.</p>	<ol style="list-style-type: none">1. Gather supplies you'll need:<ul style="list-style-type: none">▪ insulin vial/bottle▪ syringe▪ alcohol swabs▪ container for the used syringe2. Wash your hands.3. Check insulin vial/bottle to make sure it hasn't expired and is correct type of insulin.4. Remove lid from insulin vial/bottle (if it is a new vial/bottle).^o5. Wipe rubber top of the vial/bottle with alcohol swab.6. Remove cap from syringe.
 <p>A hand is shown pulling back the plunger of the syringe to draw air into the barrel.</p>	<ol style="list-style-type: none">7. Pull air into syringe by pulling back on plunger until the black tip is even with line showing the exact units of insulin needed.
 <p>A hand is shown pushing the needle through the rubber stopper of the insulin vial.</p>	<ol style="list-style-type: none">8. Push needle through rubber top of vial/bottle.
 <p>A hand is shown pushing the plunger into the vial to draw insulin into the syringe.</p>	<ol style="list-style-type: none">9. Push plunger so that air goes from syringe into vial/bottle.

*This quick tip sheet is for the purpose of giving one type of insulin.

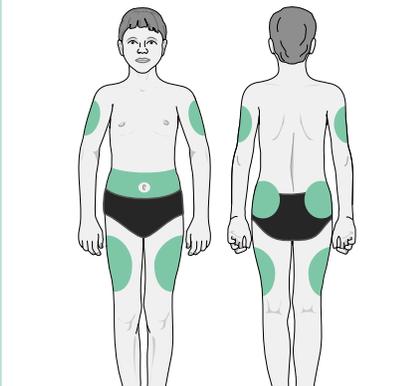
^oIf using a cloudy insulin (e.g., NPH), roll bottle gently to mix.

Quick Tip Sheet

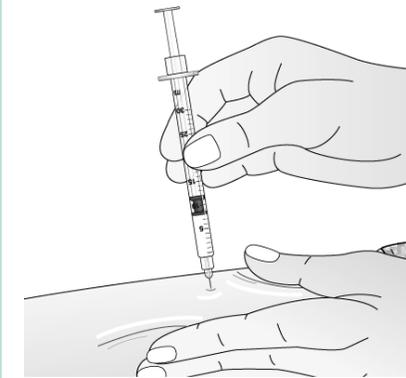
Giving Insulin Using a Vial and Syringe (page 2 of 2)



10. Turn insulin vial/bottle (with syringe in bottle) upside down. Pull insulin into syringe by slowly pulling back on plunger until top of its black tip is even with line showing units of insulin needed. Remove any air bubbles if needed.



11. The most common places to inject insulin are the abdomen (belly), the back of the upper arms, the upper buttocks, and the outer thighs. Choose a place to inject insulin, and wipe skin with alcohol swab (optional) and allow skin to dry.



12. Gently pinch skin of chosen injection site. Hold syringe at a 90-degree angle to skin, and push needle all the way in.



13. Let go of pinched skin, and slowly push plunger to inject all of the insulin. Wait about 5 seconds before pulling out needle. School personnel assisting a student should never recap the needle after the injection to avoid a needle stick injury. Place used needle in approved sharps disposal container.*

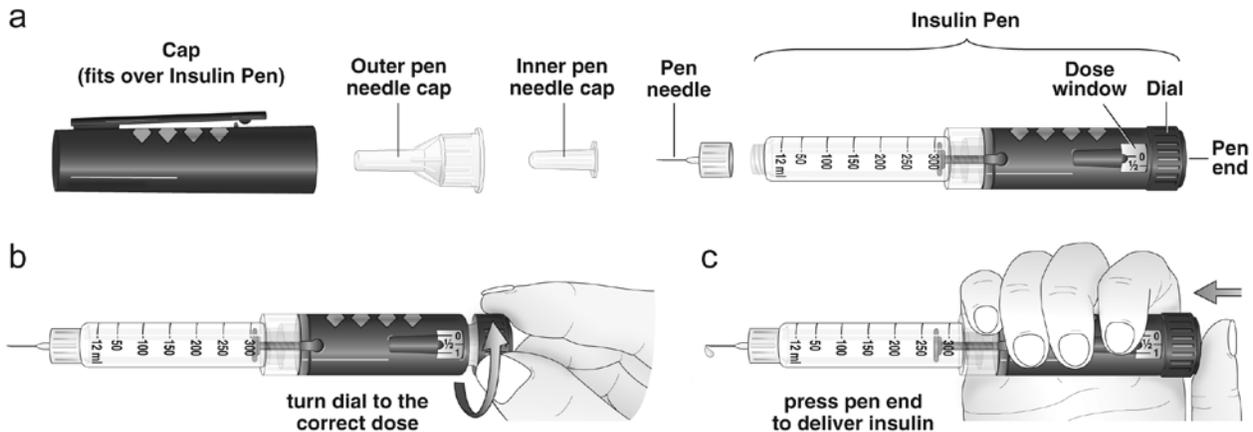
Adapted from: The Nemours Foundation, KidsHealth.

*For more information on appropriate sharps disposal in Wisconsin, go to the following website from the Wisconsin Department of Natural Resources: <http://dnr.wi.gov/org/aw/wm/medinf/sharpscollection.htm>.

Quick Tip Sheet

Giving Insulin Using an Insulin Pen

An insulin pen allows a person to dial the dose of insulin needed. Some insulin pens use replaceable insulin cartridges and some pens are entirely disposable. All pens use a special replaceable pen needle (**Figure a**).



Source: Media Solutions, UW School of Medicine and Public Health

*New disposable safety needles are now available to help reduce needle stick injuries. These needles have a safety lock mechanism that is activated automatically when the needle is removed from the skin.

Steps for Using an Insulin Pen

1. Determine type of pen that student uses (non-disposable or disposable) and prepare insulin cartridge. To reduce errors, always check the label to ensure the correct type and dose of insulin are given.
 - **Pre-filled disposable pen:** A pre-filled insulin cartridge is already in pen.
 - **Reusable (non-disposable) pen:** Most of the time, the insulin cartridge will be in pen already. If not, load insulin cartridge into pen.
2. Wash hands, gather supplies, and put clean, disposable gloves on.
3. Check expiration date for insulin pen cartridge or disposable pen.
4. Attach pen needle by twisting it on end of insulin pen. (Wipe top of insulin pen with alcohol wipe if instructed to do so.)
5. Pull off and remove outer pen needle protective cap and set aside.
6. Holding pen upright, prime pen by dialing in 2 units. This checks insulin flow (this is sometimes called an “air shot”).
7. Push end of pen (plunger) to push out the 2 units. A small drop of insulin should be seen at end of the needle.
8. Dial in desired insulin dose (pens dial insulin in 1/2, 1, or 2 unit increments) (**Figure b**).
9. Assist student in choosing injection site. Cleanse skin with alcohol and allow to dry.
10. Pinch a small area of skin and insert pen needle through skin.
11. Push end of pen (plunger) button down completely to give (deliver) insulin (**Figure c**).
12. Wait five seconds while keeping pen and pen needle in place to ensure all insulin is given.
13. Withdraw and remove insulin pen and needle from skin. Wipe injection site with cotton ball if needed.
14. Unscrew and remove pen needle without replacing needle cap (If using safety needles, twist and remove).
15. Dispose of needle properly in approved sharps disposal container.*

*For more information on appropriate sharps disposal in Wisconsin, go to the following website from the Wisconsin Department of Natural Resources: <http://dnr.wi.gov/org/aw/wm/medinf/sharpscollection.htm>.

Quick Tip Sheet

Giving Glucagon in an Emergency

Glucagon cannot harm a student.

Note: Give Glucagon if student is confused/unable to follow commands, unable to swallow, unable to awaken (unconscious), having a seizure, or having a convulsion.

Prepare Glucagon For Injection

Note: Glucagon should not be prepared for injection until the emergency arises.

1. If possible, wash hands and put clean, disposable gloves on.
2. Remove flip-off seal from vial (bottle) of Glucagon powder.
3. Remove needle protector from syringe, and inject entire contents of syringe into vial of Glucagon powder.
4. Remove syringe. Swirl vial gently until Glucagon dissolves and solution becomes clear.

Glucagon should not be used unless the solution is clear and of a water-like consistency.

Giving Glucagon

Note: Use same technique as for injecting insulin.

1. Identify Glucagon dose as indicated in student's Diabetes Medical Management Plan.
2. Insert same syringe into vial, hold vial upside down, and remove all of the solution from vial into the syringe.
3. Cleanse injection site on buttock, arm, or thigh with alcohol swab if possible.
4. Insert needle at a 90 degree angle into selected injection site and give Glucagon solution. Withdraw needle and press gently at the injection site.
5. After injection, don't recap needle. Place used needle in approved sharps disposal container.*

After Giving Glucagon

1. Turn student on his/her side to prevent choking on vomit. A student may vomit after receiving Glucagon.
2. Stay with student; do not leave him/her alone.
3. Seek assistance from school nurse or trained school personnel.
4. Ask someone to call 9-1-1, as indicated by school district policies and procedures.
5. Ask someone to contact parent/guardian and/or health care provider.
6. Check blood glucose if possible.

Adapted from: New York State Department of Health (2008). Children with Diabetes: A Resource Guide for Families and Schools.

Glucagon Kits



Glucagon Emergency Kit – Eli Lilly



GlucaGen® HypoKit® – Novo Nordisk

Source: www.ChildrenWithDiabetes.com

*For more information on appropriate sharps disposal in Wisconsin, go to the following website from the Wisconsin Department of Natural Resources: <http://dnr.wi.gov/org/aw/wm/medinf/sharpscollection.htm>.

Checking for Urine Ketones and Tips for Understanding Results

Checking for Urine Ketones

(Checking blood ketones requires use of a special monitor.)

1. Obtain urine sample from student.
2. Check expiration date of ketone strips.
3. Remove one ketone strip from container or individual foil package (recap container if using a container).
4. Locate color comparison chart on ketone strip container or box.
5. Dip ketone strip in urine and remove quickly.
6. Wait exactly 15 seconds or per manufacturer recommendations.
7. Compare ketone strip to the color chart on container or box.
8. Record result and any other information requested per school policy/procedure.

CONSIDER THESE STEPS IF URINE KETONES ARE:

Negative

Negative ketones may be a temporary situation.

- Follow student's Diabetes Medical Management Plan
- Allow free bathroom access
- Encourage water and/or other sugar-free fluids
- Recheck blood glucose levels in 2 hours
- Recheck ketones in 2 hours or with next urination
- Attempt to identify possible cause of high blood glucose
- Call parents/guardians as directed

Trace or small

Trace or small ketones are a sign that diabetic ketoacidosis (DKA) is less likely, but concern remains if blood glucose is high.

- Follow student's Diabetes Medical Management Plan
- Allow free bathroom access
- Encourage water and/or other sugar-free fluids
- Recheck blood glucose levels in 2 hours
- Recheck ketones in 2 hours or with next urination
- Call parents/guardians and/or health care provider

Moderate or large

Moderate to large ketones may be a sign of diabetic ketoacidosis (DKA).

- Follow student's Diabetes Medical Management Plan
- Allow free bathroom access
- Encourage water and/or other sugar-free fluids
- Call parents/guardians
- Arrange for student to be taken home and/or to see his/her healthcare provider
- Seek guidance from health care provider if unsuccessful in reaching parents/guardians

Note for students using an insulin pump:

Blood glucose levels can rise quickly and ketones will likely be present if there is a pump malfunction or insulin delivery problem. If this occurs, follow student's Diabetes Medical Management Plan and/or Emergency Action Plan.