



Diabetes Handbook

A Handbook for Families

ST. LOUIS CHILDREN'S HOSPITAL

WHAT IS A DIABETES EMERGENCY?

- More than one episode of vomiting
- Urine ketones test moderate or large
- Blood ketones 1.5 or higher
- Severe low blood sugar that requires using glucagon

BLOOD SUGAR TARGETS

Before exercise: _____

Before meals: _____

Before bedtime: _____

IMPORTANT CONTACT INFORMATION

Doctor's Name

Office Phone

Address

Hours

Doctor's Emergency Line

Social Worker

Phone

Dietitian

Phone

Diabetes Educator

Phone

Pharmacy or Mail Order

Phone

School Nurse

Phone

If found, please return to:

Name

Address

City

State

Zip Code

Phone

Email

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This Diabetes Education Handbook meets and exceeds American Diabetes Association Guidelines

This booklet is provided through the generosity of contributors to the St. Louis Children’s Hospital Foundation.

This handbook is dedicated to the memory of Julio V. Santiago, MD, whose vision, inspiration and leadership was instrumental in the development of St. Louis Children’s Hospital and Washington University School of Medicine into a premier center for pediatric diabetes. Dr. Santiago always did what’s right for children, and especially for children with diabetes.

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DIABETES HANDBOOK

Introducing St. Louis Children's Hospital

Founded in 1879, St. Louis Children's Hospital is one of the premier children's hospitals in the United States. It serves not just the children of St. Louis, but children across the world. The hospital provides a full range of pediatric services to the St. Louis metropolitan area and a primary service region covering six states. As the pediatric teaching hospital for Washington University School of Medicine, the hospital offers nationally recognized programs for physician training and research.

St. Louis Children's Hospital is:

- One of the world's leading treatment and clinical research centers for diabetes, providing comprehensive care for pediatric patients throughout the entire diagnostic and treatment process.
- The only pediatric hospital in St. Louis accredited by the American Diabetes Association.
- Where the first lifesaving treatment with insulin was given to a diabetic child in the United States.



Children's Hospitals'
Solutions for
Patient Safety
Every patient. Every day.



CHAPTER 1



WHAT IS DIABETES?

Basic Facts

Diabetes is the condition of high blood sugar due to various reasons. The two most common conditions that cause high blood sugar are type 1 and type 2 diabetes.

Diabetes is a disease that impairs the body's ability to use food properly. Energy required by the body to function normally comes from carbohydrates in daily food intake. Carbohydrates are digested and become glucose in the body. The blood transports the glucose around the body. The glucose contained in the bloodstream is called "blood glucose" or "blood sugar". Blood glucose levels need to be regulated to keep the body healthy and working properly. The body keeps the blood glucose levels regulated with the help of the hormone insulin.

Insulin is produced in the pancreas. Insulin helps the body to convert food into energy by letting the glucose leave the bloodstream and enter into the cells of the body.

When people are diagnosed with diabetes, they have a lack of energy because the glucose is stuck in the bloodstream and builds to dangerously high levels. This build-up of glucose in the blood is called hyperglycemia. Hyperglycemia can be caused by a lack of insulin production or insulin resistance. When someone has insulin resistance they usually have type 2 diabetes. Type 2 diabetes is discussed in chapter Chapter 12.

Ask your endocrinologist (diabetes doctor) if you are uncertain whether your diabetes is caused by a lack of insulin or insulin resistance. This is the main difference between type 1 and type 2 diabetes. Sometimes tests will be needed to determine the type of diabetes.

Diabetes Basics

Type 1 diabetes

Type 1 diabetes is one of the most common chronic diseases in children, affecting nearly one child out of every 400. Diabetes can run in families. Researchers are still studying how and why people develop type 1 diabetes.

Although diabetes cannot be cured, it can be managed. With family support and good medical care, your child with diabetes can lead a healthy, active, and fun-filled life.

SYMPTOMS OF DIABETES

When sugar enters the urine, water must go out with the sugar. The results are the most common symptoms of hyperglycemia:

- Frequent urination, nighttime urination and sometimes bed-wetting
- Increased thirst (to make up for water lost in the urine)
- Hunger (because the body is hungry for energy)
- Weight loss (when the body cannot get sugar for energy, it burns its own muscle and fat)
- Tired, lethargic or lack of usual energy level
- Changes to behavior, mood swings, irritability, attitude or acting out

Pathophysiology

In type 1 diabetes, the pancreas will completely stop making insulin. This is caused by what we call the autoimmune process. The type 1 diabetes autoimmune process is a condition in which the person with type 1 diabetes has developed antibodies against the beta cells of the pancreas. The immune system will destroy all of the insulin-producing beta cells and eventually no more insulin will be made. The period of time between type 1 diabetes diagnosis and the pancreas completely stopping insulin production is called the "honeymoon period".

- There are many theories about what causes type 1 diabetes. We do not know exactly what starts the autoimmune process that destroys the beta cells.
- A person with type 1 diabetes will never out-grow this diagnosis.
- Without insulin the blood sugar cannot pass into the body's cells to be used for fuel. The blood sugar rises to a high level and overflows through the kidneys into the urine.

	TYPE 1	TYPE 2
Incidence	10% of people with diabetes (1 of 400 kids)	90% of people with diabetes (1 of every 4-5 persons)
Common Names	Juvenile diabetes, Insulin-dependent diabetes, IDDM	Adult onset diabetes, Non-insulin dependent diabetes, NIDDM
Age	Most often less than 18 years old	Usually over 40 years old
Cause	Autoimmune process — islet cell destruction, no insulin produced	Insulin resistance or lack of adequate insulin production (insulin does not work properly).
Ketone Formation	Yes — due to the lack of insulin	Yes or no
Body Type	Tend to be thin	Tend to be overweight
Treatment	<u>Always</u> requires insulin injections	Controlled with: <ul style="list-style-type: none"> • diet, weight loss • exercise • oral medication • insulin

- Our bodies constantly need energy for all of our body functions. The person with type 1 diabetes will always need to take insulin to survive.

Type 2 Diabetes

In type 2 diabetes, the pancreas continues to make insulin but it is not used well by the body. This is also referred to as insulin resistance. Once called “adult onset” diabetes, type 2 diabetes is becoming more common in childhood. Children diagnosed with this type of diabetes often have a family history of diabetes and are usually overweight.

Causes of Type 1 Diabetes

- Inheritance (genetic) — People with insulin-dependent diabetes are more likely to have inherited certain tissue types, called HLA types.
- 85 to 90 percent have no known family history of type 1 diabetes.
- Environmental injury from a viral infection, chemical or other sources still unknown.
- A person may inherit a defect that allows a virus or a part of a protein to injure the beta cells (cells that produce insulin in the pancreas).
- Most people who develop diabetes do not suddenly develop it. They have been in the process of developing it gradually for many years. It is probable that many viral infections and other factors result in the damage and eventual destruction of beta cells.

Causes of Type 2 Diabetes

We don’t fully understand why some people develop type 2 diabetes. Certain factors increase the risk, including:

- **Family history.** If family members have type 2 diabetes (parents or siblings), there is greater risk.
- **Weight.** Being overweight is a primary risk factor for type 2 diabetes. Fatty tissue leads to an increase in insulin resistance. However, you don’t have to be overweight to develop type 2 diabetes.
- **Inactivity.** Less active people are at a higher risk. Physical activity helps control your weight and can make your cells more sensitive to insulin.
- **Race.** For still unknown reasons, certain races are more likely to develop type 2 diabetes. At higher-risk are: African Americans, Hispanics, Native Americans, and Asian-Americans.
- **Age.** The risk of type 2 diabetes increases as you get older, especially after age 45.
- **Pre-diabetes.** Pre-diabetes is a condition in which your blood sugar level is higher than normal, but not high enough to be classified as diabetes. Left untreated, pre-diabetes can eventually develop type 2 diabetes.
- **Gestational diabetes.** If you developed gestational diabetes when you were pregnant, your risk of developing type 2 diabetes increases.
- **Polycystic ovary syndrome.** Women with polycystic ovary syndrome have an increased risk.

TREATMENT OF DIABETES

The goals of diabetes treatment in children are:

- to maintain normal growth and development.
- to keep blood glucose (sugar) levels within a target range (not too high, not too low) as much as possible.
- to promote healthy emotional well-being.

Keeping blood glucose levels in a target range means balancing insulin, food, and exercise. Remember: Food raises blood glucose levels, while insulin and exercise lower them.

A good diabetes treatment plan includes:

- Eating reasonably, consistently, and on schedule.
- Testing blood glucose levels regularly.
- Adjusting insulin as blood glucose levels and activities warrant.
- Exercising regularly.

Ideas about how to treat diabetes have changed significantly in recent years. Treatment plans are more flexible and are geared to the needs of the individual child and their family.

DIABETIC KETOACIDOSIS (DKA)

Ketonuria (ketones in the urine) and acidosis occur when there is not enough insulin to meet the body's basic needs. Three main causes are:

- newly diagnosed diabetes
- missed insulin injections
- illness

Ketones come from the breakdown of body fat. Ketones are initially passed into the urine (ketonuria). They may start small and gradually increase to large amounts. Once they reach a large level, they may start to build up in the blood and body tissues. The longer someone has large urine ketones, the more likely they are to build up in the body and result in diabetic ketoacidosis (DKA).



KETONE — Read at exactly 15 seconds.

NEGATIVE



mg/dL

TRACE



5

SMALL



15

MODERATE



40

← LARGE →



80



160

Symptoms of Acidosis

- Upset stomach
- Vomiting
- Confusion
- Dizziness
- Chest Pain
- Deep breathing or difficulty breathing
- Sweet, fruity odor to breath
- If not treated – coma, brain damage, death

Use of Ketostix

- Clean hands!
- Place end of ketone test strip in fresh urine or place strip directly into urine stream.
- Completely saturate square on end of strip.
- Wait 15 seconds.
- Compare the test area with the colored chart.
- Immediately record the result in the logbook.



DKA PREVENTION DECISION TREE

Ketones are caused by lack of insulin.

Check urine ketones using ketostix:

- Any time the blood sugar level is greater than 300 mg/dl.
- Any time your child vomits.
- When your child is sick (fever, stomach ache, flu symptoms, etc.) even if blood sugar is low or in the target range.

To reduce ketones:

- Drink lots of sugar-free fluids to help flush out ketones.
- Continue to check ketones until ketones are negative for two consecutive checks.

Call the diabetes doctor/nurse at

_____ or

_____ when:

- Ketones are moderate or large. Insulin is needed.*
- Vomiting happens more than once.
- When your child is not able to drink fluids.
- **Call 911** if your child is unable to wake up and/or has difficulty breathing.

***Remember: if moderate or large ketones are present, your child needs more INSULIN!**

CHAPTER 2

Diabetes Care: Monitoring

DIABETES CARE SKILLS AND MONITORING OF BLOOD GLUCOSE

Self-monitoring is the key to achieving good control of blood glucose levels.

Reasons for Blood Glucose Testing

- To be sure that blood glucose is in a safe range.
- To assist in adjusting insulin dosage.
- To improve blood glucose control.
- To detect patterns in blood glucose levels. This may help you to better understand the effects of insulin, food, exercise, stress, and illness on blood glucose levels.

When to Check Blood Glucose

- Must be checked at least 4 times per day, everyday.
- Check before breakfast, before lunch, before dinner, and before the bedtime snack. Try to test before any bites of food have been eaten.
- Check during the night when the dose of long-acting insulin is increased or decreased.
- Check blood sugar any time your child “feels funny.”
- Occasionally spot-check the blood sugar during the night.

HOW TO DO BLOOD GLUCOSE TESTING

- The hands should be washed with warm water (to increase blood flow and clean hands)
- A finger-poking device with lancets should be used to get a drop of blood.
- Alcohol can be used to wipe the finger. Let alcohol dry completely because wet alcohol will interfere with the chemical reaction for the blood sugar test.
- Place test strip in meter.
- It is helpful to place the finger to be used on a tabletop to prevent the withdrawing of the finger and failure of getting an adequate poke.
- Obtain blood from sides of fingers, close to tip. Avoid the tip and pad of the finger since it may be more painful.
- Hold the finger down to the side below the level of the heart to increase the blood flow to the finger.
- Obtain a large drop of blood—obtaining too small a drop of blood on the test strip will cause an inaccurate result.
- Touch test strip (after insertion into meter) to the blood drop. The meter will alert you when it has received enough blood.
- Dispose of used lancet in sharps container.

Plasma Blood Glucose and A1C Goals For Type 1 Diabetes Across All Pediatric Age-Groups

Plasma Blood Glucose Goal		Rationale	A1C
Before meals	Bedtime/overnight		
90-130 mg/dL (5.0-7.2 mmol/L)	110-200 (5.0-8.3 mmol/L)	A lower goal (<7.0%) is reasonable if it can be achieved without excessive hypoglycemia	<7.5%

Key concepts in setting glycemic goals:

- Goals may be individualized, and lower goals may be reasonable based on benefit-risk assessment
- Blood glucose levels should be modified in children with frequent hypoglycemia or hypoglycemia unawareness
- After meal blood glucose values should be measured when there is a discrepancy between before meal blood glucose values and A1C levels, and to help access glycemia in those on basal-bolus regimens

Adapted from American Diabetes Association Standards of Medical Care in Diabetes 2015

Blood Sugar Log for the Week of _____

	Breakfast		Lunch		Dinner		Bedtime		During the Night			
	blood sugar before	insulin	blood sugar after	blood sugar before	insulin	blood sugar after	blood sugar before	insulin	blood sugar after	blood sugar before	insulin	blood sugar after
Monday												
Tuesday												
Wednesday												
Thursday												
Friday												
Saturday												
Sunday												

This is a sample of a blood sugar logbook.

Weekly blood sugar notes

Use this side of the page to record your blood sugar, and the opposite side to record the amount of carbs you eat each day.



- ### Keep Records of Blood Glucose
- Record keeping is preferred over meter memory.
 - Keep records of blood glucose in order to identify **patterns** in blood glucose levels.
 - Record all low blood sugars and possible causes.
 - Record times of exercise.
 - Record all insulin dosages.
 - Record carbohydrate count of meals and snacks.
 - Record urine ketones when checked.
 - Call your diabetes care provider for assistance in adjusting insulin dosage if blood sugar results are consistently outside of the target range. See page 8 for blood sugar target range details.
 - Note: illness, stress and menstrual periods can possibly affect blood sugar.

HEMOGLOBIN A1C TEST

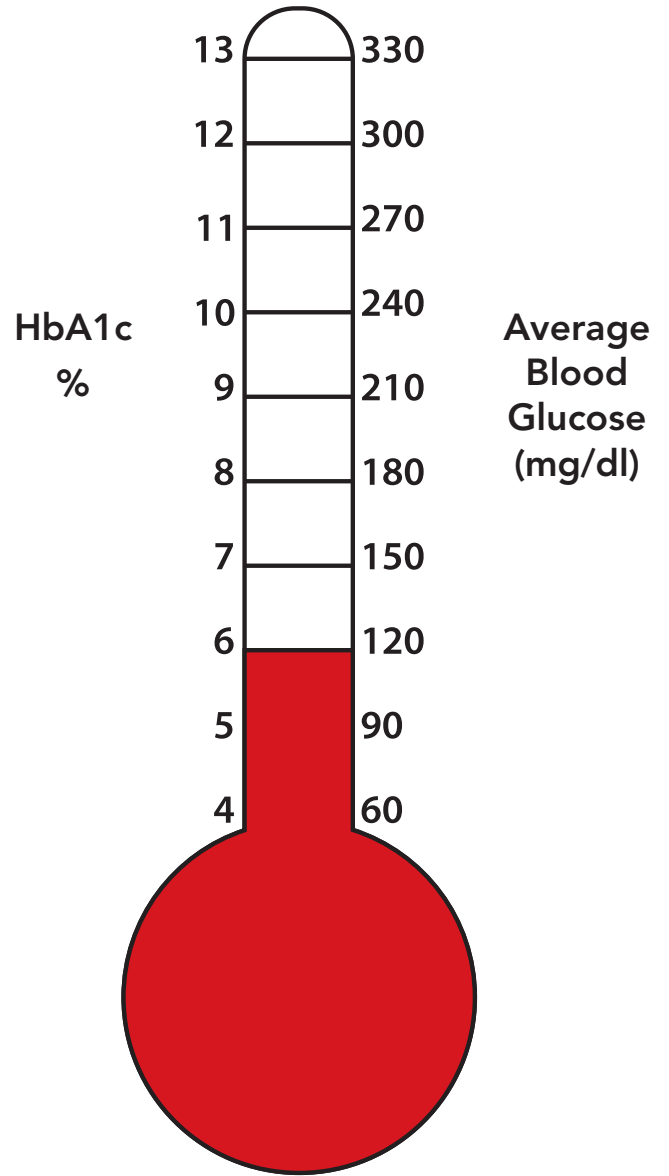
The Hemoglobin A1C is a blood test to measure your child's average blood sugar control for the past two to three months.

Hemoglobin is the protein in the red blood cells that carry oxygen to the various parts of the body. If the blood sugar is high, sugar attaches to the hemoglobin and remains there for the life of the red blood cell (an average of two to three months).

The hemoglobin A1C test can be done at the clinic visit; the child does not have to be fasting. The test can be done by drawing blood from a vein or from a finger stick. The result will usually be available during the clinic visit.

In general, the goal for hemoglobin A1C for all children with diabetes is 7.5 percent. Your diabetes doctor may give you direction for hemoglobin A1C level in infants, toddlers and preschool-age children may be higher (8 to 9 percent range) since their brains continue to grow and frequent low blood sugar levels are dangerous to a growing brain. Ask your diabetes care provider if you are not sure what your goal hemoglobin A1C level is.

HEMOGLOBIN A1C CHART*



The normal range for the HbA1c test at my lab

is _____ %

to _____ %.

My current HbA1c test result is

_____ %

My goal for my HbA1c test result is

_____ %

My HbA1c will be checked every

_____ months.

* 1995 – Boehringer Mannheim Corporation, Eli Lilly and Company, Becton Dickinson 207-5757-1095

CHAPTER 3

Insulin Guidelines

WHAT IS INSULIN?

Insulin is a hormone made in the pancreas. The insulin-producing cells in the pancreas are located in a group called beta cells. The food we eat is converted to sugar for the body to use as energy. Insulin allows the sugar to pass from the bloodstream into the cells where it is used for energy. The body cannot turn sugar into energy without insulin.

When a child has type 1 diabetes, the beta cells stop making insulin and the child must take insulin injections.

Insulin is both a hormone and a protein, therefore, it must be injected for use. It cannot be taken by mouth because the stomach would digest and destroy the insulin. Insulin is injected into the fatty tissue under the skin. From there, it is absorbed into the bloodstream and travels to all parts of the body. Insulin lowers the blood sugar.

TYPES OF INSULIN

The first insulin came from cows and pigs. Most people with diabetes now use human insulin or analog insulin. These insulins are made in a laboratory and causes fewer allergic reactions than animal insulin.

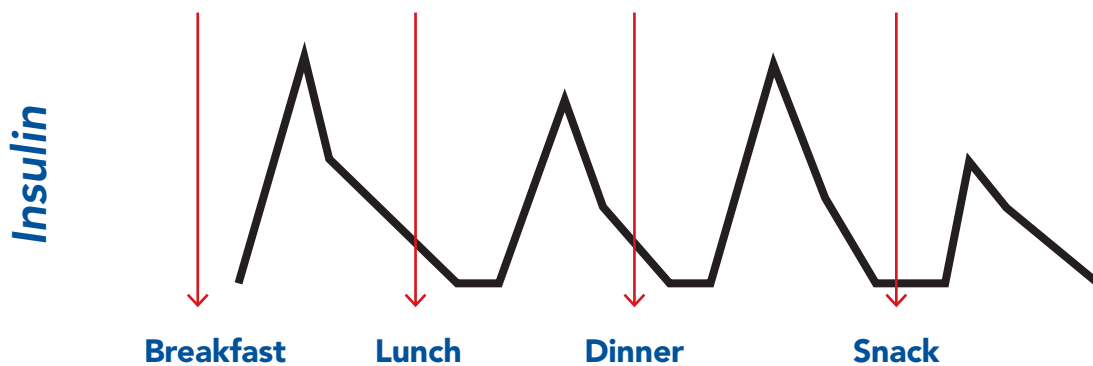
Different types of insulin work for different lengths of time in the body. There are rapid-acting, short-acting, intermediate-acting, and long-acting insulin.

Rapid-Acting Insulin: Humalog® (insulin lispro), Novolog® (insulin aspart) and Apidra® (insulin glulisine) begin to work almost immediately after being injected. They work hardest for about 60 to 90 minutes after injection and may last for 3 to 4 hours. These rapid acting insulins manage the rise in blood sugar when eating, lower high blood sugars, and/or help clear ketones.

Short-Acting Insulin: Regular insulin starts to work within half an hour after injection is given. It works hardest two to three hours after the injection. Regular insulin is usually given 30 to 60 minutes before a meal.

BASAL AND BOLUS INSULIN

Bolus Insulin is timed and amount is given based on food intake.



Basal Insulin provides steady dose throughout day and night.



Blood glucose still rises with food intake, but doesn't peak as high.

Intermediate-Acting Insulin: NPH (also referred to as “cloudy” insulin) works best about six to nine hours after the injection and usually works for about 12 hours. This type of insulin is usually given in the morning and evening.

Long-Acting Insulin: Lantus, Basaglar (insulin Glargine), Tresiba (degludec), and Levemir (insulin detemir) are given once or twice a day, at the same time of day every time. These insulins are clear and cannot be mixed in the same syringe with any other insulin. Care must be taken not to confuse long-acting insulins with short acting or rapid acting insulins; they are all clear. Long-acting insulins provide a basal dose of insulin for six to 24 hours with no official peak in action. Long-acting insulin works by forming a slowly dissolving crystal in the fatty tissue. Giving the other injections in the same spot can disrupt the long-acting insulin crystal and should be avoided.

Tresiba is an ultra long acting insulin that is given one time per day. It starts to work in 30 to 90 minutes, has no peak in action, and can work for 24 to 42 hours.

Many people who take long-acting insulin say that it is more comfortable at room temperature. You may wish to draw up the long-acting insulin dose a few minutes early so it warms to room temperature.

How Often is Insulin Given?

Most people obtain better blood sugar control using multiple daily injections of insulin. At the time of diagnosis many children are started on a dose of rapid-acting insulin (Humalog, Novolog, or Apidra) with each meal and a separate daily or twice daily dose of long-acting insulin. The insulin regimen will be individualized to the specific needs of your child.

The best time to give mealtime rapid-acting insulin is immediately before eating. For infants, toddlers, and children who have variable, unpredictable appetites, you may give insulin immediately after eating. When insulin is given after eating, give it within 30 minutes of the start of the meal.

The long-acting insulin (Lantus, Basaglar, Tresiba or Levemir) is given at the same time each day to avoid gaps or overlaps of doses. Choose a time that works best for your daily schedule. It is recommended that you speak with your diabetes care provider before changing the timing of your long-acting insulin dose.

Insulin should not be injected just prior to taking a bath, shower or entering a hot tub. If insulin has just been injected, the increase in body temperature could cause the insulin to absorb faster, therefore possibly altering the

desired action time of the insulin. Try to inject insulin at least 20-30 minutes before or after the bath or shower.

AMOUNT OF INSULIN

How much insulin your child needs is based on body weight and blood sugar level. Your child’s insulin doses may change often. This is why it is important to monitor blood sugar levels frequently, so that your child’s insulin needs can be determined. At the time of diagnosis the insulin doses may change daily. You will be in frequent telephone contact with the diabetes team. A few weeks after diagnosis, many children go into the “honeymoon period,” when less injected insulin is needed. The honeymoon period generally lasts six to 12 months and the child’s insulin needs can be minimal; some may actually find they can maintain normal or near normal blood glucose taking very little or no insulin. During this time the few remaining insulin-producing beta cells are eventually destroyed. As these cells die they produce less and less insulin, so your child will need more insulin by injection after the honeymoon period.

Insulin dosages can be adjusted to fit your child’s needs and lifestyle. As your child grows, they will need larger doses of insulin. During puberty the growth hormone level and other hormones are high. These hormones block insulin activity. The insulin dosage may increase significantly during this time. Many children need more insulin in the winter than in the summer, because of differences in their activity level.

Initially the diabetes team will make all insulin dosage adjustments. You will soon become comfortable making minor changes in your child’s insulin dosages, following insulin adjustment guidelines. Major changes in your child’s insulin dose should only be made with the guidance of your diabetes doctor or diabetes nurse educator.

INSULIN SYRINGES

Insulin is measured in units. You must use an insulin syringe to draw up the dose of insulin.

There are three sizes of insulin syringes.

- 3/10 mL syringe holds up to 30 units of insulin, and each marking on the syringe is 1 unit.
- 1/2 mL syringe holds up to 50 units of insulin, and each marking on the syringe is 1 unit.
- 1 mL syringe holds up to 100 units of insulin, and each marking on the syringe is 2 units.

Syringes come with variable needle lengths. The diabetes

nurse educator will help you determine the size of syringe and needle length that is appropriate for your child.

Drawing Up Insulin from a Vial:

1. Wash hands.
2. Gather supplies: insulin bottles, syringe, alcohol, log book with insulin dosage.
3. Wipe the top of the insulin bottle with alcohol and allow to air dry.
4. Put air into the insulin vial and leave needle in the bottle.
5. Invert bottle and draw up insulin, get rid of any air bubbles, and remove needle.

Be EXACT about the number of units needed.

Never mix long-acting insulin with any other insulin.

Mixing Insulin:

Usually recommended to mix a rapid-acting insulin (Humalog, Novolog or Apidra) with an intermediate-acting insulin called NPH.

- Wash hands.
- Gather supplies: insulin vials, syringe, alcohol, log book with insulin dosage.
- Roll vial of cloudy insulin to mix.
- Wipe tops of insulin bottles with alcohol.
- Put air into the intermediate-acting insulin (NPH — this is the cloudy insulin) and then remove needle.
- Put air in the rapid-acting insulin or short-acting insulin vial (this is a clear insulin) and leave needle in bottle.
- Invert bottle and draw up clear insulin, get rid of air bubbles, and remove needle.
- Draw up cloudy insulin last (intermediate-acting, NPH).
- Be precise about the dosage!

SITE ROTATION

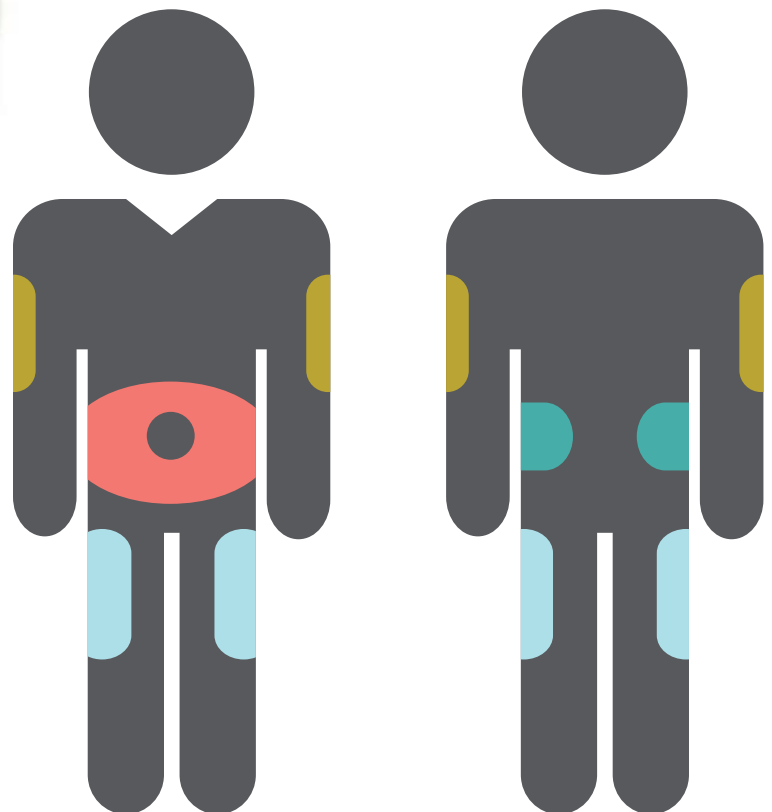
Insulin is injected into the fat layer beneath the skin. Insulin can be given in a variety of sites including the arms, thighs, abdomen and hips. Insulin is absorbed most rapidly from the abdomen. The arms absorb insulin more rapidly than the thighs or hips.

Giving your child's insulin injections in different places is called site rotation. Rotating insulin injection sites is important so that puffy, lumpy areas do not develop. When insulin is injected into the same site over time, it can cause the fat to build up, leading to the formation of lumps made of fat and scar tissue. Absorption of insulin from these lumpy areas is poor. If insulin is poorly absorbed, your child may have wide fluctuations in blood sugar levels.

Give insulin injections in at least two different areas of the body. Together with your child, develop a site rotation plan. Some families give all injections in the same area of the body for one week and then rotate to another site for the next week. Some families give all the morning injections in one site and all the evening injections in another site. The important thing is not how you rotate sites, but that you do rotate sites. With a very young child, the parents need to choose where the injections will be given, not the child.



Maintain a regular rotation of injection sites.



HOW TO INJECT INSULIN

Injecting Insulin:

1. Clean injection site with alcohol.
2. Pinch skin.
3. Insert needle at a 90-degree angle.
4. Push the insulin in at a steady rate.
5. After all the insulin is injected, count to five slowly.
6. Release pinch. Remove needle and dispose in sharps container.
7. Record insulin dosage in log book.

Insulin Pens

Insulin pens are available in two styles:

prefilled or permanent with disposable cartridges. The prefilled pens measure insulin in 1 unit increments and are thrown away when empty or 28 days after opening, whichever occurs first. The permanent pens hold disposable cartridges of insulin. Depending on the style, these pens may measure in half unit or one unit increments. Cartridges are discarded when empty or 28 days after opening.

For all pens, injecting insulin is similar to using a syringe.

- Wipe the top of insulin cartridge in the pen with alcohol and allow to air dry.
- Remove the paper tab from the needle and screw onto the top of the insulin pen.
- Remove the plastic cover(s) on the needle.
- Dial up two units on the insulin pen, point the needle upward into the air, and push the button. This primes the needle and makes sure there are no air bubbles in the pen and needle. If there is NOT a steady stream of insulin with the priming dose, repeat this step until there is a steady stream of insulin coming out of the needle.
- Dial the desired dose of insulin to be given.
- Wipe the injection site with alcohol.
- Pinch skin.
- Insert needle into the skin at a 90-degree angle.
- Push the button to inject the insulin in at a steady rate.
- After the complete dose of insulin is injected, count to 10 slowly.
- Pinch and remove needle from skin.

- Remove pen needle from pen and dispose in sharps container.
- Record insulin dosage in logbook.
- Be precise about the dosage.

Storage of Insulin

- Keep extra unopened bottles of insulin in the refrigerator.
- Keep insulin as cool as possible. If using ice, avoid freezing and do NOT use insulin that has been frozen.
- Insulin can break down and not work if it gets too cold (less than 36°F) or too warm (over 86°F). Keep insulin away from direct heat and out of direct sunlight.
- Unopened and refrigerated insulin is good until the stamped expiration date on the box and bottle of insulin.
- Insulin bottles that are open and currently in use may be kept at room temperature or in the refrigerator. All opened insulin bottles should be discarded after 28 to 30 days, regardless of storage conditions and amount of insulin remaining in vial or pen.
- Insulin pens that are open and currently in use should be stored at room temperature and away from heat and light. Humalog, Novolog, Lantus and Levemir pens must be used within one month of opening and the first dose given. If you are using any other type of insulin pen contact your pharmacist or see product insert for details.
- Store dilute insulin (U10) in refrigerator. It is good for only 28 days from date prepared by pharmacy.

WHEN YOU TRAVEL

- Protect insulin from becoming too hot or too cold. Keep below 86° F and above 36° F. (Do not leave insulin in a parked car).
- When traveling by plane, keep insulin and syringes in a carry-on bag. Do not put insulin in luggage that will be checked and placed in the baggage compartment.





- Be prepared to provide airport security personnel with copies of prescriptions for all diabetes supplies and the name of your diabetes doctor. Contact the diabetes office for a travel letter when flying.
- Airport X-ray machines do not affect insulin.
- People with insulin pumps and continuous glucose monitors can wear the devices through the airport X-ray machine.

MULTIPLE DAILY INJECTIONS

Your child will be taking insulin several times each day. A **long-acting insulin** is usually given once daily. The doctor will tell you the number of units to give. **Rapid-acting insulin** is given at all meals and for snacks containing carbohydrates. It is also given as directed by the diabetes team for high ketone levels. You will calculate the rapid-acting insulin each time it is given at meals and

snacks based on a formula given to you by the doctor.

What is the formula to calculate meal time insulin?

- The insulin sensitivity formula is used to calculate rapid acting insulin doses. It uses three pieces: The **target blood glucose**, the insulin **sensitivity factor** and the **insulin to carbohydrate ratio** or **ICR**. For each meal time dose, your child will take insulin for the food eaten and pre-meal blood sugar if it is above the target blood glucose.
- The **target blood glucose** is the blood glucose level expected after insulin is given.
- The **sensitivity factor** (also known as a **hyperglycemia correction factor**) is the amount 1 unit of insulin is expected to lower your child's blood glucose
 - Most often used for dosing at meals and snacks
 - May also be used to clear ketones and for sick day management.
- The **insulin to carbohydrate ratio (ICR)** is the number of grams of carbohydrates covered by 1 unit of insulin.

How does it work?

- Step 1:** Calculate the **correction dose**:
$$\text{BG (from glucometer)} - \text{target blood glucose (from diabetes doctor)} \div \text{sensitivity factor (from diabetes doctor)} = \text{Correction dose (units)}$$
- Step 2:** Calculate the **carbohydrate dose**:
$$\text{Total carbohydrate eaten} \div \text{ICR} = \text{Carbohydrate dose (units)}$$
- Step 3:** **Correction Dose + Carbohydrate Dose = total mealtime insulin dose**
- Step 4:** Round to either whole or half unit.

Rounding Rules:

Half- or whole-unit dosing will be specified by diabetes doctor.

- Full Unit rounding:
 - 0 to 0.49 rounds to 0
 - 0.5 to 0.99 rounds to 1
- Half unit rounding:
 - 0.1 to 0.25 rounds to 0
 - 0.26 to 0.75 rounds to 0.5
 - 0.76 to 0.99 rounds to 1

Let's practice:

Example:

ICR is 1 unit of insulin per 15 grams of carbohydrate.

Target blood glucose (BG) is 130 and sensitivity* is 50.

Mealtime BG is 199 and the child eats 79 grams.

Step 1: Calculate correction dose
 $BG - \text{Target BG} \div \text{Sensitivity} = \text{Correction dose (units)}$
 $199 - 130 = 69$ this means the child's BG is 69 points above target BG.
 $69 \div 50 = 1.38$ units this is your correction dose.

Step 2: Calculation of carbohydrate dose
 $79 \text{ grams of carbohydrate} \div 15 \text{ (ICR)} = 5.2 \text{ units}$

Step 3: Add correction dose to carbohydrate dose
 $1.38 \text{ units} + 5.2 \text{ units} = 6.58$

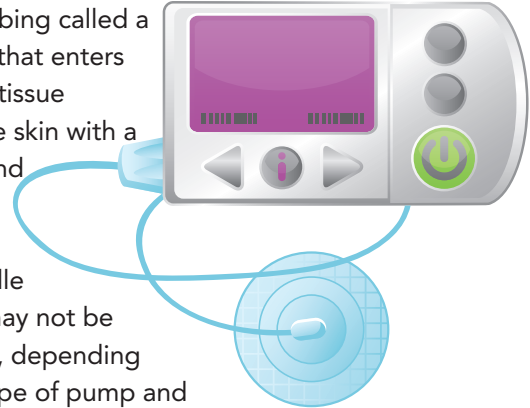
Step 4: Round. This child's meal time dose would be 6.5 units if dosing in half units, 7 units if dosing in whole units.

Other information about the multiple injection insulin regimen

- If your child eats a snack containing carbohydrates, they will likely need to take rapid-acting insulin. Use your child's insulin-to-carbohydrate ratio to determine the amount of insulin for the snack. It is not necessary to add the blood sugar correction at snack time unless instructed by your diabetes doctor or nurse.
- This regimen allows for flexibility in timing of meals and the amount of food eaten at each meal. You will have the most success with this plan when you check blood sugar before meals, accurately count grams of carbohydrate, and determine your child's insulin dose based on carbohydrate intake and pre-meal blood sugar. It is best to try to take the mealtime dose of insulin before your child begins eating if you know the number of grams of carbohydrate your child will eat with the meal.
- Insulin doses are tailored to your child's specific requirements and will change to meet their needs.

INSULIN PUMPS

An insulin pump is an insulin-delivering device about the size of a deck of cards that can be worn on a belt or kept in a pocket. An insulin pump connects to narrow, flexible plastic tubing called a catheter that enters the fatty tissue under the skin with a needle and is taped in place. The needle may or may not be removed, depending on the type of pump and insertion device.



Insulin pumps deliver insulin in two ways, one in a steady continuous trickle dose (the basal insulin) and two as a surge dose (the bolus insulin) around mealtime. Users set the pump to give a basal rate of insulin continuously throughout the day. Pumps release bolus doses of insulin (several units at a time) at meals and at times when blood glucose is too high, based on programming done by the user.

This delivery system most closely mimics the body's normal release of insulin. Both types of insulin doses require the user to push buttons on the pump to program the doses and to ensure adequate insulin delivery. The basal dose takes the place of the long-acting insulin (Tresiba, Lantus, Levemir, or Basaglar) and the bolus doses take the place of the mealtime injections. The insulin pump is usually filled with rapid-acting insulin (Humalog, Novolog, Apidra) by the user or a caregiver.

Insulin doses are delivered from the pump mechanism and into the body via the catheter or needle. Some insulin pumps have a length of tubing between the computerized device and the catheter, and some do not have tubing. All insulin pumps require the person with diabetes or a caregiver to insert a new needle and/or catheter into the body every two to three days. Some people need to change more frequently depending on total daily insulin dose and capacity of reservoir; average number of days depends on the type of pump.

People who use insulin pumps still have to monitor their blood glucose. Some insulin pumps communicate wirelessly with the glucometers or continuous glucose monitors (CGM's), and some insulin pumps require the user to enter the blood sugar levels each time they give a bolus dose.

CONTINUOUS GLUCOSE MONITORING

A continuous glucose monitoring device (CGM) is a piece of technology that can register fluctuations in the levels of glucose in the body. Different CGM's measure different types of body fluids. None of the devices measure actual blood glucose, but use a formula to convert body fluid glucose levels to a comparable value to blood glucose. All CGM's are implanted into the abdomen by the user or caregiver, and are connected to a transmitter which sends the glucose data to a receiver. In some instances the receiver may be an insulin pump, but the user does not have to use an insulin pump in order to use a CGM device.

CGM devices typically take glucose readings every 5 minutes. The user still needs to test blood glucose in order to calibrate the CGM device. It is recommended to continue to dose mealtime insulin based on blood glucose values, not CGM readings.

CGM devices can be helpful because they are very good at reporting glucose trends. They give warning alerts (vibrations or beeps) when the glucose level is rapidly rising or falling. The CGM readings are not as accurate as blood glucose testing, so this technology would not take the place of finger pokes or glucometers.

You will want to check with your insurance carrier before you buy an insulin pump or continuous glucose monitor (CGM), and supplies. Most insurance carriers cover these but some don't.

This technology is not an artificial pancreas. The concept of an artificial pancreas is a closed-loop-system that would monitor blood glucose, administer insulin, and make critical decisions for the person with diabetes. There currently is no artificial pancreas on the market for patient use outside of research studies in supervised settings.

Contact your diabetes doctor, nurse practitioner or certified diabetes educator if you are interested in insulin pumps or continuous glucose monitors.

CHAPTER 4

High Blood Sugar/ Hyperglycemia

HIGH BLOOD SUGAR (HYPERGLYCEMIA)

Blood Sugar Greater Than 200



Causes:

- too little insulin
- spoiled insulin
- too much food
- too little exercise
- illness, infection, fever
- late insulin injections (delayed or missed insulin injections)
- sneaking food
- inaccurate carbohydrate counting

Signs and Symptoms:

- increased thirst
- increased urination (frequent use of bathroom or bed-wetting)
- increased appetite
- weight loss
- vision problems (blurred vision)
- tired, weak
- headache
- irritable, crabby

You will learn to recognize the signs and symptoms of high blood sugar in your child.

One of the most helpful strategies to prevent high blood sugar levels is to frequently test blood sugars, keep records, and contact your diabetes doctor or nurse when you notice patterns of high blood sugars. This will help you adjust your child's insulin dose, food intake, or exercise level to prevent symptoms from occurring.



Ketone Formation

Check for ketones if blood sugar is higher than 300.

Without insulin, glucose cannot enter the body's cells to provide energy. The cells are forced to burn fat to get the energy they need. When fat is burned, by-products called ketones build up in the blood and spill into the urine.

When ketones build up they cause the blood to turn acidic, which can act like a poison. A high level of ketones in the blood is called diabetic ketoacidosis (DKA). Diabetic ketoacidosis usually comes on slowly, over several hours.

The most common causes of diabetic ketoacidosis are:

- newly diagnosed diabetes
- missed insulin injections
- severe illness

Eating extra food, sugar or candy does not directly cause ketones.

Symptoms of Diabetic Ketoacidosis (DKA):

- upset stomach or stomachache
- vomiting
- sweet (fruity) odor to the breath
- deep, heavy breathing
- drowsiness, coma

The prevention of diabetic ketoacidosis is based on being able to detect changes early, when ketones are present in the urine, but before the ketones build up in the body.

Check urine for ketones using a Ketostix. See Chapter 1, page 7 for How to Use Ketostix.

Low blood sugar can sometimes be present with ketoacidosis, so urine must be checked for ketones with every illness or any time your child vomits.

Call the diabetes doctor immediately (day or night) if ketones are moderate or large. Your child may need extra rapid-acting insulin (Humalog, Novolog or Apidra) to clear the ketones.

Drinking lots of sugar free fluids (water, diet soda) is also important to help clear the ketones out in the urine.

A "one time" high blood sugar with negative ketones is not a diabetes emergency. If your child has a pattern of frequent high blood sugars, call the diabetes doctor or nurse educator for assistance with insulin dosage adjustments.



CHAPTER 5



Low Blood Sugar/ Hypoglycemia

Signs and Symptoms:

The SIX S's of Low Blood Sugar

- | | |
|---------------------------------------|------------------|
| S haky | S taring |
| S leepy | S tubborn |
| S weaty
(but cool to touch) | S pacey |

LOW BLOOD SUGAR (HYPOGLYCEMIA)

Hypoglycemia occurs when the body doesn't have enough sugar to burn for energy, and the level of sugar in the blood falls too low. You may also hear this referred to as "insulin reaction."

Low blood sugar comes on quickly and must be treated by the person, family, friends or responsible caregiver. The family of a newly diagnosed child with diabetes must know the signs of low blood sugar before leaving the hospital. The family must teach any babysitter, teacher, coach, bus driver, etc., the signs of low blood sugar and how to provide treatment.

Blood Sugar Less Than 70

FOOD

INSULIN **EXERCISE**

Causes:

- Too much insulin
- Excessive exercise
- Not enough food
- Delayed meal or snack
- Drinking alcoholic beverages



Shaky



Sweaty



Dizzy



Stubborn



Starving



Sleepy

Other Symptoms:

- Confused
- Pale
- Crying, disorientation
- Irritability, anger
- Headache
- Strange behavior

At Night, Watch For:

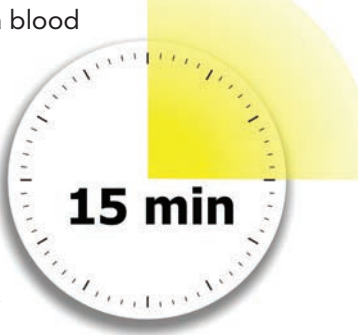
- Nightmares
- Sleep walking or talking
- Restless sleep
- Any symptoms listed above
- Blood sugar should be >120 at bedtime and >100 through the night.

GLUCAGON

- If your child is unconscious, uncooperative, unable to swallow and/or having a seizure (jerking of the arms or legs), do not attempt to feed the child. Turn child on his/her side to prevent choking. Give your child an injection of Glucagon and call 911. Placing a call to 911 during an episode of severe low blood sugar will provide a back-up in case glucose needs to be given by vein.

HOW TO TREAT HYPOGLYCEMIA/ LOW BLOOD SUGAR

Rule of 15:

- 
- Step 1** Try to obtain a blood sugar test as soon as possible.
- Step 2** If 70 or under, your child needs to eat or drink 15 grams of fast-acting sugar (see chart).
- Step 3** Recheck the blood sugar 15 minutes after treating.
- Step 4** If the blood sugar is still under 70, or if the child does not feel better, repeat the above treatment.
- Step 5** If more than one hour until the next scheduled meal or snack, then a protein and complex carbohydrate snack must also be given (see chart).

If your child feels low but is unable to check blood sugar, treat symptoms as low blood sugar.



- Glucagon is a hormone naturally released by the body that frees stores of sugar from the liver. An injection of glucagon causes the body's own stored sugar to move into the bloodstream and raise the blood sugar.
- Always keep a Glucagon Emergency Kit at home and school. Notify your child's diabetes doctor or nurse immediately after giving glucagon. This is important so that your child's insulin dose may be appropriately adjusted and a new prescription for glucagon given.
- Side effects of glucagon may include nausea and vomiting. Place the child on their side after the shot of glucagon is given.
- Glucagon should be stored at room temperature. It should not be frozen or exposed to temperatures greater than 78°F. After mixing glucagon, it should be used immediately. Discard any unused portion.
- Check expiration date on the box regularly and replace the kit if it has expired.

WHAT TO DO: GIVE FAST-ACTING SUGAR, SUCH AS:

Sugar	3 packets, 1 tablespoon
Fruit Juice	½ cup / 4 oz.
Regular Soft Drink	½ cup
Glucose Tablets	3-4 tablets
Honey, Syrup, or Jelly	1 tablespoon
Cake Decorating Frosting	1 ounce tube



SNACK SUGGESTIONS:

1 glass of milk / 8 ounces
1 sandwich (meat, cheese, peanut butter)
3-6 graham crackers or saltine crackers with meat, cheese or peanut butter

CHAPTER 6



The person with diabetes must take extra precautions because diabetes can get out of control quickly during illness. Illness puts more stress on the body, and extra insulin may be required by the body to prevent ketones from building up in the blood. Ketones are a type of acid, and if allowed to build up, can lead to ketoacidosis. Also, illness can make it difficult to eat and to drink.

The stress of illness increases the blood sugar because stress hormones are released by the body when sick. These hormones work against insulin and cause the body to release stored sugar from the liver to provide the body with extra energy. Stress hormones also cause fat to be burned, leading to ketones. Illness, therefore, may cause diabetes to get out of control. The main goal of sick day management is to keep the child out of ketoacidosis.

When not feeling well, people with diabetes must continue to test their blood sugar, test their urine for ketones, and take their insulin. More frequent testing of blood sugar and ketones may be necessary.

Sick Day Management

Sick Day Rules

- Never skip insulin during illness; call the diabetes doctor if you are unsure of your child's insulin dose while they are sick.
- Child may need extra doses of insulin during illness, especially the rapid acting insulin (Humalog®, Novolog®, or Apidra®).
- Always have a bottle of Humalog, Novolog, or Apidra insulin available for such days even if your child does not routinely take a short-acting insulin.
- Drink sugar-free liquids to prevent dehydration. Aim for one ounce of fluid per hour for every year of age up to age 16. Older teens can aim to drink 16 ounces per hour.
- Check blood sugar and ketones every 2-3 hours.
- If unable to eat solid foods, replace them with carbohydrates in the form of liquids or soft foods. Your child needs carbohydrates for energy. Eating is important to keep blood sugars from dipping low and to prevent the body from burning fat that produces ketones.
- If your child is unable to eat, sweetened liquids may be substituted for the amount of carbohydrates in your child's meal plan, if tolerated.
- Return to your regular meal plan when illness subsides.
- During any illness, have your child drink a large glass of water or calorie-free liquid every hour *in addition* to the liquids used to replace the carbohydrates. This will help to prevent dehydration. This is especially important if your child has a fever, is vomiting, or has diarrhea. If child is nauseated or vomiting, try giving small sips of (1-2 tablespoons) liquids every 15-30 minutes.
- Always remember to check for ketones any time a person with diabetes is ill. A low blood sugar can sometimes be present with acidosis, and so ketones must be checked with every illness, even if the blood sugar is low.
- Call your diabetes team if you have questions about insulin doses and diabetes management during illness. Call the pediatrician for treatment of the illness.

See *Sick Day Action Plan* on page 23.

Call your health care team immediately if your child:

- Vomits twice or has diarrhea.
- Cannot keep any carbohydrate liquid down for 6-8 hours.
- Has moderate to large urine ketones.
- Has difficulty breathing, chest pain, is confused, has slurred speech, double vision, or is very drowsy (possible diabetic ketoacidosis).
- Has a bad stomachache.

Glucagon Administration for Illness

Call the diabetes doctor if your child's blood sugar is less than 100 mg/dl and is unable to eat or keep food down. A low dose of glucagon may be recommended to raise blood sugar. Glucagon would be prepared according to instructions. It would be drawn up with an insulin syringe and given in the same place you would give an insulin injection (this is different from the instructions for glucagon used for severe low blood sugar reactions!). The diabetes doctor will tell you the dose to give your child. The usual dose for children age 2 years and younger is 2 units (0.02 ml of mixed glucagon solution). Children age 3 years and older may receive one unit of glucagon per each year of age. The maximum dose is 15 units even for teens and adults. If the blood sugar is not above 100 mg/dl in 30 minutes, the dose may be repeated. After you have mixed the glucagon with the diluting solution, any remaining solution should be discarded.

SICK DAY FOODS IN 15 GRAM PORTIONS

½ cup orange juice	½ cup regular Jell-O
1 cup Gatorade	6 saltine crackers
1 slice toast or bread	½ cup sugar-free pudding
1 regular popsicle	½ cup ice cream
¼ cup sherbet	1 cup chicken noodle soup
½ cup cooked cereal	1 cup plain yogurt
1 cup milk	½ cup regular soda
½ cup custard	

SAMPLE SICK DAY MENU

8 a.m.	12 ounces regular soft drink	45 grams
10 a.m.	½ cup regular Jell-O	15 grams
12 p.m.	⅔ cup apple juice and ½ cup regular Jell-O	30 grams
2 p.m.	8 ounces Gatorade	15 grams
4 p.m.	2 twin bar popsicles	15 grams
6 p.m.	1 cup chicken noodle soup and 6 saltines	30 grams
8 p.m.	12 ounces regular soft drink	45 grams
TOTAL		195 grams

Each time the child consumes more than 15 grams of carbohydrate, you should try to dose rapid-acting insulin (Novolog, Humalog or Apidra) like you would at a normal meal. It is acceptable to dose afterwards when a child is sick. Dose according to your normal mealtime guidelines unless a diabetes doctor or nurse instructs you otherwise. Consult diabetes doctor or nurse if you are considering dosing for under 15 grams, especially if blood glucose is below target ie, if experiencing a low blood sugar.(hypoglycemia is defined by blood sugar less than 70 in most people, but younger children might have target ranges starting at 80 or 100, depending on age and developmental stage).

DIABETES SICK DAY ACTION PLAN

NAME _____

Your diabetes care provider will help you fill out this plan.

Date of Birth _____

Ketones are caused by lack of insulin.





1. CHECK KETONES IF:

- > Blood sugar is above 300 mg/dl
- > Blood sugar is below 300 mg/dl but you are sick: vomiting, fever, stomach pain

Date of Visit _____

Weight _____

2. FIND YOUR KETONE ZONE BELOW.

<h3>Green Zone:</h3> <ul style="list-style-type: none"> • Urine ketones — negative or trace • Blood ketones — less than 0.6 		<p>Drink lots of sugar-free fluids.</p> <p>Drink _____ per hour</p> <p>At least 1 ounce for each year of age, every hour Example: a 5-year-old should drink at least 5 ounces every hour</p>									
<h3>Yellow Zone: Watch Out!</h3> <ul style="list-style-type: none"> • Urine ketones — small • Blood ketones — 0.6-1.4 		<p>Continue checking blood sugar every 2 hours and ketones every time you pee while you are sick or your blood sugar is above 300 mg/dl.</p> <p>Keep giving BOTH long-acting and rapid-acting insulin according to your usual doses.</p>									
<p>If you have vomiting for more than 2 hours or blood sugars less than 100 and are not eating/drinking well, call your doctor.</p>											
<h3>Red Zone: Danger!</h3> <ul style="list-style-type: none"> • Urine ketones — moderate or large • Blood ketones — 1.5-3.0 		<h4>MY SICK DAY DIABETES REGIMEN</h4>									
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Medicine:</th> <th style="width: 33%;">My Doses:</th> <th style="width: 33%;">When:</th> </tr> </thead> <tbody> <tr> <td>Long-Acting Insulin</td> <td></td> <td>Normal time if no dose was missed.</td> </tr> <tr> <td>Rapid-Acting Insulin</td> <td></td> <td>Every 2 hours if blood sugar is above 200 mg/dl. If eating, add to carb dose.</td> </tr> </tbody> </table>	Medicine:	My Doses:	When:	Long-Acting Insulin		Normal time if no dose was missed.	Rapid-Acting Insulin		Every 2 hours if blood sugar is above 200 mg/dl. If eating, add to carb dose.
		Medicine:	My Doses:	When:							
		Long-Acting Insulin		Normal time if no dose was missed.							
		Rapid-Acting Insulin		Every 2 hours if blood sugar is above 200 mg/dl. If eating, add to carb dose.							
<p>Check blood sugar and ketones every 1-2 hours.</p>											
<p>Drink lots of sugar-free fluids (see above). If blood sugar is less than 250 mg/dl then include 15 grams of sugar-containing fluids (Gatorade, juice, soft drink, etc.) every 1-2 hours.</p>											
<p>If ketones do not decrease after 2 red zone insulin doses, you have vomiting for more than 2 hours, your blood sugar is less than 100 or other concerning symptoms — CALL YOUR DOCTOR right away.</p>											
<h3>STOP: High risk of diabetic ketoacidosis!</h3> <ul style="list-style-type: none"> • Blood ketones — more than 3.0 • Fast or abnormal breathing • Weak or difficult to awaken 		<p style="text-align: center;">CALL YOUR DOCTOR RIGHT AWAY!</p> <p style="text-align: center;">Phone number of doctor/nurse:</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Ask for the diabetes doctor-on-call.</p>									
		<p>If unable to wake your child or if child appears very weak, call 911 immediately.</p>									

CHAPTER 7

Meal Planning Guidelines

NUTRIENT GROUPS

All foods are made up of at least one of the major nutrient groups: carbohydrates, protein or fat. Many foods are made up of a combination of these nutrients.

Carbohydrates

Carbohydrates are used mainly as a source of energy. During digestion carbohydrates are broken down to blood glucose (sugar). Glucose is used by the body for energy. A well-balanced meal plan contains approximately 50 to 60 percent of calories from carbohydrates. Insulin is needed to allow the glucose to pass from the bloodstream into the cell. Carbohydrates can be complex or simple. Complex carbohydrates such as breads, noodles, fruits or potatoes provide vitamins, minerals, and energy for the body. Simple carbohydrates are found in juice, soft drinks, candy and sweet desserts. They provide energy, but few nutrients. We should limit simple sugars to no more than 10 percent of our daily calories. You will need to read food labels to determine how much sugar is in a product. Sugar can have several different names when listed in the ingredients. Look for the following in the ingredients to assess how much sugar is found in the product. (Sugar names often end in "ose.")

- **Sucrose** is table sugar and is often found in soft drinks and candy.
- **Glucose** is the sugar found in our bloodstream. It can be found in corn syrup.
- **Fructose** is found mainly in fruit and fruit juice, but is also found in many food products, especially high-sugar beverages and is also sold in granulated form.
- **Lactose** is the form of sugar naturally occurring in milk and dairy products.
- **Maltose** is 100 percent glucose.
- Syrups are all primarily **glucose**. Examples are maple syrup and corn syrup.

Proteins

Proteins are used primarily by the body for muscle and bone growth. Protein also provides valuable vitamins and minerals. Most protein is found in animal products such



as milk, meats, fish, chicken, turkey, eggs and cheese. Non-animal sources of protein include dried beans, tofu, legumes and nuts. About 15 to 20 percent of our calories should come from protein sources. Eating more protein than we need, especially animal protein, usually results in excess calories and an increase in weight.

Fats

Fats are used primarily for energy; they are also a source of vitamins and minerals. Fats should provide 25 to 30 percent of our total calories for the day. Higher saturated and trans fat intake can lead to high cholesterol levels and a higher risk for heart disease. Healthier fats include olive oil, canola oil, and avocado.

CARBOHYDRATE COUNTING

If you have diabetes you must pay particular attention to the type of food and the amount of food you consume. This will determine how high and how fast your blood glucose (blood sugar) level will rise.

The carbohydrates in food have a greater effect on your blood glucose level than protein or fats. It is important to add up the total carbohydrates eaten at each meal and snack. Once you know how many carbohydrates you

have eaten, then you can determine how high your blood glucose level should rise.

Carbohydrates are found in breads, cereals, pasta, potatoes, fruit, fruit juices, milk and yogurt. Carbohydrates are measured in grams. The way to count carbohydrates is to read the food label or look up the food item in your Calorie King book. Go to www.calorieking.com for useful information and helpful apps.

FOOD PLANNING FOR PEOPLE WITH DIABETES

The diet for a person who has diabetes is a well-balanced, nutritious meal plan. It is individualized according to the patient's age, food preferences and life style.

General guidelines are:

- Limit snacks to foods with minimal to no carbohydrate.
- Eat a well-balanced diet that includes a variety of foods. You do not need special or diet foods.
- Eat on a regular schedule. Do not skip meals. Eat meals at about the same time each day.
- Eat 5 to 9 servings of fruits and vegetables each day.
- Eat at least 3 meals a day according to your meal plan.
- Be consistent. Eat similar size and types of meals from day to day.
- Offer nutritious substitutes for uneaten or refused foods from the meal plan.
- Choose low fat foods often.
- Eliminate juice from your diet or limit your fruit juice to one 4-ounce portion with a meal, once a day. If you choose canned fruit, use unsweetened, water-packed or packed in juice (not syrup).
- Always include a food with protein with bedtime snacks.

Building healthy meals using the MyPlate approach can help you include more fruits and vegetables, whole grains, lean protein, and low-fat dairy in your diet.

See page 27 or go to ChooseMyPlate.gov for more information.

FOOD LABELS

The United States Department of Agriculture (USDA) and the Food and Drug Administration (FDA) standardize food labels. All food packages are required to provide certain nutritional information.

Similar food products have similar serving sizes. This

Nutrition Facts

Serving Size 1 cup (228g)

Servings Per Container about 2

Amount Per Serving

Calories 250 Calories from Fat 110

	% Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
<i>Trans</i> Fat 3g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	

Proteins 5g

Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

For educational purposes only. This label does not meet the labeling requirements described in 21 CFR 101.9.

makes it easier to compare foods. The amount of calories per serving, total fat, cholesterol, sodium, total carbohydrate and proteins are specified on each label so you can purchase foods that fit your child's meal plan.

To help control blood glucose and to fit a variety of foods into your child's meal plan, check the amount of total carbohydrate listed per serving. Note that sugar is listed

under the total carbohydrate column. Sugars are already included in the carbohydrate totals.

SUGAR IN THE DIET

The new guidelines for using sugar in your diet will allow the use of a small amount of table sugar (sucrose). If your blood glucose levels are under good control, a certain amount of foods containing sugar can be worked into your meal plan. Sugar is not a “free food.” It counts as a carbohydrate and must be substituted for other foods containing carbohydrates. The nutrition facts labels on almost all packaged foods will tell you how many grams of carbohydrates and sugar are in the food.

There are good reasons to limit the amount of sugar you consume. Sugary foods are often foods without much nutrition. They have calories but lack vitamins, minerals, protein and fiber that are important to your health. Foods that are made with a lot of sugar are often also high in fat. Eating too many high fat foods can cause an increase in weight, and this may make your diabetes more difficult to control. It may also put you at higher risk for heart disease.

LOW CALORIE SWEETENERS

Using artificial sweeteners will make your food taste sweet, but they do not count as carbohydrates in your meal plan. There are six artificial sweeteners approved for use in moderate amounts. *NOTE: Most research on the safety of artificial sweeteners has been done in adults, not children.*

Acesulfame potassium

Acesulfame potassium (brand names include Sweet One or Acesulfame K) is calorie-free and about 200 times sweeter than sugar. It can be used in baking and cooking because it does not break down when heated.

Aspartame (NutraSweet)

Aspartame (brand names include NutraSweet and Equal) is a very low calorie sweetener and is about 200 times sweeter than sugar. Although aspartame is widely used in foods and beverages, it is not recommended for use in recipes that require lengthy baking because of the loss of sweetness. Persons with a rare hereditary disease known as phenyl ketonuria (PKU) must control their intake of phenylalanine from all sources, including aspartame.

Saccharin

Saccharin (brand names include Sweet 'N Low and Sugar Twin) is calorie-free and about 300 times sweeter than sugar. Because saccharin is stable when heated, it is suitable for foods and beverages, and in cooking and baking. Decades ago there were questions about whether saccharin could cause cancer based on animal studies. Numerous follow up studies with animals and humans have shown no overall association between saccharin consumption and cancer incidence.

Sucralose

Sucralose (brand name Splenda) is calorie-free and is approximately 600 times sweeter than sugar. It is made from sugar through a patented, multi-step process. Sucralose is highly stable and can be used in foods, beverages, and in cooking and baking. Sucralose is not recognized by the body as a sugar or carbohydrate. Studies show that sucralose can raise the blood sugar, but not as high as sucrose (table sugar).

Stevia

Stevia (brand names include Truvia, Sun Crystals, and PureVia) is the latest artificial sweetener to be generally recognized as safe by the FDA. It is calorie-free and 200-300 times sweeter than sugar. It has been approved for use as a tabletop sweetener and as an ingredient in foods and beverages. Some people believe that stevia is healthier than other artificial sweeteners because it is derived from a plant, but there is currently no evidence that stevia provides extra health benefits other than being sugar-free and calorie-free.

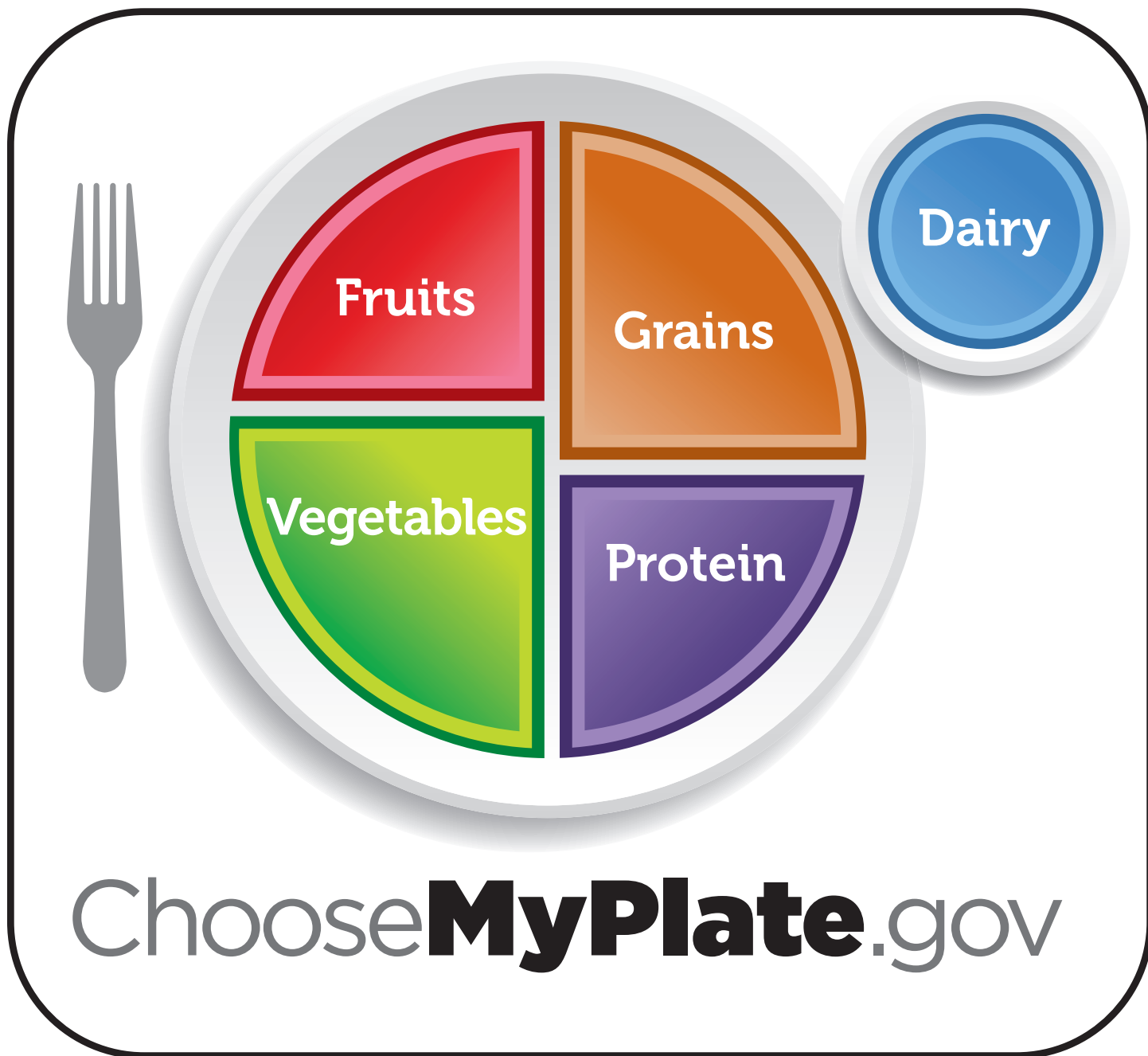
Polyols

Polyols (or sugar alcohols) are another group of reduced calorie sweeteners that contain some calories. Polyols are found naturally in berries, apples, plums, and other foods, but are manufactured from carbohydrates for use in sugar-free candies, cookies, chewing gums and other reduced calorie foods. Familiar names include sorbitol, mannitol and isomalt. Polyols provide on average half the calories of sugar and other carbohydrates. Some polyols, such as sorbitol, may produce gas and discomfort in the stomach and may cause diarrhea in some people when large amounts are consumed.

CHOOSE MY PLATE

Visit Choosemyplate.gov to learn how to make healthier choices.

To start building better meals using this approach, focus on filling half of your plate with fruits and vegetables, make sure half of the grain products you eat are whole grains, choose lean proteins, and try to eat or drink some calcium-rich foods throughout the day.



BASIC NUTRIENT GROUPS

* contains carbohydrates

CARBOHYDRATE

Starch Group

- Bread
- Cereal
- Pasta
- Rice
- Potato, corn, peas



PROTEIN

- Meat
- Chicken
- Turkey
- Fish
- Cheese
- Eggs
- Peanut Butter*
- Beans or Lentils*



Fruit Group

- Fruit and fruit juices



FAT

- Margarine
- Salad Dressing*
- Cooking Oil
- Cream Cheese
- Cream
- Nuts
- Bacon
- Shortening



Milk Group

- Milk
- Yogurt



Vegetable Group

- Leafy greens and other vegetables



CARBOHYDRATES

In the meals below circle the foods that would count as **CARBOHYDRATES**.

Breakfast	Lunch	Dinner
1 4x4 inch pancake	4 ounces hamburger	4 ounces baked fish
1 large egg	Small order french fries	½ cup broccoli
1 tablespoon syrup	12 ounces diet soft drink	½ cup potatoes
1 teaspoon margarine	1 tablespoon ketchup	1 tablespoon sour cream
1 slice bacon	½ cup frozen yogurt	8 ounces milk
4 ounces orange juice		½ cup sugar-free Jell-O

The next step is to find out the amount of carbohydrate, fat and protein in each food. Remember portion sizes are key to accurate carbohydrate counting!



ESTIMATING PORTIONS

Proteins



3 oz. serving of meat is the size of a deck of cards



2 Tbsp. peanut butter is the size of a ping pong ball



1 oz. cheese is size of a domino

The most accurate way to measure portions is to read the label. Use the Calorie King book you were given, access the website at www.calorieking.com, or using the Calorie King smartphone app.



Carbohydrates



1 average pancake is the size of a DVD



1/2 cup cooked rice, pasta or potatoes is half of a baseball



Small baked potato is the size of a computer mouse



Medium piece of fruit is the size of a baseball



1/2 cup of sliced canned fruit is the size of a tennis ball



1/2 cup of ice cream or frozen yogurt is half of a baseball



Average bagel is about the size of a hockey puck

Fats



2 Tbsp. salad dressing is size of a golf ball



1 tsp. butter or margarine is the size of 1 die

SNACKS

(g. = grams of carbohydrate)

- Mini-pretzel twists, 12 pretzels = 15 g.
- Fresh fruit, ½ cup = 15 g.
- Raisins, 0.9 oz. box = 21 g.
- 5 Vanilla Wafers = 15 g.
- 7 animal crackers = 15 g.
- 20 Cheese Nips = 15 g.
- Traditional Chex Mix, ½ cup = 15 g.
- 6 Ritz or Hi Ho crackers = 15 g.
- 14 Wheat or Vegetable Thins = 18 g.
- Juice (apple, grapefruit, orange), ½ cup = 15 g.
- Juice (grape, cranberry, pineapple), ⅓ cup = 15 g.
- 1 granola bar = 18 g.
- Rice cakes, ½ oz. = 11 g.
- Small muffin, 3 oz. = 25 g.
- 1 slice of bread = 15 g.
- ½ English muffin or bagel, 1 oz. = 15 g.
- Unbuttered popcorn, 3 cups = 15 g.
- Mashed potato, ½ cup = 15 g.
- Rice, ⅓ cup = 15 g.
- 1- 4½ inch waffle = 15 g.
- Unsweetened cereal, ¾ cup dry = 15 g.
- 12 grapes or cherries = 15 g.
- Nonfat frozen yogurt, ⅓ cup = 15 g.



LOW-CARBOHYDRATE SNACKS
















(less than 5 grams per serving)

- 1 Tbsp. peanut butter spread on 5 celery sticks
- ¼ cup cottage cheese
- 1 cup light popcorn
- ¼ cup almonds, peanuts, pistachio or macadamia nuts
- String cheese, cheese cubes
- Salad: 1 cup lettuce/spinach, ½ cup carrots, ½ cup tomatoes, 1 Tbsp. dressing
- 1 oz. tuna mixed with 1 Tbsp. light mayo spread on 4 whole grain Wheat Thin crackers
- 1 cup raw broccoli, cauliflower, peppers, cucumbers dipped in 1-2 Tbsp. light ranch dressing
- Cucumber salad prepared with thinly sliced cucumbers, sour cream, dill and vinegar
- 2 oz. grilled chicken breast mixed with light mayo/mustard or Italian dressing, wrap in lettuce leaf
- 6 baby carrots with 1 Tbsp. ranch dressing, 1 piece string cheese
- Omelet: 1 egg and 1 egg white, ¼ cup green pepper, 2 Tbsp. shredded cheese
- Eggs (hard boiled, scrambled, fried)
- Scrambled egg substitute (½ cup)
- Sugar-free gelatin
- Deli meats (3 oz. serving): turkey, roast beef or ham

Remember:

- Select the portion sizes that will fit into your meal plan!
- Check food labels of specific products for amount of total carbohydrates per serving.
- Depending on the amount of carbohydrate, some snacks may require insulin. Always follow the recommendations of your diabetes doctor and/or nurse.

CREATIVE CARBOHYDRATE AND PROTEIN SNACK COMBINATIONS

	Snack	Carb	Protein
	1 tablespoon peanut butter and 5 crackers	18 grams	4 grams
	1 ounce cheese and 5 crackers	15 grams	7 grams
	1 tablespoon peanut butter on 1 slice whole wheat toast	18 grams	5 grams
	1 slice cheese on 1 slice whole wheat toast	15 grams	8 grams
	1 egg and 1 slice whole grain toast	15 grams	7 grams
	String cheese and 1 ounce pretzels	23 grams	8 grams
	Mini pizza on toasted English muffin or 1 ounce bagel	15 grams	8 grams
	3 cups popcorn with 2 tablespoons Parmesan cheese	15 grams	6 grams
	8 Melba toast or bread sticks with cottage cheese	20 grams	18 grams
	Quesadilla: corn tortilla with 1 ounce grated cheese and salsa	15 grams	9 grams
	Meat or 1 ounce cheese taco	15 grams	9 grams
	½ cup cottage cheese and ½ cup fresh fruit	20 grams	20 grams
	1 ounce cheese cubes and ½ cups fresh fruit	15 grams	9 grams
	Frozen banana (4 inches) with 1 tablespoon peanut butter	19 grams	4 grams
	Small baked potato 1¾" diameter with 1 ounce grated cheese	15 grams	7 grams

Remember to follow insulin dose instructions for snacks!

MEALTIME MATH

Find the amount of carbohydrate in each meal item. Add up the total to see how many total carbohydrates are in these healthy meals and snacks.

FOOD	AMOUNT	CARBOHYDRATE
Skim Milk	6 ounces	11 grams
Water	8 ounces	0 grams
Orange Juice	4 ounce	15 grams
Apple	1 regular	18 grams
Banana	1 regular	23 grams
Garden Salad	1 cup	3 grams
Potato	10 oven-roasted slices	25 grams
Carrots	½ cup raw baby carrots	8 grams
Green Beans	½ cup serving, steamed	6 grams
Chicken	1 grilled chicken breast	1 gram
Natural Peanut Butter	2 tablespoons	6 grams
Cheese Cubes	1 ounce	1 gram
Yogurt, Fruit Flavored	4 ounces	22 grams
Meat Sauce	½ cup	7 grams
Spaghetti Noodles	1 cup	33 grams
Corn Flakes Cereal	1 cup	24 grams
Mini Pretzel Twists	1 ounce	26 grams
Garlic Breadstick	1 breadstick	26 grams
Ranch Dressing	1 ounce	4 grams

Breakfast

Yogurt +
 Banana +
 Cereal +
 Milk +
 Orange Juice +
Total =



Lunch

Spaghetti +
 Meat Sauce +
 Garden Salad +
 Ranch Dressing +
 Garlic Breadstick +
 Milk +
Total =



Dinner

Grilled Chicken +
 Green Beans +
 Baked Potato +
 Milk +
Total =



Snack 1

Water +
 Baby Carrots +
 Ranch Dressing +
Total =



Snack 2

Water +
 ½ Apple +
 Peanut Butter +
Total =



Snack 3

½ oz. Mini Pretzels +
 Cheese Cubes +
Total =



BENEFITS OF EXERCISE

Exercise Helps to Lower Blood Sugar

Exercise helps the body to lower blood sugar. During exercise, blood flow increases in the body, causing more of the injected insulin to be absorbed into the blood. This increase of insulin flowing in the blood allows the muscles to take up more sugar to use for energy, which lowers blood sugars.

Exercise Helps to Make People More Sensitive to Insulin

The number of insulin receptors (places where insulin attaches to cell membranes to allow sugar to pass into the cell) actually increases as the result of exercise. This is the only way people can increase insulin sensitivity. Insulin can then work more efficiently, possibly allowing a person to take a lower dose of insulin.

It may be helpful to think of exercise as causing increased insulin sensitivity over the next 12-16 hours.

Exercise Helps Maintain Normal Blood Circulation to the Feet

Studies have shown that teenagers who exercise regularly and continue to exercise throughout their lives are more likely to maintain normal foot circulation in later life. Circulation to the feet can be a problem as persons grow older, especially persons who have diabetes.

Exercise Helps People Feel Better

Exercise can be good for your mental health too! Many people seem to have more confidence and self-esteem when they exercise regularly. They feel a pride in being in good physical condition and tend to have a higher energy level. Some people say that exercise seems to elevate their mood, helping to relieve stress and anxiety. Exercise also gives people the opportunity to socialize with others. It is important that young children play outdoors with their friends, and that teenagers are involved in organized sports or activities.

Exercise Helps Keep the Body in Good Shape

Exercise is important for everyone. Years ago, most daily tasks involved exercise. Today, modern machines such as cars and washing machines prevent us from having to exercise. As we get older, this lack of exercise can lead to health problems such as obesity and heart disease. Recent studies have shown that more and more children and teenagers are overweight. One of the best ways to prevent being overweight and to promote a healthy lifestyle is to exercise regularly.

Exercise Helps Lower Heart Rate (Pulse) and Blood Pressure

Exercise helps the heart become stronger. A healthy heart can pump more blood with each heartbeat, allowing it to work at a slow and steady pace. An average heart rate (pulse) is 80 beats per minute. Blood pressure also tends to be lower in people who exercise, causing less stress to the heart. Lower blood pressure helps decrease the risk of heart attacks later in life, as well as preventing the eye and kidney complications of diabetes.

Exercise Helps Keep Blood Fat Levels Normal

Studies have shown that higher levels of blood fat (also known as lipids, cholesterol and triglycerides) in the blood can lead to early aging of blood vessels. Many children with diabetes tend to have higher levels of these blood fats. Exercise and good blood sugar control are the best ways to reduce blood triglyceride levels and help remove cholesterol from blood vessel walls.





Safe Exercise Tips

- Check blood sugars before exercise, every 30 minutes during strenuous exercise, and after exercise. This is the most effective tool for deciding when and how to increase food intake or reduce insulin dosage during exercise.
- Wear an identification (ID) bracelet or necklace.
- Make sure coaches know about low blood sugars and how to treat them
- Avoid injecting insulin into a site that will be actively involved in exercise.
- The blood sugar lowering effects associated with exercise may last up to 24 hours. Check blood sugar at 2 a.m. if bedtime blood sugar is less than 120.
- Check ketones before exercise if not feeling well or if blood glucose levels are >300 .
- DO NOT ALLOW EXERCISE if ketones are present.
- You may end up reducing insulin doses for planned exercise. This is not always recommended. Ask your diabetes doctor or nurse educator for assistance. It is best to have your newly diagnosed child exercise without modifications, then make changes based on how their blood sugar was affected by the exercise.
- My child's blood sugar goal prior to exercise is:
_____ (ask your diabetes doctor or nurse)

EXERCISE QUESTIONS

When should I exercise?

Try to exercise at the same time each day. Most children exercise after school, either playing outside or participating in school sports. Aim for a total of 60 minutes of activity each day. Be prepared for unplanned activity by having quick-acting sugar available.

Are there times that I should not exercise?

Do not exercise if you have any ketones in the urine. If your urine ketone level is large or moderate, exercise can raise the sugar or ketone level.

What kinds of exercise are best?

The very best exercise is the one that you enjoy doing. If you hate jogging but are told to do it because it is good for you, you probably will not keep it up very long. Exercise is more likely to become a lifetime habit if it is enjoyable.

Aerobic exercise helps keep your heart in good shape. Aerobic exercise is any continuous activity (walking, bicycling, swimming, aerobic dance) which takes at least 25 minutes or longer to do, and which gets your heart beating at a faster pace. At least 25 minutes of aerobic exercise, at least 3 times per week, is enough to improve the health of your heart.

How can I prevent low blood sugar reactions during exercise?

Exercise affects each person with diabetes differently. The best way to learn how exercise will affect you is to check blood sugars before, during (when possible), and after you exercise. Keeping good records will help you to know how the exercise has affected your blood sugar levels. Based on these records, a plan can be developed for changing insulin doses or including additional snacks during exercise.

If you are going to exercise around mealtime, eat the meal first. Try to allow at least a half hour for digestion to occur. Liquids, such as milk or juices, are absorbed more rapidly, and generally will prevent low blood sugar reactions for 30 to 60 minutes. Solid foods, like a sandwich, are digested more slowly, and usually provide protection from lows for up to 2 to 3 hours. If possible, try to begin an exercise 30 to 60 minutes after a meal.



ADDITIONAL SNACK GUIDELINES

When exercising around meal times, eat the meal first when possible. Try to begin exercise 30 to 60 minutes after a meal. Additional snacks may be necessary if there has not been a meal prior to the exercise.

In general, 15 to 20 grams of carbohydrate should be eaten for every 30 minutes of strenuous exercise or for every 60 minutes of less strenuous activity. Ask your diabetes doctor or nurse if you have questions about what is best for you.

- If blood sugar is less than 120, eat a snack that contains both 15 grams of carbohydrate and some protein to help prevent hypoglycemia during exercise. Good choices would include cheese and crackers, half of a peanut butter sandwich, half of a turkey sandwich, etc.
- Drinking water before, during and after exercise is important, especially during hot weather.
- Always have a source of fast-acting sugar — such as sugar packets, fruit juice or glucose tablets — available in case a low blood sugar occurs.
- Have a variety of snack foods available during and after exercise.
- More intense exercise, such as swimming, might require bigger snacks than less intense exercise, such as baseball. If blood sugar is below the target range at the start of exercise, the amount of carbohydrate in the snacks should be doubled. Try 30 to 40 grams of carbohydrate and see how much that helps raise the blood glucose. If exercise is prolonged (greater than 1 hour in duration), monitor blood sugar during and following activity. Keep good notes as to what works so that the regimen can be repeated at the next exercise session.
- If the length of time or distance between home and the activity is more than 45 minutes to an hour, a carbohydrate and protein snack is needed to help keep blood sugars within the target range until the next meal. A good snack idea is a piece of fruit or crackers with a protein (peanut butter or cheese).

CHAPTER 9

Diabetes Daily Schedule and Checklist



DIABETES DAILY SCHEDULE

		COMPLETED
Wake/Breakfast	Check blood sugar before meal	<input type="checkbox"/>
	Count carbohydrates eaten	<input type="checkbox"/>
	Calculate rapid-acting insulin dose	<input type="checkbox"/>
	Administer insulin	<input type="checkbox"/>
	Record in Logbook	<input type="checkbox"/>
Call daily if newly diagnosed	Between 8 a.m.-noon call diabetes clinic/on-call doctor with logbook and questions for first week after diagnosis	<input type="checkbox"/>
Snack (optional)	Must be less than _____g carbohydrates	<input type="checkbox"/>
Lunch	Check blood sugar before meal	<input type="checkbox"/>
	Count carbohydrates eaten	<input type="checkbox"/>
	Calculate rapid-acting insulin dose	<input type="checkbox"/>
	Administer insulin (rotate site)	<input type="checkbox"/>
	Record in Logbook	<input type="checkbox"/>
Snack (optional)	Must be less than _____g carbohydrates (<i>no insulin</i>)	<input type="checkbox"/>
	OR	
	Eat 2 hours after lunch and 2 hours before dinner:	<input type="checkbox"/>
	Count carbohydrates eaten	<input type="checkbox"/>
	Calculate rapid-acting insulin dose	<input type="checkbox"/>
	Administer insulin (rotate site)	<input type="checkbox"/>
Dinner	Record in Logbook	<input type="checkbox"/>
	Check blood sugar before meal	<input type="checkbox"/>
	Count carbohydrates eaten	<input type="checkbox"/>
	Calculate rapid-acting insulin dose	<input type="checkbox"/>
	Administer insulin (rotate site)	<input type="checkbox"/>
Bedtime	Give long-acting insulin (Dose _____ units) (should be given at same time each day)	<input type="checkbox"/>
	<i>*Do not use this site again for 24 hours</i>	
	Check blood sugar (before any snacks). Blood sugar should be greater than 120 before bed.	<input type="checkbox"/>
	*If greater than _____ no snack necessary or less than _____g carbohydrate snack	<input type="checkbox"/>
	*If less than _____ eat 15g carbohydrate snack	<input type="checkbox"/>
	Record in Logbook	<input type="checkbox"/>

My Target Blood Sugar is:

_____ - _____

Exercise Rules

Check Blood Sugar:

- Before starting
- Every 30 minutes of exercise
- When done

If blood sugar is less than _____ eat a 15g carbohydrate snack (no insulin necessary)

Low Blood Sugar (Less than 70)

- Check Blood Sugar (If no meter is available, assume blood sugar is low if child has signs of low blood sugar)
- Eat 15g fast-acting carbohydrate
- Check blood sugar in 15 minutes
- If still low, give another 15g fast-acting carbohydrate and recheck blood sugar in 15 min.
- Once back in target, if next meal is more than an hour away, eat 15g complex carbohydrate snack with protein
especially at night

Check Ketones

- Blood Sugar greater than 300
- Sick/Vomiting
- Missed Insulin

DIABETES SUPPLIES CHECKLIST

Remember all diabetes supplies should go everywhere with child.

PRESCRIPTIONS

You should have prescriptions for the following when you leave the hospital:

- Insulin
- Syringes and/or pen needles
- Blood glucose meter
- Blood glucose test strips
- Lancets
- Ketostix
- Glucagon emergency kit



Additional supplies should include:

- Alcohol wipes
- Log book and pen
- Carrying case
- Glucose tablets/gel
- Measuring cup or spoon

Emergency Box (home, school, babysitter, etc.):

- Cake icing and/or glucose gel
- Glucose tablets
- Snack crackers (peanut butter or cheese crackers)
- Juice box
- Glucagon emergency kit
- Ketostix
- Emergency names and phone numbers



CHAPTER 10

Goal Setting

Taking care of diabetes each and every day can be overwhelming! You may be asking yourself, “How will I be able to do all this?” Setting goals can help you stay on track and manage diabetes safely.

Here are examples of questions to ask yourself or your child to help you identify goals for managing diabetes:

- **Healthy eating:** Can we increase the number of fruits and vegetables your child eats each day? Do you want to count carbohydrates more accurately?
- **Physical activity:** Do you want your child to start exercising or increase their activity level?
- **Monitoring:** Do you want your child to write blood sugar levels in the logbook? Do you want to increase the number of times you test your child each day? Do you want to review the logbook with your child at least one time each week?
- **Medications:** Does your child want to learn to take their own insulin? Should we call in blood sugars each week?
- **Reducing risk:** Do you want to make sure your child carries quick acting sugar with them? Do you want your teen to check their check blood sugar before driving?
- **Keeping well:** Do you make and keep appointments with the diabetes team 4 times per year? Does your child brush and floss their teeth twice every day? Does your child see their pediatrician at least once per year and a dentist twice per year?
- **Healthy coping and reducing stress:** Do you want your child to ask others to help with blood glucose testing and insulin injections when they don’t feel like doing them?

Here are some tips on goal setting:

- Identify the change you want to make
- Identify the steps you need to take to make the change
- Identify the goal in Specific, Measurable, Attainable, Realistic /Relevant, Time-related terms (SMART goals!)
- Develop a plan
- Ask yourself:
 - What am I going to do?
 - How much and/or how often am I going do it?
 - When am I going to do it?
 - How confident am I that I will achieve this goal? (if you don’t think you can be successful, set a different goal)
- Reflect on your progress
 - Did you achieve your goal?
 - If yes: What helped you stay on task? What will you do next to maintain and/or move toward healthy management of diabetes?
 - If no: What got in the way? How will you change the goal to make it achievable and meaningful?
- Staying motivated
 - Write down your goal
 - Keep your self-talk positive
 - Surround yourself with people who are dedicated to helping you succeed
 - If you slip up, remember it’s a normal part of making a change. Get back on track by recommitting or revising your goal

MY GOALS	I WANT TO ACHIEVE MY GOAL BY THIS DATE	I ACHIEVED MY GOAL! <input checked="" type="checkbox"/>	HOW DID I DO?
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	

CHAPTER 11

Hygiene

Proper hygiene is important for all children. However, children with diabetes have some special needs.

DENTAL CARE

Children with diabetes usually do not have any more dental problems than other children. Diabetes may make children more susceptible to periodontal (gum) disease. It is important to have good blood sugar control to lessen this risk. It is also important to practice good oral hygiene. This includes six-month dental check-ups, brushing and flossing daily, and possibly antibacterial plaque treatments. See your dentist if you notice that the gums bleed with brushing.

If your child needs dental surgery, the application of braces, or any other device which may affect their eating habits, consult your diabetes doctor or nurse first. Insulin doses may need to be adjusted.

YEAST INFECTIONS/DIAPER RASH

Vaginal infections may occur in females with diabetes. This is especially true if the blood sugar is high. The most common vaginal infection is caused by the growth of the fungus *Candida albicans*. This fungus also causes diaper rash. It is normally present in the skin, mouth, intestinal tract, and vagina. When the fungus multiplies abnormally, it can cause an infection. Having a high level of glucose in the blood and urine and taking some kinds of antibiotics can cause an overgrowth of this fungus.

Symptoms of *Candida* infection include: itching, burning, and a thick white or yellow discharge. These infections can usually be treated with over-the-counter creams. Improving diabetes control can help to prevent *Candida* infections.

FOOT CARE

Foot problems due to poor circulation or nerve damage do not usually occur in children. A child may be at risk for these long-term problems if they have had diabetes for over 15 years. Your child's doctor should examine the feet regularly.



It is important to begin to practice healthy foot-care habits in childhood, because these habits need to be carried into adulthood. Clean feet daily and dry them carefully. Children should be taught to tell their parents of any scrapes or cuts on their feet, so that they can be examined and treated to ensure that they heal properly.

The most common form of diabetes is type 2 diabetes. It is most common in adults, but may occur in children and teenagers. In type 2 diabetes the pancreas is still able to produce some insulin. However, either the body is not able to secrete the insulin, or the insulin made is not able to work properly. Insulin resistance is frequently seen in type 2 diabetes. This occurs when the insulin in the body is not able to function normally. Excess body fat and insulin resistance can decrease your body's ability to use its own insulin, causing hyperglycemia. Weight loss, along with exercise and certain medications may help insulin work more efficiently and better control blood sugar levels.

CAUSES OF TYPE 2 DIABETES:

- Inheritance (genetic) — People with type 2 diabetes are likely to have a close relative with type 2 diabetes.
- Intake of excessive calories — Obesity and lack of physical activity are probably the most powerful risk factors for developing type 2 diabetes.

Treating Type 2 Diabetes:

- Diet
- Exercise
- Oral medication
- Insulin

DIET

Diet is one of the most important components in the treatment of type 2 diabetes. By adopting healthy eating habits, a person with type 2 diabetes can achieve good control of blood sugar levels, maintain a healthier body weight, obtain desirable blood fat levels (cholesterol), and avoid long-term complications of diabetes such as nerve, eye, heart and kidney damage.

A reduced fat and lower calorie diet in combination with regular exercise can lead to gradual weight loss, which has been proven to improve blood glucose control. Adopting a healthy diet and active lifestyle can help with weight control and diabetes management.

Diabetes meal planning means knowing how to choose

healthy foods as well as eating the right amount of those foods at the right times. These are all important for blood sugar control. Your child's meal plan should be individualized according to medications and amount of physical activity.

Start using this basic meal planning information as soon as possible. Your dietitian may work with you to develop guidelines detailed to fit your child's needs. These guidelines are healthy recommendations for all members of the family, not just people with type 2 diabetes.

Guidelines for Healthy Eating Habits:

- Eat high-fiber foods, such as fruits, vegetables, whole grains, and beans.
- Use less grease/fat, sugar and salt when cooking foods.
- Eat three or more small meals throughout the day.
- Try not to skip meals.
- In order to lose weight, decrease your portion sizes of snacks and meals.
- Cut out simple sugars such as candy, fruit juices, regular soft drinks, Kool-Aid, etc.
- Use artificial sweeteners such as Stevia, Sweet 'N Low, Splenda or Equal sparingly and in place of sugar.

SCREEN TIME

Screen time includes time spent using cellphone, tablets, computers, video games, and watching TV. All of these activities should be limited to two hours or less per day. In addition, food consumption during these activities should be avoided.

EXERCISE

Weight management and good blood sugar control can be achieved through a combination of healthy eating and exercise. Find an aerobic exercise that your child likes and develop a regular exercise program. It is recommended that children get 60 minutes of aerobic exercise every day. Examples include walking, swimming, jogging or riding a bicycle.

For Exercise Guidelines, refer to Chapter 8.

ORAL MEDICATIONS

Most children/adolescents with type 2 diabetes will initially be treated with insulin injections. A child with type 2 diabetes may have ketones present, which requires additional insulin to be injected into the body. There may also be uncertainty about the type of diabetes, in which case insulin must be used to keep the child safe from diabetic ketoacidosis, a risk for people with type 1 or type 2 diabetes.

Some individuals with type 2 diabetes will always need to take insulin injections. Those who are successful with lifestyle changes (weight loss, exercise, and reduction of fat, calories and carbohydrates in the diet) are more likely to come off of insulin injections. These individuals may be able to take oral anti-diabetic medications. These oral medications are not insulin; they make people more sensitive to their own insulin. Some oral medications also make the pancreas release extra amounts of insulin.

Metformin (glucophage) is the oral medication that is most commonly prescribed for type 2 diabetes in children. In addition to helping control blood sugars, this medication may also help with weight loss.

The initial starting dose of Metformin (glucophage) is 500 mg once or twice a day. The dosage may be increased

if needed, and the dose will increase by small amounts weekly until the goal dose is met.

The main side effects of Metformin (glucophage) include upset stomach, nausea, diarrhea and bloating. These symptoms are usually temporary and decrease with continued use of the medication. These side effects may be less of a problem if Metformin (glucophage) is taken with food at mealtime. Metformin does not cause hypoglycemia (low blood sugar). Metformin should be stopped if the individual becomes ill. Consult your physician if vomiting, ill, or ketones are present. If the individual is having an X-ray procedure that involves contrast dyes, Metformin should also be stopped during that time to prevent a rare side effect called lactic acidosis. Consult your physician if scheduled for an X-ray procedure involving dye.

There are many other oral anti-diabetic medications that can be used to treat type 2 diabetes. If appropriate, one of the drugs may be prescribed for your child.

INSULIN

Some children and adolescents with type 2 diabetes will need insulin. Refer to Chapter 3 for more information.



CHAPTER 13

Long-Term Complications



LONG-TERM COMPLICATIONS OF DIABETES

Most of the long-term complications of diabetes do not occur in young children. The years of greatest risk for complications begin after puberty. Even though most of the long-term complications of diabetes do not occur in young children, it is important for the child with diabetes to be monitored for complications and follow the directions of their diabetes doctors and/or nurses to prevent future complications.

In general, long-term complications of diabetes occur in people who have had diabetes and high blood sugar levels for many years. The Diabetes Control and Complications Trial (DCCT) proved that the eye, kidney, and nerve problems associated with diabetes were decreased in people whose blood sugars were kept close to the non-diabetic range.

The most common parts of the body to be damaged by high blood sugars are the eyes, kidneys, nervous system and heart.

SCREENINGS AND PREVENTION

For the best diabetes care, the American Diabetes Association (ADA) recommends:

- Diabetes clinic visits every 3 months with a hemoglobin A1c
- These may alternate between a physician and a nurse practitioner
- Yearly visits with a diabetes dietitian
- Ongoing diabetes education
- Screenings for complications of diabetes

EYE DISEASE

Test: Eye exam (yearly)

Having diabetes puts your child at increased risk for eye problems such as:

- **Retinopathy:** changes to the layers of tissue at the back of the eye called the retina. The retina has many small blood vessels. Minor eye changes are called microaneurysms — ballooning of the small retinal blood vessels. These changes do not affect vision and may be reversible. Some people can have these minor changes for many years without developing more serious eye problems.
- **Proliferative Retinopathy:** the more serious eye disease involving the formation of new and more fragile blood vessels. These vessels are at greater risk of breaking and bleeding, which can affect vision and could cause blindness.

Retinal detachment is also a risk and may happen if the retina separates from the other layers in the back of the eye.

Laser treatment, using a very bright light to destroy the proliferative new blood vessels, has been effective in preventing loss of vision. Close follow-up is extremely important once severe changes have occurred.

- **Cataracts:** thickening and clouding of the lens of the eye. If a cataract interferes with vision, it can be surgically removed by an eye doctor.
- **Increased risks:** poor blood sugar control (high blood sugars over a period of time), high blood pressure, and smoking or using tobacco.

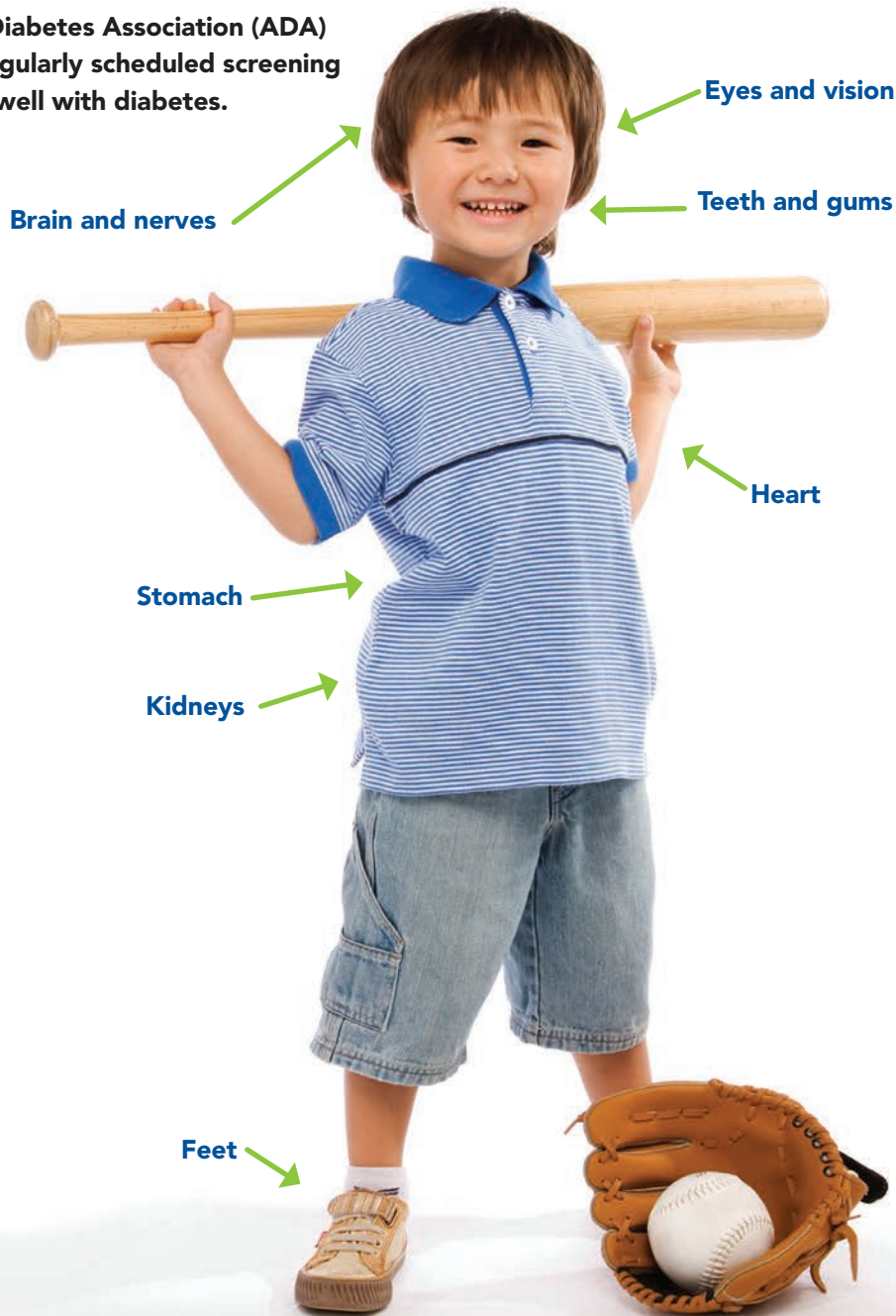
KIDNEY DISEASE

Test: Urine Microalbumin (yearly)

Having diabetes can also put your child at increased risk for kidney disease. Kidney disease does not typically happen before puberty because it is more likely to occur in people who have had diabetes for a long time.

- **Nephropathy:** kidney damage. Kidneys filter waste and water from blood. When blood sugar levels are high, pressure increases in the kidneys' filtering system which can damage the blood vessels of the

The American Diabetes Association (ADA) recommends regularly scheduled screening tests for living well with diabetes.



kidneys. This can also cause proteins (albumin) to start leaking into the urine. A urine microalbumin test checks for the presence of small amounts of protein (microalbumin) which is a sign of early kidney damage. This early damage may be reversible.

- **Increased risks:** having diabetes a long time, poor sugar control, high blood pressure, using protein supplements, and smoking or using other forms of tobacco. Warning signs of kidney disease include swelling feet or ankles and high blood pressure.

NERVE DISEASE: PERIPHERAL NEUROPATHY AND AUTONOMIC NEUROPATHY

Test: Physical exam including foot exam

Having diabetes can also put your child at increased risk for nerve damage also known as neuropathy. There are different symptoms depending on the type of neuropathy your child may be experiencing. A physical exam is very important, but it is also important to tell your nurse and doctor about any other symptoms you may be experiencing because they may be caused by neuropathy.

- **Neuropathy:** nerve damage. This may cause persistent numbness, tingling, and sharp pains in the extremities, usually starting with the feet and lower legs. It can also lead to increased hypoglycemia unawareness (difficulty recognizing when blood sugar is low), dizziness, heart problems, erectile dysfunction and gastrointestinal problems such as gastroparesis or diarrhea.

Remove your child’s shoes and socks off when you get into the exam room at each clinic visit. This makes it easier for the provider to do the exam. Be sure to tell your provider if you’ve noticed any foot problems.

HEART AND BLOOD VESSEL DISEASE

Tests: Blood pressure checks (every visit), lipid (cholesterol) panel (yearly)

Having diabetes can put your child at an increased risk for early heart and blood vessel disease. Having blood pressure checked at each clinic visit and a lipid panel

checked regularly helps catch problems early before they become a major health risk. You should also see our dietitian at least once yearly. We may ask you to schedule a clinic visit at a different location or on a specific day so that you can see the dietitian. The dietitian may recommend a lower fat diet to lower the risk of heart and blood vessel disease.

OTHER SCREENINGS

Thyroid disorders and celiac disease are not complications from diabetes. They are not caused by having diabetes or from taking insulin. However, it is common for people with type 1 diabetes to also have these conditions. Because of this, we routinely check thyroid labs and screen for celiac disease in all our patients with type 1 diabetes. Left untreated, these conditions can make controlling blood sugars more difficult. We also recommend regular visits to see the dentist every 6 months. All patients will also undergo an annual mental health screening.

SCREENING TEST RECORD

SCREENING TEST	FREQUENCY*	DATE OF TESTING/RESULT			
Eye Exam (eyes must be dilated by an eye doctor)	Type 1: Yearly for those who have been diagnosed for more than 5 years, or after 10 years of age (whichever is first) Type 2: At diagnosis & then yearly				
Dental Visit	Every 6 months				
Mental Health Evaluation	Yearly				
Lipid Panel	Type 1: Every 5 years from age 8-18 years, yearly after age 18 Type 2: At diagnosis & then yearly				
Urine Microalbumin	Type 1: Yearly for those who have been diagnosed for more than 5 years Type 2: At diagnosis & then yearly				
Foot Exam	Every visit				
Blood Pressure	Every visit				
Thyroid Labs	Type 1: Once every 2 years Type 2: Only if symptomatic				
Celiac Screen	Type 1: Once, or if symptomatic Type 2: Only if symptomatic				

*may be more often if results are abnormal or if your provider has concerns

CHAPTER 14



Psychological Adjustment

GRIEF REACTION TO DIAGNOSIS

Grief is a normal, healthy emotion that often helps us move on after encountering a life-altering event. Both parents and children may experience this emotion following the diagnosis of diabetes. It is a time for healing and restoring balance.

Typical Symptoms of Grief:

- Shock and disbelief
- Feelings of numbness
- Feelings that things are “unreal”
- Anger
- Guilt
- Pain
- Inability to concentrate
- Panic
- Anxiety
- Crying spells
- Depressed mood
- Loss of appetite
- Sleeplessness
- Loss of energy
- Sense of being overwhelmed
- Frustration

Coping with Grief

In general it is best to share your feelings openly and honestly with each other. This goes for both parents and children. Remind yourself that nothing you did caused your child's diabetes. Don't try to live up to others' expectations about how you should express your grief

or for how long. Thoughts such as, “If only I had done this or that” are an attempt to find an answer to “WHY?” questions. These questions are largely unanswerable. Give your child credit. Children can often handle their illnesses as well as, if not better than, their parents.

Realize that many people, especially men, tend to keep feelings inside. This does not necessarily indicate a lack of caring or that they are not feeling the same sense of loss that you may be feeling. Be aware that the parent is the child's role model and that displaying an artificial sense of happiness sends a false message to the child and may not give the child permission to express their own feelings of grief. If accepting the diagnosis is extremely difficult for you, try not to share all of these feelings with your child. Instead, try sharing your feelings only occasionally. Use other adults for support, especially those who have had similar experiences.

Realize that no one expects you to become a parent who always knows exactly what to say and do. Learn to share your anger constructively, as this can provide an appropriate release of tension. Sharing feelings with significant others, exercising, support group participation, and involvement in diabetes-related activities are a few opportunities to release some of your anxieties.

Understand that parents can be at different levels in the grief process, but that it is essential to understand and support each other throughout the process. Take care of yourself in order to take care of your child (i.e. physical exercise, eat well-balanced meals, continue with hobbies, use relaxation techniques, stay connected with your spiritual/religious faith, and don't forget to hug your child!). Take care of your marriage (or significant adult relationship) by spending time alone with each other. Begin to have a sense of control by learning as much as possible about your child's condition and needs.

How long will it take to adjust to the diagnosis?

Adjusting to the diagnosis of diabetes takes time. It is a process that can not be rushed. Emotional healing and acceptance of a chronic condition such as diabetes is unique to each family member. As time passes, grief diminishes and the family begins to incorporate diabetes care as a routine, not a central focus of life.



Parental and Family Involvement

The family is the single most important support for the child with diabetes. Family life both affects and is affected by diabetes. All family members are affected to some extent and thus open honest communication within the family is essential.

Learn as much as you can about diabetes. To understand how you want your family to help, you first have to know what diabetes is and how to take care of it. Involvement and education of all family members is important. Try to share responsibilities fairly so that one family member is not overwhelmed with responsibility while another has no responsibilities.

Diabetes care begins with simple steps or tasks. Upon diagnosis, have a family meeting to discuss these tasks.

- Make a list of diabetes care tasks including:
 - Insulin injections (usually 4 each day)
 - Blood glucose testing and recordings (usually prior to breakfast, lunch, supper, and bed time)
 - Meals and snacks (planning, shopping, cooking)

- Contacting physicians and diabetes team (calling with blood glucose readings and scheduling appointments)
- Exercise
- Financial (completing insurance forms)
- Sick day management (ketone testing, calling physician and diabetes team)
- Educating school personnel and caretakers
- Siblings (do not tease or eat sweets in front of the child with diabetes).
- Negotiate differences. Tasks can be adjusted or rotated at subsequent family meetings.
- Discuss strategies for handling diabetes emergencies, organizing the home to encourage adherence, planning holidays, and working out schedules. This will help to minimize conflicts.
- The involvement of all caregivers in a child's diabetes care daily regimen is important and includes helping to give insulin injections, blood glucose testing and attending clinic visits. Caregivers can use their influence

to stress the importance of the daily regimen. A child will view the daily regimen as important if they see their caregivers make diabetes care and education a priority. The caregiver's involvement in day-to-day diabetes care usually leads to a more realistic attitude and knowledge regarding blood glucose control.

- Get support from outside the immediate family (i.e. extended family members, friends, support groups). This is particularly important in the single-parent family.
- All caregivers should be consistent regarding diabetes care and should be equally firm in expecting the child to follow the diabetes regimen.
- The following are family factors that have been associated with improved adherence, positive coping, and family functioning:
 - parental involvement
 - shared responsibilities
 - good parental self-esteem
 - low family conflict
 - good problem-solving skills
 - stable family
 - good parental/child communication
 - high marital satisfaction
 - encouragement of the child's independence
 - acceptance of diabetes and a perception of the child as normal
 - good social support
 - being realistic regarding blood glucose expectations
 - being non-judgmental and a good listener
- Education for family members should not stop at diagnosis. Caregivers should be open to ongoing diabetes education as the child's needs change as they develop. As a child grows, the knowledge and skills required at diagnosis become inadequate to meet new developmental challenges (i.e. knowledge received at initial diagnosis for a school child is not sufficient to handle adolescent issues).
- Sharing feelings and solving problems about diabetes can bring families closer together if there is an atmosphere of mutual concern and caring.
- The whole family will also benefit from eating healthy balanced meals.
- Diabetes places limits on the flexibility and spontaneity of family life, but good problem solving skills can help meet these challenges.

- Family members should be supportive without fostering dependency. The families that manage diabetes the best are those that strive for a happy medium and balance between giving diabetes too much or too little attention.

Sibling Involvement

- It is important that siblings be involved in diabetes education. Older siblings might attend the education sessions with their parents.
- A sibling will learn most about caring for and reacting to diabetes from the parents' attitudes and behaviors. When a child with diabetes is hospitalized, some sacrifice on the part of the sibling is required. Parents may not be available at home, and resentment may be felt. This can be lessened by the parents on their return home. They might spend time alone with the sibling and express appreciation for their help and cooperation.
- Younger siblings may worry about catching diabetes and will need reassurance that diabetes is not contagious. Older siblings may worry about diabetes "running in the family." Explanation of the low risk of this occurring can be reassuring.
- Siblings should be observed closely for signs of anger, resentment, jealousy, guilt, conflict, and bereavement. Explain to them that nothing they did, said, thought, or wished caused the illness and allow them to talk about their feelings.
- When a child with diabetes requires a lot of attention from parents, the non-diabetic sibling often acts out to get the attention they feel is being denied them. Again, give each sibling special time alone with their parent(s) by focusing on activities that make them feel special.
- The sibling should have diabetes knowledge (i.e. symptoms of low blood sugars) as they can help you recognize and avert an impending diabetic crisis. Practice how the family would react in an emergency.
- Do not overburden a sibling with too much responsibility for the child's care, as most children with diabetes will resent their sibling watching over their shoulder.
- The more honest information you can share with your child's siblings about diabetes, including what must be done to care for it and how family life might change, the more easily they will adjust to the diagnosis and changes it brings to the family.

CHAPTER 16

Managing Diabetes At School

Advance planning with your child and with school staff will make management of your child's diabetes a regular, non-disruptive part of your child's daily routine. Fulfilling your responsibilities as primary caregiver will help your child feel safe and confident they can fit in and be a normal kid around their classmates.

- The first step is to teach your child as much about diabetes as possible. Try to plan for specific school situations with your child prior to their return to school. However well organized you and your child are, there will be some days when the plans do not work well and this prior planning will enable your child to deal with problems more confidently. Also, make sure they know when and who to ask for help.
- A second responsibility of the parent is to provide the school with diabetes supplies (i.e. blood glucose monitor, blood glucose test strips, lancets, Ketostix, alcohol wipes, an adequate supply of instant glucose for treatments of low blood sugars, insulin, syringes, appropriate snacks and glucagon) if the school personnel are trained in its use and are agreeable.
- A third responsibility of parents is to provide the school with a list of emergency phone numbers, including the parent's home, cell and office number, alternate persons, physician and hospital numbers, and a diabetes health care plan (school letter).
- The final responsibility of parents is to educate those who will be working with their child by setting up a school conference and distributing written information.

SCHOOL CONFERENCE

Should be initiated by the parents at the following times:

- Prior to the child's return to school following a new diagnosis of diabetes.
- Beginning of the new school year (if possible the week prior to the start of classes).
- A child's transfer to a new school.
- Throughout the school year if the child is having specific problems with blood sugar control or to answer any questions the teacher may have.

- Participants in the conference may include:
 - Parents
 - Child
 - School nurse
 - Teacher(s)
 - Principal
 - Lunchroom personnel (if appropriate)
 - Transportation provider (if possible)
 - School social worker

TOPICS TO BE DISCUSSED AT THE CONFERENCE SHOULD INCLUDE:

General Information

- Type 1 diabetes is a condition in which the pancreas gland is no longer producing a critical hormone called insulin. A lack of insulin (a hormone that regulates blood glucose sugar) results in food not being used by the body properly, resulting in too much sugar in the blood. Treatment consists of daily insulin injections, blood glucose monitoring, food management and exercise.
- Type 2 diabetes is a condition where the pancreas may not make enough insulin and/or the insulin may not work normally. Some children with Type 2 diabetes require insulin injections.
- A balance between insulin, food intake and exercise must be maintained to prevent blood sugar levels from being too high or too low.
- Diabetes is not contagious.
- A child with diabetes can lead a normal life — as the goal of treatment is to promote normal childhood growth and development.
- A child with diabetes should be encouraged to participate in all school activities, including sports and field trips.
- Schoolwork and grades should not be affected by diabetes that is well controlled.
- Decide who will supervise and assist with blood glucose monitoring and insulin injections at school. Parents should provide the school with a letter (provided by our diabetes

center) specifying the type of insulin and times administered.

- Regular class attendance should be encouraged — recurrent illnesses or requests to be excused from class should be carefully evaluated by parents, school staff and physician.
- Section 504 of the Federal Rehabilitation Act of 1973 states that “all children are entitled to participate fully and without discrimination in school programs.”

Low Blood Sugar (also called hypoglycemia or an insulin reaction)

- Low-blood sugar is the most common problem that would require immediate treatment at school as its onset is sudden. So teachers need to know about low blood sugar and how to treat it.
- Causes include: too much insulin, extra exercise, and missed or less food at a meal or snack.
- If not treated promptly, it can be an emergency as loss of consciousness and/or a seizure may result.
- Warning signs vary, but usually include any of the following:
 - Shaky
 - Sweating
 - Sleepiness (at unusual times)
 - Hunger
 - Headache
 - Pale face
 - Poor coordination
 - Crying
 - Confusion
 - Stubbornness
 - Dizziness
 - Slurred speech
- Most likely to occur before lunch or after gym or recess
- Treatment — a fast acting source of sugar such as:
 - 4 ounces fruit juice
 - 4 ounces regular soda
 - 3-4 glucose tablets
 - 2-3 sugar packets
- Following treatment, recheck the blood sugar in 15 minutes. If the blood sugar is still less than 70, or if your child does not feel better, repeat the treatment. If it will be more than one hour until the next scheduled meal or snack, child should eat an additional protein and



carbohydrate snack (i.e. cheese and crackers, peanut butter and crackers or a carton of milk) to keep blood sugar from falling low again.

- If a severe reaction occurs resulting in a seizure or unconsciousness, do not give fluids or solid food as the child may choke. Call 911 immediately (or paramedics). School nurses are allowed to administer a Glucagon injection, available by prescription.
- The school should notify the parents if an insulin reaction has occurred, as this will allow for adjustment of the insulin dose, so that hopefully further reactions will be reduced.
- A low blood sugar can be treated in the classroom, but if the child prefers treating it in the school office or nurse’s office, someone should accompany him/her as they may become confused.
- Most school-age children are able to identify when their blood sugar is low.
- Prevention of low blood sugars includes:
 - Eating meals/snacks at specific times
 - Snack prior to exercise
- All children taking insulin should wear a medical alert bracelet/necklace.
- A child should have a fast-acting source of sugar available at all times for treatment of low blood sugar.
- School personnel need to be assured that it is better to treat and be wrong than to delay the treatment and let low blood sugar progress.

High Blood Sugar (also called hyperglycemia)

- A person with diabetes may have high blood sugar and spill extra sugar into the urine on occasion. This is usually not a problem until sugars are >300 or if the child is ill.
- Causes include periods of stress, illness, overeating and/or lack of exercise.
- Generally NOT an emergency (unless accompanied by vomiting or ketones).
- Ketones may be present in the blood and urine. High blood sugars and urine ketones contribute to an emergency condition called ketoacidosis. Ketones result when the body breaks down fat for energy and can be tested for by using urine Ketostix.
- Symptoms: *(if any of these occur, parents should be contacted)*
 - Excess thirst (thus child should have unrestricted access to water)
 - Frequent urination (thus child should have unrestricted access to bathroom)
 - Dehydration
 - Fruity odor in breath
 - Difficulty breathing
 - Stomachache
 - Vomiting/Nausea
 - Weight loss
 - Fatigue
- If symptoms of high blood sugars occur, test the child's blood sugar and if it is greater than 300, check the urine for ketones.
- School staff needs to know how to test for ketones and when and where to report ketones so insulin can be properly adjusted.

SCHOOL LUNCH PROGRAMS

Many schools offer lunch programs for students. It is important to check the menus ahead of time to determine if your child will eat the foods being offered, or will choose to take a lunch from home.

Ask your school principal or nurse, to have a food service worker provide you with a menu that includes portion sizes and grams of carbohydrate for each food offered. A cookie or a plain piece of cake can be eaten occasionally. Fresh fruit is usually recommended for dessert.

Meals provided by the school can easily fit into your child's meal plan. Your child's school must provide standardized

portion sizes and balanced meals. Most school lunches will include 60-75 grams of carbohydrate, but it is best to look at each day individually. It may be beneficial (as well as a good learning experience) to sit down with your child on a daily/weekly basis to discuss upcoming school meals and how they fit into the meal pattern. By looking at the menus ahead of time, you and your child can discuss the need for eating additional carbohydrates or taking away excess carbohydrates to make each day fit your meal plan perfectly.

It is important that your child be given an ample amount of time to eat all of their lunch. This should be discussed with school personnel.

Once you have prepared your child, yourself and the school for all these eventualities, let your child enjoy school to the fullest. The process of "letting go" is perhaps the most important step of all. Involvement in school activities is all part of the child's total school experience and is as important to a child's development as the classes.

Snacks

- A child with diabetes may need snacks in the morning and/or afternoon, as these are often the times when insulin has its greatest effect and blood sugars are lowest.
- Most children do best just eating their snack at their desk, but some may prefer to eat their snack at the nurses or school office. Decide where your child will eat their snack.
- Provide teachers with times snacks usually eaten:

A.M. _____ and/or P.M. _____

- Examples of snacks include:
 - Cheese crackers
 - Pretzels
 - Milk
 - Fresh fruit
 - Peanut butter/crackers
 - Graham crackers
- Younger children often need to be reminded to eat a snack.
- The teacher might keep an acceptable snack box packed by the parent — each food could be labeled with its amount of carbohydrate to help the child select the proper food.
- Be aware of gym class schedule — late morning or afternoon gym classes may require an extra snack to prevent low blood sugars.

Blood Glucose Monitoring

- Blood sugar testing needs to be done before meals eaten at school, when a child is experiencing episodes of low or high blood sugars, or if the child is recovering from an illness.
- Monitoring involves a finger prick to obtain a single drop of blood to place on a test strip that is inserted into a blood glucose meter. Time and result of blood glucose check need to be recorded.
- Parents should provide necessary blood glucose testing supplies.
- School personnel may need to be taught how to test in order to assist the younger child
- Discuss method by which parents will receive documentation of blood sugar test results.
- Discuss expectations for blood sugar ranges and demonstrate use of monitor.

Substitute Teachers

- Any substitute personnel should be made aware that there is a child with diabetes in the class, symptoms and treatment of low blood sugars, and when/if the child eats a snack.

Class Parties

- A child with diabetes should be given a snack if their class is having a special snack.
- The school should notify the parents ahead of time, so they can decide whether the child may eat the same snack or if they may want to provide an alternate snack.

Exercise and Sports

- Children with diabetes should be encouraged to participate in physical education and school sports.
- Low blood sugars may occur during exercise, thus a major consideration should be the prevention and/or early detection and treatment of low blood sugar.
- Often a snack is recommended before gym and thus the child may be delayed in getting started. The child should not be penalized for this.
- Exercise is an important part of the treatment of diabetes and is encouraged.
- The child should not exercise if symptoms of high or low blood sugars are present.
- Physical education teachers should be familiar with the symptoms and treatment of low blood sugars.

- Exercise should be encouraged to be a regular occurrence, preferably at a fixed time, since food and insulin must balance with exercise.

After-School Discipline

- A child with diabetes should not be disciplined differently from the rest of the class. Check blood glucose to make sure inappropriate or unusual behavior is not caused by high or low blood glucose levels.

Field Trips

- Send snacks with your child, as often lunch is delayed because of the time of the field trip or the class does not return at the expected time.
- Send necessary diabetes supplies for a day away from school.
- Make sure your child travels with a list of important phone numbers and a medic alert in case of an emergency.

Bus Travel

- A child with diabetes should be allowed to take a snack on his/her bus and permission from the driver to eat it if needed. Bus rides can often take longer than planned.
- Bus drivers should have information regarding the symptoms and treatment of low blood sugar in case of emergencies.



CHAPTER 17

Insurance and Diabetes Care

In 2010, the health care reform law was passed. It is known as the Affordable Care Act (ACA) and has many changes to health insurance coverage. People may now buy health insurance from an insurance company, an insurance broker or through your state's marketplace (exchange). Or your child or family may qualify for Medicaid or the Children's Health Insurance Program (CHIP).

For more information: healthcare.gov

Find insurance coverage in your state:
insurekidsnow.gov or 1.877.543.7669

Medicaid:

In Missouri: MO Health Net for Kids

dss.mo.gov/mhk/

MO HealthNet Service Center 855.373.4636

MO HealthNet Case Information 800.392.1261

In Illinois: All Kids

illinois.gov/hfs/MedicalPrograms/AllKids

All Kids Hotline 866.255.5437

It is critical for a person with diabetes to have insurance coverage to help assist with the costs. For persons with medical insurance, each insurance plan varies greatly and may be frequently changing. Upon diagnosis (and at least annually), you should refer to your coverage policy or contact your insurance customer service agent (usually listed as a toll free number on your insurance card) to clarify coverage benefits information and if any pre-certification is needed for services.

PROBLEMS WITH INSURANCE COMPANIES

It is important for anyone experiencing problems with health insurance to contact your employer, the insurance company itself, your elected legislator and/or the health insurance industry.

- I. Missouri Department of Insurance
insurance.mo.gov
Main Office 573.751.4126
- II. Illinois Department of Insurance
insurance.illinois.gov
Main Office number 217.782.4515
- III. Office of Consumer Health Insurance
877.527.9431



DIABETES IS RARE IN INFANTS

Description

Infants diagnosed with diabetes are expected to grow and gain weight normally, as if they did not have diabetes. Diagnosis may be difficult as symptoms of diabetes often resemble other infant illnesses. Diabetes is not expected to affect the infant's achievement of normal developmental milestones. Infants with diabetes usually have type 1 diabetes. Type 1 diabetes diagnosed in an infant should not be considered worse or more serious than type 1 diabetes diagnosed in an older child. Transient diabetes, a temporary condition, may sometimes occur in very young, underdeveloped infants shortly after birth; this is a very rare condition and should not be confused with type 1 diabetes.

Management

In addition to the fingers, blood glucose testing may be taken from heels and toes. Blood sugar goals are kept higher than a school aged child in order to avoid low blood sugar. A major goal of treatment with infants is to maintain good growth and development while avoiding low blood sugars.

General sick day guidelines for an infant are the same as those for older children with diabetes. It is important to realize that an infant can become very ill more quickly than an older child as they can get dehydrated more quickly. It is extremely important for the infant to take in fluids when sick. In addition, the caretaker should check for ketones and call the physician. When sick, the caretaker should offer small amounts of fluids frequently. If baby refuses to drink, try again in 10 minutes.

In order to test for ketones in an infant, you may need to put cotton balls in the diaper. Some parents elect to use a blood ketone meter to measure ketone levels.

The usual practice of frequent infant feedings can help prevent low blood sugars. There is no specific meal plan for an infant with diabetes. An infant has the advantage of no prior history of poor eating habits (i.e. sweets). The infant has the opportunity to develop healthy eating habits from an early age.

Parents should always be alert to a possible low blood sugar. Since an infant can't tell the caretaker that they are having a low blood sugar, the caretaker should always be alert that symptoms may include: shaking, tiredness, enlarged pupils, bluish color around lips, pale or clammy skin, sweating, crying or irritability. Treat low blood sugar as instructed in chapter 5 Hypoglycemia.

It is important that the parent have trained babysitters who can give them a break.



DESCRIPTION

When initially diagnosed or hospitalized, a toddler's developmental skills might temporarily regress (i.e. may want a bottle instead of the usual cup). A toddler with diabetes may have temper outbursts to express their frustration as they have a minimal ability to speak or articulate their needs. Toddlers have little concept of time. Routine is critical with toddlers — try not to vary diabetes care schedule from day to day, even on weekends.

Any day care setting that receives federal funding cannot discriminate in accepting a toddler with diabetes. When educating daycare providers, stress the importance of recognizing symptoms and treatment of low blood sugar emergencies. It is important to stay in close and ongoing communication with the staff.

Good sources of babysitters include family members, friends, local college students majoring in nursing or early childhood education, teens with diabetes (i.e. those who have been ADA camp counselors are usually particularly good) and other parents with children with diabetes. Start out slow with babysitters, an hour at first, and then for the whole evening.

Get toddlers in habit of wearing a medic alert ID as they will more likely maintain the habit when they get older. Consider a bracelet instead of a necklace that could cause choking around a toddler's neck.



INJECTIONS/BLOOD GLUCOSE TESTING

- Toddlers think concretely (everything is either black or white) and are usually unable to realize that having an insulin injection will help them stay healthy.
- The earliest that a toddler can begin being actively involved in diabetes self-care is probably between 2 and 4 years old. They can begin self-care tasks that include: making choices (i.e. picking finger for blood glucose testing, picking site for injection, choosing foods within their meal plan), communicating changes in wellness (i.e. low blood sugar symptoms), and gathering the equipment. The key to helping with self care is their ability to communicate and follow directions.
- Positive reinforcement (i.e. praise, rewards) for good behavior during the procedures is the most effective way to prevent poor behavior. This also increases your child's self-esteem.
- Needles and finger sticks may be especially threatening for this age as toddlers have difficulty in understanding the reasons for them.
- Follow through with the blood glucose testing and insulin injection as quickly (but safely) as possible. (i.e. do not let toddler stall; prepare monitor and draw up insulin before you enter the toddler's room).
- It is typical that a toddler may try to delay injections and finger sticks. From the start of diagnosis, do not reinforce this behavior. Remember that it has to be done. The longer the procedure takes the more anxious everyone becomes.
- If the toddler does not cooperate with the blood glucose testing, you may have to hold them or get someone to assist you. Afterwards hug them and explain that you have to do this to them to keep them healthy.
- Incentive sticker charts may encourage a toddler to cooperate with blood glucose testing, insulin injections or the meal plan. (i.e. select a particular behavior problem area, with the toddler draw a behavior chart that can be placed on the refrigerator at their eye level, they will earn a sticker when cooperating and then have a special inexpensive reward when they earn a specific number of stickers — the goals for the stickers should be an



attainable goal for the toddler). Keep a stash of items the toddler likes available as rewards for good behavior.

- Keep the disruption to a minimum when giving the injection or blood glucose testing (i.e. if toddler is playing in the living room give the injections and finger sticks in the living room; have all the supplies and meds ready before you take the toddler away from their activities and let them return to the activity as soon as possible). They may be more irritated about being taken away from their playing than having the injection or finger stick.
- Have the toddler give practice injections (without needles) to a favorite doll or stuffed animal as this may help them express their frustration and give them some sense of control.
- Be aware of your reactions while giving injections and checking blood sugars. Children learn how to respond by observing others.
- If toddler is capable, let them prick their finger (with parental supervision) as it gives them a sense of control over their own body.

- Don't sneak up on a child or give injections by surprise.
- Treat finger sticks and injections with a matter of fact, no nonsense attitude. Use a firm, pleasant, calm and patient approach.
- Never do procedures during or immediately after a toddler has been disciplined as you do not want them to associate procedures with being punished.
- Be specific about what behavior you want a toddler to do during their injections or blood glucose testing (i.e. tell them to "please hold still" not "be good").
- Organize diabetes supplies so they are readily available yet out of child's reach.
- A toddler may demonstrate increased emotions when a significant other (i.e. grandparent) watches the procedure.
- It is against a parent's instinct to knowingly hurt their child and that initially it may be very emotional for them to administer an injection or finger stick. It is helpful that they experience both themselves so that they realize there are minimal amounts of actual pain involved. Remember that the insulin injection is saving their toddler's life and provides them with good health. Not doing them would be medically neglecting your child.
- A toddler may resist injections and finger sticks by yelling and hitting. Acknowledge their feelings. Give hugs and positive feedback on cooperative behaviors.
- It is difficult for a toddler to understand why they need medicine when they feel fine – emphasize insulin is what keeps them feeling good.
- An Inject Ease device might be considered for hiding the insulin syringe needle.

TODDLERS AND LOW BLOOD SUGAR REACTIONS

- A toddler cannot always communicate the signs of low blood sugars thus frequent blood glucose checks are needed. They will gradually learn to recognize the signs of low blood sugars, but perhaps not until they are 5-6 years old.
- Treat your child as a child first. All mood swings don't have to be a diabetes emergency.
- Encourage the toddler to verbalize what particular symptoms (i.e. headache, shaky) they feel when blood sugars are getting low – not just to say that they "feel funny." This will help you identify their individual symptoms and may also help them learn to recognize low sugars. Provide this information to their other



caretakers so that they can be alert when toddler displays the same symptoms.

- Always use the same words with toddler when referring to insulin reactions (i.e. low blood sugar).
- Refer to blood sugars as “high” or “low” not “good” or “bad.”
- Do not let a toddler take extended naps as they may miss a meal or snack. Do a blood sugar check if they are sleeping longer than usual.

TODDLERS AND MEAL PLANNING

- Serve meals about the same time and in a designated place.
- Toddlers have typical erratic eating patterns. The key is to try to vary the foods you give. Food jags (repeatedly eating the same foods) are common. Allow your child to eat the favorite food as long it is low in simple sugars and reasonably nutritious. Be flexible and creative in food selections at meal times. For example, it is okay to serve eggs and pancakes for dinner.
- Allow a certain amount of time (not more than 25 minutes) for each meal. When time is up the meal is over.
- Do not nag or physically force a toddler to eat as this usually will make them resist more. Do not get in a power struggle with your toddler.
- Allow the toddler reasonable choices of foods (i.e. pick one out of several vegetables). This may help reduce their anger and feelings of lack of control.
- Remember that a common sign of a low blood sugar insulin reaction is hunger.
- Toddlers have short attention spans and attention is easily diverted from food. You need to limit their distractions, for example, by turning off TV during meals.
- Avoid using food as a reward. Rewards for cooperative behavior should be non-food items (i.e. hugs, toys, books).
- Avoid eating in your toddler’s presence if it is not meal or snack time and/or an appropriate food choice.

CHAPTER 20

Adolescents With Diabetes

The teen years can be challenging whether or not a teen has diabetes. In addition to developmental tasks, teens with diabetes are expected to assume most of the responsibility for diabetes management. During this time there may be an increase in risk-taking behaviors (i.e. missing insulin, drinking, smoking, etc.) in addition to the changing roles related to the balance between independence and parental control. Many studies show that there is a relationship between successful diabetes management and teens that live in an environment with the following characteristics:

- Parent — teen communication occurs frequently with mutual respect and is constructive rather than filled with conflict
- Diabetes responsibilities are transferred appropriately and in small steps with continued parental support and involvement
- Parents and diabetes team convey an attitude of support and praise for self-care success rather than criticism for self-care failures

TYPICAL CHARACTERISTICS

Identity (Who am I?)

- May not want to tell friends about diabetes as they “don’t want to appear different.”
- Encourage teen to share their feeling regarding diabetes as having anger surrounding a chronic condition is not unusual.
- May want to keep blood glucoses high to avoid low blood glucose emergencies which may be embarrassing.

Body image (Do I like my body?)

- Increase in hormone levels results in an increase in insulin needs.
- Well regulated diabetes usually does not interfere with growth and development but chronic high blood glucoses may cause slower growth and delayed puberty.

Peer Relations (Who are my friends and what do they think of me?)

- Teen diabetes camps and activities can help ease the way through adolescence.



- Encourage the teen to talk to their close friends regarding their diabetes, as the teen may need their help if an insulin reaction occurs. Also, the understanding of peers about diabetes may increase peer support and regimen adherence.

Independence (Who is in charge of my life?)

- Parents need to be supportive and allow teens to manage their disease but be ready to step in, if needed. Ask your teen how you can help. Meet once a week with your teen to review blood sugar readings in a calm, cooperative, supportive manner.
- Some rebellion may be demonstrated towards parents as they grow into separate independent individuals.
- Responds more to praise than to constant criticism.
- Slowly transfer responsibility for diabetes care to the teen. Continued adult support, assistance, and supervision are needed during this time of transition.

- Teens may incorrectly record blood glucose numbers in log book to avoid conflict with parents/medical team.
- Constant nagging can lead to anger and resentment.
- Negotiation is the key to adolescence; involve the adolescent in making decisions. Behavior contracts between parents and teens are a helpful tool in negotiating goals.
- Diabetes clinic visits should allow the teen to have some independent time with the health care team.

Remember! The primary goal is to encourage a positive attitude towards living with diabetes while successfully managing diabetes and minimizing risk-taking behaviors.

ALCOHOL

The use of alcohol by adolescents is never acceptable, and can be extremely dangerous to anyone with diabetes. The healthiest choice is not to drink! Alcohol has no nutritional value, is fattening and can prevent the liver from releasing its own stores of sugar into the bloodstream, possibly causing a low blood sugar reaction.

Other points to consider include:

- Signs of a low blood sugar reaction may be confused with drunkenness and may go untreated.
- Makes people hungry and causes poor judgment that can lead to over-eating, forgetting insulin, not adhering to meal plan.
- Different drinks raise blood glucose levels to differing degrees.
- Pure alcohol does not raise blood sugar, but when mixed with sweeteners, blood sugars will rise.

RECREATIONAL DRUGS

Recreational drugs are drugs that do not treat a specific disease/condition. General effects of drug use include:

- decreased awareness and treatment of high or low blood sugar emergencies
- forgetfulness and a decreased sense of time awareness (i.e. skipped insulin and/or blood sugar testing, meals/snacks)
- increase or decrease in appetite.
- increased or decreased blood sugars.

TOBACCO

- There is no safe tobacco. Persons with diabetes are advised to not smoke.

- Smoking increases the chances of getting diabetes complications including kidney damage, eye damage and narrowing of blood vessels. People with diabetes who smoke are much more likely to get heart disease or need an amputation.

Becoming 'Smoke-Free'

- Parents can help teens to decide against smoking by providing them with the facts (i.e. pamphlets written for teens) and by not smoking themselves.
- To help a teen stop smoking, focus on benefits of cleaner teeth, better smelling breath and clothing, saving money, better able to participate in sports and improved self-esteem.
- When discontinuing the use of tobacco completely, one may experience symptoms of nicotine withdrawal that may be confused with the signs of low blood sugars (i.e. headaches, anxiety, drowsiness, hunger, irritability) thus, extra testing is important.
- A combination of family support, replacement therapy (patches and gum) and behavior tactics may be effective in quitting smoking.

EATING DISORDERS

- The most common types of eating disorders are anorexia nervosa (severe weight loss, unrealistic body image, intense fear of gaining weight, menstrual cycles stopping, vigorous exercise) and bulimia (binging on large amounts of food and purging the intake by self-induced vomiting and/or excessive use of laxatives).
- Intentional omission of insulin in the diabetic population may also be considered a disorder. Both diabetes and eating disorders focus on foods as part of treatment, feelings of being deprived, weight and rebellion from a stringent regimen.
- There is a higher prevalence of eating disorders in the diabetic population.
- Newly diagnosed persons with diabetes often lose weight and a teen may struggle to maintain that lower weight, which triggers the eating disorder.
- Adolescents need sound information about diet, exercise and weight regulation. If you suspect an eating disorder, please consult your physician immediately.
- If a teen acknowledges having an eating disorder, parent/medical team should have a non-judgmental attitude along with problem solving skills.
- Depression symptoms may accompany an eating disorder.

- Teens tend to gain weight during the first year following diagnosis and thus become more concerned about their body image.
- Persons at greater risk appear to be mid-to-late adolescent females with tendency to be overweight.
- Contributing psychological factors include low self-esteem, body image distortion, social pressure to be thin, perfectionism, passivity and inability to communicate feelings.
- Warning signs may include cracks in corners of mouth, wearing multiple layers of clothing, trips to bathroom after meals and preoccupation with exercise.

PREGNANCY

- Sex education and avoidance of teen unplanned pregnancies is important. Extra medical care is required for diabetes pregnancies (i.e. extra lab tests, extra physician visits and/or hospitalization).
- Please consult physician if adolescent female is sexually active.

SEXUALITY

- Sex education is important for all adolescents.
- A teen with diabetes has the same risk as non-diabetic teens of contracting sexually transmitted diseases.
- Family planning clinics are helpful with birth control information and visits are confidential and low cost.
- Please consult the diabetes team for additional information.

EMPLOYMENT

- Federal regulations (i.e. The Rehabilitation Act of 1973) have made it illegal for most major employers (or schools) to reject a person (regarding hiring, promotions, or work activities) with diabetes on the basis of their diabetes alone unless the position is clearly hazardous to the person or to those working nearby.
- ADA employment policy recognizes that a person with diabetes is employable for the vast majority of professions and job positions.
- One is not required to disclose their diabetes unless they know it would interfere with their job performance. A person could be fired if they lie on a job application. The best advice is to prepare for job interviews by being aware of one's rights and what to do if they are violated.
- If one discloses their diabetes, they should lead with their strengths, (i.e. volunteer activities, good student, sports

they are involved in, how few sick days they have taken in the past).

- Employers usually are not permitted to ask questions about one's health before deciding whether to hire.
- Once there has been a job offer, employers can ask health questions as part of the employment physical exam.
- Acknowledging diabetes to employers and prospective employers builds a record of credibility and provides one with more safety on the job (i.e. assistance with severe low blood sugars, need for a snack etc.).
- Individuals with diabetes may qualify for state financial assistance for college/trade school through the Department of Vocational Rehabilitation.
- If discriminated against — consider talking to employer, get support from union or human resources, contact JDRF or ADA affiliate or hire an attorney to file a complaint under federal law (be persistent).
- Almost any career is open for persons with diabetes but some careers that may be difficult to pursue include



military service, airplane pilots, firefighters, policeman, interstate bus or truck drivers.

- Depending on the treatment regimen a job with fairly regular hours is more desirable than one with swing shifts.
- First critical step to prepare for employment is to carefully manage one's diabetes and attend appointments with one's diabetes health care team.
- If your teen mentions diabetes on a job application, it's important to explain it is under control and will not interfere with work or attendance (your teen's health care team can provide confirmation to the employer).
- Pamphlets from JDRF or ADA (i.e. "A Word to Employers") are available to help educate employers.
- Have your teen plan career choices with a trained counselor. Have them ask for a complete assessment of interests, aptitudes, skills and talents.

DRIVING

- All states allow people with diabetes to drive but may require a doctor's statement that there are no serious complications that could interfere with driving.
- Do not fail to report diabetes on your teen's driver's license application. Lying about it may result in loss of the driver's license.
- Low blood sugar reactions may temporarily impair judgment. Before driving, check blood sugar. If it is low,

eat or drink 15 grams of carbohydrate. Wait 15 minutes, recheck blood sugar. When blood sugar is in target range, it is safe to drive. (Refer to Chapter 5 Hypoglycemia/Insulin Reactions.) Your teen should never skip a meal if they are going to be driving.

- Never drink or take medications before driving that increase sleepiness.
- When driving long distances, your teen can avoid low blood sugar reactions by eating snacks at regular intervals and test blood glucose frequently.
- If symptoms of low blood sugar occur while driving, pull over as soon as possible, park the car and treat the low level. Wait until blood sugar level returns to normal before resuming driving. It will take 15-30 minutes before sugar level is high enough for safe driving. If necessary, let someone else do the driving for a while.
- Keep snacks or treatments for low blood sugar available at all times; traffic, weather and other variables could delay a needed meal or snack.
- Wear a medical ID tag. In case of an accident or driving problem, police or medical personnel will know you have diabetes. It could save your life.
- Driving may be a problem for a person who has hypoglycemia unawareness, i.e. does not feel early warning signs. It is essential to do blood glucose testing at regular intervals while driving.



CHAPTER 21

Resources

Included in this section is a list of diabetes organizations that can aid in diabetes education and care.

American Diabetes Association (ADA)

15455 Conway Rd., Suite 360
Chesterfield, MO 63017
800.342.2383 or 314.822.5490
diabetes.org



A voluntary organization concerned with diabetes and its complications, its mission is to prevent and cure diabetes and to improve the lives of all people affected by diabetes. ADA sponsors numerous events and activities, including Camp EDI (an overnight diabetes camp for children and teens), fundraising walks and bicycle rides.

A free activities mailing list is available by calling their office. A general membership enrollment fee entitles a family to 12 issues of *Diabetes Forecast*, a monthly magazine that addresses a multiple of diabetes-related issues. This organization also makes available numerous diabetes-related books (including cook books), tapes, etc. It also has a 24 hour information help line, 800.342.2383.

Juvenile Diabetes Research Foundation (JDRF)

50 Crestwood Executive Center, Ste 401
St. Louis, MO 63126
314.729.1846
jdrf.org



A non-profit organization that focuses its energies on fund raising, referrals, educational materials, and information pertaining to juvenile diabetes. It has been funding research to find a cure for diabetes and its complications since 1970. Fundraising events include: The Gala, golf outings, JDRF Night at the Ballpark, Walk for a Cure, and the purchasing of diabetes supplies at the Fifty 50 Pharmacy. They dispense a free bag of hope to newly diagnosed children.

A free activities mailing list is available by calling their office. An annual membership enrollment fee entitles a family to *Countdown*, a magazine with an emphasis on research, issued 4 times per year.



Medic Alert

800.432.5378
medicalert.org



This is an emergency medical identification system that provides a wrist or neck emblem custom engraved with medical facts. It also has a 24-hour help line that provides a confidential record that includes health condition, physician, pharmacy, family contacts, and allergies.

National Institute of Diabetes and Digestive and Kidney Diseases

800.860.8747 and 301.496.3583
diabetes.niddk.nih.gov

This organization offers various material resources, books, pamphlets, etc. in the area of diabetes and diabetes-related issues.



**St. Louis Children's Hospital
Family Resource Center**

One Children's Place
St. Louis, MO 63110
314.454.2350
StLouisChildrens.org

The Family Resource Center at St. Louis Children's Hospital is a no-cost library that offers:

- Books that can be checked out.
- Computers for on-line research.
- Access to packets of illness information.
- A business center where parents can access e-mail, a fax machine and copy machine.



ASSISTANCE PROGRAMS FOR DIABETES SUPPLIES/MEDICATIONS

fifty50pharmacy.com

Online pharmacy offers various subscriber services including discounts on some diabetes supplies. 50 percent of sales is donated to diabetes research.

AbbVie Patient Assistance Foundation

Abbott Laboratories' program for assistance with Freestyle diabetes products.

1.800.222.6885 abbviepaf.org

AstraZeneca

Prescription Savings Programs.

1.800.AZandME (1.800.292.6363) azandmeapp.com

Bayer Health Care Pharmaceutical Patient Assistance Program

Assistance with cost of Precose/acarbose medication.
1.866.575.5002

Benefits Check-Up

Search engine to help senior citizens find assistance programs for prescriptions, health care, rent, utilities, etc.

benefitscheckup.org

BD (Becton, Dickinson and Company)

BD Insulin Syringe Assistance Program.

1.866.818.6906 <http://www.bd.com/us/diabetes/page.aspx?cat=7002&id=14199>

Bristol-Myers Squibb Patient Assistance Foundation

Assistance with some diabetes medications.

1.800.736.0003 bmspaf.org

GlaxoSmithKline (GSK for you)

Assistance with some diabetes medications

1.866.728.4368 gskforyou.com

Lilly Cares Patient Assistance Program

Provides vouchers for purchasing insulin. Eligibility based on income, assets and lack of health insurance.

1.800.545.6962 lillycares.com/findprogram.aspx

Medtronic/Mini-Med Financial Assistance Program

Provides financial assistance with insulin pump supplies. Eligibility based on income/lack of insurance coverage.

1.800.MINI.MED (1.800.646.4633)

medtronicdiabetes.com/support/ordering/billing

The Merck Patient Assistance Program

1.800.727.5400 merckhelps.com

Needy Meds

Information on pharmaceutical and health care assistance.

1.800.503.6897 needymeds.org

Novartis Patient Assistance Foundation, Inc.

1-800-277-2254 or 1-800-245-5356

patientassistancenow.com

Cornerstones 4 Care Patient Assistance Program

Eligibility based on income and lack of health insurance.

Assists with access to Novo-Nordisk diabetes medications and Novolog insulin.

1.866.310.7549 <https://www.cornerstones4care.com/patient-assistance-program.html>

Partnership for Prescription Assistance

Assistance obtaining medications and supplies free or low cost. Eligibility based on income and lack of insurance.

888.477.2669 <https://www.pparx.org/>

Roche Laboratories Inc.

Genetech Access Solutions may improve access to

Accu-chek insulin pump and glucometer supplies.

1.866.4ACCESS (1.866.422.2377) genetech-access.com/patient.html

Rx Assist

Patient assistance center provides a comprehensive database of pharmaceutical assistance programs.

<http://www.rxassist.org>

Rx Hope

Access to medications for free or small co-payments.

rxhope.com

Sanofi-Aventis Patient Assistance Connection

1.888.847.4877 Assistance with cost of Lantus insulin.

sanofipatientconnection.com



CHAPTER 22

Books and Media About Diabetes

These resources are available in the Family Resource Center. The Family Resource Center is a Consumer Health Library and is open to the public.

Monday-Thursday 8:30 a.m.-7 p.m.

Friday 8:30 a.m.-4:30 p.m.

Saturday 10 a.m.-2 p.m.

Located in the hospital in room 3S-12

Phone: 314.454.2350 • Email: frc@bjc.org

BOOKS FOR ADULTS

100 Questions & Answers About Your Child's Type 1 Diabetes

Elizabeth Platt, Jerrold Olshan & Maryann Waterman, 2012

American Dietetic Association Guide to Eating Right When You Have Diabetes

Maggie Powers, 2003

Complete Guide to Carb Counting

Hope S. Warshaw, 2011

Diabetes 365: Tips for Living Well

Susan Weiner and Paula Ford-Martin, 2015

Diabetes 911: How to Handle Everyday Emergencies

Larry A. Fox, MD & Sandra L. Weber, MD, 2009

Diabetes A To Z: What You Need to Know About Diabetes — Simply Put

American Diabetes Assoc., 2010

Diabetes Snacks, Treats & Easy Eats for Kids

Barbara Grunes, 2006

Diabetes Travel Guide 2nd Ed.

Davida F. Kruger, 2006

Diabetic Athlete

Sheri R. Colberg, 2002

Diabetic Meals in 30 Minutes – Or Less!

Robyn Webb, 2006

Eat to Beat Diabetes: Stop Type 2 Diabetes and Prediabetes

Diabetic Living, 2016

Eat What You Love, Love What You Eat With Diabetes

Michelle May, MD 2012

Elle & Coach: Diabetes, the Fight for My Daughter's Life, and the Dog Who Changed Everything

Stefany Shaheen, 2015

Everything Parent's Guide to Children with Juvenile Diabetes: Reassuring Advice for Managing Symptoms and Raising a Healthy, Happy Child

Moira McCarthy, 2007

First Book for Understanding Diabetes, 13th Ed.

H. Peter Chase, 2014

Getting a Grip on Diabetes: Quick Tips & Techniques for Kids and Teens

Spike Nasmyth Loy and Bo Nasmyth Loy, 2007

BOOKS FOR CHILDREN

The Bravest Girl in School

Kate Gaynor, 2008

Coco and Goofy's Goofy Day

Susan Amerikaner, 2011

Coco's First Sleepover

Susan Amerikaner, 2013

Coco Goes Back to School

Susan Amerikaner, 2012

Cooper has Diabetes

Karen Olson, 2003

Even Little Kids Get Diabetes

Connie White Pirner, 1991

Jacob's Journey: Living with Type 1 Diabetes

Deanna Kleiman, 2012

Medikids Explain Type 1 Diabetes

Dr. Kim Chilman-Blair, 2012

My Sister Rose has Diabetes

Monica Driscoll Beatty, 1997

Rufus Comes Home: Rufus, the Bear with Diabetes

Kim Gosselin, 1998

Taking Diabetes to School

Kim Gosselin, 1998

Trick-or-Treat for Diabetes

Kim Gosselin, 1999

Type 1 Teens: A Guide to Managing Your Life with Diabetes

Korey K. Hood, 2010

Why am I So Tired? A First Look at Childhood Diabetes

Pat Thomas, 2008

BOOKS FOR TEENS

Highs & Lows of Type 1 Diabetes: The Ultimate Guide for Teens and Young Adults

Patrick McAllister and Stuart A Weinzimer MD., 2018

Raising Teens with Diabetes: A Survival Guide for Parents

Moira McCarthy and Jake Kushner MD., 2013

Type 2 Diabetes in Teens: Secrets for Success

Jean Betschart-Roemer., 2013

COOKBOOKS

America's Best Cookbook for Kids with Diabetes

Colleen Bartley, 2005

Complete Quick & Hearty Diabetic Cookbook, 3rd Ed.

American Diabetes Assoc., 2008

Diabetes Snacks, Treats & Easy Eats for Kids

Barbara Grunes, 2006

Diabetic Meals in 30 Minutes or Less, 2nd Ed.

Robyn Webb, American Diabetes Assoc., 2006

Asian Flavors Diabetes Cookbook

Corinne Trang, American Diabetes Assoc., 2012

Cocinando para Latinos Con Diabetes, 2nd Ed.

Olga V. Fuste, American Diabetes Assoc., 2011

The New Soul Food Cookbook for People with Diabetes, 2nd Ed.

Fabiola Demps Gains and Roniece Weaver, American Diabetes Assoc., 2006

America's Best Cookbook for Kids with Diabetes

Colleen Bartley., 2005

Just What the Doctor Ordered Diabetes Cookbook Book

Joseph D'Amore and Lisa D'Amore-Miller., 2010

Delicious One-Pot Dishes: Quick, Healthy, Diabetes-Friendly Recipes

Linda Gassenheimer., 2015

Cooking up Fun for Kids with Diabetes

Patti B. Geil, 2003

DIABETES WEB SITES

www.stlouischildrens.org/diabetessupport

www.childrenwithdiabetes.com

www.dlife.com/diabetes/diabetic-recipes/

www.diabeticlivingonline.com/diabetic-recipes/

www.diabetes.org

www.calorieking.com

www.diabetes.org

www.jdrf.org

www.eatingwell.com

www.nutritiondata.com

www.childrensdiabetesfoundation.org

www.yourdiabetesinfo.org

<http://peds.wustl.edu/endodiabetes>

www.ndep.nih.gov



HELPFUL DIABETES APPS

Here we list some of the most popular and free apps available at the time this handbook was printed. Please keep in mind that new apps are constantly created and this list does not reflect every available diabetes app.

Specific Devices Key:

Apple Products: **i** | Android/Google Play: **G**

Blue Loop

This app (with companion website) serves as an information hub for caregivers of children with diabetes. Parents and other caregivers can update a child's information, which the other caregivers can view in real time. **G, i**

Carb Counting With Lenny

Kids can browse photos of common foods to learn how many carbs are in each or play a "does this food have carbs?" game to rack up points. **G, i**

Calorie King

Look up foods and corresponding carbohydrate, calorie and fat content, easy to use. Search food database in place of the paper copy of Calorie King. **G, i**

Fooducate

This app aims to improve nutrition choices by providing a thorough look at the foods you eat. Search for foods or scan bar codes to get a comprehensive profile, including nutrition facts, tips, etc. **G, i**

GoMeals

Using a plate graphic and bold colors, this app can help you visualize how well you're meeting your daily nutrition needs. Log foods using a comprehensive database that includes more than 40,000 common foods and over 20,000 restaurant meals, view nutrition facts, and see what percentage of your current calorie intake is from carbohydrate, fat, and protein. **G, i**

My Net Diary

Assists with personal weight loss and exercise goals by tracking nutrient intake and fitness goals. Can scan barcodes of foods to analyze nutrient content per serving size. **G, i**

Glucagon

Free app designed to give training instructions and to help users with Glucagon administration. Interactive video-game-like demonstration, speaks verbal directions for administering Glucagon, and can keep track of kit expiration dates. **G, i**

Glucose Buddy

Manually enter blood glucose numbers, carbohydrate, insulin and activities. Free version very basic. **G, i**

LogFrog DB

Child friendly app that offers logbook for documenting exercise, blood sugars, carbohydrates and medication doses. **G, i**

dLife Diabetes Companion

Ability to look up foods and recipes, logbook function for glucose, carbohydrates and insulin, Q&A section with videos and interviews. Very helpful, targeted audience adults/adolescents. **G, i**

Blood Sugar Tracker

Free and simple app. Manually log blood sugar levels, set target blood glucose ranges, view history and simple graphs to identify numbers that are in and out of target range. **G, i**

Lose It

Track your daily food intake, weight and exercise with this comprehensive app. You can add meals as you eat them and watch the sliding scale climb toward your daily calorie limit. **G, i**

Glooko

This is a free app, but requires you to purchase a specific cable to download your meter memory to the app. This app can create graphs and charts with your blood glucose results, has a food database with carbohydrate counts and connects to the glooko Facebook page. **G, i**

On Track Diabetes App

This application helps parents manage their child's diabetes by tracking various items such as blood sugar, food, medication, blood pressure, pulse, exercise and weight. **G**

Health2Sync

This APP understands that living with diabetes can at times feel isolating. That's why you can invite friends or family as a partner on this app for added support and motivation. The app lets you see all your vital stats at a glance within the dashboard or look more deeply at individual metrics like blood pressure, weight, and blood glucose. You can also export your data. By reviewing your diary, you can look for trends in what's causing any symptoms or mood shifts. **G, i**

AADE Diabetes Goal Tracker

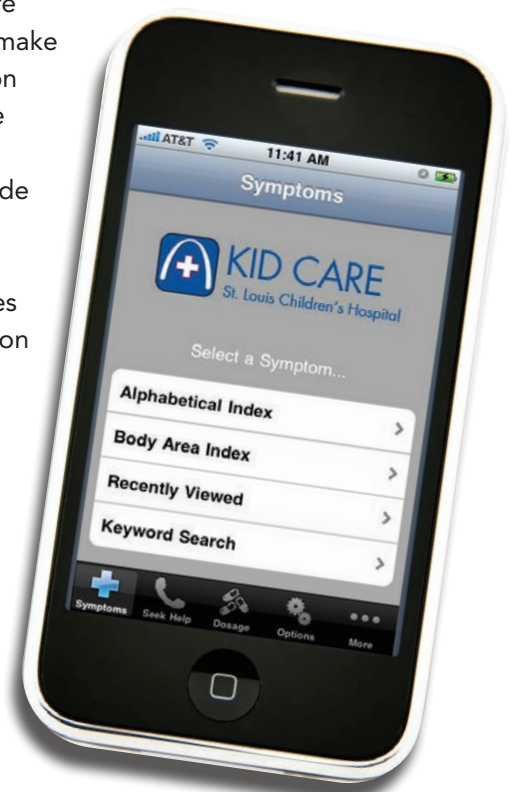
Diabetes Goal Tracker is a tool to help you set your goals based on the seven proven diabetes management approaches. **G, i**

Glucosio

This app for types 1 and 2 diabetes. It tracks important metrics like A1C, body weight, ketones, cholesterol, blood pressure, and more. Against a hot-pink background, you can select your targets and set reminders to keep your program on point. With your permission, the open source platform allows you to help diabetes researchers by sharing your data anonymously. Currently, you can back up your data to Google Drive and share it via CSV file. Stay tuned for more exporting formats and backup as well as new features like bolus and basal tracking. **G, i**

Kid Care from St. Louis Children's Hospital

The symptom care guides help you make smart decisions on what level of care (if any) is needed and how to provide speedy symptom relief for minor illnesses or injuries you can manage on your own. **G, i**



ST. LOUIS CHILDREN'S HOSPITAL SPECIALTY CARE CENTER

Advanced Pediatric and Adolescent Care

The St. Louis Children's Specialty Care Center is our new outpatient facility in west St. Louis County focused on providing the very best care for young patients. At the Center, Washington University Physicians and St. Louis Children's pediatric nurses and staff bring nationally recognized expertise to children and families, in an environment completely dedicated to kids and teens. The Specialty Care Center features a range of pediatric medical services. The Specialty Care Center is conveniently located on Highway 40/ I-64 and Mason Road in west St. Louis County, (one mile west of the I-270 and I-64 interchange). A surface parking lot is adjacent to the Center.



DIABETES WORD FIND



Look for the following words:



autoimmune

carbohydrate

diabetes

exercise

glucagon

glucose

humalog

hyperglycemia

hypoglycemia

insulin

ketone

lancet

lantus

logbook

meter

novolog

pancreas

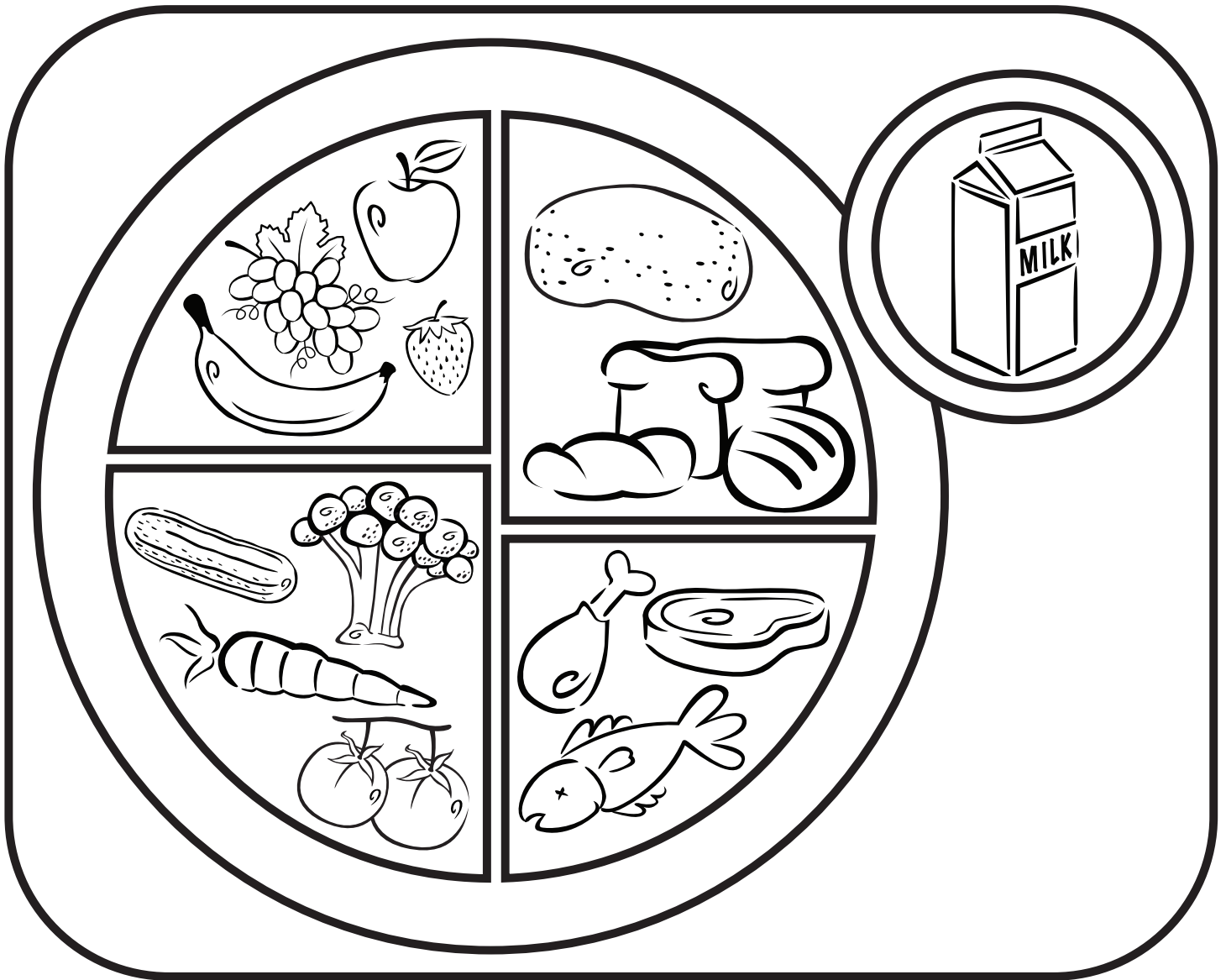
protein

syringe

test strip

COLORING PAGE

Color in the foods that contain carbohydrates



NOTES

Horizontal lines for writing notes



ST. LOUIS CHILDREN'S HOSPITAL

One Children's Place
St. Louis, Missouri 63110

**ST. LOUIS CHILDREN'S HOSPITAL
SPECIALTY CARE CENTER**

13001 North Outer Forty
Town and Country, Missouri 63017

314.454.KIDS (5437)
800.678.KIDS (5437)

StLouisChildrens.org



St. Louis Children's Hospital complies with applicable federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability or sex.

Atención: hay servicios de asistencia de idiomas disponibles a su disposición sin costo. Llame al 314-747-5682 (TTY: 1-800-735-2966).

注意：免费提供语言协助服务，如有需要敬请致电 314-747-5682 (TTY: 1-800-735-2966)。