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The Education Manual for The Management of Type 1 Diabetes

Editors of the 2009 Edition

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Special thanks to the members of the division
of pediatric endocrinology, metabolism and nutrition.

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Education Manual is also available on our website at
www.academicendocrinology.com

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INTRODUCTION

Your child has been diagnosed with diabetes. Most parents feel shocked, sad and/or scared. As you and your family learn about diabetes, these feelings should lessen and/or go away. Many parents have mentioned that it seems like life will revolve around diabetes and that the entire day will be used to manage diabetes.

Diabetes management may require major changes in a family's lifestyle.

- Blood glucose values must be monitored and recorded with meals and snacks.
- Insulin injections need to be given based on the size of the meal and/or the number of carbohydrates.

Eventually many, if not all of these tasks, will become part of the family's routine. Some parents have said that it takes 2-3 months for diabetes management to feel like part of a routine and for family life to return to "normal". During the first days after diagnosis, you and your family will be taught the following skills:

1. How to test blood glucose (sugar)
2. How to test urine for ketones
3. How to give insulin
4. How to prevent, recognize and treat high and low blood sugars (including glucagon injection)
5. How to plan the daily meals

6. How to combine activity with diabetes management



The skills above are the basics of diabetes management. Diabetes education is an ongoing process and will continue at office visits, visits to the diabetes education center, over the phone and through your own reading. Always feel free to ask questions and discuss any concerns. Each child with diabetes and their family will have different needs that change over time. Your family is now a part of the Diabetes Management Team. We will work together to learn how to best manage diabetes in your busy family life for healthy growth and development of your child and family.

Please fill in the following questions:

WHAT FINDING OUT ABOUT DIABETES FIRST MEANT:

WE NEED TO LEARN MOST ABOUT:

THE DIABETES MANAGEMENT TEAM

The Endocrinology, Metabolism and Nutrition Office telephone number is (630) 416-4501.

The emergency pager is 630/901-1911.

The diabetes team approach is focused on the needs of the child with diabetes. The needs of the family will be identified by the health care professionals and by you.



Diabetes care, with age appropriate glucose goals, can only be accomplished by you and your family. Our job is to help you accomplish this with education and support.

Drs. W. Patrick Zeller, Jennifer Miller, Carrie Zimmer and the diabetes education team will coordinate the child's care during hospitalization. After discharge, you and your family can reach us 24 hours a day, as necessary, to answer emergencies.

Non-emergency situations (e.g. questions, insulin adjustment, dietary adjustments) can be discussed during your office visits and with the diabetes education centers at Edward Hospital or Central DuPage Hospital. If it is urgent, please call Monday through Friday 9:00am to 4:30pm. A team member will call you back or take the call at that time if possible. The return call may not be until the next business day.

If a problem arises after the office has

closed or on a weekend, call the emergency pager at 630/901/1911 or call the office at **(630) 416-4501 and you will be instructed how to use our emergency pager.** Your call will be directed to the team member providing evening or weekend coverage.

Our goal is to provide you with the skills, resources, and a plan of treatment for yourself and your child to live a happy productive life with as near normal blood glucose control as possible. It is current thinking that this lifestyle can stave off or prevent long-term complications. You must become a "diabetes professor". We will work together to achieve this goal.



DEFINITIONS

BASAL INSULIN: The dose of insulin given to provide sufficient “background” levels in circulating blood to keep blood glucose in the desired range when the effects of bolus insulin doses have subsided.

BLOOD GLUCOSE:

Also called blood sugar. The sugar measured in the blood. Blood glucose and blood sugar are used interchangeably.

BOLUS INSULIN: The dose of short-acting insulin given before meals. Also called “prandial” insulin.

CONTINUOUS GLUCOSE MONITORING SYSTEM (CGMS):

A system (sensor) to measure glucose continuously in interstitial fluid for up to 72 hours. The sensor is placed in subcutaneous tissue and once removed is downloaded for analysis to make recommendations in therapy.

CONTROL: (also blood glucose control)

Refers to the target range for blood glucose values for a child with diabetes. This target varies based on the age of the child and examples are listed in the **Blood Glucose Control** section.

COUNTER REGULATORY HORMONES:

Hormones, which cause the blood glucose values to increase. These hormones are released in response to stress (e.g. illness, trauma, low blood sugar.) They are called growth hormone, cortisol and glucagon.

FINGER STICK:

Pricking of the fingertip to obtain a drop of blood to measure the amount of glucose in the blood.

GLUCAGON:

A hormone normally produced in the pancreas, which causes glucose stored in the liver to be released into the blood. Glucagon will cause blood glucose levels to increase. Glucagon is one of the counter regulatory hormones. Glucagon must be given by injection for severe low blood sugar when the patient is not able to eat or drink. If you are unsure whether to use

glucagon, you should use it! Glucagon is your friend. You cannot harm someone with glucagon.

GLUCOSE:

The most common form of sugar found widely in bodies of living things. It is the principal circulating sugar in blood and the major energy source of the body.

HONEYMOON PERIOD:

A period of time, shortly after diagnosis with diabetes, during which the pancreas is temporarily able to produce some insulin. During the honeymoon period, less insulin is needed in daily injections. Not everyone will experience a **honeymoon period**. The honeymoon period can last for weeks or months. Optimal glucose control can prolong the honeymoon.

HYPERGLYCEMIA:

High blood glucose (sugar). A blood glucose value of 300 mg/dl or more. Not an emergency. All diabetics have an occasional high blood glucose.

HYPOGLYCEMIA:

Also called low blood glucose (sugar). A blood glucose value of < 80 mg/dl where physical symptoms occur, such as sweating or shakiness.

INJECTION:

A shot with a needle and a syringe or with an insulin pen.

INSULIN:

A hormone normally made in the pancreas, which lowers blood glucose. Insulin enables cells in the body to use glucose, protein and fat. Insulin can only be given directly into the body by a shot or by intravenous (IV) fluids. Insulin should not be swallowed. Insulin will not be active if eaten. It will be digested. People with Type 2 diabetes sometimes take pill(s) instead of or in addition to an insulin injection as their medicine. The pills used in Type 2 diabetes, work to make a pancreas produce more insulin or to use their insulin better.

INSULIN PUMP:

A device used to mimic normal insulin secretion by providing continuous insulin administration over a 24 hour period. The pump is activated before meals to provide increments of insulin, called a meal bolus. Basal rates are small increments of insulin delivered over 24 hours. Rapid acting insulin analogs are used in pumps.

JUVENILE DIABETES:

An old term that was used as a name for insulin dependent diabetes mellitus (IDDM) or Type 1 diabetes. In Type 1 diabetes, the body loses its ability to make insulin. Therefore, insulin has to be given by a "shot". What was typically referred to as Juvenile Diabetes is now officially called type 1 diabetes and usually starts in children.

KETOACIDOSIS:

Also called diabetic ketoacidosis. A person who is sick with ketoacidosis can have very high blood glucose and always has too little insulin with too many ketones in the blood. Without enough insulin, blood glucose cannot be used for energy and the body tries to use fat – the breakdown products which are ketones. The person becomes dehydrated with extra fluid

losses in the urine because of high blood sugar. This can happen very quickly (a few hours), especially in a young child. The body fluids become acidotic (acid builds up in the blood). **Ketoacidosis requires rapid medical treatment in a hospital. See the Hyperglycemia section.**

KETONES:

Substances produced in the body when fat stores (instead of glucose) are used by the body for energy. Ketones are measured in the urine and also in the blood. Normally there should be no ketones in the urine or in blood.

MEAL PLAN:

A well-balanced daily guide based on appropriate amounts of carbohydrates (measured in grams), protein and fat to help your child grow and develop.

NORMAL BLOOD GLUCOSE VALUES:

Blood glucose levels in the same range as in a person without diabetes.

PEAK INSULIN ACTION (EFFECT):

The time after the insulin injection when the insulin has its strongest effect. Since blood glucose is lowered by insulin, diet and activity must balance the insulin effect.

REACTION:

Also called a low blood sugar reaction, insulin reaction or hypoglycemic reaction. During a reaction, blood glucose values drop too low and/or symptoms of low blood glucose occur. The treatment is to eat and/or drink 15 grams of a fast acting form of glucose. Examples of the symptoms and foods are listed in the **Hypoglycemia section**.

TYPES OF INSULINS:

NPH INSULIN:

Insulin with a medium (8-12 hrs.) time of action. NPH insulin in the bottle is white and cloudy in color. NPH is mostly used in young children or as a second option if another regimen is not optimal.

REGULAR INSULIN:

Insulin with a short time of action. Regular insulin in the bottle is always clear.

LISPRO (Humalog), ASPART (Novolog) or GLULISINE (Apidra) INSULINS:

An insulin that starts working in a few minutes, peaks in 1-2 hours, and lasts 4-6 hours. This is designated "bolus insulin" to be used with meals and to correct high blood glucoses.

GLARGINE (Lantus) or DETEMIR (Levemir) INSULINS:

A long-acting insulin that does not have a peak (designated as a basal insulin). Also looks clear in the bottle.

TYPE 1 DIABETES:

Formerly called insulin dependent diabetes (IDDM) or juvenile onset diabetes.

TYPE 2 DIABETES:

Formerly called non-insulin dependent diabetes or adult onset diabetes.

The basis of developing type 2 diabetes is the body becoming more resistant to insulin or needing a lot more insulin to do the same job (use carbohydrates for energy).

More key points to show your understanding of the material:

WHAT ARE KETONES?

WHEN KETOACIDOSIS OCCURS WE SHOULD?

A REACTION IS ALSO CALLED?

TO TREAT A REACTION WE SHOULD?

WHAT IS DIABETES?

Q&A

Most people have heard of diabetes but many people do not understand what diabetes is or how it affects a person's life. To understand diabetes, you must first understand what happens in the body of a person who does not have diabetes.

When a person without diabetes eats, part of the food he/she eats is turned into a type of sugar called glucose. All foods except fat and meat will contain some glucose. Glucose is used by the body for energy and growth. After the body turns the food into glucose, the glucose enters the blood stream. The blood carries the glucose throughout the body to wherever it is needed. Glucose is removed from the blood and enters cells with the help of a hormone called insulin. Insulin is normally made in the body in an organ called the pancreas. Insulin helps "open" the door to the cell allowing glucose to enter and be used for energy. Without insulin, glucose stays in the blood. Insulin also helps "put away" fat and protein into the body's cells.

Q: What Is Diabetes?

A: In a person with Type 1 diabetes (the most common type of diabetes in children), the pancreas stops making insulin. The glucose, which is made from food, remains in the blood unable to be used for energy or growth. The amount of glucose in the blood will continue to increase. The body tries to get rid of the extra glucose in the urine. A person with high blood glucose (sugar) will urinate frequently, because

glucose is spilled into the urine and brings water with it. If a person urinates frequently, the person may become dehydrated and will feel very thirsty. The first two signs of diabetes that a child or parent may notice are frequent urination (or bed wetting) and increased thirst.

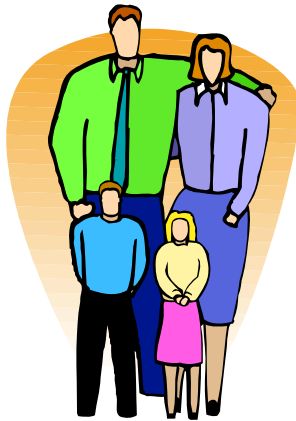


Without glucose for energy, the body will start to use body protein and fat stored for energy. Use of protein and fat from the body will cause a person to lose muscle mass and body weight. When fat is used for energy, ketones are produced. If ketones remain in the body, the person will become very ill. The body will normally try to get rid of ketones in the urine. If a person is becoming dehydrated because of high blood glucose (sugar), he/she will not be able to get rid of the ketones fast enough. When ketone levels become very high, a person becomes nauseated and "**ketoacidosis**" may develop. A person with ketoacidosis is very ill. He/she may be very tired, have a stomachache and/or rapid deep breathing, begin vomiting and appear to have the flu. He/she may need hospitalization if they cannot drink without vomiting.

Q: What Caused Diabetes?

A: As of now, there is still not a definite answer to this question. There are two main types of diabetes: Type 1 and Type 2. Type 2

is usually diagnosed in adults. The person with Type 2 diabetes is able to make insulin, but the insulin does not work well enough in his/her body. Sometimes people with Type 2 diabetes are able to take pills, which will stimulate their pancreas to make more insulin. Often a person with Type 2 diabetes is overweight and can control or lower his/her blood glucose through weight loss (even just 10 or 15 pounds) and balanced meal planning. It is thought that this type of diabetes is inherited. Type 2 diabetes is currently becoming more common in children.



Type 1 diabetes is much more common in children. As mentioned, the pancreas in someone with Type 1 diabetes does not make insulin. Pills and/or weight loss cannot replace the missing insulin with this type of diabetes. Diet changes alone will not cause the blood glucose to return to a normal level. The treatment for Type 1 diabetes must include insulin. It is not clear why children develop this type of diabetes. Some times type 1 diabetes seems to “run” in families, but **the child did not directly inherit or get the diabetes from his/her parent.** No relative in the family may have ever been diagnosed with Type 1 diabetes. A child may inherit "genes" that give him/her the tendency to develop diabetes. (Genes determine what we look like, how tall we will be, what color hair we have, etc.) People with certain gene types are more likely to develop Type 1 diabetes; however, people without these genes also develop Type 1 diabetes, so genes cannot be the only explanation for diabetes.

Type 1 diabetes is most often an autoimmune

disease. People with Type 1 diabetes produce antibodies, which "attack" the insulin producing cells in the pancreas. Antibodies are substances produced in our bodies that normally help prevent infection. For unknown reasons, the antibodies in some people mistakenly think that the pancreas does not belong and “fight it off” and destroy the insulin-producing cells of the pancreas and the pancreas cannot produce insulin. Usually this process has been going on for months to years. At the time diabetes is diagnosed , 80-90% of the insulin producing cells are already destroyed.

Q: Could Anything Have Prevented the Diabetes from Developing?

A: No matter what the cause of diabetes, at this time there is nothing that a parent, child or physician can do to prevent the development of Type 1 diabetes. There are many ongoing studies worldwide to help prevent diabetes. See resources at the end to learn more. Diabetes does not develop because of anything a person has done or hasn't done or has or hasn't eaten (like a lot of candy). Sometimes parents wonder if they had brought their child to the doctor more quickly, would the doctor have been able to do something to stop the development of diabetes. The answer is **no.**

Q: Is There a Cure for Diabetes?



A: Currently, there is no cure for diabetes. The only way to cure a person of diabetes is to transplant a pancreas that produces insulin into the person, or transplant cells that produce insulin (islets of Langerhans...). Unfortunately, the body can recognize transplanted organs as "foreign" and tries to reject the transplanted organ. To prevent rejection, a person must

take drugs that suppress the body's ability to get rid of the transplanted organ or cells. These drugs can have some very serious side effects (including re-destroying the insulin producing cells) and must be taken daily for life. The side effects of the medications could be harmful. In August 2001, limited stem cell research was given an "OK" by the federal government. These cells appear very promising.

Q: Will It Be Necessary to Take Insulin Every Day Forever?

A: Yes. At this time there is only one way to control blood glucose levels in a person with Type 1 diabetes. The person must count carbohydrates and give appropriate amounts of basal and bolus insulin to cover for the body's insulin needs. At this time, the best way to give insulin is in the form of an injection or shot. If the insulin is swallowed, the stomach will digest or destroy the insulin before it reaches the blood. Inhaled insulin was taken off the market because of causing decreased lung function. The amount of insulin a person needs depends on his/her weight, activity and diet.

Within several weeks of diagnosis, some people notice that the amount of insulin they need to maintain blood glucose in a normal range may decrease. Inside their bodies, the remaining cells that produce insulin temporarily produce more insulin. If the body produces more insulin, then less insulin needs to be given in the injection. Unfortunately, these remaining cells eventually lose their ability to produce insulin. When this occurs, there will be a need to increase the amount of insulin given daily in the injections. The time period that the pancreas is temporarily able to make more insulin is called the "**honeymoon period**". The honeymoon period always ends. The decreasing and increasing of insulin doses does not mean the diabetes is getting better or worse. Not every child goes through a "honeymoon".

Q: When Will Noninvasive Testing be Ready?



A: Noninvasive testing or monitoring is when a person can check their blood glucose by a "reading" from the surface of the skin or other body fluid instead of by a drop of blood. This form of blood glucose monitoring is not readily available.



Continuous glucose monitoring, where a probe sits beneath the skin and blood glucose is checked every 5 minutes is promising and a useful tool for monitoring blood glucose trends. Three main sensors are available to date:

- DexCom – Sensor Plus
- Freestyle – Navigator
- Metronics – Guardian REAL-time

Use of a continuous glucose monitoring system (CGMS) can help monitor trends in blood glucose, it does NOT yet replace the need for 4+ finger sticks per day. At this time it is an adjunct to finger sticks. Usually it isn't used until all the basics of diabetes care are like second nature for a family. Currently some insurances may not cover these devices. Families should check with their individual insurance companies to see what is covered.

Q: What Devices are Available to Inject Insulin?



A: Insulin must be given into the subcutaneous tissue (just below the skin). This can be given with either insulin vial and syringe with needles, with insulin pens with needles (only some can give ½ unit increments), or continuously through an insulin pump.

The insulin pens are designed to make dosage and injection of multiple injections easier. These pens are especially handy for insulin administration at school or away from home.

Insulin pumps are now recommended by the International Society for Pediatric and

Adolescent Diabetes and are used in children. Near normal blood sugar control can be attained with the use of an insulin pump. If an insulin pump is used, our Edward Center for Diabetes Education or Central DuPage Hospital Diabetes Education Center will teach you how to use it. Insulin pumps are more expensive and more work but are a very important tool in diabetes treatment.

The air injector guns are not recommended by the International Society for Pediatric and Adolescent Diabetes (ISPAD) in their consensus guidelines. We also do not recommend the jet injectors because of difficulties with the depth of penetration of insulin and therefore altered insulin action.

MY OTHER QUESTIONS ARE:

TYPE 1 VERSUS TYPE 2 DIABETES

Most people have known an adult who has diabetes. Some of these adults take insulin; others take pills. You may wonder why there is so much difference in the treatment of diabetes.

There are two main types of diabetes: Type 1 and Type 2. Although the word diabetes is used for both Type 1 and Type 2, they are very different types of diabetes.

Type 1 Diabetes

Type 1 is usually diagnosed in children.



Over time, the cells in the pancreas that make insulin will stop making insulin.

Type 1 diabetics must take insulin multiple times a day.



They cannot take pills to make insulin-producing cells in the pancreas work, because the cells can't be stimulated.

Weight loss/diet alone will not control blood glucose levels.

Type 2 Diabetes

Epidemic in adults (2004).
Increasing in children.

Type 2 is most often diagnosed in adults.



The cells in the pancreas make insulin, though the insulin may not be 100% effective or there may not be enough insulin for the body's needs.

Patients are usually overweight.

Type 2 diabetics may need insulin to add to their own supply.

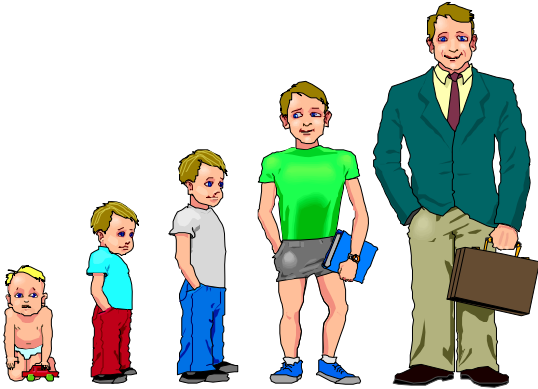
They may take pills to stimulate the cells in the pancreas to make more insulin.



Weight loss and medicine may control blood glucose levels. **Insulin is usually needed as diabetes progresses.**

GOALS IN THE MANAGEMENT OF DIABETES

1. Normal Growth and Development to Become a Happy Healthy Productive Adult:



A child with diabetes should grow at the same rate as a child without diabetes. A child with diabetes can play all the same games and participate in all the same activities/sports as a child without diabetes. The meal plan and/or insulin dose may need to be adjusted for some activities/sports. School performance and attendance should not be affected by diabetes. Glucose levels alone should not keep children home from school. High blood glucose on a daily basis may make a person feel ill and lead to a serious condition called diabetic ketoacidosis.

2. Normal Blood Glucose Values:

Normal blood glucose values are the blood glucose values found in a person without diabetes. Blood glucose values are kept slightly higher in the young child with diabetes to prevent hypoglycemia. Low blood glucose levels need to be addressed rapidly. The symptoms of hypoglycemia need to be identified and treated quickly to prevent severe reactions.



High blood glucose values, over a long period of time (years), may cause permanent damage to nerves and small blood vessels in the eyes and kidneys. Prolonged high blood glucose values may also slow or stop normal growth.

Normal glucose values are beneficial to everyone. The glucose goals for you/ your child will be based on the child's age and the time of the blood tests.

The guidelines for glucose targets are listed below. Individual goals may vary later when control is established, as schedules change and/or your child grows.

General Guidelines for Desired Glucose Values:

AGE*	WAKING UP IN THE MORNING	BEFORE MEALS	BEFORE BEDTIME SNACK
INFANT - 3 years	150 mg/dl	150 mg/dl	>150 mg/dl
3 - 5 years	70 -110 mg/dl	70 -110 mg/dl	>120 mg/dl
5 - 13 years	70 -110 mg/dl	70 - 110 mg/dl	>100 mg/dl
>13 years	70 - 110 mg/dl	70 - 110 mg/dl	>80 mg/dl

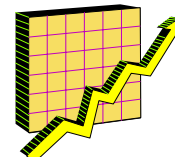
* American Diabetes Association guidelines 2005 are approximately 20mg/dL higher.

3. Self Management:



Managing diabetes is a daily job. A person with diabetes and his/her family needs to know how to change the meal plan and/or insulin dose to keep the blood glucose values in a near normal range.

4. Appropriate Glycosylated Hemoglobin Values:



Glycosylated hemoglobin (also called hemoglobin A1c = HbA1c) is a blood measurement that helps determine the level of blood glucose concentration over the previous 3 months. The values are expressed as a percent of total red blood cell protein (hemoglobin).

Age Appropriate Glycosylated Hemoglobin A1c Goals:

AGE	APPROPRIATE GLYCOSYLATED HEMOGLOBIN GOALS
Infants	Higher than 7- 8%
3-5 years	Higher than 7- 8%
5-13 years	6 -7%
>13 years	6 -7%

* American Diabetes Association guidelines 2005 are approximately 1% higher.

THE INFANT AND TODDLER WITH DIABETES



An infant does not understand that anything has changed in their world. An infant cares only about how he/she feels at the moment. As a child gets older, he/she will begin to remember experiences and respond to the situation (e.g. cry when he/she sees the syringe). However, his/her main concern will be about what is happening at the moment. An infant/toddler does not worry about the past or what will happen in the future.

An infant who is adjusting well to diabetes will eat, gain weight, sleep without any problems, be alert when awake and be interested in his/her surroundings. The infant should also develop at a normal rate: intelligence, motor skills and social skills. Parents may be upset about the diagnosis and treatment. This is a normal response. For every family there is a period of adjustment. If the parent is extremely anxious, this anxiety will affect the child. For example, if the parent is very nervous about giving a shot, the child may become very fussy at shot time. This is not because the child fears the shot, but because he/she may be upset by the parent's behavior.

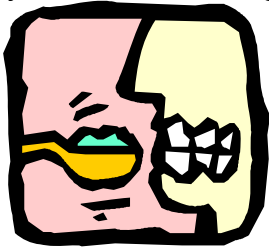


Parents of infants and toddlers have a number of unique concerns. The child is not able to say how he/she feels or what they want. Living

with an infant or toddler with diabetes is much easier if the parents follow these guidelines:

1. Remember, as your child grows older, he/she will develop attitudes about diabetes that are similar to yours. If you feel that diabetes is the worst thing that could happen to your child or family, then your child will also grow up feeling this way. **YOUR ATTITUDE IS VERY IMPORTANT.** People can live long, healthy, happy, productive lives with diabetes. Diabetes, if properly managed, should not affect your child's growth, appearance or intelligence. It is important that your child grow up knowing these facts.
2. The balance between food, activity and insulin are just as important in an infant as in any other child. The team takes into consideration normal infant activity and nutritional needs when developing your child's management plan. As an infant grows, his/her activity, behavior and nutritional needs can change very quickly from month to month. It is essential that you work closely with the team on a continuing basis. During some periods, you may need to change schedules and meal plans on a monthly basis.
3. To achieve blood glucose control and manage your child's diabetes safely, it is important for you to check your child's blood sugar multiple times per day. After some time, you will be able to identify many signs of low blood glucose before doing a blood

glucose test. You should check a blood glucose value whenever there is a question regarding your child's blood glucose level.



4. There will be times when your child does not feel like eating. This also happens to children without diabetes. If your infant does not finish a meal, note this in your logbook. Do not try to force your child to eat if he/she is not interested. Do not start to substitute foods. Your child's diet should consist of foods he/she will eat. Meal times should be as long as they were before your child developed diabetes. Whatever your child has not finished by the end of the mealtime should be put away.

Likewise, a child cannot constantly eat or drink. If your child likes to carry around a bottle and drink, it should contain water. There will also be times when your child seems hungry. If this happens occasionally, and the blood glucose levels are normal, give the child something from the "free" group to eat or drink. If your child seems hungry and the blood glucose is low,

treat this episode like a reaction and note it in your record. If either of these situations happen on a regular basis (≥ 2 days in a row), your child's meal plan may need to be revised. Revise the meal plan or make an appointment with us to revise the meal plan.

5. If allowed to do so, your child will develop a regular pattern for eating and sleeping. Meals and snacks (hopefully naps and bedtime, too) should be at the same time of day as much as possible. Remember, every time your child cries he/she is not hungry. If your child is crying at a non-feeding time, try other ways to quiet and console other than food.
6. It will take some time to adjust to the routine required to manage diabetes. Eventually, you will have a routine and plan established which would help your family and your child handle the demands of diabetic management without major problems. If you would like to speak to another parent of a child with diabetes, please let us know. It often helps to talk with other parents who have gone through similar experiences. The SUPPORT GROUP is another good way to share with other parents.

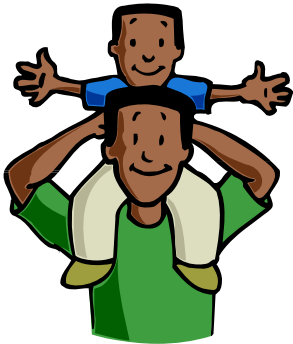
Answer these questions:

A TIME WHEN MY ANXIETY AFFECTED MY BABY I SUCCESSFULLY CALMED US BOTH BY:

WHEN MY CHILD SEEMS TOO HUNGRY OR TOO FULL FOR THE MEAL PLAN I SHOULD:

SOME THINGS THAT WILL HELP US ADJUST TO THE OBJECTIVES FOR DIABETES MANAGEMENT ARE:

THE PRESCHOOLER WITH DIABETES

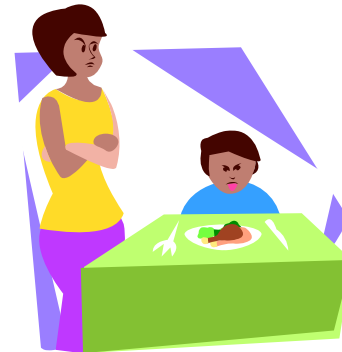


The preschool child begins to try to understand what diabetes is and why he/she has diabetes. His/her level of understanding is very basic. It is important that the child is told (repeatedly) that we do not know why he/she developed diabetes. Children this age often think that an illness such as diabetes is a punishment for "bad" behavior. They need to be told (even if they do not bring it up) that they are not "bad", and they are not being punished. When a child fusses or complains about a shot, the meal plan, etc., agree that it is hard to get a shot, follow the meal plan, etc. Emphasize the things your child can do not those they can't. If you plan ahead, there should be very few, if any, activities that your child cannot do. Your child should be encouraged to attend birthday parties and other special events. If you have questions regarding snacks, birthday cake and the meal plan, etc., bring them up at an office visit. "Be prepared" is our motto.

Your child may attend a day-care center if this is your choice. Please ask for the school letter and form when you are at the office.

Your child should have regular scheduled meals and sleep. Once you have prepared the meal, do not substitute foods if your child refuses to eat. If you begin to substitute foods and urge your child to eat, he/she will quickly

learn that they can get your attention by refusing to eat and form a habit that will be very difficult to break. Mealtime should not be lengthened because the child is not finished or refuses to eat. Your child will have three meals and three snacks. These times will provide more than enough opportunities for your child to eat. If your child does not finish a meal, he/she may not have any other food until the next scheduled time to eat, unless there is a low blood glucose reaction. Treat these carefully to avoid your child "refusing" the meal in order to get a "sweet"/low blood glucose treat.



Remember, as your child grows older he/she will develop attitudes about diabetes similar to yours. **YOUR ATTITUDE IS VERY IMPORTANT.** People can live long, healthy, productive lives with diabetes and be able to participate in all activities. Diabetes, if properly managed will not affect your child's growth, appearance or intelligence. It is important that your child grows up knowing these facts. It will take time to reorganize your life to include the day-to-day management of diabetes. Eventually you will gain the ability to organize the day and plan ahead so that diabetes does not interfere with activities and family life. If you would like to speak to another family who has a child with diabetes, please let us know.

Please answer these questions:

AT A TIME WHEN MY ANXIETY OR ATTITUDE AFFECTED MY CHILD, I SUCCESSFULLY CALMED US BOTH BY:

WHEN MY CHILD SEEMS TOO HUNGRY OR TOO FULL FOR THE MEAL PLAN I SHOULD:

SOME THINGS THAT WILL HELP US ADJUST TO THE OBJECTIVES FOR DIABETES MANAGEMENT ARE:

TEENAGERS WITH DIABETES



Adolescence (the teenage years) is an exciting and frustrating time for both the child and the parents. The teenager is learning to take care of himself/herself and to be independent. It is often difficult for a parent to "let go" and transfer the responsibility of diabetes care to the adolescent.

Behavior may change during adolescence. A person who kept excellent blood glucose records, tested regularly, followed the meal plan, etc. during the school age years may decide during adolescence that he/she does not want to do these activities and that they are really not important.

Glucose control may also become more challenging during puberty (development of the glands responsible for sexual maturity). Hormones present in the body may affect blood glucose levels. Usually teenagers need a higher dose of insulin.

Parents and adolescents should discuss what activities (e.g. meal plan, recording of blood glucose values, etc.) the adolescent will manage. Failure to manage their diabetes should be handled in the same manner as when the adolescent fails to carry out other

responsibilities (e.g. household jobs, doing homework, etc.). The adolescent needs to be told very clearly what activities they are to manage and what happens if they do not manage these activities.

Parents are responsible for providing their children with the necessary supplies and the guidance needed to manage diabetes. If the adolescent fails to manage their diabetes and/or family conflict arises surrounding the issue of diabetes, this should be discussed with the diabetes team (MD, nurse, nutritionist, physician's assistant, psychologist....).



It should be stressed that self-care for diabetes, as well as other responsibilities, is mandatory. The transition to more tightly controlled glucose levels as the child grows older is critical to prevent the long-term complications associated with diabetes, though this reason may not convince the "healthy" teenager. Alternative options for diabetes management need to be discussed at the office visit (e.g. total diabetes supervision if compliance is an issue).

Please answer these questions:

WE CAN SET THESE GROUND RULES FOR CARE BY:

IN ORDER TO DRIVE A CAR THE CHILD'S GLUCOSE CONTROL AND SELF-DISCIPLINE ARE SHOWN BY:

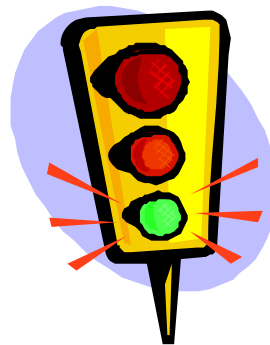
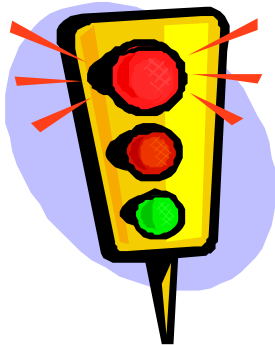
RULES OF THE ROAD FOR THE DIABETIC DRIVER



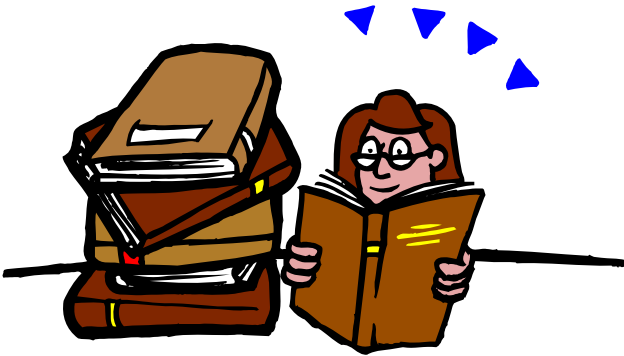
There are rules of the road for the diabetic that include respect. This respect for yourself and others means you wear a Diabetes Alert tag whenever driving. It also means that the driver will never drive when he or she is sick or with low blood glucose concentration. The test range for blood sugars prior to driving should be in the normal range (70-120). The driver must agree to always have treatment for low blood sugar available. The driver should also report any losses of consciousness at times even when not driving.

Clarke, Cox, Gonder-Fedrick, and Kovatchev: Hypoglycemia and the Decision to Drive a Motor Vehicle by Persons with Diabetes, JAMA, August 25, 1999, Volume 282, page 750-754.

The conclusions of this article are that a person with Type 1 diabetes may not correctly judge his/her blood glucose concentrations, and it may be too low to permit safe driving. No one should drive with a low blood glucose concentration. If the blood sugar ever falls below 70 mg/dl, the driver should pull over, have a 15 gram carbohydrate snack, wait 15 minutes and recheck and not begin driving until blood sugar is >70 mg/dl. The level considered too low is less than 70 mg/dl. Therefore, we recommend testing blood prior to driving. When on a long drive, test frequently during that drive and be sure that blood sugar levels are greater than 70 mg/dl.



SCHOOL AND THE CHILD WITH DIABETES



Well-controlled diabetes should not affect the child's intelligence or his/her school performance. Having diabetes does not mean missing school. If your child's school performance drops after the diagnosis of diabetes, please notify us at the office visit. Likewise, if diabetes is affecting school attendance, please also let us know at the office visit.

Activities may be planned at school (e.g. party or field trip) that requires an adjustment in diet and/or insulin dose. Ask that the teacher(s) keep you informed of special activities so that

you can make changes in the diabetes management as necessary. Remember a child with diabetes can participate in all school activities.



Before returning to school, the child with diabetes should decide how he/she would explain diabetes to their classmates and friends. A letter is sent with you to the school. Many misconceptions exist regarding diabetes. (See copy of school letter with introductory materials.)

Please answer these questions:

WE NEED THIS INFORMATION FOR PLANNING WITH SCHOOL (start planning in the spring for the upcoming fall semester.):

SOME THINGS THAT WILL HELP US ADJUST TO THE OBJECTIVES FOR DIABETES MANAGEMENT ARE:

Children with Diabetes-Informational & Medical Authorization for School Nurses, Teachers and Administrators

Diabetes is a chronic disease that impairs the body's ability to use food properly. The hormone insulin, which is produced in the pancreas, helps the body to convert food into energy. In people with diabetes, either the pancreas does not make insulin or the body cannot use insulin properly. Without insulin, glucose, the body's main energy source, builds up in the blood.

Children with diabetes usually have type 1 diabetes, where the pancreas does not make insulin. They need daily insulin injections to enable their bodies to use food properly.

Two kinds of problems can occur when the body does not make insulin, hypoglycemia or hyperglycemia. **Hypoglycemia is the most common problem in children with diabetes. Usually it is mild and can be easily treated by mouth. Hypoglycemia** occurs when blood glucose levels get too low (<80 mg/dl) (e.g. when the body gets too much insulin, or too little food or too much exercise.)

Signs and Symptoms of Hypoglycemia (or child may display no symptoms at all):

Shakiness	Dizziness	Crying
Pale skin	Fatigue	Slurred speech
Sweating	Headache	Lack of concentration
Rapid pulse	Hunger	Daydreaming
Poor coordination	Irritability	

Do not leave the child unattended. All supplies are to be provided by the parent.

If it is time for lunch, give the child lunch. If not, give the child either 3 or 4 glucose tablets, or 4 oz. of juice, or 4 oz. of **regular soda**.

If the child has low blood sugar, but is too weak or confused to chew or swallow fluids, then he/she can be given glucose gel or cake frosting.

ALWAYS recheck blood glucose 15 minutes after treatment. Blood glucose should be >80 mg/dl.

If the child has low blood sugar and is unable to take anything by mouth or is unconscious, the school nurse is to give glucagon, ½ to 1 ml subcutaneously. The child may vomit or be sick to his/her stomach after glucagon.

If the child is not better in 10-15 minutes, (e.g. the child does not have acceptable glucose level), the nurse should use her judgement as to whether a 911 call is needed. **Notify child's parents and/or physician immediately.**

Hyperglycemia occurs when blood glucose levels get too high (e.g. when the body gets too little insulin or too much food). Untreated, hyperglycemia may develop (in hours to days) into ketoacidosis, a very serious condition.

PARENTS' SUPPLY LIST FOR SCHOOL/DAYCARE

- Glucagon Emergency Kit (Check the expiration date to be certain it has **not expired**).
- Glucose Gel / Cake Frosting.
- Snacks (Crackers with peanut butter or cheese, pretzels, apples, juice - from the child's meal plan).
- Insulin (Become familiar with your child's dosages and the types of insulin he/she takes at different times of the day) Supply insulin for the school as needed.
- Paraphernalia for testing Blood Glucose Levels at school (Strips, meter, lancets).

Keep supplies at school, and be responsible for their inventory.

SUPPORT FOR CHILDREN WITH DIABETES AT SCHOOL

According to the American Academy of Pediatrics, December 1999, Volume 15, no. 12, page 20, schools should be made cognizant of the fact that to achieve success, all students are to be as physically healthy as possible without regard to their disease or disability.

With that goal in mind, schools should adhere to the following guidelines with respect to students with diabetes:

- Allow students to test their blood glucose level before lunch and at other times if indicated. Ideally, this should occur in the classroom with no disruption in the learning environment.
- Allow the student to administer insulin according to his routine schedule or at times, if necessary, to correct abnormal blood glucose levels.
- Treat hypoglycemia with oral glucose in the classroom or with emergency administration of glucagon.

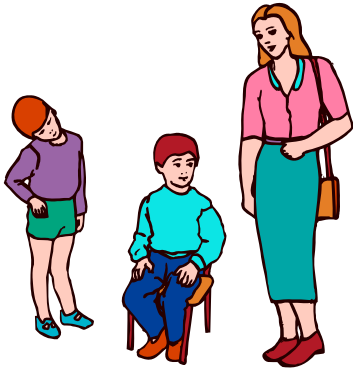
If a child is symptomatic or has low blood sugar – he/she should **NOT** walk to an office to check and treat. Especially **NOT ALONE**. Optimately a child should check **IN** a classroom, and if ≤ 80 mg/dl have 15 gram snack and recheck in 15 minutes.

Obviously, some children (especially younger children) may require emergency procedures to be done for them; hence, schools should have someone on the staff trained in the administration of glucagon. Schools should also be aware that to ask a student who might be hypoglycemic to go from the classroom to another part of the school might subject the child to a potentially dangerous and life-threatening delay in treatment.

A more pro-active stance is called for to heighten awareness of diabetes and its prevalence among school-age children. This involves pediatric and parental advocacy of their children's needs, keeping the school informed of a diabetes regimen, being available to answer questions concerning diabetes, keeping emergency supplies on hand and being in contact with the school board.

*** All school-age children will be given a diabetes care plan annually.

THE SIBLING'S RESPONSE TO DIABETES



When a child is diagnosed with diabetes, diabetes affects the child, parents and the rest of the family, including brothers and sisters. It is important that the siblings have time to learn about diabetes and to adjust to their feelings about having a brother or sister with diabetes.

****We recommend that every family has a visit with a counselor**.**

Siblings may experience a number of feelings about their brother or sister with diabetes. The sibling may feel jealous and/or angry toward the child with diabetes. When children are diagnosed with diabetes, parents often spend a great deal of time with the diabetic child, and relatives and friends bring presents to the hospital. The child with diabetes has food delivered to him/her, eats in bed and even has his/her own television! To the sibling at home, having diabetes might look like a good way to get extra attention, presents and have fun. It is helpful if the siblings are able to visit in the hospital and, if old enough, participate in some of the educational sessions. After seeing their brother or sister receive an injection, diabetes does not look like as much fun.

As meal times, menus and desserts may change at home, it is important that the siblings have an understanding of how diabetes is

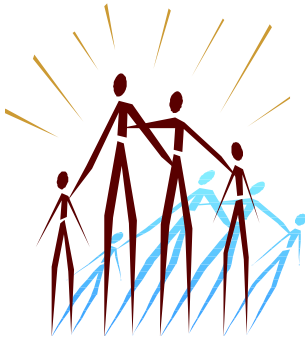
managed and why some changes are necessary. It is also important that parent(s) sit down and discuss diabetes and the effects it may have on the family. This will help the sibling feel part of the family and less left out when parents are at the hospital. Gift giving to the hospitalized child should be discouraged unless gifts are given to all children in the family.

The child diagnosed with diabetes does not always feel ill or have an activity restriction and may be in the hospital only 1-2 days. It is not necessary or helpful to the hospitalized child to be given special attention. Instead, it is helpful to emphasize what has **not** changed in a child's life due to diabetes. After discharge, try to resume the normal home routine as much as possible and as quickly as possible. Whatever structure and discipline worked before diagnosis should be used after returning home. The child with diabetes should not be treated in any special way. This is always hard to do.

Siblings may also feel guilty when their brother or sister is diagnosed with diabetes. It is natural for children to occasionally wish bad things to happen to a sibling when they are angry or upset. When a child is diagnosed with diabetes, some children may feel that they are responsible in some way for this illness occurring in their brother or sister. It is important that the siblings understand that they are in no way responsible for the child's diagnosis.

Siblings may also fear that they too will get diabetes. While some siblings do develop diabetes, there is nothing that can be done to prevent this from occurring, nor is it anyone's

fault. Siblings should understand that one does not "catch" diabetes from a person having diabetes. It should be stressed that a child with diabetes is not that different from a child without diabetes.



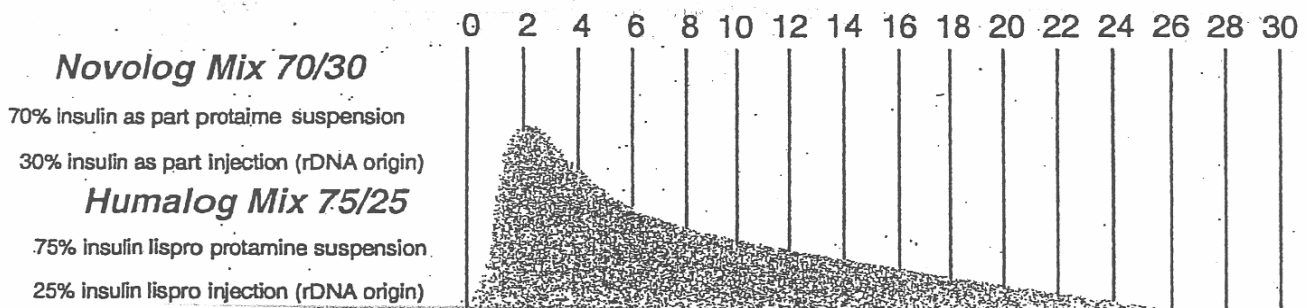
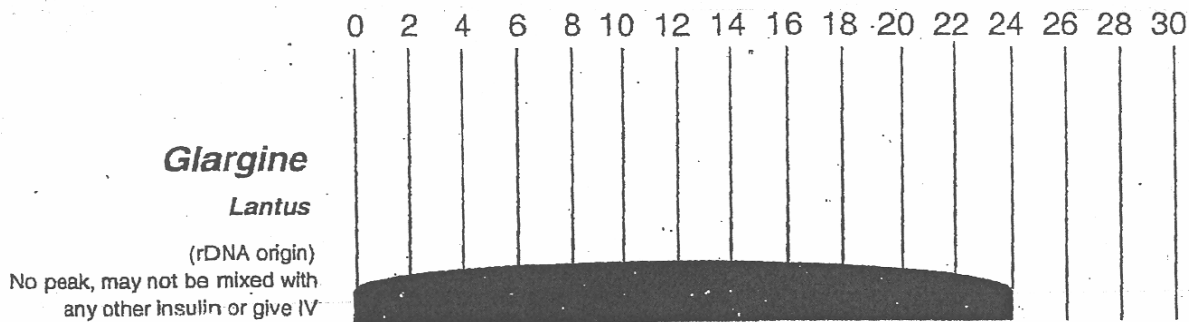
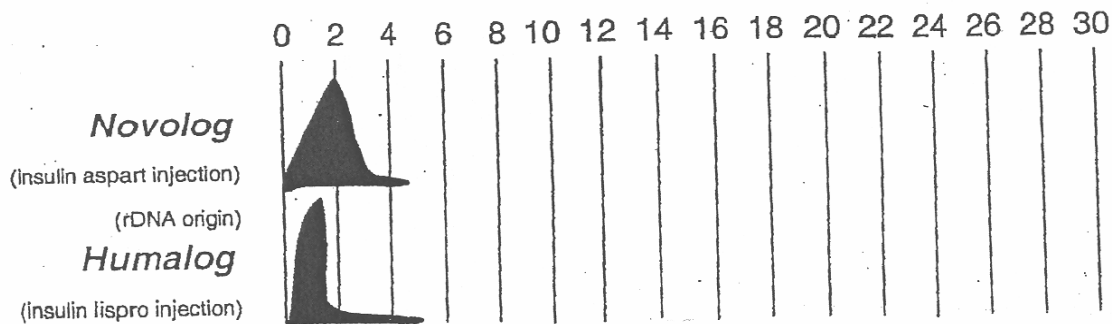
After returning home, take time out occasionally to discuss with family members the effect of diabetes on their daily life. Siblings will more easily adjust to changes in the home when given a chance to ask questions and express their feelings.

Please answer these questions:

MY CHILD HAS THE FOLLOWING BROTHER (S) AND SISTER (S) WITH THE FOLLOWING CONCERNS:

THE OTHER CHILDREN HAVE THESE QUESTIONS:

Insulin Time-Action Profiles



INSULIN ADMINISTRATION

Insulin doses are measured in units. U 100 insulin has 100 units in every ml of insulin. Always give the amount of insulin prescribed. **NEVER omit an insulin injection unless instructed by a member of the Diabetes Management Team.**

NOTE: opened or used insulin (vials or pen cartridges) are good until expiration date.

Once opened/used insulin is good for only 30 days. After 30 days throw away remaining insulin in the bottle or pen.

Regular or Rapid-acting Insulins - If you note any crystals around the inside of the top of the bottle, the insulin should be thrown out. Rapid-acting insulins include: Humalog (lispro), Novolog (aspart), Apidra (glulisine).

Mixing (drawing up) Insulin

1. Wash your hands.
2. Wipe the top of the bottle with alcohol. Allow the alcohol to dry.
3. To keep equal pressure inside the insulin bottle. Air must be injected that equals the amount of insulin that will be withdrawn. Going straight through the top of the bottle, put the needle in the bottle.
4. Turn the bottle upside down.
5. Draw the plunger back past the number of units you will need.

6. Push the plunger back up to the number of units needed. If you notice any air bubbles in the syringe, leave 2 extra units of insulin in the syringe. Take the needle out of the bottle. (Air will not hurt you but does take up space that should be filled with insulin.)
7. Hold the syringe firmly with one hand, needle pointing up. With the other hand, "flick" or tap the syringe so that the air bubbles go up toward the needle.
8. Squirt out the air and any extra insulin, pushing the plunger to the correct number of units of insulin.

Giving an Insulin Injection (shot)


1. Choose the site for injection.
2. Clean the area with soap and water or wipe with alcohol. If you use alcohol, allow the area to dry before giving the insulin.
3. Hold the syringe in one hand like a dart. With the other hand, place two fingers on either side of the site, about two inches apart.
4. Using only the motion of your wrist, quickly put the needle through the skin. The motion is the same used to throw a dart. Your elbow and shoulder should not move. The needle should go straight in the site (90 degree angle to the skin).
5. Slowly push the plunger down, injecting the insulin.



6. When all the insulin is injected, pull the needle straight out, holding down the skin with the two fingers of the other hand.

NOTE: Sometimes a bruise or a drop of blood develops at the spot where the injection was given. Don't worry, a small blood vessel was nicked either when the needle was going in or coming out. This can happen and does not mean that you have given the injection incorrectly.

Sometimes a small amount of insulin will leak out after an injection is given. This will happen if the needle did not go all the way in to the injection site or if you push on the plunger as you remove the needle. If you notice insulin leaking out after an injection do not give more insulin. Watch the blood sugar readings after the injections. This will tell you what to do.

 **Disposal of Needles** - When you are finished with your syringe, do not throw it directly into your garbage. Needles and lancets should be thrown out in containers, which are non-biodegradable and made of a material, which the needle cannot puncture. (Do not recap your needle. There is less of a chance to stick yourself if you do not recap the needle.) Examples are: coffee cans, plastic milk bottles or diaper wipe containers. When the container is full, seal it with heavy tape. It is important that the container is not opened

again after disposal.

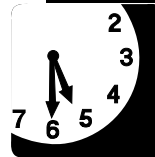
Time of Insulin Injection – Lantus or Levemir (basal insulins) should be given within 30 minutes of the same time each day. Routinely, begin eating after your lispro (humalog) injection. If your blood glucose is at or below 60 mg/dl at a scheduled test time, take a fast acting carbohydrate (see **Hypoglycemia section**), take your insulin and immediately begin eating from your meal plan. If your blood glucose is at or higher than 300 mg/dl, determine why blood sugar is high. Then use your correction bolus to decrease your high blood sugar.

Initially, you will learn to count the carbs your child eats, then give an injection immediately **after** eating. Optimally, over time, you will start giving insulin immediately **before** eating, not after. Always check blood glucose before eating.

Timing of Injection and Meals with Blood Glucose Checks:

The lunch check is 11:30 pm and the blood glucose level is 55 mg/dl. The child should eat _____ as a fast acting carbohydrate and then eat the following foods for lunch

at _____ time.



The usual dinner check is 5:30 pm, and dinnertime is 6:00 pm. Today the blood glucose level is 320 mg/dl. The dinner shot should be increased with a correction bolus to decrease your blood sugar. This is when you will use the correction factor.

ROTATION OF INJECTION SITES

Lipohypertrophy is an increase in the fat under the skin. Lipohypertrophy occurs where insulin is injected too frequently.

Rotation of sites or selecting a different site for each injection will prevent lipohypertrophy from happening.

Lipoatrophy is a decrease in fat under the skin; the injection site looks like a dent in the skin.

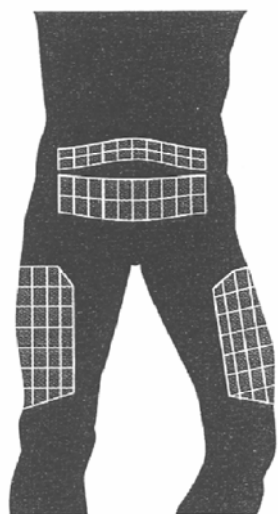
Insulin injected into areas of lipohypertrophy may enter the blood at an altered speed.

If lipohypertrophy or lipoatrophy occurs at an injection site, do not continue to inject into that area.

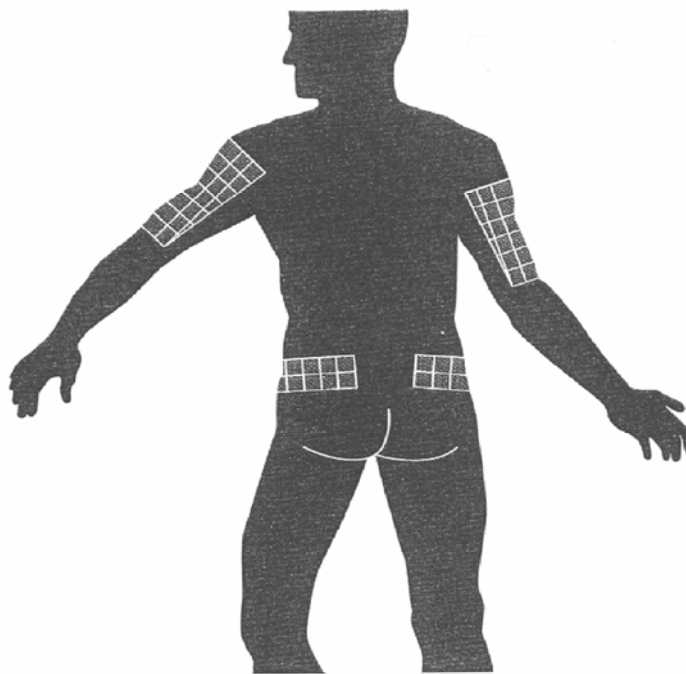


Sometimes people who participate in sports (e.g. biking, swimming, running) may need to use certain sites on days of exercise. Rotation should be discussed during your office visit.

INSULIN INJECTION SITE ROTATION CHART



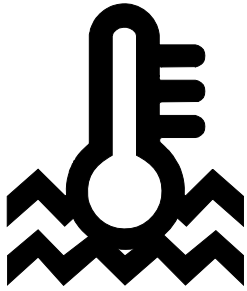
FRONT



BACK

INSULIN STORAGE RECOMMENDATIONS

Insulin should be kept in the refrigerator or at room temperature (between 50° and 80° F).



Insulin that has become frozen will need to be discarded. Insulin stored in sunny areas or in areas above 80°F should also be discarded.

When traveling in the summer, insulin should be kept cooler than 80° F but not less than 50° F.

If insulin is kept in the refrigerator between uses, it may be used for one month after opening.

If your insulin is kept at room temperature between uses, it may be used for one month after opening.

Insulin that has not been opened and is kept in

the refrigerator may be used until the expiration date listed on the bottle.

HUMALOG, NOVOLOG, APIDRA INSULINS:

The insulin should always be clear. If anything is seen floating in the insulin or if you notice crystals on the inside of the bottle, throw out the insulin.

LANTUS or LEVEMIR INSULINS:

These types of insulin are always clear. Throw away these insulins if they are cloudy or if you notice crystals on the inside of the bottle.

NPH INSULIN:

NPH insulin is cloudy. If your child takes NPH insulin you will learn about how to roll and/or mix one insulin.



BLOOD GLUCOSE CONTROL

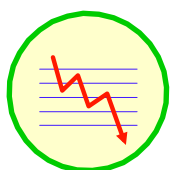


One of the goals of diabetes management is to keep the child's blood glucose (sugar) values routinely within a normal or non-diabetic range. A non-diabetic person's blood glucose is 70 -110 mg/dl before meals.

Desired Blood Glucose Values:

AGE	WAKING UP IN THE MORNING	BEFORE MEALS	BEFORE BEDTIME SNACK
INFANT - 3 years	150 mg/dl	150 mg/dl	>150 mg/dl
3 - 5 years	70 - 110 mg/dl	70 - 110 mg/dl	>120 mg/dl
5 - 13 years	70 - 110 mg/dl	70 -110 mg/dl	>100 mg/dl
>13 years	70 - 110 mg/dl	70 -110 mg/dl	>80 mg/dl

*American Diabetes Association guidelines 2005 are approximately 20mg/dl higher.



Hypoglycemia:

If the blood glucose values routinely are below the normal range, an adjustment in insulin dose and/or meal plan is needed. Reactions (also called low blood sugar reactions) are defined as blood glucose values of 80 mg/dl or below. If the blood glucose before the bedtime snack is at or below 100 mg/dl in a child 5 years or younger add 5-10 grams of carbohydrate to the snack (½ milk or ½ starch exchange).



Hyperglycemia:

If blood glucose values are routinely above the normal range, an adjustment in insulin and/or meal plan may be needed. A member of the Diabetes Team should be contacted immediately if ketones are found in the urine two times in a row or are moderate or large.

Like being too hungry or too full, if trends in blood glucose levels above or below the desired range are seen at the same times for

≥3 days in a row, think about changes in long-acting or short-acting insulin and/or food.

A complete listing of blood glucose targets is stated in the **Goals in the Management of**

Diabetes section and in the **Blood Glucose Record Book**. Further information about what to do with high and low blood glucose follow this section.

Please answer these questions:

OUR GOALS FOR BLOOD GLUCOSE LEVELS ARE:

The child's age is years mg/dl before meals.

HYPERGLYCEMIA: HIGH BLOOD SUGAR



Signs and symptoms:

List Examples:

High Blood Glucose Values
_____ or _____ mg/dl
Increased Thirst and Urination

Glucose and Possibly Ketones in the Urine

Headache

Vision Disturbance

Dehydration and Vomiting

Diabetic Ketoacidosis:

If high blood glucose has led to dehydration and/or urine ketones are large or increasing in concentration (e.g. moderate to large), the condition called **Diabetic Ketoacidosis (DKA)** may have developed. This can be an emergency situation. Call the doctor's office/emergency pager immediately or take your child to the nearest emergency room.

Signs of Ketoacidosis include:

Weakness, stomach pains, nausea and/or vomiting, deep labored (heavy) breathing, fruity smell to the breath

Causes:

- Not enough insulin
- Illness

What to do:

* If signs of **Ketoacidosis** are present and urine ketones are large call the office and tell us it is an emergency. If all the lines are busy, page us.



Drink increased amounts of fluid and take additional insulin. (See sick day).

Check the urine for ketones any time your child is sick – even if the blood glucose level is not elevated.

If the blood glucose level is at or above 300 mg/dl for two readings, check the urine for ketones. Call the office if hyperglycemia continues or ketones are not going away.

Adjust insulin as directed:

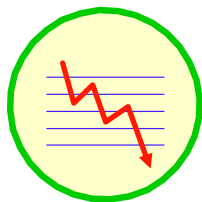
Occasionally hyperglycemia will be present even if the correct amount of insulin has been given and the meal plan and exercise plan are followed. Hormones (the counter regulatory ones) are present in the body, which can cause blood glucose levels to increase. A person cannot control his/her counter regulatory hormones. If blood glucose values are occasionally high, adjust the insulin dose as directed. If blood glucose values are routinely high, discuss this at the next visit or adjust insulin and/or meal plans accordingly. If you have questions about how to adjust insulin, call the Edward or CDH Diabetes Education Centers or our office, or return for a visit to discuss.

Please answer these questions:

WE CAN RECOGNIZE HYPERGLYCEMIA AND KETOACIDOSIS BY: _____

***During illness always check urine for ketones even if blood glucose values are at goal. Ketones that progress in the urine (positive urine ketones moderate to large) signal an emergency situation where you should call the office or pager.**

HYPOGLYCEMIA: LOW BLOOD SUGAR



Signs and Symptoms:

Some children may have no symptoms. Irritability, Hunger, Weakness, Faintness, Sleepiness, Lethargy (Lack of interest/awareness of surroundings), Confusion, Sweating, Blood glucose value **50-70 mg/dl or less** (even if no other signs/symptoms are present)

Late Signs:

Seizures (see use of **Glucagon** on the next page) Unconsciousness (see use of **Glucagon** coming up)

Causes:

- More insulin than needed
- Not enough food
- Delayed meals or snacks
- More than the usual amount of exercise

What to do:

1. Check the blood glucose level if strips are quickly available.
2. Give 15 grams of fast-acting glucose (sugar) immediately.

15 grams carbohydrate:

Glucose tablets.....3 (4mg tablet)
Monojel or Honey*.....3 tsp
Jelly.....3 tsp
Juice.....4 oz
Regular Soda.....4 oz.

*Honey should not be given to children less than 1 year.

DO NOT GIVE FLUID IF THE CHILD IS UNABLE TO TALK, SWALLOW AND/OR IS DROOLING

3. If the low blood glucose reaction occurs right before a meal or snack, eat the usual meal or snack immediately after taking the fast-acting glucose. You do not need to eat extra foods. Over treating reactions can cause later measurements of high blood glucose levels and weight gain.

If the reaction occurs in between meal or snack times; give 15 grams of carbohydrates and recheck blood glucose 15 minutes after above snack. If blood sugar is <80 mg/dl, eat 15 grams more of carbohydrates, such as crackers or milk.

4. If low blood sugar reactions repeatedly occur in the 60's or below, decrease the insulin as we have directed. (Usually a 10% decrease in Lantus or Levemir – discuss at next visit).

GLUCAGON IS YOUR FRIEND

Glucagon is a hormone that will raise a person's blood glucose.

Glucagon is your friend and should be used if any of the following circumstances are present:

1. The child is experiencing seizures.
2. The child is unconscious.

ANY TIME YOU NEED TO USE GLUCAGON, ADMINISTER THE GLUCAGON. USE YOUR JUDGEMENT AS TO IF YOU NEED TO CALL 911.



After the child is conscious with a normal blood sugar, call our office later that day or the following morning to tell us what happened.

To administer Glucagon:

1. Take the syringe from kit and inject the

fluid into the vial containing powder.

2. After the powder has dissolved, draw all of the liquid out of the vial with the syringe.



3. Give the injection like you would give any kind of an injection.

4. The child may vomit after the use of glucagon. Lay your child on his/her side to prevent choking.

5. You will generally see a response to the glucagon in 10-15 minutes with an increase in glucose level.

6. Your dose of Glucagon is either ½ ml (if less than 44 pounds) or 1 ml (if greater than 44 pounds).

7. Glucagon does have an expiration date.

Please answer these questions:

HOW SHOULD I PRACTICE PREPARING THE GLUCAGON?

SHOULD I HAVE A GLUCAGON EMERGENCY KIT AT SCHOOL?

SHOULD I CALL THE OFFICE AFTER THE GLUCAGON HAS WORKED AND THE PATIENT HAS RECOVERED?

CAN GLUCAGON CAUSE PERMANENT HARM?

BLOOD GLUCOSE TESTING

Equipment: Meter and Strips
Lancet and Finger Stick Device
Watch with Second Hand (for ketones)
Record Book



1. Wash hands with warm soap and water. You do not need to use alcohol. If you use alcohol, be sure to let it air dry first.
2. Select finger (rotate sites) and pierce skin. (Use the sides of your finger, **NOT** the middle or the tip.)
3. **GENTLY** stroke finger until a drop of blood appears. Do not squeeze.
4. Place a drop of blood onto the strip. **DO NOT TOUCH THE STRIP WITH YOUR FINGER.**

5. **DO NOT SMEAR THE BLOOD ONTO THE STRIP.**
6. The meter will track time for the testing.
7. **Always record the blood glucose value in your record book.** This will help you keep blood sugar near normal just by using the record book.



8. Call the number on the back of your meter to get a device to download blood glucose numbers at home on your computer if you have one. This can also be done at your local library.

TARGET BLOOD GLUCOSE LEVELS:

DATE: _____

IN THE MORNING: _____ mg/dl

BEFORE MEALS: _____ mg/dl

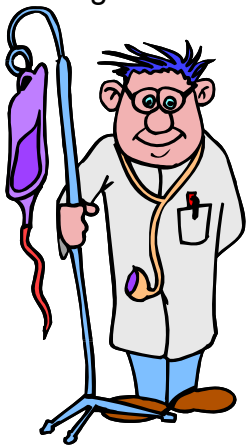
BEFORE BEDTIME SNACK: _____ mg/dl

URINE TESTING

Supplies: Ketostix - urine ketone testing strips.

Urine testing is done to check for ketones in the urine. Every person with Type 1 diabetes will on occasion need to check their urine for ketones.

Ketones in the Urine - Your body uses glucose (sugar) for energy. If there is not enough insulin to take the glucose out of the blood for energy, your body will break down fat tissue as a source of energy. When fat is used for energy, ketones are produced. Ketones are harmful to your body. If fat breakdown is not stopped, the amount of ketones in the body will increase until the person feels ill (like having the flu). If vomiting persists and your child cannot keep fluids down, you must go to the hospital and have an IV to replace lost fluids and reduce blood glucose levels.



The Ketostix, from a new vial, can be used until the expiration date on the vial. **AFTER** opening consult vial for new expiration date.

A person with ketones from fat breakdown may or may not have a high blood glucose value. If the glucose is high, it is because there is plenty of sugar but not enough insulin to get the sugar out of the blood to the rest of the body for energy use.



Regardless of blood sugar readings, check urine for ketones if:

1. Illness, until you are well
2. Blood glucose is 300 mg/dl or higher 2 times in a row
3. If insulin pump is not working

Anytime ketones are found in the urine and progress (moderate to large), call our office. If the office lines are busy, page us. This can be an emergency.

Answer the following questions:

WHENEVER I AM ILL I SHOULD TEST URINE KETONES BECAUSE...

IF KETONES ARE PROGRESSING FROM MODERATE TO LARGE I SHOULD...

YOUR MEAL PLAN

Eating Guidelines:

1. **HEALTHY EATING FOR THE WHOLE FAMILY**
2. **MEET NORMAL GROWTH NEEDS**
3. **CONTINUE FAMILY FOOD RULES**
4. **EAT AT SET TIMES – IN GENERAL**
5. **WATCH SERVING SIZES AND FOOD GROUPS**



The meal plan will be designed to fit your child and your family's pattern of eating. The meal plan provides the energy and nutrients needed for the child's age and size. The information you gave us about the kinds and amounts of food you/your child usually eat and you/your child's daily routine is put into a pattern. This pattern or meal plan describes what foods are to be eaten and at what times. Foods are grouped according to carbohydrate, protein and fat content. A meal plan for diabetes is simply good nutrition. It is a balanced diet in which the amounts of calories, carbohydrate fat and protein have been measured. All family members can eat and benefit from a balanced diet.

The energy value from foods in the meal plan

comes from carbohydrate, protein and fat. Calculations for the amount of calories from each nutrient for the meal plan are based on previous eating habits and balanced eating guidelines for the age of the child. A typical pattern is approximately 50-60% from carbohydrate, 15-20% from protein and 25-30% from fat.



Carbohydrate sources are classified as "simple" and "complex". The type of carbohydrate is often included on the food label of processed foods. Simple carbohydrates, or sugars, need careful portion control and are limited until glucose control is established. Complex carbohydrates, starches and fiber, are a necessary part of healthy eating. At least 50% of the calories from carbohydrates should come from complex

carbohydrates. Most importantly, the meal plan needs to match your child's food rules, growth needs, appetite and glucose control.



Meat and fats do not affect blood glucose values as do carbohydrates, but should also be measured. Healthy diets should not include more than 25-30% of calories from fat. Low fat foods should be routinely eaten for children at least two years old.

The meal plan is a healthy way to eat for all members of the family. Though portion sizes will vary from family member to family member, everyone in the family should eat the same foods as the child with diabetes.

There are certain things that you can do to help your meal plan work best for you/your child. One of these things is to have a generally consistent eating and insulin schedule.

Another important practice is to closely follow the portion sizes listed on your meal plan. In the beginning, weigh meat and measure other foods. With practice, you will be able to know portions by sight. Later, when your meal plan is updated, you may be asked again to weigh and measure for a while to keep your talent for judging portions.

Staying with a schedule and watching serving sizes brings consistency to your meal plan. You will learn how to count carbohydrates and how to dose insulin based on carbohydrates. Fat and protein affect blood glucose in more subtle ways and you will learn these as time goes on.

If a meal is not eaten in a reasonable time, say 30 minutes, the food is removed. There are two exceptions. One ounce of meat and the fat

exchanges may be moved during the day to different times to add variety. Since meat and fat have little or no carbohydrates, these changes will not have such a marked effect on blood sugar.

During the day, three items, each having 20 calories or less, may be added to the meal plan without accounting for the food in exchanges. This could be a teaspoon of diet jelly at breakfast, a packet of regular catsup with lunch or a 20-calorie frozen dessert bar in the afternoon.

While learning to live with diabetes a food from one exchange list is not traded for one from another group, even though the carbohydrate content or the calories may be similar. This is because of the difference in nutritional make-up. The exception to this is pizza. It is suggested that on those special pizza occasions all exchanges are traded in for starch and meat exchanges, and that the pizza is served with a large salad (since amounts of pizza normally eaten are too large to figure into the meal plan) and a diet drink. Work with the team to fit in your favorite foods with good glucose control. More variety is possible after 6 months of diabetes and still having blood sugars more near normal.



The meal plan (including eating of snacks) should be followed no matter what the blood glucose value at testing time. Do not omit snacks or food because of high blood glucose values.

Parents are encouraged to present food in a matter-of-fact way. Choices may be given to the child, but if a food is then refused, substitutions are not made. Parents have many roles, but short-order cook is not one of them.

MEAL PLAN ADJUSTMENTS FOR INCREASED ACTIVITY AND EXERCISE



Blood glucose levels may be affected by activity or prolonged periods of exercise. There are no activity restrictions just because a person has diabetes. Exercise/sports are encouraged as they increase general body fitness and are fun.

It will take some time to figure out how your child's diabetes responses to exercise. Young children are generally active. When deciding insulin doses and diet, the child's usual activity level is considered. Additional food is needed only for periods of more activity than usual. For young children, these times may occur on holidays when families gather. For older children, additional activity may occur during sports (competition or practice). Some sports require only short periods or bursts of activity. (e.g. baseball). Other sports require sustained activity (e.g. swimming). Observing your child during an activity will help you decide if your child is more active than usual.

If increased activity occurs right after a meal or snack, no additional food may be needed. If increased activity occurs in between or before normal eating times, additional food may be needed (5-10 grams carbohydrate for each hour of increased activity). If a sport/activity is to occur shortly after an injection time, the insulin dose may be adjusted.

It is wise to check blood glucose before and after an activity. A blood glucose value before activity will help you decide if additional food is needed. For example, if the blood glucose is <100 mg/dl before activity, your child should have a 15 gram snack. If it is >300 mg/dl before activity your child should check for ketones. If ketones are $>$ trace, your child should NOT participate until ketones are negative. Drink water, correct blood glucose and recheck in 2 hours. If ketones are negative the child can participate in the activity.

For example, if the blood glucose value is 200 mg/dl, additional food is not needed before starting an activity. If the activity lasts several hours, check the blood glucose level 1/2 way through the activity. Deciding whether or not to give extra food is done on a trial and error basis. If food is given before an activity, and the blood glucose value is high after the activity, you may need to omit the food next time. Exercise may affect blood glucose levels for up to many hours after the activity. The higher than normal glucose use by muscles will decrease blood glucose levels and food intake is needed to balance the energy needs.



"Stress hormones" also affect the blood glucose value. These hormones cause glucose to be produced and released in the

blood from supplies stored in the liver. Excitement during a competitive sport may cause stress hormones to raise the blood glucose level, producing high blood glucose after the sport as opposed to a lowered blood glucose value from the activity. Blood glucose testing gives you information regarding the body's response to increased activity.

The child may play or do tasks inside so the parent and/or child can be alert for signs of hypoglycemia. Even a partially eaten meal may be sufficient to avoid hypoglycemia. The division of responsibilities is very important: **the parent presents the healthy foods at the right times, and the child decides how much will be eaten.**



Since a child's needs change, how do we know that it is time to revise the meal plan? During outpatient visits the Team will monitor growth, lab values and review the blood glucose values. If a youngster is **constantly hungry** or **constantly being encouraged to finish meals**, revisions in the meal plan need to be made. If blood values are consistently too high or too low during a certain time of day, changes might be made in insulin dose or in the meal plan. For young children, energy or caloric needs can be expected to increase with increased growth. For the older adolescent, weight maintenance might require holding or reducing the calories provided by the meal plan. Records, observations and comments are vital in modifying the meal plan to fit the needs of the person with diabetes.

The tools we use for meal planning change, as the child grows older.

1. We need to stage the information about diabetes for education just like the subjects at school change levels in different grades. You and your child let us know when you are ready for the "next class". You can use worksheets and home projects to keep growing in diabetes management skills.
2. Meal planning changes to fit schedule changes. How we track carbohydrate intake, glucose levels and insulin doses may shift from exchange lists to **intensive management and/or carbohydrate counting** if knowledge and control are good and a change is needed.
3. At the back of this book are appendixes with information for you. This includes: carbohydrate resources, the meal pattern, label reading, snacks, eating out, combination foods and free foods. **BON APPETIT!**



Before beginning a new activity/sport, discuss this topic with a member of the Diabetes Management Team.

Please answer these questions:

OUR EXERCISE AND ACTIVITIES WE CAN PLAN ON ARE:

EXAMPLES OF HIGH LEVEL ACTIVITIES MAY BE:

EXAMPLES OF ADDITIONAL FOODS THAT MAY BE NEEDED ARE:

SNACKS THAT MAY BE NEEDED ARE:



SPECIAL OCCASIONS

Birthdays: Just as in other children without



diabetes, a generally healthy diet is most important, but there are some exceptions and times that the routine is “routinely” broken.

Families have shared some of their ideas for decorating a birthday cake:

Use whipped cream or whipped cream substitutes for icing; add coloring or sprinkle with artificially-sweetened drink mix; make an ice cream cake; microwave mini ice cream cakes with plain cake dough.

If your child has a regular piece of cake, be sure to count the carbs and include them for that meal’s insulin.

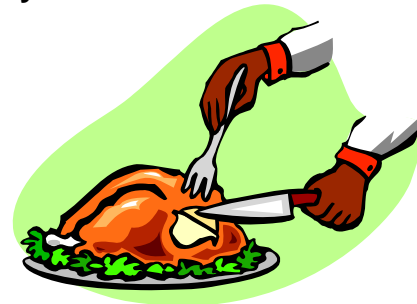
Halloween:

Some possibilities for Halloween fun:

- Skip “trick or treat” and have a party at home.
- “Trick or treat” and then auction off or trade in candy for money, a toy or a special trip to a museum, game or other special event.
- Limit the amount of candy your child eats (as you would with children without diabetes).

- Be sure your child does receive insulin for candy he/she eats.

Holidays:



Sometimes families like to eat holiday meals in the middle of the afternoon.

- Be sure to check blood glucose 4 times that day (as usual).
- Be sure to give insulin for all meals eaten, (even if only 2).
- No corrections as needed.
- Be sure to give insulin for any snack ≥ 30 grams.

Eating Out:

Having dinner out sometimes requires making some adjustments, so you may want to wait and to go out to eat until you are getting adjusted to diabetes care.

- Carry a fruit or starch with you. If a host serves a meal later than expected, your snack can tide you over.
- You may switch the evening snack with dinner so that you can attend a special dinner function. Again, it would be wise to carry a snack along in case things run late.
- Use books and online guidelines to determine carbohydrate content of

restaurant foods.

School Parties:

Families with a child who has diabetes often say that the meal plan has had a beneficial effect, not only on the way the family eats, but also at school festivities. For those times when some unacceptable items are offered, the child might bring his/her own treat, such as a diet beverage and a food that fits the snack carbohydrates. Some of the traditional party foods can be figured into the snack, especially if the child is comfortable scraping icing from the cake.

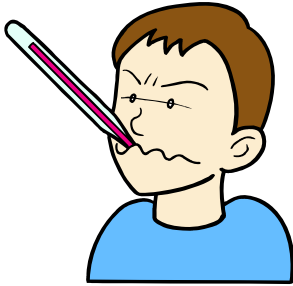
One Carbohydrate Serving:



3" cookie or two 1¾" cookies; one piece plain cake (2" square); one cupcake without icing; one small piece of angel food cake; or ½ cup ice cream or ice milk.

FOR THE NEXT HOLIDAY THAT IS COMING UP WE CAN CHANGE OUR CELEBRATION TO FIT THE GOALS FOR DIABETES BY:

SICK DAYS



For a day when your child is feeling ill but still able to keep fluids down or eat, follow the regular meal plan as much as possible. Only give as much short-acting insulin as your child eats. Use your insulin to carbohydrate ratio. You might want to select foods, like toast or soup with noodles that he/she finds appetizing and soothing. **Never** skip basal insulin.

If your child only is drinking water or diet soda, don't give short-acting insulin if blood glucose is <100 mg/dl. Encourage juice or regular soda, unless your child is hypoglycemic, use the insulin to carbohydrate ratio.

- Be sure to check for ketones.
- Be sure to encourage regular drinking of fluids without carbs if eating, with carbs if not eating.
- Call emergency pager if not keeping fluids down.

Fluids and calorie needs will be calculated by the family. It is important to watch for signs and symptoms of dehydration. Sugar-free beverages will also be incorporated to meet fluid needs.

Taking sips or small amounts of the following items every 15 minutes can supply the needed carbohydrates and fluids.

5 Grams Fast-Acting Carbohydrate

- 1 tsp. Honey
- 1 tsp. Jelly
- 1 tsp. Molasses
- 1 tsp. Corn Syrup
- 1 tsp. Maple Syrup
- 1 tsp. Frosting/Icing

10 Grams Carbohydrate

- ½ cup Regular Carbonated Beverage
- ½ Twin Bar Popsicle with Sugar
- 2 tsp. Corn Syrup or Honey
- 2½ tsp. Sugar*
- ¼ cup Regular Jello
- 1 cup Soup with Rice or Noodles

15 Grams Carbohydrate

- ¾ cup Regular Carbonated Beverage
- ½ cup Ice Cream
- ¼ cup Sherbet
- ⅓ cup Regular Jello
- 1 cup Cream Soup
- ⅓-½ cup Juice
- 1 Bar Popsicle
- ¼ cup Milkshake
- ½ cup Eggnog-Commercial
- ⅓ cup Tapioca Pudding
- ½ cup Regular Fruit-Flavored Yogurt



20 Grams Carbohydrate

- Whole Twin Bar Popsicle
- ½ cup Regular Jello

*To be added to a non-caloric beverage, such as tea to provide both sugar and fluid

Calories in Meal Plan

1000-1300 Calories

1400-1700 Calories

1800-2000 Calories

2100-2500 Calories

2600-3000 Calories

Carbohydrate Needed

10-15 Grams/Hr. or 6 Small Feedings w/25-30 Grams Each

15-20 Grams/Hr. or 6 Small Feedings w/35-40 Grams Each

20-25 Grams/Hr. or 6 Small Feedings w/45-50 Grams Each

25-30 Grams/Hr. or 6 Small Feedings w/55-60 Grams Each

30-40 Grams/Hr. or 6 Small Feedings w/65-70 Grams Each

**Grams per hour is figured over a 12-hour period, such as 8 am - 8 pm

Be prepared for a brief illness by keeping a supply of some of the following items: regular jello, regular carbonated beverage, juice, soup, saltines and sugar. Remember that the need for insulin may increase during illness. By keeping informed about blood glucose and urine ketone readings, adjustments can be made in the insulin dose. Non-caloric beverages and broth can be taken in addition to the above items to help provide extra fluid.



NEVER OMIT OR SKIP AN INSULIN INJECTION, unless otherwise directed.

***Ketones should not be present for more than 24 hours. Ketones should decrease if the appropriate insulin need is met.**

Please answer these questions:

IF I DON'T KNOW HOW MUCH INSULIN TO GIVE I CAN GIVE...

IF URINE KETONES CONTINUE MORE THAN ONE DAY I WILL...

IMPORTANT DECISIONS

We, on the Diabetes Management Team, feel it is important for you to understand why we support the decision to say **NO** to alcohol, cigarettes and drugs.

We are concerned about any substance that can affect the individual's ability to make judgments. Many times a day you make decisions necessary to maintain appropriate blood glucose levels. With both alcohol and drugs, hypoglycemia may go unrecognized or untreated. Friends or other observers may think that your behavior or actions are due to drug or alcohol use instead of hypoglycemia. Other necessary daily tasks to manage diabetes may also be missed.

The following briefly describes how your diabetic management is affected by various agents. Even if the following substances do not affect your blood glucose values, they may be harmful to your general health.



Cigarettes

- Increase chances of damage to the blood vessels
- No direct effect on blood glucose levels
- Damages every organ in the body

Beer

- Moderate to large hyperglycemic effect
- May delay recovery from low blood sugar reaction
- Extra calories
- Alcoholic ketosis

Dry Wine

- May interfere with recognition/treatment of hypoglycemia
- May increase chance of low blood sugar reaction
- Extra calories



Sweet Wine

- May interfere with recognition/treatment of hypoglycemia
- Marked hyperglycemic effect
- May increase chance of low blood sugar reaction
- Extra calories

Hard Liquor

- May interfere with recognition/treatment of hypoglycemia
- Small hyperglycemic effect
- Can cause severe hypoglycemic reaction
- Extra calories

Marijuana

- May interfere with recognition/treatment of hypoglycemia
- Small hyperglycemic effect
- May cause overeating

Stimulants

- May increase chances of damage to blood vessels
- Small hyperglycemic effect
- No effect on hypoglycemia

Depressants

- Interferes with recognition of hypoglycemia
- No significant hyperglycemic effect

Hallucinogens

- Interferes with recognition of hypoglycemia
- Minimal hyperglycemic effect

Reference: Pediatric and Adolescent Diabetes Mellitus Stuart J. Brink

OUTPATIENT VISITS

Office patient visits are available during days and early evenings. You need to arrive 15 minutes before your first visit to register. If you're an HMO member, you must have your referral for each visit.

If you do not carry your referral, you will be expected to pay for the visit at the time of service.

After the initial intense training, outpatient visits are generally every 2-3 months. A letter discussing the outpatient visit will be sent to your child's physician. You will need to continue to see your child's physician for all non-diabetes related treatment (e.g. physical exams, infections, etc.).

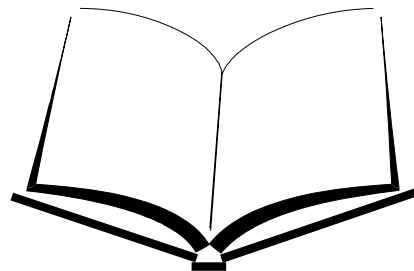


Outpatient visits may take two hours. Please bring any scheduled snacks or meals, monitoring supplies and insulin to the outpatient visit. To help make the most out of your visit, we will work with you to address short-term needs and long-term goals.

- Always bring meter and blood glucose

record book with you.

- If possible, download your meter at home before coming and bring a print-out.



- Remember your meter, list of questions, prescription needs and any forms that you need completed.
- Blood work testing done before the appointment is best so that the results are available at the visit, and the planning can be done together.

Outpatient telephone calls:

***Always have in your hand before you call our office:**

- Blood glucose record, meter, blood and urine ketone results
- Information on illness
- List of medicines taken/ including current insulin dose or pump rates
- If vomiting is occurring, weigh your child and have the weight available

GLYCOSYLATED HEMOGLOBIN

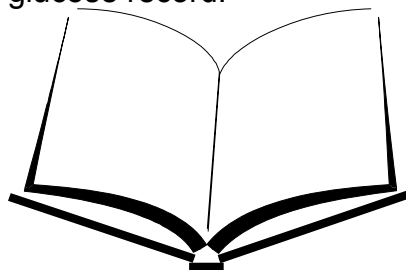
Glycosylated Hemoglobin = HbA1c.

The higher the average daily blood glucose values, the higher the glycosylated hemoglobin value. The glycosylated hemoglobin value is a reflection of the average blood glucose levels during the previous 3 months. In people without diabetes, the glycosylated hemoglobin (A1C) value is 4.4- 5.7.**

A glycosylated hemoglobin test will be done at every clinic visit. Blood for this test may be obtained by a finger stick at our office.

We do the A1C at our office, because it is done by finger sticking, available in 6 minutes and is reproducible on the same instrument. The

results of the glycosylated hemoglobin test will be reviewed along with the daily blood glucose record.



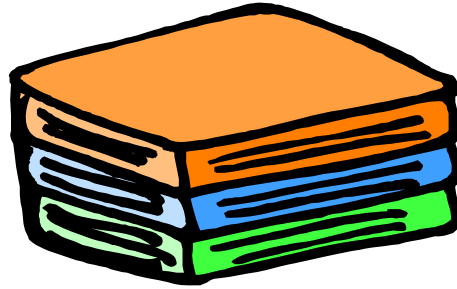
** Normal values vary depending on which laboratory is used. This value is a normal value for glycosylated hemoglobin values done at our office.

Office visits

You will have office visits at least every 3 months (sometimes more often as needed). You will alternate seeing a doctor – Dr. Zeller, Miller or Zimmer or a certified nurse practitioner (CNP) and/or physician assistant (PA) at each visit.

Diabetes can have long term complications, such as eye disease, kidney disease, nerve damage, high cholesterol, hypertension, heart disease. We will ask you questions about these at the visits and encourage your questions as well. We will ask you to get yearly blood work to monitor for complications and will review results at subsequent visits.

SUGGESTED READING



We encourage you to read and learn on your own and to ask us questions.

Cookbooks:

The Art of Cooking for the Diabetic

Katherine Middleton and Mary Abbott Hess
Contemporary Books, Inc.
180 North Michigan Avenue
Chicago, IL 60601 (Available at Bookstores)

Family Cookbook, Volumes I, II, III

The American Diabetes Association
American Dietetic Association
Prentice-Hall
Englewood Cliffs, NJ 07632
(Available at Bookstores)

The No Sugar Delicious Dessert Cookbook

S. Abrams, J. Moe, K. Rubin
Celestial Arts
P.O. Box 7327
Berkeley, CA 94704

Meal Planning and Dietary Guides:

The Calorie King Calorie, Fat and Carbohydrate Counter. www.CalorieKing.com

Exchanges for All Occasions, Fourth Edition

Marion J. Franz, MS, RD, CDE

Fast Food Facts

Marion J. Franz, MS, RD, CDE

Web Sites:

American Diabetes Association (ADA)	www.diabetes.org
American Dietetic Association (ADA)	www.eatright.org
Juvenile Diabetes Research Foundation (JDRF)	www.jdrf.org
Trial Net Diabetes	diabetestrialnet.org
Children with Diabetes	www.childrenwithdiabetes.com
Food Pyramid	mypyramid.gov

Insulin Pump Web Sites:

<http://pumpschool.minimed.com>
<http://www.myomnipod.com/products/>
<http://www.animascorp.com>
<http://www.roche.com> or www.disetronic-usa.com

ADA Book Store: Check out the following books –

Smart Pumping for People with Diabetes, Howard Wolpert, MD
Pumping Insulin, John Walsh and Ruth Roberts, Fourth Edition
The Pink Panther, Understanding Insulin Pumps & Continuous Glucose Monitors, 1st ed.
H. Peter Chase

Other Books:

The Pink Panther, A First Book for Understanding Diabetes, H. Peter Chase, MD
The Barbara Davis Center for Childhood Diabetes
777 Grant Street, Ste. 302, Denver, CO 80203
In Control, A Guide for Teens with Diabetes, Jean Betschart, MN, RN, CDE

General Information:**Learning to Live Well with Diabetes**

Editorial Committee: D. D. Etzwiler, M. J. Franz P. Hollander, J. O. Joynes

NOTE: Books under **Exchanges** and **General Information**
available on order from:

Diabetes Center, Inc.
P. O. Box #739
Wayzata, MN 55391 Toll-Free Number: 1-800-848-2793

Literature is available from the American Diabetes Association. Diabetes Forecast, a magazine published monthly by the American Diabetes Association, is a good source of information.

Cookbooks may be found at your local library or bookstore.

*******CHECK OUT OUR WEBSITE AT www.academicendocrinology.com**

SPECIAL ACKNOWLEDGEMENT: The authors wish to thank Elizabeth Zeller for her help with layout, the rest of my family, and my lovely wife Gail. These pages reflect textbooks and real-life experiences. We dedicate these efforts to the families on our team - taking care of children with diabetes.

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