

# **IN CONTROL – MANAGING SICK DAYS FOR CHILDREN WITH TYPE 1 DIABETES**



Program developed for the  
Nevada Diabetes Association

by

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## **INTRODUCTION**

Control over diabetes is possible when parents and children know how to balance insulin with diet and exercise. When a child is sick, however, parents may feel they are losing control. Common childhood illnesses such as vomiting or the flu can result in diabetic ketoacidosis (DKA). This serious complication can be life threatening, sending many children to the hospital. DKA is responsible for 85% of hospital admissions in children with known type 1 diabetes. The good news is that DKA is 98% preventable if parents follow sick day rules.

### **The Golden Rules of Care**

*This online program will educate parents of children with diabetes about the Golden Rules of sick day management:*

- Checking ketones and blood glucose
- Insulin dose management
- Managing your child's diet during illness
- Preventing dehydration and DKA
- What medical and nutritional supplies to have on hand
- When to call your pediatrician or diabetic care provider
- What information to report – preparing a Sick Day Worksheet

## WHAT'S WRONG WITH THIS PICTURE ???

*Our program begins with a case study about Steven and his family. When you read Steven's story, think about whether these events could happen to you and your family.*



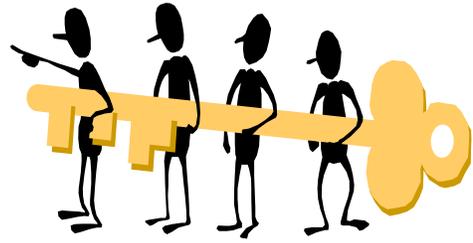
### **Steven, Coming Out of the “Honeymoon Period”**

Steven, a 7-year-old, has had diabetes for one year, and developed his first illness since diagnosis. He complained of a severe sore throat and cough. His blood sugars were unstable and had gone up steadily over the past 24 hours. His latest blood sugar reading was 348. The ketone strips from a year ago have expired, and like so many “shoulds” in busy lives, new ketone strips were never purchased. Is Steven spilling ketones?

Who knows? It is 2 AM. Where would a parent get ketone strips now? Steven's parents question if the current high blood sugar level of 348 could be from the cough medicine he has been taking. It did have sugar in it.

Now, in the middle of the night, Steven's temperature is 102.5, his blood sugar is 348, and he has vomited three times. His parents remember some mention of “Sick Day Rules,” but have no idea of what to do next. PANIC sets in. Hopefully, a relationship has been established that supports and encourages Steven's parents to seek help from their health care system. They do call the Nurse Hotline, and are referred to a local emergency room for IV fluids.

Could this scene happen to you? What can you do to prevent it?



## **PREVENTATIVE HEALTH CARE**

*The key to preventing illness and DKA is just that: PREVENTION! The list below tells just what each health care provider or testing routine can do for your child.*

### **1. Pediatrician (Primary Care Provider):**

- Checkups every 6-12 months
- Include weight, height, blood pressure, sexual maturation
- Immunizations
- Annual flu shot (for all family members)

### **2. Dentist:**

- Regular dental care

### **3. Diabetes Care Team: Endocrinologist, nurse practitioner, certified diabetes educator (CDE), nurse, dietitian, social worker**

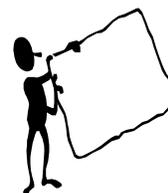
- Clinic visits every 3 months
- Physical exam at least every 3 months
- Diet education at least every 12 months
- Diabetes education every 3-6 months
- Insulin evaluation every 3 months and adjustments as needed

### **4. Routine Testing**

- Glycosylated hemoglobin (A1C) every 3-6 months
- Urine microalbumin test every 12 months after diabetes for 5 years duration, or immediately if 10 years of age or older
- Eye and vision exam every 12 months after diagnosis. Many providers want children to have a baseline exam after blood sugars stabilize.
- Based on family history and the child's signs or symptoms, other tests that are frequently done include: (a) lipid profile, (b) thyroid tests, (c) celiac screening.

**SICK DAY SUPPLIES / INFORMATION SHEET**

*Another way to prepare for illness is to have essential information where you can find it and to stock-up on diabetes and sick day supplies. These charts will give you a head start in your planning and preparation.*



Pediatrician:	Endocrinologist:
Nurse Practitioner:	Nurse Educator:
Dietitian:	Pharmacy:

**DIABETIC SUPPLIES AND MEDICATIONS**

- |   |  |
|---|--|
| <input type="checkbox"/> Blood glucose meter & strips       | <input type="checkbox"/> Urine or blood ketone strips            |
| <input type="checkbox"/> Short-acting & long-acting insulin | <input type="checkbox"/> Thermometer                             |
| <input type="checkbox"/> Insulin syringes                   | <input type="checkbox"/> Glucose tablets                         |
| <input type="checkbox"/> Insulin pump supplies              | <input type="checkbox"/> Glucose gel                             |
| <input type="checkbox"/> Glucagon / Glucagen                | <input type="checkbox"/> Lifesavers                              |
| <input type="checkbox"/> Anti-nausea meds                   | <input type="checkbox"/> Throat lozenges (Cepacol, Chloraseptic) |
| <input type="checkbox"/> Afrin nasal spray                  | <input type="checkbox"/> Acetaminophen/ Ibuprofen                |

**SICK DAY FOODS**

- Liquids:
- Fruit juice (orange, etc.)
  - Regular & sugar free beverages
  - Electrolyte drinks: Gatorade, G2, Powerade, Pedialyte, KAO Lite
  - Tea with honey or sugar
  - Jello (regular & sugar free)
  - Popsicles (regular & sugar free)
  - Broth type soup (bullion, chicken broth)
- Solids:
- Saltine & graham crackers
  - Banana or other fruit
  - Applesauce
  - Pudding
  - Bread or toast
  - Soup



## **WHAT HAPPENS TO THE BODY WITH ILLNESS?**

*Being prepared to deal with illness also includes understanding how illness affects blood sugar and ketones in type 1 diabetes.*

### **Illness = Stress on the Body**

Body requires more energy to fight infection

More insulin is required to help sugar pass into cells = more energy

### **Hormones are Released to Fight Disease**

These are stress hormones (epinephrine) and steroids

Hormones raise blood sugar levels

More insulin is required to burn this extra sugar

### **Without Enough Insulin, Sugar Can't be Used for Energy**

Sugar sits in blood stream; can't pass into cell

Fats break down as a source of energy

Ketones are a byproduct of fat breakdown

Excessive ketones = acidosis

DKA = diabetic ketoacidosis

### **How to Stop Fat Breakdown, Once Ketones are Present**

If blood sugar is high, give extra short-acting insulin

If blood sugar is low, eat first (raise blood sugar), then give insulin

Insulin is required to rid body of excessive ketones

## ALL ABOUT DIABETES KETOACIDOSIS (DKA)

*The first goal when dealing with illness is to prevent diabetes ketoacidosis or DKA. Read on to learn about DKA, its causes, signs, and symptoms.*



### Definition

DKA is a serious condition that can develop in a person with type 1 diabetes when his/her body does not get enough insulin. It can often be prevented by careful management of diet, insulin, and activity during illness.

### What happens in the body?

When the body does not have enough insulin to use blood sugar for energy or when not enough food has been eaten, it breaks down fat for energy. As the fats break down, ketones are released and begin to build up in the blood and pass into the urine. Ketones are toxic byproducts of fat breakdown. Ketones cause the body to have a low pH, resulting in acidosis. In an acidotic state, the body's enzymes can no longer work effectively. If left untreated, death will eventually follow.

### Causes

1. illness
2. forgetting to take an insulin shot
3. not taking enough insulin
4. insulin pump is not working

### Time of onset

hours or days

### Blood sugar

usually high, but may be in child's regular range, or anywhere from 70 to over 400. Look for **symptoms**. Do not go by high blood sugar alone!

### Urine ketones

usually moderate or large ketones

### Blood ketones (Precision Xtra meter)

1. above 0.6 indicate fat metabolism is taking place
2. above 3.0 are consistent with acidosis (DKA)

### Signs and Symptoms

#### Mild

mod/lg ketones in urine  
high blood sugar  
blood ketones above 3.0  
thirst  
frequent urination  
sweet, fruity breath

#### Moderate

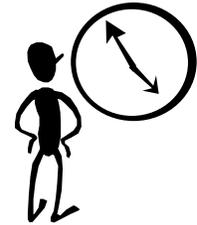
Mod/lg ketones in urine  
nausea  
vomiting  
abdominal pain  
dry mouth  
dry or flushed skin

#### Severe

large ketones in urine  
labored, deep breathing  
extreme weakness  
very tired  
confusion  
coma

**MONITORING AND RECORDING:  
WHEN TO CHECK BLOOD AND URINE**

*More frequent monitoring of glucose and ketones is essential during illness. You will need to report these values to your diabetes provider when seeking guidance about care. With experience, you will be able to use this information to regulate your child's diet, activity, and insulin.*



**Blood sugars**

- every 2-4 hours with illness
- more frequently may be necessary if supplemental insulin given

**Urine ketones**

- at least every 4 – 6 hours, or every urination, when sick
- when blood sugars are over 240 for two tests in a row
- after any vomiting, abdominal pain or nausea
- parent and child should both check
- use foil-wrapped strips or bottle open less than 6 months. Write the date opened on the bottle.

**Blood ketones**

- when blood sugars are over 240-300 for more than 1 – 2 hours
- when blood sugars are over 240-300 once, for insulin pump patients, when cause is unexplained
- with signs of DKA (ex. vomiting)
- every 2 – 4 hours with illness

**Develop a plan**

- discuss when to monitor blood sugars and ketones with your provider, as they may have more specific instructions



## CONTACTING HEALTH CARE PROVIDERS

*How do you decide when to seek help in managing your child's illness? With type 1 diabetes complicating a childhood illness, you may not be able to manage alone.*

### CALL THE PEDIATRICIAN:

#### **\*When urine or blood ketones are negative**

- And there are other signs of illness

### CALL THE DIABETES CARE PROVIDER:

#### **\*When blood sugar or ketone values are abnormal**

##### **1. Ketones are present**

- Urine ketones are moderate or large
- Blood ketones are above normal  
(0.6 to 1.5 may require medical assistance)  
(above 1.5, at risk for DKA, call immediately)  
(0 to 0.5, increase fluids and recheck in 3-4 hours)

##### **2. Blood sugars are very high or low**

- 240-300 or above 2 or more times
- 70-80 or below
- Ask your provider what blood sugar value to use for your child

##### **3. Questions on insulin dosage**

- Extra insulin is usually needed, either Humalog, Novolog, or Apidra
- Amount of insulin and how often you give it varies, depending on blood sugar and diet intake

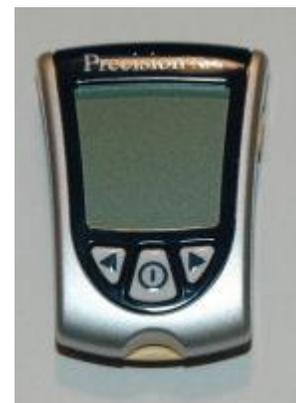
##### **. Suspect diabetes ketoacidosis (DKA) & consider an Emergency Dept. visit**

- Vomiting occurs, with ketones moderate or large
- Antiemetic isn't controlling vomiting
- Child has been unable to drink or eat for approximately 6 hours
- Other signs of DKA: trouble breathing, confusion, etc.

The following chart can help you interpret the results of the Precision Xtra®'s blood ketone test results:

Blood Ketone Reading Indications
<b>Above 1.5 mmol/l</b> Readings above 1.5 mmol/l in the presence of hyperglycemia indicate that you may be at risk for developing diabetic ketoacidosis (DKA). Contact your healthcare provider immediately for advice.
<b>0.6 to 1.5 mmol/l</b> Readings between 0.6 and 1.5 mmol/l may indicate the development of a problem that may require medical assistance. Follow your healthcare provider's instructions.
<b>Below 0.6 mmol/l</b> Readings below 0.6 mmol/l are in the normal range.

Source: Precision Xtra® documentation



The Precision Xtra® meter



## MANAGING YOUR CHILD'S DIET DURING ILLNESS

*One of the most important ways to treat an illness is to provide the right type of fluids and food for your child. These choices are based on the type of illness and your child's blood sugar and ketone readings.*



### Drinking Liquids is Most Important

#### WHY:

1. To prevent dehydration
  - fluids are lost in urine due to high blood sugar
  - fluids are lost by vomiting, diarrhea, fever
2. To wash out ketones
  - may be enough to rid body of small ketones
3. To reduce high blood sugar

#### WHAT:

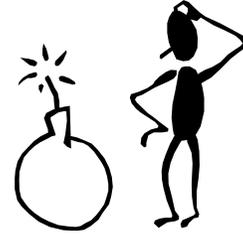
1. Offer whatever your child likes best
  - he/she needs 2-4 cups every 6 hours to prevent dehydration
  - Gatorade, Pedialyte replace electrolytes
  - orange juice and bananas replace potassium
2. Give anti-nausea med, if prescribed by your doctor, to help keep fluids down.

#### WHEN:

1. Offer **sugar-containing liquids** when:
  - child can't eat solids or is vomiting
  - blood sugar is below 180-200
  - ketones are present and blood sugar is below 180-200  
(Note: will raise blood sugar so insulin can be given and will stop body from breaking down fats)
2. Offer **sugar-free liquids** when:
  - blood sugar is above 180-200
  - extra fluid is needed to flush out ketones/high blood sugar
3. Your provider may have more specific instructions

### Offer Solids When Child is Ready

1. Child has gone a few hours without vomiting
2. Bland, soft foods are best (see Sick Day Worksheet)
3. Extra snacks may be needed if child not eating well



## **GUIDELINES FOR THE CHILD WITH VOMITING**

*Vomiting presents a special problem for the child with diabetes, because it can be part of an illness that leads to DKA and it can complicate treatment of any illness. Vomiting is also a symptom of DKA, so in a situation where your child has ketones present and you cannot stop the vomiting, you should seek medical care right away.*

- Avoid solid foods until the vomiting has stopped.
- If nausea and vomiting persist, many providers recommend giving an antiemetic, such as:
  1. Zofran (ondansetron), an oral prescription drug for younger and older children that will not make your child sleepy.
  2. Phenergan suppository (prescription drug), in older children only; has a sedative effect, which can cause difficulty in evaluating signs of DKA.
  3. If you do not have medication at home, ask for a prescription at your clinic visit.
- Wait to give fluids for 1/2 to 1 hour, after the medication is working. Gradually start liquids in small amounts. Here are examples of rules for deciding the amount:
  1. Give liquids in the amount the child is able to take and keep down:
    - 1 tablespoon every 5 - 10 minutes → *if tolerates, then increase to...*
    - 1 ounce (2 TBS) every 15 minutes → *if tolerates, then increase to...*
    - 2 ounces every 30 minutes → *if tolerates, then increase to...*
    - ½ - 2 cups every hour, depending upon age of child
- Give sugar or sugar-free fluids depending upon the blood sugar level:
  1. Above 180 - 200, give sugar-free liquids (G2, soda, tea, water, broth) or jello or popsicles if cannot drink fluids
  2. Below 180 - 200, give sugar containing liquids (Gatorade, Pedialyte, regular soda) or jello or popsicles
- If there is no further vomiting, gradually increase the amount of fluid. If vomiting restarts, it may be necessary to rest the stomach for another hour and then restart with small amounts of fluids. A repeat antiemetic may be given after 3 - 4 hours, as directed by your provider.
- After a few hours without vomiting, gradually return to a normal diet. Soups are good to start with, and they provide needed nutrients. Choose low fat, bland foods.



## **HYPOGLYCEMIA AND THE RULE OF 15**

*The “Rule of 15” provides guidance about how to deal with low blood sugars. The target for blood sugar in children is about 80. Check with your provider about the target level for your child.*

### **If Blood Sugar (BS) is 70-90 or below:**

- treat with 15 grams of carbohydrate in older children (5-10 gms in younger children)
- check BS in 15 minutes
- If not above 70-90, repeat treatment and recheck BS in 15 minutes

### **If Blood Sugar begins to increase:**

- give 15 grams or carbohydrate with protein and fat (such as peanut butter) or a meal.

### **The following have 15 grams of carbohydrate:**

- glucose tablets (three 5 gm tablets or four 4 gm tablets)
- 4 oz fruit juice
- ½ can regular soda pop
- 6 lifesavers
- 1 tablespoon table sugar or honey
- tube of glucose gel (especially good if vomiting)

## **Carry carbohydrate with you at all times for treating hypoglycemia**

## **MINI-DOSE GLUCAGON RESCUE**

One way of preventing severe hypoglycemia in a child with a stomach illness is to give very small doses of glucagon, injected subcutaneously, using an insulin syringe. The glucagon is diluted as instructed in the emergency kit, but much smaller doses are given, based in the physician’s instructions.



## **EXAMPLES OF CHANGES IN INSULIN INJECTIONS**

*General guidelines for adjusting subcutaneous insulin doses are summarized below. Check with your child's provider to decide just how much insulin to give.*

### **General Rules for Sick Day Changes in Insulin**

1. Extra doses of short acting insulin are usually given in addition to the child's usual daily dose.
2. Ketones and high blood sugar block the normal sensitivity of the body to insulin, which is why doses may seem large.
3. Each child is different; this is why keeping good records during illness is important, so that your care can improve with experience.
4. If your child is still having high blood sugar and positive urine ketones, call your diabetes care provider for help.

### **Insulin Changes with High Blood Sugar and Moderate/Large Ketones**

1. Give an extra dose of insulin as determined by your diabetes clinician.
  - as Humalog, Apidra or Novolog insulin every 2-4 hours
  - until ketones measure small or less

### **Insulin Changes when Blood Sugar is below 150 and Moderate / Large Ketones**

1. Give sugared drinks to bring the blood sugar back up before giving the next insulin injection.



## **EXAMPLES OF CHANGES IN INSULIN PUMPS**

*A properly functioning pump is a good tool for controlling blood sugar during illness. If your child is on an insulin pump and has ketones present, it is important to rule out pump malfunction. You may need to revert to subcutaneous injections temporarily.*

### **General Rules for Sick Day Changes in Insulin**

1. If blood sugars are above 240 and ketones are moderate or large, give insulin by syringe **and contact diabetes provider**.
2. Continue to give insulin by syringe until the cause of high blood sugar is identified and corrected.
3. If trouble shooting does not locate the cause of high blood sugar, replace the reservoir and change the infusion set immediately.
4. Check blood sugar every 1 – 2 hours and continue to take insulin every 2 – 4 hours until blood sugar reaches target.

### **Changes Based on Insulin Sensitivity**

1. Insulin correction dose for high blood sugars is based on insulin sensitivity factor: 1.0 unit of insulin lowers blood sugar \_\_\_\_\_ mg/dl
2. Rule for determining insulin sensitivity factor:  

$$\frac{\text{_____}}{\text{total daily dose of insulin}} \times 1800 = \text{BS: _____ mg/dl}$$

(amount that 1.0 unit of insulin will decrease blood sugar)

### **When Ketones are Present**

1. A higher temporary basal rate may be needed for ketones and high blood sugar
2. If moderate or large ketones are present in the urine, insulin doses that normally would be used to lower a high blood sugar may need to be increased.
3. Check readings every 1 - 2 hours until blood sugar control is regained.

### **Mealtime Insulin**

1. If your child is able to eat regular food or drink liquids that contain sugar, continue to give mealtime boluses based on carbohydrate intake.

### **Pump Problems**

1. If a pump problem occurs, such as a leak, clog, or displaced infusion set, or if the pump is removed, the normal insulin infused from a pump will be completely used up by the body in 3 to 4 hours. Novolog, Apidra or Humalog is gone from the body in 3 to 4 hours.
2. Ketosis can occur rapidly. The greatest danger is ketosis occurring overnight.



## **GOLDEN RULES OF SICK DAY CARE**

*The Golden Rules of sick day care are summarized below.*

**Rule 1:** Always check ketones with any illness (even if BS is low), when BS is above 240-300, and if your child vomits even once

**Rule 2:** Always give your child some insulin

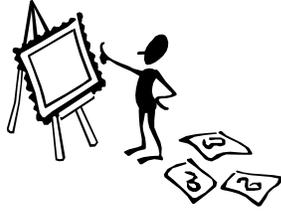
**Rule 3:** Your child must drink plenty of fluids to prevent dehydration and DKA



## **WHEN TO SEEK EMERGENCY CARE**

*If you are not able to manage your child's illness at home, you may encounter some of the situations presented below. Call your provider and/ or take your child to the Emergency Department (ED).*

- If your child has difficulty breathing or has “deep breathing” you need to go to the emergency department right away. This usually indicates severe acidosis (DKA).
- If your child has signs and symptoms of DKA and you are unable to contact your health care provider, you should go to urgent care or the ED.
- If moderate or large ketones are present in the urine, and the treatment suggested by your diabetes provider is not working, they may suggest you go to urgent care or the ED.
- If your child has uncontrollable vomiting, he/she will probably need intravenous fluids.
- If there is unusual behavior such as confusion, slurred speech, double vision, inability to move or talk, or jerking, someone should give sugar or instant glucose. The health care provider should be contacted if a severe reaction occurs. Glucagon is given if the child is unconscious or a seizure occurs. In this case, it may be necessary to call the paramedics (911) or go to the ED. (Note that Glucagon may not work if your child has had extended vomiting or lack of appetite.)



## **GENERAL GUIDELINES FOR DIABETES MANAGEMENT AROUND SURGERY**

*Surgery is a stress to the body, just as illness is. Careful planning and monitoring can prevent complications.*

- If possible, schedule surgery in the morning, so that you have more time to monitor your child after surgery.
- Give your surgeon or dentist the name, address, and telephone of your diabetes care provider, so that they can discuss the best way to manage surgery and diabetes care.
- After you know the time and place of surgery, and whether food intake will be allowed, call the diabetes care provider to discuss your child's needs.
- Plan to take the following supplies with you to the surgery center:
  - --Blood glucose meter
  - --Urine or blood ketone strips
  - --Diabetes provider's phone number
  - --Glucose tablets, glucose paste, or cake icing
  - --Glucagon / Glucagen (if needed)
- Always check the urine ketones before surgery. If they are abnormal, it may be necessary to cancel the surgery. If they are within normal range, this will serve as a baseline for any changes after surgery. Always check at least one to two times after surgery.
- If urine ketones are moderate or large, call your diabetes care provider.
- Check your child's blood sugar before and approximately every 2 hours after the surgery, until your child's food intake and activity return to normal.

## **MAKING THE MOST OF THE HOSPITAL EXPERIENCE**

*Although hospitalization is very stressful, it may also provide an opportunity for you and your child to review diabetes care and plan for modifications when you return home.*



- Examine and discuss your child's reasons for being in the hospital.
- Ask for a nutritional consult with the dietitian to review diet information.
- Review sick day management with your diabetes educator and plan how to deal with future illnesses.
- Discuss realistic goals for your child's care and expected outcomes of care, with the endocrinologist.
- Discuss with provider how to best involve your child in decisions and choices.
- Sit down with your child, if appropriate, to review information together.
- Utilize resources: read books on diabetes, parenting, and childhood illnesses.
- Discuss experiences with other parents.

## CASE SCENARIOS—JUST FOR PRACTICE

Work through the attached case studies to test your knowledge about sick day management. Answers can be found after the Resources section.



### # 1 CASE SCENARIO: ROBIN, 10 YEARS OLD, WITH FLU

Although no one else in her family had been sick, Robin complained of a stomach ache after supper, and at 7:30 pm, vomited most of her supper. She continued to be nauseated. Her temperature was 100.2 degrees.

Blood sugars:		Urine ketones:	
5:30 pm:	148		
7:00 pm:	180	7:00 pm	negative
8:30 pm:	285	9:00 pm	small

1. At 9:00 pm, how would you describe Robin's status in terms of DKA?
  - a. She is in DKA now.
  - b. She is not in DKA, but headed in that direction.
  - c. It is inevitable that she will develop DKA.
2. At 9:00 pm, Robin's temperature was 101.3. What medication should her parents give her at this time? \_\_\_\_\_

3. How should she manage her food and fluid intake at this time? \_\_\_\_\_  
\_\_\_\_\_

4. How frequently should they continue to check her BS and urine ketones?

BS \_\_\_\_\_ Urine Ketones \_\_\_\_\_

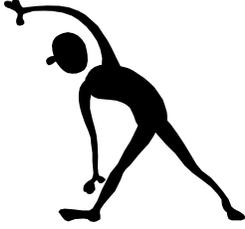
Robin's usual insulin injections were as follows:

7 am:	1 unit Novolog for each 10 grams carbohydrate
Noon:	1 unit Novolog for each 12 grams carbohydrate
6:00 pm:	1 unit Novolog for each 12 grams carbohydrate
9 pm:	22 units Lantus

5. Robin gave her 22 units Lantus insulin dose at 9 pm. At 11:00 pm her urine ketones were moderate and her blood sugar was 400. Should Robin's parent give her an extra dose of insulin at 11:00 pm? \_\_\_\_\_ If so, what type? \_\_\_\_\_

6. When should her parents call the diabetic care provider, and what should they report?  
\_\_\_\_\_

7. At 1 am, Robin's blood sugar was 300 and ketones were moderate. What should they do? \_\_\_\_\_



## # 2 CASE SCENARIO: THOMAS, 14 YRS OLD, AFTER SURGERY

About six months after starting on the insulin pump, Thomas was told that he had to get all four of his wisdom teeth removed. He worried that he would be unable to eat after dental surgery, and wondered if he should take his insulin on the day of surgery.

1. What effect is surgery likely to have on Thomas's blood sugar levels?
  - a. no effect
  - b. decrease blood sugars
  - c. increase blood sugars

Both Thomas and his mother called the diabetes clinician. She told them that the stress of surgery could make his blood sugars go up. On the morning of surgery, Thomas checked his blood sugar and urine ketones before going to the dentist's office. The ketones were negative.

2. Why should Thomas check both BS and ketones before surgery? \_\_\_\_\_  
\_\_\_\_\_

3. What diabetic supplies should he take to the office? \_\_\_\_\_  
\_\_\_\_\_

The procedure went smoothly, and Thomas went home with a sore mouth and a prescription for pain medicine.

4. What type of diet should Thomas eat on the afternoon of surgery? \_\_\_\_\_  
\_\_\_\_\_

5. Should Thomas take mealtime/ snack boluses?
  - a. yes
  - b. no

6. How often should Thomas check his blood sugar? \_\_\_\_\_

7. Who should call the diabetic clinician with a progress report?
  - a. Thomas
  - b. His mother

## RESOURCES ON TYPE 1 DIABETES IN CHILDREN

### BOOKS:

***A Child in Your Care has Diabetes, 3rd Edition***, by Elisa Hendel.  
Published by Hen House Press, 2005.

***The Everything Parent's Guide to Children with Juvenile Diabetes*** by Moira McCarthy with  
Technical Review by Jake Kushner, M.D. Published by Adams Media, 2007.

***A First Book for Understanding Diabetes*** by H. Peter Chase, M.D. Published by the Children's  
Diabetes Foundation at Denver, 2004.

***Highs & Lows*** by Michael Twist. Published by Insomniac Press, 2001.

***My Child Has Diabetes: A Parent's Guide to a Normal Life After Diagnosis*** by Karen  
Hargrave-Nykaza. Published by iUniverse, 2006.

***My Life as a Pancreas: Reflections on Raising a Child with Diabetes*** by Priscilla Call Essert.  
Published by LuLu.com, 2006.

***Pumping Insulin***, Fourth Edition by John Walsh, P.A., C.D.E., and Ruth Roberts, M.A. Published  
by Torrey Pines Press, 2006.

***Real Life Parenting of Kids with Diabetes*** by Virginia Nasmyth Loy. Published by the American  
Diabetes Association, 2001.

***Think Like a Pancreas*** by Gary Scheiner. Published by Marlowe & Company, New York, 2004.

***Type 1 Diabetes: A Guide for Children, Adolescents and Young Adults -- and Their  
Caregivers*** by Ragnar Hanas, M.D. Published by Marlowe & Company, New York, 2005.

***Understanding Diabetes, 11th Edition*** by H. Peter Chase, M.D. Published by the Children's  
Diabetes Foundation at Denver, 2006. The complete text of the 11th edition is online at  
<http://www.uchsc.edu/misc/diabetes/books/ud11/ud11.html>

***Understanding Insulin Pumps & Continuous Glucose Monitors*** by H. Peter Chase, Jana  
Gaston, and Laurel Messer. Published by the Children's Diabetes Foundation at Denver, 2007.

### WEB SITES:

Nevada Diabetes Association (<http://diabetesnv.org> )

American Diabetes Association (<http://www.diabetes.org>)

Children with Diabetes (<http://www.childrenwithdiabetes.com>)

Juvenile Diabetes Research Foundation International (<http://www.jdrf.org>)

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)  
(<http://niddk.nih.gov>)



## **ANSWERS TO CASE STUDY QUESTIONS**

### **1. Robin, 10 years old, with Flu**

Question 1. answer b

Question 2. First give acetaminophen (Tylenol) or ibuprofen (Advil) to bring Robin's fever down. Note, never give aspirin to a child with suspected viral illness.

Question 3. Encourage sugar-free liquids in an amount that she can keep down.

Question 4. Check blood sugar (BS) at least every 2 hours. Check urine ketones every void.

Question 5. Yes, an extra dose of short-acting insulin is probably necessary to eliminate ketones and lower blood sugar.

Question 6. Call the diabetes provider now (at 11 pm) if parents are unsure how much insulin to give.

Question 7. Another dose of short-acting insulin at 2-3 am is probably necessary.

### **2. Thomas, 14 years old, after Surgery**

Question 1. answer c

Question 2. Check BS and ketones before surgery as a baseline measure. If ketones are positive, the surgery may need to be cancelled.

Question 3. Take blood glucose meter and strips, ketone strips or Precision meter, glucose paste, glucagon, and phone number of diabetes provider.

Question 4. Soup, liquids, or soft foods, in the place of his usual meal

Question 5. answer a

Question 6. Check blood sugar at least every 2 hours.

Question 7. answer a or b (your call). If Thomas calls the diabetes provider, his mother should be aware and involved in any changes in care.

## **QUESTIONS ABOUT THIS EDUCATIONAL PROGRAM:**

If you have questions or suggestions about ways to improve this online program, please e-mail the author, Sherrilyn Coffman, at [sherrilyn.coffman@nsc.nevada.edu](mailto:sherrilyn.coffman@nsc.nevada.edu)