

Chapter 16

Sick-Day and Surgery Management





SICK-DAY MANAGEMENT

The person with diabetes can get sick just as any other person does. With proper “thinking ahead” and help from health professionals, the risks from illnesses are not much greater than they are for anyone else. However, there are certain precautions that must be taken. The purpose of this chapter is to review these precautions. If you have a young child with diabetes, just change the “you” to “your child” in your thinking when you read this chapter.

WHAT YOU NEED TO KNOW

When you get sick, the first thing you must do is to get the information you need. This will help you decide if you need assistance from health professionals. They will usually want to know this information. Keep your book open to this page to remind you of the 10 things to report when you phone. They are listed in Table 1 and discussed in the following text.

When calling please give:

-  The **name** and **age** of the person with diabetes and who is calling
-  About **how long** the person has had diabetes
-  **Name of the diabetes doctor**
-  **Present problem:** Diarrhea, vomiting, bad headache, cold, cough, earache, sore throat, stomachache or injury. If vomiting or diarrhea is present, note the number of times and when the episodes happen. It is also important to note

TOPIC:

Prevention,
Detection and
Treatment of
Acute
Complications
(with illness)

TEACHING OBJECTIVES:

1. Discuss the information needed when the person with diabetes becomes ill.
2. Distinguish treatment plans for small, moderate and large ketones.
3. Indicate the appropriate time to call a healthcare provider for assistance with illness or planned surgery.

LEARNING OBJECTIVES:

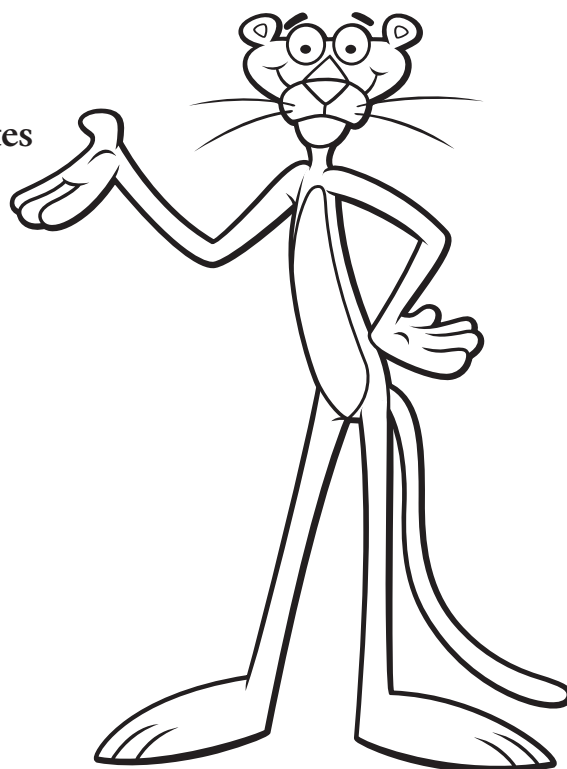
Learners (parents, child, relative or self) will be able to:

1. List three areas of care that must receive special consideration when the person with diabetes is ill.
2. State treatment plans for small, moderate and large ketones.
3. Identify the appropriate time to call the healthcare provider for assistance with illness or planned surgery.

Table 1

When Calling, Give:

1. Name and age of the person with diabetes
2. About how long the person has had diabetes
3. Name of the diabetes doctor
4. Present problem
5. Blood sugar level
6. Urine or blood ketone result
7. Signs of low blood sugar or of acidosis
8. Intake of foods and liquids
9. Usual insulin/oral medication dosage, time and amount of last dosage
10. Last body weight (if known)





if there have been any recent illnesses in other family members or close friends. This will help you decide if you have a similar illness.


Fever does not generally occur with diabetes-related problems. Fever is usually a sign of an infection. However, infections can be present without a fever. It is helpful if you are able to take your temperature before calling the diabetes care provider to discuss an illness. Sick people usually don't feel like doing much. If you are still active, it is usually a good sign.

Blood sugar: As we noted in the chapter on self blood sugar monitoring, you must do even more blood sugar tests than usual on sick-days. Parents, spouses, or friends should know how to accurately measure blood sugars using test strips and meters in case you are feeling too sick to do the testing. The blood sugar test should always be done before calling your diabetes care provider.

Ketones: DON'T FORGET, urine or blood KETONES MUST ALWAYS BE CHECKED AT LEAST TWICE DAILY IF A PERSON DOESN'T FEEL WELL (see Table 2). This is necessary even if the blood sugar is normal! Ketones must always be checked if fasting blood sugars are 240 mg/dl (13.3 mmol/L) or more. During the day, values above 300 mg/dl (16.7 mmol/L) indicate a need to check ketones. However, **with an illness, ketones can be present even when the blood sugar is lower.** It is wise to have some small paper cups in the bathroom. The urine can be left in the cup so that another person can be certain they agree with the reading (and to make sure the test was really done). **Always do the test before calling your diabetes care provider.** If you don't have the foil-wrapped Ketostix (Chapter 5), check to make sure the Ketostix bottle has not been opened for more than six months. They lose sensitivity after six months.


 **Signs of low blood sugar and acidosis:** These were discussed in Chapters 6 and 15, respectively. Deep, labored breathing or continual vomiting can be signs of acidosis. These indicate the person should be seen in an emergency room as soon as possible.

 **Eating and drinking:** It is important to know how well you are taking liquids and/or eating. Use a 1-liter water bottle to help keep track of how much liquid you have had. Often you can look at your tongue in the mirror to see the amount of moisture present. If the tongue starts to become too “dry” (dehydrated), intravenous fluids may be needed. Children five years old and younger can become dehydrated in 4-6 hours. If trips to the bathroom become only 1-2 times per day or if there are half the usual number of diapers, call the healthcare provider immediately.

 **Insulin dosage:** You should know the usual insulin dose and when this was last taken. Were any doses skipped or forgotten? Finally, if you have had a similar illness in the past, it would be helpful for the doctor or nurse to know how much extra Humalog/NovoLog/Apidra or Regular insulin you took at that time. Did the dose seem to work? If the morning or

evening insulin dose has not yet been given and you have moderate or large ketones, **call the diabetes care provider before you give the injection.** Extra rapid-acting insulin will probably be needed.

Fortunately, with use of basal insulin therapy (given as Lantus or by pump) many people have their usual number of illnesses (approximately six per year) and do fine. They do not have to worry about low blood sugar from a peak insulin (e.g., NPH) when they can't eat. The basal insulin is often adequate to keep ketone production turned off.

 **Oral medications:** If the person is taking Metformin (glucophage) and there is vomiting, diarrhea, difficulty breathing or any serious illness, **the Metformin must be stopped.** Call the healthcare provider **AFTER** checking the blood sugar and ketones.





 **Body weight:** It is helpful to know the last weight from a clinic visit (within three months) and the present weight (if you have a scale). This will help the doctor choose the right amount of insulin and also know how much weight you may have lost.

Table 2

Most Important

 **Always check ketones with any illness.** Even if the blood sugar is low, check for ketones at least twice daily every day you are sick. Call your healthcare provider if urine ketones are moderate/large or blood ketones are above 1.0 mmol/L.

 **Always take some insulin.** Never skip a dose entirely. Call your diabetes care provider if you don't know how much to take.

 It is particularly important to **check ketones if you vomit even ONCE!** Ketones can cause vomiting. If you vomit more than three times, call your diabetes care provider.


CHANGING THE INSULIN DOSAGE FOR ILLNESS

*It is important to remember that **SOME INSULIN MUST ALWAYS BE GIVEN EACH DAY** (Table 2). You cannot skip the injection just because you are sick and/or vomiting.* Often the body will require more energy during illness to help fight the infection. Hormones in the body other than insulin (e.g., steroids) increase with illnesses and raise the blood sugar level. More insulin will be needed to allow the body to burn extra sugar for energy when the blood sugar is high. Usually only the rapid-acting insulin is increased. If the blood sugar is low, the rapid-acting insulin is not increased and may instead be reduced or omitted. Occasionally the blood sugar will be low but ketones will be present. The ketones form because the body needs extra energy and fat is broken down. Ketones are a by-product of fat breakdown for energy. In this case, you should eat and see if the ketones go away.


If **vomiting** is a problem, and the blood sugar is low or normal, sips of regular pop or of another “high-sugar” liquid may help raise the blood sugar. Sometimes sugar popsicles or honey will help. Once the blood sugar is up, you can then give the insulin to help get rid of ketones (if they are still present). The low dose of glucagon (Chapter 6) may also help. Table 3 gives other suggestions for the management of vomiting.


The best way to know how much insulin is needed is to have kept records from a previous similar illness and to know what insulin dose worked then. It is important and helpful to keep good records. If you do not know about previous illnesses, look at the present blood sugar levels. If the blood sugar is high, check for ketones.

Supplemental Rapid-Acting (Humalog, NovoLog, Apidra) or Regular Insulin

 If ketones are negative (or small) in the urine or below 0.6 mmol/L in the blood, extra insulin can be based on the blood sugar level alone. A common formula is to

give 1 unit of rapid-acting insulin for every 50 mg/dl (2.8 mmol/L) of blood sugar above 150 mg/dl (8.3 mmol/L).

 If ketones are moderate or large in the urine or above 1.0 mmol/L in the blood, then double the dose calculated above.


 Another way to calculate the rapid-acting insulin dose is to give 10 percent of the total daily insulin dose for moderate urine ketones (or 0.6-1.5 mmol/L blood ketones). For large urine ketones (or > 1.5 mmol/L blood ketones), give 20 percent of the total daily insulin dose.

These dosages are in addition to your usual daily dose. When possible, you should call the diabetes specialist to get help with the dose. **You will need to repeat the injections of rapid-acting insulin every 2-3 hours if moderate or large urine ketones are still present (or blood ketones above 1.0 mmol/L).** We do not generally give extra shots of insulin for elevated blood or urine ketones unless the blood sugar is at least 150 mg/dl (8.3 mmol/L). It may be necessary to first give sips of a high sugar drink, glucose tablets, hard candy, honey or other high-sugar-containing foods.

GENERAL GUIDELINES: SICK-DAY MANAGEMENT

Generally, the body will require more energy during an illness. More insulin allows more sugar to pass into cells, providing more energy to fight infection. Some insulin is always needed.

Important things to remember are:

 **Ketones:** Always test for ketones if you feel ill. Also check if the blood sugar is over 240 mg/dl (13.3 mmol/L) fasting or over 300 mg/dl (16.7 mmol/L) during the day. One study showed that 91 percent of teenagers would check blood ketones (using the Precision Xtra) when ill, whereas only 56 percent of teens using urine strips would do the test when ill.

- ❖ **Vomiting:** If you are vomiting and have a low blood sugar, an insulin reaction could occur. At the same time, you may still have ketones. Always test for ketones if you are vomiting. Vomiting may be due to an infection or due to ketones. Management of vomiting is outlined in Table 3.
- ❖ **Insulin:** Keep a bottle of rapid-acting insulin available even if you don't usually use it. You may need to give it during an illness. Be sure it is not outdated.
- ❖ **Blood Sugar Testing:** All people must have some method of home blood sugar testing available and be ready to do extra testing on sick-days (usually every 2-4 hours). This has greatly reduced the need for hospitalizations.
- ❖ **Extra Snacks:** It is important to take in adequate calories on sick-days or the body will start to break down fat for energy. If this happens, ketones will appear in the urine (see Chapter 15). Regular sugar pop (soda), popsicles and regular JELL-O are good to eat if you do not feel like eating regular food and your blood sugar is below 180 mg/dl (10.0 mmol/L). Much of eating is psychological and we often suggest you eat whatever you feel like eating on sick-days! Also see Table 4.
- ❖ **Past Experience:** Base your judgments on past experience. Refer to your record book to see if this illness has occurred before. See what worked or didn't work in the past.
- ❖ **Doctor:** Call your pediatrician or family doctor for non-diabetes related problems such as sore throats, earaches, rashes, etc. Unless the diabetes specialist also provides general care, only call him/her if the urine ketones are moderate/large or if the blood ketone level is above 1.0 mmol/L. Also call if you need help with an insulin dose, if hypoglycemia is a problem or if you need help with other parts of diabetes management.

FLUID REPLACEMENT

If you have difficulty eating or keeping food down and the blood sugar is below 180 mg/dl (10.0 mmol/L), take sugar-containing liquids (see Table 4). These may include fruit juices, popsicles, slushes, tea with sugar or honey, broth, syrup from canned fruit or even regular pop. Stir pop to get rid of bubbles. If you are vomiting, take a small amount (juice glass size or less) of sugar pop after you vomit. If it stays down 15 minutes, some sugar will be absorbed. If there is no vomiting after 1/2 hour, increase the amount of fluids. If you have ketones and are not vomiting, take at least one cup of liquid every hour. Children should receive one ounce of fluid per year of age per hour up to age 16 years. Older teens can consume two cups per hour. The liquids help to prevent dehydration and also to "wash out" the ketones. Specific instructions regarding vomiting are given in Table 3.

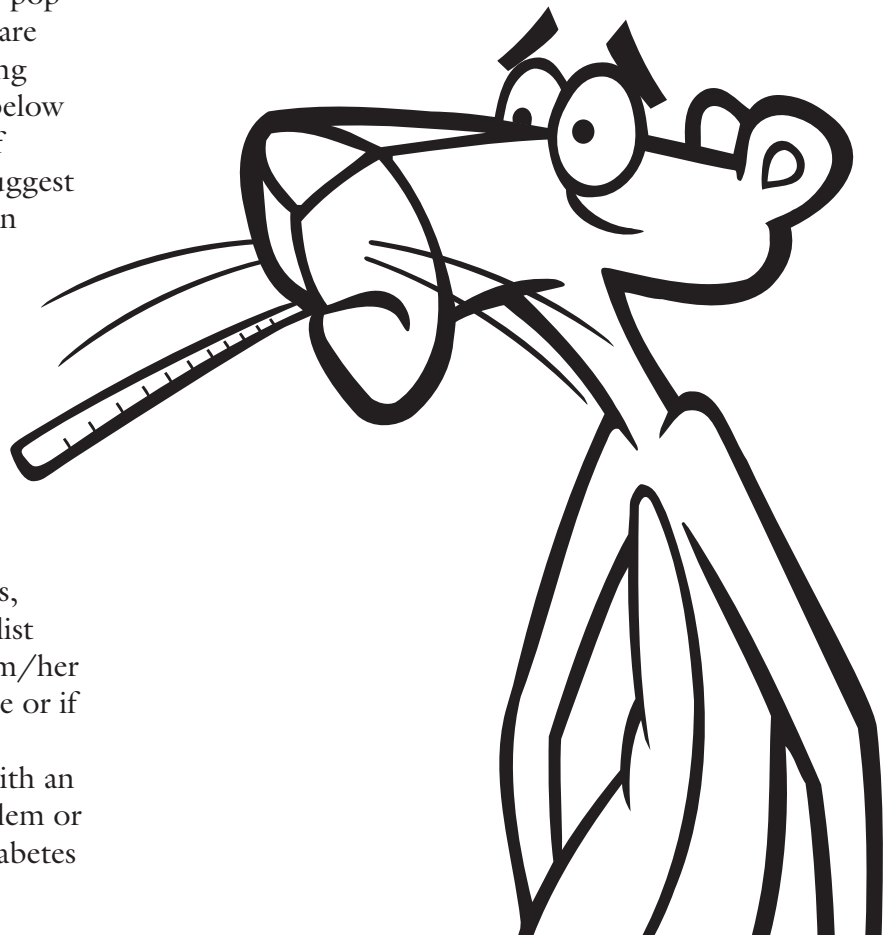


Table 3

Management of Vomiting (Negative Ketones)

- ❧ Avoid solid foods until the vomiting has stopped.
- ❧ If vomiting is frequent, we recommend giving a Phenergan suppository or patch to reduce vomiting and waiting to give fluids for an hour until the medicine is working. If you do not have Phenergan, ask for a prescription at the time of your clinic visit. For teens or others who do not like suppositories, Phenergan gel can be applied to the skin. The gel requires composition by a Prescription Compounding Center of America (or equivalent). The usual dose for a teen is 50 mg in 1cc. The gel is rubbed into the skin while wearing a rubber glove, and is then covered with plastic wrap. Preteens usually get 25 mg (1/2cc). The dose can be repeated in four hours. The main side effect of the Phenergan is sleepiness.
- ❧ Sometimes the blood sugar can be low (< 60 mg/dl or < 3.3 mmol/L) and the person cannot keep any food down. Glucagon can be mixed (Chapter 6) and given just like insulin – using an insulin syringe. The dose is one unit per year of age up to a maximum of 15 units. If the blood sugar is not higher in 20-30 minutes, the same dose can be repeated.
- ❧ Gradually start liquids (sugar pop [soda], juice, Pedialyte, water, etc.) in small amounts. Juices (especially orange) replace the salts that are lost with vomiting or diarrhea. Pedialyte popsicles are also available. Start with a tablespoon of liquid every 10-20 minutes. If the blood sugar is below 100 mg/dl (5.5 mmol/L), sugar pop can be given. For the child five years of age and over, sucking on a piece of hard candy often works well. If the blood sugar is above 180 mg/dl (10.0 mmol/L), do not give pop with sugar in it. If there is no further vomiting, gradually increase the amount of fluid. If vomiting restarts, it may again be necessary to rest the stomach for another hour and then restart the small amounts of fluids. A repeat suppository or topical Phenergan dose can be given after three or four hours. Dairy products should not be used until the person is able to drink fluids and eat crackers and soup without vomiting.
- ❧ After a few hours without vomiting, gradually return to a normal diet. Soups are often good to start with and they provide needed nutrients.

A LOW DOSE OF GLUCAGON

Sometimes the blood sugar can be low (< 60 mg/dl [3.3 mmol/L]) and the person cannot keep any food down. Glucagon can be mixed and given just like insulin, using an insulin syringe. The dose is one unit per year of age up to age 15 years. Older people can just use the 15 units.

For example:

a five-year-old would get five units

a 10-year-old would get 10 units

If the blood sugar is not higher in 20-30 minutes, the same dose can be repeated. This treatment has saved many ER visits for our Clinic patients.

FOODS FOR SICK-DAYS

Table 4 suggests carbohydrate-containing foods that might be tried during an illness. Eating carbohydrates is important to provide energy and to prevent the body from breaking down fats (and thus making ketones). Drinking liquids is important to prevent dehydration. Thus, liquids are usually tried first. A general

Table 4

Sick-Day Foods

1. Liquids (In addition to water – particularly if the blood sugar is below 180 mg/dl [10.0 mmol/L]):

- 🍷 Sugar-containing beverages: regular 7-Up, ginger ale, orange, cola, PEPSI®, etc.¹
- 🍷 Pedialyte or Infalyte® (especially for younger children)
- 🍷 Sports drinks: Gatorade®, POWERÂDE®, etc. (any flavor)
- 🍷 Tea with honey or sugar¹
- 🍷 Fruit flavored drinks: regular Kool-Aid, lemonade, Hi-C®¹, etc.
- 🍷 Fruit juice: apple, cranberry, grape, grapefruit, orange, pineapple, etc.
- 🍷 JELL-O: regular (for infants, liquid JELL-O warmed in a bottle) or diet¹
- 🍷 Popsicles: regular or diet¹
- 🍷 Broth-type soup: bouillon, chicken noodle soup, Cup-a-Soup®

2. Solids (when ready) – good foods with which to start:

- 🍷 Saltine crackers
- 🍷 Banana (or other fruit)
- 🍷 Applesauce
- 🍷 Bread, toast or tortillas
- 🍷 Graham crackers
- 🍷 Soup
- 🍷 Rice

¹ Sugar-free may be needed depending on blood sugars (e.g., > 180 mg/dl [> 10.0 mmol/L])

rule of thumb is to offer whatever you/your child like(s) best. You may want to have a “sick-day kit” on hand which could include items such as sugar-containing 7-UP, sports drinks, regular and diet JELL-O or pudding, apple juice in small cans, regular Kool-Aid mix, Cup-a-Soup, Pedialyte and any other items you would like to have available.

EXERCISE

The person with moderate or large urine ketones should not exercise. Exercise can further increase the ketones.





CONTACTING YOUR DOCTOR OR NURSE

Keep a card with your doctor’s and nurse’s phone numbers in a place where you can easily find it. Take the card with you if you are out of town. It is easier to call your own doctor rather than to go to an emergency room and see a new doctor.

Think ahead! You should keep Phenergan or other medicine on hand in case of vomiting. (Some physicians prefer not to use it.) Before you call the doctor or nurse, be sure you have the necessary information (see the list at the

Table 5

Sick-Day Management: When to Call for Emergency Care

-  If you have vomited more than three times and can keep nothing in your stomach, and urine or blood ketones are not elevated, call your primary care physician. If help is needed with an insulin dose, call your diabetes care provider.
-  If moderate or large urine ketones or blood ketones (above 1.0 mmol/L) are present, call your diabetes care provider.
-  If you have difficulty breathing or have “deep breathing,” you need to go to an emergency room. This usually indicates severe acidosis (ketoacidosis; Chapter 15).
-  If there is any unusual behavior such as confusion, slurred speech, double vision, inability to move or talk or jerking, someone should give sugar or instant glucose. (Glucagon [Chapter 6] must be given if the person is unconscious or if a convulsion [seizure] occurs.) The healthcare provider should be contacted if a severe reaction occurs. In case of a convulsion or loss of consciousness, it may be necessary to call the paramedics or to go to an emergency room. Have an emergency number posted by the phone.

beginning of the chapter). **Always check the blood sugar and urine or blood ketones before calling.** Have the number of your pharmacy available in case the doctor needs it. Table 5 tells when to call or get emergency care. Remember to keep sugar pop, popsicles and soup available for illnesses.

CLINIC OR EMERGENCY ROOM VISITS

If you do decide to go to a clinic or emergency room, remember to take your hospital card if you have one, your diabetes records and your insurance information. Take extra clothes in case you must be admitted to the hospital. A relative or friend going with you will need money for food, telephone numbers of people they might need to call and something to read.

SICK-DAY MEDICATIONS

Our general philosophy is that **if you need a medicine for an illness, take it!** We can handle the problems related to diabetes. The classic example is asthma. With a bad attack, the person will need adrenaline (epinephrine), which raises

the blood sugar. Steroids (cortisone) may also be needed which also raise the blood sugar. For the short time that these medicines are needed, extra insulin can be taken to help control the blood sugar. Short-term elevations of blood sugar are not what we worry about in relation to the complications of diabetes.

Over-the-counter medications can be purchased with care. Look at the label to see if sugar is added. Tablets are less likely to have sugar (and alcohol) than are liquids. Again, the small amount of sugar in a medicine taken for a short time is okay. *We do not endorse any products but do suggest these:*

Generic daytime/nighttime cold capsules: Are fine to use in children old enough to swallow the capsules. The capsules are alcohol-free and don't have an after-taste as do liquids. They usually contain pseudoephedrine, which can help reduce any fluid buildup in the middle ear.

Nasal sprays (e.g., Afrin®): Can be used for colds and allergies. A nasal spray is less likely to affect the entire body than pills or liquid medicines. If these do not work, or if long-term use is anticipated (as with seasonal allergies), antihistamine tablets or liquids such as Chlor-trimeton® or Triaminic® might be tried next.

Acetaminophen (TYLENOL®) or Ibuprofen:

To relieve fever if a flu is going through the community. Do not give aspirin to children or adolescents.

Pepto-Bismol®, Kaopectate® or Imodium

AD®: These are fine to use for diarrhea. (Lomotil® should NOT be used in children).

DI-GEL®, MYLANTA®, Gelusil® and

Maalox®: These are all sugar-free antacids.

Cough medications: Use a cold air vaporizer if this relieves the cough. During the day, a cough is often protective to keep material out of the lungs. Thus, we do not give cough medicines. A combined cough and fever means the child should be seen by a physician. If the vaporizer does not stop the cough at night, use sugar-free cough medicines with less than 15 percent alcohol. Examples: Colrex Expectorant®, CONTAC Jr.®, Hytuss Tablets®, Queltuss Tablets®, Robitussin CF® liquid, Supercitin®, Tolu-Sed®, Tolu-Sed DM®, Tussar-SF®.

Sore Throats: A throat culture to rule out a streptococcal (strep) infection should be done because strep can lead to rheumatic fever or other problems. Salt water gargles (1/4 teaspoon salt in one glass water) may help. Chloraseptic Spray® is sugar-free, as are Cepacol®, Cepastat®, Chloraseptic® mouthwashes or lozenges and N'ICE® lozenges.







FOLLOW THE DIRECTIONS ON THE LABEL FOR ANY MEDICINE YOU USE.

FLU SHOTS

The method of preparing the flu vaccine has improved so that side effects are now less likely. The American Academy of Pediatrics recommends flu shots for all children with diabetes, and we agree. Preventing an episode of flu may prevent an episode of ketoacidosis. It is common for the flu (and other illnesses) to raise the HbA_{1c} level by one-half to one point. It is important to get the flu shot early in the fall so it can be working when the flu season begins.

Table 6

Guidelines for Management Around Surgery

-  Always contact your diabetes care provider if surgery is planned – **AFTER** you find out the time and whether normal food intake will be allowed. You may wish to give the name and phone number of the diabetes care provider to the person doing the surgery.
-  Plan to take your own blood sugar and ketone checking equipment.
-  Take your own materials to treat low blood sugar (a source of instant glucose and even glucagon).
-  Always check the ketones prior to surgery. Then, if they are present at a later time, it will be known that they were negative earlier. If the urine ketones are found to be moderate or large or the blood ketones above 1.0 mmol/L, it may be necessary to cancel the planned procedure. Take the ketone strips with you to the procedure in case vomiting occurs and you need to do a check. It is also wise to check ketones once or twice after the procedure.
-  Take your diabetes clinic's phone card so that you may quickly call the diabetes care provider if needed.
-  If on basal insulin therapy (Lantus or a pump), it is best to continue insulin in this way during the surgery. Often no other insulin is needed.

SURGERY MANAGEMENT

Some general guidelines for diabetes management around surgery are outlined in Table 6. The insulin dose may not change if the person is receiving a basal insulin (Lantus or an insulin pump). If NPH is taken in the morning for someone also receiving Lantus insulin, the NPH (or boluses of rapid-acting insulin) is often omitted. Any change in insulin dose depends on the person, the type of surgery that is scheduled and the time of day the surgery is to be done. If possible, surgery should be scheduled early in the morning. In general, it is best to call your diabetes care provider and discuss insulin changes **after** you find out the time of day the procedure is to be done and whether or not food intake will be limited. Sometimes it is also helpful to have the person who is going to do the surgery call the diabetes care provider. This is more likely to be done if the family gives the doctor or dentist a note with the name and phone number of the diabetes specialist. The two of them can then work out the best time for a given person to have elective surgery.

We frequently receive calls from families related to planned dental surgery. Often this can be done under local anesthesia, and sometimes the person can eat regular meals prior to and after the surgery. In this situation it is only necessary to reduce the insulin dose slightly in anticipation of some reduction in food intake due to soreness in the mouth.

If the person is going to have a general anesthetic, eating may be restricted. This is because vomiting can occur while recovering. If vomiting does occur in a person who is still partly under the influence of anesthesia, there is a danger of some of the food getting into the airway. Thus, food restriction is usually necessary if a general anesthetic is to be used. Anytime the amount of food intake is to change, the amount of insulin to be given must also be changed. Often the basal insulin (Lantus or pump basal dose) is not changed. The peak-insulins (NPH and rapid-acting insulins) are either reduced or omitted with the reduced food

intake. If the person is going to have a general anesthetic in the hospital, some doctors prefer to give all of the insulin by intravenous infusion. Any of these methods work. **The important thing is the close monitoring of blood sugars! By doing this, low blood sugars can be prevented. It is also wise to check the urine or blood ketones before and after the procedure.** These may increase with changes in the insulin dose and with the stress of surgery. Needless to say, your diabetes care provider must always be notified if the urine ketones are moderate or large or the blood ketones are above 1.0 mmol/L following surgery.

Blood sugar monitoring is usually the responsibility of the parent or the patient when procedures are done in the dentist's or doctor's office. If a meter is used for blood sugar monitoring at home, this should be taken along to the dentist's or doctor's office. If the child is being admitted to the hospital, also take the meter along. If the child is to have a general anesthetic, the blood sugar monitoring is the responsibility of the doctor giving the anesthesia or the doctor doing the surgery. The doctor usually orders dextrose, which is glucose (sugar), to be added to the intravenous fluids if the blood sugar is below a certain level (200 mg/dl or 11.1 mmol/L is a safe level to use). Blood sugars are usually measured at regular intervals by the doctor or nurse.

It is also wise to take along urine or blood ketone checking strips. Many doctors or nurses who do not care for people with diabetes on a regular basis may forget the importance of routinely checking for ketones. Also take your diabetes care provider's phone numbers with you. If urine ketones are moderate or large, or the blood ketones are above 1.0 mmol/L, you may wish to call your diabetes care provider.

DEFINITIONS

Anesthetic (anesthesia): A medication (such as ether) used to reduce pain or to allow a person to sleep through an otherwise painful procedure.

Dextrose: The name for glucose (sugar) added to an intravenous (IV) feeding to prevent low blood sugar.

Suppository: A medication inserted into the rectum (bottom), usually because liquid, food or medicine cannot be kept down (as with vomiting).

QUESTIONS AND ANSWERS FROM NEWSNOTES

Q In the chapter on “Sick-day Management” in the Pink Panther book, you state four times that ketones must always be checked at least twice daily when someone is ill. Is it necessary to be that repetitive?

A Forgetting to check ketones with an illness is one of the most common errors families make in managing diabetes. As a result, ketones can build up to high levels in the body, which can then be dangerous (and expensive to treat). There is no charge for a few phone calls to a diabetes care provider to receive suggestions for supplemental rapid-acting insulin to combat early ketone formation. In contrast, the charge is usually \$5,000-\$10,000 for one or two nights in an intensive care unit as a result of large ketones building up in the body. As pointed out at the end of Chapter 15 on Acidosis (Ketoacidosis), this charge and the related risk from ketoacidosis can be avoided if families will just check for ketones immediately (and twice daily) when the person with diabetes is ill. The diabetes care provider must then be called when moderate or large ketones are detected, or the blood ketone level is above 1.0 mmol/L, and every 2-3 hours thereafter until the ketones are below these levels.

Q Our son is now a teenager and with a recent episode of vomiting was quite shy about letting us use a rectal suppository. The phenergan suppository had worked well in the past, and so I was quite disappointed. Do you have any thoughts?

A Certainly the modesty of teens and young adults must be respected. It is now possible to get phenergan (promethazine) in a gel or patch which can be applied to the skin. It will be absorbed in about 15 minutes. It can be ordered in a 1 ml syringe. There is 25 mg (one dose) in each 1/2 ml (one syringe has two doses). It is available from a pharmacy that is a member of “Prescription Compounding Centers of America”. (There are about 1,000 in the U.S.) One such pharmacy noted the cost of one syringe (two doses) was \$7.00 which is about the same as suppositories.

Q Should flu shots be given to children with diabetes?

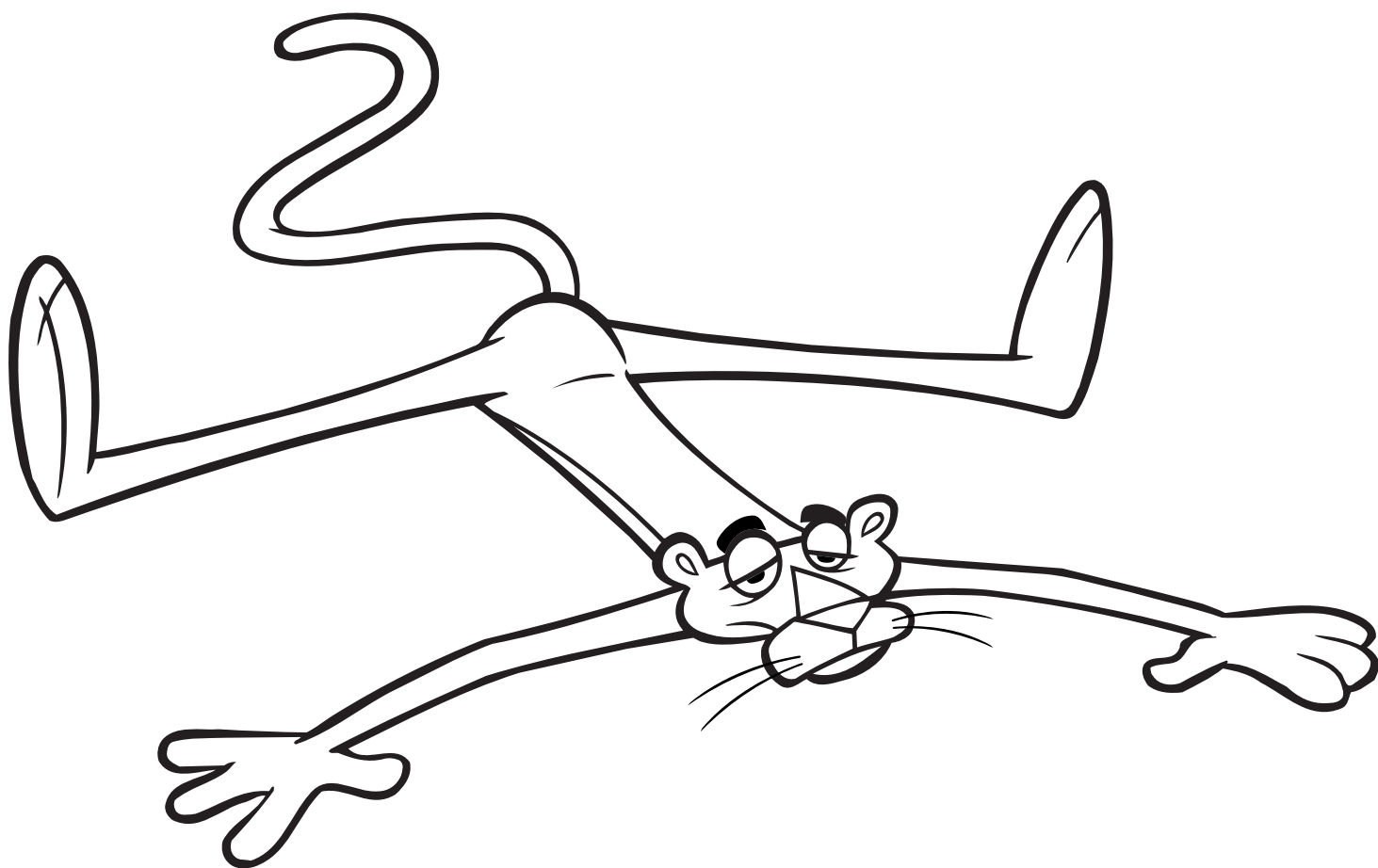
A The American Academy of Pediatrics recommends flu shots for all children with diabetes. Flu is a common cause of ketonuria and of acidosis, so the shots may also help prevent ketoacidosis (and an increase in the HbA_{1c} level). If you do decide to get them for your child, we would prefer that you go to your primary care physician for this purpose. Call first to make sure the doctor’s office has the vaccine. If a young child has not previously received the flu vaccine, it is necessary to get it in two injections, approximately one month apart, and it is best to start during the months of September or October.

Q Should my child receive the chicken pox vaccination?

A Yes, if he or she has not had chicken pox! It is recommended by the American Academy of Pediatrics for all children who have not had prior chicken pox

infections, and we support that recommendation. There is an additional factor for children with diabetes who still produce some insulin. Chicken pox is probably one of the many infections that stimulate white blood cells in the pancreas to make toxic particles that cause further islet destruction. This is not proven, but we have heard many times of children being diagnosed with diabetes in the month or two after having chicken pox.

The Varivax is a live vaccine. The main side effects are a mild rash (approximately three percent), and/or a temperature elevation (approximately 15 percent) and/or tenderness at the site (approximately 19 percent). Ninety-nine percent of people are immune as a result of the vaccination.



Always remember to check ketones when sick!