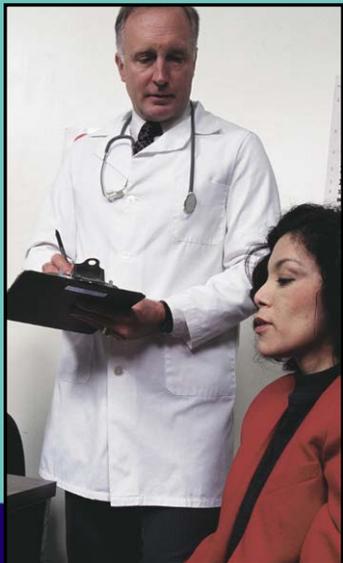


Hypoglycemia

Low Blood Sugar Reaction

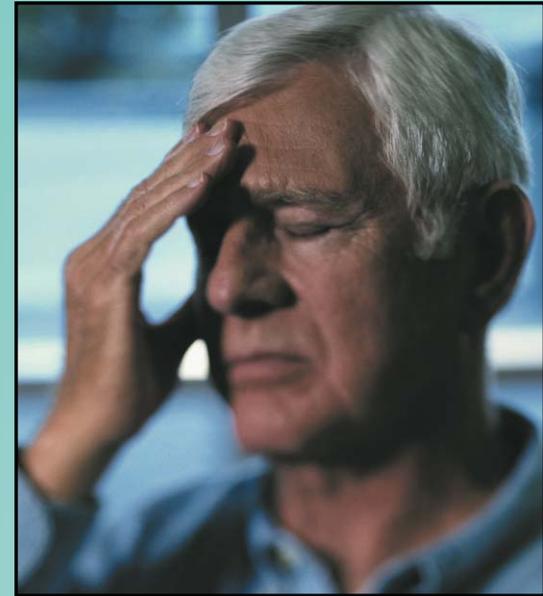


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Objectives

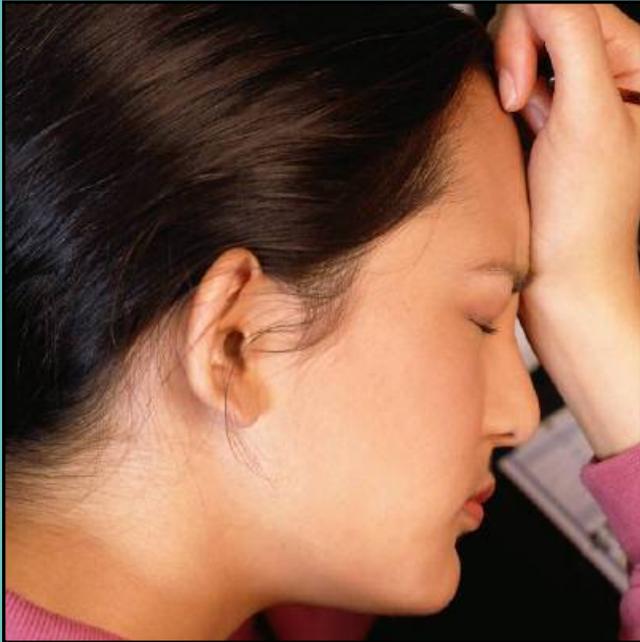
At the conclusion of this program, you will be able to:

1. Recognize the signs and symptoms of hypoglycemia
2. Treat hypoglycemia
3. Know **what to do to** prevent Hypoglycemia
4. Know the difference between hypoglycemia and hyperglycemia



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Hypoglycemia



- Sometimes called “lows” or a low blood sugar reaction.
- Occurs when the blood sugar drops below normal, usually $<60\text{mg/dl}$
- Not enough sugar is available for energy needs.
- Organ of most concern: brain



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Hypoglycemia

- May be considered a medical emergency
- Requires immediate action/treatment
- Very uncomfortable feeling
- Left untreated may result in seizures or “passing out”



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What Causes Low Blood Sugar?

1. A mismatch between blood glucose and insulin.
 - Not eating enough carbohydrate (carb) at a meal or snack
 - Skipping or delaying a meal
 - Taking more insulin or diabetes pills than needed to “cover” carb eaten.

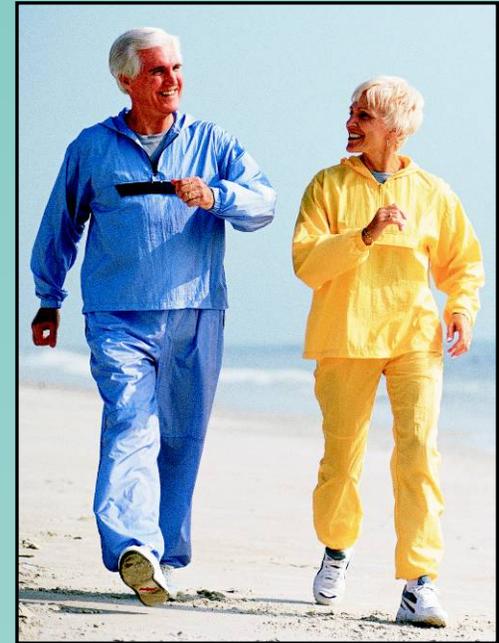


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What Causes Low Blood Sugar?

2. Exercising or being more active than usual

- Exercise acts to lower blood glucose
- Makes insulin more efficient
- Exercise combined with insulin or medications that stimulate insulin production increases the risk of hypoglycemia
 - During exercise
 - Immediately after exercise
 - Several hours after exercise



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What Causes Low Blood Sugar?

3. Drinking alcohol without eating

- Alcohol lowers blood glucose
- Alcohol in “mixed drinks” contains carbohydrates
- Interferes with the liver’s ability to make and/or release stored glucose during hypoglycemia.
- Decreases the ability to recognize symptoms

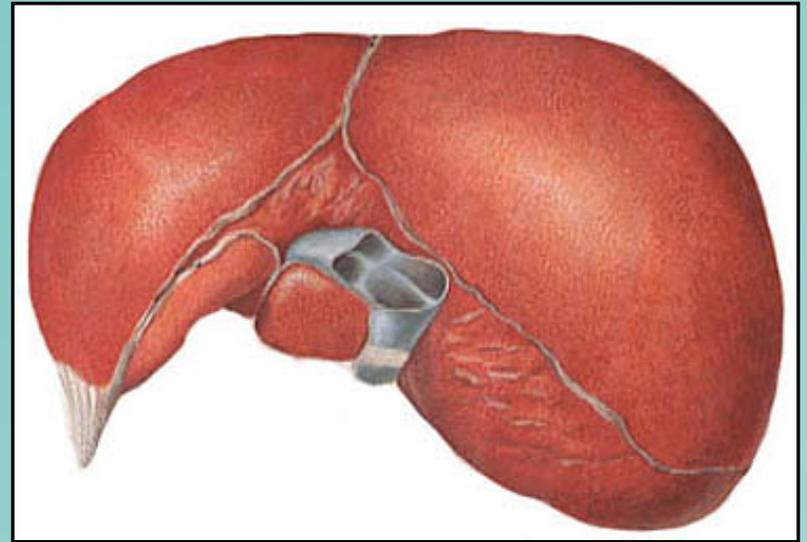


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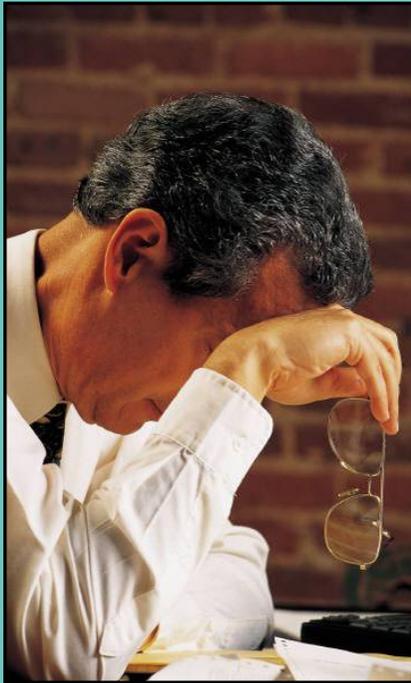
What Happens when the Blood Glucose Drops Low?

Hormones are released that act on the liver to:

- release stored glucose
- produce new glucose
- produce ketones



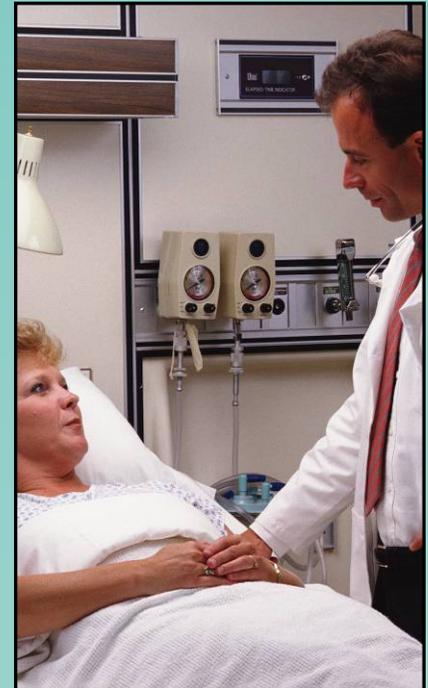
Hypoglycemia can be classified as:



Mild



Moderate



Severe



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Signs and Symptoms of Mild Hypoglycemia

Neuro-glycopenic

- Headache
- Sudden Hunger
- Tired
- Dizzy
- Blurred vision
- Drowsy

Adrenergic

- Shaking
- Nervous, excited
- Fast or pounding heartbeat
- Sweating
- Numbness or tingling around mouth or lips

May Self Treat



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Signs and Symptoms of Moderate Hypoglycemia

Neuro-glycopenic Symptoms:

- Personality change
- Irritability
- Confusion
- Poor coordination
- Difficulty concentrating
- Slurred or slow speech



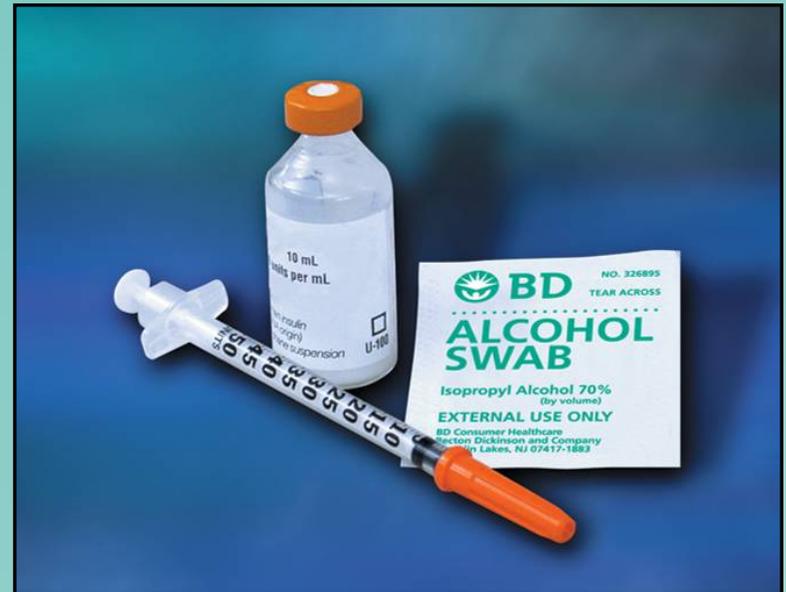
*May need prompting
or assistance to self-treat*



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Severe Hypoglycemia

- Unable to swallow or follow directions
- Requires emergency treatment
 - Glucagon given by trained family member or friend
 - May require IV glucose



Unable to self-treat



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Hypoglycemia is related to:

1. Level of blood sugar

- The signs and symptoms are related to the low blood glucose level.



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Hypoglycemia is related to:

2. The rate at which blood sugar is dropping
 - Signs and symptoms are related to the rapid drop in blood glucose.
 - The blood glucose may be normal, but the quick drop may trigger the release of hormones that raise glucose.



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Hypoglycemia Should be Confirmed

- *If possible*, check blood sugar to verify if hypoglycemia is present
 - If you feel very *uncomfortable* and do not feel you have the time to check your blood sugar, *treat first* and then check your blood sugar.



Hypoglycemia Unawareness

- **Hypoglycemia Unawareness:** Loss of the ability to “feel” the early signs of mild hypoglycemia
- First symptoms may be confusion or passing out.
- People with “tightly” controlled blood glucose may be at higher risk



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Treatment for Hypoglycemia

- If possible, check blood glucose
- If blood glucose is normal or high but symptoms are present:
 - If you do not plan to eat for at least an hour, eat 15 grams of carb and protein
 - Crackers and peanut butter or cheese
 - Half of a ham or turkey sandwich
 - A cup of milk and crackers or cereal



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Treatment for Hypoglycemia

- If blood glucose < 60 mg/dl
 - Treat with 15 grams of glucose or carb
 - 10 oz. glass of skim milk
 - 4 oz. juice
 - Glucose tablets (15 grams of carb)
- Wait 15 minutes and retest. It takes 15 minutes to raise blood glucose.



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Treatment for Hypoglycemia

- If blood glucose < 40 mg/dl
 - Treat with 30 grams of glucose or carb
 - 8 oz. juice
 - Glucose tablets (30 grams of carb)
- Wait 15 minutes and retest. It takes 15 minutes to raise blood glucose.



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Treatment

- Blood glucose still <60 mg/dl?
 - Treat with another 15 grams of Carb
- Away from home?
 - Use glucose gels or tablets, regular soft drink or juice



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Follow Treatment with a Meal or Snack

- If next meal or snack is 30-60 minutes away, eat a snack that includes 15 grams of carb
 - Five crackers, piece of fruit or slice of bread



Follow Treatment with a Meal or Snack

- If next meal or snack is more than 60 minutes away, eat 15 grams of carb and one ounce of protein.
 - Five crackers and one ounce of low fat cheese



Foods containing 15 grams of Carb

- Pure sugars
 - Glucose Gel or Tablets
- Mixed Sugars
 - ½ cup (4 ounces) of any fruit juice
 - 10 ounces of skim milk
 - 4 teaspoons of granulated sugar
 - 6 ounces regular soda
 - 8 Lifesavers



Candy Bars, Chocolate & Ice Cream are not Good Treatment Choices

- Foods containing fat slows the release of glucose into the blood and will not allow a rapid rise in blood glucose.



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Can Hypoglycemia be Over-Treated?

- It takes 15 minutes for the effects of the treatment to be felt
- Hypoglycemia is uncomfortable. The inclination is to eat “everything in sight”
- Eating more than 15-30 grams of carb may cause “rebound” hyperglycemia



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What is Glucagon?

- Hormone that raises blood glucose immediately.
 - Injected by friend or family member when not able to respond to directions.
 - Requires Prescription
 - Ensure that expiration date hasn't passed



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What Should You Know About Glucagon?

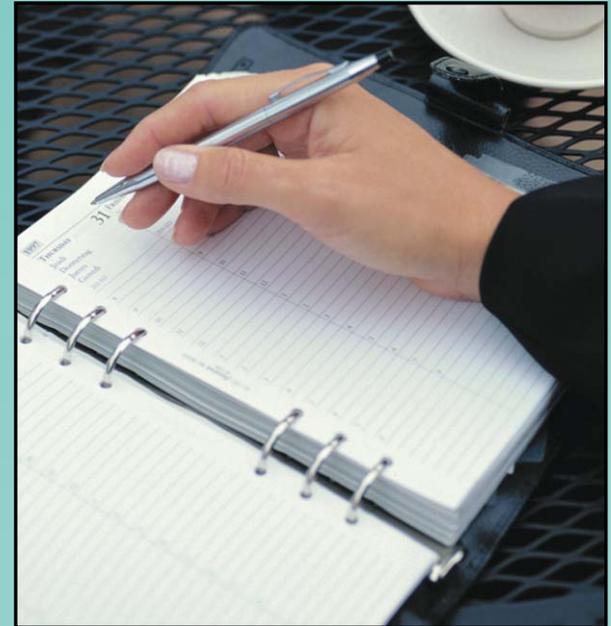
- Family members of people *at risk* for severe hypoglycemia **should know** how to give Glucagon if needed.
- People who are at risk for experiencing a **severe** hypoglycemic reaction requiring Glucagon usually have:
 - Type 1 diabetes
 - Hypoglycemia Unawareness



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When do I call my doctor?

- Hypoglycemia events should be recorded in a logbook and discussed with your health care provider
- **Unexplained or severe hypoglycemia** should be reported immediately



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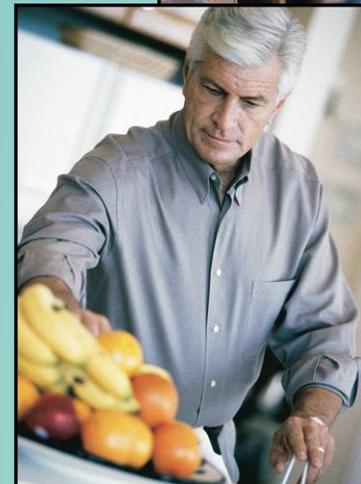
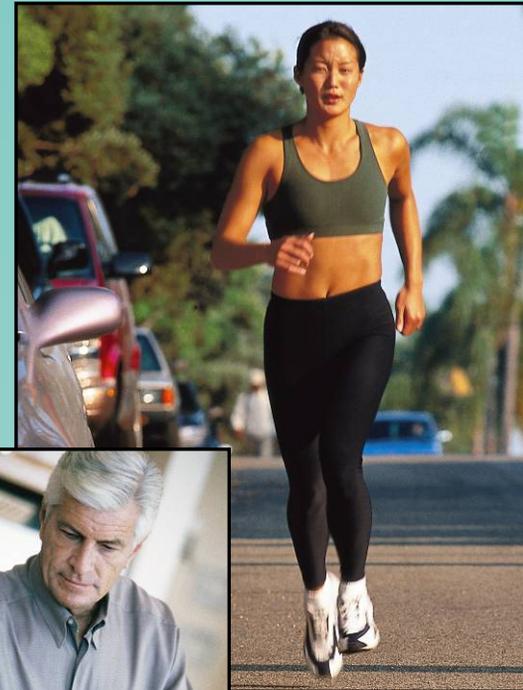
What Can You Do to Prevent Hypoglycemia?

1. Eat on time
2. Eat enough carb to match the insulin/medication you are taking
3. Drink alcohol with a meal or snack
4. Take medications on time



What Can You Do to Prevent Hypoglycemia?

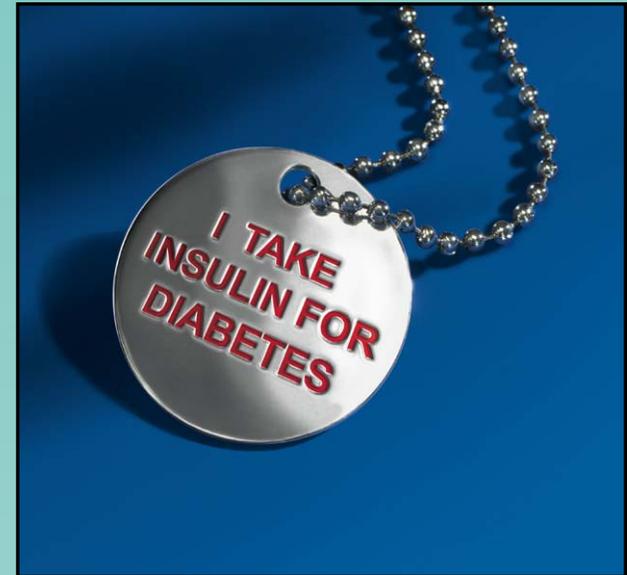
5. Be prepared: carry some form of carb at all times!
6. Be aware of the time of day your medication “peaks” or you are at higher risk
7. Plan for exercise



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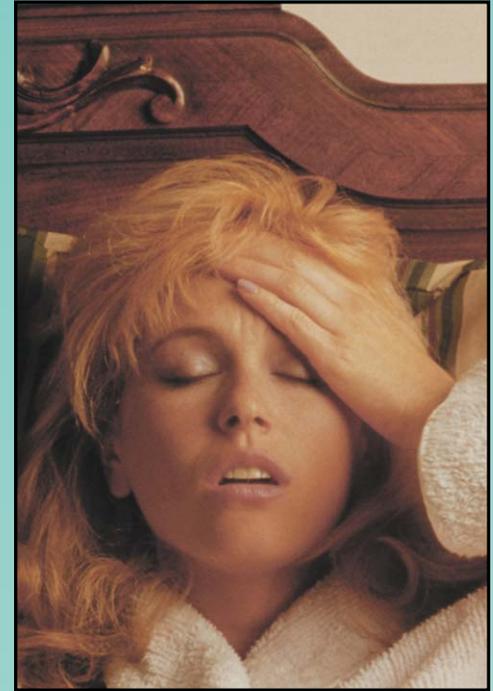
Managing Hypoglycemia Unawareness

- Wear medical identification
- Hypoglycemia Unawareness is reversible
 - Achieve hypoglycemia-free state
- SMBG:
 - Before driving
 - Before, during and after exercise



Hypoglycemia during Sleep is Serious

- Check your blood glucose at night before going to sleep
 - Readings <120 may require a carb and protein snack
- If FBG is high despite an increase in the basal insulin dose, check blood glucose at 3:00 AM to see if you're becoming hypo and then rebounding....
- Symptoms may be subtle
 - Nightmares
 - Night sweats
 - Morning headaches



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Know the Difference

HYPOGLYCEMIA (INSULIN REACTION)

(Signs and symptoms occur very quickly — within minutes)

Watch for:

- Cold sweat, faintness, dizziness
- Headache
- Pounding of heart, trembling, nervousness
- Blurred vision
- Hunger
- Irritability
- Personality change
- Not able to awaken

What to do:

- Check blood sugar level if possible
- Take 2 to 3 BD™ Glucose Tablets, liquids or foods containing sugar
- Wait 15 minutes and retest blood sugar
- If blood sugar is still less than 60 mg/dl, treat with BD™ Glucose Tablets or liquids/foods containing glucose. Follow with next meal or snack
- Do not give anything by mouth if not conscious
- If unconscious give glucagon according to package directions and call local Emergency Medical Services
- Report all moderate and severe reactions to Doctor

Causes:

- Too much insulin
- Not eating enough food
- Unusual amount of exercise
- Delayed meal
- Drinking alcohol without eating food

**LOW
BLOOD
SUGAR**

**HIGH
BLOOD
SUGAR**

HYPERGLYCEMIA

(Signs and symptoms occur slowly over hours to days)

Watch for:

- Increased thirst and urination
- Large amounts of sugar in the blood
- Ketones in urine
- Weakness, stomach pains, general aches
- Heavy, labored breathing
- Loss of appetite, nausea and vomiting
- Fatigue

What to do:

- Call Doctor immediately
- Drink fluids without sugar if able to swallow
- Test blood sugar frequently
- Test urine for Ketones if blood sugar is greater than 300 mg/dl
- If using an insulin pump, change the infusion set, reservoir and insulin
- If insulin pump supplies are not available, give regular insulin via insulin syringe according to prescribed sliding scale

Causes:

- Not enough insulin
- Too much food
- Infection, fever, illness
- Emotional stress



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