

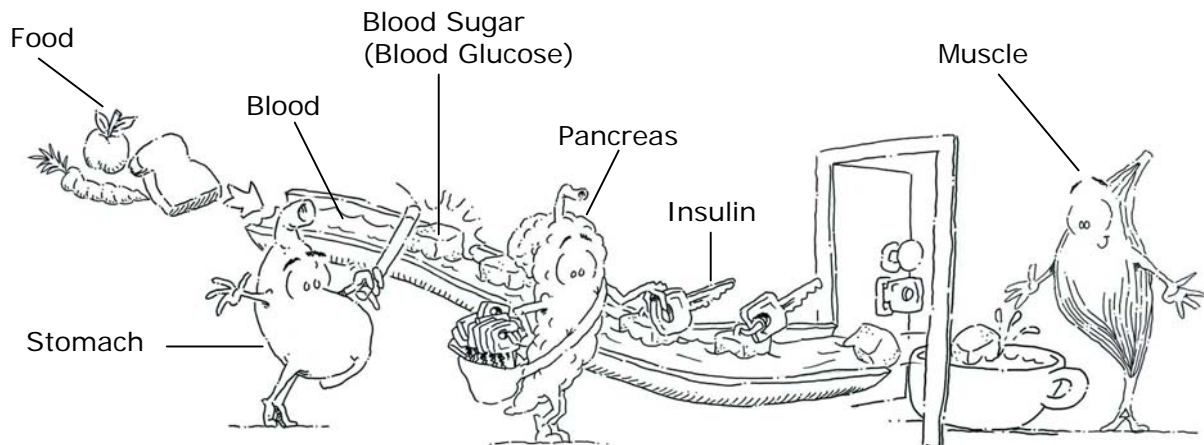
Your child has high insulin

What does this mean?



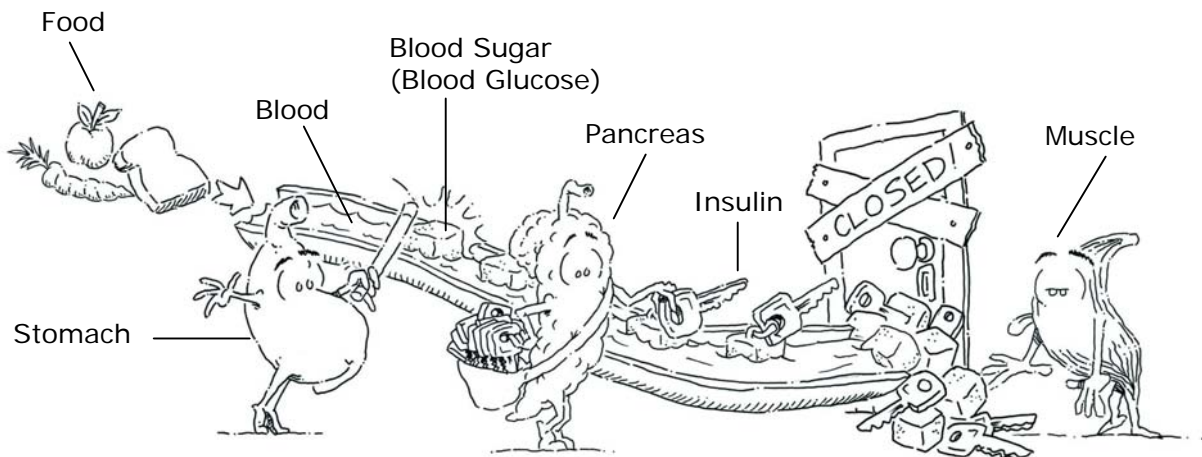
What is insulin?

Insulin is a hormone made by the pancreas. It increases in the blood after a person eats. Insulin controls blood sugar by taking the sugar (also called glucose) from the blood and moving it into the body's cells. This is important because too much sugar in the blood can make a person sick.



What causes insulin to remain high?

Your child may be insulin resistant. This means that insulin is trying to move sugar into your child's cells but the sugar cannot get in. When this happens your child starts to make more insulin which we see on the blood test.



What causes insulin resistance?

Body fat

Insulin resistance can be caused by too much body fat. Fat cells make certain hormones which can cause insulin resistance.

Eating too much

Insulin itself can cause insulin resistance. The more often cells are exposed to insulin the less effective the insulin becomes. Insulin increases after you eat so if your child eats too much he or she may become insulin resistant. As your child becomes insulin resistant, his or her body will produce more insulin. This can become a vicious cycle. More insulin can make cells even more insulin resistant.

Eating unhealthy foods

Certain foods may increase your child's risk of insulin resistance. Refined carbohydrates, saturated and trans fats are foods that can lead to insulin resistance. Check out page 8 for some tips on healthy eating!

Not enough activity

Regular physical activity helps your body to use insulin. The more active your child is the better his or her body will be able to use insulin to let sugar into his or her cells. If your child is not very active he or she may become insulin resistant.

Genetic factors

Certain genes can make your child more likely to become insulin resistant. Researchers have shown that African American and Hispanic children are more likely than Caucasian children to become insulin resistant. Changing diet and exercise habits can help overcome this risk factor.



What the dangers related to having high insulin?

It is important to help your child lower his or her insulin level. High insulin and insulin resistance may cause your child to develop:

Type 2 diabetes

Type 2 diabetes can develop when levels of insulin are always or often high. When your child is insulin resistant, his or her pancreas has to work extra hard to make enough insulin to move sugar into his or her cells. If this continues, your child's pancreas may not be able to keep up and too much sugar will start to build up in his or her blood. When too much sugar is in your child's blood all the time, it means he or she has type 2 diabetes.

Metabolic syndrome

Metabolic syndrome is a collection of risk factors. These risk factors include:

- high blood fats such as triglycerides
- too little good cholesterol called HDL cholesterol
- too much sugar in the blood
- high blood pressure

Even though metabolic syndrome is not a disease, it is very dangerous. It can cause your child to develop clogged arteries and heart disease.

Non-alcoholic fatty liver disease

Non-alcoholic fatty liver disease happens when too much fat builds up in the liver. The disease is described as “non-alcoholic” when it is seen in people who do not drink alcohol. Too much fat build up in the liver can cause scarring. If the disease is not treated it can lead to liver failure which may be life threatening.



Polycystic ovary syndrome

Polycystic ovary syndrome can happen if your daughter produces too many hormones called “androgens”. High levels of insulin can lead to high levels of androgens. This means that insulin resistance can lead to polycystic ovary syndrome. If left untreated girls with polycystic ovary syndrome can have:

- irregular periods
- infertility
- increased body hair – hair may grow on the face and chest
- acne
- diabetes
- heart disease
- high blood pressure
- cancer

What changes can my child and I make to decrease his or her insulin level?

Insulin resistance may sound scary and it is important for you to know that it can be a dangerous problem. But do not worry there are many changes you can make to help your child decrease his or her insulin level. Make sure you keep a positive attitude. Focus on what your child **can do**, rather than what they should **not** do. The two main things you want to focus on are increasing activity and improving nutrition.



Encourage your child to get more active

Getting active is a great way to spend time with family and friends! There are so many activities your child may want to try.

Why not suggest these activities to your child?

- Join a sports team at your school.
- Play outside with your friends or parents.
 - Climb a tree.
 - Play hide and go seek.
 - Play colour tag. The person who is “it” calls out a colour and everyone runs to find something that is that colour before being tagged.
- Go hiking with your family – see if you can race up the hills faster than your mom or dad.
- Play basketball with your friends.
 - Challenge yourself! See how many hoops you can shoot in a row.
- Go sledding.
- Dance.
- Make a fort, inside with blankets or outside in the snow.
- In the fall rake leaves into a pile and jump in them or have a leaf fight with your family.
- Have a water balloon fight outside.
- Run through the sprinkler in the summer.
- Learn to cartwheel, summersault or do handstands.
- Wash the car.
- Fly a kite.
- Make an obstacle course.
- Test your speed! See how fast you can run between telephone poles or houses.



- Play parachute! Raise a sheet high in the air and run under it before it falls.
- Ride your bike or scooter.
- Go skating.
- Join a class and learn a new activity like:
 - yoga
 - gymnastics
 - martial arts

**Ask your child to think of some activities he or she would like to try.
Come up with some goals together and write them down here.**



Improve your family's nutrition!

There are many changes you and your child can make to your diets which may help your child to lower his or her insulin level. Focus on lowering your child's intake of fat and refined carbohydrates and increasing his or her intake of fibre.

Limit your family's intake of refined carbohydrate.

Refined carbohydrates are made from grains but do not have very much fibre, vitamins or minerals. They include foods like white bread, sugary cereals, fruit snacks, juice and pop. Refined carbohydrates make blood sugar increase a lot very quickly. When this happens the body has to make a lot of insulin to move all that sugar. Remember that making too much insulin all the time can lead to insulin resistance.

Encourage your child to eat whole grain foods instead of refined carbohydrates. Here are some tips:

- Serve whole grain or “brown” foods instead of “white” foods.
- Give your child water instead of juice and pop.
 - Try water with lemon or lime if your child does not like it plain.
- Serve air-popped pop corn instead of chips and candy.
- Limit your child's intake of sugary breakfast cereal.
 - Try whole grain cereals that are a little bit sweet like Shreddies or Frosted Mini-Wheats.
- Limit your child's intake of french fries.



Make fibre a family friend

Fibre helps to keep blood sugar stable. This is good because it means the body does not have to make so much insulin all at once. Encourage your child to increase his or her fibre intake to decrease insulin resistance.

Here are some tips:

- Include:
 - whole grain bread
 - whole grain pasta
 - whole wheat pancakes with your child's favourite fruit
 - brown rice
 - try sweat brown rice with Mrs. Dash and pepper
 - try brown rice with chicken, chicken stock and broccoli
- Encourage your child to eat fruits and vegetables every day. They are full of fibre.
- Serve oatmeal with fruit and cinnamon.
- Choose a breakfast cereal that is high in fibre (4 grams or more a serving).
- Add berries to your child's cereal in the morning.
- Choose cereal or granola bars for your child that are higher in fibre and lower in sugar.
- Serve potatoes with the skins. Try baked potatoes or leave the skins on when you mash potatoes.
- Eat more beans and lentils.

Bean Burritos Recipe

Heat black beans, chickpeas, red peppers and mushrooms in a large skillet.

Spoon onto whole wheat tortilla shells with salsa and a little shredded cheese.

Add lettuce and fresh tomatoes, roll and eat.



Chili Recipe

In a large pot combine

500 mL can kidney beans (rinsed and drained)

50 mL can chickpeas (rinsed and drained)

1 250 mL jar medium salsa

500 ml canned tomatoes

500 ml water

300 g (500 mL) frozen corn

2 Tbsp chilli powder

Optional Ingredients:

1 Tbsp sugar

1 tsp paprika

1 Tbsp basil

1 Tbsp oregano

½ tsp garlic powder

Heat on high until it comes to a boil.

Reduce heat and simmer for 20 minutes.

Visit Dietitians of Canada for more ideas on eating fibre.

http://www.dietitians.ca/english/tips/fib_tips.asp

Limit your family's intake of trans fats and saturated fats

Eating too much fat, especially trans and saturated fat, can lead to insulin resistance.

- **Trans fats** are found in packaged snack foods like cookies and chips, deep-fried foods and baked goods like doughnuts and store-bought muffins.
- **Saturated fat** is found in animal products like red meat, butter and lard.

Trans and saturated fats can lead to insulin resistance by increasing the amount of fat in the blood. Eating too much fat can also cause your child to gain weight. Remember that body fat itself can also cause insulin resistance. So help your child limit his or her fat intake.



Choose lower fat meats and alternatives for you and your child.

- Try fish or shell fish.
- Try skinless chicken or turkey.
- Choose lower fat cuts of red meat.
 - Such as eye round, top round, round tip, top sirloin, bottom round, top loin and tenderloin.
 - Try marinating meat for 24 hours.

Marinade Recipe

Whisk together:

125 mL balsamic vinegar	15 mL minced garlic
15 mL olive oil	30 mL fresh rosemary
15 mL honey	5 mL freshly ground pepper

- Try legumes or tofu.

Baked Tofu Pieces

Tofu can be used as a hot or cold snack, as a salad topping or serve instead of meat.

Ingredients:

1 (16 ounce) package of extra firm tofu	
2 Tbsp soy sauce	1 Tbsp sesame seeds
2 Tbsp maple syrup	¼ tsp garlic powder
2 Tbsp ketchup	¼ tsp ground black pepper
1 Tbsp vinegar	

Preheat oven to 375°F (190°C). Lightly spray a non-stick baking sheet with oil.

Slice tofu into ½ inch slices and gently press excess water out of tofu. Cut sliced tofu into ½ inch cubes.

In a bowl, stir together the soy sauce, maple syrup, ketchup, vinegar and hot sauce. Stir in sesame seeds, garlic powder and black pepper. Gently stir tofu cubes into sauce. Cover and marinate at least 5 minutes.

Place the tofu on the baking sheet in a single layer. Bake in a preheated oven for 10 minutes. Turn tofu and bake until the tofu turns golden brown, about 10 minutes more.

- Try cooking meals at home instead of going to restaurants.



Other tips

- Be a good role model for your child. Your child will be more likely to make healthy changes if you make them too.
- Make sure your child eats breakfast and pack nutritious lunches for school.
- Let your child help with meal planning, shopping and cooking.
- Focus on portion sizes. Do not supersize.

Think of some specific nutrition goals you would like to make. Write them down here and work on them for next time.

What's the bottom line?

Your child's insulin is higher than it should be. Your child's weight is now affecting his or her health. High insulin can lead to some dangerous problems but dietary changes and increasing activity can help decrease insulin and prevent health problems. So set some goals with your child and work on them together!