

PATIENT & FAMILY GUIDE TO SECOND-GENERATION ANTIPSYCHOTICS

Developed by the
Provincial Mental Health Metabolic Program
at BC Children's Hospital

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This booklet can be found online at:
<https://keltymentalhealth.ca/antipsychotic-medications>



Booklet Feedback

We value your input! Please take the time to provide us with your feedback, comments and suggestions:

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Disclaimer

The Patient and Family Guide to Second-Generation Antipsychotics (the "Guide") is intended as an aid to families of children with mental health challenges in B.C., to support such families to develop and maintain healthy living habits while taking second-generation antipsychotics. The Guide is not intended as a substitute for the advice of an appropriate health care professional. If professional advice is required, the services of a competent and qualified professional should be sought. Nothing contained in the Guide should in any way be construed as being either official or unofficial policy of British Columbia Mental Health Society Branch, Children's & Women's Health Centre of British Columbia Branch or Provincial Health Services Authority (together the "Societies").

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Section 1:

INTRODUCTION

Your child has been prescribed a medication. This booklet has information that can help your child live well while taking this medication. There is a lot you can do to help your child live a balanced and healthy life.

What are Second-Generation Antipsychotics (SGAs)?

These medications are used to treat several mental health conditions. They are also called atypical antipsychotic medications (AAPs). Some of the common ones are: quetiapine (Seroquel), risperidone (Risperdal), aripiprazole (Abilify) and olanzapine (Zyprexa). Other SGAs also include: clozapine (Clozaril), lurasidone (Latuda), paliperidone (Invega), and ziprasidone (Zeldox).

What are SGAs Used for in Children and Youth?

They are used to reduce symptoms like:

- > Problems knowing what is real and what is imaginary (Psychosis)
- > Mood swings (Bipolar Disorder)
- > Irritability associated with Autism Spectrum Disorder
- > Tics with Tourette Syndrome
- > Aggression
- > Difficult behaviour – conduct problems, irritability, hyperactivity

What are the Possible Side Effects?

All medications have side effects, and these side effects can be different for each person. SGAs have some common side effects that can include:

- > Weight Gain (often around the belly)
- > High Blood Sugar/ High Insulin
- > High Cholesterol Level
 - High LDL (known as “bad” cholesterol)
 - Low HDL (known as “good” cholesterol)
- > High Triglycerides (a type of fat in the blood)
- > High Blood Pressure

If your child has three or more of these side effects, it is called **Metabolic Syndrome**.

Each person will have different side effects and some will have none at all. You can find more information about the side effects in *Section 3: Metabolic Side Effects of SGAs*.

Your child may be more likely to have some of the side effects if there is a family history of diabetes, stroke, heart attack, high blood pressure or high cholesterol. If a family member has any of these conditions, it is important to tell your doctor.

What about Neurologic Side Effects?

SGA medications can cause other side effects in some children and youth. These side effects have to do with how the brain sends messages to the body. In this booklet, we refer to them as “Neurologic Side Effects.”

These types of side effects usually occur in the first few days or weeks of starting medication. If they occur, doctors sometimes decide to stop the medication or add a different medication. It is very important to tell your doctor right away if your child:

- > Is restless
- > Moves constantly
- > Moves or speaks very slowly
- > Gets “stuck” in certain body positions
- > Drools a lot
- > Has a blank face (shows less emotion – like wearing a mask)
- > Moves face, mouth, lips or tongue repeatedly
- > Has stiff or rigid muscles
- > Moves strangely or differently
- > Shakes
- > Shuffles when walking

What is the Best Way to Monitor for Side Effects?

It is important for your doctor and health care team to watch for side effects of SGA medication. They may use a tool called the Metabolic Assessment, Screening and Monitoring Tool. Your child should have:

1. An examination – before starting medication and at 1, 2, 3, 6, 9 & 12 months after starting medication (and then yearly or more often if needed).
The examination will include:
 - Height
 - Weight
 - Waist Circumference (distance around waist)
 - Blood Pressure
 - A Neurological Examination

Your doctor and health care team will measure your child's height and weight and calculate body mass index (BMI). This information is put on a growth chart. It is important to make sure weight gain and BMI are normal as your child grows. They will also measure around your child's waist and check it on a chart that shows what is normal for a child that is the same sex and age. You can keep track of this information by using the *Metabolic Side Effects Monitoring Tool* found in *Section 5: Tools and Resources*. For more information on BMI, see: www.dietitians.ca/growthcharts

2. Blood Tests - before starting medication, and at 3, 6, and 12 months after starting medication (and then yearly or more often if needed).
 - Your child should have blood tests before starting medication. Then, if the results are abnormal, your doctor will know it is not because of the medication.
 - Keep track of blood test results by using the *Metabolic Side Effects Monitoring Tool* found in *Section 5: Tools and Resources*. You will be able to see if your child's lab results are changing.

You can also help by watching for the following symptoms. It is important to tell your doctor right away if your child:

- > Urinates (pees) more than usual
- > Feels thirsty more than usual
- > Feels tired all the time for no reason
- > Has any of the neurologic side effects noted previously

Other symptoms to discuss with your doctor at the next appointment are:

- > A big increase in your child's appetite
- > A decrease in your child's energy level and physical activity

All of these side effects put your child at higher risk for many serious health conditions. There are many things that you can do to help your child manage these side effects.

Section 2:

GENERAL LIFESTYLE TIPS

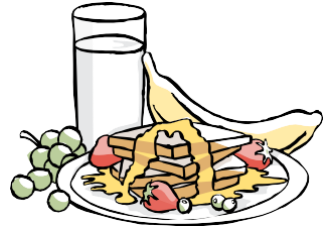
Healthy Eating: Key Tips

1. Have 3 meals and 2 - 3 snacks a day at set times

Give children and youth meals and snacks at set times that are no more than 3 hours apart. They will learn that even if they don't like the food at one meal, there will always be another meal or snack coming. In this way your child will not get too hungry. When children get too hungry, they often overeat and make poor food choices. It is also important to eat at set times at a table with no screens on. Snacking all the time can encourage eating out of boredom and cause overeating.

2. Eat breakfast

Children who eat breakfast do better in school and have a higher intake of many nutrients, vitamins and minerals.



3. Limit drinks sweetened with sugar - Drink water instead!

It is important to limit fruit drinks and drinks that contain added sugar such as pop, juice, energy drinks, slurpees, frappucinos, sports drinks, iced tea, lemonade, etc. They contribute to obesity and the development of type 2 diabetes. Watch for drinks that seem to be healthy but have sugar, glucose, fructose or corn syrup in the ingredient list, such as Vitamin Water®. See the following website for more information on choosing drinks: <http://sipsmart.ca>

4. Treat with love, not sweets

When children do something well and are given a treat, they may start to think of food as a reward. Or if they hurt themselves and get a cookie to make them feel better, they may connect food to feeling better. This link can stay with them through life. So later, when they are sad or anxious or even happy, they may want to eat. Try to find ways to reward your child that do not include food.

5. Focus on whole grains and fibre

There is fibre in fruits, vegetables and grain products. Fibre helps with many different health issues including weight management, diabetes, and high cholesterol. It is one of the best nutrients to look at when you read a nutrition facts table. Look for breads and cereals with a whole grain as the first listed ingredient and at least 2 or more grams of fibre per serving. Then slowly work your way up to 4 or more grams of fibre per serving. For an example, see the food label below.

Nutrition Facts	
Per 3/4 cup (100g)	
Amount	% Daily Value
Calories 80	
Fat 1 g	1%
Saturated Fat 0 g	
+ Trans Fat 0 g	
Cholesterol 0 mg	
Sodium 2 mg	0%
Carbohydrate 15 g	5%
Fibre 3 g	12%
Sugars 7 g	
Protein 3 g	
Vitamin A 1%	Vitamin C 2%
Calcium 1%	Iron 3%



For more information on how to read food labels, see:

www.canada.ca/en/health-canada/services/understanding-food-labels.html

Physical Activity: Key Tips

1. Physical activity can have many benefits

When children are active, they have more energy, sleep better, and their overall health improves.



2. Pay attention to health recommendations

Most children will get health and fitness benefits from at least 60 minutes of physical activity each day. It may take time to reach this goal. Be realistic about your activity goals: some is good, more is better, and everything counts.

3. Find the starting point and build on it

Think about your child or family's starting point. Not all changes need to happen right away or need to be extreme. Changes that are small and gradual usually last longer.

4. Start with your child's ideas

Ask your child about their favourite activities. Is there anything new they would like to try? Suggest they think of activities they can do on their own, and also those they can do with friends and family.



5. Move beyond barriers to meet goals

Talk to your child and find out what is stopping them from taking part in physical activity. Explore ways together to overcome these barriers. Remember that physical activity should be fun, not a punishment or consequence.

6. Be a role model and play together

Let your child see you do the things you would like them to do. Get out and play, walk, run, dance, etc. with your child.

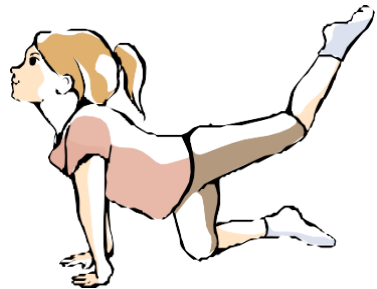


7. Manage screen time

Children and youth should spend no more than 2 hours per day in front of a screen for recreation. This includes TV, computer, cell phone and video games. If your child usually spends more than 2 hours per day on recreational screen time, try cutting back slowly instead of all at once. For example, start with 10 minutes less each day.

Try to:

- > Schedule in activity breaks during screen time. For example, move around, do sit ups or dance during commercials. After playing video games for a half hour, pause and do some stretching or star jumps.
- > Have screen free breaks built into your day - start with meal times then expand.
- > Include fun activities that are non-screen based in your day, especially over the school holidays.
- > Switch indoor screen time for outdoor play.
- > Turn off screens at least an hour before bed to prepare the body for sleep, and avoid having screens in the bedroom at night.



Section 3:

METABOLIC SIDE EFFECTS OF SGAS

SGAs can cause different side effects for some children or youth. This booklet has already talked about some of the general side effects. Now we will explain five common side effects in more detail with tips on how to help manage them.

This part of the booklet has the following sections:

Part 1: High Appetite Accompanied by Weight Gain

Part 2: High Blood Sugar/ High Insulin

Part 3: High Cholesterol

- Low HDL Cholesterol
- High LDL Cholesterol
- High Triglycerides

Part 4: High Prolactin

Part 5: High Blood Pressure



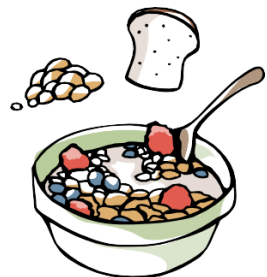
PART 1: High Appetite Accompanied by Weight Gain

Some children and youth treated with SGAs become more hungry than normal. They may also find it difficult to feel full. This change in appetite can lead to weight gain, often around the belly. Your health care team will regularly measure your child's height and weight (to calculate BMI) and waist circumference.

Nutrition Tips for High Appetite/Weight Gain

Children may be treated with SGAs over long periods of time. It is hard to feel hungry **all of the time** and not be able to eat extra food. Some foods can help your child or youth feel more full.

- > Make the food environment easier to make nutritious a choice:
 - **Keep tempting foods out of sight:** If high energy foods are available and visible, they are very hard to resist. Keep foods like ice cream, chips and pop, either out of the home or out of sight. Go for a walk for a small serving size (e.g. small bag of chips).
 - **Have nutritious snacks easily available:** Have the food that you are wanting your child to eat in sight. Try fruit on the table, fresh cut veggies in the fridge, and plain or lightly salted/buttered popcorn in the cupboard.
- > Eat foods that increase feelings of fullness:
 - **Encourage water-based foods before meals:** A large glass of water before a meal helps to fill up the stomach and reduce the amount of food eaten. Soups that are mainly broth or salads also work like this. Vegetables and broth-based soups have a high water content to help the stomach feel full.
 - **Increase fibre:** Fibre helps with the feeling of fullness. Try whole grains like 'stone-ground' whole wheat bread or sprouted grain breads, brown rice, and whole wheat pasta, or a mixture of these with white grains to increase fibre slowly. Try breakfast cereals that have more than 4 grams of fibre per serving.



Other foods like legumes and beans (chickpeas, lentils, etc.) are high in fibre and a great way to substitute for some meat. When baking, replace half of the white flour with whole wheat and add old fashioned rolled oats. Vegetables are also high in fibre; try to add extra veggies to meals. For example, grate carrots into pasta sauce, or add veggies onto pizza or in sandwiches.

- **Eat regular meals and snacks:** Aim for 3 meals and 2-3 snacks per day at scheduled times at a table with screens off. If your child or youth is hungry between meal and snack times and can't be distracted by a different activity, have fruit or vegetables.
- **Think about drinks:** Drink water and plain milk. Limit 100% fruit juice. Choose whole fruits instead. Stay away from drinks sweetened with sugar and juice drinks. Keep plain milk to 2-3 cups per day maximum (500-750mL). For tips and information on sugar-sweetened beverages, see *Section 2 Healthy Eating: Key Tips*.

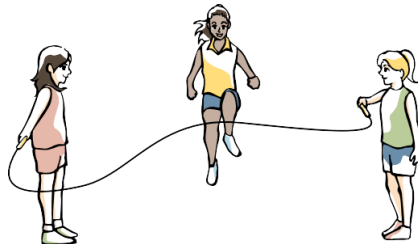


Activity Tips for High Appetite/Weight Gain

To help reduce weight gain around the belly, encourage your child or youth to aim for moderate to vigorous activity for 60 minutes per day. It may take some time to build up to 60 minutes, so start small and work your way up!

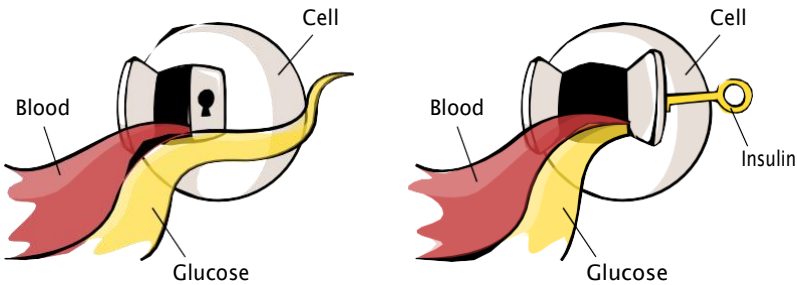
> The intensity depends on how hard you work. Some examples of activities that can be moderate to vigorous include:

- Walking
- Running
- Skipping
- Shovelling snow
- Raking leaves
- Biking
- Swimming
- Dancing



PART 2: High Blood Sugar/ High Insulin

Insulin is a hormone. It is produced in the pancreas. It takes sugar (from food) that is in your child's blood and helps to bring it into cells. Insulin is like a key that opens up the door in cells to let in the sugar (glucose) (see image below).



The cells in your child's body can become resistant to insulin. Think of this as the door becoming sticky and not opening well. When this happens it takes more insulin to move the sugar into your child's cells. Your child's body now makes extra insulin ("keys") to unlock the door to the cells. This results in high levels of insulin in your child's blood. High insulin levels can be a warning sign that the pancreas is working too hard and will get too tired to produce insulin. If the pancreas stops producing insulin, blood sugars get too high. This is how diabetes develops.

Many things can cause high insulin and high blood sugars including: some SGAs, weight gain, diet, not enough physical activity, stress, or certain hormones or hormonal changes.

Your child cannot feel it when his or her insulin is high, but it's important to be aware of it. If it is not treated, the risk of developing diabetes is much higher. High insulin levels can also cause hormone problems, muscle cramps and changes in skin colour (called acanthosis nigricans).

Where Does Diabetes (High Blood Sugar) Fit in?

- > Prediabetes is when blood sugars are higher than normal but not high enough to be diagnosed with diabetes. It can also be called Impaired Glucose Tolerance (IGT) or Impaired Fasting Glucose (IFG).
- > **Type 1 Diabetes** is when cells in the pancreas are destroyed so that they no longer produce insulin.
- > **Type 2 Diabetes** can be caused by cells that are resistant to insulin or by the pancreas not producing enough insulin.
- > The diagnosis of diabetes is made when the fasting blood sugar is at a level of 7.0 mmol/L or higher or when the result of an oral glucose tolerance test is 11.1 mmol/L or higher.

Diabetes and high insulin levels can put your child at a higher risk for heart disease and stroke.

Nutrition Tips for High Insulin and Blood Sugar Levels

Blood sugars go up when sugars and grains (carbohydrates) are eaten. Carbohydrates and sugars are in many foods, such as fruits and fruit juices, rice, pasta and breads, and milk products (except cheese).

Carbohydrates are important because they provide energy, but too much at once can make insulin levels high.

- > **Eat regular meals and snacks:** If your child snacks all day long, insulin levels stay high and the pancreas does not get a break. Skipping meals is also hard on the pancreas. It is best to have 3 meals and 2-3 snacks per day at set times during the day.
- > **Stay away from juice and drinks that are sweetened with sugar:** Limit 100% fruit juice. Have your child eat whole fruits instead. There is a large amount of sugar in sugar-sweetened drinks, juice drinks, as well as in 100% fruit juice. Every 355 mL serving of pop or juice (1 can) has 10 cubes or teaspoons of sugar. Your child's body absorbs this type of sugar very fast and the pancreas has to work too hard. For more information on sugar-sweetened beverages, see *Section 2: Healthy Eating: Key Tips*.

- > **Choose high fibre grains:** Whole grains that are higher in fibre break down more slowly into sugar in the body. Choose whole grain types of pasta, rice, bread and cereals that are high in fibre. As a result, the pancreas will make less insulin at once. See *Section 2: Healthy Eating: Key Tips* for ideas on how to increase fibre in your child's diet.

Activity Tips for High Insulin and Blood Sugar Levels

When children and youth are active, insulin levels improve even if there is no weight loss. Try to encourage your child to be active most days and not go for more than 2 days without activity. All children and youth should be properly supervised while doing physical activities.

There are two types of physical activity that improve insulin levels:

- > **Get your child's heart pumping with cardiovascular exercise:** When the heart is pumping faster, insulin is better at unlocking the door to your cells. The pancreas does not need to make as much insulin, and insulin levels go down. Examples of cardiovascular exercise include anything that gets the heart pumping such as running, walking, biking, dancing, skipping, playing tag, swimming, etc.
- > **Increase muscle mass with resistance training:** When muscle mass is increased, insulin levels improve. Any exercise that makes muscles work harder will increase muscle mass. These kinds of exercises are called resistance training. They can increase muscle strength and endurance. Examples of resistance exercise include: lifting weights (or lifting grocery bags), using rubber exercise bands, push-ups, squats, chin ups, going across the monkey bars, climbing, etc.



Schedule in some daily activity for the whole family:

- > **Do light activity after meals:** Going for a walk after dinner helps your body manage blood sugars better.
- > **Stand more, sit less:** New research tells us that being active by just standing or walking more (and sitting less) can improve insulin levels.

PART 3: High Cholesterol

There is cholesterol in everyone's blood and it is needed for the body to work properly. It is produced in the liver and is also found in food (dietary cholesterol). The body uses cholesterol to make cell membranes, hormones and Vitamin D. Health problems may occur when your child or youth has too much cholesterol.

There are different types of cholesterol. The types that are usually tested are:

- > **Total Cholesterol (TC):** The test for total cholesterol measures the total amount of cholesterol in the blood. Before the test, your child must fast (nothing to eat or drink) for 8-12 hours. This test includes both LDL cholesterol and HDL cholesterol. It is important for test results to be considered along with other risk factors your child may have. Ask your child's doctor what your child's test results mean.
- > **HDL (high density lipoproteins):** HDL is sometimes called "good" cholesterol. It can lower the risk of health problems including heart attack and stroke.
- > **LDL (low density lipoproteins):** LDL is sometimes called "bad" cholesterol. It can increase the risk of health problems including heart attack and stroke.
- > **Triglycerides:** Triglycerides are not cholesterol; they are a type of fat in the blood that is measured when cholesterol is tested. High levels of triglycerides are a risk factor for heart disease.

People develop high cholesterol for many reasons including: family history of high cholesterol, diet, not enough physical activity, alcohol consumption, and taking medications such as SGAs.

Your child cannot feel when his or her cholesterol levels are high, but it is important to pay attention to them. *High cholesterol can increase the risk of developing heart disease and can lead to many health problems including heart attack or stroke.*

Low High Density Lipoprotein (HDL)

HDL cholesterol is known as “good” cholesterol. HDL cholesterol takes “bad” cholesterol from the blood and sends it to the liver to be removed. People with higher levels of HDL cholesterol have a lower risk of stroke, heart disease and clogged arteries. It is recommended that HDL levels be *higher than or equal to 1.05 mmol/L*.

Nutrition Tips for Low HDL Cholesterol Levels

People with low HDL levels often have high triglyceride levels. A diet that lowers triglycerides will also increase HDL levels. See the section below on diet tips for triglycerides if your child or youth has low HDL levels.

Also, some fats like monounsaturated fatty acids increase HDL levels. These fats include olive oil, canola oil, and are found in foods like nuts, seeds and avocados.

Activity Tips for Low HDL Cholesterol Levels

Exercise that is moderate to vigorous helps to raise a low HDL. Short bursts of high intensity exercise combined with moderate intensity exercise have the most benefit. This is called interval training.

Activity is the best way to improve HDL levels. To do this:

- > Have your child choose a type of exercise such as walking, jogging, swimming, biking, etc.
- > Next, have your child determine how hard he or she needs to work to be at the low/moderate intensity level (4-5 on the Rate of Perceived Exertion Scale).
- > Then have your child increase the intensity level up to where he or she feels the intensity is hard to very hard (6-7 on the scale or unable to sing).
- > Have your child change intensity levels while exercising. For example, your child can work at the low/moderate intensity for 5 minutes and then increase to higher intensity for 2 minutes and then go back to low/moderate intensity for 5 minutes. Some sports naturally do this, such as soccer or playing tag.



High Low Density Lipoprotein (LDL)

LDL cholesterol is known as “bad” cholesterol. It can lead to a build up of plaque in the arteries. This build up can increase the risk of heart attack or stroke. It is recommended that LDL levels be below 3.35 mmol/L.

Nutrition Tips for High LDL Cholesterol Levels

Some foods have been shown to lower LDL cholesterol levels. These include:

- > **Nuts:** 1/3 cup [80 mL] of nuts at least 5 days per week can lower LDL cholesterol. Most nuts lower cholesterol equally. Dry roasted peanuts, almonds, walnuts or pistachios are great choices.
- > **Soluble fibre:** There are two types of fibre: soluble and insoluble. Soluble fibre expands in water. 10 grams or more of soluble fibre per day may lower LDL cholesterol. This type of fibre is in:



- legumes like kidney beans, soybeans, and chickpeas
- vegetables like artichokes, brussel sprouts, okra and sweet potatoes
- fruit like oranges, apples, pears and mango
- grains like oatmeal, oat bran and barley
- psyllium fibre which is added into some foods like All Bran Buds®



- > **Plant sterols:** Plant sterols or phyto sterols can lower LDL cholesterol. They are found naturally in vegetables, fruit, whole grains, nuts and vegetable oil. They are also enriched in margarine (Becel Pro.Active®) and fruit juice (Minute Maid Heartwise®).

Some foods have been shown to raise LDL cholesterol levels. Include these foods less often in your diet. They include:

- > **Red meat** – Especially processed red meat: Red meat includes beef, pork and lamb. Processed red meat includes sausages, hot dogs, bacon, and deli meats like ham and salami. Have beans and lentils, fish or poultry (e.g. chicken or turkey) most often.

Overall, a diet that is high in fruits, vegetables, whole grains, nuts, fish and dairy and soy proteins like tofu will improve cholesterol levels.

High Triglycerides

Triglycerides are not cholesterol, but another type of fat. It is usually measured when cholesterol is tested. This common form of fat in the body is linked to higher risk for heart disease, blood clots, heart attack and stroke. It is recommended that triglyceride levels be below 1.5 mmol/L.



Nutrition Tips for High Triglyceride Levels

Although triglycerides are a type of fat, they are affected by processed grains (refined carbohydrates) and sugars in the diet. Here are some tips to help lower your child's triglyceride levels:

- > **Stay away from juice and drinks sweetened with sugar:** There is a large amount of sugar in sugar-sweetened drinks, juice drinks, as well as in 100% fruit juice. This can cause triglyceride levels to go up. Although juice has more health benefits than pop, the amount of sugar is the same and will affect triglycerides just as much. Have your child eat whole fruits instead. For more information on sugar-sweetened beverages, see *Section 2: Healthy Eating: Key Tips*.

- > **Stay away from alcohol:** Drinking alcohol can increase triglyceride levels.
- > **Choose whole grains:** Use more whole grain foods in your child's diet like whole wheat bread and brown rice. See *Section 2: Healthy Eating: Key Tips* for ideas on how to increase fibre in your child's diet.
- > **Look for less sugar:** Choose products with less added sugar. Keep desserts high in sugar like ice cream and candy as a treat once in a while. Look for breakfast cereals and granola bars with less than 6-8 grams of sugar per serving. Check the amount of sugar in packaged foods on the nutrition facts label.
- > **Eat fish:** Fish have omega-3 fatty acids that can lower triglyceride levels. Encourage your child to eat fatty fish twice per week. Good choices are salmon, mackerel, herring, sardines, tuna and trout. For information on mercury levels in fish and how much is safe, see HealthLinkBC handout #68m – Healthy Eating: Choose Fish Low in Mercury
www.healthlinkbc.ca/healthfiles/hfile68m.stm

PART 4: High Blood Pressure

High blood pressure is also called hypertension. In children, blood pressure that is normal depends on age, sex, and height. Children are at risk for developing high blood pressure if they: are overweight, are not doing enough physical activity, are a certain ethnicity (Hispanic, African), have a family history of high blood pressure, or are smoking. Changes in diet and physical activity can help to lower blood pressure. *It is very important to try and lower blood pressure levels. High blood pressure can lead to heart failure, early heart attack, stroke, or seizures.*

Nutrition Tips for High Blood Pressure

- > **Eat fruits and veggies:** More than three servings per day can reduce the risk of high blood pressure, and even more is better. Look at how many servings per day of fruits and vegetables your child or youth eats (1 serving = ½ cup [250 mL] fruit and vegetables or 1 medium-sized fruit). Add one serving at a time until you reach your goal. Have fresh cut vegetables and dip for a snack ready to go in the fridge. Put fresh fruit out on the table to encourage your child or youth to eat them more often.
- > **Go for dairy:** Two or more servings of low-fat dairy per day have been shown to reduce the risk of high blood pressure.
- > **Cut back on processed foods:** Foods that are highly processed are often very high in salt and can increase blood pressure. These include potato chips, processed meats like salami, or pre-packaged and frozen meals. Try making homemade meals more often. See the Meal Planning Handout in *Section 5: Tools and Resources* for ideas.

Activity Tips for High Blood Pressure

Blood pressure has been shown to decrease with as little as 30 minutes or more of physical activity 3 times per week. Exercise should be done at a moderate to vigorous intensity to lower blood pressure.

- > Children should accumulate at least 60 minutes of moderate to vigorous physical activity every day (running, jumping, dancing – moving so you sweat and get your heart rate up).

To keep your child's blood pressure low, your child needs to keep active. Remember the amount of time spent exercising adds up over the day. For example, if your child walks 15 minutes to school and 15 minutes home, that can “count” as thirty minutes of daily physical activity.

Exercise should be fun and can include any number of different activities. For examples of activities that are moderate to vigorous in intensity, see *Section 3, Part 1: Activity Tips for High Appetite/Weight Gain*.

PART 5: High Prolactin

Prolactin is a hormone. It is made by the pituitary gland that lies just below the brain. The main job of this hormone is to regulate breastfeeding in women. Some SGAs cause the level of prolactin in the blood to go up. Often, there are no symptoms. However, for some girls, higher levels can delay puberty, affect their menstrual periods, or cause nipple discharge. For boys, higher levels of prolactin can lead to delayed puberty, sexual dysfunction, breast enlargement, or nipple discharge.

Your child's prolactin levels should be checked by regular blood tests. Talk to your doctor if your child or youth experiences any of the above side effects. It is not known how high prolactin levels affect children over a long period of time. High prolactin levels may lower your sex hormone levels and decrease bone mineral density over the long term. This can lead to weakening of the bones (osteoporosis). Most bone building occurs during childhood, adolescence, and early adulthood. Peak bone mass (when people have the most amount of bone) is reached in the late teens to early twenties. It is important for your child to get plenty of exercise and good nutrition to build healthy bones and prevent osteoporosis.

Nutrition Tips for High Prolactin Levels

Children or youth with high prolactin levels should follow the standard guidelines for calcium and vitamin D to help keep their bones strong.

- > For Calcium and Vitamin D recommendations for children and youth go to: www.healthlinkbc.ca/healthfiles/hfile68e.stm

Activity Tips for High Prolactin Levels

There is no specific exercise for high prolactin levels, but there are activities that help build and strengthen bones. Your child or youth can do a variety of activities including:

- > **Weight-bearing activities:** These include: walking, hiking, jogging, skipping, dancing, etc. Jumping is especially good for bone because it's a high-impact activity.



- > **Resistance activities:** These include: weight training, climbing (stairs, play gym, etc.), squats, lunges, push ups, chin ups, etc.
- > **Combination activities:** Some activities are a combination of both weight-bearing activities and resistance activities. For example: tennis, martial arts, etc.



Section 4:

THE PROVINCIAL MENTAL HEALTH METABOLIC PROGRAM

What is the Program?

This program at BC Children's Hospital provides care for children and youth with mental health disorders who:

- > Have pre-existing metabolic conditions
- > Are at high risk for metabolic side effects of their medication such as:
 - weight gain (especially around the belly)
 - high cholesterol
 - pre-diabetes, type 2 diabetes, high insulin
 - high prolactin
 - thyroid problems

Our team provides screening, education, medical assessment, monitoring and follow up. Our team includes a psychiatrist, endocrinologist, nurse practitioner, dietitian, and occupational therapist.

We help patients manage the metabolic side effects that come from some psychiatric medications with:

- > Healthy eating
- > Physical activity
- > Good sleep habits
- > Stress management



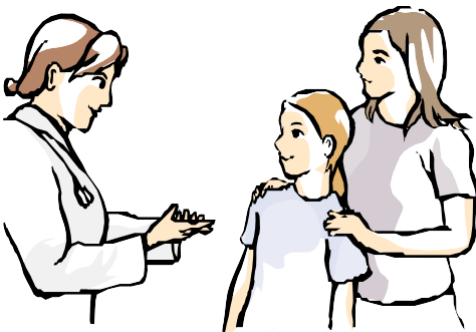
How to be Referred

Your child can be referred by your family doctor, pediatrician, nurse practitioner or psychiatrist. Referral forms can be found on the BC Children's website at: www.bcchildrens.ca/health-professionals/refer-a-patient/metabolic-program-referral

Who can be Referred?

- > Children less than age 8 who are being considered for or being treated with an SGA
- > Youth aged 9-18 who are being considered for SGAs and have risk factors (ethnicity, family history, exposure to diabetes in the uterus)
- > Youth aged 9-18 who are being treated with SGAs who develop metabolic complications
- > Youth up to age 18 with metabolic problems who develop mental health concerns

We do not see patients with type 1 diabetes



Section 5:

TOOLS AND RESOURCES

Online Resources

Dietitian Services at HealthLink BC	<ul style="list-style-type: none"> > Nutrition handouts on healthy eating for specific age groups as well as for different medical conditions > Free access to dietitians. Call HealthLinkBC at 811 and ask to speak with a dietitian 	www.healthlinkbc.ca/dietitian
UnlockFood.ca by Dietitians of Canada	<ul style="list-style-type: none"> > Information on nutrition and healthy eating as well as recipes, videos and interactive healthy eating tools 	www.unlockfood.ca
Dietitians of Canada	<ul style="list-style-type: none"> > Find a Dietitian search page > WHO growth charts and a guide on how to use them 	www.dietitians.ca www.dietitians.ca/growthcharts
Healthy Families BC	<ul style="list-style-type: none"> > Tips, tools and resources on physical activity and healthy eating 	www.healthyfamiliesbc.ca

Kelty Mental Health
Resource Centre

- > Information and resources on a wide range of mental health and substance use issues that affect children and youth in BC. More detailed medication information is also available
- > Access Healthy Living resources for families who have a child or youth with mental health challenges

www.keltymentalhealth.ca

Health Canada

- > Access to Canada's Food Guide (free copies can be ordered in many languages as well as a Food Guide for First Nations, Inuit, and Métis)

<https://food-guide.canada.ca>

Canadian Society for
Exercise Physiology
(CSEP)

- > Canada's physical activity and sedentary behaviour guidelines

<https://csepguidelines.ca>

Public Health Agency
of Canada

- > Information on physical activity including tips on how to get active

<https://www.canada.ca/en/public-health/services/being-active/physical-activity-your-health.html>

Metabolic Side Effects Monitoring Tool *(continued...)*

Date				
Lab Values	Normal Values			
Fasting Blood Sugar	≤ 6.1 mmol/L			
Fasting Insulin	≤ 100 pmol/L			
Total Cholesterol	< 5.2 mmol/L			
LDL Cholesterol	< 3.35 mmol/L			
HDL Cholesterol	≥ 1.05 mmol/L			
Triglycerides	≤ 1.5 mmol/L			
Prolactin				
Other (OGTT, etc)				

Handouts:

- > Great Breakfast Ideas
- > Great Snack Ideas
- > Great Lunch Ideas
- > Healthy Eating: Meal Planning
- > Physical Activity: Activities Your Family Can Try
- > Physical Activity Time Comparison Worksheet
- > Healthy Living Pinwheel Goal Setting Tool

