

Nonalcoholic Fatty Liver Disease (NAFLD) in Childhood

Why is your liver important?

The liver has many important functions in the body including the ability to breakdown toxic substances in the body, metabolize and store energy and to help with digestion, breakdown and storage of nutrients (e.g fat, carbohydrate, proteins and vitamins and minerals) that you get from the foods that you eat. The liver helps the body to digest and absorb fat and some vitamins by producing bile. When the liver becomes damaged, the body can experience problems such as high levels of toxins and waste substances in the body or the build-up of fat in the liver. When the liver is injured, many of these normal functions become impaired.

What is NAFLD?

NAFLD occurs when excess fat is stored in the liver. This can cause damage to the liver making it harder to perform its normal activities. The accumulation of fat in the liver can lead to increased inflammation and a more serious liver disease called nonalcoholic steatohepatitis (NASH). Both fatty liver and/or NASH represent the spectrum of the liver disease that is called NAFLD.

Who can get NAFLD and how is it caused?

In Canada, NAFLD is thought to occur in one in five overweight or obese children. However, it can also occur in children with healthy body weights but who may have larger waist circumferences than other children of the same weight and height. NAFLD is more common in boys than girls and tends to occur in children of Caucasian or South Asian ancestry. It is also more common in children who have family members with fatty livers or type 2 diabetes. The cause of NAFLD is understood to be related to factors such as diets high in fatty foods and simple sugars and inactive lifestyles, particularly in children or adolescents who are overweight or obese.

How is NAFLD diagnosed in children?

In childhood, a fatty liver can be caused by a variety of disorders including those related to problems with copper metabolism (e.g Wilson Disease), viral hepatitis or a variety of autoimmune diseases. It is very important that your doctor makes sure that your child does not have these conditions first. Hence, NAFLD can only be diagnosed in children once all other potential causes of fatty liver have been ruled out. If your doctor or healthcare provider thinks your child may be at risk for NAFLD, they may order some blood tests and an ultrasound of the abdomen to determine whether your child has NAFLD or not. Consult your doctor about what types of tests your child needs to undergo to determine if your child has NAFLD.



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What are the symptoms of NAFLD?

Most children with NAFLD do not experience any symptoms associated with fatty liver. However, for those that do present with symptoms, the most commonly experienced is generalized fatigue or weakness. Although rare, some children may also present with vomiting and tenderness of an enlarged liver.

Healthy Body Weights for Children

The best tool to decide if your child's body weight is in the healthy range is to plot your child's weight and body mass index (BMI) on growth curves (<http://www.cpeg-gcep.net/content/who-growth-charts-canada>). A healthy body weight is when your child's weight or BMI falls between the third percentile and the 95th percentile. If your child's BMI is above the 95th percentile then your child is obese. If your child's BMI is between the 85th percentile and 95th percentile, they may be overweight. It is important to follow the 'trend' of where your child is 'tracking' on the growth curve and not just one point in time. Remember your child is growing and so you should expect that your child's BMI will change with time.

BMI is calculated as your child's weight (in kg) divided by your child's height (in meters) squared.

$$\text{BMI} = \frac{\text{weight}}{\text{height} \times \text{height}}$$

Waist Circumference (WC)

Measuring waist circumference and your child's height can help you determine if your child is depositing extra fat around the middle of their body. It is important to measure your child's waist circumference in the same way each time it is done. The best way is to take a tape measure and gently wrap it around your child's waist approximately 2 cm above the belly button. Make sure the tape measure lays flat on the body and bring the ends together. Do not pull tight, but let it rest gently against the child's skin.

The exact number that you get for a child's WC is not what is important as each child grows at different rates and so each child may have a different number. A general rule of thumb is to measure the ratio between your child's WC and their height (in cm). A ratio of greater than 0.5 may mean the child may be depositing a little extra fat around their middle. However, it does NOT mean your child has NAFLD.

$$\text{Waist-to-height ratio} = \frac{\text{WC (cm)}}{\text{Height (cm)}}$$

What is the treatment for NAFLD?

There is no specific medical treatment for non-alcoholic fatty liver disease. However, lifestyle changes and weight loss can help to reverse fatty liver disease and prevent further damage to the liver. Currently, it is recommended that children with fatty liver disease follow a balanced diet based on the recommendations of *Eating Well with Canada's Food Guide*. The diet should be focused on lowering your consumption of **fatty and sugary foods such as sugar sweetened beverages and/or fried foods and should focus on eating a variety of foods including fresh fruits and vegetables, whole grains, lean cuts of meats and/or dairy products.**

Link for *Eating Well with Canada's Food Guide*: <http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>

Eating a balanced and health diet can be fun!

- Parents, include your child in meal preparation and decisions about what foods to buy from the grocery store. It can be a lot of fun.
- Follow the Canadian Food Guide recommendations for the type and amount of food group consumption per day (specific for age and gender)
- Read processed food labels and try to choose the healthier options
- Avoid soft drinks (or at least substitute with diet), chocolate and candies
- Substitute fruit drinks with whole fresh fruits
- Substitute full fat milk and yogurt with skim or 1%
- Use more often whole grain breads/cereals e.g. add half of favorite cereal with oats or healthier cereal
- Choose lower fat meat options
- Add more vegetables to meals (half your plate)

Consult a registered dietitian for more tips on how to eat a healthier diet for your liver.

Increasing Physical Activity can be fun!

Physical Activity is important! But it is also important to **decrease your sedentary activity time**. Here are some tips to decrease your time spent in sedentary activity and become more active!

- When going out as a family looks for ways to walk more
- Get off the bus one stop early
- Take the stairs instead of the elevator
- Take a skateboard, bike or walk instead of getting a drive
- Do some chores around the house (shovel snow, carry groceries or cleaning)
- Dance to your favorite music



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- Go to the playground or go for a walk
- Reduce screen time and take frequent breaks (get up and walk around)
- Teachers: Build active opportunities into daily classroom routines and encourage students to join a school sport team or simply to move around the classroom. It's amazing how much fun walking around the school inside can be as a group!

Link for Canada's Physical Activity Guidelines for Youth:

http://www.csep.ca/cmfiles/guidelines/csep_guidelines_handbook.pdf

Consult your health care provider for tips on how to increase your physical activity.

Remember making one small change at a time can be important to your overall liver health!

This information is current for April 2017.