CONDITION

High cholesterol - children

High cholesterol in children means unhealthy levels of fats in the blood that may raise future heart and blood vessel risks.

WHAT IT IS
Unhealthy levels of cholesterol in a child's blood

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Usually none, tendon lumps, skin cholesterol deposits

WHAT CAUSES IT
Inherited traits, lifestyle factors, or other health conditions

HOW IT IS DIAGNOSED
Repeated lipid panels; sometimes genetic testing

MAIN TREATMENT
Family-based lifestyle changes and sometimes cholesterol-lowering medicine

CAN IT BE CURED?
Sometimes - reversible causes can be corrected

IS IT AN EMERGENCY?
No - except possible heart attack or stroke symptoms

LONG-TERM OUTLOOK
Usually good with monitoring and appropriate treatment

Overview

Cholesterol is a waxy substance carried in the blood. The body needs some cholesterol to make cells and hormones. A child's liver makes cholesterol, and some also comes from food.

A blood test called a lipid panel measures several types of fat:

High cholesterol usually means LDL or non-HDL cholesterol is above a healthy range. Some children also have high triglycerides or low HDL.

The main concern is long-term exposure. Over many years, excess LDL can help form plaque inside arteries. Plaque is a buildup of cholesterol and other material that can narrow or stiffen blood vessels. This process is called atherosclerosis.

Most children with high cholesterol feel well. Heart attacks and strokes during childhood are

uncommon, but untreated high cholesterol can increase the risk of cardiovascular problems later in life. The risk is especially important when cholesterol is very high because of an inherited condition.

- LDL cholesterol is often called "bad" cholesterol because high levels can contribute to fatty deposits in arteries.
- HDL cholesterol helps carry cholesterol away from the arteries.
- Triglycerides are another type of blood fat.
- Non-HDL cholesterol includes LDL and other particles that can contribute to artery deposits.

Symptoms

High cholesterol usually causes no symptoms. A child can be active, appear healthy, and have cholesterol levels that need attention. It cannot be identified by body size or appearance alone.

In severe inherited cases, cholesterol may collect in the skin or tendons. Possible signs include:

These signs are unusual in children and need medical assessment. Their presence does not confirm high cholesterol by itself.

Headaches, tiredness, dizziness, and weight gain are not reliable symptoms of high cholesterol. A blood test is needed to know the cholesterol level.

- Firm, painless lumps over tendons, especially near the heels or knuckles
- Yellowish cholesterol deposits around the eyes or elsewhere on the skin
- A pale or grey ring around the coloured part of the eye

Causes and risk factors

Some children inherit genes that prevent the body from clearing LDL effectively. The best-known inherited form is familial hypercholesterolaemia , often shortened to FH. A child with FH usually has high LDL from birth, even with a balanced diet and regular activity.

FH may be suspected when a parent or close relative has very high cholesterol or developed heart or artery problems at an unusually young age. A family may not know it carries FH until one person has a cholesterol test.

Other factors can affect cholesterol and triglycerides, including:

Body weight is only one factor. Children at any weight can have high cholesterol, particularly

when it is inherited.

Cholesterol levels may also change during growth and puberty. A single result does not always show the child's usual level.

- Eating patterns high in saturated fat or highly processed foods
- Limited physical activity
- Excess body fat, particularly around the abdomen
- Diabetes or problems controlling blood sugar
- An underactive thyroid gland
- Certain kidney or liver conditions
- Some medicines

Diagnosis

A lipid panel is the main test. It reports total cholesterol, LDL, HDL, and triglycerides. Non-HDL cholesterol can be calculated from the same results.

Some screening tests can be done without fasting. If a result is abnormal, a fasting test may be used to measure LDL and triglycerides more accurately. The result is usually repeated before a long-term diagnosis or treatment decision is made. Recent illness can temporarily affect lipid levels.

Recommendations about routine screening are not identical. Some US pediatric guidance recommends cholesterol screening once between ages 9 and 11 and again between 17 and 21. Earlier or additional testing may be recommended when a child has risk factors. The US Preventive Services Task Force has concluded that evidence is insufficient to determine the overall benefits and harms of routine screening in children without symptoms.

Assessment may include questions about:

Other blood or urine tests may look for an underlying cause. If FH is suspected, genetic testing may help confirm it and identify relatives who could also be affected. A negative genetic test does not always rule out inherited high cholesterol.

- High cholesterol in parents, siblings, or grandparents
- Heart attacks, strokes, or artery procedures at younger ages in relatives
- Eating patterns, activity, growth, and medicines
- Diabetes, thyroid, kidney, or liver problems

Treatment and management

Treatment aims to lower unhealthy lipid levels and reduce lifelong strain on the arteries. The plan is based on the child's age, repeated test results, family history, other health conditions, and whether an inherited condition is likely.

Lifestyle support is usually part of treatment. Changes should provide enough energy and nutrients for normal growth. They are most helpful when the whole household takes part rather than singling out one child.

Common approaches include:

Highly restrictive diets are not appropriate without professional guidance. A registered dietitian with pediatric experience can help protect growth while making useful changes.

Lifestyle changes may be enough when the elevation is mild or linked to a reversible factor. They often improve overall heart health even when an inherited condition means cholesterol remains high.

Medicine may be considered when LDL stays high, FH is present, or the child has additional cardiovascular risks. Statins like atorvastatin or simvastatin are the most commonly used cholesterol-lowering medicines in children who meet treatment criteria. They reduce the liver's production of cholesterol and increase removal of LDL from the blood. Other medicine types may be considered in selected cases.

Treatment with medicine requires follow-up. This may include blood tests, checks for side effects, and review of growth and development. Adolescents taking cholesterol medicine should have the plan reviewed if pregnancy is possible, planned, or confirmed.

- Offering vegetables, fruit, whole grains, beans, nuts, and other fibre-rich foods
- Choosing suitable sources of unsaturated fat in place of foods high in saturated fat
- Limiting trans fats and heavily processed foods
- Choosing water rather than sugary drinks
- Supporting regular, age-appropriate physical activity
- Reducing long periods of sitting when practical
- Addressing sleep, blood sugar, and weight concerns without blame

Complications

The main complication is gradual atherosclerosis. This process can begin without symptoms

and continue over decades. It may eventually contribute to coronary artery disease, heart attack, stroke, or circulation problems in other parts of the body.

Risk is higher when LDL is very elevated from early childhood, as can happen with FH. Smoking, high blood pressure, diabetes, kidney conditions, and a strong family history can add to that risk.

Extremely high triglycerides can inflame the pancreas, causing pancreatitis. This is a different problem from high LDL cholesterol, although both may appear on the same lipid panel. Pancreatitis can cause severe upper abdominal pain, nausea, and vomiting.

Complications are not inevitable. Identifying high cholesterol early allows families to manage the factors that can be changed and to use medicine when its expected benefits justify it.

Prevention

Inherited high cholesterol cannot be prevented. A child does not develop FH because of something they or their family did.

Some non-inherited cholesterol problems may be prevented or improved through balanced eating, regular activity, healthy sleep, and management of conditions such as diabetes or an underactive thyroid. Avoiding tobacco smoke also helps protect blood vessels, although it does not directly correct an inherited LDL problem.

For children with FH, treatment is about reducing lifelong cholesterol exposure rather than preventing the inherited condition itself. Testing close relatives can help find others who may benefit from assessment.

Living with it and what to expect

Most children with high cholesterol continue their usual school, sports, and social activities. The condition rarely limits daily life.

Follow-up usually involves lipid tests at intervals chosen for the child's situation. Levels may change with growth, puberty, illness, lifestyle changes, treatment, or control of another health condition. An unexpected result may be repeated before the plan changes.

High cholesterol caused by a temporary or treatable condition may improve when that cause is corrected. Cholesterol related to lifestyle factors can also improve, although the amount of change is not predictable.

FH is generally lifelong. Healthy habits remain valuable, but they may not lower LDL enough on

their own. Some children with FH need long-term medicine and specialist follow-up. Treatment may change as they grow.

It can be helpful to speak about cholesterol without shame. Food, weight, and inherited risk are sensitive subjects. Focusing on family routines and long-term health is usually more constructive than labelling foods or bodies as good or bad.

As teenagers become more independent, they can gradually learn what their results mean, how medicines are taken, and why follow-up matters. They will eventually need to move from pediatric to adult healthcare.

When to get medical help

Arrange a routine appointment if your child:

Contact the care team promptly if a child taking medicine develops new, unexplained muscle pain or weakness. Do not stop a prescribed medicine without discussing the next step unless emergency care is needed.

Seek urgent same-day care for severe, persistent upper abdominal pain with vomiting, especially if the child is known to have very high triglycerides.

Call emergency services for chest pressure, severe breathing difficulty, fainting, or signs of stroke such as sudden facial drooping, weakness on one side, or trouble speaking. These symptoms are uncommon in children and often have causes other than cholesterol, but they still need emergency assessment.

- Has an abnormal cholesterol result
- Has a parent or sibling with FH or very high LDL
- Has close relatives who had early heart attacks, strokes, or artery procedures
- Develops unexplained yellow skin deposits or firm tendon lumps
- Has diabetes, kidney disease, an underactive thyroid, or another condition that can affect lipids
- Is taking cholesterol medicine and develops a possible side effect

Common questions

Can a thin or athletic child have high cholesterol?

Yes. Fitness and body size do not rule it out. Inherited high cholesterol can affect children who

eat a balanced diet, exercise regularly, and have no visible signs.

Is my child's high cholesterol my fault?

No. Genes, other health conditions, medicines, growth, and many environmental factors can affect cholesterol. Family-based changes may help, but blame does not support effective care.

Does my child need to fast for a cholesterol test?

Not always. A nonfasting test can be used for some screening. A fasting lipid panel may be requested after an abnormal result or when triglycerides need closer assessment. Follow the instructions provided for that specific test.

Can high cholesterol go away?

It may improve if it is related to a reversible condition or modifiable lifestyle factors. Inherited high cholesterol is usually lifelong, although treatment can lower the level and reduce future risk.

Will my child need cholesterol medicine forever?

Not every child needs medicine. When medicine is used for FH, long-term treatment is often needed because the inherited cause remains. The plan should be reviewed over time rather than assumed to stay unchanged.

Can my child still eat eggs, cheese, or treats?

Usually, individual foods do not need to be banned. The overall eating pattern matters more than one item. A pediatric dietitian can help create a practical plan that supports normal growth, family culture, and enjoyment of food.

Sources

- National Heart, Lung, and Blood Institute. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report . Pediatrics. 2011;128(Suppl 5):S213-S256.
- US Preventive Services Task Force. Screening for Lipid Disorders in Children and Adolescents: US Preventive Services Task Force Recommendation Statement . JAMA. 2023;330(3):253-260.
- American Academy of Pediatrics. Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity . Pediatrics. 2023;151(2):e2022060640.

- National Institute for Health and Care Excellence. Familial hypercholesterolaemia: identification and management . Clinical guideline CG71, updated 2019.
- Daniels SR, Gidding SS, de Ferranti SD. Pediatric aspects of familial hypercholesterolemias: recommendations from the National Lipid Association Expert Panel on Familial Hypercholesterolemia . Journal of Clinical Lipidology. 2011;5(3 Suppl):S30-S37.
- National Center for Biotechnology Information, Endotext. Guidelines for Screening, Prevention, Diagnosis and Treatment of Dyslipidemia in Children and Adolescents . Updated review chapter.