

Hypertension (high blood pressure)

This infoKID topic is for parents and carers about children's kidney conditions. Visit www.infoKID.org.uk to find more topics about conditions, tests & diagnosis, treatments and supporting information.

Each topic starts with an overview followed by several sections with more information.

[Links to sections in topic](#) | [Other topics](#) available on website

Hypertension is blood pressure that is too high. In some children, hypertension can be a serious condition. It can increase the risk of getting other diseases, especially if the hypertension continues into their adult years.

Hypertension in children is rare. If your child has hypertension, your doctor will try to find out what is causing it and if it is affecting other parts of his or her body, such as the kidneys or heart.

This information covers:

- what hypertension is and why it is important
- symptoms of hypertension
- what may cause hypertension
- how your doctor can find out if your child has hypertension
- any treatment or lifestyle changes that your child may need
- monitoring hypertension
- long-term effects of hypertension.



Overview

About blood pressure

Blood pressure is the force, or pressure, caused mainly by the heart pumping, that makes the blood flow round the body. It is important that blood pressure is in a healthy range – not too high and not too low.

The kidneys normally control blood pressure to help make sure it is at a healthy level. They do this by regulating how much salt and water is in the blood. If the kidneys are not working properly, they may not be able to control blood pressure well.

Symptoms

Hypertension can be mild, moderate or severe. Often, there are no early symptoms or signs in hypertension. Some children with hypertension have the following:

- headaches that keep coming back or that do not go away
- vomiting (being sick), especially with a headache
- blurred (fuzzy) vision
- odd feelings/numbness

- poor coordination, or movement disorders – they may seem clumsy
- temporary weakness or paralysis (difficulty moving) of one side of the face
- seizures (which may also be called fits or convulsions).

→ **If your child has any of the above, take them to your doctor to check their blood pressure as soon as possible.**

» [More about symptoms](#)

Causes

Hypertension in children is rare. It is much more common in adults, especially older adults.

In children it is often caused by an underlying health condition.

» [More about causes](#)

Tests and diagnosis

Your child's doctor or nurse will measure your child's blood pressure a few times before **diagnosing** (identifying) hypertension. Your doctor or nurse will know the healthy range of blood pressure for your child.

» [More about tests and diagnosis](#)

Treatment

If your child continues to have hypertension after careful assessment and monitoring, he or she will need to control their blood pressure.

Eating a healthy diet with no added salt and getting plenty of exercise can help to reduce blood pressure. Some children need to take medicines.

» [More about treatment](#)

About the future

Hypertension can be a serious condition **if it is not well controlled**. Hypertension increases the risk of other

diseases, especially if it continues into adulthood. These include stroke, heart attack, heart failure and kidney disease.

If your child continues to have hypertension, his or her blood pressure will need to be carefully controlled. If your child has an underlying condition, this may need treatment.

Follow up

Your child may need to go back to your doctor or to the hospital to have more blood pressure measurements, or for other tests or treatment. Your doctor will let you know what to expect.

→ **Contact your doctor straight away if your child is vomiting (being sick) and cannot take their medicine for more than 24 hours (1 day).**

» [More about the future](#)

Symptoms

Often, there are *no* early symptoms in hypertension, especially if it is mild or moderate.

More common symptoms

Some children with hypertension have the following symptoms:

- headaches that keep coming back or that do not go away
 - vomiting (being sick), especially with a headache.
- **If your child has any of the above symptoms, take them to your doctor to check their blood pressure as soon as possible.**

Less common symptoms

A few children with hypertension – especially if it is very high (**malignant hypertension**) – have the following symptoms:

- blurred (fuzzy) vision
- odd feelings/numbness
- poor coordination, or movement disorders – they may seem clumsy
- temporary weakness or paralysis (difficulty moving) of one side of the face (this is called Bell's palsy)
- seizures (which may also be called fits or convulsions).

→ **If your child has any of the above symptoms, take them to your doctor or call 999 straight away.**

Causes

Your child's doctor will try to find out what is causing hypertension in your child, and how severe it is. Hypertension may be primary or secondary.

Primary hypertension

Sometimes there is no known cause of hypertension. This is called **primary hypertension** or **essential hypertension**. It is quite common in older adults, but much less common in children. It may be linked to a eating a high-salt diet, smoking, drinking alcohol or being overweight. There are often no early symptoms.

Secondary hypertension

Sometimes an underlying problem with the kidneys or another part of the body is causing the hypertension. This is called **secondary hypertension**. It is more common in children. It can be acute (sudden) or long-term.

Acute hypertension

Acute hypertension starts suddenly or gets worse quickly. If your child has acute hypertension, he or she is admitted to the hospital. Your doctor will try to diagnose and treat the condition that is causing the high blood pressure. In some cases, after treatment, the blood pressure gets better over time.

Causes of acute hypertension in children include:

- structural problems in the **urinary system** – where one or more parts have not developed normally
- **pyelonephritis** – infection in the kidney
- **glomerulonephritis** – a group of diseases in which the kidneys leak blood and protein into the urine
- a side-effect of some medicines
- problems with the **endocrine system** (which controls many of the body's functions), the heart or brain.

Causes: Read more about causes of acute hypertension

Structural problems of the urinary system

In some children, one or more parts of the urinary system do not develop, or grow, normally. Children with structural problems are usually born with them, and they are sometimes found on a pregnancy ultrasound scan.

Different problems in the urinary system may cause acute hypertension:

- **posterior urethral valves (PUV)** – a blockage in the back part of the **urethra** (nearest the bladder) in some boys
- **pelviureteric junction (PUJ) dysfunction** – a blockage between the kidney and the ureter
- **vesico-ureteral reflux and reflux nephropathy** – some urine backs up towards the kidneys
 - **renal dysplasia** – one or both kidneys do not form properly
 - **renal hypoplasia** – one or both kidneys are smaller than normal.

Infection in the kidney

A **urinary tract infection** (often called a UTI) happens when germs (usually bacteria) get into the urine and travel into the urinary system. In serious cases, this infection can travel into the kidney – this is called **pyelonephritis**.

Glomerulonephritis

Glomerulonephritis is a group of diseases in which the kidney filters, the glomeruli, are damaged or inflamed (swollen). Children with this condition have blood and protein in their urine, as well as swelling of the body, especially around their face and legs.

Other problems

Rarely, acute hypertension is caused by other problems:

- a side-effect of some medicines – for example, a high dose (amount) of **steroids** that may be given in hospital
- a problem with the **endocrine system**, which is the system of glands that controls many of the body's functions – for example, a tumour in the **adrenal gland**, which sits on top of the kidney
- a problem with the heart or the brain.

Long-term hypertension

Hypertension may also be caused by **chronic conditions**, which start slowly and last a long time, sometimes for life. If your child has a chronic condition that causes hypertension, his or her blood pressure will need to be controlled on a long-term basis. This often means taking medicine.

Chronic conditions that cause hypertension in children include:

- scars in the kidneys – the scars may be present with or without chronic **urinary tract infections**
- **cystic kidneys** – where the kidneys have cysts, round swellings that may be filled with a watery liquid
- **renovascular disease** – which affects the blood vessels in the kidneys.

Hypertension with chronic kidney disease

Many children with **chronic kidney disease** have hypertension due to fluid and salt retention (the kidneys cannot remove enough water and salt). If the hypertension is not controlled, this increases the risk of further kidney damage.

Malignant hypertension

Malignant hypertension is *very* high blood pressure.

Children with malignant hypertension usually have most of the symptoms described in the **Symptoms section**.

These children need quick and intensive treatment to control their blood pressure. They will need to be admitted to a specialist unit in the hospital that treats malignant hypertension.

Scars in the kidneys

Some children have scars in the kidney – this is called **renal scarring**. Some children are born with these scars and do not have any other symptoms. Other children have chronic **urinary tract infections**, which are caused by germs in the urine, because of the scars.

Cystic kidneys

Cystic kidneys are kidneys that have cysts on them. Cysts are round swellings that may be filled with a watery liquid. There are different types of diseases that cause cystic kidneys. Diseases that cause cystic kidneys include:

- autosomal recessive polycystic kidney disease
- autosomal dominant polycystic kidney disease
- **multicystic dysplastic kidney**.

Renovascular disease

In **renovascular disease** (or renal vascular disease), there is a problem with the blood vessels that carry blood to the kidney. Types of renal vascular disease include mid-aortic syndrome and renal artery stenosis.

Tests and diagnosis

The first tests are to obtain accurate blood pressure measurements. Because hypertension in children is rare, your child's doctor will also do an examination of your child and arrange urine tests and blood tests.

Some children will need further tests.

Measuring blood pressure

At hospital or GP clinic

Your child's doctor or nurse **measures your child's blood pressure**. An electronic or manual (worked by hand) instrument, which is the best type and size for your child, is used.

Measuring blood pressure in young children can be challenging especially if they are anxious or frightened. Your child's doctor or nurse will take a few measurements when your child is relaxed. Your child may need to go back on three separate occasions for more measurements.

At home

Blood pressure can vary throughout the day, when we exercise and when we feel stress. Some children feel stress when they visit the doctor. If they feel stress and have higher blood pressure, and no other symptoms of hypertension, this is called white coat hypertension.

Your doctor or nurse may ask a community nurse to measure your child's blood pressure at home. Or, you may be asked to use a home electronic monitor to measure your child's blood pressure at regular intervals during the day.

Ambulatory blood pressure monitoring

One of the best ways to assess a child suspected of hypertension is to use **ambulatory blood pressure monitoring (ABPM)**. Your child may be fitted with a special electronic monitor that automatically measures blood pressure over a period of time, usually 24 hours.

This monitor will automatically measure your child's blood pressure every half hour during the day, and every hour during the night while they are sleeping. Your child will need to keep their arm still during each measurement.

ABPM gives a true picture of your child's blood pressure when he or she is awake and asleep. It is normally only used for children aged 5 years or older.

Examination

Your doctor will talk to you or your child about his or her symptoms and any medicines that he or she takes, and do an examination of your child.

Urine tests

You or a nurse will collect some of your child's urine in a small, clean container for a **urine test**. A **dipstick** is used – this is a strip with chemical pads that can change colour depending on what substances are in the urine. The urine sample may also be sent to a laboratory for more testing.

Blood tests

Blood tests may be taken to check kidney and thyroid hormone levels in your child's blood. A small amount of blood will be taken from a **vein** with a needle and syringe.

Other tests

If your child is diagnosed with hypertension, your doctor may arrange other tests.

Imaging tests

Imaging tests (scans) to try to find the cause of his or her high blood pressure. These use special equipment to get images of the inside of the body.

These scans should not cause any pain. Some scans require an injection using a needle or plastic tube – a local

anaesthetic, a spray or cream, can be put on the skin before the test to make the area numb.

- **Ultrasound scan** – looks at look at the shape and size of the kidneys and other parts of the urinary system. A small handheld device is moved around your child's skin and uses sound waves to create an image on a screen.
- **Echocardiogram (ECHO)** – checks the blood flow through the heart and how hard the heart has been working. Like an ultrasound scan, it uses sound waves to take images of your child's heart.
- **DMSA** – shows whether there is any damage in the kidneys or other parts of the urinary system. A chemical that gives out a small amount of radiation is injected into one of your child's blood vessels, and a special camera takes pictures.

Electrocardiogram

An **electrocardiogram (ECG)** checks whether the heart is working too hard, or if there any problems with the heartbeat. Small sticky patches are put on your child's arms, legs and chest, and connected to a machine.

Angiogram and angioplasty

If the **arteries** (blood vessels) that lead to the kidneys are too narrow, this means there is less blood flowing to the kidneys, which can lead to hypertension.

- An **angiogram** is a type of imaging test that looks at these arteries in detail. A **general anaesthetic (GA)** is used to make your child go to sleep so he or she does not feel pain anywhere in his body. The doctor makes a very small cut in the skin. He or she uses an **ultrasound scanner** as a guide, and inserts a needle through the cut into one of the large arteries in the body – usually one in the groin. A long thin

tube called a **catheter** is passed through this artery until it reaches the artery leading to the kidney, and a special dye is placed through the catheter to flow to the kidney. X-ray images are taken.

- An **angioplasty** is a treatment that stretches the artery. This lets blood flow more easily to the kidney, and so helps reduce blood pressure. A small balloon is placed through the catheter and when it gets to the narrowed section, it inflates. After the procedure, the catheter is drawn back and removed, and the opening in the skin heals in a few days.

Referral

Depending on the results of these tests, your doctor may refer your child to:

- a **paediatrician**, a doctor who treats babies, children and young people, and may be in a hospital or a clinic
- a **paediatric nephrologist**, a doctor in a **paediatric renal unit** (a specialised unit that treats babies, children and young people with kidney conditions) who specialises in treating babies, children and young people with kidney problems, and may need to confirm the diagnosis and advise on treatment.

Questions to ask the doctor or nurse

- What other tests will my child need?
- How do I help prepare my child for the tests?
- Why does my child have hypertension?
- How will you know if my child has an underlying condition?
- How can I get more information about that condition?

Treatment

If your child has hypertension, he or she will need to reduce and/or control their blood pressure. There are different ways to do this.

- For some children, hypertension can be controlled with a healthy diet and lifestyle, as well as medicines, over a period of time.
- For other children, hypertension is caused by an underlying condition that needs to be treated.

Your child's doctor will recommend the treatments that are right for your child. This may include prescribing one or more medicines. If you have any questions or concerns, speak with your child's doctor or nurse. Your views about treatment will be considered.

- **It is important that your child follows the treatment plan agreed with your doctor. If the blood pressure is not controlled, he or she is at higher risk of stroke, heart attack and heart failure. Your child is also at higher risk of damaging their kidneys.**

Eating and drinking

Your child may need to change what he or she eats and drinks. Speak to the doctor or nurse for more information. Below are some tips you can follow as a family to keep your child's blood pressure healthy.

Eat less salt

Reducing the amount of salt you eat can help to control blood pressure. Avoid eating or drinking lots of salted nuts, crisps, crackers, soft drinks, fast food meals, takeaways and processed foods (meals that are pre-prepared, including soups) – these often have more salt than we think. **Do not** add extra salt to meals that you cook or at the dining table.

Eat a healthy diet

Eat lots of fresh fruits and vegetables. Swap white bread, rice and pasta for whole-wheat varieties. Avoid food and drinks with lots of added sugar (including sweets, sugary

cereals, high-sugar squash and fizzy drinks or sodas). Limit caffeine (which is found in coke drinks, tea and coffee).

Drinks

Your doctor will advise you on how much fluid (such as water) your child should drink.

If your child has a kidney condition

If your child has a **kidney** condition, he or she may need to make further changes to their diet. This is because your child's kidneys need special care. A **paediatric dietitian** may be able to provide further support.

Sports and activities

Some children with hypertension need to limit the amount of exercise they do when their blood pressure is too high or if they have some types of heart conditions.

Once their blood pressure is controlled, most children can take part in the same sports and activities as others. Most children should be physically active for at least 30 minutes a day. Speak to your doctor or nurse about which sports and activities your child can take part in.

Make sure your child gets plenty of sleep.

Medicines

Your child's doctor may prescribe medicine to control or reduce their blood pressure, in order to treat hypertension. A few children with hypertension need to take medicine to control blood pressure for the rest of their life.

→ **Never stop the medicine without telling your doctor or nurse.**

» **Medicines for Children – information about giving medicines to children**

Which medicines are used

There are many types of medicines used to treat hypertension in children. Your doctor will prescribe the medicine that they think is best for your child.

- Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) – common medicines include captopril, enalapril, lisinopril, losartan, valsartan

- Calcium-channel blockers – including **amlodipine**, nifedipine, nimodipine
- Beta-blockers – including **atenolol**, **carvedilol**, esmolol, **labetalol**, metoprolol, propranolol, sotalol
- Alpha-blockers – including doxazosin, phenoxybenzamine, prazosin
- Vasodilators – including hydralazine, methyldopa, minoxidil
- Diuretic – including amiloride, bendroflumethiazide, bumetanide, chlorothiazide, chlortalidone, furosemide, metolazone, spironolactone

General information about medicines for hypertension

- **It is important** that your child continues taking the prescribed medicine. If you are not sure a medicine is working or think it is no longer needed, contact your doctor but continue to give the medicine as usual in the meantime. Do not give extra doses as you may do harm.
- **Contact your doctor straight away** if your child is vomiting (being sick) and cannot take medicine for more than 24 hours.
- Check with your doctor or pharmacist *before* giving any other medicines to your child. This includes paracetamol, ibuprofen, herbal or complementary medicines.
- Only give the medicine to *your* child. Never give it to anyone else, even if they have high blood pressure, as this could do harm.
- If you think someone else may have taken the medicine by accident, contact your doctor straight away.

Side-effects

Sometimes medicines have other effects that we don't want - **side-effects**. Your child's doctors will check the side-effects and if the medicine is working. They may need to change the medicine so that it is right for *your* child.

Let your doctor know if your child has any of the following side-effects:

- feeling tired or drowsy
- a dry cough

Treatment: Read more about types of medicines for hypertension

- **Angiotensin-converting enzyme (ACE) inhibitors** and **angiotensin receptor blockers (ARBs)** relax blood vessels. ARBs may also be called angiotensin II receptor antagonists.
- **Calcium-channel blockers** widen blood vessels so the blood flows more easily.
- **Beta-blockers** make the heart beat more slowly and with less force. They may also be called beta-adrenoceptor-blocking medicines.
- **Alpha-blockers** relax the blood vessels, making it easier for blood to flow through them. They are also called alpha-adrenoceptor-blocking medicines.
- **Vasodilators** widen blood vessels so the blood flows more easily.
- **Diuretics** get rid of extra water and salt into urine, which affects the blood pressure.

- dizziness, faintness or light-headedness
- a skin rash
- headaches
- poor sleeping.

Other side-effects to watch out for include the below.

- With some medicines, your child may grow more hair around their body. If you are concerned, speak to your doctor about it at your next visit.
- If your child takes some blood pressure medicines for a long time (several months), their gums may become tender or swollen, and may bleed when they brush their teeth. They will return to normal when the treatment is stopped. Brushing their teeth with a soft toothbrush and regular flossing will help. If you are concerned, contact your doctor or dentist.
- Your child's ankles may swell (get bigger).

Questions to ask the doctor or nurse

- Do I need to make any changes to what my child eats and drinks? How can I get more information and support about this?
- Can my child take part in all types of sports and activities?
- How often do I need to measure my child's blood pressure at home?
- What is the acceptable range for my child's blood pressure?
- What do I do if the blood pressure readings are too high?
- When do I need to call or come back to my child's doctor or the hospital?

About the future

Hypertension can be a serious condition if it is not well controlled. Hypertension increases the risk of other diseases, especially if it continues into adulthood. These include stroke, heart attack, heart failure and kidney disease.

Your child's blood pressure will need to be carefully controlled to reduce the risk of other diseases. If your child has an underlying condition, they will also need treatment for that.

Follow-up appointments

Your child may need to go back to your doctor or to the hospital to have more blood pressure measurements, or for further tests or treatment.

Your child may need to see a **paediatrician** (children's doctor) in your local hospital, or to see a specialist paediatrician. Your doctor will let you know what to expect.

- **Contact your doctor straight away if your child is vomiting (being sick) and cannot take his or her medicine for more than 24 hours (1 day).**

Monitoring blood pressure

Your doctor or nurse will let you know when your child's blood pressure needs to be measured. He or she will know normal ranges of blood pressure for children who are the same age, sex and height as your child, and will let you know what your child's readings mean.

In children, the systolic blood pressure (top number) is normally more important. For example, the targets for the systolic numbers for children are as follows (mmHG means millimetres of mercury, which is how blood pressure readings are recorded):

- 4 years old – 95 mmHg
- 8 years old – 100 mmHg

- 12 years old – 110 mmHg
- 16 years old – 115 mmHg

Your doctor or nurse may ask you to **check your child's blood pressure at home or over 24 hours.**

Other procedures

- **If your child is having another procedure at hospital, tell the doctor there that he or she has hypertension and give a list of the medicines being taken. Your child may need to stop one or more medicines.**

Impact on your child

Children with hypertension can generally do all of the things that other children their age do, as long as their blood pressure is well controlled.

Getting support

This can be a difficult and stressful experience for your child and the whole family, including other children.

- **If you have any concerns or need additional support, speak with your doctor or nurse.**

Further information

This is the end of the information on hypertension. If you would like to read more about other conditions affecting the kidneys, tests and diagnosis, treatment or supporting information, you can find a list of topics covered on the infoKID website at www.infoKID.org.uk.

Your notes and contact information

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www.infoKID.org.uk



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For details on any sources of information used in this topic, please contact us through our website, www.infoKID.org.uk.

We take great care to make sure that the information in this leaflet is correct and up-to-date. However, it is important that you ask the advice of your child's doctor or nurse if you are not sure about something. This information is intended for use in the United Kingdom, and may not apply to other countries.

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