

Beta-blockers

Beta-blockers are medicines that are used to treat a variety of conditions. Their full correct name is beta-adrenoceptor blocking medicines (or beta-adrenergic blocking agents), but they are commonly just called beta-blockers.

How do beta-blockers work?

Beta-blockers work by blocking the transmission of certain nerve impulses. The ends of some nerves release a chemical (neurotransmitter) called noradrenaline when the nerve is stimulated. This chemical then stimulates beta-adrenergic receptors.

These receptors are tiny structures which occur on cells in various parts of the body, including the heart, brain, and blood vessels. When these receptors are stimulated, they cause various effects. For example, nerve impulses to the heart can stimulate beta-adrenergic receptors on heart cells. This causes an increase in the force and rate of the heartbeat. This can cause a fast heartbeat and higher blood pressure.

The beta-adrenergic receptors are also stimulated by adrenaline (epinephrine), a hormone which circulates in the bloodstream. Adrenaline is made in the adrenal gland. The blood level of adrenaline can vary. For example, you may release a lot of adrenaline into the bloodstream when you are frightened or anxious which can cause an increase in your heart rate, and other effects.

The beta-blocker medicine 'sits' on beta-adrenergic receptors and stops (blocks) the receptor from being stimulated. So, for example, if beta-adrenergic receptors in the heart are blocked, the force and rate of the heartbeat are reduced.

Types of beta-blockers

There are several types of beta-blockers – these include:

- [Acebutolol](#).
- [Atenolol](#).
- [Bisoprolol](#).
- [Carvedilol](#).
- [Celiprolol](#).
- [Labetalol](#).
- [Metoprolol](#).
- [Nadolol](#).
- [Nebivolol](#).
- [Oxprenolol](#).
- [Pindolol](#).
- [Sotalol](#).
- [Propranolol](#).
- [Timolol](#).

Each type has one or more brand names.

What are beta-blockers used for?

Heart and blood vessel conditions

Because of their effect on the heart cells, beta-blockers may be used to:

- [Prevent angina pains](#).
- [Reduce the risk of a further heart attack \(myocardial infarction\) if you have already had one](#).

- [Control certain abnormal heart rhythms \(arrhythmias\)](#), particularly those where the heartbeat is too fast. A common arrhythmia is called atrial fibrillation. Beta-blockers are often used to control the fast heart rate in atrial fibrillation. Calcium-channel blockers are an alternative medicine that can be used for this problem.
- Help to treat [heart failure](#).
- [Lower your blood pressure if you have high blood pressure](#).
- Treat [postural tachycardia syndrome \(PoTS\)](#).

Other conditions

Because beta-adrenergic receptors are found in other parts of the body, beta-blockers are also used for various other conditions. These include:

- [Glaucoma](#). Beta-blocker eye drops reduce the fluid that you make in the front chamber of the eye. This reduces the pressure in the eye.
- [Anxiety](#). Beta-blockers do not reduce anxiety itself but can reduce some of the symptoms. For example, they can reduce shaking (tremor) and a fast heart rate.
- [Overactive thyroid gland](#). Beta-blockers can help to reduce symptoms such as tremor, and slow down a fast heart rate.
- [Migraine](#). Beta-blockers can reduce the number of migraine attacks if the attacks occur frequently.
- [Tremors](#) - beta-blockers can be used in benign hand tremors which have no other underlying cause and are causing significant problems in daily activities.

Beta-blockers side-effects

Most people who take beta-blockers have no side-effects, or only minor ones. However, because of their action in various parts of the body, some people have unwanted side-effects. The side-effects of beta-blockers include:

- Sometimes the heart rate can go too slowly. This can make you dizzy or feel faint.

- If you have diabetes you need to be aware that beta-blockers may dull the warning signs of low blood sugar ([hypoglycaemia](#) - often called a hypo). For example, you may not develop the sensation of rapid, forceful or irregular heartbeats (palpitations) or tremor, which tend to occur as the blood sugar is going too low.
- Some people develop cool hands and feet when taking beta-blockers. This is because they can narrow (constrict) small blood vessels and reduce the circulation to the skin of the hands and feet.
- Tiredness, [depression](#), [inability to achieve a proper erection \(impotence\)](#), vivid dreams, nightmares and other sleeping problems occur in some people.
- There is some evidence to suggest that beta-blockers may provoke type 2 diabetes to develop in some people.

Some people with asthma are advised not to take a beta-blocker. If you have asthma or something similar, discuss this with your GP.

The above is not a full list of possible side-effects but mentions the main ones that may occur. Read the information leaflet that comes with your particular brand for a full list of possible side-effects and cautions.

How long can you stay on beta-blockers?

The length of treatment depends on why you are taking a beta-blocker. Some people only need to take beta-blockers for a few weeks, or months - for example, if you have an overactive thyroid. Some people need to take beta-blockers for the rest of their lives - for example, after a [heart attack \(myocardial infarction\)](#).

Who cannot take beta-blockers?

You cannot take a beta-blocker if you have certain conditions, including:

- [Asthma](#).
- Uncontrolled heart failure.
- Very slow heart rate ([bradycardia](#)).
- Low blood pressure (hypotension).

- Certain problems with the rhythm of your heart – eg, sick sinus syndrome.

How to use the Yellow Card Scheme

If you think you have had a side-effect to one of your medicines you can report this on the Yellow Card Scheme. You can do this online at www.mhra.gov.uk/yellowcard. The Yellow Card Scheme is used to make pharmacists, doctors and nurses aware of any new side-effects that medicines or any other healthcare products may have caused. If you wish to report a side-effect, you will need to provide basic information about:

- The side-effect.
- The name of the medicine which you think caused it.
- The person who had the side-effect.
- Your contact details as the reporter of the side-effect.

It is helpful if you have your medication – and/or the leaflet that came with it – with you while you fill out the report.

Further reading

- [Hypertension overview](#); NICE Pathway, August 2011
- [Acute coronary syndrome](#); Scottish Intercollegiate Guidelines Network – SIGN (2016)
- [Atrial fibrillation: diagnosis and management](#); NICE guideline (April 2021 – last updated June 2021)
- [2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure](#); Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) With the special contribution of the Heart Failure Association (HFA) of the ESC
- [Migraine](#); NICE CKS, April 2024 (UK access only)

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