

## Beta blockers

This factsheet is intended to help those affected by atrial fibrillation (AF) understand beta blocker medication, with a brief introduction to how it works, dosing and side effects. The information in this resource is based on the most current clinical understanding of AF.

### Introduction

The first beta blocker, propranolol was invented by the Scottish pharmacist Sir James Black in the late 1950s and contributed to his winning the Nobel Prize for Medicine in 1988. Since their development, the roles of beta blockers in medicine have been very wide ranging; treating problems from heart rhythm abnormalities to anxiety attacks.

Beta blockers can be spotted in your medication list by their names ending in '-olol' such in bisoprolol or atenolol.

### How do they work?

Cells of organs such as the heart, kidneys, and lungs, as well as veins and arteries, are receptors for the hormone adrenaline. When adrenaline is released in the body it will activate these receptors so that the organ becomes more active. This is best illustrated when you are exercising, at which time adrenaline is released to ensure that both your heart rate and respiratory rate increase to maintain your activity. These receptors are called beta adrenergic receptors and it is here the beta blockers have their effect blocking the receptor site from binding with adrenaline.

Beta blockers have a minimal effect at rest, however during activity, when adrenaline is released, the medication will reduce adrenaline's effect on the heart rate and force of contraction. Beta blockers also have effects in other places where there are beta receptors such as the airways of the lung and the muscle walls of our arteries.

### Clinical use

#### Antihypertensives (blood pressure tablets):

For a long period beta blockers were seen as first line medications for blood pressure. However, since 2006 they have shifted in position with other families of medications e.g. ACE inhibitors and calcium channel blockers being regarded as more effective.

**Anginal medications:** Since beta blockers reduce the work of the heart during activity, they are used to reduce the problems of angina pain (heart pain felt as a tightness in the chest) and many people take beta blockers regularly for this purpose. There is a great body of medical evidence that suggests that patients who have suffered a heart attack (myocardial infarction) have an increased life expectancy if treated with beta blockers and so most people who suffer a heart attack will find beta blockers included in their repeat prescriptions.

**Left ventricular failure (heart failure):** Although it was once thought that beta blockers could worsen the condition, studies in the late 1990s showed their positive effects on illness and prognosis in heart failure. They are now specifically indicated to work alongside the standard therapy in heart failure. Medical research has shown that beta blockers reduce the absolute risk of death from heart failure by 4.5% over a 13 month period as well as reducing the number of hospital visits.

**Atrial fibrillation:** As beta blockers reduce the effect of adrenaline on the heart rate they have a significant role to play in the management of persistent and permanent AF to steady the heart rate. Many doctors would consider beta blockers first-line in managing a patient with an uncontrolled heart rate in AF. Usually they are started at a low dose and their dose is slowly increased over time to balance their beneficial

effects with the possible side effects (see below). In people with paroxysmal AF (AF that spontaneously comes and goes over time) or persistent AF (AF that is continuous but may possibly be returned to normal rhythm by an intervention such as cardioversion at some time) beta blockers have the added advantage that they may assist in maintaining the normal rhythm or even assist in returning the heart to its normal rhythm.

### Side effects and problems

**Light-headedness:** Due to their effect on blood pressure, some patients taking beta blockers can feel faint and light headed.

**Raynaud's phenomenon:** In some individuals beta blockers can cause coldness of the fingers and toes. In particularly susceptible people this can cause a transient loss of circulation to the fingers and toes making them white and painful. This is called Raynaud's phenomenon and may be an indication to stop the beta blocker.

**Fatigue:** Approximately one patient in ten will complain that beta blocker treatment will make them feel tired and fatigued. They generally describe this as tiredness rather than a feeling of sleepiness. Unfortunately this side effect can present even after you have been taking the medication for some time.

**Breathlessness:** As beta blockers also have an effect on the airways of the lungs they can make susceptible people feel breathless. Due to this problem beta blockers are not used in patients with asthma. However, many people with chronic bronchitis are able to use them successfully.

### Caution

Beta blockers should be taken as prescribed and should not suddenly be stopped without advice from your doctor. Often, when a beta blocker is being used at a higher dose, most doctors would reduce the dose before withdrawing the beta blocker rather than stopping it suddenly, which can lead to unwanted side effects.

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