

Medicine for Managers

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Beta Blockers Made Easy

Beta-blockers, more correctly known as *beta-adrenergic receptor blocking drugs*, have been available to doctors for over fifty years and are one of the major medical advances of the last century. They entered the pharmacopoeia at a time when clinicians had relatively few drugs at their disposal and they have proved to be amongst the most versatile groups of drug available.

The first drug, found to inhibit the actions of adrenaline, was released in the USA in 1958. Subsequently at ICI in Great Britain, in the early 1960s, a further series of such drugs including **propranolol** were identified.

In 1964 propranolol became the first major advance in the treatment of **angina pectoris** since the introduction of nitroglycerin (GTN tablets and spray) nearly one hundred years earlier. It also quickly became an important treatment for **hypertension, abnormal heart rhythms** and **cardiomyopathy**.

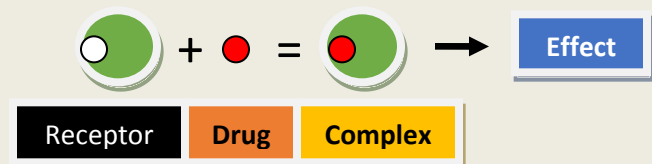
Since that time the range of uses has continued to extend and, amongst other things, it is now additionally used for:

- Mitral valve prolapse
- Aortic dissection (splitting of the wall of the aorta)
- Pheochromocytoma (tumour of adrenal glands)
- Protection after heart attack

- Congestive Heart Failure
- Migraine
- Some types of tremor
- Atrial Fibrillation
- Thyrotoxicosis (overactive thyroid)
- As eye drops for glaucoma
- As part of treatment for cirrhosis
- Anxiety (e.g. before driving test)

The identification of the beta-blocker and its actions delivered to pharmacological research a huge boost because it opened the door to the discoveries of basic receptor structure and function. In simple terms body chemicals achieve their effect by linking reversibly with receptors with the result that the chemical/receptor complex results in an action.

In other words



The drug substitutes in the receptor for the natural body chemical altering the effect. In the case of adrenaline and similar naturally occurring body chemicals (called catecholamines), the beta blocker molecules are preferentially taken up into the receptor sites preventing the adrenaline from getting to them.

Over all those years a large number of different beta-blocking drugs have been developed and the characteristics of each may differ.

Therefore the actual type of beta-blocker prescribed will depend on the condition from which you are suffering.

Commonly used beta-blockers are:

- Propranolol (Inderal)
- Atenolol (Tenormin)
- Metoprolol (Betaloc)
- Bisoprolol (Cardicor)
- Nadolol (Corgard)
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There are a number of others with similar properties

There are a number of conditions which the beta-blockers will aggravate:

- Asthma
- Diabetes
- Heart block (where the heart's electrical activity is slowed by faulty conduction of electrical impulses

- Severe narrowing of peripheral arteries (e.g. arms and legs)

Other conditions, where there are blood pressure disturbances or where the heart or circulation is involved, may require careful use of beta-blockers.

So the effects of the beta blockers are varied and not all effects are a feature of every beta-blocker. They include:

- Reduction in blood pressure
- Slowing of the pulse
- A calming effect
- Symptomatic relief of migraine and thyroid overactivity

However they are not without side effects.

Key features include

- Tiredness and lethargy
- Cold extremities
- Impotence in men
- Nightmares

Other features are

- Dizziness
- Blurred vision
- Slow heartbeat
- Diarrhoea
- Depression
- Loss of libido

Although beta-blockers are very useful they should be taken with care when some other types of medication are being used.

- Hypertension. When used to control high blood pressure in combination with another drug(s) the effect may be a profound reduction with faintness or even collapse.
- Anti-dysrhythmics. When a drug is used to control irregular heart beat it tends to slow the heart down and a beta-blocker may have the same effect resulting in the heart becoming too slow and risking collapse in the patient.
- Anti-psychotics, if combined with beta-blockers may facilitate the development of arrhythmias (irregular heartbeat) which could also cause collapse.

I conclude by quoting Dr William Frishman who said, in 2008,

*“The fifty-year beta-blocker experience, with the ability to modulate catecholamine (adrenaline and similar chemicals) activity has reaffirmed the observations of the **Ancients** who believed that imbalances in naturally- occurring body humours could cause disease, whilst the re-establishment of a humoural balance would contribute to health.”*

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