Asthma Medicines and how they work.

ASTHMA MEDICINES AND HOW THEY WORK

Asthma is a chronic lung disease and, with the correct treatment, can be fully controlled in most people so that you can live a completely normal life, enjoying full involvement in sport and all other activities.

Asthma is caused by inflammation in the airways. This causes swelling and narrowing of the airways (see *What is Asthma*). Because the airways are inflamed (irritated), they can easily go into spasm which may lead to an asthma attack. To keep the constant airway inflammation under control, you need to know what your asthma medicines are, and how they work. There are two groups of medicines used in the treatment of asthma: controllers and relievers.

Controllers (sometimes called preventers) are there to treat the inflammation and stop the airways going into spasm (being irritated and twitchy). Controllers should be used regularly to reduce the inflammation that results in swelling, mucus, and muscle tightening around the airways. As with other conditions (such as epilepsy, diabetes, or HIV) you must use your controller even if you have no symptoms. If you are using your reliever more than twice a week, it tells you the airways are not under control. Under very special circumstances, your doctor might combine a controller and reliever. You can ask your doctor if this would work for you.

Reliever treatment (emergency pump) is there to be used when your airways go into spams and tighten up. Ideally, you should never need to use a reliever if your asthma is perfectly controlled. Relying on your reliever to "open up your chest" - and not using a controller to prevent this - is a very dangerous and vicious cycle. The reliever only helps to open up the airways but does not treat the cause (usually inflammation). Using a reliever more than once or twice a week is considered poor control and you should see your doctor and talk about how to adjust your treatment.

Although medicines are essential, it is important to remember that they are not the only part of asthma treatment. You also need to avoid the triggers of asthma attacks (see *Risk Factors for Asthma and Triggers for Asthma Attacks*).

Always make sure that somebody shows you how to use an inhaler correctly; many patients make important mistakes despite having used their pumps for a long time. Bring all your pumps and medicines with you to every visit so that your doctor, nurse, or pharmacist can explain to you what type of medicine it is, and check whether your technique in using it is good enough (see *Inhaler Devices in Asthma*).

CONTROLLERS

- Controllers help to calm the airways and stop them being irritable and swollen;
- Uncontrolled inflammation leads to thick and mucus-filled airways. Both make breathing difficult, as the airways are narrowed and more easily blocked; and
- Controllers - unless combined with a reliever-type medication - will not open up the airways and you may not feel any "benefit". The medication is working

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"behind the scenes" and takes a few days to weeks to get control of the inflammation so that you don't need your reliever.

RELIEVERS

- Airways that are inflamed and swollen may also get tightening of the muscle around the airways, called airway spasm or bronchospasm (see *What is Asthma*). This causes a cough, wheezing (whistling in the chest), or a tight chest with difficulty in breathing;
- Emergency treatments open up your airways when they are even tighter/more closed than usual, in order to make breathing easier;
- Relievers produce almost instant relief and are used as an emergency treatment for asthma symptoms or attacks. Always carry them with you for first aid treatment! Relievers, however, have no effect on the swelling in the airways or the build-up of mucus; and
- Relievers are used only when you have symptoms. If you need to use a reliever more than 3 times a week, then your asthma is not well controlled and you should also be on a controller, or your medication and technique may need to be checked by a doctor.

CONTROLLERS

Steroid Controllers

- Steroids are chemicals made by the body. One group of steroids, the corticosteroids, are used to treat asthma. Corticosteroids are different from the anabolic steroids taken by some athletes. Anabolic steroids are not used to treat asthma;
- Steroids are the strongest controller treatment for asthma;
- Your doctor should advise you on whether to decrease or increase the dose you are taking. They should never be stopped without advice and in consultation with your doctor; and
- They are best used via an inhaler.

Inhaled (breathed in) steroids: beclomethasone (sold as Beclate® and Qvar®), budesonide (sold as Budeflam®, Inflammide® and Pulmicort®), ciclesonide (sold as Alvesco®) and fluticasone (sold as Flixotide®). These may also be combined with a long acting bronchodilator as in: Foxair®, Sereflo®, Seretide®,Relvar® Dulera®, Innuvair®, Vannair® ,Symbicord®.

- Inhalation is best because the medicine goes straight to the lungs where it is needed. Because the smallest dose possible is used, side-effects are uncommon;
- The most common side-effect is a hoarse voice or oral thrush, both of which can be prevented by rinsing your mouth with water after inhalation;
- Side-effects are reduced if a spacer is used, so if you are using a high dose you should use a spacer;
- Children can take up to 4 puffs per day of most steroids without fear of severe side effects; and
- Asthmatics on higher doses of inhaled steroids should have their treatment reviewed by an expert.
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Oral steroids: prednisone (sold as Betabs Prednisone®, Meticorten®, Panafcort® and Pulmison®) and prednisolone (sold as Aspelone®, Capsoid®, Lenisolone®, Preflam® and Prelone®):

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- Oral steroids are usually given for only a short period of time (5 -7 days) to relieve an acute attack of asthma. Oral steroids for a short time are highly effective, but should not be taken without instruction from a medical practitioner;
- If you have an asthma action plan (see *Keeping Asthma Under Control*) you will have instructions on how to use them at home, if needed;
- A small group of very severe asthmatics need to take low-dose oral steroids on a long-term basis, because their asthma is not controlled despite other types of therapy; and
- Oral steroids can have serious side-effects and this form of treatment is becoming less common with better therapies. If you are on long-term oral steroids, you need to see your doctor frequently. If you are on oral steroids but are not taking inhaled steroids, then your treatment needs to be changed.

Non-Steroid Controllers

Leukotriene receptor blockers: montelukast (sold as Singulair® and Topraz®) and zafirlukast (sold as Accolate®):

- These are both available as tablets for adults. Montelukast is available for children as chewable tablets, and as a formulation that can be sprinkled on food;
- They are useful for young children and as add-on therapy for asthmatic children and adults not controlled on current controller therapy;
- They are useful in patients who also have allergic rhinitis;
- They are used to reduce the number of asthma episodes induced by the common cold in small children; and
- They are extremely safe.

Long-acting Beta agonists: formoterol (sold as Foradil®, Foratec® and Oxis®) and salmeterol (sold as Serevent®).

Inhaled long-acting beta-agonists are only given in combination with steroid controller medicines. This combination therapy may get better asthma control without having to increase the dose of the inhaler steroid. They may be used in a separate pump, together with a steroid inhaler, or as a combination in a single pump or asthma device. There are multiple combinations available, such as Foxair®, Sereflo®, Seretide®,Relvar® Dulera®, Innuvair®, Vannair®, and Symbicord®. They come in different devices and so can be tailored to your needs and ability to use the individual pump.

No medication containing long-acting beta-agonists are recommended for children below the age of 5.

RELIEVERS

Relievers are sometimes called “bronchodilators” because they open (dilate) the airways (bronchi).

Inhaled Relievers: Beta agonists: salbutamol (sold as Venteze®, Ventimax®, Asthavent®, Ventolin®), fenoterol (sold as Berotec®) and terbutaline (sold as Bricanyl®). Ipratropium (sold as Atrovent® and Ipvent®) is not recommended as a primary asthma reliver and is often in combination in a single inhaler, as ipratropium plus

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salbutamol (sold as Combivent®) and ipratropium and fenoterol (sold as Duovent®).

OTHER MEDICATIONS

Theophyllines are a unique group of medications that have both an anti-inflammatory and bronchodilator effect, though are not as effective as the genuine controllers and relievers: Aminophylline (sold as Phyllocontin SR®), theophylline (sold as Alcophyllin®, Euphyllin Retard®, Nuelin®, Sandoz Theophylline®, Solphyllin®, Theophen®, Theoplus® and Uniphyl®).

- Theophyllines have many side effects and are only used in difficult-to-control asthma patients, and where inhaled medication is not working well; and
- Long-acting theophyllines are started in low doses and are used once or twice a day. If you are taking long-acting theophyllines, your doctor may send you for a blood test to measure the level of theophylline in the blood to determine the correct dosage.

OTHER MEDICINES

- Homeopathic medicines are not commonly recommended for asthma. If you do wish to use these, please do not stop your child's usual asthma medicines as prescribed by your doctor;
- Antihistamines can be used for other allergic conditions, such as hay fever, but are not considered to be standard asthma medicines;
- Antibiotics are rarely necessary as viral infections are by far the most common triggers of asthma attacks, but your doctor may use them for a bacterial infection; and
- Cough mixtures usually do not help the cough of an asthmatic. Oral relievers may be found in small amounts in combination cough mixture remedies, but even these are not effective in an asthma attack. The cough may be a sign of poor asthma control and require inhaled reliever medicines.

KEY POINTS TO REMEMBER

Controllers

- Controllers must be used every day whether you are feeling well or unwell;
- Inhaled steroids are the most effective controller medicines;
- Inhaled steroids are safe at doses used most commonly;
- Spacers reduce the risk of side-effects; and
- Steroid tablets may need to be used in a short course for an asthma attack.
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Relievers

- Used for emergency relief of symptoms, but do not help with the underlying inflammation or swelling of the airways;
- If you need relievers a lot (more than 3 times per week), it means you are not getting enough controller medicine;
- Relievers should only be used when asthma symptoms appear, not every day; and
- The technique of using your pump will affect how well it relieves your symptoms.

Written by Prof Robin Green and Dr Mike Levin. Revised in 2012. Based on a previous version by Prof Robin Green, Dr Mike Levin and Mr Andy Gray. Updated in 2019 by Associate Prof Richard van Zyl-Smit..