جامعة الريّان

AL RAYAN UNIVERSITY

كلية الصيدلة

اسم الطالب :.....

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Management of hypertension

Adrenergic Modifiers for Hypertension

Medication*	Selected Adverse Effects	
Alpha-2-agonists (central acting)		
Clonidine	Drowsiness, sedation, dry mouth, fatigue, sexual dysfunction, rebound hypertension with abrupt discontinuance (particularly if doses are high or concomitant beta-blockers are continued), localized skin reaction to clonidine patch; possibly liver damage, Coombs-positive hemolytic anemia with methyldopa	Should be used cautiously in older patients because of orthostatic hypotension Interferes with measurements of urinary catecholamine levels by fluorometric methods Should not be combined with an alpha-1-blocker because of a risk of significant orthostatic hypotension.
Clonidine TTS (patch)		
Guanabenz		
Guanfacine		
Methyldopa		
Alpha-1-blockers		
Doxazosin	First-dose syncope, orthostatic hypotension, weakness, palpitations, headache	Should be used cautiously in older patients because of orthostatic hypotension Relieves symptoms of benign prostatic hyperplasia
Prazosin		
Terazosin		

ACE inhibitors are:

- Benazepril.
- Captopril.
- Enalapril.
- Fosinopril.
- Lisinopril.
- Moexipril.

Perindopril.

- Quinapril.
- Ramipril.
- Trandolapril.

All of the ACE inhibitors are taken orally (by mouth). One, enalapril, can also be given in intravenous (IV) form, meaning it can be delivered right to your bloodstream.

ACE inhibitors can treat the following conditions:

- High blood pressure (hypertension).
- Heart failure (including left ventricular systolic dysfunction, where the lower left chamber of the heart can't pump well).
- Heart attack.
- Prevention of heart attack and stroke in people at high risk for either.
- Preventing and slowing the progression of kidney failure in people with diabetes.

ACE inhibitors also treat several kidney diseases in people who don't have diabetes, including:

- Nephrotic syndrome (having kidney damage or its symptoms).
- Proteinuria (too much protein in your urine).
- Glomerular disease (problems with your kidney's filtration system).

- Post-transplant glomerulonephritis (kidney inflammation and filtration problems).

side effects and complication risks of these medications

- Dry cough. This is possible with all ACE inhibitors. For some people, it may go away. If it doesn't, you can ask your healthcare provider about ways to remedy it.
- Dizziness. This is common with all blood pressure medications. You shouldn't stand up too quickly after you start taking an ACE inhibitor. Standing up too quickly can make you feel dizzy or pass out.
- Headache.
- Drowsiness.
- Feeling fatigued.
- Weakness.

Less-common side effects include:

- Abnormality in taste (decreased ability to taste, or a noticeable metallic taste).
- Upset stomach or nausea.
- Rash.

Severe side effects

Certain severe side effects can happen with all ACE inhibitors. These include:

- Swelling of your face, eyes, mouth, lips, tongue, throat, or to your legs, feet or hands. Swelling is a sign of a condition called angioedema, and it can be dangerous if it affects any part of your mouth or throat. If you have this kind of swelling in your face,

mouth or throat, you should get medical attention right away.

- Jaundice (yellowing of the whites of your eyes or your skin, which can be a sign of serious liver problems).
- Allergic reactions.

Angiotensin II Receptor Blockers (ARBs)

Angiotensin II receptor blockers (ARBs) have similar effects as ACE inhibitors, another type of blood pressure drug, but work by a different mechanism. These drugs block the effect of angiotensin II, a chemical that narrows blood vessels. By doing so, they help widen blood vessels to allow blood to flow more easily, which lowers blood pressure.

Examples of ARBs include:

Atacand (candesartan)

Avapro (irbesartan)

Benicar (olmesartan)

Cozaar (losartan)

Diovan (valsartan)

Micardis (telmisartan)

Teveten (eprosartan)

What Are Some of the Side Effects?

Some of the side effects of taking ARBs include:

Dizziness, lightheadedness, or faintness upon rising, This side effect may be strongest after the first dose, especially if you have been taking a diuretic (water pill). Contact your doctor if these symptoms are persistent or severe.

Physical problems.Diarrhea, muscle cramps or weakness, back or leg pain, insomnia (difficulty sleeping), irregular heartbeat, or fast or slow heartbeat, sinusitis or upper respiratory infection. Contact your doctor if these symptoms are persistent or severe.

Confusion. Contact your doctor right away.

Severe vomiting or diarrhea. If you become sick with severe vomiting or diarrhea you may become dehydrated, which can lead to low blood pressure. Contact your doctor.

beta-blockers:

Uses

Beta-blockers have a range of uses. The sections below outline some of them.

Cardiovascular symptoms

The main use of beta-blockers is to manage cardiovascular symptoms.

- angina
- congestive heart failure
- hypertension, or high blood pressure
- irregular heartbeat

- myocardial infarction, or heart attack
- a rapid heartbeat, or tachycardia
- coronary heart disease

Migraine

recommended using propranolol and metoprolol, both of which are types of beta-blocker, as a first-line therapy for preventing migraine.

Glaucoma

Glaucoma is a condition in which pressure grows within the eye due to a buildup of fluid. It is a common cause of vision loss among older adults.

Doctors often prescribe eye drops containing beta-blockers to lower the production of this fluid and reduce pressure within the eye.

Anxiety

Beta-blockers block the effects of stress hormones. As a result, they can also reduce the physical symptoms of anxiety, such as trembling and sweating.

Overactive thyroid

Beta-blockers can reduce symptoms such as tremor and a rapid heart rate in people with an overactive thyroid.

They do this by blocking the action of thyroid hormone in the bloodstream.

Essential tremor

Beta-blockers such as propranolol and primidone can help manage essential tremor.

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Types and brands

Beta-blockers help manage a range of conditions by blocking beta receptors, which occur throughout the body.

There are three typesTrusted Source of beta receptor:

- beta-1 (B1) receptors, which occur mainly in the heart and regulate cardiac activity
- beta-2 (B2) receptors, which occur in various organs and play a role in smooth muscle relaxation and metabolic activity
- beta-3 (B3) receptors, which help break down fat cells

.

Here are some common types and brandsTrusted Source of beta-blockers:

- acebutolol (Sectral)
- atenolol (Tenormin)
- betaxolol (Kerlone)
- bisoprolol/hydrochlorothiazide (Ziac)
- bisoprolol (Zebeta)
- metoprolol (Lopressor, Toprol XL)
- nadolol (Corgard)

- propranolol (Inderal)
- sotalol (Betapace)
- carvedilol (Coreg)

Side effects

Beta-blockers affect receptors throughout the body and can have a range of side effectsTrusted Source, including:

- slow heartbeat, or bradycardia
- low blood pressure
- cold feet and hands
- fatigue
- nausea and vomiting
- weakness and dizziness
- abdominal discomfort
- constipation
- sleeping difficulties and disturbances
- erectile dysfunction
- memory loss
- confusion
- fluid retention, or edema, which may occur when a person starts using carvedilol

People with Raynaud's disease or asthma may have more pronounced side effects.

There is also a risk of heart block, especially in people with heart disease.

Cautions

People should advise their doctor if they have a history of any of the following before taking beta-blockers:

- asthma, though some types may be suitable
- bronchospasm
- severe peripheral artery disease, including Raynaud's disease
- a slow heart rate
- uncontrolled heart failure

People with stable heart failure can use beta-blockers.

Those who have a heart condition or chest pain and a history of cocaine use should talk with their doctor before using beta-blockers. This is because there is some debateTrusted Source about whether or not it is safe to use them in these circumstances.

People with diabetes, especially hypoglycemia, should monitor their blood sugar regularly. This is because beta-blockers can obstruct signs of low blood sugar, such as a rapid heartbeat.

Some types of beta-blocker may be safe to use during pregnancy if a doctor advises it. The doctor can advise on which beta-blockers are suitable for an individual to use after considering their full medical history.

calcium channel blockers:

There are two different types of calcium channel blockers, known as dihydropyridines and nondihydropyridines.

Dihydropyridines	Nondihydropyridines

amlodipine (Norvasc)	verapamil (Calan, Isoptin)
felodipine (Plendil)	diltiazem (Cardizem)
isradipine (DynaCirc)	
nicardipine (Cardene)	
nifedipine (Adalat, Procardia)	
nimodipine (Nimotop, Nymalize)	
nisoldipine (Sular)	

Dihydropyridines

Dihydropyridines target a specific type of calcium channel in the body. They cause the blood vessels to widen, lowering blood pressure.

It is sometimes possible for these medications to widen the blood vessels too much, resulting in swelling in the feet and legs. Doctors are careful to prescribe a dosage that reduces the risk of this happening.

Doctors may also minimize this risk by prescribing extended-release calcium channel blockers. The body absorbs this form of the drug over a longer period, which prevents the blood vessels from widening too much.

Nondihydropyridines

Nondihydropyridines widen blood vessels in the same way as dihydropyridines. However, they have additional effects on the heart that can help control a rapid heart rate.

Currently, there are only two nondihydropyridine medications.

Verapamil specifically targets heart muscle cells or the myocardium. Doctors use this drug to reduce chest pain because it relaxes blood vessels and reduces the amount of oxygen the heart requires.

Verapamil is also useful for slowing atypically rapid and potentially dangerous heart rhythms, such as supraventricular tachycardia.

Diltiazem is a medication for controlling heart dysrhythmias (rapid or irregular heart rhythms) and lowering blood pressure. In comparison with verapamil, it has a less significant effect on heart rate.

Side effects

Common side effects of calcium channel blockers include:

- fatigue
- heartburn
- facial flushing
- swelling in the abdomen, ankles, or feet

Less commonly, these medications can cause:

- constipation
- dizziness
- arrhythmia
- tingling or numbness in the hands and feet

- shortness of breath
- wheezing
- upset stomach
- difficulty swallowing
- coughing

The rarest side effects that occur with calcium channel blockers include:

- bleeding gums
- headaches
- chest pain
- fainting
- fever
- a yellow tint to the eyes and skin, known as jaundice
- rashes

If someone experiences any side effects from taking calcium channel blockers, they should see a doctor. If the side effects are causing serious problems, a doctor may change the prescription or reduce the dosage.

Direct renin inhibitors:

HOW ARE RENIN INHIBITORS USED?

Renin inhibitors are given as oral tablets for the treatment of hypertension.

WHAT ARE SIDE EFFECTS OF RENIN INHIBITORS?

Side effects associated with renin inhibitors include:

Nausea and vomiting

Diarrhea

Rash

Cough

Hyperkalemia (increase in potassium levels in the blood)

Severe hypotension (low blood pressure)

Dizziness

Headache

Angioedema (accumulation of fluid cause swelling of the area below the skin or mucosa)

Tiredness

Chest pain

Rhabdomyolysis (muscle injury)

Toxic epidermolysis (severe skin reaction)

Hyponatremia (decreased sodium levels)

Renal stones

Increased serum creatinine

Hyperuricemia (high uric acid levels in the blood)

Anaphylaxis (life-threatening allergic reactions)

Aliskiren and Suppression of the Renin–Angiotensin System

Aliskiren is highly specific for human renin and binds to the active site of renin to inhibit the production of Angi.

Diuretics

Types of diuretics include:

Thiazide diuretics, such as hydrochlorothiazide (Microzide® or Oretic®) or chlorthalidone (Hygroton® or Thalitone®).

What they do: They make your kidneys pull salt and extra water into your pee.

Selected side effects:

- Headache.
- Loss of appetite.
- Hair loss.

Loop diuretics, such as furosemide or bumetanide.

What they do: They affect part of your kidneys (the loop of Henle) to get salt and excess water out of your body.

Selected side effects:

- Dizziness.
- Diarrhea.
- Upset stomach.

Potassium-sparing diuretics, such as triamterene or amiloride.

What they do: They help your kidneys clear salt and water out of your body, but don’t let you lose too much potassium in the process.

Selected side effects:

- Gas.
- Nausea.
- Headache.

A mixture of two types in one pill, like triamterene and hydrochlorothiazide (Dyazide® or Maxzide®)

What they do: They make your kidneys move salt and extra water out while keeping you from losing too much potassium.

Selected side effects:

- Headache.
- Peeing often.

People usually take diuretics by swallowing diuretic pills, but your provider can give some diuretics through an IV in your arm during a hospital stay. Most people can take diuretics without getting serious problems from them.

What do diuretics treat?

Diuretic medications can help with:

- High blood pressure.
- Heart failure.
- Cardiomyopathy.
- Pulmonary edema.
- Ascites.
- Renal failure.
- Nephrotic syndrome.
- Diabetes insipidus.
- High intraocular pressure.
- High intracranial pressure.

Usual side effects of diuretics include:

- Peeing more than usual.
- Dizziness.
- Tiredness.
- Headache.
- Gout.
- Difficulty getting an erection.
- Low potassium (unless you’re taking a potassium-sparing type of diuretic).

- Muscle cramps.
- Heart palpitations.
- Higher blood sugar in people with diabetes.
- Dehydration.
- Unbalanced electrolytes.

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- Cardiomyopathy.
- Pulmonary edema.
- Ascites.
- Renal failure.
- Nephrotic syndrome.
- Diabetes insipidus.
- High intraocular pressure.
- High intracranial pressure.

Vasodilators:

Vasodilators are a group of medicines that dilate (open) blood vessels, which allows blood to flow more easily.

They're used to treat or prevent:

- High blood pressure (hypertension)
- Heart failure
- Preeclampsia (high blood pressure during pregnancy)
- Angina (chest pain caused by reduced blood flow to the heart)
- Pulmonary hypertension (high blood pressure that affects the arteries in your lungs)

Vasodilators are often combined with other drugs and are rarely used alone.

Types of Vasodilators

There are different types of vasodilators, including:

- Arterial dilators (mainly affect the arteries)
- Venous dilators (mainly affect the veins)
- Mixed dilators (affect veins and arteries)

Common Vasodilators

The following are commonly prescribed vasodilators:

Are You Exercising Too Much? Here's How to Tell (and Why It

Can Be Risky)

Hydralazine

ACE inhibitors

Minoxidil

Side Effects of Vasodilators

Side Effects of vasodilators may include:

Chest pain

Heart palpitations (fluttering or pounding heartbeat)

Rapid heartbeat

Fluid retention

Nausea or vomiting

Dizziness

Headache

Flushing

Excessive hair growth

Nasal congestion

Management of coronary heart disease:

Many different medicines are used to treat CHD. Usually, they either aim to reduce your blood pressure or widen your arteries.

Some heart medicines have side effects, so it may take a while to find one that works for you. A GP or specialist will discuss your options with you.

Heart medicines should not be stopped suddenly without the advice of your doctor. There is a risk that stopping your medicines may make your symptoms worse.

Antiplatelets

Antiplatelets are a type of medicine that can help reduce the risk of a heart attack. Antiplatelets thin your blood and prevent it from clotting.

Common antiplatelet medicines include:

low-dose aspirin

clopidogrel

ticagrelor

prasugrel

Statins

Cholesterol-lowering medicine called statins may be prescribed if you have high cholesterol.

Examples include:

atorvastatin

simvastatin

rosuvastatin

pravastatin

Statins work by blocking the formation of cholesterol. They also increase the number of low-density lipoprotein (LDL) receptors in the liver.

This helps remove LDL cholesterol from your blood, which makes a heart attack less likely.

Not all statins are suitable for everyone. You may need to try several different types until you find one that is suitable.

Beta blockers

Beta blockers are often used to prevent angina and treat high blood pressure. They work by blocking the effects of a particular hormone in the body. Beta blockers slow down your heartbeat and improve blood flow.

Important

Never stop taking a beta blocker without checking with your GP.

Nitrates

Nitrates are used to temporarily widen your blood vessels. Doctors sometimes refer to nitrates as vasodilators. They're available in a variety of forms, including tablets, sprays and skin patches.

Nitrates work by relaxing your blood vessels, letting more blood pass through them. This lowers your blood pressure and relieves any heart pain you have.

Nitrates can have some mild side effects, including:

headaches

dizziness

flushed skin

Angiotensin-converting enzyme (ACE) inhibitors

ACE inhibitors are commonly used to treat high blood pressure. Examples include ramipril and lisinopril. They block the activity of a hormone called angiotensin II. This hormone causes the blood vessels to narrow.

As well as stopping the heart from working so hard, ACE inhibitors improve the flow of blood around the body.

Your blood pressure will be monitored while you're taking ACE inhibitors. Regular blood tests will be needed to check that your kidneys are working properly. Around 1 in 10 people have kidney problems as a result of taking the drug.

Side effects of ACE inhibitors can include a dry cough and dizziness.

Angiotensin II receptor antagonists

Angiotensin II receptor antagonists work in a similar way to ACE inhibitors. They're used to lower your blood pressure by blocking angiotensin II.

Mild dizziness is usually the only side effect. They're often prescribed as an alternative to ACE inhibitors, as they do not cause a dry cough.

Calcium channel blockers

Calcium channel blockers also work to decrease blood pressure. They relax the muscles that make up the walls of your arteries. This causes the arteries to become wider, reducing your blood pressure.

Examples include:

amlodipine

verapamil

diltiazem

lercanidipine

Side effects include headaches and facial flushing. But these are mild and usually decrease over time.

Diuretics

Diuretics work by flushing excess water and salt from the body through urine. Diuretics are sometimes known as water pills.

Management of thrombosis:

Treatment

The most common and effective treatments for thrombosis are medications called anticoagulants. These help prevent the formation of new blood clots. Usually, a person receives injectable anticoagulants, such as heparin or low-molecular-weight heparin. These medications begin working within hours.

In emergency situations, a person with thrombosis may receiveTrusted Source medications called tissue plasminogen activators. They promote the production of the enzyme plasmin, which is involved in dissolving clots.

Long-term treatment for thrombosis typically involves medications called direct oral anticoagulants. These block parts of the coagulation process. Examples of these drugs include warfarin (Coumadin, Jantoven) and rivaroxaban (Xarelto).

People who are unable to take anticoagulant medications may instead undergo surgery to have a filter placed inside the vena cava, which is a large vein in the abdomen. The filter prevents any blood clots from traveling to the heart and lungs.

The doctor may also recommend wearing compression stockings to encourage blood flow and help reduce the risk of long-term complications from thrombosis.

Treatment side effects

People taking anticoagulation medications have an increased risk of excessive bleeding. Signs of this issue include:

- severe or excessive bruising

- bleeding gums
- prolonged or frequent nosebleeds
- coughing up or vomiting blood
- increased menstrual bleeding

The following further increase the risk of bleeding complications in people taking anticoagulants:

- being over 65 yearsTrusted Source of age
- having liver or kidney failure
- having cancer

People taking anticoagulant medications should receive emergency medical attention if they experience any of the following:

- a major injury, such as from a car accident
- a head injury
- bleeding that will not stop

Management of Asthma

Therapy is based on two classes of drugs:

Anti-inflammatory drugs

Bronchodilators

Anti-inflammatory drugs suppress the inflammation that narrows the airways. Anti-inflammatory drugs include corticosteroids (which can be inhaled, taken by mouth, or given intravenously), leukotriene modifiers, and mast cell stabilizers.

Bronchodilators help to relax and widen (dilate) the airways. Bronchodilators include beta-adrenergic drugs (both those for quick relief of symptoms and those for long-term control), anticholinergics, and methylxanthines.

Beta-Adrenergic Drugs

Short-acting beta-adrenergic drugs

Short-acting beta-adrenergic drugs are usually the best drugs for relieving asthma attacks. They also are used to prevent exercise-induced asthma. These drugs are referred to as bronchodilators because they stimulate beta-adrenergic receptors to widen (dilate) the airways. Bronchodilators that act on all beta-adrenergic receptors throughout the body (such as epinephrine) cause side effects such as rapid heartbeat, restlessness, headache, and muscle tremors. Bronchodilators (such as albuterol) that act mainly on beta-2-adrenergic receptorsMost short-acting beta-adrenergic drugs, especially the inhaled ones, act within minutes, but the effects last only 2 to 6 hours.

Long-acting beta-adrenergic drugs

Long-acting beta-adrenergic drugs are available, but they are used to prevent rather than to treat asthma attacks. Long-acting beta-adrenergic drugs are effective for about 12 hours, so people usually need two doses per day.

The long-acting beta-adrenergic drugs are not used alone because people using only long-acting beta-adrenergic drugs may have a slightly higher risk of death. Thus, doctors always give them together with inhaled corticosteroids.

Ultra–long-acting beta-adrenergic drugs

Ultra–long-acting beta-adrenergic drugs are effective for up to 24 hours, so people need only one dose per day.

Ultra–long-acting beta-adrenergic drugs are also not used alone because they may cause the same increase in the risk of death as long-acting drugs. Thus, doctors always give them together with inhaled corticosteroids.

Anticholinergic Drugs

Anticholinergic drugs, such as ipratropium and tiotropium, block acetylcholine from causing smooth muscle contraction and from producing excess mucus in the bronchi. These drugs are inhaled.

Leukotriene Modifiers

Leukotriene modifiers, such as montelukast, zafirlukast, and zileuton, also help control asthma. They are anti-inflammatory drugs that prevent the action or synthesis of leukotrienes. Leukotrienes are chemicals made by the body that cause bronchoconstriction. These drugs, which are taken by mouth, are used more to prevent asthma attacks than to treat them.

Mast Cell Stabilizers

Mast cell stabilizers, which are inhaled, include cromolyn and nedocromil. These drugs are thought to inhibit the release of inflammatory chemicals from mast cells and make the airways less likely to narrow. Thus, they are also anti-inflammatory drugs. They are useful for preventing but not treating an attack. Mast cell stabilizers may be helpful for children who have asthma and for people who develop asthma due to exercise. These drugs are very

safe and must be taken regularly even when a person is free of symptoms.

Corticosteroids

Corticosteroids block the body's inflammatory response and are exceptionally effective at reducing asthma symptoms. They are the most potent form of anti-inflammatory drugs and have been an important part of asthma treatment for decades.

Corticosteroids can be taken in several different forms. Often, inhaled versions are best because they deliver the drug directly to the airways and minimize the amount sent throughout the body. The inhaled form is used to prevent attacks and improve lung function. Inhaled corticosteroids come in several strengths and are generally used twice a day.

If taken for long periods, corticosteroids gradually reduce the likelihood of an asthma attack by making the airways less sensitive to a number of provocative stimuli. Long-term use of corticosteroids, especially larger doses taken by mouth, can cause side effects including obesity, osteoporosis, cataracts, easy bruising, skin thinning, insomnia, elevated blood glucose levels, and, very rarely, psychosis.

Immunomodulators

Omalizumab is a drug that is an antibody directed against a group of other antibodies called immunoglobulin E (IgE). Omalizumab is used in people with asthma who also have severe allergies and high levels of IgE in their blood. Omalizumab prevents IgE from binding to mast cells and thus prevents the release of inflammatory

chemicals that can narrow the airways. It can decrease requirements for oral corticosteroids and help relieve symptoms. The drug is injected subcutaneously every 2 to 4 weeks.

Benralizumab, dupilumab, mepolizumab and reslizumab a re antibodies that target molecules that cause airway inflammation (interleukins). They are used in the treatment of people with severe asthma triggered by allergens. Mepolizumab reduces the number of asthma attacks, decreases asthma symptoms, and reduces the need for corticosteroids. Mepolizumab is injected subcutaneously every 4 weeks. Reslizumab reduces the number of asthma attacks and decreases asthma symptoms. It is given intravenously every 4 weeks. Benralizumab and dupilumab may be given in addition to other asthma drugs for people who have a lot of eosinophils (a type of white blood cell) in their bloodstream.

Methylxanthines

Theophylline, a methylxanthine, is another drug that causes bronchodilation. It is now used less frequently than in the past. Theophylline is usually taken by mouth. Oral theophylline comes in many forms, from short-acting tablets and syrups to longer-acting sustained release capsules and tablets. Theophylline is used mainly for prevention of asthma.

Other drugs that may be given for chronic asthma include lidocaine or heparin given with a nebulizer, colchicine, and intravenous immune globulin.

Management of COPD:

Bronchodilators

Bronchodilators are medications that usually come in inhalers — they relax the muscles around your airways. This can help relieve coughing and shortness of breath and make breathing easier.

Depending on the severity of your disease, you may need a short-acting bronchodilator before activities, a long-acting bronchodilator that you use every day or both.

Examples of short-acting bronchodilators include:

- Albuterol (ProAir HFA, Ventolin HFA, others)
- Ipratropium (Atrovent HFA)
- Levalbuterol (Xopenex)

Examples of long-acting bronchodilators include:

- Aclidinium (Tudorza Pressair)
- Arformoterol (Brovana)
- Formoterol (Perforomist)
- Indacaterol (Arcapta Neoinhaler)
- Tiotropium (Spiriva)
- Salmeterol (Serevent)

- Umeclidinium (Incruse Ellipta)

Inhaled steroids

Inhaled corticosteroid medications can reduce airway inflammation and help prevent exacerbations. Side effects may include bruising, oral infections and hoarseness. These medications are useful for people with frequent exacerbations of COPD. Examples of inhaled steroids include:

- Fluticasone (Flovent HFA)
- Budesonide (Pulmicort Flexhaler)

Combination inhalers

Some medications combine bronchodilators and inhaled steroids. Examples of these combination inhalers include:

- Fluticasone and vilanterol (Breo Ellipta)
- Fluticasone, umeclidinium and vilanterol (Trelegy Ellipta)
- Formoterol and budesonide (Symbicort)
- Salmeterol and fluticasone (Advair HFA, AirDuo Digihaler, others)

Combination inhalers that include more than one type of bronchodilator also are available. Examples of these include:

- Aclidinium and formoterol (Duaklir Pressair)
- Albuterol and ipratropium (Combivent Respimat)
- Formoterol and glycopyrrolate (Bevespi Aerosphere)
- Glycopyrrolate and indacaterol (Utibron)
- Olodaterol and tiotropium (Stiolto Respimat)

- Umeclidinium and vilanterol (Anoro Ellipta)

Oral steroids

For people who experience periods when their COPD becomes more severe, called moderate or severe acute exacerbation, short courses (for example, five days) of oral corticosteroids may prevent further worsening of COPD. However, long-term use of these medications can have serious side effects, such as weight gain, diabetes, osteoporosis, cataracts and an increased risk of infection.

Phosphodiesterase-4 inhibitors

A medication approved for people with severe COPD and symptoms of chronic bronchitis is roflumilast (Daliresp), a phosphodiesterase-4 inhibitor. This drug decreases airway inflammation and relaxes the airways. Common side effects include diarrhea and weight loss.

Theophylline

When other treatment has been ineffective or if cost is a factor, theophylline (Elixophyllin, Theo-24, Theochron), a less expensive medication, may help improve breathing and prevent episodes of worsening COPD. Side effects are dose related and may include nausea, headache, fast heartbeat and tremor, so tests are used to monitor blood levels of the medication.

Antibiotics

Respiratory infections, such as acute bronchitis, pneumonia and influenza, can aggravate COPD symptoms. Antibiotics help treat episodes of worsening COPD, but they aren't generally recommended for prevention. Some studies show that

certain antibiotics, such as azithromycin (Zithromax), prevent episodes of worsening COPD, but side effects and antibiotic resistance may limit their use.

Lung therapies

Doctors often use these additional therapies for people with moderate or severe COPD:

Oxygen therapy. If there isn't enough oxygen in your blood, you may need supplemental oxygen and. **Pulmonary rehabilitation program.**

Management of diabetes:

General treatment of diabetes mellitus for all patients involves lifestyle changes, including diet and exercise.

Patients with type 1 diabetes mellitus are treated with insulin and also benefit from diet and exercise. Analogs of amylin, another hormone produced by pancreatic beta-cells, may be used as an adjunctive treatment to insulin.

Patients with type 2 diabetes mellitus are often initially treated with only diet and exercise.

If those measures are not sufficient for glycemic control, patients may be prescribed non-insulin antihyperglycemic medications.

[redacted]

Insulin is required for all patients with type 1 diabetes mellitus because they do not produce insulin (due to destruction of the pancreatic beta-cells) and will

develop ketoacidosis without it. Insulin is also used in the management of many patients with type 2 diabetes. Insulin replacement in type 1 diabetes should ideally mimic beta-cell function to provide basal and prandial requirements (physiologic replacement or basal-bolus dosing). To achieve this, different preparations of insulin and methods of administration can be used. Except for use of regular insulin, which is given IV in hospitalized patients, insulin is almost always administered subcutaneously. An inhaled insulin preparation is also available for patients who prefer not to inject themselves. It has a slightly more rapid onset of action compared to subcutaneously injected rapid acting insulin.

Insulin is typically administered as either:

- Multiple daily subcutaneous injections administered by the patient, with 2 preparations of insulin used depending on the anticipated glycemic control needs
- An insulin pump that delivers a rapid- or short-acting insulin and administers a basal rate of insulin and additional boluses with meals or for correcting a high blood glucose level.
  - **Regular insulin** is slightly slower in onset (30 to 60 minutes) than lispro and aspart but lasts longer (6 to 8 hours). It is the only insulin form for IV use.
  - **Intermediate-acting insulins** include insulin isophane (Neutral protamine Hagedorn, or NPH) and U-500 regular. The onset of action for insulin isophane is about 2 hours after injection; peak effect is 4 to 12 hours after injection, and duration of action is 18 to 26 hours. Concentrated regular insulin U-500 has a similar peak and duration of action (peak 4 to 8 hours; duration 13 to 24 hours) and can be dosed 2 to 3 times per day.
  - **Long-acting insulins,** such as insulin glargine, insulin detemir, and U-300 insulin glargine, unlike insulin isophane, have no discernible peak of action and provide a steady basal effect over 24

hours. Insulin degludec (another long-acting insulin) has an even longer duration of action of over 40 hours.

Complications of insulin treatment

The most common complication is

- Hypoglycemia

Uncommon complications include

- Hypokalemia
- Local allergic reactions
- Generalized allergic reaction
- Local fat atrophy or hypertrophy
- Circulating anti-insulin antibodies.

Oral Antihyperglycemic Medications:

1-long acting insulin sectretagogues.

Sulfonylureas: They lower plasma glucose by stimulating pancreatic beta-cell insulin secretion and may secondarily improve peripheral and hepatic insulin sensitivity by reducing glucose toxicity. (acetohexamide, chlorpropamide, tolazamide, tolbutamide)

Side effect;1-hypoglycemia- because long acting medicationsmay last for days after treatment cessation.

2-short acting insulin sectretagogues.

Biguanides (metformin) lower plasma glucose by decreasing hepatic glucose production (gluconeogenesis and glycogenolysis).

Thiazolidinediones: (troglitazone-pioglitazone, rosiglitazone)

Side effect: edema- heart failure-angina, myocardial infarction, stroke,

Alpha-glucosidase inhibitors:

Alpha-glucosidase inhibitors are less effective than other oral medications in reducing plasma glucose, and patients often stop the medications because they may cause dyspepsia, flatulence, and diarrhea.

Dipeptidyl peptidase-4 inhibitors:
(eg, alogliptin, linagliptin, saxagliptin, sitagliptin)

Sodium-glucose co-transporter 2 (SGLT2) inhibitors (bexagliflozin, canagliflozin, dapagliflozin, empagliflozin, ertugiflozin)

The most common adverse effects are genitourinary infections, especially mycotic infections. Orthostatic symptoms can also occur. SGLT-2 inhibitors can cause diabetic ketoacidosis (DKA) in patients with either type 1 or type 2 diabetes.
Dopamine agonist

Bromocriptine is a dopamine agonist that lowers hemoglobin A1C about 0.5% by an unknown mechanism. Although approved for type 2 diabetes, it is not commonly used because of potential adverse effects.

Management of UTI

A urinary tract infection (UTI) starts when bacteria get into your bladder, kidneys, or another part of your urinary tract. The best way to treat a UTI -- and to relieve symptoms like pain, burning, and an urgent need to pee -- is with antibiotics.

These medications kill bacteria that cause the infection. It's important to take them just as your doctor prescribed. A minor UTI can turn into a serious kidney or blood infection if you don't.

Which antibiotic you get and how long you take it depend on your urine culture results.

Which Antibiotic Will Work Best?

Your doctor will take a urine sample to confirm that you have a UTI. Then the lab will grow the germs in a dish for a couple of days to find out which type of bacteria you have. This is called a culture. It'll tell your doctor what type of germs caused your infection. They'll likely prescribe one of the following antibiotics to treat it before the culture comes back:

- Amoxicillin/augmentin
- Ceftriaxone (Rocephin)
- Cephalexin (Keflex)
- Ciprofloxacin (Cipro)
- Fosfomycin (Monurol)
- Levofloxacin (Levaquin)
- Nitrofurantoin (Macrodantin, Macrobid)
- Trimethoprim/sulfamethoxazole (Bactrim, Septra)

Which medication and dose you get depends on whether your infection is complicated or uncomplicated.

“Uncomplicated” means your urinary tract is normal. “Complicated” means you have a disease or problem with your urinary tract. You could have a narrowing of your ureters, which are the tubes that carry urine from your kidneys to your bladder, a narrowing in the urethra which transports urine from the bladder out of the body, or, you might have a blockage like a kidney stone or an enlarged prostate (in men). It's also possible you have a urinary fistula or a bladder diverticulum.

To treat a complicated infection, your doctor might prescribe a higher dose of antibiotics. If your UTI is severe or the infection is in your kidneys, you might need to be treated in a hospital or doctor's office with high-dose antibiotics you get through an IV.

Your doctor will also consider these factors when choosing an antibiotic:

- Are you pregnant?
- Are you over age 65?
- Are you allergic to any antibiotics?
- Have you had any side effects from antibiotics in the past?

- **RELATED:** How to Prevent Damaging Your Kidneys

How Long Should I Take Antibiotics?

Your doctor will let you know. Typically, for an uncomplicated infection, you'll take antibiotics for

2 to 3 days. Some people will need to take these medicines for up to 7 to 10 days.

For a complicated infection, you might need to take antibiotics for 14 days or more.

If you still have symptoms after completing antibiotics, a follow-up urine test can show whether the germs are gone. If you still have an infection, you'll need to take antibiotics for a longer period of time.

If you get UTIs often, you may need a prolonged course of antibiotics. And if sex causes your UTIs, you'll take a dose of the medicine right before you have sex. You can also take antibiotics whenever you get a new UTI if you're having symptoms and a positive urine culture.

Side Effects of Antibiotics

There are some, as is the case with any medicines you take. Some of these include:

- Rash
- Diarrhea
- Nausea, vomiting
- Headache
- Tendon or nerve damage

Why Should I Take the Full Dose?

Antibiotics work well against UTIs. You might start to feel better after being on the medicine for just a few days.

But even so, keep taking your medicine. If you stop your antibiotics too soon, you won't kill all the bacteria in your urinary tract.

These germs can become resistant to antibiotics. That means the meds will no longer kill these bugs in the future. So if you get another UTI, the medication you take might not treat it. Take the full course of your medicine to make sure all the bacteria are dead.

Gastrointestinal Medications

Antacids
Aluminum hydroxide, magnesium hydroxide (Mylanta, Maalox)
Calcium carbonate (Tums, Rolaids, Chooz)
Bismuth subsalicylate (Pepto-Bismol)
Sodium bicarbonate (Alka-Seltzer)

Proton Pump Inhibitors
Omeprazole (Prilosec)
Lansoprazole (Prevacid)
Rabeprazole (Aciphex)
Esomeprazole (Nexium)
Pantoprozole (Protonix)

Histamine2 Blockers
Cimetidine (Tagamet)
Ranitidine hydrochloride (Zantac)
Famotidine (Pepcid)
Nizatidine (Axid)

Promotility Agents
Metoclopramide (Reglan)

DRUGS USED IN ACID-PEPTIC DISEASES

Acid-peptic diseases include gastroesophageal reflux, peptic ulcer (gastric and duodenal), and stress-related mucosal injury. In all these conditions, mucosal erosions or ulceration arise

when the caustic effects of aggressive factors (acid, pepsin, bile) overwhelm the defensive factors of the gastrointestinal mucosa (mucus and bicarbonate secretion, prostaglandins, blood flow, and the processes of restitution and regeneration after cellular injury). Over 90% of peptic ulcers are caused by infection with the bacterium *Helicobacter pylori* or by use of nonsteroidal anti-inflammatory drugs (NSAIDs). Drugs used in the treatment of acid-peptic disorders may be divided into two classes: agents that reduce intragastric acidity and agents that promote mucosal defense.

side effects are those that affect your gastrointestinal system and include nausea and vomiting, diarrhea, constipation, flatulence, mucositis and loss of appetite

management of meningitis:

Antibiotics for adults

While there's overlap between antibiotics used to treat children and adults, some are only prescribed for adult use. This is because antibiotics can be hard on your body while trying to resolve a serious infection.

If you're 18 or older, the first line of treatment for bacterial meningitis is ceftriaxone or cefotaxime.

Other antibiotics used after the first stage include:

- ampicillin
- penicillin G

- vancomycin
- meropenem
- aztreonam
- rifampicin
- ciprofloxacin

Your doctor may adjust the type of antibiotics administered if you:

- are pregnant or breastfeeding
- have a weakened immune system
- have other preexisting health conditions
- are allergic to specific medications
- take other medications

A course of antibiotic treatment for bacterial meningitis usually lasts anywhere from or longer, depending on the type of bacteria causing your infection.

Your antibiotic regimen may also look different if you have healthcare-associated meningitis. This can happen rarely as a complication from neurosurgery, or from the implantation of a medical device such as a cerebrospinal fluid shunt, or deep brain stimulation hardware.

Antibiotics for children

Infants and children are at particular risk for bacterial meningitis. Their immune systems are less developed and more vulnerable to infections.

The type of treatment they receive depends on their age and usually lasts between 1 to 3 weeks.

Newborns under 2 months may receive:

- cefotaxime
- benzylpenicillin

A child over 2 months may receive:

- cefotaxime
- ceftriaxone
- vancomycin

Bacterial meningitis is always a medical emergency. You'll need to be in the hospital during treatment.

Your doctor will want to determine the type of infection you have but may begin an antibiotic IV treatment while still waiting for test results.

An IV is an infusion of fluid or medication delivered through a tube or needle into your body. An IV will often go into the crook of your arm or back of your hand. A secure "port" and tape keep the IV in place.

In addition to antibiotics, you might also receive the following through an IV during your bacterial meningitis treatment:

- a steroid to ease brain swelling
- fluids to keep you hydrated
- oxygen, if having trouble breathing

During your hospital stay, the medical team will carefully monitor your condition

Antibiotic side effects:

- nausea or vomiting

- abdominal pain or cramps
- diarrhea
- skin rashes
- vaginal yeast infections

management of surgi cal site infection:

Antibiotic Prophylaxis to Prevent Surgical Site Infections

such as cefazolin, cefuroxime, or ceftriaxone, and penicillin-type antibiotics, such as Augmentin, amoxicillin, and ampicillin . According to the American Center for Disease Control and Prevention (CDC) guidelines, in the absence of infection, antibiotic prophylaxis should be stopped 24 hours after surgery The antibiotic dosage should be calculated according to body weight . For efficient prevention of SSIs, prophylactic antimicrobials alone are not sufficient, so other measures must be considered such as the control of some risk factors, instrument sterilization, and proper skin preparation [

include a list of proposed antimicrobial agents to be used in different cases. For example, for uncomplicated appendectomies and laparoscopic procedures like cholecystectomies in adults, these are IV Cefazoline and IV metronidazole, cephalosporin, gentamicin, or vancomycin as alternative choices

antibiotics commonly cause the following side effects:

diarrhea.

nausea.

vomiting.

rash.

upset stomach.

sensitivity to sunlight, when taking tetracyclines.

with certain antibiotics or prolonged use, fungal infections of the mouth, digestive tract, and vagina

management of HIV infection:

There are six classes of drugs, which are usually used in combination, to treat HIV infection. Antiretroviral (ARV) drugs are broadly classified by the phase of the retrovirus life-cycle that the drug inhibits. Typical combinations include two nucleoside reverse-transcriptase inhibitors (NRTI) as a "backbone" along with one non-nucleoside reverse-transcriptase inhibitor (NNRTI), protease inhibitor (PI) or integrase inhibitors (also known as integrase nuclear strand transfer inhibitors or INSTIs) as a "base"