



Medications

A guide to medications for Chronic Obstructive Pulmonary Disease (COPD)

Do you know how each of your inhalers works to help your breathing?

Do you know the correct order in which to use your inhalers?

Are you using the proper technique to ensure your medication is working the best for you?

As part of the pulmonary rehabilitation program, you will meet with a clinical pharmacist to improve the knowledge of your pulmonary medications and your inhaler technique.

Introduction

This class provides a basic overview of medications used to treat pulmonary (lung) disorders such as emphysema, chronic bronchitis, and asthma. You may be taking some of the medications to be discussed. You may also be taking medications for other medical problems. Learning about each of your medications will help you get the most benefit from them while minimizing side effects.

Ask questions about your medications during class and your one-on-one session with the pharmacist, which may be scheduled at a later time. Bring all of your medications, including your inhalers, to this session. During this visit we will review each medication with you to ensure you are:

- Taking it in the best way to help your lung condition
- Minimizing side effects
- Avoiding drug interactions

We will also review proper inhaler technique. We will even provide recommendations to you and your doctor, if needed, to simplify and improve your medications regimen.

Objectives

By the end of the class, you should be able to:

- Discuss the basic actions and most common side effects of medications reviewed.
- Know your inhalers both by name and by how they look.
- State and show, in order, the steps involved in using an inhaler the right way.
- State the purpose of each of the medications you are taking.

$$\begin{array}{l}
 \text{Total \# of sprays} \\
 \text{available in the inhaler} \\
 \text{(on canister)} \\
 \div \\
 \text{Number of puffs} \\
 \text{used per day} \\
 = \\
 \text{Number of days} \\
 \text{inhaler should last}
 \end{array}$$

Bronchodilators

Bronchodilators work to relax the muscles around the airways in your lungs. They dilate (open up) the bronchi (airways in the lungs). This allows more air to pass through the lungs and makes the work of breathing easier. Some bronchodilators are used on an “as needed” basis to treat symptoms. Common symptoms include: wheezing, coughing, shortness of breath or difficulty breathing. Other bronchodilators are used on a regular schedule to help keep the airways open and decrease the frequency of attacks.

Beta Agonists

Available Products

Generic Name	Brand Name	Inhaler	Nebulizer	Tablets	Oral Liquid
Albuterol	Ventolin® Proventil®	X	X	X	X
Bitolterol	Tornalate®	X			
Epinephrine	Bronkaid® Medihaler-Epi® Primatene®	X	X		
Isoetharine	Bronkometer® Bronkosol®	X	X		
Isoproterenol	Medihaler-Iso® Isuprel®	X	X		
Metaproterenol	Alupent® Metaprel®	X	X	X	X
Pirbuterol	MaxAir®	X			
Salmeterol	Serevent®	X			
Terbutaline	Brethaire® Brethine®	X		X	

Actions

- Relaxes airways
- Decreases cough
- Stimulates secretion clearing mechanisms (cilia lining the airways)

Possible Side Effects

- Increased heart rate, palpitations, dizziness
- Tremor, shakiness, nervousness

Special Instructions

- Do not crush or chew long-acting tablets.
- Do not use more puffs or use more often than prescribed by your doctor (especially important with long-acting bronchodilators like salmeterol).
- Contact your doctor if you are using your fast-acting bronchodilator more times per day than usual– this may be a sign that your lungs are in trouble.
- Carry your “rescue” inhaler (usually albuterol or metaproterenol) with you at all times.
- Use your fast-acting bronchodilator first, before all other inhalers.
- Refill your medications before you run out. Learn to estimate how long each inhaler should last.

$$\begin{array}{r}
 \text{Total \# of sprays} \\
 \text{available in the inhaler} \\
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 \end{array}$$

Anticholinergics**Available Products**

Ipratropium bromide (**Atrovent**[®]) is available as an inhaler or nebulizer solution or combined with albuterol in an inhaler called **Combivent**[®].

Actions

- Blocks nerve signals that constrict (close up) airways
- Used to prevent bronchospasm
- Enhances effects of beta agonists, may decrease amount of beta agonists needed

Potential Side Effects

- Dry mouth, throat irritation, cough
- Eye irritation, blurred vision (only if sprayed in or near eyes)

Special Instructions

- Use at regularly spaced intervals around the clock to be most effective.
- Use with a spacer to minimize throat irritation and cough.
- Avoid spraying near eyes.
- Not to be used to treat shortness of breath or other symptoms (use fast-acting bronchodilator such as albuterol).

Keep the prescription label on your inhaler (rather than on the box, which might be thrown away) so you know when you filled it. Or, put a small sticker on the inhaler canister with the date you started using it.

Theophylline

Available Products

Available as liquid, tablets, long-acting tablets or capsules, and intravenous injection. Some of the most common products are:

- Slo-Bid[®]
- Theo-Dur[®]
- Theolair[®]
- Uniphyl[®]
- Slo-Phyllin[®]
- Theo 24[®]

Actions

- Relaxes airways by blocking the enzyme that causes airways to constrict
- Prevents bronchospasm
- Strengthens the diaphragm and other breathing muscles
- Stimulates the respiratory center in the brain

Potential Side Effects

- Nausea, vomiting, diarrhea (can be a sign dose is too high)
- Insomnia, restlessness, anxiety, irritability, headache
- Palpitations

Special Instructions

- Do not switch back and forth between different brands.
- Do not crush or chew long-acting tablets. Some capsules may be opened and the contents mixed with soft food before swallowing. Do not chew the beads.
- Do not take more than prescribed. Take at regularly spaced intervals.
- If you miss a dose, do not double up at your next dose; just skip the tablet and go on with your regular schedule.
- Ask your doctor or pharmacist about potential drug interactions any time a new medication is prescribed (especially antibiotics) or if you wish to take non-prescription medications (e.g., cimetidine [Tagamet[®]] can increase theophylline blood level).

- Minimize intake of coffee, tea, colas or other caffeinated drinks, as these can increase side effects of theophylline.
- Do not take non-prescription cold, allergy, asthma medications or diet pills without first checking with your doctor or pharmacist. These may contain ephedrine, pseudoephedrine, phenylpropanolamine or other stimulants that may increase the side effects of theophylline.

Anti-inflammatory Medications

Corticosteroids

Corticosteroids (commonly referred to as “steroids”) are similar to a natural hormone called cortisol that is produced by the adrenal glands in your body. When corticosteroids are used daily as prescribed, they can decrease inflammation and swelling in your airways, and decrease frequency of attacks of shortness of breath. Corticosteroids can be taken by inhalation. Side effects are usually minimal (see next page) because the medicine stays mostly in the lungs. High-dose inhaled corticosteroids and/or steroids taken by mouth have more side effects because they get into the blood and therefore have effects all over the body for prolonged periods of time.

Available Oral Inhaled Steroids

Generic Name	Brand Name
Beclomethasone	Beclovent [®] , Vanceril [®] , QVAR [®]
Dexamethasone	
Flunisolide	AeroBid [®] , AeroBid-M [®]
Fluticasone	Flovent [®]
Triamcinolone	Azmacort [®]
Budesonide	Pulmicort [®]

Notes:

Notes:

Combination Product of Inhaled Steroid with Bronchodilator

Generic Name	Brand Name
Fluticasone with salmeterol	Advair® Diskus

Available Oral Steroids

Generic Name	Brand Name
Dexamethasone	Decadron®
Methylprednisolone	Medrol®
Prednisone	Deltasone®, Orasone®
Prednisolone	Prelone®, Delta-Cortel®

Actions

- Reduces inflammation and swelling of the lining in the airways
- Reduces mucus production in the airways
- Prevents bronchospasm and constriction of the airways, making it easier to breathe
- Treats allergic symptoms: also available in nasal and topical forms

Possible Short-Term Side Effects of Oral Tablets

- Nausea, vomiting, stomach discomfort, increased appetite
- Mood changes, depression or euphoria
- Water retention, bloating
- Loss of potassium in blood
- Glucose intolerance (i.e. high blood sugar)

Possible Long-Term Side Effects (may occur if on medicine more than 1 to 2 weeks)

- Changes in body fat distribution (moon face, buffalo hump, trunk obesity), weight gain, bloating or swelling
- Muscle weakness
- Increased blood pressure
- Glucose intolerance (diabetes)
- Osteoporosis (brittle bones)
- Increased tendency to develop infections, poor healing of wounds

- Skin changes (thinning, easy bruising, stretch marks, acne)
- Vision changes, cataracts

Possible Side Effects of Inhaled Steroids

- Mouth or throat irritation, hoarseness, voice changes, cough
- Thrush (white patches of fungal infection on inside of cheeks or on the tongue – can be avoided by rinsing mouth after inhaler use)
- Short- and/or long-term side effects (those listed on page 6 under “oral tablets”) may occur if using inhaled steroids at very high doses

Special Instructions

- Must be used on a regular basis to be most effective. Try to space doses evenly throughout the day.
- Use steroid inhaler 5 to 10 minutes **AFTER** beta-agonist inhalers. Beta-agonists help to open airways before using steroid inhaler. (If using Serevent, wait about 20 minutes after Serevent before using inhaled steroids.)
- Use with a spacer to decrease risk of developing hoarseness, voice changes, cough, or thrush and to improve delivery of medication to the lungs.
- Rinse your mouth after use to remove steroid residue from your mouth to decrease risk of thrush.
- It may be better to take tablet(s) in morning since oral steroids may cause insomnia. If taking steroid more than 1 time daily, you may wish to take the last dose late in the afternoon or early evening.
- Always take steroid tablets **with food** to minimize stomach upset.
- Do not suddenly stop taking oral steroids or high dose inhaled steroids unless told to do so by your doctor.

Notes:

The order in which you take your different inhalers is important. Most times, fast-acting beta-agonists like albuterol should be used first to open up your airways and allow the maximum amount of inhaled medications to reach the lungs. Other bronchodilators (for example, Atrovent or Serevent) should follow and inhaled steroids (like Flovent) are last. It is also important to wait in between puffs of each inhaler.

What is the correct order for my inhalers?

Fill in the chart below with the correct order for your inhalers. Speak with the pharmacist if you have any questions.

Correct Order for My Inhalers

	Name of Medication	Time to wait before using next inhaler	Number of puffs and frequency	Reminders
1.				
2.				
3.				
4.				
5.				
6.				
7.				

How to Determine If Your Inhaler Is Full or Nearly Empty

Most inhalers contain more propellant than medication to allow you to get the maximum number of sprays out of the canister. Because of this, sometimes you may continue to get what seems like a full spray out even though there is no medication left. It is important that you be able to tell when you need to replace your inhaler so that you are always getting the correct amount of medication.

Calculation Method

1. Determine the maximum number of sprays available from the inhaler. This number is listed on both the box and the metal canister. Note that each type and brand of inhaler contains a different number of sprays! (For example, Azmacort has 240 sprays, and Ventolin has 200 sprays.)
2. Determine the number of sprays you will use each day by multiplying the number of puffs used with each dose by the number of times per day you use it.
3. Divide the number from Step 1 by the number from Step 2 to determine the approximate number of days your inhaler will last.

Spacer Devices

A number of spacer devices are available to help you achieve the most benefit and least amount of side effects from your inhalers. Two highly recommended devices are the AeroChamber[®] and the InspirEase[®]. Most inhalers will fit these two spacers. Others are available.

Why use a spacer?

- Increases the amount of medication that reaches the lungs
- Increases the effectiveness of medication since more is delivered into lungs when using a spacer with an aerosol inhaler
- Decreases the amount of medication deposited in mouth and throat where it can cause irritation and side effects (hoarseness, cough, bad taste, fungal infection of mouth)
- Helps to coordinate steps to use inhaler correctly since spacer serves as holding chamber for medication mist
- InspirEase[®] requires minimal effort on part of person inhaling the medication – it can be used to give medication to someone who is unable to use an inhaler without assistance

Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns. UWMC Clinic staff are also available to help at any time.

Pulmonary Rehab
206-598-3195

Clinical Pharmacists
206-598-5367

Special Instructions

Aerochamber®

- Inhale slowly. Aerochamber® will whistle if you breathe in too quickly.
- If you are unable to inhale your medication with a full deep breath, you may obtain your dose by breathing in and out back into the spacer.
- Replace Aerochamber® at least once a year; every 6 months if using high dose inhaled steroids.
- Keep mouthpiece cover in place when not in use to prevent dust from getting inside.
- Clean your Aerochamber® by rinsing it gently in a basin of warm soapy water once a week. Use mild liquid dishwashing soap. After rinsing in soapy water, rinse spacer in basin of clean warm water to remove soap. Allow pieces of the spacer to dry thoroughly before putting them back together again (letting them sit on a paper towel overnight is generally adequate). Do not run water through the spacer, scrub the inside of the spacer or use a hair dryer to dry the spacer.

InspirEase®

- Inhale slowly. If you breathe too quickly, the InspirEase® will make a musical sound.
- For each puff sprayed into the bag, breathe in and out of the bag at least 2 to 4 times.
- Inspect the bag for holes or tears before each use.
- Replace the mouthpiece on InspirEase® at least once a year, every 6 months if using high dose inhaled steroids. Replace the InspirEase® bag every month.
- Do not try to wash the bags. The mouthpiece should be washed by hand with warm water each day. Allow to dry thoroughly before each use.

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