



Living with Lung Disease



THE OHIO STATE UNIVERSITY

WEXNER MEDICAL CENTER



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Talk to your doctor or health care team if you have any questions about your care.

For more health information, go to wexnermedical.osu.edu/patiented or contact the Library for Health Information at 614-293-3707 or health-info@osu.edu.

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For a digital copy of this book, please visit <https://go.osu.edu/pted3522>.

Pulmonary Rehab as a Part of Your Care

Your doctor would like you to take part in a **Pulmonary Rehab Program** to improve your breathing and strength. Work with our doctors and staff to learn about your disease and how exercise can help you feel better.

Locations

☐ **Martha Morehouse Outpatient Care, Pavilion, Center for Wellness and Prevention**

2050 Kenny Road, Suite 1008
Columbus, OH 43221
614-293-2820

Monday, Wednesday and Friday mornings and afternoons



☐ **Outpatient Care East**

543 Taylor Avenue, Room 3068
Columbus, OH 43203
614-688-6307

Located north of The Ohio State University Wexner Medical Center East Hospital, close to I-670

Monday, Tuesday and Thursday afternoons



What to expect

We will call you to schedule 3 visits:

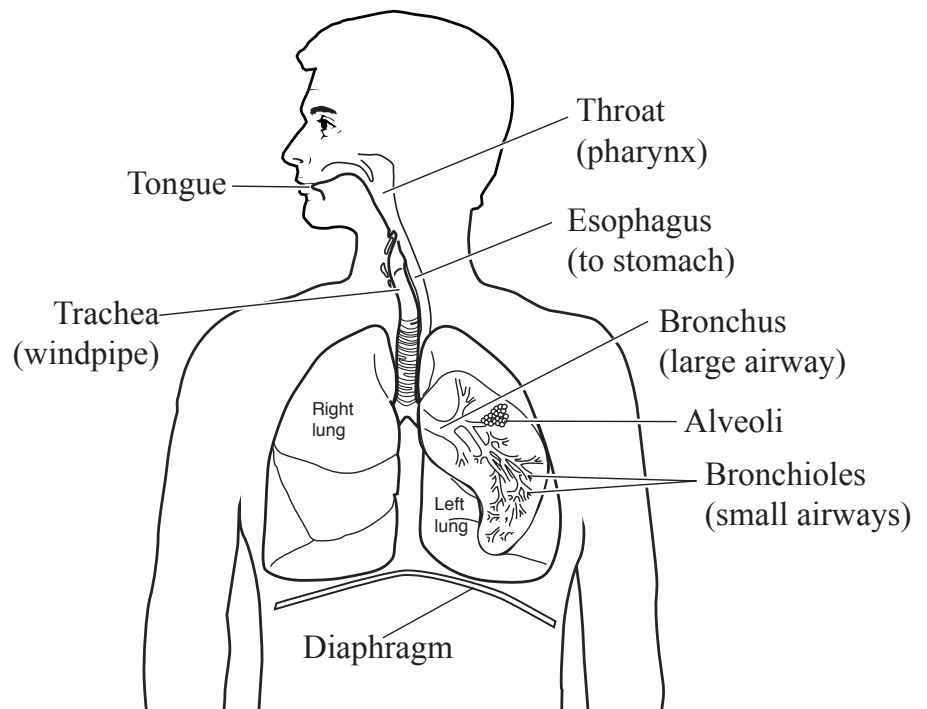
- **A testing visit:** Breathing tests are done to check your lungs.
- **An evaluation visit:** A six-minute walk is done to plan program goals for you. You are also seen by a doctor.
- **An orientation group class:** This class is an overview of the program. You also start your exercise plan.

The program lasts 8 weeks, with class 3 times each week. Classes focus on exercise and managing your disease. Your exercise plan includes weight training and aerobic exercise. Morning and afternoon class times are offered. Choose a time that best fits your schedule. Plan 1½ to 2 hours for each class.

How Your Lungs Work

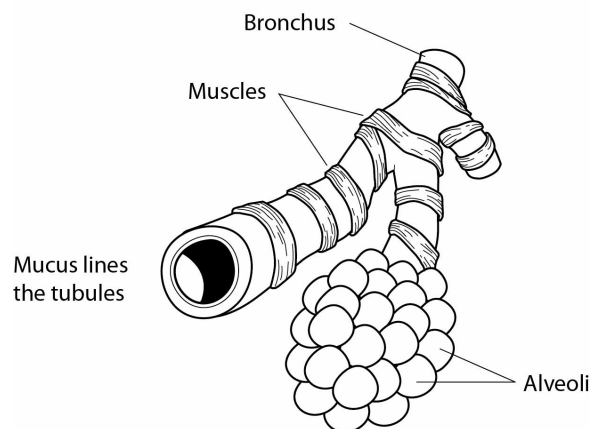
The **respiratory system** is made up of large airways (bronchi), small airways (bronchioles), lung tissue, blood vessels (capillaries) and muscles.

The **lungs** are organs that take in oxygen molecules from the air when you inhale and circulate them in your bloodstream to meet your body's energy needs. When you exhale, the lungs remove a waste gas, called carbon dioxide. The right lung has three lobes and the left lung has two lobes to make room for your heart. Together, they hold a total of 4 to 6 liters of air.



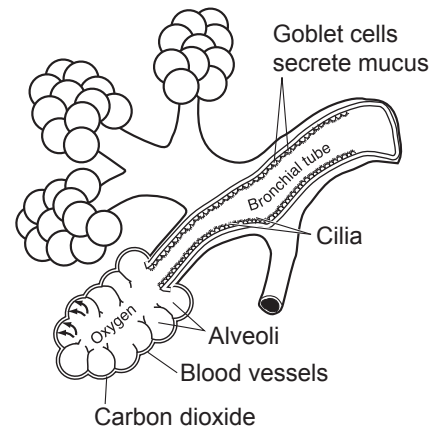
The air (oxygen) you breathe in travels down through your:

- Nose and mouth
- **Trachea** (windpipe)
- Right and left main **bronchus** (major airways)
- **Bronchi** (large airways)
- **Bronchioles** (small airways)
- **Alveoli**: these small “grape-like” sacs are where oxygen and carbon dioxide molecules are exchanged during breathing. Alveoli sacs are surrounded by **capillary blood vessels**. Both lungs are made up of millions of these thin tissue air sacs.



The **diaphragm** muscle helps the lungs expand in the chest cavity when you inhale (breathe in) by contracting and pulling down. When you exhale (breathe out), the muscle relaxes to allow air flow out of the lungs.

Mucus production by **goblet cells**, and small hairs, called **cilia**, line the respiratory system. They filter out debris and small particles, and decrease the risk of infection.

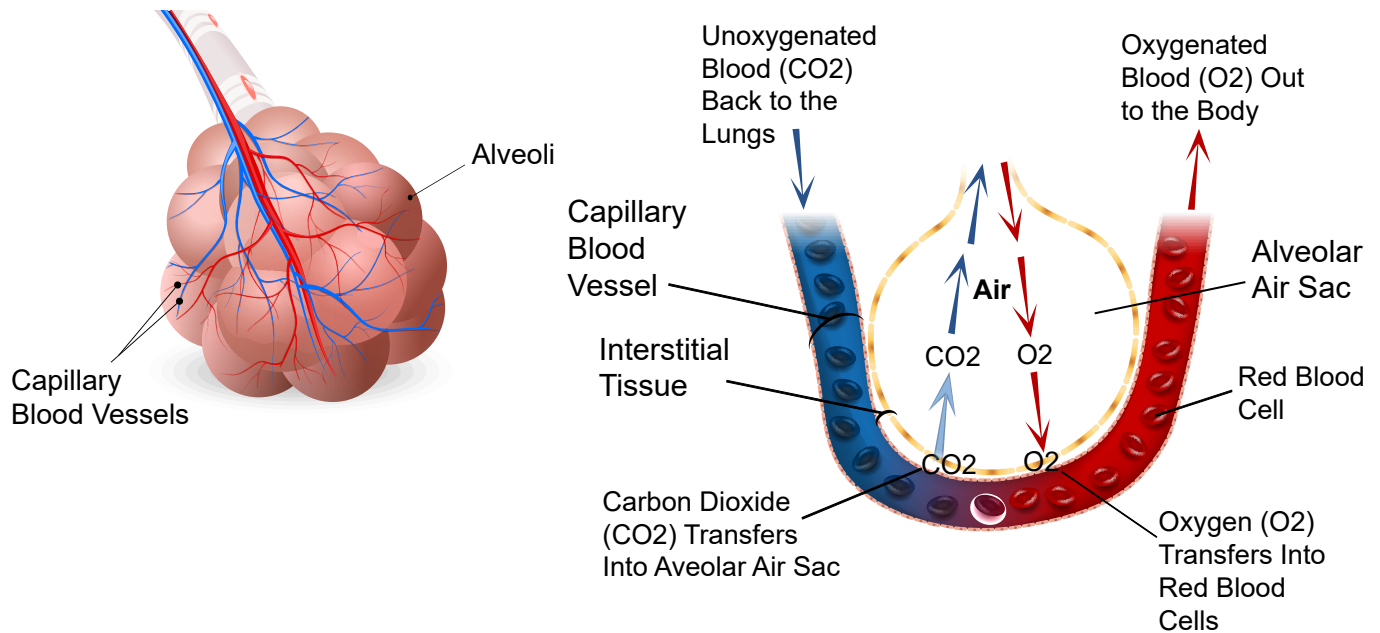


Obstructive lung disease occurs with airway inflammation, increased mucus production or air-trapping due to over-inflation of the air sacs. With air-trapping, the air sacs are not able to get air out when you exhale.

Oxygen and carbon dioxide exchange

When you inhale, oxygen (O₂) molecules transfer through thin lung tissue to enter capillary blood vessels. They attach to **hemoglobin**, a protein in red blood cells, and travel around the body in the bloodstream to be used as energy by your cells, muscles and organs.

Hemoglobin carry carbon dioxide (CO₂) molecules, a waste product, back to the lungs. There they transfer through thin lung tissue to be exhaled out of the lungs.



Restrictive lung disease occurs when oxygen and carbon dioxide is inhibited due to lung tissue scarring or thickening. Other restrictive lung diseases may be due to body shape and increased weight.

Types of Lung Disease

Lung disease prevents the lungs from working well. To find out what type of lung disease you have, your doctor may have done breathing tests, chest x-rays or a CT (computed tomography) scan. **Place a mark next to the lung disease(s) that you have.** If you are not sure, ask a staff member for help.

❑ Obstructive lung disease

Obstructive lung disease **affects the airways and air sacs (alveoli)** of the lungs. The airways narrow or become blocked, **decreasing the amount of air exhaled out of the lungs.**

People with obstructive lung disease may feel like they are trying to breathe out through a straw. Over time, the lungs may get bigger because the air gets trapped.

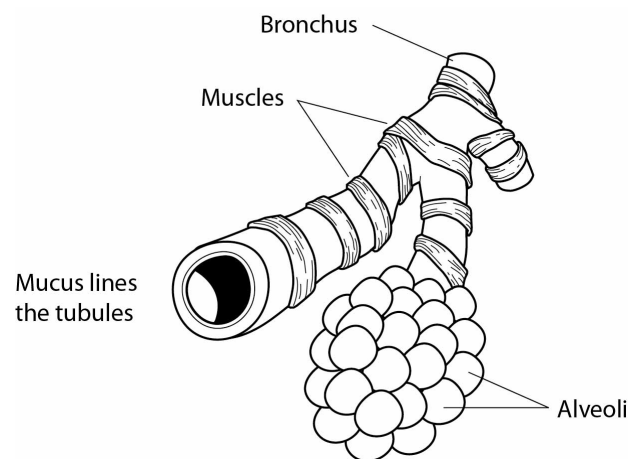
Symptoms include: shortness of breath, chest tightness, increased mucus, wheezing and coughing.

Treatments include: medicines, inhalers, oxygen use, breathing retraining, exercise, surgery or lung transplant.

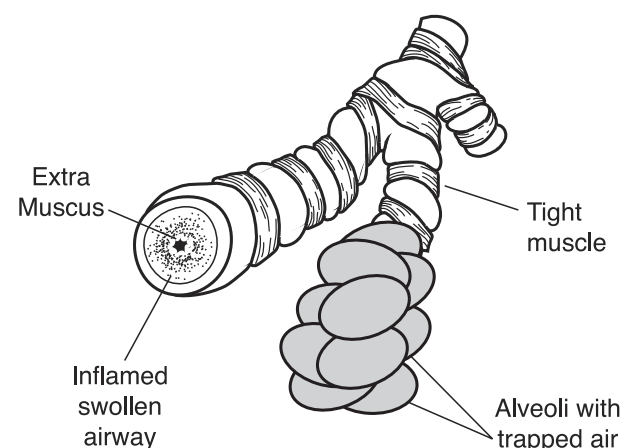
Obstructive lung diseases include:

- ❑ **Alpha-1 antitrypsin deficiency** - an air sac disease passed down through families that may cause lung and liver disease. People with this disease can develop emphysema.
- ❑ **Asthma** - lung irritants and allergens cause the airways to swell, narrow and tighten.
- ❑ **Bronchiectasis** - damage, scarring and widening of the large airways caused by recurring swelling or infection of the airways. People with this disease are at risk for frequent lung infections.
- ❑ **Bronchiolitis obliterans syndrome** - damaged and inflamed airways from chemical particles, lung infections or inflammation in lung transplant patients. This leads to scarring that blocks the airways in the lungs.

Healthy airways



Obstructive lung disease airways



- ❑ **Chronic obstructive pulmonary disease (COPD), such as emphysema and chronic bronchitis:**
 - ❑ **Chronic bronchitis** - frequent infections that cause inflamed airways, increased mucus, shortness of breath, wheezing and chest tightness. Treatment may include antibiotics, steroids and oxygen use. Chronic bronchitis means that you have had these episodes a few times a year for 2 years or more. The main cause of chronic bronchitis is smoking.
 - ❑ **Emphysema** - the air sacs lose their elasticity and become overinflated. This causes air trapping, shortness of breath and a decrease in gas exchange. The main cause of emphysema is smoking.
- ❑ **Cystic fibrosis** - a disease passed down through families that causes thick, sticky mucus to build up in the lungs, digestive tract and other areas of the body.

❑ Restrictive lung disease

Restrictive lung disease, also called **interstitial lung disease**, may affect lung tissue by causing scarring, inflammation (swelling) or thickening of lung tissue. This makes the lungs unable to expand fully. It becomes hard for the lungs to take in oxygen and release carbon monoxide. Oxygen and carbon dioxide molecules have a hard time passing through the lung tissue to enter or exit the blood stream. (See the illustrations at the bottom of page 6 to learn more about oxygen and carbon dioxide exchange.)

Other conditions, such as obesity and scoliosis or side curve to the spine, may also prevent the lungs from expanding fully and be considered a restrictive lung disease.

Symptoms of restrictive lung disease include: shortness of breath, fatigue especially with activity, chest tightening and increased mucus.

Treatments include: medicines to decrease swelling or the progression of the disease, breathing retraining, exercise, oxygen use, surgery or lung transplant.

Restrictive lung diseases include:

- ❑ **Autoimmune connective tissue disorders** may affect the connective tissue in the body and the lungs, causing inflammation, swelling, hardening and scarring.
 - ❑ **Rheumatoid arthritis** - a disorder that causes inflammation of the body's joints because of increased immune cell production. About 1 in 10 people with rheumatoid arthritis develop restrictive lung disease. Scarring of the lungs occurs from the body's over-active immune system attacking the lungs.
 - ❑ **Scleroderma** - immune cells produce more collagen, causing the body's skin to harden or scar. One type of scleroderma, called systemic sclerosis, can cause hardening or scarring in many parts of the body, including the lungs.
 - ❑ **Sjögren's syndrome** - autoimmune disease of unknown cause that causes dryness of the eyes, mouth and other body parts. Pulmonary symptoms act like interstitial lung disease, causing swelling and inflammation.
- ❑ **Bronchiolitis obliterans with organizing pneumonia (BOOP) / Cryptogenic organizing pneumonia (COP)** - a rare condition where the small airways (bronchioles) and air sacs (alveoli) become inflamed and blocked with connective tissue.

- ❑ **Hypersensitivity pneumonitis** - a disease that causes inflammation of the alveoli in the lungs due to an allergic reaction to dust, fungus, molds or chemicals. Exposure comes most often from the person's occupation or hobbies. The disease causes symptoms that are similar to the flu.
 - ❑ **Bird fancier's lung / pigeon breeder's disease** - from inhaling bird feathers or droppings.
 - ❑ **Farmer's lung** - from inhaling mold that grows on hay, straw or grain.
- ❑ **Pneumoconiosis** - a disease caused by inhaling workplace dust. The disease causes coughing and shortness of breath. It may lead to pulmonary fibrosis.
 - ❑ **Asbestosis** - from inhaling asbestos fibers.
 - ❑ **Black lung disease** - from inhaling coal dust (coal miners).
 - ❑ **Siderosis** - from inhaling iron from mines or welding fumes.
 - ❑ **Silicosis** - from inhaling silica dust.
- ❑ **Pulmonary fibrosis** - lung tissue becomes scarred overtime, making it hard to breathe. Scarring may occur from the environment, chemotherapy, radiation, certain medicines, autoimmune disease or unknown cause.
- ❑ **Sarcoidosis** - disease of unknown cause where abnormal growths, called granulomas, grow in the tissue of the lungs, skin or lymph nodes, causing inflammation. The disease may progress into pulmonary fibrosis or bronchiectasis.

❑ Other lung conditions

- ❑ **Recovery from lung transplant** - after a single or double lung transplant, pulmonary rehab is done to improve your physical strength and endurance. Preventing Infection and watching for symptoms of rejection are key during your recovery.
- ❑ **Pulmonary hypertension** - the blood vessels (pulmonary arteries) that carry blood from the heart to the lungs become hard and narrow. This causes pressure within the heart, leading to a decrease in gas exchange in the lungs. The heart has to work harder and over time weakens. Chest pain, shortness of breath, abnormal heart rhythm and heart failure can occur. Treatment may include medicines to open the pulmonary arteries and oxygen use. High pressure in these arteries is not shown with an arm blood pressure reading. It is diagnosed based on medical history, physical exam and results from tests and procedures.
- ❑ **Diaphragm disorders** - half or all of the diaphragm muscle does not work well due to nerve damage or unknown causes. You may hear this called diaphragm paralysis or eventration (thinning of the diaphragm muscle). Treatment may include chest wall muscle strengthening with breathing exercises (inspiratory muscle training), breathing retraining, surgery or phrenic nerve pacing where electrical impulses are applied to the diaphragm.
- ❑ **Chest wall restriction** - conditions, such as morbid obesity and scoliosis or side curve to the spine may prevent the lungs from fully expanding, causing shortness of breath.

Environmental Tips

There are irritants in the environment that may make breathing more difficult. Some can be avoided and some cannot. Become aware of irritants and avoid or limit your exposure.

Smoking



Smoke from tobacco products irritates the lining in your lungs. Mucus is produced, which may plug your lungs. In time, this leads to infection and may cause permanent lung damage. Avoid secondhand smoke and if you smoke, stop. Emphysema and bronchitis are largely diseases of smokers. No matter how long you have smoked, coughing and sputum may decrease when you quit.

Pollution

Watch for **air quality alerts**. These alerts are issued when there is potential for high pollution levels. People with lung disease need to stay inside to limit exposure to unhealthy air. Smoke from tobacco products is another form of pollution. Ask your family and friends not to smoke around you.

Aerosol sprays

Aerosol sprays, such as room fresheners, deodorants and oven cleaners, pollute the air in your home. Breathing in these products is irritating to your lungs. These products linger in the air making them hard to avoid. Substitute aerosol spray in your home for products that can be poured or rubbed.

Fumes

Avoid fumes that may irritate your lungs. Ventilate your cooking stove by turning on the exhaust fan or opening a nearby window to draw the cooking fumes out of the house.

Humidity

If you live in a humid area and have mildew or mold in the house, you may want to dehumidify your home. Air conditioning will do this, or you can use a dehumidifier. If your house is too dry, it can dry out the mucus linings of your airways. Use a humidifier to add moisture to the air.

Dust

Avoid activities that raise dust, such as sweeping, dusting, driving on dirt roads and mowing grass. If you must get involved in a dusty job, wear a scarf or handkerchief over your nose and mouth or buy a surgical mask to wear. This helps to filter the air that you inhale. Also, regularly clean filters in air conditioners and furnaces.

Extremely cold weather

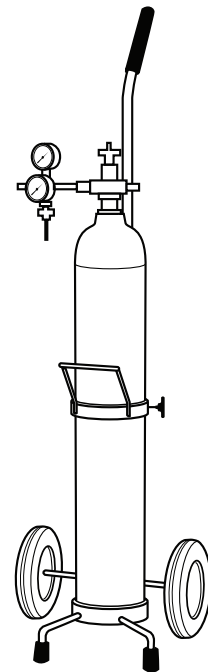


Cold air can irritate the bronchial tubes and cause coughing. When you go outdoors in very cold weather (less than 40 degrees Fahrenheit), breathe through a scarf or handkerchief held over your nose. This will help warm the air as it enters your lungs.

Oxygen Safety at Home

Oxygen itself does not burn. Oxygen can feed a spark and cause it to become a large fire in seconds. To be safe at home, **follow these fire safety guidelines.**

- **Do NOT smoke or allow anyone to smoke in the room where oxygen is being used. E-cigarettes, matches, and lighters should not be used in the room either.** A spark could ignite the oxygen, setting your face and oxygen tubing on fire! Your oxygen home care company will provide “No Smoking” signs to hang in your home.
- **Avoid open flames.** Do NOT store oxygen tanks within 10 feet of open flames, such as fireplaces, wood-burning stoves and gas stoves. When cooking, wear your tubing behind your head and down your back.
- **Use caution when using electrical equipment.** Do NOT use equipment with frayed cords or electrical shorts. They could cause a spark.
 - ▶ Use **battery powered** razors and hair dryers when using oxygen.
 - ▶ Hair dryers should be used on a **cool setting only.**
 - ▶ If you must use an electric razor or hair dryer, be sure to use it at least 5 to 10 feet away from the oxygen.
 - ▶ Do NOT use an appliance with a control box, such as a heating pad. Control boxes may throw sparks.
- **Avoid static electricity.**
 - ▶ Avoid nylon or woolen clothing that is more likely to cause static electricity.
 - ▶ Use a humidifier in winter to add moisture to dry air in your home.
- **Store and handle oxygen properly.** Store tank and liquid oxygen away from heat and direct sunlight. Secure tanks with chain as arranged by your home care therapist. Place tanks in a secure holder in an upright position.
- **Never apply any oily substance**, such as petroleum-based lip products, Vaseline®, Blistex® or Chapstick®, **to your nose, lips or the lower part of your face.** They are highly flammable. You may use saline-based products to ease dry or irritated nostrils, such as Ocean® Saline Nasal Spray or K-Y® Liquid Personal Lubricant.



Breathing Retraining

Breathing retraining can help reduce feeling short of breath and tired, and help you use less energy in your daily tasks. **Practice this breathing for 10 to 15 minutes each day.** Rest as needed between breaths.

Pursed lip breathing

This type of breathing helps during exercise or any activity that may cause you to feel short of breath. It keeps your airways open longer as you exhale to release trapped air in your lungs. **Practice this when you are resting,** so you can use it when you feel short of breath.

Follow these steps:

1. Breathe in through your nose and feel your lungs fill with air.
2. Purse your lips together as if you were going to whistle or blow out a candle.
3. Breathe out slowly through your pursed lips. **It should take 2 to 3 times longer to breathe out than it take to breathe in.**
4. You may need to adjust your breathing rate and how much you purse your lips to help your comfort.

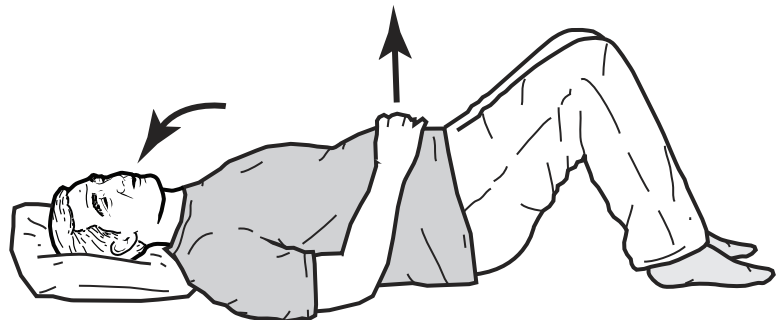


Diaphragmatic breathing

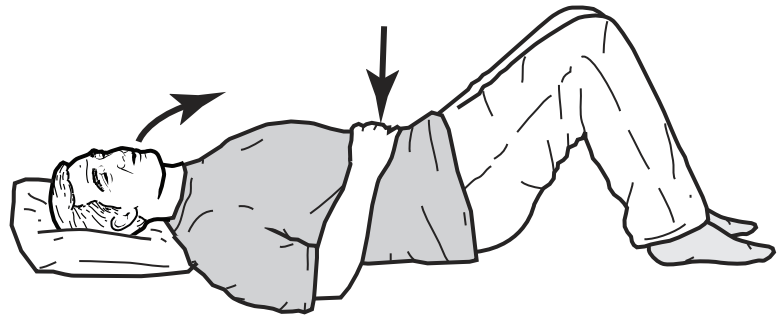
This type of breathing strengthens your diaphragm and stomach muscles to clear trapped air in your lungs.

Follow these steps:

1. Lie or sit down in a comfortable position, relaxing your neck and shoulder muscles.
2. **Place one hand on your chest and the other hand at the bottom of your ribs** just above your waistline. Use your hands to feel the movements as you breathe.
3. **Take a breath in through your nose and feel your hand on your stomach move outward. Do NOT** let your shoulders move up. **Do NOT** expand your chest. Think about expanding your lungs in all directions.



- 4. Breathe out slowly through your mouth with pursed lips** as if you were going to whistle or blow out a candle. The hand on your stomach moves in as you breathe out. You may need to pull your stomach muscles in at first to help move your diaphragm up. Exhale or breathe out at least twice as long as you take to inhale or breathe in.



Patterned breathing

This type of breathing moves the air in a pattern in and out of the lungs. It controls your shortness of breath during a burst of strenuous activity, like:

- Lifting or pushing objects
- Climbing a step or two
- Standing up from a seated position
- During strength training with upper and lower body exercises

With patterned breathing, you breathe out during the hardest part of the activity, such as lifting a weight. Remember to never hold your breath during activity.

Example 1: Standing up from a seated position.

1. Inhale while you are seated.
2. Exhale as you stand up.

Example 2: Lifting a laundry basket.

1. Inhale when bending down to grab the basket.
2. Exhale as you stand up, holding the basket.

Saving Energy and Making Work Simple

Balancing rest and activity is important when you are recovering from an injury or illness or coping with a chronic illness. Saving energy, also called conserving energy, can help you do everyday tasks without putting too many demands on your body.



5 Ps for saving energy

The way you do a task is as important as what you do. You may need to change how and when you do a task to save energy.

Consider these things when doing tasks:

- **Plan** out your daily schedule.
- **Prioritize** your tasks to get the most important things done first.
- **Pace** yourself, so you can get more done.
- **Position and posture.** Sit instead of standing when you can and use good posture.

Apply these **5 Ps for saving energy** and the tips below in your daily life to help make tasks easier.

General tips

1. Sit when doing a task. Standing takes more energy.
2. Do work with your arms instead of your legs. Working with your legs takes more energy.
3. Avoid doing activities in temperatures above 80 degrees F with humidity or below 20 degrees F. Extremes of heat or cold can have a dangerous effect on your heart.

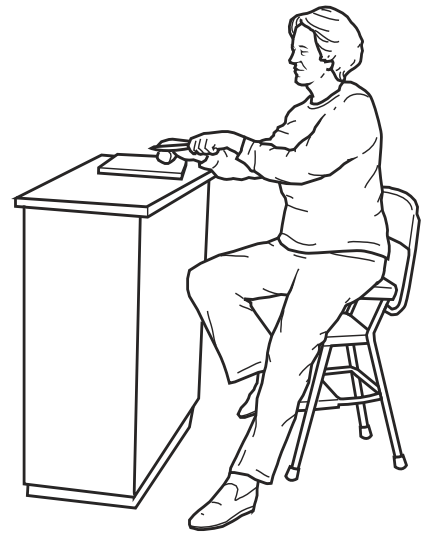
Pace yourself to save energy

1. Get at least 6 to 8 hours of sleep each night.
2. Rest for 20 to 30 minutes at least twice a day or 10 minutes every hour.
3. If you get tired, stop and rest for 15 minutes, whether you have finished the task or not.
4. Trade off between easy and hard tasks or spread a task out over the day.
5. Ask for help if the demands on your energy are too much. Hire help, if you are able to.
6. Avoid stress as much as you can.
7. Never rush.

Use labor-saving methods and devices to save energy

1. Sit to work as much as possible:

- Sit at a counter or table to prepare food.
- Use a riding lawn mower.
- Sit to dress, shave, comb your hair, or put on makeup.
- Use a shower bench in the shower and sit while you dry off.
- Put chairs around your home for places to sit and rest as needed.

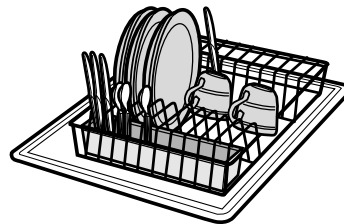


2. Organize work areas:

- Keep cleaning materials on each floor of the house.
- Store garden tools closest to where you use them.
- Store shaving items and cosmetics near the sink and mirror.
- Store equipment that you don't use often out of the way.
- Store items that you use often at chest height to avoid bending and stretching.
- Gather up all the items you need for a task to avoid extra trips.

3. Get rid of extra work:

- Use a dishwasher.
- Let dishes soak instead of scrubbing them.
- Air dry dishes rather than hand drying them.
- Cut open sealed bags instead of tearing them.
- Wear no-iron, permanent press clothes.
- Use long handled mops, dusters and dustpans.

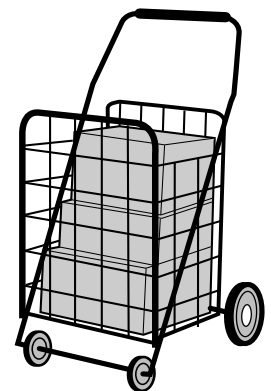


4. Use automatic or electric appliances:

- Use an electric can opener, mixer and dishwasher.
- Use an electric sander, riding mower or saw.
- Use a clothes dryer instead of hanging clothes to dry.
- Use cruise control when driving.
- Use a rubber mat or wet towel under your mixing bowls to help steady them while stirring or mixing.
- Use an automatic robot vacuum.
- Use an automatic garage door opener.

5. Use wheels to move things:

- Shopping cart for groceries.
- Garbage can on wheels.
- Cart for cleaning supplies or to move heavy bags or laundry.



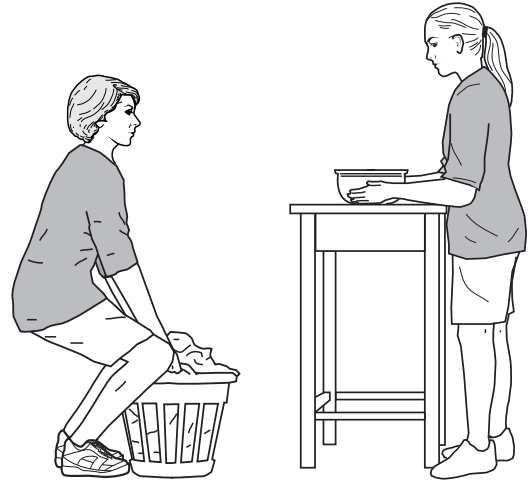
6. Use good lighting and ventilation.

7. Use both hands to:

- Lift objects, such as from the oven or refrigerator.
- Push objects.

8. Use proper body mechanics:

- Slide rather than lift, when you can.
- Relieve back strain by keeping one foot up on a low stool while standing.
- Use good posture when driving.
- Do not lean forward unsupported. Rest your elbows on a counter top instead.
- Bend at the knees to lift.
- Sit and stand using good posture.



9. Dressing and bathing tips:

- Wear clothing with buttons.
- Wear loose clothing for easier breathing.
- Sit while putting on shoes and socks.
- Wear slip on shoes. Use a long-handled shoe horn and sock aid.
- Use a terry cloth robe instead of a towel to dry off.
- To bathe, use a shower bench to sit and a hand-held shower head or a sponge with a long handle.
- Wear low-heeled shoes with shock absorbers.
- Use a raised toilet seat.



10. Shopping tips:

- Use a shopping list. Organize it in order of where things are in the store.
- Shop at less busy times.
- Use a motorized shopping cart to get around larger stores, if offered.
- Carry grocery bags half full.
- Arrange for grocery delivery or pickup, if you can.



11. Preparing meals:

- Rearrange your kitchen to put items used often in easy reach.
- Gather all the items you need to prepare the meal in your work area.
- Use easy-to-prepare ingredients, like bags of salad or pre-cut vegetables.

12. Cleaning tips:

- Make a schedule for household chores and spread it out during the week.
- Focus on cleaning one room at a time.
- Keep cleaning materials on each floor of the home.

Eight-Week Walking Program

Talk to your health care provider about how much exercise is right for you before starting any exercise program. If you have been inactive, this program can help improve your fitness. Consider investing in comfortable walking shoes to prevent injury. Walk most days of the week and over time walk longer or faster.



About the program

This program starts slowly to rebuild your strength and stamina. You will walk short distances and then rest. This is called interval training. Your speed or pace when walking will slowly increase over time.

Walk at a pace that does not leave you out of breath. Only move to the next level if you feel you can. It is okay to repeat a week if the effort needed is moderately difficult for you to achieve. The goal is to increase activity safely for your body.

| Week # | Walking interval | Rest interval | Repeat the intervals | Total activity time (minutes) |
|--------|------------------|---------------|----------------------|-------------------------------|
| 1 | 2 minutes | 1 minute | 5 times | 10 |
| 2 | 4 minutes | 2 minutes | 4 times | 16 |
| 3 | 5 minutes | 2 minutes | 4 times | 20 |
| 4 | 7 minutes | 2 minutes | 3 times | 21 |
| 5 | 5 minutes | 2 minutes | 5 times | 25 |
| 6 | 10 minutes | 2 minutes | 3 times | 30 |
| 7 | 15 minutes | 2 minutes | 2 times | 30 |
| 8 | 20 minutes | 2 minutes | 2 times | 40 |

Exercising safely

If you have chest pain, nausea or light-headedness during exercise, stop exercising and seek medical help.

Use one or more of these methods to measure how hard the exercise feels to you:

Heart Rate:

To determine your resting heart rate, take your pulse before you get out of bed in the morning:

- Find your pulse on your wrist.
- Count your pulse for 10 seconds then multiply that number by 6.
- **My resting heart rate is _____.**

During exercise:

1. Warm up for 5 minutes then check your heart rate. Exercise at 20 to 30 beats above your resting heart rate. Slow down if it is too high.
My heart rate goal for exercise is _____ to _____.
2. End with a 5 minute cool down and then check your heart rate. Your heart rate should be within 10 beats of your resting heart rate. If it is too high, continue to cool down. **My heart rate should cool down to at least _____.**

Talk Test: Exercise at a level you can hold a conversation without breathing hard.

Rate of Perceived Exertion (RPE)*:

This scale rates your effort in response to an activity. **A rating of 4 to 6 is a safe level of exertion.** This means you are comfortably tired after an activity. If your rating is less than 4, it is safe for you to increase your speed or exercise longer. If your rating is greater than a 6, slow down.

Dyspnea Rating (Breathing)*:

This scale rates shortness of breath, also called dyspnea (disp-nee-uh). **If your rating is greater than 6, slow down.** If your rating is under 6, you can safely increase your speed or exercise longer.

Rate of Perceived Exertion (RPE)*

| | | |
|----------|-------------------------------|-------------|
| 0 | No effort | |
| 0.5 | Noticeable effort | |
| 1 | Very light effort | |
| 2 | Light effort | |
| 3 | Moderate effort | |
| 4 | Somewhat strong effort | Goal |
| 5 | Strong effort | |
| 6 | | |
| 7 | Very strong effort | |
| 8 | | |
| 9 | Very, very strong effort | |
| 10 | Maximum effort | |

Dyspnea Rating (Breathing)*

| | |
|-----|---|
| 0 | No shortness of breath |
| 0.5 | Slight shortness |
| 1 | |
| 2 | Mild shortness |
| 3 | Moderate shortness |
| 4 | |
| 5 | Strong or hard breathing |
| 6 | |
| 7 | Severe shortness |
| 8 | |
| 9 | |
| 10 | Shortness so severe you need to stop and rest |

* Adapted from Borg G. Perceived exertion as an indicator of somatic stress. Scand J Rehabil Med. 1970;2: 92-98.

Nutrition and Lung Disease

When you have lung disease, it can be hard to eat the right amount of food each day, especially as your disease progresses.

Symptoms, like fatigue, shortness of breath (dyspnea), phlegm or sputum production (which can cause taste changes), depression and side effects of medicines, can alter eating habits and your preferences.

What and how much you eat can also affect your breathing by limiting your lungs' ability to expand.

Maintaining a healthy weight is important for your lung health. It can help you manage your breathing problems, handle treatments and recover from illnesses and procedures. Discuss with your lung care team what is a healthy weight for you.

Each patient with lung disease has unique needs. Work with your dietitian and other members of your lung care team to improve your nutrition to affect your long term wellness.

If you need to gain weight:

- Eat 6 or more mini meals and snacks if you cannot eat 3 substantial meals a day. This will provide your lungs more room to expand and feel less overwhelming, which will help you to eat enough overall.
- Eat at least 250 to 500 more calories a day above your normal intake. Individual needs may vary.
- Eat nutrient and calorie-dense foods, such as those with a high fat or protein content. Examples include dairy products like ice cream, whole milk, yogurt and others, mono or poly-unsaturated fats like olive, safflower or canola oil, nuts and nut butters like peanut or almond butter. For more information, please read *High Calorie High Protein Diet*.
- Avoid filling up on foods high in added sugars. Sugar is a type of carbohydrate and too many carbohydrates may produce more carbon dioxide, which may increase your work of breathing.
- Eat healthy fats, like olive oil and nuts, which improve your work of breathing and are concentrated calories. You get more energy to breathe from small portions of healthy fats.
- Avoid drinking large amounts of liquids before and during meals, which may fill you up and make it harder to breathe and eat enough.
- When you do drink liquids, choose ones high in nutrients like milk, juices, smoothies, milk shakes and other blended drinks. Do not fill up on soda, coffee, tea, broth or water as they have little nutrients or calories.

- Use liquid meal supplements between meals or as snacks. Modify to enhance flavor or increase nutrients.
 - Example products include Carnation Breakfast Essential, Ensure or Boost.
 - Homemade recipe: In a large glass, mix 8 ounces of whole milk, 1/3 cup dry milk powder and 2 tablespoons of flavored syrup, such as chocolate or strawberry. Serve cold or warm. Nutrition information: 340 calories and 22 grams of protein.
- Eat fewer foods that cause gas if you feel bloated or short of breath. While everyone is different, these may include raw apples, asparagus, beans, broccoli, cabbage, carbonated drinks, cauliflower, corn, cucumbers, melons, raw onions, peas and peppers.

If you are at a healthy weight:

Follow these general guidelines. As each person's nutritional needs are unique, discuss with your lung care team what is right for you.

- Women need about 300 to 500 calories per meal.
- Men need about 400 to 600 calories per meal.
- Eat snacks that are about 100 to 250 calories each.
- Eat a variety of healthy foods like vegetables, fruits, whole grains, dairy products and protein foods.
- Pay attention to serving sizes, especially when eating foods that are high in added sugar and low in nutrients like chips, candy, fried foods, cake, cookies and soft drinks.
- Include protein-dense foods like milk, meats, fish, poultry, eggs, beans and nuts each day to support respiratory muscle strength.

If you need to lose weight:

Not all lung patients are underweight or under nourished. Obesity can be a problem for people with lung disease due to lack of physical activity, poor food choices and certain medicines.

- Small changes can have a big impact on your health. The goal is to lose your excess fat stores without losing muscle mass or functional status (especially your lung function). Work with a dietitian or a medical weight management program to achieve your goals in a healthy way.
- Avoid fad diets as they often have the opposite effect on maintaining a healthy weight long-term.
- Structure can be helpful when starting to make healthier choices. For example:
 - Visit www.choosemyplate.gov or download the MyPlate App to learn how to create a healthy plate that includes fruits, vegetables, grains, protein foods and dairy products.
 - Read *Healthy Meals for Weight Loss*.
 - Follow a DASH (Dietary Approaches to Stopping Hypertension) eating plan to achieve a healthy weight. Visit www.nhlbi.nih.gov/health-topics/dash-eating-plan for more information, or read *Heart Healthy Eating with DASH*.

- Increase the fiber in your diet to 25 to 35 grams a day. Good sources of fiber include whole grains, nuts and seeds, fruits and vegetables. Fiber adds bulk to your diet and makes you feel full faster, helping you to manage your weight. It also aids in digestion and helps to prevent constipation. Increase your fiber intake slowly to avoid abdominal discomfort.
- Choose foods low in saturated fat and added sugars. Avoid fried and fast food meals, which contain a lot of fat, sugar and sodium.
- Discuss physical activity with your lung care team. They can help you find activities that are safe and that you enjoy. Physical activity can aid in weight loss and maintain your muscle tone and lung function. Start small. Try 15 minutes, twice a day and slowly increase to 180 minutes per week or to the goal set with your lung care team.

Other key nutrients

Calcium and vitamin D:

If you are taking a steroid or have osteopenia or osteoporosis, including foods high in calcium and vitamin D can help maintain your bone health.

The table below shows some good sources of calcium. Eat 4 servings of calcium-rich foods a day.

| Foods High in Calcium | Serving size |
|---------------------------------|---------------------|
| Milk | 1 cup |
| Yogurt, fruit flavored | 1 cup |
| Frozen yogurt | ½ cup |
| Cottage cheese | ½ cup |
| Colby, cheddar and jack cheeses | 1 ounce |
| American cheese | 1 ounce |
| Swiss cheese | 1 ounce |
| Non-fat dry milk powder | 1 tablespoon |
| Clams | 3.5 ounces |
| Sardines, canned with bones | ½ cup |
| Shrimp | 3.5 ounces |
| Orange | 1 medium |
| Calcium-fortified orange juice | 6 ounces |

The table below shows some good sources of vitamin D. Most people are not able to get enough vitamin D from foods alone. However, eating these foods will help you meet your total daily needs.

| Foods High in Vitamin D | Serving size |
|--|----------------------------|
| Cod liver oil | 1 tablespoon |
| Salmon, cooked | 3 ounces |
| Salmon, canned | 3 ounces |
| Tuna fish canned | 3 ounces |
| Shrimp, cooked | 4 ounces |
| Milk, fortified with vitamin D | 1 cup |
| Yogurt, fortified with vitamin D | 1 cup |
| Orange juice, fortified with vitamin D | 1 cup |
| Cereal, fortified with vitamin D | $\frac{3}{4}$ cup to 1 cup |
| Cheese | 1 ounce |

Vitamin D supplement:

Your doctor may take a blood sample to check your body’s vitamin D level. If it is low, your doctor may recommend taking a vitamin D supplement that is more than the Recommended Daily Allowance (RDA) to raise your vitamin D to a normal level. After a period of time using the supplement, your doctor will check your blood again to make sure that your vitamin D level has reached the recommended range.

Sodium:

Most Americans eat too much sodium. If you also have high blood pressure, heart disease or heart failure, it is even more important for you to avoid eating too much sodium.

To lower sodium in your diet:

- Eat a very low sodium diet or less than 2,000 mg of sodium a day.
- Avoid packaged, processed foods, which are high in sodium. These include condiments, frozen meals, lunch meats, canned foods, and ready-to-eat cereals, breads and baked goods.
- Do not add salt to foods. Use herbs and spices to flavor your foods instead of salt.
- Cook at home. Read food labels to help you plan low sodium meals and snacks.
- Avoid fast food meals, which are high in sodium.

For more information, read *Lowering Sodium in Your Diet* and *Making Sense Out of Food Labels*.

Please visit wexnermedical.osu.edu/patiented if you would like to read the nutrition resources mentioned in this handout, or ask your health care provider to print a copy.

About Lung Medicines

Questions to ask your doctor

When you are prescribed a new medicine, it is always good to ask your doctor questions about it before you leave the clinic office.

- What is the new medicine for and what results can I expect?
- How long do I need to be on this medicine? Some medicines may only be prescribed for a few days or weeks.
- How do I use this medicine? There may be new inhalers and devices to learn how to use.
- Does this medicine interact with my other medicines or are there any side effects I should watch for?

Things to know about your medicines

- Learn the generic and brand names of your medicines and what they are used for.
- Tell all of your doctors what prescription medicines, over the counter medicines, supplements, vitamins and herbal products you are taking. Keep a current medicine list with you.
- Do not stop taking a medicine without first talking to your doctor, even if you feel better. This includes sample medicines given to you as they need to be taken for the full time to show if they are working.
- Do not share or give your medicine to family or friends.

- Store your medicines away from heat, direct sunlight and moisture. The bathroom is the worst place to store your medicines.
- Keep all medicines out of the reach of children.
- If you have heartburn (GERD) and are not currently taking medicine for it, talk to your doctor. Gastric juices can travel up the esophagus and down into the windpipe (trachea), causing erosion of lung tissue. This can lead to interstitial lung disease.
- If you have any questions about your medicines, call your doctor's office or talk to your pharmacist.

Types of lung medicine

- **Inhalers** - Inhalers allow medicine to reach deep into the lungs. There are different types of inhalers, including dry powder inhalers (DPI), metered dose inhalers (MDI) and soft mist inhalers (SMI).
- **Nebulizer treatments** - A nebulizer changes liquid medicine into a fine mist to let you breathe it into your airways. The machine is called a compressor and may be electric or battery powered.
- **Pills and liquid medicines** - Lung medicines taken by mouth include antibiotics, steroids, cough suppressants and allergy medicines.

Obstructive Lung Disease Medicines

There are many medicines used to treat obstructive lung diseases or COPD like asthma, chronic bronchitis, bronchiectasis and emphysema. Some medicines are **short acting**, taken to prevent or quickly ease bronchospasms of the airways. Others are **long acting**, taken on a set schedule to prevent bronchospasms.

Place a mark next to the medicines you are taking. If you need help, ask a member of your care team. Please ask if you would like more written information about your medicines or if you have questions about any medicine you are taking or its side effects.

Short acting medicines

- These medicines come as inhalers and may be called “rescue” inhalers. Use these inhalers when you are having increased shortness of breath for no reason or chest tightness due to shortness of breath. The medicine acts quickly to decrease swelling and open airways caused by bronchospasms. Relief comes in 5 to 10 minutes.
- Some of these medicines come as nebulizer treatments where you inhale the medicine as a fine mist.
- **Keep your short acting medicine with you at all times in case of an emergency.**

Dosage

- Read the dose instructions that come with your medicine. If they call for 2 puffs, inhale 1 puff at a time, holding the medicine in your lungs for 5 to 10 seconds before exhaling. Wait 1 minute, and then inhale the second puff.
- If you have the medicine in the form of an inhaler AND a nebulizer treatment, use one or the other during the 4 to 6 hour time frame. **Never** use both forms together!

Timing

- Use this medicine every 4 to 6 hours as needed.
- Use your inhaler or nebulizer treatment to open your airways:
 - When you have shortness of breath
 - Before exercise or increased activity
- Remember: use it, don't abuse it! If you just walked far or up a flight of steps and have shortness of breath, don't go right to the rescue inhaler. Do pursed lip breathing and think about how long it has been since your last dose of short acting medicine.

Medicines

- **Short Acting Beta-Agonists (SABA):**
 - albuterol (Pro-Air, Proventil, Ventolin) - inhaler or nebulizer treatment
 - levalbuterol (Xopenex) - inhaler or nebulizer treatment
- **Short Acting Antimuscarinic (SAMA):**
 - ipratropium (Atrovent) - inhaler or nebulizer treatment
- **Short Acting Beta-agonists and Short Acting Antimuscarinic (SABA + SAMA):**
 - ipratropium-albuterol (Combivent) - inhaler
 - ipratropium-albuterol (Duoneb) - nebulizer treatment

Long acting medicines

These medicines are used to keep your airways open and to prevent shortness of breath and inflammation. They do not stop an active bronchospasm.

Dosage

- Read the dosing instructions that come with your medicine. If it calls for 2 puffs, inhale 1 puff at a time, holding the medicine in your lungs for 5 to 10 seconds before exhaling and repeating the dose.

Timing

- Use this medicine as directed, often 1 or 2 times a day.

Medicines

- **Long Acting Beta-Agonists (LABA):** These medicines relax and open the small airways in the lungs.
 - salmeterol (Serevent) - inhaler to be used 2 times a day
 - indacaterol (Arcapta Neohaler) - inhaler to be used 1 time a day
 - arformoterol (Brovana) - nebulizer treatment to be used 2 times a day
 - formoterol (Perforomist) - nebulizer treatment to be used 2 times a day
 - olodaterol (Striverdi Respimat) - inhaler to be used 1 time a day
- **Long Acting Antimuscarinics (LAMA):** These medicines relax and open the large airways in the lungs.
 - umeclidinium (Incruse Ellipta) - inhaler to be used 1 time a day
 - tiotropium (Spiriva) - inhaler to be used 1 time a day
 - aclidinium bromide (Tudorza Pressair) - inhaler to be used 2 times a day
 - glycopyrrolate (Seebri Neohaler) - inhaler to be used 2 times a day

- **Combination Long Acting Beta-Agonist and Long Acting Antimuscarinics (LABA +LAMA):** These medicines relax and open the large and small airways in the lungs.
 - vilanterol-umeclidinium (Anoro Ellipta) - inhaler to be used 1 time a day
 - olodaterol-tiotropium (Stiolto Respimat) - inhaler to be used 1 time a day
 - formoterol-glycopyrrolate (Bevespi Aerosphere) - inhaler to be used 2 times a day
 - indacaterol-glycopyrrolate (Utibron Neohaler) - inhaler to be used 2 times a day
- **Inhaled Corticosteroids (ICS):** These medicines contain a steroid to decrease inflammation in the lungs. Brush your teeth and tongue or rinse your mouth after use to prevent thrush, a fungal infection, which causes white sores in the mouth and throat.
 - mometasone (Asmanex) - inhaler to be used 1 to 2 times a day
 - fluticasone furoate (Arnuity Ellipta) - inhaler to be used 1 time a day
 - fluticasone (Flovent) - inhaler to be used 2 times a day
 - budesonide (Pulmicort) - inhaler to be used 2 times a day
 - beclomethasone (Qvar) - inhaler to be used 2 times a day
- **Combination Long Acting Beta-Agonist and Long Acting Inhaled Corticosteroid (LABA + ICS):** These medicines decrease inflammation in the lungs and also contain a steroid. Brush your teeth and tongue or rinse your mouth after use to prevent thrush, a fungal infection, which causes white sores in the mouth and throat.
 - formoterol-budesonide (Symbicort) to be used 2 times a day with an inhaler
 - salmeterol-fluticasone (Advair) to be used 2 times a day with an inhaler
 - formoterol-mometasone (Dulera) to be used 2 times a day with an inhaler
 - vilanterol-fluticasone (Breo Ellipta) to be used 1 time a day with an inhaler
- **Combination Inhaled Corticosteroid, Long Acting Antimuscarinic and Long Acting Beta-Agonist (ICS + LAMA + LABA):** These medicines contain a steroid to decrease inflammation in the lungs. Brush your teeth and tongue or rinse your mouth after use to prevent thrush, a fungal infection, which causes white sores in the mouth and throat. These medicines also relax and open the large and small airways in the lungs.
 - Fluticasone-umeclidinium-vilanterol (Trelegy Ellipta) - inhaler to be used 1 time a day
- **Other Medicines:**
 - roflumilast (Daliresp) - this pill is to be taken by mouth 1 time a day for severe COPD or asthma.
 - prednisone - this pill or liquid medicine is a corticosteroid that decreases inflammation in the lung tissue. It is different from inhaler medicines that decrease inflammation. It may be used short term or long term at a low dose to ease shortness of breath. Take the medicine as directed. **Do NOT stop taking this medicine suddenly.** Your doctor will instruct you how to slowly decrease your dose before stopping it completely.
 - guaifenesin (Mucinex, Vicks 44E, Robitussin and others) - this pill or liquid medicine is a cough suppressant or expectorant that thins mucus, so you can clear it from your lungs. Take the medicine as directed or follow the instructions on the medicine label for dosage.

Restrictive Lung Disease Medicines

Medicines used to treat restrictive lung diseases ease shortness of breath and other symptoms. Inhalers may not give you relief from shortness of breath as the inflammation and thickening of your lung tissue is different from the inflammation that occurs with obstructive lung disease.

Place a mark next to the medicines you are taking. If you need help, ask a member of your care team. Please ask if you would like more written information about your medicines or if you have questions about any medicine you are taking or its side effects.

Restrictive lung disease medicines

Based on your type of restrictive lung disease, these medicines may be ordered. Talk with your doctor about your symptoms of lung disease and if you find relief from your medicines. Take your medicines as directed.

- prednisone - this pill or liquid medicine is a corticosteroid that decreases inflammation in the lung tissue. It may be used short term or long term at a low dose to ease shortness of breath. **Do NOT stop taking this medicine suddenly.** Your doctor will instruct you how to slowly decrease your dose before stopping it completely.
- methotrexate - this pill decreases inflammation.
- immunosuppressive drugs - these medicines suppress the immune system to decrease inflammation.
 - mycophenolate (Cellcept) - pills or liquid
 - cyclophosphamide (Cytoxan) - pills
 - azathioprine (Imuran) - pills

Pulmonary fibrosis medicines

Medicines for pulmonary fibrosis slow the progression of fibroblast cell production in the lung tissue that cause scarring (fibrosis). Take as directed.

- pirfenidone (Esbriet) - pills are taken 3 times a day. Your doctor will work with you to increase your dose slowly to an amount that treats your symptoms while limiting side effects.
- nintedanib (Ofev) - pills are taken 2 times a day.
- prednisone - this pill or liquid medicine is a corticosteroid that decreases inflammation in the lung tissue. It may be used short term or long term at a low dose to ease shortness of breath. Take the medicine as directed. **Do NOT stop taking this medicine suddenly.** Your doctor will instruct you how to slowly decrease your dose before stopping it completely.

Medicines for Other Lung Conditions

Your doctor will work with you to manage your condition. Your treatment may include medicines to ease your symptoms. Please ask if you would like more written information about your medicines or if you have questions about any medicine you are taking or its side effects.

Place a mark next to the medicines you are taking. If you need help, ask a member of your care team.

Lung transplant medicines

Medicines for lung transplant protect the new lungs from rejection and prevent infection. Take your lung transplant medicines each day as ordered, have your labs drawn as ordered and keep your follow up appointments to prevent rejection.

- Immunosuppressive drugs - these medicines suppress the immune system to prevent rejection of the new lungs. Examples include:
 - tacrolimus - pills
 - azathioprine (Azasan, Imuran) - pills
 - cyclosporine - pills or liquid
- Anti-infection drugs - Because you take medicines to suppress the immune system, you are at increased risk for infections. These medicines treat viral, bacterial and fungal infections. Examples include:
 - sulfamethoxazole/trimethoprim (Bactrim) - pills or liquid
 - azithromycin (Zithromax) - pills or liquid
 - valacyclovir (Valtrex) - pills
 - voriconazole (Vfend) - pills or liquid
 - amoxicillin - pills or liquid

- prednisone - this pill or liquid medicine is a corticosteroid that decreases inflammation in the lung tissue. It may be used short term or long term at a low dose. **Do NOT stop taking this medicine suddenly.** Your doctor will instruct you how to slowly decrease your dose before stopping it completely.
- Other medicines - due to side effects of transplant medicines, you may be started on other medicines to help manage high blood pressure, upset stomach, heartburn (GERD), mineral deficiency like calcium and magnesium, and other problems. Talk to your doctor or any member of your care team if you notice side effects from the medicines you take.

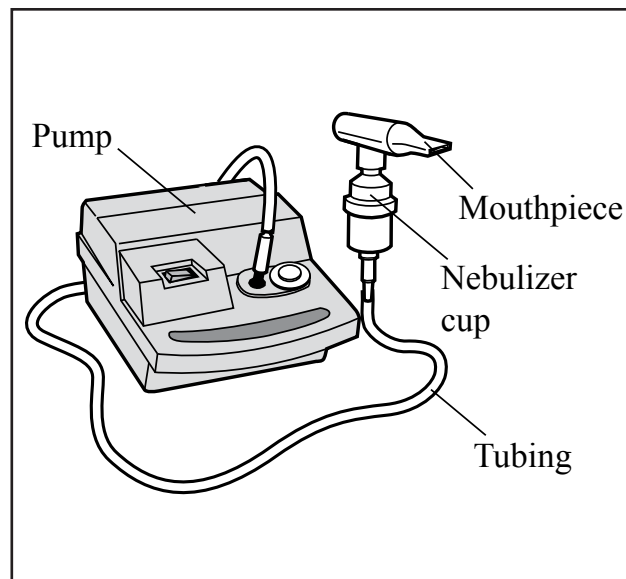
Pulmonary hypertension medicines

Medicines for pulmonary hypertension open up (dilate) the pulmonary arteries that carry blood from your heart to your lungs to pick up oxygen.

- ambrisentan (Letairis) - pills
- bosentan (Tracleer) - pills
- iloprost (Ventavis) - nebulizer treatment
- sildenafil (Revatio) - pills
- tadalafil (Adcirca, Cialis) - pills
- treprostinil (Tyvaso) - nebulizer treatment
- macitentan (Opsumit) - pills
- treprostinil (Remodulin) - continuous subcutaneous infusion
- riociguat (Adempas) - pill
- tresprostinil (Orenitram) - pill

Nebulizer Treatments

You may receive medicine through a nebulizer treatment, also called a breathing treatment or aerosol treatment. A nebulizer changes liquid medicine into a fine mist to let you breathe it into your airways. Most often the breathing treatments are given to help you breathe easier. How often you have a treatment depends on how short of breath you are, the amount of wheezing you have and the type of medicine you take.



How to take a treatment

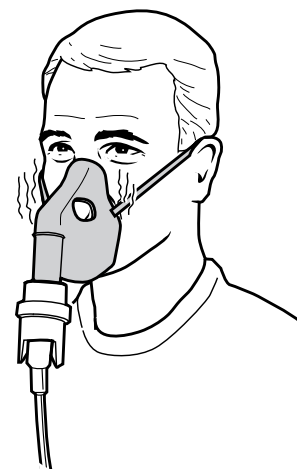
Sit down during your treatment. The treatment can be done with a mask or mouthpiece depending upon what works best for you.

- **If using a mouthpiece**, place the mouthpiece in your mouth past your teeth. Make a seal around the mouthpiece with your lips.
- **If using a mask**, place it over your mouth and nose.

You will see a fine mist when the treatment is started. Relax and breathe normally. Every 4 to 5 breaths, take a deep breath and hold it a few seconds. Then exhale completely. Continue until no mist is present.

Tap the nebulizer cup at times to be sure all the medicine is nebulized. The treatment will last about 10 to 20 minutes.

Remember to cough and bring up loose mucus at the end of your treatment.



Treatments in the hospital

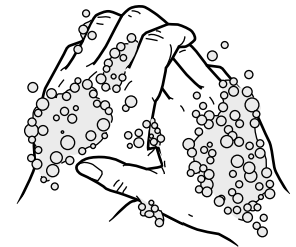
A respiratory therapist will give you your breathing treatment in the hospital as your doctor orders. The therapist will use different nebulizers, based on the type of medicine ordered. Some nebulizers break the medicine into even finer particles.

The nebulizer used in the hospital does not require cleaning. It will only be used for your treatment. It is thrown away and replaced every few days, or when it is dirty.

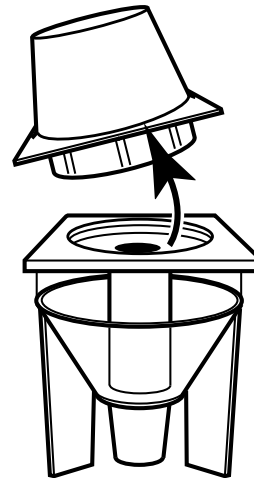
Treatments at home

Follow these steps to do your treatment at home:

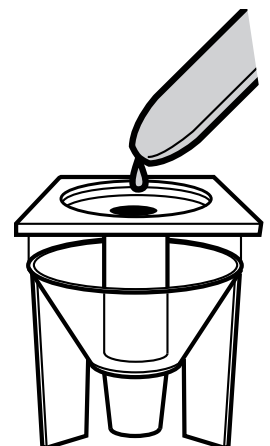
1. Wash your hands with soap and warm water. Rinse and dry your hands.
2. Gather your medicine and the right nebulizer for that medicine.
3. Check your medicine label to be sure it is the right medicine name. Also check that you have the correct dose or strength of medicine your doctor ordered. Look at the expiration date on the label and be sure that your medicine is not out of date. If the date is past, you need to get new medicine.



4. Remove the top of the nebulizer cup.



5. Measure your medicine and put it into the nebulizer cup. Use only the amount of medicine your doctor ordered. Put the top back on the cup.



6. Connect the tubing from the machine to the bottom of the cup. Connect the tubing for the mask or mouthpiece to the top of the cup.
7. Check your pulse before your treatment and write it down.
8. Turn the nebulizer on and breathe in the medicine. It is best to sit down and try to relax while you breathe.
9. Stop the treatment if:
 - Your pulse rate gets much faster.
 - You feel light headed, dizzy or shaky.
10. Wait a few minutes and if the signs go away, restart the treatment. If the signs do not go away, or if they come back when you restart the treatment, call your doctor. You may need to change your medicine or dose.
11. Clean your equipment after each treatment. Rinse the parts of the nebulizer cup and mouthpiece or mask under warm running water. Shake off the excess water and place parts on clean paper towels to air dry. Cover the parts with another clean paper towel until your next treatment.
 - You will need to do some more cleaning of your equipment at home. That is in the next section of this handout.
12. Wash your hands with soap and warm water. Rinse and dry your hands.

Clean your equipment to prevent infection

One time each day:

- Wash parts with antibacterial dish washing liquid detergent and warm water.
- Rinse parts well with warm running water.
- Place parts on paper towels to air dry. Cover with a clean paper towel until your next treatment.

On Mondays, Wednesdays and Fridays:

- **Mix up a white vinegar solution using 1 part white vinegar and 3 parts distilled water.**
 - For example, mix 1 cup of white vinegar with 3 cups of water in a container.
 - You can store any extra white vinegar solution in a tightly sealed container in your refrigerator and use it for up to one week.
- Soak the pre-washed parts in white vinegar solution for 30 to 40 minutes. All parts should be completely covered by the solution while soaking.
- Rinse the parts well with warm running water.
- Place the parts on clean paper towels to air dry. Cover lightly with a second clean paper towel until your next treatment.

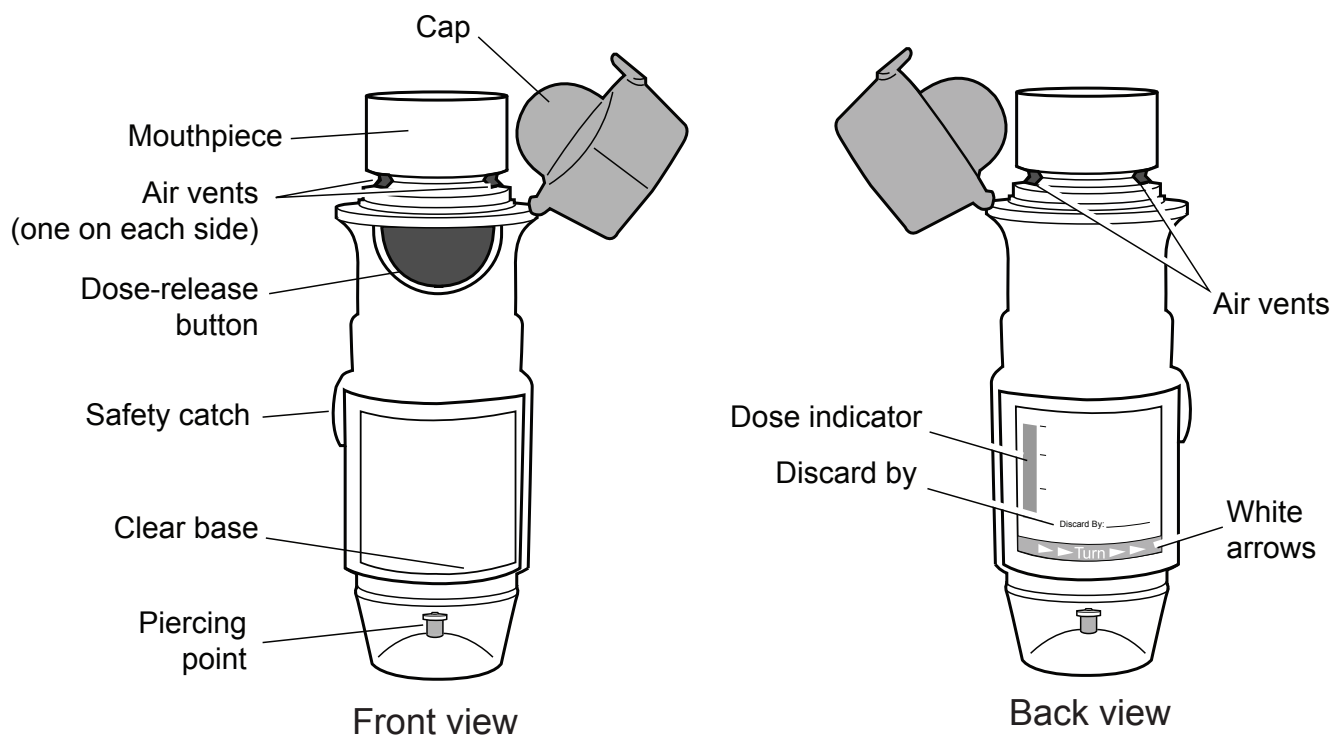
If you have any questions about your nebulizer treatment, ask your health care provider.

Respimat Soft Mist Inhaler (SMI)

The soft mist inhaler (SMI) gives medicine deep into your lungs. Talk to your health care provider if you have questions about how to use your inhaler.

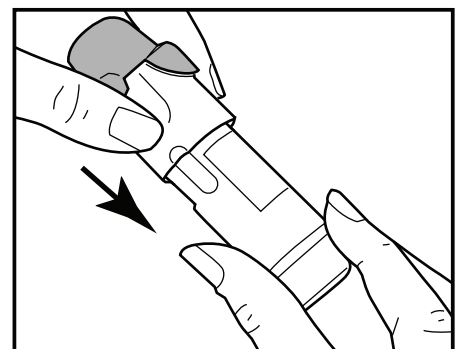
Parts of the inhaler

Use the pictures as a guide as you review the parts of your inhaler. Check the instructions that come with your inhaler each time you open a new one to be sure nothing has changed.

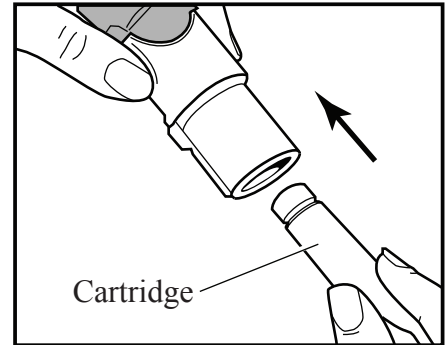


How to get the inhaler ready

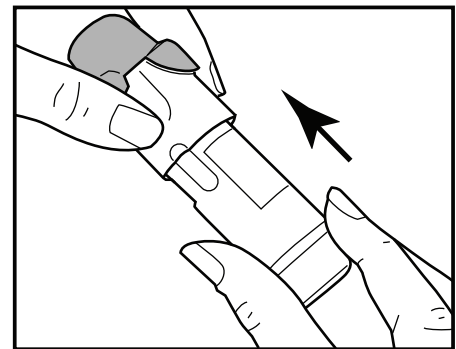
1. Wash your hands well with soap and water. Rinse with clean water and dry your hands with a towel.
2. Open the inhaler package and remove the plastic inhaler and metal cartridge. Set the cartridge to the side.
3. Push in on the Safety Catch button and pull the clear base off.



4. Write in the date you should discard the inhaler on the label on the back of the inhaler. You should discard the inhaler 3 months after you put the cartridge in.
5. Pick up the cartridge and push the narrow end into the inhaler. Put the cartridge end on a table or counter top and push down. The cartridge will stick out just past the inhaler when it is in correctly.



6. Put the clear base back on the inhaler. You should not take the inhaler apart after you have it ready for use.



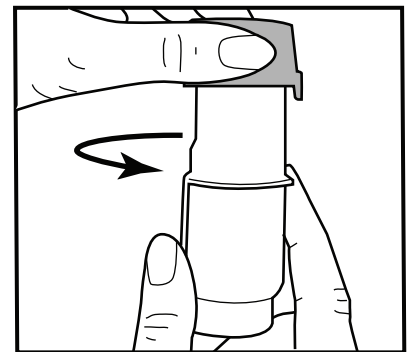
How to prime the inhaler

At times, you will need to prime the inhaler to insure you get the right amount of medicine with each dose. **Prime the inhaler if:**

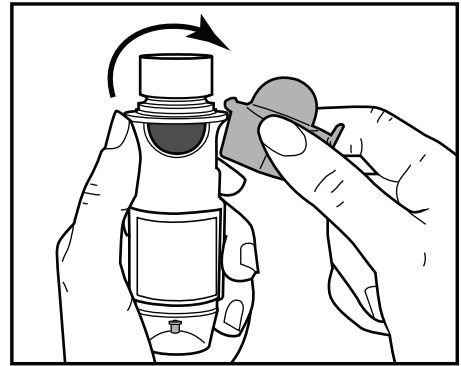
- **It is new.**
- **You have not used the inhaler for more than 3 days.**
Follow steps 1 to 4 to get the inhaler ready for use.
- **You have not used the inhaler for more than 21 days.**

Follow these steps:

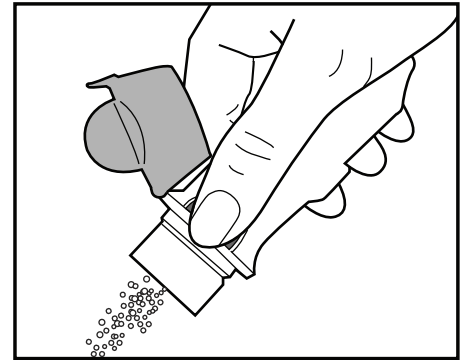
1. Hold the inhaler upright with one hand on the cap and one hand on the clear base.
2. Turn the clear base in the direction of the white arrows on the label until it clicks. It will be about half a turn.



3. Open the orange cap.



4. Point the inhaler away from you towards the ground and **press the dose release button.**



5. Close the cap and then repeat steps 1 through 4 until you see a spray of mist.

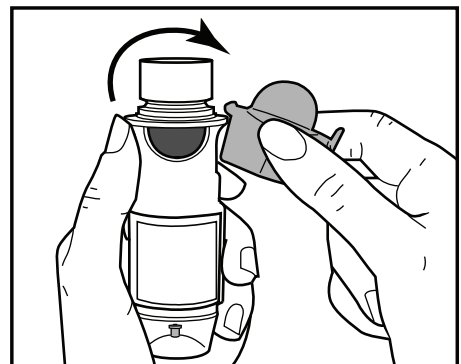
6. When you see the spray, repeat steps 1 through 4 **three more times** to be sure the inhaler is ready to use.

7. After you prime the new inhaler, you will have 120 doses left.

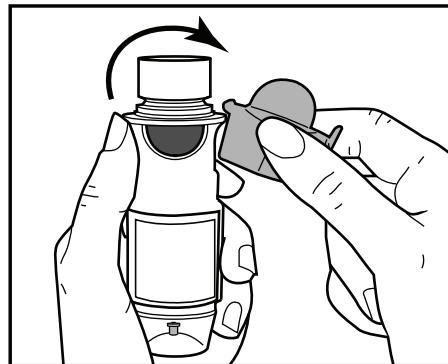
How to take your dose

1. Hold the inhaler upright with one hand on the cap and one hand on the clear base.

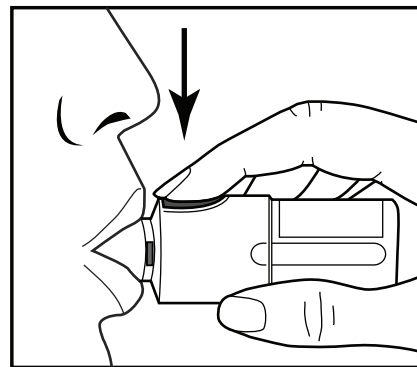
2. Turn the clear base in the direction of the white arrows on the label until it clicks. It will be about half a turn.



3. Open the orange cap.



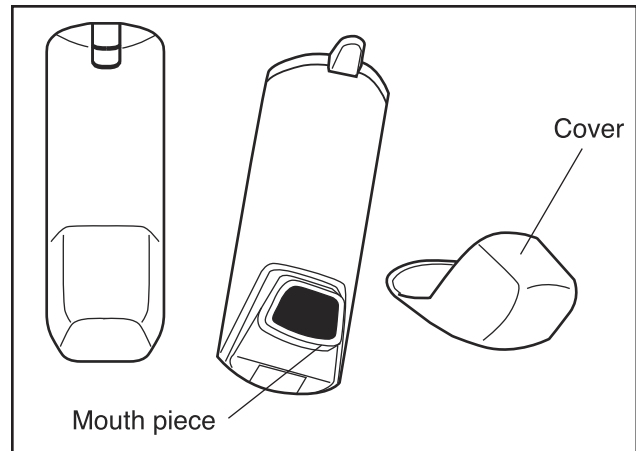
- 4. Breathe out and close your lips around the mouthpiece, pointing the inhaler to the back of your throat. **Do not cover the air vents.**
- 5. Push the dose release button while taking in a slow deep breath through your mouth.
- 6. Hold your breath for 10 seconds or as long as you can.



- 7. Remove the inhaler and put the cap back on the mouthpiece.
- 8. Rinse your mouth with water and then spit the water out. Do not swallow the water.
- 9. Put the inhaler away until your next dose is due.

Breath Actuated Metered Dose Inhaler (MDI)

A metered dose inhaler (MDI) is filled with a medicine that can be inhaled into the lungs. A breath actuated inhaler means that when you breathe in, it releases the medicine. Inhaled medicines work in the lungs right away.



How to use your inhaler

1. Shake gently and remove the cap from the mouthpiece.
2. Hold the inhaler upright and flip open the lever or take off the cap.
 - If the inhaler is new or has not been used in the last 48 hours it must be primed. Point the inhaler away from you. Lift the lever on top of the canister. Push the test fire slide button on the bottom while holding the inhaler upright. Lower the lever and repeat the steps to release the second prime spray.
3. Tilt your chin up slightly and breathe out.
4. Place your lips around the mouthpiece and begin breathing in slowly.
5. Breathe in slowly through your mouth for 3 to 5 seconds. The inhaler will release a puff of medicine.
6. Hold your breath for 10 seconds and then breathe out slowly.
7. Close the flip lever and replace the cap over the mouthpiece.

How to care for your inhaler

Your inhaler has many doses of medicine, so it is important to keep it in good working order. Use these tips to take care of your inhaler:

- Store it in a cool, dry place away from heat.
- Wipe off the mouthpiece with a dry tissue to keep it clean.
- Once a week, turn the inhaler upside down and tap so that the spray hole can be seen. Clean the hole if it gets clogged with a dry cotton swab.
- Keep the inhaler at room temperature.

How long will the inhaler last?

Check the canister label to see how many puffs of medicine it contains.

Figure out how many puffs you will use each day. Divide the number of puffs in the canister by the number you will use each day. This is how many days the canister will last.

For example, if your canister has 200 doses and you take 2 puffs, 4 times each day, that is 8 puffs a day. Dividing 200 by 8 equals 25, so the canister will last 25 days.

Write the date on the canister when you start using it so you can figure out when you will need to replace it.

Throw the canister away after you have used the number of days or puffs in the canister even if it sounds like more medicine is left. A chemical additive will be left in the canister after the medicine is gone.

Other tips

Keep track of how many doses are left by circling the start date on a calendar or writing down how many doses you use a month. **Call your pharmacist for a refill before your inhaler is empty.**

Bring your inhaler to your appointments so you can show your health care provider how you use the inhaler. Let them know if you are having problems using your MDI. If you use more than one inhaled medicine, ask about the order in which to take these medicines.

Check the expiration date and do not use the medicine after it expires.

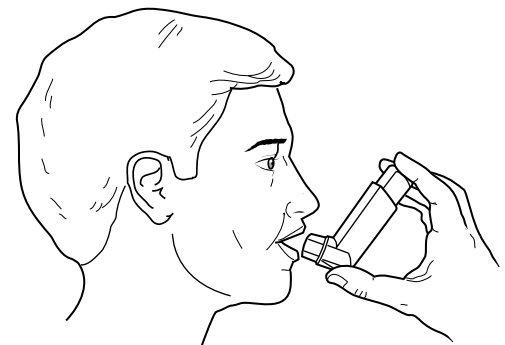
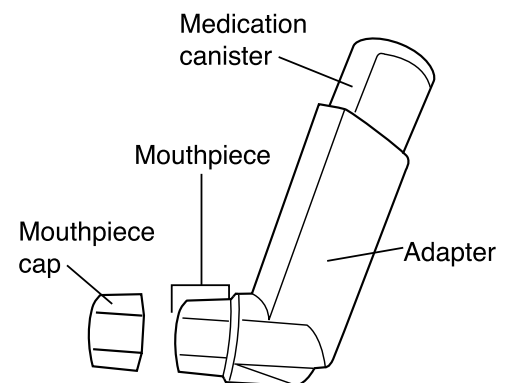
Spray Canister Metered Dose Inhaler (MDI)

Metered dose inhalers (MDI) are filled with a medicine that can be inhaled into the lungs. The spray canister MDI has the medicine in a small metal canister under pressure. The canister is placed in an L-shaped plastic holder, called an adapter, for use. When the canister is pressed down in the holder, the medicine sprays out.

How to use your inhaler

If you are using a **spacer** with your inhaler, see the next page.

1. Shake the inhaler.
2. Remove the cap. If the canister is brand new or you have not used it for several days, spray it into the air 2 or 3 times to prime it.
3. Hold the inhaler upright with the mouthpiece facing you.
4. Tilt your chin up slightly and breathe out.
5. Open your mouth and hold the inhaler 1 to 2 inches from your mouth.
6. Begin breathing in slowly through your mouth while you push down on the canister. Breathe the medicine into your lungs slowly.
7. Hold your breath for 10 seconds to let the medicine get deep into your lungs.
8. Repeat if more than 1 puff is ordered. Wait at least 1 minute between puffs.
9. Place the cap over the mouthpiece.
10. If the medicine is a steroid, rinse your mouth with water and spit the water out.

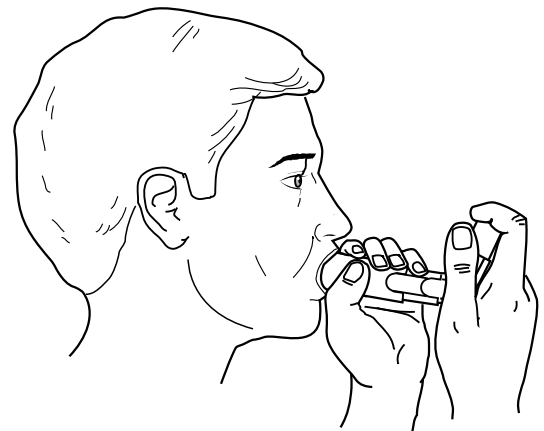
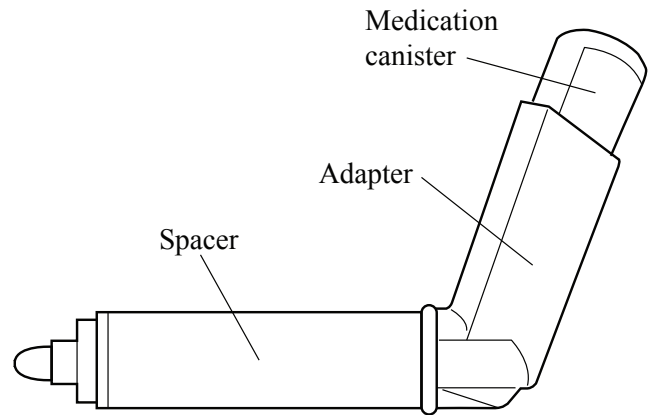


How to use a spacer with your inhaler

A spacer is a hollow tube that attaches to your inhaler. The spacer holds the medicine from your inhaler until you are able to breathe it into your lungs. A spacer helps more of the medicine get into your lungs where it is needed. A spacer is also good for people who have trouble pressing the inhaler and taking a breath at the same time.

You will need a prescription from your doctor to get a spacer. Most pharmacies will have spacers or be able to get one for you. Check with your doctor or pharmacist if you have questions about using a spacer.

1. Shake your inhaler.
2. Remove the cap from your inhaler and the spacer.
3. Hold the inhaler up and place the mouthpiece into the large end of the spacer.
4. Breathe all the way out.
5. Put your lips around the mouthpiece of the spacer.
6. Press down on the canister of your inhaler one time and take in a slow, deep breath. **If you hear a whistling sound, you are breathing in too fast and need to slow down.**
7. Hold your breath for 10 seconds. Take the spacer out of your mouth.
8. Breathe out slowly.
9. Wait at least 1 minute and repeat if another puff is ordered.



How to care for your inhaler

Your inhaler has many doses of medicine, so keep it in good working order. Use these tips to take care of your inhaler:

- Store it in a cool, dry place away from heat.
- Wipe off the mouthpiece with a dry tissue to keep it clean.
- Once a week, turn the inhaler upside down and tap, so the spray hole can be seen. Clean the hole with a dry cotton swab if it gets clogged.

How to clean the spacer

Medicine builds up inside the spacer. The spacer must be kept clean to work well.

Clean the spacer when it is cloudy inside or at least one time each week. If you use the spacer for more than one medicine, you may need to clean it every 2 to 3 days.

1. In a pan or bowl that is large enough to hold your spacer, place a few drops of antibacterial liquid dish washing soap and add warm water.
2. Place the spacer in the water to soak for 5 to 10 minutes.
3. Take the spacer apart and wash the pieces in the soapy water.
4. Rinse the parts well with clean water.
5. Shake to remove excess water and sit the spacer parts on a paper towel to air dry.
6. Make sure all parts are dry before putting it back together and using it.

When to replace a spacer

Ask your doctor for a new prescription to replace your spacer if:

- The spacer is cracked.
- Any rubber parts harden, curl or crack.
- Any part is broken or missing.
- The film inside the spacer will not come off with cleaning.

How long will the inhaler last?

Check the canister label to see how many puffs of medicine it contains.

Figure out how many puffs you will use each day. Divide the number of puffs in the canister by the number you will use each day. This is how many days the canister will last. For example, if your canister has 200 doses and you take 2 puffs 4 times each day, that is 8 puffs a day. Dividing 200 by 8 equals 25, so the canister will last 25 days.

Write the date on the canister when you start using it, so you can figure out when you will need to replace it.

Throw the canister away after you have used the number of days or puffs in the canister even if it sounds like more medicine is left. A chemical additive will be left in the canister after the medicine is gone.

Other tips

Keep track of how many doses are left by circling the start date on a calendar or writing down how many doses you use a month. **Call your pharmacist for a refill before your inhaler is empty.**

Bring your inhaler to your appointments so you can show your health care provider how you use the inhaler. Let them know if you are having trouble using the MDI. If you use more than one inhaled medicine, ask about the order in which to take these medicines.

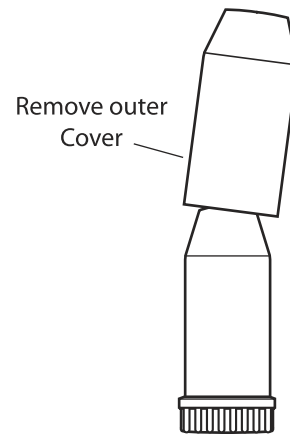
Check the expiration date and do not use the medicine after it expires.

Turbuhaler Dry Powder Inhaler (DPI)

Dry powder inhalers (DPI) are filled with powdered medicine that is inhaled into the lungs. For the Turbuhaler DPI, the powder comes in a pre-filled holder that is punctured before inhaling. You must inhale fast and deep to pull the medicine out of the holder and deep into your lungs. Inhaled medicine is a good way to take medicine because it can begin working in the lungs right away. There are fewer side effects with inhaled medicine compared to pills or liquid forms of medicine.

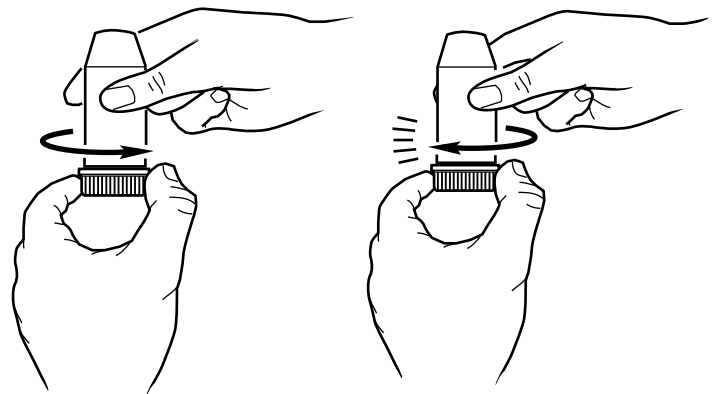
How to use your inhaler

1. Turn the cover and lift off.

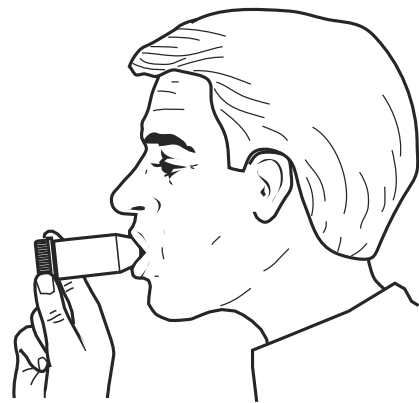


2. Hold the Turbuhaler with the mouthpiece up.
3. Twist the grip fully to the right as far as it will go. Then, turn it fully to the left until you hear a “click”.

If your inhaler is brand new, it may need to be primed before you use it. Ask your pharmacist or see the package insert to see if your inhaler needs to be primed. Prime it by turning the grip at the bottom to the right and then left until it clicks. Repeat one more time, and it will be ready for use.



4. Turn your head away from the inhaler and breathe out.
5. Seal your lips around the mouthpiece and inhale fast and deep. Do not tilt the inhaler too far.



6. Repeat steps 2 through 5 if a second dose is ordered.
7. Replace the cover and twist shut.
8. If the medicine is a steroid, rinse your mouth with water and spit the water out.

How to care for your inhaler

- Do not place your Turbuhaler in water.
- Wipe the mouthpiece off with a dry tissue or cloth if needed.
- Keep the Turbuhaler at room temperature.

How long will the inhaler last?

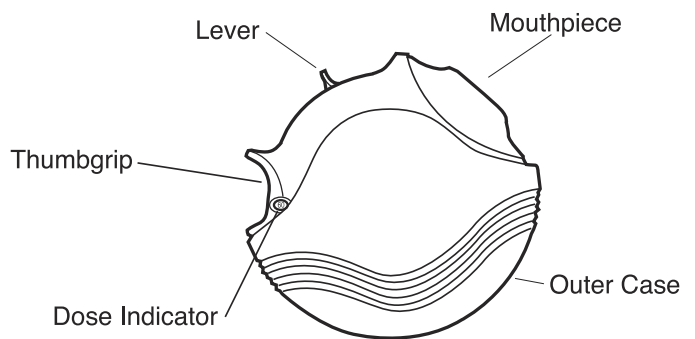
- The Turbuhaler contains 200 doses of medicine.
- A red mark appears at the top of the window when there are 20 doses of medicine left in the inhaler. When the red mark is at the bottom of the window, the inhaler is empty. Throw it away.
- **Throw away the inhaler 45 days after removing it from the wrapper or when the red mark is at the bottom of the window, whichever comes first.**

Other tips

- Keep track of how many doses are left by circling the start date on a calendar or writing down how many doses you use a month. **Call your pharmacist for a refill before your inhaler is empty.**
- Bring your inhaler to your appointments so you can show your health care provider how you use the inhaler. Let them know if you are having trouble using it. If you use more than one inhaled medicine, ask about the order in which to take these medicines.
- Check the expiration date and do not use the medicine after it expires.

Discus Dry Powder Inhaler (DPI)

Dry powder inhalers (DPI) are filled with powdered medicine that is inhaled into the lungs. For the discus DPI, the powder comes in a pre-filled holder that is punctured before inhaling. You must inhale deeply to pull the medicine out of the holder and deep into your lungs.



Inhaled medicine is a good way to take medicine because it can begin working in the lungs right away. There are fewer side effects with inhaled medicine compared to pills or liquid forms of medicine.

How to use your inhaler

1. Hold the discus flat, like holding a sandwich or hamburger.
2. Slide the cover open using your thumb.
3. Tilt your chin up slightly and breathe out.
4. Press down on the lever until it clicks.
5. Place your lips around the discus mouth piece and inhale deeply.
6. Hold your breath for 10 seconds.
7. Close the discus until your next dose.
8. If the medicine is a steroid, rinse your mouth with water and spit the water out.



How to care for your inhaler

- Do not place the discus in water.
- Wipe the mouthpiece off with a dry tissue or cloth if needed.
- Keep the discus at room temperature.

How long will the inhaler last?

- A small window on the discus shows the number of doses left in the discus.
- Discard 1 to 2 months after the discus is removed from the foil package.

Other tips

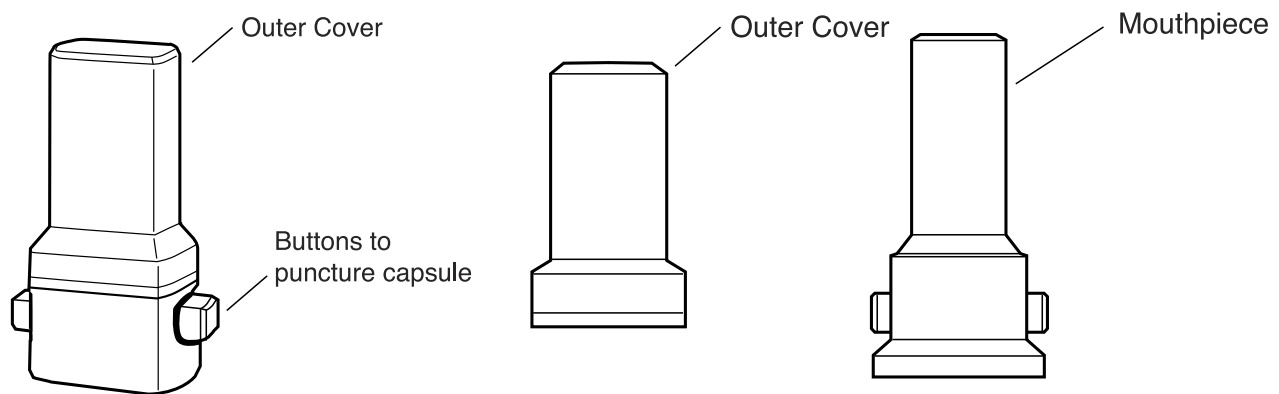
- Keep track of how many doses are left by circling the start date on a calendar or writing down how many doses you use a month. **Call your pharmacist for a refill before your inhaler is empty.**
- Bring your inhaler to your appointments so you can show your health care provider how you use the inhaler. Let them know if you are having trouble using it. If you use more than one inhaled medicine, ask about the order in which to take these medicines.
- Check the expiration date and do not use the medicine after it expires.

Capsule Aerolizer

Dry Powder Inhaler (DPI)

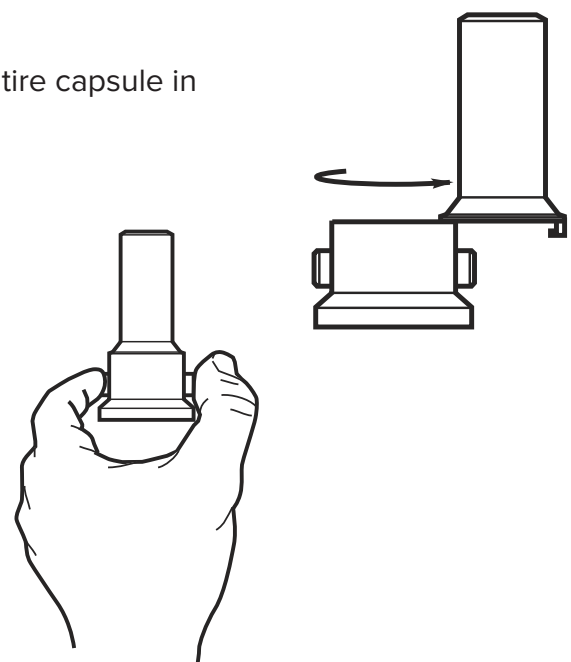
Dry powder inhalers (DPI) are filled with powdered medicine that is inhaled into the lungs. For the capsule aerolizer DPI, the powder comes in a capsule that is punctured before inhaling. You must inhale fast and deep to pull the medicine out of the holder and deep into your lungs.

Inhaled medicine is a good way to take medicine because it can begin working in the lungs right away. There are fewer side effects with inhaled medicine compared to pills or liquid forms of medicine.

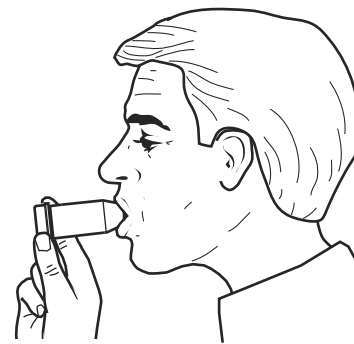


How to use your inhaler

1. Open the plastic medicine holder.
2. Open the capsule from the foil wrap and place the entire capsule in the bottom of the holder.
3. Close the holder.
4. Breathe out and press the side buttons once to puncture the capsule to release the powder.



5. Seal your lips over the mouth piece. Do not tip the holder too far.
6. Inhale at a medium speed. You will hear the capsule “rattle” in the bottom.



7. Hold your breath for 10 seconds.
8. Repeat steps 5 through 7 if the capsule is not empty.
9. Open the holder and throw away the empty capsule.

How to care for your inhaler

- Wipe the mouthpiece off with a dry tissue or cloth if needed.
- Never wash the holder.
- Replace the holder every month with your prescription refill. Throw the old one away.

Other tips

- Each capsule is a single dose of medicine. **Do not swallow the capsules.**
- Handle the capsules with dry hands and keep them away from moisture.
- Do not breathe into the holder.
- Keep track of how many capsules are left by circling the start date on a calendar or writing down how many you use a month. **Call your pharmacist for a refill before your capsules run out.**
- Bring your inhaler to your appointments so you can show your health care provider how you use the inhaler. Let them know if you are having trouble using it. If you use more than one inhaled medicine, ask about the order in which to take these medicines.
- Check the expiration date and do not use the medicine after it expires.

My Medicine Schedule

Sample medicine schedule

| Medicine name | Times my medicines are to be taken | | | | | | | | | | | | | | | | | | | | |
|---------------|------------------------------------|----|----|----|-----|-----|-----|----|----|----|----|----|----|----|----|----|-----|-----|-----|----|--|
| | 6a | 7a | 8a | 9a | 10a | 11a | 12p | 1p | 2p | 3p | 4p | 5p | 6p | 7p | 8p | 9p | 10p | 11p | 12a | 1a | |
| Spiriva | | | ✓ | | | | | | | | | | | | | | | | | | |
| Symbicort | | | ✓ | | | | | | | | | | | | ✓ | | | | | | |
| Combivent | | | ✓ | | | | | | ✓ | | | | | | ✓ | | | | | | |
| Albuterol | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| About my medicines | | | |
|--------------------|------------------------|--------------------------------------|--|
| Medicine name | How much I take (dose) | How often (frequency) | Other instructions |
| Spiriva | 1 pill | Every morning | |
| Symbicort | 2 puffs | 2 times a day in morning and evening | |
| Combivent | 2 puffs | Every 6 hours while awake | |
| Albuterol | 2 puffs | As needed | Call doctor if I need to take more often |
| | | | |
| | | | |

My medicine schedule

| Times my medicines are to be taken | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|----|----|----|----|-----|-----|-----|----|----|----|----|----|----|----|----|----|-----|-----|-----|----|--|
| Medicine name | 6a | 7a | 8a | 9a | 10a | 11a | 12p | 1p | 2p | 3p | 4p | 5p | 6p | 7p | 8p | 9p | 10p | 11p | 12a | 1a | |
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| About my medicines | | | |
|--------------------|------------------------|-----------------------|--------------------|
| Medicine name | How much I take (dose) | How often (frequency) | Other instructions |
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