



HOW TO DO BREATHING TREATMENTS WITH YOUR INFANT OR TODDLER

When infants and young children do **breathing** (or respiratory) **treatments**,* they **inhale*** medicines directly into their **lungs**.* The **cystic fibrosis*** (CF)* doctor prescribes several types of inhaled medicine to treat CF. Some medicine, such as Pulmozyme,[®] helps loosen **mucus**.* Some medicines, including albuterol or levalbuterol, relax the **airway*** muscles to relieve **bronchospasm**.* Inhaled **corticosteroids*** and other medicines treat **inflammation**.* Inhaled **antibiotics***, such as TOBI,[®] treat **infection**.* Your CF health care team will help you decide which inhaled medicines your child should take and how these can best be given to your child.

Infants and toddlers inhale medicines either through a **nebulizer*** as an **aerosol*** mist or with a **metered dose inhaler*** (MDI) using a valved **holding chamber*** and mask. The steps on the next page will help you use the equipment correctly so that your infant or child is inhaling as much medicine as possible.

Before you follow the tips for giving breathing treatments, make sure you have your child sit up, if possible. Sitting up allows your child to take deeper breaths. You may find it easiest to hold your child in your lap, facing forward. Some babies are calmer if they have a blanket wrapped around them and are held snug during the treatment.

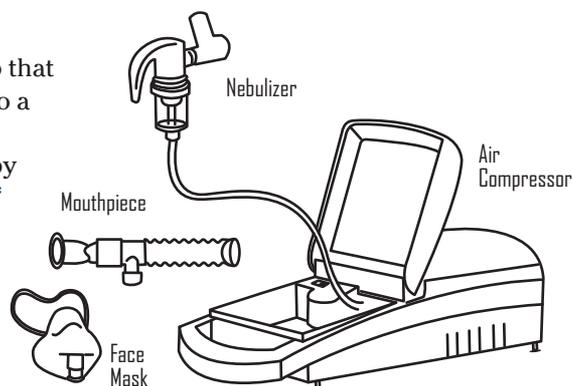


NEBULIZER AND MASK

A nebulizer is a plastic cup that turns a liquid medicine into a mist. Air is blown into the nebulizer through tubing by a medical **air compressor*** machine. The infant or young child inhales the mist through a **face mask***, or if the child is older, he or she uses a **mouthpiece**.* Even if a baby or young child can hold a mouthpiece like a straw, it is still recommended that a young child inhale medicine through a face mask. Young children will be able to inhale more medicine through a face mask because they breathe more through their noses than older children do. Usually when children are 5 years old, they can begin to use a mouthpiece. Ask your CF doctor or **respiratory therapist*** to help you decide when your child is ready to use a mouthpiece.

Some medicines used in a nebulizer come in a pre-mixed **vial*** that you just pour into the cup. Other medicines have to be measured. Make sure you know how to measure the liquid medicine correctly. Always check the parts of the nebulizer to make sure there are no cracks or leaks.

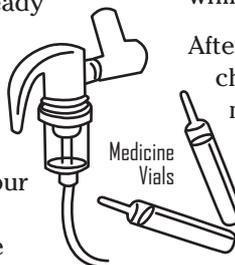
Some medicines require a specific type of nebulizer. Different nebulizers are designed to make different **particle*** sizes in a mist. The doctor, respiratory therapist, or **pharmacist*** can help make sure you have the right nebulizer.



Since a nebulizer treatment takes from 10 to 15 minutes, and children need to wear a mask, they may cooperate better if they are distracted. For your infant, you may want to try a mobile or music. If you have a toddler, you might sing songs or let him or her watch a special DVD or TV show during the treatment. Give your child a choice: “Do you want to watch *Sesame Street* or read a story while we do your treatment?”

After you place the mask on your child so that it covers his or her nose and mouth, you will need to hold or stay with your child the whole time. To avoid any interruptions, take care of your other children, phone calls, food on the stove, and other tasks before you start the treatment. New types of machines are being designed that may shorten nebulizer treatments, but for now, plan on at least 15 minutes for every treatment.

Note: If your child’s breathing treatment takes longer than 15 or 20 minutes, there may be something wrong with the air compressor or the nebulizer. Talk to your CF health care team if you think it is not working properly.

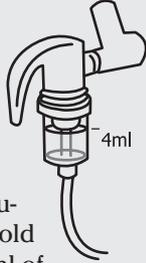


*See CF Words to Know Glossary.



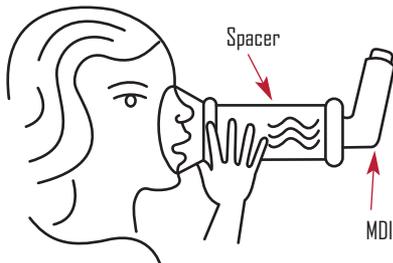
STEPS: Using a Nebulizer with Air Compressor

1. Remember to wash your hands before giving a treatment.
2. Obtain a unit **dose*** of medicine. If you need to give more than one medicine be sure that it is okay to mix the medicines. The nebulizer cup does not hold much more than 4 ml of medicine so you may have to give separate treatments. If you have to measure or mix a medicine solution, get instructions from the pharmacist or CF team. You should try to have 3 to 4 ml in the cup to get a good mist.



3. Set up the air compressor and attach the tubing. Be sure that you do not put the air compressor on a soft surface, such as a bed or couch, where the air openings and ventilation slots may be blocked.
4. Put together the nebulizer and connect it to the tubing.
5. Remove the top of the nebulizer and pour in the medicine. Replace the top of the nebulizer cup, being careful not to spill any medicine.
6. Attach the mask to the nebulizer cup. Place the mask over your child's nose and mouth. You can hold the mask or use the elastic strap around your child's head to secure it. The mask should feel comfortable, yet snug, so no air leaks out.
7. Have your child sit up or use pillows to prop up your child. You may want to hold a young child in your lap.
8. Turn on the air compressor. Encourage your child to take slow, deep breaths.
9. Stay with your child during the treatment. Continue the treatment until the mist stops and the medicine is gone from the nebulizer.
10. Remove the mask from your child. Clean the mask and nebulizer as instructed.

METERED DOSE INHALER (MDI) AND VALVED HOLDING CHAMBER (SPACER)



A metered dose inhaler or MDI is a metal canister with a valve that releases a pre-measured puff of medicine when it is pressed down. (The MDI is also called an **inhaler*** or **puffer***.) The medicine comes out as a quick puff. It's best if you use a **spacer*** with an MDI to help hold the medicine so that your child can inhale it more slowly and deeply. Your CF health care team can show you how to use your child's spacer correctly.

STEPS: Using an MDI with Spacer

1. Remember to wash your hands before giving a treatment.
2. Shake the metered dose inhaler (MDI) and remove the cap.
3. Put the MDI mouthpiece into the spacer opening with the canister pointing up.
4. Place the mask snugly onto your child's mouth and nose. It must make a good seal so the medicine does not leak out.
5. Spray one puff of medicine into the spacer.
6. Have your child take four to six normal breaths with the mask in place. Some spacers have flaps you can watch move back and forth as your child breathes in and out.
7. Remove the mask from your child's face. To give another puff, wait 30 seconds, then repeat steps three through five.
8. Clean the spacer as instructed.

You can ask your pharmacist or CF health care team how to tell when the MDI needs to be replaced. Check the number of doses (**inhalations***) that a canister has in it. How long a canister lasts depends on how many inhalations (puffs) you use per day. You cannot tell if a canister is empty by shaking it because sometimes you can still hear the propellant when the medicine is gone. You should *not* float the MDI in water to see if it is empty. Putting the canister in water could clog the valve.



CLEANING INSTRUCTIONS FOR RESPIRATORY EQUIPMENT

Germs*, including **bacteria*** and mold, can get in the equipment. You should clean equipment, including nebulizers and spacers, after each treatment. The plastic tubing that carries the air to the nebulizer does not require cleaning unless it is dirty on the outside. The tubing can be wiped off, but do not try to wash the inside. If it looks dirty on the inside, it should be replaced. You can wipe the air compressor on the outside. The filters on the inside should be changed according to the manufacturer's instructions. You can learn more about CF germs and why it's important to clean and disinfect respiratory equipment on the CF Foundation Web site (<http://www.cff.org>).

STEPS: Cleaning Respiratory Equipment

1. Clean your child's respiratory equipment after every treatment. Take apart the pieces of the nebulizer. Remove the back piece from the spacer only. Do not remove the face mask or valves.
2. Clean all parts with warm water and a mild dishwashing liquid.
 - Fill a bowl or sink with warm water and add a mild detergent.
 - Submerge the spacer, soak for 15 minutes, and then swish back and forth gently.
3. Rinse by submerging in clean water.
4. Shake off the excess water.
5. Disinfect to destroy germs by soaking the equipment in one of the solutions described on this page under **Solutions to Disinfect the Equipment**.
6. Rinse with sterile water (you can get this from a medical supply company or make it by boiling water for 5 minutes and then cooling it).
7. Let the equipment parts air dry on a clean towel or cloth.

Note: Washing the spacer in the dishwasher or with boiling water could damage it. Routinely check the equipment for damage. The equipment does wear out with time. Replace cracked or broken parts. You may want to have two sets so you can have one clean at all times. Call your CF health care team if you need a prescription to replace equipment. Make sure you have the instructions for the type of equipment that you use.

Solutions to Disinfect the Equipment

Any of the following solutions can be used to disinfect respiratory equipment. You should make a fresh batch of any of these solutions each time you clean the equipment. **Do not leave disinfectant solutions in reach of children.** Remember, these chemicals could be dangerous to a child. Pour the solutions out right after you finish cleaning.

Disinfecting solutions and soaking times:

70% isopropyl alcohol	5 minutes
3% hydrogen peroxide	30 minutes
bleach solution*	3 minutes

** The bleach solution is made by mixing 2 teaspoons of a chlorine bleach with 2 cups of tap water. This makes a solution that is equal to 1 part bleach to 50 parts water.*

*See CF Words to Know Glossary.



HELPING YOUR CHILD ADJUST TO THE FACE MASK

Toddlers and young children may resist using a spacer or nebulizer mask at first. They will adjust, however, to using the mask within several days if caregivers are consistent in using the face mask. Keep the face mask on until your child, whether crying or not, has finished the treatment. Your child will inhale more medicine if he or she is not crying. Use the suggestions in the shaded box to help your child adjust to the mask and treatments.



Remember: Even if young children can put a mouthpiece in their mouth, they will not inhale as much medicine as they would if they used a face mask.

STEPS: Helping Your Child Cooperate with Treatments

Follow these steps each time you do a treatment:

1. Tell your child it is time to take his or her medicine.
2. Ask your child if he or she wants to help hold the face mask or if you should do it. (If your child does help, make sure the mask is still held snugly to his or her face.)
3. Do not spend time trying to convince your child to put the mask on or that it will not hurt him or her. Negotiation will just delay the process. Make the decision on who holds the face mask within 30 seconds. Once you decide it is time, give the puffs even if your child is not cooperative at first.
4. After you have given your child the puffs, reinforce your child's efforts by saying, "Good job!" or "You're learning to take your medicine."

If you follow these steps the same way for each treatment, it will help your child learn to work with you to take the medicine in a short period of time.

NOTE TO PARENTS:

If your child does not begin to cooperate within a week or two, talk to your health care provider about a referral to a child psychologist* or other behavioral specialist.

For more information about **respiratory treatments*** and inhaled medicines, see the CF FEP module *Managing Lung and Other Respiratory Problems*, or go to the CF Foundation Web site (<http://www.cff.org>), or call 1-800-FIGHT-CF.