

Editorial

Clinical Practice Guidelines for Nebulized Inhalation Therapy

Cheng-Fei Lu[†], Lin Zhao[†] and Fang Huang^{*}Yangpu District Shidong Hospital of Shanghai,
Endocrinology and Metabolism, No.999, Shiguang Road,
Yangpu District, Shanghai, China[†]These Authors Share First Authorship***Corresponding author:** Fang Huang, Yangpu
District Shidong Hospital of Shanghai, Endocrinology and
Metabolism, No.999, Shiguang Road, Yangpu District,
Shanghai, ZIP code: 200438, China**Email:** ffx2012bbt@163.com**Received:** July 10, 2025**Accepted:** July 24, 2025**Published:** July 25, 2025

Editorial

Nebulized inhalation therapy, or “nebulization,” is a treatment method for coughing, shortness of breath, and wheezing. When a child has recurrent coughing, shortness of breath, and wheezing episodes, nebulization becomes the first option for many families. This “breathing medicine” method seems simple, but hides many secrets. As a parent accompanying your child for home nebulization, have you mastered the correct nebulization method? This article will help you become a qualified “home nebulizer”.

Nebulizer Treatment is Better for Children

Nebulization inhalation therapy: It transforms drugs into aerosol particles with a particle size of 0.01-10 μ m through the nebulizing device, enters the airway through respiratory movement, and deposits in the lungs, to achieve the purpose of treating diseases. It is an essential means of treating respiratory diseases such as asthma and bronchitis and relieving respiratory symptoms such as coughing and phlegm. Compared with injections and medications, nebulization treatment is like giving the respiratory tract “a medicinal bath”. The fine mist particles directly reach the lesion area, with fast effect, low dosage, and low side effects. It is especially suitable for babies under 3 years old who are resistant to medication and injections. Nebulizer treatment does not require injections or swallowing movements, significantly improving treatment compliance.

Selection of Nebulizing Machines

Nebulization treatment cannot be separated from the great help of a nebulization machine, so a good nebulization machine is crucial. However, the good and bad of the nebulizer are not all about the price; three key parameters should not be ignored when purchasing a machine:

- Nebulized Particle Size (MMAD): The Ideal range is 1-5 microns, too small to be easily exhaled, too extensive to stay in the throat. Too small to be easily exhaled and too large to be retained in the throat.
- Output rate: 0.2-0.3 ml/min is most suitable. Too fast may irritate the respiratory tract, and too slow will likely cause the child to become tired.
- The residual liquid is recommended to be less than or equal to 0.5 mL: the smaller the better, to avoid drug waste.

There are 3 types of nebulizers commonly used on the market:

- Ultrasonic nebulizer: large fog particles that are not conducive to the deposition of drugs to the lower respiratory tract; nebulization of medication is limited, only for phlegm drugs, and clinical use has been limited.
- Compressed Nebulizer: Most nebulized medications can be optimally delivered this way. However, it is large, noisy, and suitable for more fixed places, such as pediatric wards or long-term use at home.
- Sieve nebulizer: compact and lightweight, but more expensive, low screen durability, prone to microbial growth, suitable for noise-sensitive or highly portable dwellings.

When purchasing a nebulizing machine, consider your child's age and condition. For home nebulization, try to choose a machine with qualified nebulized particles that is easy to operate and maintain.

Selection of Nebulized Drugs

The main medications that are often used in your child's home nebulizer treatment consist of the following:

- Fast-acting “quick fixes” to relieve coughing and wheezing: Salbutamol, Terbutaline, etc., which work quickly and must be used as needed, depending on body weight. A few children may experience shaking hands and rapid heartbeat after use, which is usually relieved when the medication is stopped.

- The “little hygiene” that can control inflammation: Budesonide, although it is a hormone drug, because the dose is small, few side effects, and small children can also be used without fear, but please remember to wash your face and rinse your mouth after each use of the drug.

- The “thinner” phlegm thinner is acetylcysteine, which should be used alone and not in combination with other medications.

- Long-acting diastolic agents that dilate the airway: ipratropium bromide, contraindicated in children with glaucoma.

WARNING: The implementation of home nebulization varies depending on the child's health status and the parents' ability to recognize changes in the child's condition. It is best to consider home nebulization only after the hospital has identified therapeutically effective nebulizing medications and the doctor's consent has been obtained. The choice of drug and dosage should be made under the guidance of a physician, and parents should not act on experience.

Home Fogging Operation Procedure Details

Preparation before Nebulization

- Do not eat 30 minutes before nebulization to prevent nausea and vomiting due to crying during nebulization.
- Before nebulization, the oral secretion and food debris should be evident, so as not to affect the nebulization therapy.
- You can pat your back and cough up sputum before nebulizing.
- Wash your face before nebulization, but do not apply oily creams or ointments to reduce medication absorption on your face.

Fitting in Fogging

Position:

- Infants and young children can sit rather than lie down, and those who can not sit can raise the head and chest at 30°, avoiding the supine position, so as not to affect the effect of nebulization.

Wearing a mask or an oral nebulizer mouthpiece

- The mask fits snugly over the child's face but does not compress the face to avoid air leakage and to minimize eye irritation from the medication.

- Ensure that the nebulizer cup is kept in an upright position to prevent tilting and spilling the medication.

- With an oral nebulizer, have your child put the entire nebulizer mouthpiece in his or her mouth.

Respiratory:

- Guide your child to calm breathing and intermittent deep inhalations.

- If you cannot grasp the rhythm of breathing correctly, it can easily cause dizziness or nausea due to over-breathing. You can remove the nebulizer, take a few easy breaths through the nose, and continue the treatment after the uncomfortable feeling disappears.

- Nebulizer treatments are less effective when crying, and infants and toddlers can wait until they are asleep to have their nebulizer treatments done.

Timing:

- The fogging time is usually 10-15 minutes, when the fogging until you hear the “bared” sound or the aerosol stops, you can turn off the power.

At the End of the Atomization

- Assist your child in washing their face and rinsing their mouth to minimize medication residue.

- For children who are too young to rinse their mouths, wipe their mouths with a cotton swab, or drink a small amount of water or milk 10 minutes after the end of nebulization.

- After nebulization, you can help your child pat his or her back to promote expectoration. The parent's right hand is in a hollow palm and taps rhythmically from the waist to the shoulders, from bottom to top, and from outside to inside.

Home Fogging Precautions to Know

Clean the Nebulizing Mask

- After use, the nebulizer mask can be detached, rinsed with running water, cooled with boiled water, and left to dry. The connecting tube does not need to be rinsed.

- Nebulizer masks should be replaced periodically according to product requirements. It is recommended that the Simple Nebulizer Mask be renewed after 14 uses.

- Nebulizing masks should be used exclusively to avoid cross-contamination.

Follow Medical Advice

- Strictly follow the doctor's advice on medication use and control the duration and frequency of nebulization.

- If you have any questions or discomfort, you should consult your doctor.

Observe the Child's Reaction

- During nebulized inhalation, closely observe the child's response; if shortness of breath or chest pain occurs, stop nebulized inhalation immediately and seek medical attention.

- Cough, wheezing aggravation, and other uncomfortable symptoms should slow down the speed of nebulized inhalation and undergo close observation; if they cannot be relieved, the treatment must be stopped.

- The type and severity of adverse reactions in nebulizer therapy vary, which is not only related to whether the nebulizer therapy is standardized and whether the nebulizer therapy medication is reasonable, but also related to the child's factors, such as intolerable situations. In such cases, the treatment should be stopped immediately, and the child should seek medical attention promptly. Home nebulization is a medical practice and a special time of parent-child interaction that requires a balance of reason and warmth. When the child resists, it may be worth dressing up the mask as a space helmet and turning the treatment into an interstellar adventure. Through standardized operation and patient guidance, we can guard the child's health and cultivate their courage to face the disease. Combining scientific care and wise guidance will eventually help children breathe freely.