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# Asthma Devices



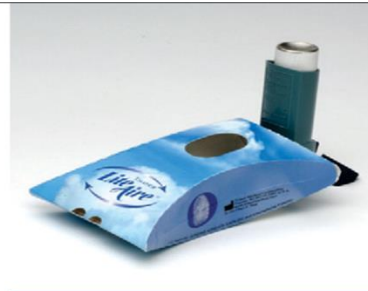
ACE spacer



AeroChamber Plus Flow-Vu



Vortex



LiteAir



EZ-Spacer



Aerolizer



Turbuhaler



HandiHaler



Diskus



Manta



MicroAir NE-U22



Aeroneb GO



eFlow



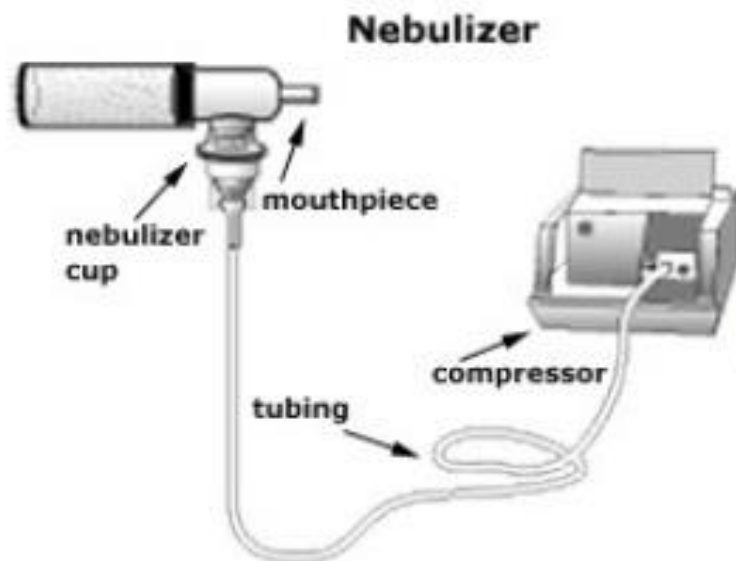
I-neb



Respimat



### 3. Nebulizer



# PEAKFLOWMETER

**Peak expiratory flow rate (PEFR)  
using the peak flow meter**



# 3.Devices

## 1.Metered-dose inhalers

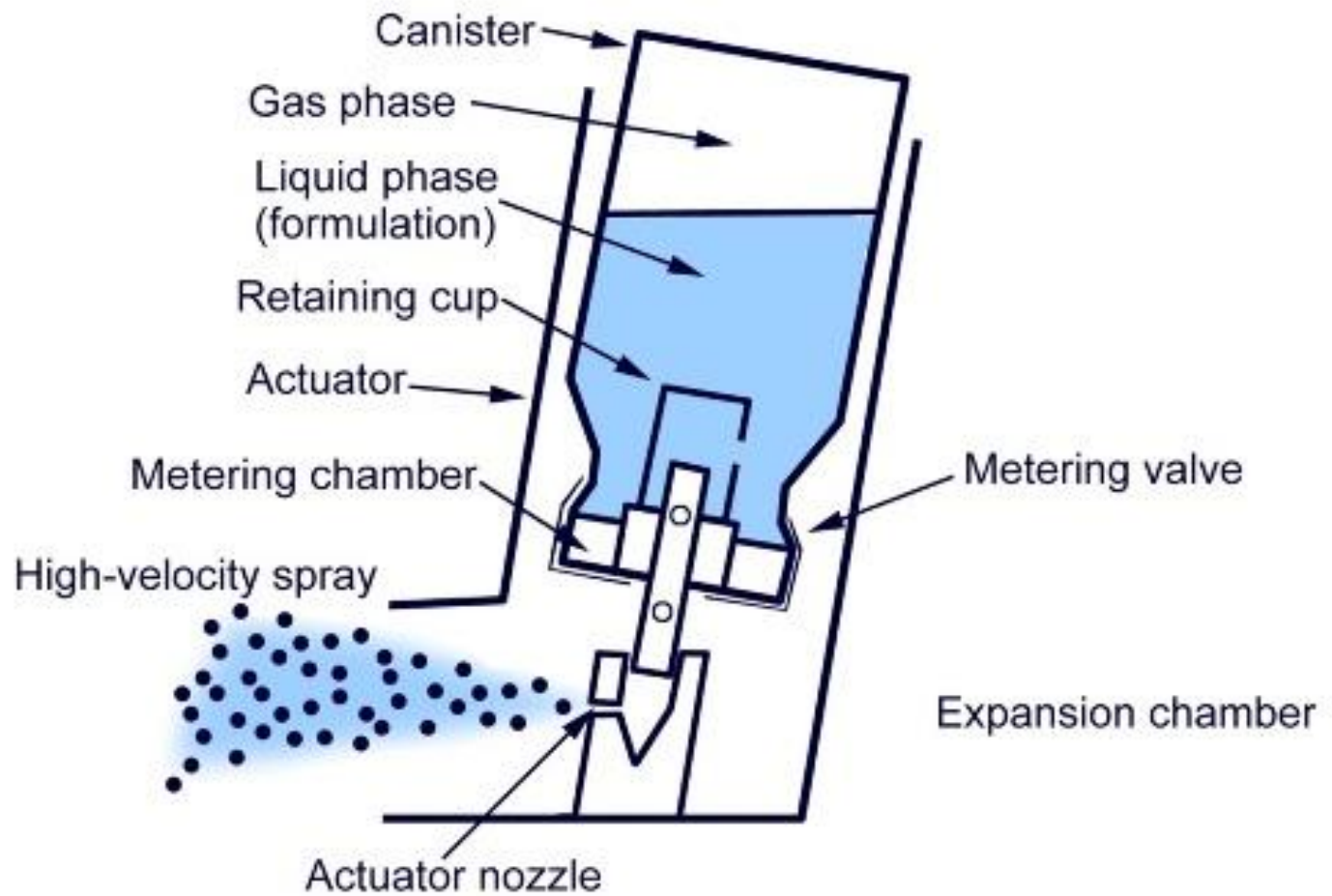




## Properties

A liquid propellant

Inhalation technique is critical for optimal drug delivery







1. Remove the cap from the MDI and shake well.
2. Breathe out all the way.
3. Place the mouthpiece of the inhaler between your teeth and seal your lips tightly around it.
4. As you start to breathe in slowly, press down on the canister one time.





5. Keep breathing in as slowly and deeply as you can. (It should take about 5 to 7 seconds for you to completely breathe in.)
6. Hold your breath for 10 seconds (count to 10 slowly) to allow the medication to reach the airways of the lung.
7. Repeat the above steps for each puff ordered by your doctor. Wait about 1 minute between puffs.



8. Replace the cap on the MDI when finished.

9. If you are using a corticosteroid MDI, you should use a valved holding chamber as described above.



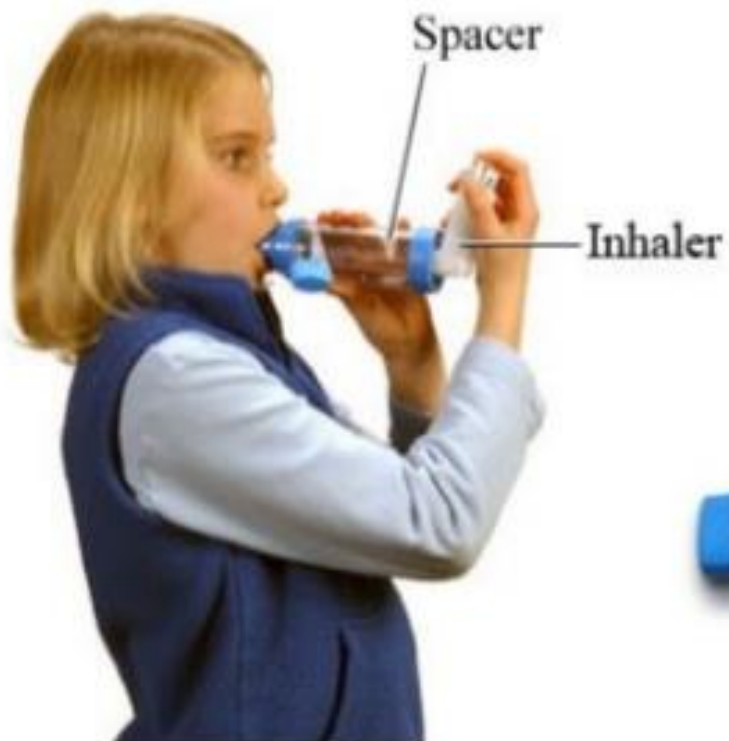
## How to use

### Without chamber





## With chamber





## Advantages Vs Disadvantages

### Advantages

- Rapid application
- Handling
- Multidose

### Disdvantages

- Hand-breathe coordinations
- Ineffective use in poor ventilated patients
- Oropharyngeal deposition and local side effects

# Turbuhaler







## Properties

- ✓ just dry-powder and no propulsion system.
- ✓ manual mechanism to insert one dose of dry-powder drug into the mouthpiece.





## How to use

1. To load a dose, hold the DPI with mouthpiece up to ensure proper loading of the medication.
2. Twist the \ grip fully in one direction as far as it will go and then fully back again. You will hear a click. The DPI is now loaded with a dose.
3. Turn your head away from the inhaler and breathe out as much air as you comfortably can.



4. Place the device in your mouth and breathe in as forcefully and deeply as you can.
5. Hold your breath for 10 seconds.
6. Take the DPI away from your mouth and exhale slowly.
7. If more than one dose is prescribed, repeat steps 1 through 5 for each dose.
8. When your treatment is complete, replace the white cover and twist it completely to close



## Advantages Vs Disadvantages

### Advantages

- Less patient coordination required
- Spacer not necessary
- Compact Portable
- No propellant
- Usually higher lung deposition than a pMDI

### Disadvantages

- Work poorly if inhalation is not forceful enough
- Many patients cannot use them correctly (e.g. capsule handling problems for elderly)
- Most types are moisture sensitive.
- Need to reload capsule each time

# How to use Aerolizer?

1- Remove cap



2- Rotate the mouthpiece off the base and you will see an empty space for the capsule



3- Remove a capsule from the packaging and put the capsule in the empty space



4- After the capsule is in place, click the mouthpiece shut.

# How to use Aerolizer?

5- Before using the inhaler, you will need to press the buttons firmly on both sides of the inhaler

6-Turn your head away from the inhaler and breathe out fully

7- Put the Aerolizer in your mouth; do not block the mouthpiece with your teeth or tongue

# How to use Aerolizer?

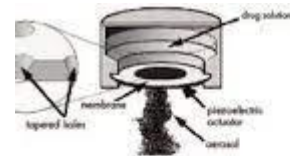
- 8- breathe in as steadily and deeply as you can
- 9- Remove the inhaler from your mouth while holding your breath for 5-10 seconds. Breathe out away from your inhaler
- 10- To make sure that you breathed in your full dose, check to see if there is any powder left in the capsule
- 11- If there is any powder left in the capsule, repeat steps 7-9
- 12- Dispose of the capsule and put the cap back on the inhaler







typi.com





## Properties

- The fundamental concept of nebulizer performance is the conversion of the medication solution into droplets in the respirable range of 1-5 micrometers

# Comparison of different types of nebulizers

Advantages and disadvantages of different types of nebulizers

Nebulizers	Advantages	Disadvantages
Jet nebulizers with corrugated tubing	<ul style="list-style-type: none"> <li>• Cheap</li> <li>• Easy to use</li> <li>• Effective in delivering drugs that can not be delivered with pMDIs and DPIs</li> </ul>	<ul style="list-style-type: none"> <li>• Inefficient</li> <li>• Difficult to clean</li> <li>• Need compressed gas and additional tubing</li> </ul>
Breath-actuated & Breath-enhanced jet nebulizers	<ul style="list-style-type: none"> <li>• Drug delivery only during inhalation</li> <li>• Easy to use</li> <li>• Less medication wasted</li> <li>• More efficient than JNs with tubing</li> </ul>	<ul style="list-style-type: none"> <li>• Need sufficient flow to trigger drug delivery</li> <li>• Takes longer to deliver drug</li> <li>• Not ventilator-enabled</li> <li>• More expensive</li> </ul>
Ultrasonic nebulizers	<ul style="list-style-type: none"> <li>• Easy to use</li> <li>• More efficient than jet nebulizers</li> </ul>	<ul style="list-style-type: none"> <li>• Large residual volume</li> <li>• Inability to aerosolize viscous solutions</li> <li>• Degradation of heat-sensitive materials</li> </ul>
Mesh nebulizers	<ul style="list-style-type: none"> <li>• Fast, quiet, portable</li> <li>• Self-contained power source</li> <li>• Optimize particle size for specific drugs</li> <li>• More efficient than other nebulizers</li> <li>• Easy to use</li> </ul>	<ul style="list-style-type: none"> <li>• More expensive</li> <li>• Cleaning can be difficult</li> <li>• Medication dosage must be adjusted in transition from JNs</li> <li>• Not compatible with viscous liquids or those that crystallize on drying</li> </ul>

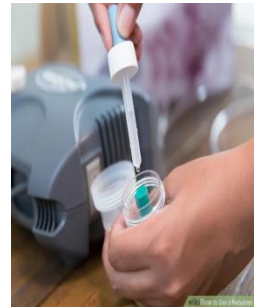
JNs: Jet nebulizers; pMDIs: pressurized metered-dose inhalers

# How to Use a Nebulizer

1- Wash your hands. Start by washing your hands for no less than 20 seconds with soap under running water



2- Place the medication into the nebulizer



# How to Use a Nebulizer

3- Attach the mouthpiece



4- Connect the tubing. Attach one end of the oxygen tubing to the nebulizer cup



# How to Use a Nebulizer

5- Turn on the air compressor and use the nebulizer



6- Continue to inhale the medication. Sit up and keep inhaling the medication until the mist stops. This usually takes about 10-15 minutes, once all liquid is gone, the mist stops coming out. The nebulizer cup should be empty



# How to Use a Nebulizer

7- Turn off the nebulizer and clean up. Be sure to unplug it from the outlet and detach the medicine cup and mouthpiece from the tubing. Wash the medicine cup and mouthpiece with warm soapy water and rinse them with water

8- Disinfect the nebulizer once a week







## Advantages Vs Disadvantages

### Advantages

- Provide therapy for patients who cannot use other inhalation modalities (eg, MDI, DPI)
- Allow administration of large doses of medicine
- Patient coordination not required
- Effective with tidal breathing
- Dose modification possible
- Can be used with supplemental oxygen

### Disadvantages

- Decreased portability
- Longer set-up and administration time
- Higher cost
- Electrical power source required
- Contamination possible

# PEAKFLOWMETER

**Peak expiratory flow rate (PEFR)  
using the peak flow meter**



# PEAKFLOWMETER

## **Why do we do peak flows?**

- **Peak expiratory flow (PEF) measurements can be an important aid in both diagnosis and monitoring of asthma.**
- **PEF measurements are ideally compared to the patient's own previous best measurements using his/her own peak flow meter.**

# PEAKFLOWMETER



- When recording a peak flow result, the three readings should be within 20 litres per minute of each other; if not the peak flow rate recording should be repeated up to five times.

# PEAKFLOWMETER

## PEFR

- Lowest in the morning
- Highest at night
- Careful instruction is required
- Effort dependent



# PEAKFLOWMETER

## **Determining your personal best**

- **To determine your personal best, Typically, you'll take readings twice a day for two weeks when you're not having symptoms.**
- **The highest consistent reading during the trial period is your "personal best" peak flow rate.**

# PEAKFLOWMETER

## Peak Expiratory Flow Rate (PEFR)

### Normal Values:

- Normal values are related to the patient's height as follows:
- An easy to remember approximation is:  
$$\text{PEFR (L/min)} = [\text{Height (cm)} - 80] \times 5$$



# PEAKFLOWMETER

## Daily Variability of PEFR

$$\frac{\text{PEFR at night} - \text{PEFR at morning}}{\frac{1}{2} (\text{PEFR at night} + \text{PEFR at morning})} \times 100\%$$



# PEAKFLOWMETER

- A diurnal variation in PEF of more than 20 percent is considered to be diagnostic of asthma, the magnitude of the variability being broadly proportional to disease severity
- In mild intermittent asthma or in severe intractable disease, variability in PEF may not be present or may be lost.

# How to Measure Peak Flow

- 1- Move the marker to the bottom of the numbered scale
- 2- Stand up straight
- 3- Take a deep breath. ...
- 4- Hold your breath while you place the mouthpiece in your mouth, between your teeth. ...
- 5- Blow out as hard and fast as you can in a single blow. ...
- 6- Write down the number you get

# How to use a nasal spray

- 1- blow your nose
- 2- Shake the bottle
- 3- Tilt your head forwards
- 4- Hold the spray bottle upright
- 5- Insert the tip of the spray bottle just inside one nostril.

Close the other nostril with your other hand, and apply one or two sprays as prescribed.



# How to use a nasal spray

6- Breathe in as you spray (but do not sniff hard as the spray then travels past the nose to the throat)

7- Do not angle the canister towards the middle or side of the nose, but straight up. With your head tilted forward, the spray should go to the back of your nose

Repeat in the other nostril

