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WAOB Hyderabad Regional Insider



## Inhalation Devices in India

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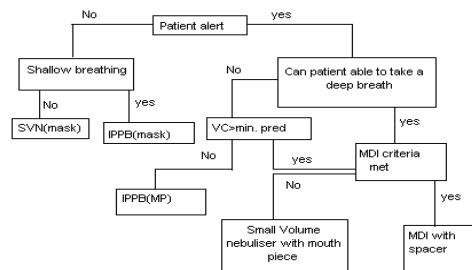
## Aerosol

- Is a suspension of solid or liquid particles in gas
- Are used to deliver bland water solutions to the respiratory tract or to administer drugs to lungs, throat or nose
- Aim is to deliver therapeutic dose of the selected agent to the desired site of action with minimal side effects and greater efficacy and safety

## Characteristics of aerosol

- Aerosol output
- Particle size
- Particle deposition
- Aging

## Aerosol therapy



## Inhalers



Inhalers are hand-held portable devices that deliver medication directly to the lungs.

## Factors influencing the choice of inhaler device.

- Patient.
- Acceptance of the diagnosis.
  - Age.
  - Lifestyle.
  - Ease of use.
  - Inspiration flow rate.
  - Dexterity.
  - Taste.
  - Appearance of device.

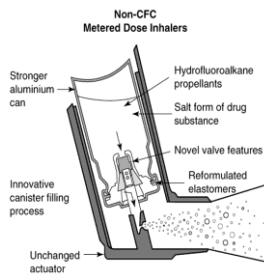
## Factors influencing the choice of inhaler device.

Practitioner.

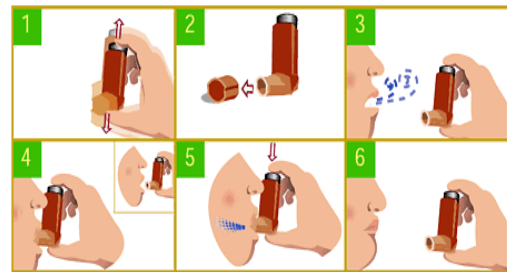
- Cost.
- Consistency of delivery.
- Availability of various drugs in the same device.
- Compatibility with other devices.
- Easy to teach technique.
- Effectiveness of the device.

## MDIs

## Metered Dose Inhaler



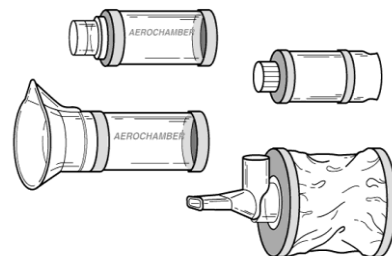
## Using MDI without Spacer

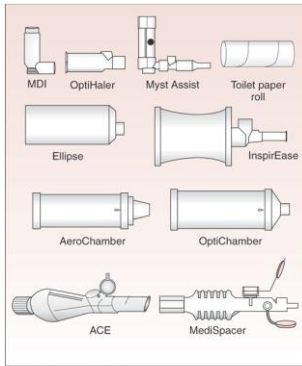


## Using MDI without Spacer

- Shake the inhaler well before use (three or four shakes)
- Remove the cap
- Breathe out, away from your inhaler
- Bring the inhaler to your mouth. Place it in your mouth between your teeth and close your mouth around it.
- Start to breathe in slowly. Press the top of your inhaler once and keep breathing in slowly until you've taken a full breath
- Remove the inhaler from your mouth, and hold your breath for about ten seconds, then breathe out
- If you need a second puff, wait 30 seconds, shake your inhaler again, and repeat steps 3-6.
- Always write down the number of puffs you've taken so that you can anticipate when you need to refill your prescription.
- Store all MDI's at room temperature.

## Always use a spacer





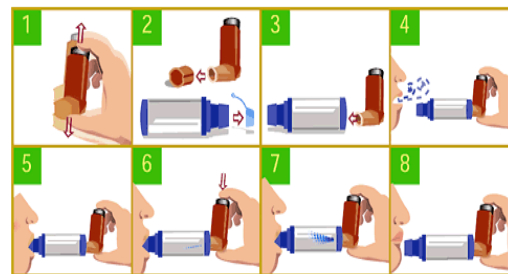
## Spacer Use

- Decreases oral deposition
- Increases amount of medicine making the small airways
- Flow signal for too fast an inhalation
- Permits many small breaths instead of one large breath

## Tidal Breathing Technique with Spacer.

1. Take cap off, shake inhaler well and place in hole in end of spacer.
2. Hold spacer with both hands, place mouthpiece in mouth and gently breath right out into spacer.
3. Press inhaler once.
4. Gently breath in and out five times.
5. Remove from mouth. Wait 30 seconds to 1 minute before repeating above steps as many times as prescribed.

## Using MDI with Spacer

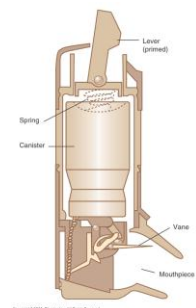


## One Breath Technique with Spacer.

1. Remove the cap.
2. Shake the inhaler and insert into the device.
3. Place the mouthpiece in the mouth.
4. Press the canister once to release a dose of the drug.
5. Take a deep, slow breath in.
6. Hold the breath for about 10 seconds, then breathe out through the mouthpiece.
7. Breathe in again but do not press the canister.
8. Remove the device from the mouth.
9. Wait about 30 seconds before repeating steps 2-8.

## Flow Triggered MDI

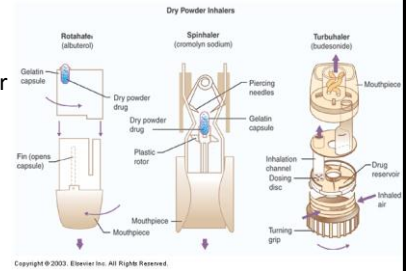
- An old idea that did not work
- Autohaler (3M)
- Pirbuterol only



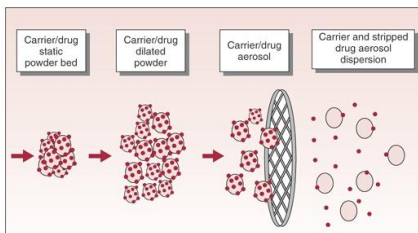
## DPIs

## Older Units

- Rotahaler
- Spinhaler
- Turbuhaler



## Aerosolization of Dry Powder

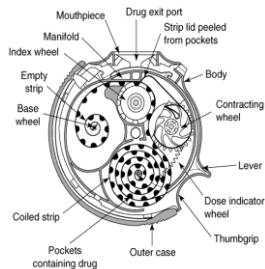


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## Newer Unit – Dry Powder Inhaler



## Inner workings of DPI



## Optimal Technique

- Open, Click, Inhale
- Exhale slowly to empty lungs
- Seal lips on mouthpiece
- Inhale quickly (>40 L/min) and deeply
- A breathhold is not necessary
- Repeat if needed

## Dry Powder Inhaler

- The latest and the greatest
- Need higher inspiratory flow rates

**“Works like a charm”**

## Advantages vs Disadvantages

- Nebulizer
- MDI
- DPI
- USN


British Guideline on the Management of Asthma  
The British Thoracic Society • Scottish Intercollegiate Guidelines Network



## Inhaler devices

Inhaler devices. Thorax 2003; 58 (Suppl 1): 11-92

British Guideline on the Management of Asthma




## Device selection

<b>B</b>	Prescribe inhalers only after patients have been trained and have demonstrated satisfactory technique
<b>B</b>	<ul style="list-style-type: none"> <li>• Reassess inhaler technique as part of structured clinical review</li> <li>• The choice of device may be determined by choice of drug</li> <li>• If patient unable to use a device satisfactorily, find alternative</li> <li>• Titrate medication needs against clinical response to ensure optimum efficacy</li> </ul>

Inhaler devices. Thorax 2003; 58 (Suppl 1): 11-92

British Guideline on the Management of Asthma




## Delivery of $\beta_2$ agonists

Adults	Children 5-12 years	Children <5 years	
A	A		Use pMDI and large volume spacer for adults and children aged 2-12 years with mild and moderate exacerbations of asthma
		<b>B</b>	pMDI + spacer preferred delivery method for children aged 0-5 years
	A		In children aged 5-12 years with chronic asthma, pMDI + spacer is as effective as any other hand held inhaler
A			In adults, pMDI ± spacer is as effective as any other hand held inhaler, but patients may prefer dry powder inhalers
<b>B</b>			Base choice of reliever inhaler for stable asthma on patient preference/ability to use, as many patients will not carry a spacer
A			Salbutamol non-CFC pMDI can be substituted for CFC pMDI at 1:1 dosing

Inhaler devices. Thorax 2003; 58 (Suppl 1): 11-92

British Guideline on the Management of Asthma



## Delivery of inhaled steroids

Adults	Children 5-12 years	Children <5 years	
		<b>B</b>	pMDI + spacer preferred delivery method for children aged 0-5 years
	A		For children aged 5-12 years, pMDI + spacer is as effective as any dry powder inhaler
A			In adults, a pMDI ± spacer is as effective as any dry powder inhaler
<b>B</b>			HFA-BDP pMDI can be substituted for CFC-BDP pMDI at 1:2 dosing, but should incorporate period of close monitoring
A			Fluticasone non-CFC pMDI can be substituted for CFC pMDI at 1:1 dosing

Inhaler devices. Thorax 2003; 58 (Suppl 1): 11-92

British Guidelines on the Management of Asthma

## Use and care of spacers

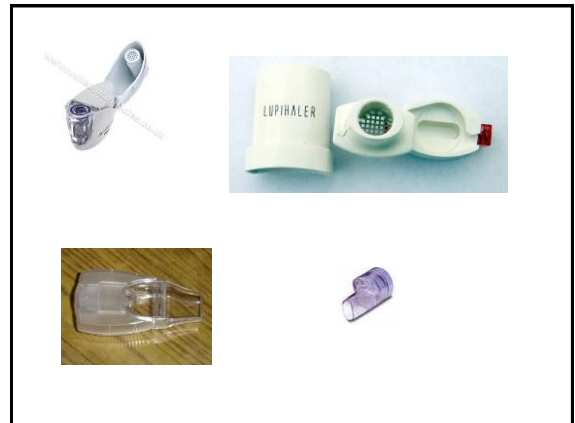
- Ensure spacer compatible with pMDI used
- Administer drug by repeated single actuations of pMDI into spacer, each followed by inhalation
- Minimise delay between pMDI actuation and inhalation
- Tidal breathing is as effective as single breaths
- Spacers should be cleaned monthly by washing in detergent and air drying, with mouthpiece wiped clean of detergent before use
- Drug delivery may vary significantly due to static charge
- Replace after 6-12 months

Inhaler devices. Thorax 2003; 58 (Suppl 1): 11-192

## Choice?

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Metered dose inhaler	Metered dose inhaler with a spacer	Dry powder inhaler
Portable and convenient	Less portable and convenient, more complex and more expensive than a metered dose inhaler without a spacer	Portable and convenient
Doesn't require a deep, fast breath	Doesn't require a deep, fast breath	Requires a deep, fast breath
Accidental exhalation before activation won't disrupt medication	Accidental exhalation before activation won't disrupt medication	Accidental exhalation before activation will blow away medication
Hand-actuated models without a spacer require hand-breath coordination	Hand-breath coordination is not critical	Hand-breath coordination is not necessary
Can result in large amounts of medication on the back of your throat and tongue	Less medication settles on the back of your throat and tongue	Can result in large amounts of medication on the back of your throat and tongue
Minimal or no maintenance required	Spacer requires periodic cleaning with soap and water	Minimal or no maintenance required
Some models require you to keep track of how many doses remain	Some models require you to keep track of how many doses remain	It is clear when the device is out of medication



VISIT : [www.chestandmaternitycentre.com](http://www.chestandmaternitycentre.com)

## THANK YOU