

**Association of  
Asthma Educators:  
Becoming an Asthma  
Educator and Care Manager**

Produced by the Alabama Department of Public Health  
Video Communications and Distance Learning Division

**Inhalation Devices**

**Faculty**

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**Asthma Devices:  
Medication Administration**

- Correct inhalation technique is important
- AAE Inhalation Device Handouts support your education

**Asthma Devices:  
Medication Administration**

- Metered dose inhalers (MDIs):
  - Closed mouth technique or holding chamber
  - Open mouth technique no longer recommend due to new HFA formulation

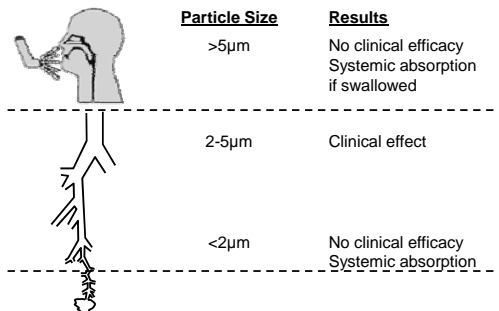
**Asthma Devices:  
Medication Administration**

- Infants and children may use MDIs with a one way valve holding chamber with mask
- Reassess device administration technique at every visit
- Teach patients when to refill MDIs

### Asthma Devices: Medication Administration

- One way valve holding chambers:
  - Available with a mouthpiece
  - Available with facemask in three sizes:
    - Small for infants
    - Medium for toddlers
    - Large teens/adults/elderly

### Particle Size and Airway Deposition

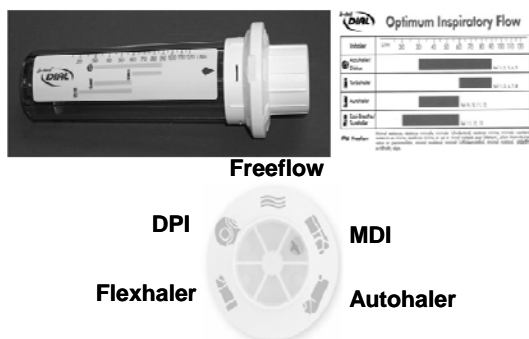


### Importance of Optimum Inspiratory Flow

### Optimum Inspiratory Flow

Device	Optimum Inspiratory Flow
Diskus	30 to 90 L/min
Flexhaler	60 to 90 L/min
Autohaler	30 to 60 L/min
Common MDI	25 to 60 L/min
Aerolizer	25 to 90 L/min
Twisthaler	30 to 60 L/min
Handihaler	20 to 99 L/min

### In-Check Dial™

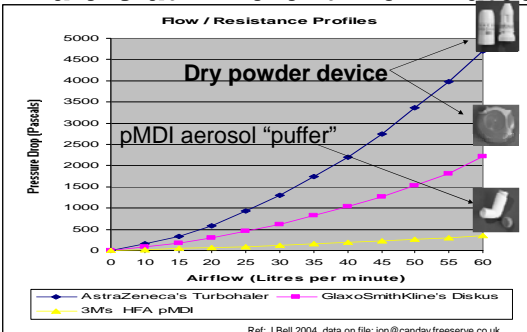


Part Ref: 3109910 - Original In-Check DIAL, Green Bar Info Scale and Chart, and Multi-language booklet (EU)

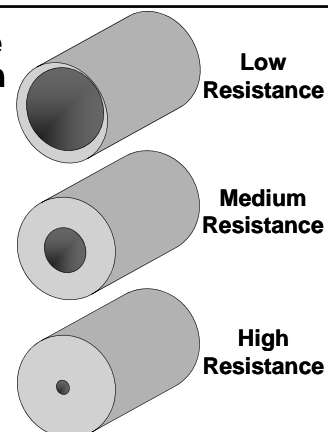
### In-Check Dial™

- Help you teach correct techniques for several different inhalers
- A multiple-use instrument where each patient uses a new, disposable, one-way check valve

## Resistance of 3 Common Inhalers at Different Flow Rates



Imagine the Effect When Drinking Through a Straw



## Common MDI Inhalation Errors

- Failure to exhale fully prior to dose resulting in inadequate volume of inhaled air with lower net dose
- Inhalation too rapid, leading to impaction of drug against pharynx and bifurcations of the airway

## EPR3 Specifies IFR and IFT

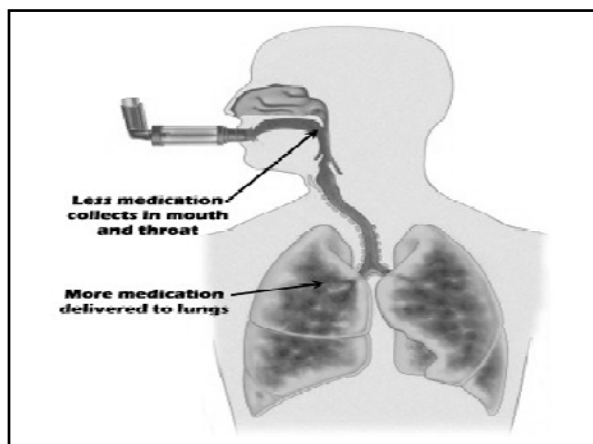
- IFR= inspiratory flow rate
- IFT= inspiratory flow time
- MDI – 30 LPM for 3-5 seconds (p. 250)
- DPI – 60 LPM for 2-3 seconds (p. 249)
- How do you measure IFR and IFT?

## Take Time to Check Inhalation

- Asthma therapy hinges on inhalation
- Your patients/families know they have not been adequately trained
- You can bill for this important service – 94664
- See "Inhalation Instructions Guide"

## Asthma Devices: Medication Administration

- One way valve holding chambers



### **Asthma Devices: Medication Administration**

- **Dry powder inhalers (DPIs):**
  - Aerolizer (Foradil)
  - Diskus (Advair and Serevent)
  - Flexhaler (Pulmicort)
  - Twisthaler (Asmanex)
  - HandiHaler (Spiriva)=for COPD only

### **Asthma Devices: Medication Administration**

- **Advantages of dry powder inhalers (DPIs)**
  - No HFA propellant
  - Improved lung deposition
  - Eliminates need for holding chamber

### **Asthma Devices: Medication Administration**

- Easy to teach/learn administration technique
- No need to count doses or guess when the device is empty

### **Asthma Devices: Medication Administration**

- **Disadvantages of dry powder inhalers (DPIs)**
  - Can be affected by humid air
    - Should not be stored in the bathroom or allowed to get wet
  - Patients will still need another device for quick relief medication

### **Asthma Devices: Medication Administration**

- Different administration technique
  - Requires a fast 30-90L/M deep inhalation

### Asthma Devices: Medication Administration

- **Nebulizers:**
  - Can be used by patients of all ages
  - Recommended by the NIH Guidelines for all children under 2 years of age
  - Teach proper maintenance

### Asthma Devices: Medication Administration

- Teach proper technique including:
  - Take deep breaths
  - Do not use blow-by, use a proper fitting mask or mouthpiece

### Asthma Devices: Medication Administration



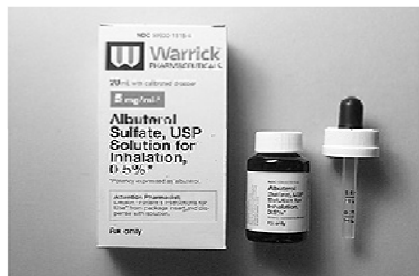
**Pulmicort Respules**

### Asthma Devices: Medication Administration



**Xopenex Nebulizer Solution**

### Asthma Devices: Medication Administration



**Albuterol Nebulizer Solution**

### Perceived Advantages of Nebulized Delivery

- **Advantages:**
  - Minimal cooperation needed
  - Use while sleeping
  - Easy to use when unwell
  - Drug to lower resp tract possibly superior to pMDI in uncooperative patients

### Perceived Advantages of Nebulized Delivery

- Higher doses delivered
- Close facial seal still delivers
- No unpleasant taste
- No propellant
- Fosters confidence

### Perceived Disadvantages of Nebulized Delivery

- Disadvantages
  - Less portable than pMDI
  - More time consuming per dose delivered
  - Requires equipment
  - Requires power source

### Perceived Disadvantages of Nebulized Delivery

- More expensive?
- Requires training
- Variability of delivery

– Adapted from: Brownlee KG: Eur Resp Rev 1997;7:177-9

### So: What Do We Know About Nebulizers?

- Delivery of aerosol drugs from Nebbs: for some drugs, less variability between machines than between spacers
- In-vitro assessments of Nebbs also dependent on test conditions

### So: What Do We Know About Nebulizers?

- BOTH MDI + spacer and Neb in-vivo lung deposition is limited by AGE
  - All other variables (flow rate, weight of patient etc) related to AGE
- Under IDEAL conditions, BOTH systems make drug AVAILABLE to the patient

### Use Objective Measures of Airflow

- Spirometric parameters improve assessment of severity, control, exacerbations and response to therapy (FEV1, FEV1/FVC ratio and PEF)
  - Symptom reports also useful, but under-estimate degree of airway obstruction in many individuals

– EPR-3 pg. 43-45

**Pop Quiz – May Use More Than Once**

1. Usually normal with asthma \_\_\_\_\_
2. Diagnosis of Asthma \_\_\_\_\_
3. Exacerbation parameter \_\_\_\_\_
4. Assessing control \_\_\_\_\_
5. Best for home monitoring \_\_\_\_\_

a) FEV1, b) FVC, c) FEV1/FVC, d) PEF

**Key Education Messages Provided by Clinician**