Implementation of Best Practices for Asthma Care

Lori Wilken, PharmD, BCACP, AE-C,
Clinical Assistant Professor
University of Illinois at Chicago
College of Pharmacy

Conflict of Interest

- I have no conflicts of interest

Pharmacy Technician Objectives

- Review the proper technique for various inhaler types.
- Describe the dosage form and proper storage of biologic agents to treat asthma.

Pharmacist Objectives

- Review the proper technique and counseling points for various inhaler types.
- Describe the mechanism of action, dosage form, side effects and proper storage of biologic agents to treat asthma.

Assessment Question

- Which of the following inhalers requires a slow, deep inhalation?
  A. Respimat
  B. RediHaler
  C. RespiClick
  D. Inhub

Assessment Question

- Which of the following is true about the storage of biologic medications for asthma?
  A. 20°C to 25°C
  B. Protect from light
  C. 2°C to 8°C thirty minutes prior to injection
  D. -50°C to -15°C
Global Initiative for Asthma (GINA)

• 68.5% of adults with asthma in Illinois have uncontrolled asthma
• 70-80% of patients have poor inhaler technique
• 50% fail to take controller medications as prescribed
• Pharmacists and pharmacy technicians are needed!

https://www.cdc.gov/asthma/asthma_stats/uncontrolled-asthma-adults.htm

Patient Case

SM is a 52-year-old admitted to the hospital 2 days ago for an asthma exacerbation. She is being discharged home today. You are delivering her medications to her bedside before discharge. She has some questions for you.

Patient Case- Medications for Home

• Symbicort 80/4.5 mcg (budesonide and formoterol) 2 inhalations bid and prn
• Spiriva (tiotropium) 1.25 mcg 2 inhalations daily
• Fluticasone nasal spray 50 mcg 2 sprays in each nostril daily
• Famotidine 20 mg PO daily
• Montelukast 10 mg PO daily

How do I use this inhaler?

• Purpose
  – Single Maintenance and Reliever Therapy
  – Off-label use**
• Expectations
• Proper use
• Side effects
• Length of therapy
• Days supply
  – Max 72 mcg formoterol/day

Asthma Action Plan with SMART

GREEN ZONE

Starting to cough, wheeze or have shortness of breath

Waking up at night

Peak Flow 60-80% personal best

Yellow Zone

Continue Symbicort 80/4.5 mcg 2 inhalations in the morning and evening

Continue Symbicort 80/4.5 mcg 2 inhalations in the morning and evening

Call the office at 312-996-3300 to start prednisone 40 mg by mouth daily for 5 days
Asthma Action Plan with SMART

**Feeling BAD**
- Waking every night
- Peak Flow < 60% of personal best

**Take Prednisone 40 mg NOW**

**Go to the hospital or call 911**

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**Transition to Outpatient**

- After discharge SM comes into the pharmacy. She has five inhalers with her and is confused.
  - Symbicort (budesonide/formoterol) MDI 80/4.5 mcg
  - Spiriva (tiotropium) Respimat 1.25 mcg
  - Qvar (beclomethasone) RediHaler 80 mcg
  - ProAir (albuterol) RespiClick 90 mcg
  - Wixela Inhub (fluticasone/salmeterol) 250/50 mcg

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**Many Products with Fluticasone/Salmeterol**

- Advair Diskus
- Fluticasone/Salmeterol Diskus
- Advair HFA
- Airduo RespiClick
- Fluticasone/Salmeterol RespiClick
- Wixela Inhub
Many Products with Albuterol

- ProAir RespiClick and MDI — generic
- Ventolin — generic
- Proventil
- Combivent and Duoneb — Albuterol/Ipratropium

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Inhaler Use MDI and DPI

**Metered-dose Inhaler (MDI)**
- Most common inhaler type
- Use
  - Slow, deep inhalation
- Use with spacer
- Avoid heat and cold
- Long discard date

**Dry-Powder Inhaler (DPI)**
- Patent inhaler examples
  - Diskus, Ellipta, Flexhaler, Inhub, RespiClick, Twisthaler
- Demonstration
  - Quick, deep inhalation
- Avoid moisture, shaking and spacer
- Short discard date

Assessment of Inspiratory Flow

Inhaler Use SMI and BAI

**Slow-Mist Inhaler (SMI)**
- Available as Respimat
- Demonstration
  - Assemble and prime
  - Avoid freezing
- Discard date 3 months

**Breath-Actuated Inhaler (BAI)**
- Available as the RediHaler
- Use
  - Opening the cap prepares the inhaler
  - Deep inhalation to release the medication
- Avoid priming, shaking, heat, water and spacers
- Long discard date

Assessment Question

- Which of the following inhalers requires a slow, deep inhalation?
  A. Respimat
  B. RediHaler
  C. RespiClick
  D. Inhub
Inhaler Disposal

- Metered-dose inhalers
- Breath-actuated inhaler
- Hazardous waste product
- Flammable
- Encourage take-back and proper disposal

Resources
- Dispose my Meds [http://disposemymeds.org/]
- Local government regulations
- EPA
- Safety Data Sheet for medications

Technology to Improve Adherence

Hailie Sensors
- Flovent HFA, ProAir HFA, Symbicort, Ventolin

Propeller
- MDI, Diskus, Ellipta, Respimat

ProAir Digitaler
- Dosing and inspiratory flow

Apps
- [www.asthmamd.org/]
- [https://www.medisafeapp.com/]

Outpatient plan

- Final medication list after assessments and talking with MD
  - Symbicort (budesonide/formoterol) MDI 80/4.5 mcg 2 inhalations bid and prn
  - Spiriva (tiotropium) Respimat 1.25 mcg 2 inhalations daily

Mechanism of Action and Dosing for Asthma Biological Agents

<table>
<thead>
<tr>
<th>Biological Agent</th>
<th>Generic</th>
<th>Xolair</th>
<th>Nucala</th>
<th>Cinqair</th>
<th>Fasenra</th>
<th>Dupixent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult dosing</td>
<td>150-375 mg SC q2-4 weeks based on baseline IgE and weight</td>
<td>100 mg SC q4 weeks</td>
<td>3 mg/kg IV q4 weeks</td>
<td>30 mg SC q4 weeks X 3 doses followed by 30 mg q8 weeks</td>
<td>400 mg SC X 1 then 200 mg SC q2 weeks OR 600 mg SC X1 then 300 mg SC q2 weeks</td>
<td></td>
</tr>
<tr>
<td>Pediatric dosing</td>
<td>6 to &lt;12 years of age 75-375 mg SC q2-4 weeks</td>
<td>6-11 years of age 40 mg SC q4 weeks (in clinic)</td>
<td>Not available</td>
<td>12 years and older see adult dosing</td>
<td>12 years and older see adult dosing</td>
<td></td>
</tr>
<tr>
<td>mAb target</td>
<td>IgE</td>
<td>IL-5</td>
<td>IL-5</td>
<td>IL-5R</td>
<td>IL-4Ra</td>
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<tr>
<td>Home</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Dosing</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Patient Case

SM returns to your pharmacy after seeing the allergist.

She has new prescriptions for:
- Zoster vaccine, recombinant adjuvant (Shingrix)
- Epinephrine pen

A new medication for asthma will be shipped to her for home administration.

“How do I store my new medication?”

“Can I stop taking my controller medication?”

Additional Indications for Asthma Biological Agents

- Omalizumab
  - Chronic Idiopathic Urticaria (CIU)
- Mepolizumab
  - Eosinophilic granulomatosis with polyangiitis (EGPA)
- Reslizumab
  - No other indications
- Benralizumab
  - No other indications
- Dupilumab
  - Moderate to severe atopic dermatitis
  - Chronic rhinosinusitis with nasal polyposis
Proper Storage and Counseling for Asthma Biological Agents

<table>
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<tr>
<th>Generic</th>
<th>Omalizumab</th>
<th>Mepolizumab</th>
<th>Reslizumab</th>
<th>Benralizumab</th>
<th>Dupilumab</th>
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<tbody>
<tr>
<td>Brand</td>
<td>Xolair</td>
<td>Nucala</td>
<td>Cinqair</td>
<td>Fasenra</td>
<td>Dupixent</td>
</tr>
<tr>
<td>Proper Storage</td>
<td>• 2°C to 8°C</td>
<td>• Room temp 30 minutes prior to injection</td>
<td>• Protect from light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counseling</td>
<td>Hypersensitivity reactions (anaphylaxis, angioedema, bronchospasm, hypotension, urticaria, rash)</td>
<td>Avoid live vaccines (Dupilumab)</td>
<td>Malignancy</td>
<td>Herpes zoster (Mepolizumab)</td>
<td></td>
</tr>
</tbody>
</table>

Counseling for all Asthma Biologic Agents

• Do not abruptly discontinue systemic or inhaled corticosteroids upon initiation
• Treat parasitic (helminth) infections
• Registry for pregnancy
• Excluded from studies cigarette smokers

Assessment Question

• Which of the following is true about the storage of biologic medications for asthma?
  A. 20°C to 25°C
  B. Protect from light
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Asthma Education Checklist

• Asthma education
  – Chronic, inflammatory disease
  – Trigger identification and avoidance
  – Medication education
  – Asthma action plans
• Inhaler skills training
• Adherence monitoring of ICS
• Vaccinations

Action Needed

• Publications of pharmacists’ interventions and patient outcomes (decreased hospitalizations and ED visits)
• Case reports including cigarette smokers with asthma and biologic agents
• Use of technology to improve adherence and outcomes
• Vaccination screening and administration for asthma patients
• Inhaler take-back program education and assessment

WHAT ARE YOU DOING TO IMPROVE THE CARE OF ASTHMA PATIENTS?
References


Websites for Inhaler Use

Websites for Asthma Action Plans


# Websites for Inhaler Use

<table>
<thead>
<tr>
<th>Inhaler Type</th>
<th>Website/Resource</th>
<th>Product Name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breath-ACT</td>
<td><a href="https://www.qvar.com/redihaler/how-to-use-qvar">How to Use Qvar</a></td>
<td>RediHaler</td>
<td>Teva</td>
</tr>
<tr>
<td>Breath-ACT</td>
<td><a href="https://www.qvar.com/redihaler/how-to-use-qvar">Dipropionate</a></td>
<td>Qvar/ beclomethasone dipropionate HFA</td>
<td>Respiratory</td>
</tr>
</tbody>
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Italicized products only have written directions for product use. 

- **BAI** - Breath-actuated inhaler aerosol
- **HFA** - Hydrofluoroalkane
- **DPI** - Dry powder inhaler
- **GSK** - GlaxoSmithKline
- **BI** - Boehringer Ingelheim
- **Merck** - Merck & Co., Inc.
- **MDI** - Metered dose inhaler
- **Sunovion** - Sunovion Pharmaceuticals Inc.
- **Armstrong** - Armstrong Pharmaceuticals Inc.