Asthma Medications

Delivery Devices & Technique

Presented by
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June 1, 2018
Welcome
Program Objectives

• Review individual medications and identify them each as Metered Dose Inhaler or Dry Powder Inhaler

• Identify meds that should be used with a spacer/holding device

• Learn what’s new in asthma treatment

• Demonstrate correct technique for medication use
Social Determinants of Health

The conditions in which people are born, grow, live, work and age.
# Social Determinants of Health

<table>
<thead>
<tr>
<th>Economic Stability</th>
<th>Neighborhood and Physical Environment</th>
<th>Education</th>
<th>Food</th>
<th>Community and Social Context</th>
<th>Health Care System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>Housing</td>
<td>Literacy</td>
<td>Hunger</td>
<td>Social integration</td>
<td>Health coverage</td>
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<tr>
<td>Income</td>
<td>Transportation</td>
<td>Language</td>
<td>Access to healthy options</td>
<td>Support systems</td>
<td>Provider availability</td>
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<tr>
<td>Expenses</td>
<td>Safety</td>
<td>Early childhood education</td>
<td>Social integration</td>
<td>Community engagement</td>
<td>Provider availability</td>
</tr>
<tr>
<td>Debt</td>
<td>Parks</td>
<td>Vocational training</td>
<td>Support systems</td>
<td>Community engagement</td>
<td>Provider linguistic and cultural competency</td>
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<tr>
<td>Medical bills</td>
<td>Playgrounds</td>
<td>Higher education</td>
<td>Discrimination</td>
<td>Providing linguistic and cultural competency</td>
<td>Quality of care</td>
</tr>
<tr>
<td>Support</td>
<td>Walkability</td>
<td></td>
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</tbody>
</table>

## Health Outcomes
- Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations


Accessed 10/18/17
Goals of Asthma Treatment

1. Reduce airway inflammation
2. Relieve broncho-constriction
3. Reduce mucous production
4. Reduce long term impairment
Asthma Medications

Understanding Differences

Long-term controllers

Quick-relievers

Biologics
Long-term controller medications

Include:

- **Single medication** controllers
  - Corticosteroid

- **Combination medication** controllers
  - Corticosteroid + long acting beta2-agonists

- **Leukotriene Modifiers**
Long-term Controller Medications

- *Prevent* symptoms by reducing inflammation
- Must be taken daily
Single Medication Controllers

Inhaled corticosteroids

- Flovent DPI fluticasone
- Flovent MDI
- Pulmicort respules
- Pulmicort flexhaler
- Armon Air Respiclick fluticasone
- budesonide suspension
- Alvesco MDI ciclesonide
- Qvar MDI beclomethasone

Reduce Airway Inflammation
Dry Up Mucous
Quick Relief Medicines

**Albuterol & Levalbuterol** – quick symptom relief

- **Proventil** MDI
- **Ventolin** MDI
- **ProAir** MDI
- **Albuterol** MDI
- **Albuterol solution**
- **Xopenex** (levalbuterol)
- **ProAir Respiclick** DPI
Quick-Relief Medications

Short acting beta2-agonists

Relieve symptoms by relaxing airway muscles

Provide prompt relief of symptoms

Used before to exercise and during a cold or the flu to prevent an asthma flare up

Do NOT provide long-term relief of symptoms
**Combination Controllers**

**Corticosteroid** decreases airway inflammation

**Long-acting beta2 agonist*** for long-acting symptom relief

<table>
<thead>
<tr>
<th>ADVAIR</th>
<th>SYMBICORT</th>
<th>DULERA</th>
<th>BREO</th>
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<tbody>
<tr>
<td>Discus</td>
<td></td>
<td></td>
<td>fluticasone furoate</td>
</tr>
<tr>
<td>Fluticasone propionate + salmeterol *</td>
<td>budesonide + formoterol* MDI</td>
<td>mometasone furoate + formoterol* MDI</td>
<td>fluticasone furoate + vilanterol *</td>
</tr>
<tr>
<td>AirDuo</td>
<td>Respiclick</td>
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</tbody>
</table>
Leukotriene Modifiers
Control for Allergic Asthma

Block the release of chemicals that increase inflammation

Accolate  Singulair  Zyflo

(montelukast sodium)
Biologics

• Disrupt the inflammatory process

• Administered in a health care setting

• SQ injection or IV infusion

• Risk of anaphylaxis requires 30-60 observation post injection
IgE mediated asthma

Xolair™ – omalizumab

• 6yrs and older

• Moderate to severe persistent asthma

• Poorly controlled with ICS

• Skin testing/RAST to confirm perennial allergies

• Subcutaneous injection every 2-4 weeks
Eosinophilic Asthma

reslizumab - Cinqair™
mepolizumab - Nucula™

• Treatment of severe asthma characterized by increased eosinophil counts

• Bind with Interleukin-5 mediator

• Reducing the signal for excess production and survival of eosinophils
<table>
<thead>
<tr>
<th>Category</th>
<th>Reslizumab (Cinqair)</th>
<th>Mepolizumab (Nucala)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication</td>
<td>Add-on maintenance therapy in patients aged ≥18 y with severe eosinophilic asthma</td>
<td>Add-on maintenance therapy in patients aged ≥12 y with severe eosinophilic asthma</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>IL-5 antagonist</td>
<td>IL-5 antagonist</td>
</tr>
<tr>
<td>Formulation</td>
<td>100-mg/10-mL single-use vial</td>
<td>100-mg single-use vial; must be reconstituted</td>
</tr>
<tr>
<td>Dosage</td>
<td>3 mg/kg IV q4w</td>
<td>100 mg SC q4w</td>
</tr>
<tr>
<td>Administered in healthcare setting</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Risk of anaphylaxis or hypersensitivity reaction</td>
<td>0.3% (boxed warning)</td>
<td>Reported</td>
</tr>
<tr>
<td>Metabolism</td>
<td>Degradation by proteolytic enzymes</td>
<td>Degradation by proteolytic enzymes</td>
</tr>
<tr>
<td>Half-life</td>
<td>24 days</td>
<td>16-22 days</td>
</tr>
<tr>
<td>Drug interactions</td>
<td>Not formally studied</td>
<td>Not formally studied</td>
</tr>
<tr>
<td>Adverse events</td>
<td>≥2%; includes oropharyngeal pain</td>
<td>≥5%; includes headache, injection-site reaction, back pain, fatigue</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Eosinophils, anaphylaxis/hypersensitivity reaction (during and after infusion), peak flow</td>
<td>Eosinophils, FEV₁</td>
</tr>
<tr>
<td>Cost</td>
<td>$1,002 (100-mg/10-mL vial)</td>
<td>$3,090 (100-mg vial)</td>
</tr>
</tbody>
</table>

FEV₁: forced expiratory volume in 1 second; IL: interleukin.
Source: References 12, 13, 23, 24.

benralizumab (Fasenra™)

• Approved by the FDA in 2017 ≥12 yrs

• Causes rapid near complete depletion of eosinophils

• Administered as 30 mg SQ injection every 4 weeks for the first 3 doses then 30 mg SQ every 8 weeks

benralizumab (Fasenra™)

• 50% reduction in annual asthma exacerbations

• Improved lung function by FEV¹

• 75% reduction in daily OCS use
Promoting Medication Adherence

• Build on what is known – dispelling myths

• Identifying barriers to access and adherence

• Being sensitive to cultural health beliefs and practices and SDOH

• Teaching benefits and correct technique for use of medication/device

• Special considerations – spacers, priming, cleaning, counters, rinsing mouth after use
Asthma Medication
Delivery Devices:

MDI – DPI - Discus
Holding Chambers
Metered Dose Inhalers

Uses a propellant to deliver a specific amount of medication to the lungs, in the form of a short burst of aerosolized medicine when the med canister is depressed. (PUMP)

*Used with a spacer/holding chamber.*
Spacers/Holding Chambers

A device that attaches to a press and breath (PUMP) metered dose inhaler (MDI)

It holds the medicine in its chamber

Should be **used every time** you use a MDI

Helps more medicine get to the lungs
Dry Powder Inhalers

Breath-actuated; medication is released as a powder with inhalation.
Nebulizers

- Help to deliver liquid medicine
- Used with a mouth piece or a face mask
- Produces a very fine mist that is inhaled
- Medicine goes directly into the lungs

Pulmicort (budesonide) Respules
Albuterol Solution
Nebulizer
Peak Flow Meters
Asthma Action Plan

1. Early symptom recognition
2. What medicines to give
3. When to give them
4. How much to give
5. When to get help

A recipe for asthma self-management and control.
RULES OF TWO®

When is quick relief for asthma NOT ENOUGH?

DO YOU...

• Take your “quick-relief inhaler” more than TWO TIMES A WEEK?
• Refill your “quick-relief inhaler” more than TWO TIMES A YEAR?
• Awaken at night with asthma more than TWO TIMES A MONTH?
• Measure your peak flow at less than two times 10 (20%) from baseline with asthma symptoms?

If YOU can answer “YES” to any of these questions, YOUR ASTHMA IS NOT UNDER CONTROL.

Talk with your healthcare provider about adding a LONG-TERM CONTROLLER® (an anti-inflammatory inhaled corticosteroid) to your treatment plan. A “long-term controller” medication can help to IMPROVE YOUR BREATHING and PREVENT ASTHMA EMERGENCIES!
Medication Hands On
Asthma Teach and Review

1. Contrast between normal airway and airway with asthma

2. The role of inflammation in asthma and what happens during an asthma flare

3. Benefits of daily medication for controlling inflammation; keep it simple; develop routines

4. Correct medication/proper technique

5. Using an AAP for symptom identification, daily control and self-management (The Rules of TWO™)
Improved Asthma Outcomes

• Fewer asthma emergencies

• Decrease ER utilization and hospitalization for asthma

• Decrease the number of missed school/daycare/work days due to asthma

• Parity NOT disparity

• Improve the quality of life for patients and families.
Questions/Evaluations
Appendix

1. For downloadable “How to” medication sheets in seven different languages
   https://www.nhp.org/provider/clinical/Pages/Asthma-Education-Materials.aspx
2. New Hampshire State Asthma Action Plan
   http://asthmanownh.org/medical-providers/asthma-management-care-plans-for-providers/
3. Rules of Two™
4. Asthma and Allergy Network patient education resources including medication phone apps and symptom diary
   http://www.allergyasthmanetwork.org/outreach/patient-resources/
   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5405559/