

Agents for Respiratory Diseases



Randal Du

Doctor of Pharmacy Candidate, 2015
University of California, San Francisco
April 2015

Adapted from slides by Tina Tran
Reviewed by: Tina Brock, EdD

- **What you should already know**
 - Pathophysiology of allergic rhinitis, asthma, and chronic obstructive pulmonary disease (COPD)
 - Common treatments for allergic rhinitis symptoms
- **What we will discuss**
 - Treatments for asthma and COPD
 - Side effects related to treatments
 - Acute vs. chronic management
- **What you should be able to do**
 - Explain to patients the importance of lung function for physical therapy treatment
 - Identify a respiratory disease agent, and its indication
 - Identify adverse effects of common respiratory agents, and be able to identify their influence on physical therapy treatment

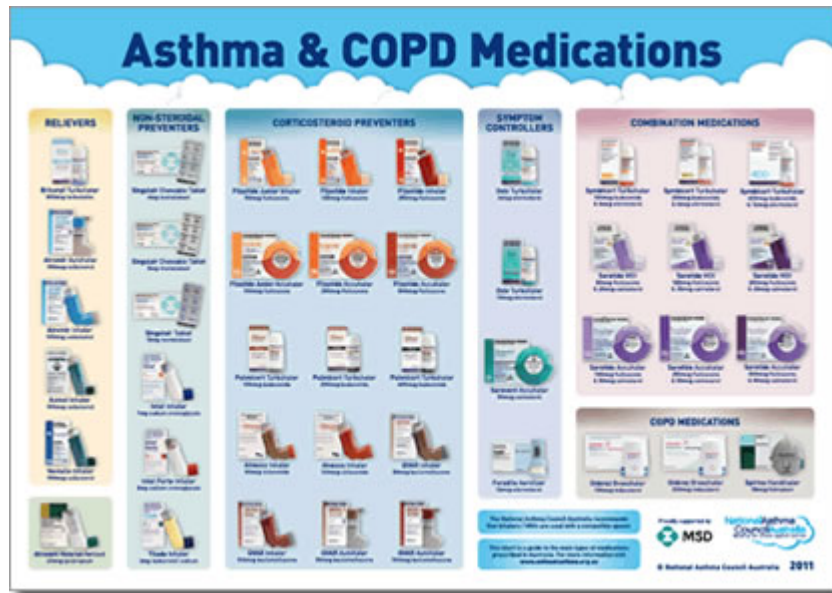
Clinical Relevance for Physical Therapy

- Respiratory agents improve pulmonary function, reduce respiration effort, and allow patients to participate in aerobic exercises during PT sessions
- Short-acting inhaled bronchodilator agents may be indicated for patients with respiratory diseases prior to PT exercises
- All health professionals should know which inhaler to use and how to use it in case of an acute asthma attack

Asthma and COPD

	Asthma	COPD
Pathophysiology	Bronchoconstriction → Reversible airflow limitation	Alveolar destruction → Irreversible airflow limitation
Epidemiology	Occurs in adults and children (common dz in children in US)	Occurs primarily in adults
Risk Factors	Exposure to smoke, allergen “Hygiene hypothesis” Atopic status	Smoking , genetic predisposition, environmental exposure
Triggers	Allergens, environments, emotions, exercises	Primarily cigarettes smoking
Treatment Goals	Rapid reversal of airway obstruction Prevent future exacerbations of asthmatic episodes	Minimize progression of COPD

Inhaler devices



Pharmacological Interventions

- **Bronchodilators**
 - Beta-2 agonists (long and short acting)
 - Anticholinergics (long and short acting)
- **Corticosteroids**

Beta-2 Agonists

(used in both asthma and COPD)

- **MoA:** Relax bronchial smooth muscle tone
 - bronchodilation
- **Short-acting (SABA)**
 - Albuterol (ProAir[®], Proventil[®], Ventolin[®])
 - **Used only as needed** for SOB, wheezing
- **Long-acting (LABA)**
 - Salmeterol (combo product – Advair[®])
 - Formoterol (combo product – Symbicort[®])
 - **Used every day** to prevent SOB, wheezing



Beta-2 Agonists

(used in both asthma and COPD)

- **Adverse Events**
 - Common: tremors, headache, cough, throat irritation, nausea
 - Serious: chest pain, irregular heartbeat, itching, swelling, hives
- Check for chest pain and irregular heartbeat during exercise and rehabilitation
- During treatment, check for SOB/wheezing (need for SABA)
- Monitor general asthma control:
 - Frequency of use of SABA (1-2x a week vs. daily)
 - Inhaler technique
 - Environmental factors/triggers

SABA Inhaler Technique

- Check for clogs in the inhaler
- Shake well, prime if new inhaler
- Stand/sit up straight and tilt head upward slightly
- Place device in mouth being careful not to block with teeth and tongue
- Inhale using a deep, slow breath as inhaler is “activated”
- Hold breath for 10 seconds
- Wait 1 minute between puffs

Anticholinergics (primarily used in COPD)

- Ipratropium (Atrovent) and Tiotropium (Spiriva Handihaler)
- **MoA:** muscarinic receptor blocker to prevent bronchoconstriction
- **Generally well tolerated**
 - Possible dry mouth
 - Possible urinary retention



Corticosteroids

(used in both asthma and COPD)

- **MoA** - Inhibits inflammatory response that contributes to bronchoconstrictive effect
- **Inhaled** (preferred therapy)
 - Beclomethasone (QVAR®)
 - Budesonide (Pulmicort® Flexhaler)
 - Fluticasone (Flovent®, Advair Diskus – combo)
 - Mometasone (Asmanex® Twisthaler)
- **Oral** (acute severe bronchospasm, refractory asthma)
 - Prednisone
 - Methylprednisolone
 - Hydrocortisone
- **ADEs**
 - Inhaled CCS: thrush or candidiasis
 - Oral CCS: insomnia, irritation, **hyperglycemia, hypertension, edema, osteoporosis, skin thinning**



Important Information Summarized

- SABA – to *treat* acute symptoms
- Other medications - to *prevent* symptoms and manage disease (in general)
- Patient should avoid triggers of acute symptoms (pollen/dust, smoking, etc.)
- Exercise is important

More important information summarized

Adverse Drug Reactions	Effects Interfering with Rehabilitation
Beta-2 agonists, anticholinergic agents – tachycardia	Precipitate chest pain in patients due to increased of cardiac workload
Corticosteroids – decreased bone density, hypertension	Increased cardiac stress due to hypertension, possible weakness due to decreased bone density

Questions?



Randal.Du@ucsf.edu