How to Manage Advanced COPD:
What Every Home Health Clinician Should Know

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Learning Objectives

➢ Review the medications used to manage advanced chronic obstructive pulmonary disease (COPD)

➢ Demonstrate patient assessment skills and decision-making in pulmonary medication selection

➢ Identify communication strategies for improving agreement and compliance with the plan of care for patients, family members, and clinicians
Disclosure

- I have no relevant financial relationships with manufacturers of any commercial products and/or providers of commercial services discussed in this presentation

- This discussion will include the use of medications for off-label indications

Air Movement in COPD

- Lungs are chronically over-inflated
  - Chest wall and diaphragm move less
  - Less negative pressure is generated in inspiration
  - Patients use accessory muscles or arms to lift and lengthen thoracic cavity

- Elastic recoil is reduced
  - Positive pressure in expiration is reduced
  - Expiration no longer passive but requires effort

- Airways are narrowed by inflammation

- Airways may collapse
  - Expiration is slower
  - Expiration takes more effort
Categorization of Patients

<table>
<thead>
<tr>
<th>Patient Classification</th>
<th>GOLD Spirometric Level</th>
<th>Summary of Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Group A: Low risk, Less symptoms</td>
<td>GOLD 1: Mild</td>
<td>0-1 exacerbations/year and no hospitalization for exacerbation; and CAT score &lt; 10 or mMRC grade 0-1</td>
</tr>
<tr>
<td>Patient Group B: Low risk, More symptoms</td>
<td>GOLD 2: Moderate</td>
<td>0-1 exacerbations/year and no hospitalization for exacerbation; and CAT score &gt; 10 or mMRC grade &gt; 2</td>
</tr>
<tr>
<td>Patient Group C: High risk, Less symptoms</td>
<td>GOLD 3: Severe</td>
<td>&gt; 2 exacerbations/year or ≥ 1 with hospitalization for exacerbation; and CAT score &gt; 10 or mMRC grade ≥ 2</td>
</tr>
<tr>
<td>Patient Group D: High risk, More symptoms</td>
<td>GOLD 3 or 4 (Severe or Very Severe)</td>
<td>&gt; 2 exacerbations/year or ≥ 1 with hospitalization for exacerbation; and CAT score &lt; 10 or mMRC grade &lt; 2</td>
</tr>
</tbody>
</table>

CAT = COPD Assessment Test
mmRC = Modified British Medical Research Council

Treatment of COPD

- **Goals:**
  - Reduce symptoms
  - Increase quality of life
  - Prevent complications

- None of the existing medications for COPD have been shown to modify the long-term decline in lung function

- Treatment should be patient specific

- Influenza and pneumococcal vaccination should be offered to every COPD patient
Patient is a 65 yo male with a PPS of 40% and end stage COPD, O₂ dependent and a past medical history of diabetes, hypertension, tobacco use, and benign prostatic hyperplasia (BPH). Uncontrolled symptoms include dyspnea at rest and pain.

Medications:
- Aspirin 81mg: Take 1 tab po daily
- Senna-S: Take 1 tab po BID
- Atenolol (Tenormin®) 25mg: Take 1 tab po daily
- Montelukast (Singulair®) 10mg: Take 1 tab po daily
- Roflumilast (Daliresp®) 500mcg: Take 1 tab po bid
- Alprazolam (Xanax®) 0.5mg q4h prn anxiety/dyspnea
- Tiotropium (Spiriva®) Inhaler: Inhale 1 puff daily
- Insulin detemir (Levemir®) Flexpen: Inject 20units SQ daily
- Tamsulosin (Flomax®) 0.4mg: Take 1 cap po daily
- Insulin aspart (Novolog®) Flexpen: Inject 3units SQ twice daily
- Prednisone 10mg: Take 1 tab po daily
- Ipratropium/albuterol (DuoNeb®) Solution: 1 vial 4-6 times per day
- Budesonide/formoterol (Symbicort®): Inhale 2 puffs BID
- Albuterol (Proair®) HFA Inhaler: Inhale 2 puffs Q6H prn

Medications for Pulmonary Disease

- Bronchodilators
  - Beta₂ agonists
  - Anticholinergics

- Corticosteroids

- Other Medications
  - Leukotriene Receptor Antagonists
  - Guaifenesin (Mucinex®)
  - Roflumilast (Daliresp®)
  - Theophylline
Inhalers & Nebulized Meds

- Mainstays of COPD therapy

- Therapy is layered based on patient risk factors and severity of symptoms
  - Low risk, few symptoms = bronchodilator PRN
  - High risk, severe symptoms = rational polypharmacy

- Therapy through the inhaled route requires attention to effectiveness of drug delivery and training of inhaler technique

Beta₂ Agonists: Pharmacology

- Relax bronchial smooth muscles (bronchodilation) by stimulating beta₂ receptors
  - Duration of action varies by agent
    - Range: 4 – 24 hours
  - Effect on heart rate varies by medication
    - All beta₂ agonists carry risk, especially with overuse and duplication of therapy
    - Short-acting > long-acting
    - Albuterol > levalbuterol
Beta₂ Agonists: Dosing & Use

- Used in combination with inhaled corticosteroids and anticholinergic inhalers, +/- oral meds

- Longer-acting agents (LABA)
  - Dose Q12 or Q24 hours
  - Scheduled use for maintenance & prevention

- Shorter-acting agents (SABA)
  - Dose Q4 or Q6 hours
  - Commonly used PRN for breakthrough symptoms
  - Rescue inhalers

Beta₂ Agonists: Adverse Effects

- Chest pain, palpitations, anxiety, dizziness, tremor, pharyngitis

- Risk of adverse effects in increased, without additional clinical benefit to patient when:
  - More than one beta₂ agonist is ordered for routine use
  - Beta₂ agonist inhaler is overused by patient
Beta$_2$ Agonists: Avoiding Duplications

- Medication profile review at each visit
  - Any new additions
  - Any inhalers missed or forgotten about from last visit
  - Are inhalers being refilled “too soon”

- Recognize duplications
  - Know the medications in each class (especially combination inhalers!)
  - Scheduled short-acting agents are equivalent to a long-acting agent
    - Ex: albuterol Q6H ATC ≈ arformoterol (Brovana®) Q12H ATC

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**Beta$_2$ Agonists: SABA Options**

<table>
<thead>
<tr>
<th>Generic (Brand)</th>
<th>Dosing Interval</th>
<th>Dosage Forms</th>
<th>FDA Approved Indication</th>
<th>Generic Available?</th>
<th>Average Cost/Month (AWP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol (AccuNeb®, Ventolin®, ProAir®)</td>
<td>Q4-6H</td>
<td>Nebulizer (Neb), aerosol inhalation tablets</td>
<td>Asthma, COPD</td>
<td>Yes</td>
<td>$47 HFA / $75 Neb / $1500 tabs</td>
</tr>
<tr>
<td>Levalbuterol (Xopenex®)</td>
<td>Q6-8H</td>
<td>Nebulizer, aerosol inhalation</td>
<td>Asthma</td>
<td>Yes (Neb)</td>
<td>$105 HFA / $525 Neb</td>
</tr>
<tr>
<td>Metaproterenol (Alupent®)</td>
<td>Q4-6H</td>
<td>Tablets, syrup</td>
<td>Asthma, COPD</td>
<td>Yes</td>
<td>$1.40 tablets</td>
</tr>
<tr>
<td>Terbutaline (Brethine®)</td>
<td>Q6H</td>
<td>Tablets</td>
<td>Asthma</td>
<td>Yes</td>
<td>$63 tablets</td>
</tr>
</tbody>
</table>

HFA = hydrofluoroalkane  
MDI = metered dose inhaler
Beta₂ Agonists: LABA Options

<table>
<thead>
<tr>
<th>Generic (Brand)</th>
<th>Dosing Interval</th>
<th>Dosage Forms</th>
<th>FDA Approved Indication</th>
<th>Generic Available?</th>
<th>Average Cost/Month (AWP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arformoterol (Brovana®)</td>
<td>BID</td>
<td>Nebulizer</td>
<td>COPD</td>
<td>No</td>
<td>$620 Neb</td>
</tr>
<tr>
<td>Formoterol (Foradil Aerolizer®, Perforomist®)</td>
<td>BID</td>
<td>Nebulizer, Dry Powder Inhaler</td>
<td>Asthma / COPD</td>
<td>No</td>
<td>$610 Neb / $300 DPI</td>
</tr>
<tr>
<td>Indacaterol* (Arcapta®)</td>
<td>QD</td>
<td>Dry Powder Inhaler</td>
<td>COPD</td>
<td>No</td>
<td>$220 DPI (capsules)</td>
</tr>
<tr>
<td>Salmeterol (Serevent®)</td>
<td>BID</td>
<td>Dry Powder Inhaler</td>
<td>Asthma / COPD</td>
<td>No</td>
<td>$288 MDI</td>
</tr>
</tbody>
</table>

DPI = dry powder inhaler

*newer medication, dosage form

Anticholinergics: Pharmacology

- Provide bronchodilation by inhibiting acetylcholine at type 3 muscarinic (M₃) receptors in bronchial smooth muscle
  - Duration of action varies by medication
    - Range: 6 – 24 hours
  - Inhaled anticholinergics have same mechanism of action as oral anticholinergics, with less systemic effect
    - Anticholinergic side effect risk increases with overuse and duplication of therapy
Anticholinergics: Dosing & Use

- Used in combination with inhaled corticosteroids and LABA or SABA inhalers, +/- oral meds

- Longer acting agents
  - Q12 or 24 hours
  - Scheduled use only, for maintenance and prevention

- Shorter acting agent
  - Q4 or 6 hours
  - Scheduled or PRN use
    - Recommend scheduled in severe disease

Anticholinergics: Adverse Effects

- Bronchitis, sinusitis, headache, dry mouth, dizziness, urinary retention

- SLUDGE: Salivation, Lacrimation, Urination, Defecation, GI, Emesis

- Cautious use if glaucoma, BPH, renal impairment

- Risk of adverse effects increased when
  - Multiple anticholinergic medications ordered
    - Both oral or inhaled contribute to adverse effects
    - Common examples listed in chart
  - Anticholinergic inhalers overused
Anticholinergics: Avoiding Duplications

- Medication profile review at each visit
  - Any new additions – oral, inhalers, nebs
  - Any inhalers missed or forgotten about from last visit
  - Are inhalers being refilled “too soon”

- Recognize duplications
  - Know the medications in each class (especially combination inhalers!)
  - Scheduled short-acting agents are equivalent to a long-acting agent
    - Ex: ipratropium (Atrovent®) Q6H ATC ≈ tiotropium (Spiriva®) QDay

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**take note**

*Short acting bronchodilators used routinely*

=  

*Long acting bronchodilator*
Anticholinergics: Options

<table>
<thead>
<tr>
<th>Generic (Brand)</th>
<th>Dosing Interval</th>
<th>Dosage Forms</th>
<th>FDA Approved Indication</th>
<th>Generic Available?</th>
<th>Average Cost/Month (AWP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipratropium (Atrovent®)</td>
<td>Q4-6H</td>
<td>Nebulizer, Aerosol inhaler</td>
<td>COPD</td>
<td>Yes</td>
<td>$280 HFA $140 Neb</td>
</tr>
<tr>
<td>Aclidinium* (Tudorza Pressair®)</td>
<td>BID</td>
<td>Dry Powder Inhaler</td>
<td>COPD</td>
<td>No</td>
<td>$261 DPI</td>
</tr>
<tr>
<td>Tiotropium (Spiriva®)</td>
<td>QD</td>
<td>Powder Capsule Inhaler</td>
<td>COPD</td>
<td>No</td>
<td>$305 DPI</td>
</tr>
</tbody>
</table>

*newer medication, dosage form


Oral Anticholinergic Duplications

<table>
<thead>
<tr>
<th>Class</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antihistamines</td>
<td>Diphenhydramine (Benadryl®), Meclizine (Antivert®), Hydroxyzine (Atarax®)</td>
</tr>
<tr>
<td>Meds for Urinary Incontinence</td>
<td>Tolterodine (Detrol®), Oxybutynin ( Ditropan®)</td>
</tr>
<tr>
<td>Tricyclic Antidepressants</td>
<td>Amitriptyline (Elavil®), Desipramine (Norpramin®), Nortriptyline (Pamelor®)</td>
</tr>
<tr>
<td>Muscle Relaxants</td>
<td>Cyclobenzaprine (Flexeril®)</td>
</tr>
<tr>
<td>Antispasmodics</td>
<td>Dicyclomine (Bentyl®), Hyoscyamine (Levsin®)</td>
</tr>
<tr>
<td>Antiemetics</td>
<td>Promethazine (Phenergan®), Prochlorperazine (Compazine®)</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>Chlorpromazine (Thorazine®)</td>
</tr>
<tr>
<td>Anti-Parkinson agents</td>
<td>Benztropine (Cogentin®), Trihexyphenidyl (Artane®)</td>
</tr>
</tbody>
</table>
Inhaled Corticosteroids: Pharmacology

- Control bronchial inflammation by suppressing leukocytes and decreasing capillary permeability
  - Anti-inflammatory, immuno-suppressive, anti-proliferative
  - Oral and inhaled corticosteroids (CS) have similar effects
  - Inhaled CS primarily local action in lungs
  - Inhaled CS limit the systemic exposure and reduce long term corticosteroid adverse effect risk

- Duration of action is similar for all
  - Range: 12-24 hours

Inhaled Corticosteroids: Dosing & Use

- Used in combination with inhaled anticholinergics and LABA or SABA inhalers, +/- oral meds
  - Dose Q12H for maintenance and prevention
  - Scheduled use only!
  - No PRN use of inhaled corticosteroids!
Inhaled Corticosteroids: Adverse Effects

- Oropharyngeal thrush, throat irritation, respiratory infection, rhinitis, headache

- Risk of adverse effects is increased, *without additional clinical benefit to patient* when:
  - More than one inhaled CS is ordered for routine use
  - Inhaled CS and oral CS are ordered routinely
  - Overuse or improper use of inhaled CS

Oral Corticosteroids: Adverse Effects

- Edema, hyperglycemia, hypertension, peptic ulcer, bruising, impaired wound healing

  - For higher functioning (non-hospice) patients, inhaled CS is preferred for maintenance with added oral CS bursts for exacerbations as needed

  - For poorer functioning (hospice/end stage) patients, added benefit from oral CS for appetite, mood, pain plus difficulty in proper use of inhaled CS
Inhaled Corticosteroids: Avoiding Duplications

- Medication profile review at each visit
  - Any new additions - oral, inhalers, nebs
  - Any inhalers missed or forgotten about from last visit
  - Are inhalers being refilled “too soon” or “too late”

- Recognize duplications
  - Know the medications in each class (especially combination inhalers!)
  - Short term “steroid bursts” to manage exacerbations may be added to a scheduled inhaled CS

### Inhaled Corticosteroids (ICS)

<table>
<thead>
<tr>
<th>Generic (Brand)</th>
<th>Dosing Interval</th>
<th>Dosage Forms</th>
<th>FDA Approved Indication</th>
<th>Generic Available?</th>
<th>Average Cost/Month (AWP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclomethasone (QVAR®)</td>
<td>BID</td>
<td>Aerosol Inhaler</td>
<td>Asthma</td>
<td>No</td>
<td>$209 MDI</td>
</tr>
<tr>
<td>Budesonide (Pulmicort®)</td>
<td>BID</td>
<td>Nebulizer, Powder Inhaler</td>
<td>Asthma</td>
<td>Yes (neb)</td>
<td>$500 Neb / $205 DPI</td>
</tr>
<tr>
<td>Ciclesonide (Alvesco®)</td>
<td>BID</td>
<td>Aerosol Inhaler</td>
<td>Asthma</td>
<td>No</td>
<td>$209 MDI</td>
</tr>
<tr>
<td>Flunisolide* (Aerospan®)</td>
<td>BID</td>
<td>Aerosol Inhaler</td>
<td>Asthma</td>
<td>No</td>
<td>$380 MDI</td>
</tr>
<tr>
<td>Fluticasone (Flovent®)</td>
<td>BID</td>
<td>Aerosol Inhaler, Powder Inhaler</td>
<td>Asthma</td>
<td>Yes (neb)</td>
<td>$340 HFA / $150 DPI</td>
</tr>
<tr>
<td>Mometasone (Asmanex®)</td>
<td>BID</td>
<td>Aerosol Inhaler</td>
<td>Asthma</td>
<td>No</td>
<td>$180 MDI</td>
</tr>
</tbody>
</table>

*new medication, dosage form

Lexi-Comp Online [Internet database]. Lexi-Drugs Online, Hudson, Ohio: Lexi-Comp, Inc. Accessed Feb 26, 2014
### Oral Corticosteroids

<table>
<thead>
<tr>
<th>Generic (Brand)</th>
<th>Dosing Interval</th>
<th>Dosage Forms</th>
<th>FDA Approved Indication</th>
<th>Generic Available?</th>
<th>Average Cost/Month (AWP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone (Decadron)</td>
<td>QD to Q6H Tablet, Solution, Injectable</td>
<td>Anti-inflammatory, Antiemetic, multiple others</td>
<td>Yes</td>
<td>$10 - $20 Tabs</td>
<td></td>
</tr>
<tr>
<td>Methylprednisolone (Medrol, Solu-Medrol, Depo-Medrol)</td>
<td>QD to Q6H Tablet, Injectable</td>
<td>Anti-inflammatory, Acute Asthma, multiple others</td>
<td>Yes</td>
<td>$40 - $80 Tabs</td>
<td></td>
</tr>
<tr>
<td>Prednisone (Deltasone)</td>
<td>QD to Q6H Tablet, Solution,</td>
<td>Acute Asthma, Pneumonia, RA, multiple others</td>
<td>Yes</td>
<td>$5 - $20 Tabs</td>
<td></td>
</tr>
</tbody>
</table>

RA = rheumatoid arthritis

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### Combination Inhaled Products

<table>
<thead>
<tr>
<th>Generic (Brand)</th>
<th>Dosing Interval</th>
<th>Dosage Forms</th>
<th>FDA Approved Indication</th>
<th>Generic Available?</th>
<th>Average Cost/Month (AWP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budesonide/ Formoterol (Symbicort®)</td>
<td>BID</td>
<td>Aerosol Inhaler</td>
<td>Asthma/COPD</td>
<td>No</td>
<td>$280MDI</td>
</tr>
<tr>
<td>Fluticasone/ Salmeterol (Advair HFA®, Advair Diskus®)</td>
<td>BID</td>
<td>Aerosol, Powder Inhaler</td>
<td>Asthma/COPD</td>
<td>No</td>
<td>$375HFA $400DPI</td>
</tr>
<tr>
<td>Mometasone/ Formoterol* (Dulera®)</td>
<td>BID</td>
<td>Aerosol Inhaler</td>
<td>Asthma</td>
<td>No</td>
<td>$235 MDI</td>
</tr>
<tr>
<td>Vilanterol/ Fluticasone furoate* (Breo Ellipta®)</td>
<td>QD</td>
<td>Powder inhaler</td>
<td>COPD</td>
<td>No</td>
<td>$320 DPI</td>
</tr>
<tr>
<td>Ipratropium/ Albuterol* (Combivent Respimat®, Duoneb®)</td>
<td>Q4-6H</td>
<td>Nebulizer, Aerosol Inhaler</td>
<td>Asthma/COPD</td>
<td>Yes (nebs only)</td>
<td>$288 MDI $120Neb</td>
</tr>
</tbody>
</table>

*newer medication, dosage form

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Leukotriene Receptor Antagonists

- Control inflammation, inhibit bronchoconstriction, decrease airway edema
  - Montelukast (Singulair®) average cost $170/month
  - Zafirlukast (Accolate®) average cost $117/month

- FDA-approved for asthma, seasonal allergies only
  - No evidence for use in COPD
  - Use not supported in 2013 GOLD guidelines

- Adverse effects: headache, nausea, diarrhea, abdominal pain, insomnia, flu-like symptoms

Roflumilast (Daliresp®)

- Bronchodilation due to inhibition of phosphodiesterase type 4; exact mechanism is unknown, but provides anti-inflammatory activity

- FDA approved indication: COPD

- Average cost (AWP): $240/month (tablets)

- Adverse effects: diarrhea, weight loss, nausea, decreased appetite, headache, dizziness, depression and insomnia
  - Dose adjustment required in liver disease
Guaifenesin (Mucinex®)

- Irritates the gastric mucosa, stimulates respiratory tract secretions, decreases mucus viscosity
- Goal is to loosen phlegm for easier expectoration and elimination
  - Encourage fluids, give with 8 oz of water for benefit
  - Anticholinergic use can reduce effectiveness
  - Use cough suppressants at night to reduce sleep interruption or for painful productive cough
- Average cost (AWP): $25/month (tablets)
- Adverse effects: dizziness, drowsiness, headache, nausea
- Max dose 2400mg/day
  - Higher doses no benefit and increased adverse effects

Theophylline (Theo-Dur®)

- Causes bronchodilation, diuresis, CNS and cardiac stimulation, and gastric acid secretion; exact mechanism is unknown
- FDA approved for asthma/COPD
- Average cost (AWP): $40/month (tablets), $111/month (elixir)
- Adverse Effects: tachycardia, atrial flutter, headache, insomnia, restlessness, seizures, tremor
  - Narrow therapeutic index:
    - Signs of toxicity from chronic overexposures: cardiac dysrhythmias, tachycardia, persistent and repetitive vomiting
    - Risk factors for toxicity: age > 60 yrs, drug-drug interactions
Future of COPD Pharma

- Inhalers containing CFC propellants have phased out
  - CFC (chlorofluorocarbon) damages ozone layer
  - Dec 2013 Combivent® MDI already replaced with Combivent Respimat®
  - Fall 2013 Aerospan® to replace Aerobid® phased out in 2011

- New inhaled medications
  - ICS: Fluticasone furoate
  - LABA: Vilanterol, Olodaterol
  - Anticholinergics: Umeclidinium, Glycopyrronium
  - Combo LABA/LA anticholinergic: umeclidinium/vilanterol (Anoro Ellipta)

- New delivery devices
  - Respimat® (Boehringer Ingelheim), Ellipta® (GSK-Theravance), Breezehaler® (Norvartis)

Choosing a Medication

- Choice within each class of medications depends on:
  - Availability
  - Cost
  - Patient response
  - Patient’s skills and ability to utilize the medication

- Choice between which medication class to start depends on the patient’s current pulmonary status
  - Patient Group A-D
## Treatment Guidelines

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Recommended First Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Group A</strong>: Low risk, Less symptoms</td>
<td>SABA prn</td>
</tr>
<tr>
<td></td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>Short-acting anticholinergic prn</td>
</tr>
<tr>
<td><strong>Patient Group B</strong>: Low risk, More symptoms</td>
<td>Long-acting anticholinergic</td>
</tr>
<tr>
<td></td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>LABA</td>
</tr>
<tr>
<td><strong>Patient Group C</strong>: High risk, Less symptoms</td>
<td>Inhaled CS + LABA</td>
</tr>
<tr>
<td></td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>Long-acting anticholinergic</td>
</tr>
<tr>
<td><strong>Patient Group D</strong>: High risk, More symptoms</td>
<td>Inhaled CS + LABA and/or long-acting anticholinergic</td>
</tr>
</tbody>
</table>

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**take note**

*Rational polypharmacy in COPD is using multiple different medications that have similar goal of treating dyspnea*
What Can You Do for Patients with COPD?

Ensure symptom relief with medications

+ Determine if decline or disease progression despite medication adherence and appropriate inhaler use

+ Keep the discussions patient-centered

Continuously monitor for:
1. Appropriate use of inhalers
2. Frequency of use of inhalers
3. Duplications in therapy
4. Adverse effects from medications

Managing Exacerbations of COPD

➤ Reduce Trigger Risk (if possible)

- Respiratory Infections: (Viral or Bacterial)
- Allergies (indoor & outdoor)
- Anxiety
- Co-morbid heart failure: pulmonary edema

➤ Be prepared for home management of exacerbations

- Oral steroid bursts
- Antibiotics if bacterial infection suspected
- Supplemental oxygen
- Palliative symptom management
Managing Exacerbations of COPD

- **Oral steroid bursts**
  - Prednisone 40mg PO Daily x 5 days; then return to prior maintenance CS regimen (lower dose oral or ICS)

- **Increase dose or frequency of short-acting bronchodilators**
  - Change to nebulizer delivery (if not already using)

- **Consider antibiotics when clinical bacterial infection signs present**
  - Increased sputum purulence, increased sputum volume, increased dyspnea

Managing Exacerbations of COPD

- **Antibiotics**
  - Choice of antibiotic depends on local resistance patterns
  - Use “Respiratory antibiotics”, for 5-10 days
  - Oral antibiotics preferred
  - Avoid using same antibiotic class within 3 months

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin-clavulanic acid (Augmentin®)</td>
<td>Penicillin</td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>3rd generation cephalosporin</td>
</tr>
<tr>
<td>Azithromycin (Zithromax®) or clarithromycin (Biaxin®)</td>
<td>Macrolide</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Tetracycline</td>
</tr>
<tr>
<td>Levofloxacin (Levaquin®) or Moxifloxacin (Avelox®)</td>
<td>Fluoroquinolone</td>
</tr>
</tbody>
</table>
**take note**

*Antibiotics should be used only when symptoms of bacterial infection are present*  
AND  
*When treatment is in line with the patient’s goals*

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**Palliative Dyspnea Management**

- **Low doses** of short-acting opioids are the mainstays of palliative dyspnea management

- Extreme anxiety can accompany the sensation of dyspnea, low dose benzodiazepines may also be useful

- Starting doses recommended for opioid-naïve patients:
  - Morphine 2.5mg PO/SL every 2 hours as needed for dyspnea
  - Lorazepam 0.25mg PO/SL every 4 hours as needed for dyspnea-associated anxiety
Patient Case: 65 yo, ES COPD

Medications:
- Aspirin 81mg: Take 1 tab po daily
- Senna-S: Take 1 tab po BID
- Atenolol (Tenormin®) 25mg: Take 1 tab po daily
- Montelukast (Singulair®) 10mg: Take 1 tab po daily
- Roflumilast (Daliresp®) 500mcg: Take 1 tab po bid
- Alprazolam (Xanax®) 0.5mg q4h prn anxiety/dyspnea
- Tiotropium (Spiriva®) Inhaler: Inhale 1 puff daily
- Insulin detemir (Levemir®) Flexpen: Inject 20units SQ daily
- Tamsulosin (Flomax®) 0.4mg: Take 1 cap po daily
- Insulin aspart (Novolog®) Flexpen: Inject 3units SQ twice daily
- Prednisone 10mg: Take 1 tab po daily
- Ipratropium/albuterol (DuoNeb®) Solution: 1 vial 4-6 times per day
- Budesonide/formoterol (Symbicort®): Inhale 2 puffs BID
- Albuterol (Proair®) HFA Inhaler: Inhale 2 puffs Q6H prn

Where Do We Start?

After any acute symptoms are controlled:
- **Step 1**: Assess for adverse effects
  - Review medication profile
  - Adverse effects from polypharmacy, incorrect use
- **Step 2**: Eliminate duplications
  - Review medication profile
  - Reduces polypharmacy
  - Reduces adverse effect exposure risk
Patient Case: 65 yo, ES COPD

Without adjusting inhalers, how would you manage the patient's symptoms?

- Add morphine 20mg/mL 2.5-5mg PO/SL/PR q2h prn pain/dyspnea
- Schedule alprazolam 0.5mg TID and continue q4h prn
- Steroid burst (i.e. Prednisone 40mg PO daily x 5 days) then return to lower daily dose
- Non-pharmacologic management

Patient Case: 65 yo, ES COPD

Medications:

- Aspirin 81mg: Take 1 tab po daily
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*Duplication of therapy*
Plan to Address Duplications of Therapy

IF the patient is on Symbicort®, Spiriva®, Daliresp®, prednisone and Duoneb® nebulized scheduled QID...

THEN there are duplications of:
- Corticosteroids: budesonide (Symbicort®) and prednisone
- Anti-inflammatories: Daliresp®, budesonide (Symbicort®), prednisone
- Anticholinergics: tiotropium (Spiriva®), ipratropium (Duoneb®)
- Beta-agonists: formoterol (Symbicort®), albuterol (Duoneb®)

SO to eliminate duplications and utilize the most cost effective therapy:
- Discontinue Symbicort®, Spiriva®, and Daliresp®
- Continue prednisone (consider burst or increase maintenance dose)
- Continue Duoneb® nebulized QID

Assessing Inhaler Appropriateness

MDIs and DPIs require good breathing coordination and inspiratory capacity to use properly.

Evaluate patient ability to use inhalers for both ability to inhale deeply, cognitive and physical ability to coordinate inhalation with inhaler activation.

Evaluation and discussion about appropriateness of these medications MUST occur on an ongoing basis.
Assessing Inhaler Appropriateness

To determine if the inhalers are used correctly, follow these three steps:

1. Ask the patient to demonstrate how they use the inhaler
2. Demonstrate appropriate use of the inhaler by walking the patient through the steps
   - Stress the importance of holding your breath for ten seconds after inhaling the medication
3. Have the patient use the inhaler again using appropriate technique

If the patient cannot complete the above steps, the medication is not reaching the site of action in the lungs and therefore is not beneficial

Inhaler Technique

Dry powder inhaler (DPI)

For efficient use, patient must be able to:

1. Follow instructions to prepare specific DPI device for use (diskus, flexhaler, twisthaler)
2. Turn head away from device to exhale completely
3. Close mouth around mouthpiece
4. Inhale forcefully, steadily, and deeply to propel medicated powder into lungs
5. Hold breath for 10 seconds
6. Remove DPI from mouth and exhale slowly
7. Repeat steps 1-6 if more than 1 inhalation is prescribed
Inhaler Technique

Metered dose inhaler (MDI)

*For efficient use, patient must be able to:*

1. Follow instructions to prepare specific MDI device for use (traditional MDI, Respimat®)
2. Shake inhaler and hold properly
3. Position for open airway inhalation
4. Exhale completely
5. Close mouth around device mouthpiece
6. Activate inhaler device timed to start of inspiration
7. Slowly and deeply inhale medication over 5-7 seconds
8. Hold breath for 10 seconds
9. Wait 1 minute and repeat steps 1-7 if more than 1 inhalation is ordered

When to Assess Ability to Use Inhalers

Assess & document patient’s ability to use inhalers:

1. With any exacerbation of condition
2. With a decline in status
3. At every recertification
4. Prior to ordering inhaler refills
5. On admission to hospice
6. With every change in location (transfer to/from ECF, IPU, hospital, etc)
Overuse of Inhalers

Non-Pharmacological Management

- **Positioning**
  - Providing an over the bed table will help patients to position themselves with their head up and support their elbows and arms to allow lengthening and expansion of the chest cavity

- **Environment**
  - Fan directed at face
  - Provide visual signs of air movement (ribbons on fan)
  - Cool air
  - Minimize odors
  - Avoid closed in spaces
Non-Pharmacological Management

➤ Smoking cessation
  • Depends on patient’s goals of care
  • Smoking can exacerbate dyspnea, mucus and cough
  • Smoking is life-threatening when patients are also using oxygen or fall asleep while smoking
  • Nicotine replacement products may be a useful alternative to reduce symptoms and address safety concerns

➤ Support
  • Psychosocial, emotional and spiritual support is extremely helpful in reducing fear, anxiety, and depression

➤ Oxygen therapy
  • Considered for any patient with hypoxemia (O2 Saturation < 90%) and during periods of exacerbation

➤ Rehabilitation
  • Considered for any patient who becomes dyspneic when walking at their own pace on level ground
  • It can improve symptoms and quality of life as well as participation in other activities
Communication Strategies
The BUILD Model

Difficult Discussions

- Patients, families and physicians have grown accustomed to the current medication regimen
- Discussing discontinuing therapy may result in a sense of abandonment or loss of hope
- Ways to address these feelings:
  - Communication and collaboration with the patient's attending physician
  - Asking the patient what provides him/her comfort
Planned Discussions

- At time of admission
- When it’s time to re-order a medication that is regarded as life prolonging or delaying disease progression, i.e. Rilutek, Namenda, Aricept
- When filling the patient’s pillbox or ordering refills
- During an extended care facility’s care conference
- Prior to recertification

Planned Discussions

- Whenever there is a change in location or Level of Care due to a change in patient condition:
  - Transfer to inpatient unit (IPU)
  - Transfer to an extended-care facility (ECF)
  - Continuous Care Initiated
- Whenever there is a need to change medications due to patient condition:
  - Patient having difficulty swallowing
  - Patient less responsive
Windows of Opportunity

Seizing the moment:
- “He takes pills all day long. No wonder he doesn’t have an appetite.”
- “It takes 20 minutes to get his pills in him.”
- “I’m having to use my inhaler more often-sometimes every 2 hours.”
- “I can’t even walk to the door anymore because I’m so short of breath.”
- “Mom doesn’t even say my name anymore.”

Windows of Opportunity

Creating the moment:
- “You take a lot of medications, I’m wondering if some may be causing side effects?”
- “With so many medications, I’m wondering if you ever prioritize the ones that are most important and skip others.”
- “I’m wondering if it’s difficult for you to think about discontinuing medications that your mother has taken for a long time.”
Talking Points for Patients and Families

➢ Follow the BUILD Model
  ● B-Build a foundation of trust and respect
  ● U-Understand what the patient and caregiver know about the medication and the disease process
  ● I-Inform the patient and caregiver of evidence based information about the medication
  ● L-Listen the patient and caregiver as they share their goals and expectations
  ● D-Develop a plan of care (POC) in collaboration with the patient and family

B-Build

➢ Follow the BUILD Model
  ● B-Build a foundation of trust and respect
    ➢ GOAL: Affirm the patient and caregiver; listen more than you talk. Validate their efforts and concerns
    ➢ Key Phrases:
      • “You do a great job advocating for your mother.”
      • “It sounds like this has been a very challenging time for you.”
U-Understand

➢ U-Understand what the patient and caregiver know about the medication and the disease process
  • Key phrases:
    – “How is the medication helpful to you?”
    – “What has the doctor told you about how this medicine works?”
    – “How will you know it’s time to stop the medicine/change the medicine?”

I-Inform

➢ I-Inform the patient and caregiver of evidence-based information about the medication
  • Key Phrases:
    – “There are other medications used to treat shortness of breath/anxiety that may be more effective than these inhalers for you.”
    – “As your disease progresses it may be useful to make some adjustments to your medications. What worked before may not work now.”
L-Listen

- L-Listen to the patient and caregiver as they share their goals and expectations
  - If the patient indicates a struggle with making a change, it may be helpful to share experiences
  - Key phrases:
    - “We can’t reverse or cure your disease but there are many things we can do to provide comfort and quality of life. What does quality of life look like to you? What’s important to you?”
    - “It sounds like it’s hard for you to make a decision about stopping the Advair® inhaler. Can I share what my experiences and observations have been?”
    - “We really just want your breathing to be more comfortable. I want you to know this is a team effort and you’re in charge of the team. I appreciate you allowing me to talk with you today.”

D-Develop

- D-Develop a plan of care in collaboration with the patient and family
  - Goals need to be patient-centered and measurable
  - Focus on patient comfort and what enhances quality-of-life
  - Ask the patient for feedback regarding the plan and make adjustments if needed
  - Key phrases:
    - “We work in collaboration with your doctor, who still guides your care and wants you to be comfortable.”
    - “You are not alone. We will walk this path with you. I’d like to come back on Tuesday and we can talk more about this.”
Talking Points for Clinicians

- Keep the conversation patient-centered
  - More than just relaying a message about medication use or cost
  - Stress your assessment of the patient
    - Inhaler use (frequency, ability, adverse effects)
    - Decline/disease progression
      - i.e. Comparison from a month ago to today
- Inform clinician of duplications of therapy
- Suggest adjusting therapy to improve symptom relief
- Recommend specific therapeutic alternatives
- Send results of therapy adjustment to physician

Examples:
- "The patient is using the inhalers more than prescribed and is still not having relief of symptoms."
- "The patient cannot use the inhalers correctly and the medication is not reaching the lungs."
- "I have noticed a significant decline in the past month, the patient is more dyspneic at rest despite current therapy."
- "The patient no longer leaves the home or facility but still uses a handheld rescue inhaler."
Questions?

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HospiScript, A Catamaran Company
awei@hospiscript.com

References

### Stages of COPD

<table>
<thead>
<tr>
<th>GOLD Spirometric Level</th>
<th>Post-Bronchodilator FEV1 (FEV1/FVC &lt; 70%)</th>
<th>Exacerbations (per year)</th>
<th>Hospitalizations (per year)</th>
<th>3-year Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD 1: Mild</td>
<td>FEV1 ≥ 80% predicted</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>GOLD 2: Moderate</td>
<td>50% ≤ FEV1 &lt; 80% predicted</td>
<td>0.7-0.9</td>
<td>0.11-0.2</td>
<td>11%</td>
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<tr>
<td>GOLD 3: Severe</td>
<td>30% ≤ FEV1 &lt; 50% predicted</td>
<td>1.1-1.3</td>
<td>0.25-0.3</td>
<td>15%</td>
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<tr>
<td>GOLD 4: Very Severe</td>
<td>FEV1 &lt; 30% predicted or FEV1 &lt; 50% predicted plus chronic respiratory failure</td>
<td>1.2-2.0</td>
<td>0.4-0.54</td>
<td>24%</td>
</tr>
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GOLD = Global Initiative for Chronic Obstructive Lung Disease