COPD/Asthma

Prudence Twigg, AGNP
COPD/Asthma Qualifying Diagnosis

- Known diagnosis of COPD/asthma or CXR showing COPD with hyperinflated lungs and no infiltrates + two or more:
  - Wheezing, SOB, increased sputum
  - O2 sat <92% (on RA or usual O2 setting)
  - Acute reduction in peak flow or FEV1
  - RR >= 24/min
## COPD/Asthma

<table>
<thead>
<tr>
<th></th>
<th>COPD</th>
<th>Asthma</th>
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<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td>shortness of breath, airway hyper-responsiveness</td>
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<tr>
<td><strong>Triggers</strong></td>
<td>respiratory tract infections: pneumonia, flu, exposure to environmental pollutants</td>
<td>allergens, cold air, exercise</td>
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<tr>
<td><strong>Causes</strong></td>
<td>smoking, exposure to fumes</td>
<td>combination of environmental and genetic factors</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>control symptoms</td>
<td>take precautions to avoid triggers</td>
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Source: [http://www.healthline.com/health/copd/asthma#asthma-vs-copd1](http://www.healthline.com/health/copd/asthma#asthma-vs-copd1)
Asthma Step Therapy Treatment

Adjusting therapy based on asthma CONTROL

Stepping down

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Stepping up

Source: Recent Advances in the Treatment of Childhood Asthma - Robert Lemanske
Chronic Obstructive Pulmonary Disease

- Common, preventable, and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases

(GOLD, 2017)
AMDA/PALTC Recommendations

• Recognition/screening at admission to LTC
• Assessment:
  – Differential diagnosis
  – Assess severity/stability of symptoms
  – Input from interprofessional team
  – Functional status
  – Summarize condition
AMDA/PALTC Recommendations

• Treatment:
  – Set treatment goals
  – Develop individualized plan of care
  – Facility programs/policies for smoking cessation
  – Nonpharmacologic interventions, education
  – O2 if indicated
  – Vaccinate for respiratory infections
Diagnostic Challenges in LTC

- COPD may not be primary diagnosis, may be secondary, or undiagnosed
- Usually do not have PFT/spirometry (required for definitive diagnosis/staging)
- Usually do not have ABGs
- Usually only imaging is CXR
Suspicion for COPD if >age 40 and

- Dyspnea
  - Progressive, worse with exertion, persistent
- Chronic cough/recurrent wheezing
  - May be intermittent, nonproductive
- Chronic sputum production
- Recurrent respiratory infections
- Risk factors (smoking)
History for COPD Diagnosis

- Smoking: #years X packs/day = pk-years Quit?
- Exposure to second hand smoke, other toxins?
- Recurrent respiratory infections?
- h/o O2, nebulizer, CPAP/BiPAP use?
- Allergies? Asthma?
- Dyspnea? Cough? Sputum?
Symptoms of COPD

- Dyspnea
- Chronic cough with/without sputum
- Periods of acute worsening of respiratory symptoms (exacerbations)
Differential Diagnosis of Cough

- Allergies?
- GERD?
- CHF?
- Dysphagia/aspiration?
Common Physical Findings of COPD

• Barrel chest, clubbing, often looking older than chronological age
• Prolonged expiration, poor air exchange/diminished breath sounds, crackles, wheezes, breathlessness with speech/exertion, use of accessory muscles
• Orthopnea
Morphologies of COPD

**EMPHYSEMA**

“PINK PUFFER”

- Alveolar (diffusion) Problem
- ↑ CO₂ Retention (Pink)
- Minimal Cyanosis
- Pursed-Lip Breathing
- Dyspnea/↑Resp Rate
- Hyperresonance on Chest Percussion
- Orthopneic
- Barrel Chest
- Exertional Dyspnea
- Prolonged Expiratory Time
- Speaks in Short Jerky Sentences
- Anxious
- Use of Accessory Muscles to Breathe
- Thin Appearance

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Morphologies of COPD

CHRONIC BRONCHITIS

“BLUE BLOATER”

* Airway Flow Problem
* Color Dusky to Cyanotic
* Recurrent Cough & ↑ Sputum Production
* Hypoxia
* Hypercapnia (↑ pCO₂)
* Respiratory Acidosis
* ↑ Hgb
* ↑ Resp Rate
* Exertional Dyspnea
* ↑ Incidence in Smokers
* Digital Clubbing
* Cardiac Enlargement
* Use of Accessory Muscles to Breathe
* Leads to Right-Sided Heart Failure: Bilateral Pedal Edema, ↑ JVD
Pulse Oximetry

- Interpret O2 sat as part of assessment
- May not be always be accurate due to:
  - Nail polish
  - Cold fingers
  - Low perfusion states:
    - CHF, cardiac arrhythmias, hypotension, hypothermia, smoking, PVD
Goals of Treatment for COPD

• Improve symptoms, comfort, function, QOL
• Manage co-morbid conditions (depression, anxiety, malnutrition, other medical conditions)
• Decreased frequency of infections, exacerbations, hospitalizations
Severity of Airflow Limitation (GOLD)

- FEV1/FVC ratio <70% after bronchodilator AND
- GOLD 1: mild, FEV1 >80% predicted
- GOLD 2: moderate, FEV1 >50% < 80%
- GOLD 3: severe, FEV1 >30% < 50%
- GOLD 4: very severe, FEV1 <30%
COPDAssessmentTest™ (CAT) Score

- Rates 8 symptoms 0-5 Likert scale (0-40)
- Scores >10, more symptomatic
- Cough, phlegm, chest tightness
- Breathless with stairs
- Limitation of activity
- Sleep, energy
- Confidence in leaving home
# Modified MRC (mMRC) Dyspnea Scale

| Grade | Impact |\[20pt\] |
|---|---|\[20pt\] |
| 1 | Not troubled by breathlessness except on vigorous exertion |\[20pt\] |
| 2 | Short of breath when hurrying or walking up inclines |\[20pt\] |
| 3 | Walks slower than contemporaries because of breathlessness, or has to stop for breath when walking at own pace |\[20pt\] |
| 4 | Stops for breath after walking about 100 m or stops after a few minutes’ walking on the level |\[20pt\] |
| 5 | Too breathless to leave the house or breathless on dressing or undressing |\[20pt\] |

MRC = Medical Research Council
ABCDs of COPD (GOLD)—Group A

- Low risk, fewer symptoms
- Grade 1 or 2 airflow limitation (mild-mod) &/or
  - 0-1 exacerbations/yr w/o hospitalization and
  - CAT score <10 or *mMRC 0 or 1

*modified Medical Research Council Breathlessness Scale
ABCDs of COPD (GOLD)—Group B

- Low risk, more symptoms
- Grade 1 or 2 airflow limitation (mild-mod)
  &/or
  - 0-1 exacerbations/yr w/o hospitalization and
  - CAT score $\geq 10$ or mMRC 2 or more
ABCDS of COPD (GOLD)—Group C

• High risk, fewer symptoms
• Grade 3 or 4 airflow limitation (severe-very severe) &/or
  – 2 or more exacerbations/yr or 1 or more hospitalization for exacerbation and
  – CAT score <10 or mMRC 0 or 1
ABCDs of COPD (GOLD)—Group D

- High risk, more symptoms
- Grade 3 or 4 airflow limitation (severe-very severe) &/or
  - 2 or more exacerbations/yr or 1 or more hospitalization for exacerbation and
  - CAT score >=10 or mMRC 2 or more
ABCDs of COPD (GOLD)

Spirometrically confirmed diagnosis

Assessment of airflow limitation

Assessment of symptoms/risk of exacerbations

Post-bronchodilator $FEV_1/FVC < 0.7$

<table>
<thead>
<tr>
<th>FEV$_1$ (% predicted)</th>
<th>GOLD 1</th>
<th>≥ 80</th>
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<tbody>
<tr>
<td></td>
<td>GOLD 2</td>
<td>50-79</td>
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<tr>
<td></td>
<td>GOLD 3</td>
<td>30-49</td>
</tr>
<tr>
<td></td>
<td>GOLD 4</td>
<td>&lt; 30</td>
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Exacerbation history

<table>
<thead>
<tr>
<th></th>
<th>≥ 2 or ≥ 1 leading to hospital admission</th>
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<tbody>
<tr>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
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</table>

Symptoms

mMRC 0–1
CAT < 10

mMRC ≥ 2
CAT ≥ 10
(C) Less symptoms High risk

(D) More symptoms High risk

(A) Less symptoms Low risk

(B) More symptoms Low risk
Common Pharmacotherapy for COPD

- Short acting beta2 agonists (SABA)-albuterol
- Long acting beta2 agonists (LABA)-salmeterol
- Short acting muscarinic antagonists (SAMA)-ipratropium
- Long acting muscarinic antagonists (LAMA)-tiotropium
- Inhaled corticosteroids (ICS)
Additional Pharmacotherapy for COPD

- Phosphodiesterase (PDE4) inhibitors: roflumilast
- Mucolytics: Acetylcysteine
- Antibiotics
Bronchodilators for COPD

- Regular/prn use of SABA or SAMA improves FEV1 and symptoms (A)
- Combination SABA & SAMA > than either alone for improving FEV1 & symptoms (A)
- LABA and LAMA improve lung function, dyspnea, health status and reduce exacerbations (A)
**Bronchodilators for COPD**

- LAMAs have greater effect on exacerbation reduction than SAMAs (A) and decrease hospitalization (B)
- Combination LAMA & LABA increases FEV1 & improves symptoms > than monotherapy (A)
Treatment Algorithm Stable COPD

Figure 4.1. Pharmacologic treatment algorithms by GOLD Grade [highlighted boxes and arrows indicate preferred treatment pathways]

**Group C**
- LAMA + ICS
- LABA + ICS
- Further exacerbation(s)
- LAMA

**Group D**
- Consider roflumilast if FEV₁ < 50% pred. and patient has chronic bronchitis
- Consider macrolide (in former smokers)
- Further exacerbation(s)
- LAMA
- LABA + ICS
- Persistent symptoms/further exacerbation(s)
- LAMA + LABA
- LABA + ICS

**Group A**
- Continue, stop or try alternative class of bronchodilator
- A bronchodilator

**Group B**
- LABA
- Persistent symptoms
- A long-acting bronchodilator (LABA or LAMA)

Source: Global Health Initiative for COPD
Treatment Algorithm Stable COPD

Group A

Continue, stop or try alternative class of bronchodilator

evaluate effect

A bronchodilator

Source: Global Health Initiative for COPD
Treatment Algorithm Stable COPD

Group B

LAMA + LABA

Persistent symptoms

A long-acting bronchodilator (LABA or LAMA)

Source: Global Health Initiative for COPD
Treatment Algorithm Stable COPD

Group C

- LAMA + LABA
- LABA + ICS
- Further exacerbation(s)
- LAMA

Source: Global Health Initiative for COPD
Treatment Algorithm Stable COPD

Consider roflumilast if FEV₁ < 50% pred. and patient has chronic bronchitis

Further exacerbation(s)

Consider macrolide (in former smokers)

Persistent symptoms/further exacerbation(s)

LAMA + LABA + ICS

LAMA + LABA

LAMA

LabA + ICS

Note: Recommendations for macrolides are not meant to be chronic treatments.

Source: Global Health Initiative for COPD
Summary of Pharmacotherapy (GOLD)

1. Use inhaled beta2 agonist (LABA) or muscarinic antagonist (LAMA) or step up to both; Prn if symptoms intermittent, routine if persistent

2. Inhaled corticosteroid (ICS) therapy as step up therapy; avoid long term oral steroids

3. Oral *PDE4 inhibitors as add on for chronic bronchitis, severe airflow obstruction with recurrent exacerbations

*PDE4 inhibitors can be used but are very costly. Their utility is limited in NH setting.
Pharmacotherapy for Smoking Cessation

- Nicotine: patch, gum, lozenges, inhaled
- Bupropion SR
- Varenicline
Pharmacological Challenges in LTC

- Formulary restrictions/interchanges
- Medication reconciliation issues with transfers
- Difficulties with inhalers
  - Staff factors
  - Resident factors
Oxygen Therapy (GOLD)

• No benefit for moderate hypoxemia (O2 sat > 88% at rest), even if exercise induced hypoxemia

• Use continuously for RESTING O2 sat ≤ 88% or PaO2 ≤ 55 or ≤ 59 with right-sided HF or polycythemia
Interprofessional Resources in LTC

- Pharmacist: interchanges, recommendations, staff education
- Respiratory Therapist: assessments, recommendations
- PT/OT: pulmonary rehab interventions: endurance/energy conservation, improving function, pursed lip breathing
- ST: swallowing/feeding
Vaccinations for Older Adults

- **PNEUMONIA:**
  - Naïve: PPSV23 then PCV13 $\geq$ 1 year later
  - Previous PPSV23 at $\geq$65 up: PCV13 $\geq$ 1 year later
  - Previous PPSV23 at <65 yo and now $>$65 yo:
    - PCV13 then PPSV23 $\geq$ 1 year later
  - **INFLUENZA:** annually
COPD Exacerbation

- Acute worsening of respiratory symptoms requiring additional therapy
- Mild: short acting bronchodilators (SABDs)
- Moderate: SABDs plus antibiotics &/or oral corticosteroids
- Severe: requires ER/hospitalization and may include acute respiratory failure
Symptoms of COPD Exacerbation

- Changes in sputum color, thickness
- Chest tightness
- Increased cough, wheezing
- Fever
- Acute mental status changes
- Increased fatigue, anxiety, sleep problems
Potential Indications for Hospitalization

- Severe symptoms: sudden worsening of resting dyspnea, high respiratory rate (>28), decreased O2 sat, confusion, drowsiness:
- Acute respiratory failure
- Failure to respond to initial management
- Serious complicating co-morbidities: CHF, new arrhythmias
Before Hospitalization Consider:

- Advanced Directives/POST/Goals of Care
- Facility resources/staff expertise
- Is there something more that can be done at the hospital that the patient/family desires and that cannot be accomplished in the ECF?
Management of Exacerbations

• Assess: CXR, labs
• Treatment:
  – Supplemental O2
  – Increase dose &/or frequency SABD
  – Consider oral corticosteroids
  – Antibiotics if indicated
  – Treat co-morbid conditions
Hospice Consideration for COPD

- Cor pulmonale
- pO2 < 55% on O2
- Albumin < 2.5
- Weight loss > 10%
- Progression of symptoms
- Worsening functional status
Hospice Criteria for Pulmonary Disease

• Primary Criteria: Patients will be considered to be in the terminal stage of pulmonary disease if they meet the following: (This refers to patients with various forms of advanced pulmonary disease who eventually follow a final common pathway to end-stage pulmonary disease)

1. Severe chronic lung disease as documented by both a and b:
   a. Disabling dyspnea at rest, poorly or unresponsive to bronchodilators, with decreased functional capacity (e.g., bed to chair assistance, fatigue, cough, or predicted FEV1<30% - is objective evidence of disabling dyspnea, but not necessary to obtain)
   b. See next slide

Hospice Criteria for Pulmonary Disease

b. Progression of end-stage pulmonary disease, evidence including prior increasing visits to the emergency department, hospitalizations, or increasing physician home visits for pulmonary infections and/or respiratory failure.

2. Hypoxemia at rest on room air;
   • evidence: p02 ≤ 55 mm Hg or
   • oxygen saturation ≤88% or
   • hypercapnia; evidence pCO2 ≤50 mm Hg

Hospice Criteria for Pulmonary Disease

• Secondary Criteria: Additional factors to assess for:
  1. Right heart failure secondary to pulmonary disease (not secondary to left heart disease or valvulopathy)
  2. Unintentional weight loss of >10% body weight over past 6 months
  3. Resting tachycardia of >100/min
References

- COPD Management in Post Acute and Long Term Care Setting. AMDA/PALTC.