COPD

Definition

- heterogenous lung condition characterized by chronic respiratory symptoms
  - dyspnea, cough, sputum production, and/or exacerbations
- due to abnormalities of the airways (bronchitis, bronchiolitis), and/or alveoli (emphysema)
- that cause peristent, often progressive, airflow obstruction

Causes

- Smoking
- Biomass
  - pollution, household gasses
- Occupational exposure
- Abnormal lung development
- Accelerated lung aging
- Gene mutations (alpha 1 antitrypsin deficiency)

Symptoms:

- Dyspnea
- Activity limitations
- Cough +/- sputum
- Exacerbations (URIs, smoke, weather changes, allergies)
- URIs last longer
- SOB

Terms:

- Chronic Bronchitis:
  - chronic cough and sputum production for at least 3 months per year x 2 consecutive years without other conditions that can explain the diagnosis.
  - persistent inflammation/swelling of airways (bronchial tubes) leading to mucus production/cough
- Bronchiolitis
  - acute inflammatory injury of bronchioles (usually viral etiology and usually in pediatrics).
- Bronchiectasis
  - chronic lung condition, permanent widening/thickening of airways (bronchi) , usually due to infection, causes mucus to collect in airways.
- Emphysema
  - progressive lung disease, form of COPD.
  - abnormal permanent enlargement of air spaces distal to terminal bronchioles, with destruction of alveolar walls and without obvious fibrosis.

Differential Diagnosis:

- Intrathoracic
  - asthma, lung cancer, tuberculosis, bronchiectasis, CHF, interstitial lung disease, cystic fibrosis, obliterative bronchilitis
- Extrathoracic
  - Allergies, postnasal drip, upper airway cough syndrome, GERD, medications (ACEi)

COPD Types Abbreviation	Description	Details
COPD-G	Genetically determined COPD	A1 antitrypsin deficiency, other genetic variants
COPD-D	COPD due to abnormal lung development	Premature birth, low birth weight early life events
COPD-C	Environmental COPD	Exposure of tobacco smoke in utero, passive smoking exposure, vaping or e-cigarette use, cannabis
COPD-P	Biomass and pollution exposure COPD	Household pollution, ambient air pollution, wildfire smoke, occupational hazards
COPD-I	COPD due to infections	Childhood infections, TB associated COPD, HIV associated COPD
COPD-A	COPD and asthma	
COPD-U	COPD of unknown cause	
Pre-COPD	Patient, any age, with respiratory symptoms or structural/functional abnormalities without airflow obstruction on spirometry.	May or may not develop COPD over time.
PRISM	Preserved ratio impaired spirometry	FEV1/FVC>0.7 but FEV1<80%. 7-11% of patients. High in smokers. May have higher morbidity/hospitalization.

Diagnosis, Classification, Staging, Management

Step 1
Clinical Diagnosis and Symptoms

- Dyspnea
- cough
- sputum
- LRTIs
- Exposure risk
- Dyspnea on exertion

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Step 2: Spirometry Criteria
(Use to Grade Gold 1-4)

1. FEV/FVC<0.7 (mandatory for diagnosis)
   a. FEV/FVC normal and FVC normal – consider bronchoprovocative testing
   b. FEV1/FVC normal, FVC dec = Restrictive pattern
      i. check PFTs
   c. FEV1/FVC decreased, FVC normal, check if reversible
      i. if reversible --> obstructive pattern
   d. FEV1/FVC decreased, FVC decreased = mixed pattern
      i. If FVC improves with bronchodilator – pure obstruction with air trapping, likely COPD.
      ii. If not, check PFTs.

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Class	Severity	FEV1
GOLD 1	Mild	FEV1 ≥ 80% predicted
GOLD 2	Moderate	50% ≤ FEV1 < 80% predicted
GOLD 3	Severe	30% < FEV1 < 50% predicted
GOLD 4	Very Severe	FEV1<30% predicted

Step 3 - Exacerbation History
Using CAT or mMRC Questionnaires

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Step 3 Exacerbation History	Classification	Classification
>2 moderate exacerbations or >1 leading to hospitalization	**Gold E (Formerly Gold C)**	**Gold E (Formerly Gold D)**
0-1 moderate exacerbations (not leading to hospitalization)	**Gold A**	**Gold B**
Questionnaire used	mMRC 0-1 CAT < 10	mMRC ≥ 2 CAT ≥ 10

Group A
SABA or LABA

Group B
1. LAMA + LABA or
2. Either alone
   a. LAMA Preferable

Group E: (previously C and D)
1. LAMA + LABA
2. Add ICS if blood eos>300
   a. Triple Therapy with LAMA + LABA + ICS
3. If blood eos>100 after LAMA + LABA
   a. consider adding ICS
4. If Max Tx but not controlled and Eos < 300
   a. Consider Rolfumilast (Daliresp) - PDE4i
   b. and/or Azithromycin in smokers

COPD Management

Vaccinations

- Flu annually
- PCV 20
  - (once prior to 65 and once after 65)
- COVID (annually)
- TDAP (every 10 years)
- RSV (once)
  - select patients ovr 60 with chronic lung disease

Lifestyle Managment

- Exercise, diet
- Assess for need for PT, Nutritionist
- Self Management education
- Managing co-morbidities

Smoking Cessation Options

- Counseling
- NRT (patches, gum, lozenges)
  - replace based on cigarette consumption
    - 1 cig - 1 mg nicotine
    - 1 gum = 1 mg nicotine
    - 14 mg patch = ½ ppd smoker
    - 21 mg patch = 1 ppd smoker
- Buproprion SR 150 mg bid x 3 months OR
- Varenicline
- Nortriptyline

Oxygen Therapy

- Criteria:
  - PO2 < 55mg Hg or O2 sat<88% with/without hypercapnia confirmed twice over 3 weeksOR
  - If PO2 55-60m Hg or O2 Sat<88% if Pulm HTN, edema from CHF, or polycythemia (hct>55%)
- Prescription for oxygen to titrate/maintain SaO2 ≥ 90%
- Recheck in 60-90 days if still indicated and if effective

Noninvasive Ventilation

- Severe chronic hypercapnia (PA CO2>53mm Hg) + hx of hospitalization for acute respiratory failure

Management of Flares

Mild exacerbation
- mild dyspnea
- RR<24
- HR<95
- O2 Sat > 92% RA at rest

→ SABA

Moderate exacerbation
- increased dyspnea
- RR>24, HR>95
- O2<92% RA at rest
- ABG with PaO2<60 and/or PaCO2 >45) without acidosis

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- SABA+Oral steroids+antibiotics
  - azithromycin (3 or 5 day course)
  - Prednisone (40-60 mg daily) for 5-7 days.
    - some patients may warrant prednisone slow taper over 2-3 weeks
- Increase maintenance therapy for 3-5 days.
- Treat allergies

Severe exacerbation
- same/worse criteria as moderate but ABG with new/worse hypercapnea and acidosis
  - (PaCO2>45mm Hg and pH<7.35)

→ Send to ER

When to Refer to Specialist

- Not controlled despite triple therapy
- Frequent exacerbations or hospitalizations
- Consideration for Interventional procedures and surgery
  - Bronchoscopic interventions
  - giant bullectomy
  - lung volume reduction surgery
  - lung transplant
- New/experimental meds:
  - erdosteine, ensifentrine

When to Refer to Hospital

- Severe Symptoms or exacerbation
- Acute respiratory failure
- New physical signs of cyanosis, edema
- Failure of response to treatment of exacerbation
- Serious comorbidities during moderate/severe exacerbation (arrythmia, ischemia, angina, heart failure exacerbation, infectious etiology requiring hospitalization, delirium, CVA, DKA, cellulitis, etc)
- Insufficient home support
- Inability to follow up
- Patient not reliable for follow up or management of exacerbation

Hospital Follow Up Visit

- Should be done within 1 week of discharge
- Obtain/review H/P, DC Summary, Consult Notes, Imaging, Labs, Procedures/interventions
- Medication Reconciliation
- Medication compliance (including inhaler technique)
- Assess and address polypharmacy/duplicate meds/herbs/supplements
- Ask about appetite, Independence level (IADL/ADLs)
- Transportation for follow ups. Affordability of meds
- Balance issues, fall risk, frailty assessment, physical ability/activity/tolerance
- Nutritional support, Support system
- Palliative care need (if appropriate), Pulmonary Rehab (Groups B/E)
- Address/screen for depression/anxiety
- Access to emergency meds, Review Inhaler technique
- Assess voiding/stooling
- Vitals: Weight, BP, HR, Pulse ox, RR, Temp
- Exam:
  - General, CV, Pulmonary, Abdomen, Skin, MSK (gait/strength/ROM), Neuropsych, Skin (wounds/sores), Lines/drains
- Address any follow up testing needed from hospital
  - Labs, imaging, cultures
  - follow up care with specialists, DME equipment needed
  - Handicap placard
- Make Follow up appointment
  - 1-2 weeks if not controlled
- 1 month if doing fair/well in terms of breathing, vitals, examination

Routine Visits

- Address Meds, Polypharmacy, Address Symptoms, exacerbation signs and management
- Ask about hospitalizations, Action Plan
- Verify GOLD Classification - Spirometry
- Symptom score and Classification - CAT or mMRC tool
- Ask about IADL/ADL, support system, affordability of meds
- Smoking status, risk factor mitigation, allergen management
- Inhaler technique/adherence/affordability
- Physical activity, exercise, Need for pulmonary rehab (Groups B/E), Need for oxygen
- Spirometry annually, LDCT annually, AAA Screen (if not done)
- Vaccinations - assess need
  - Flu, COVID, TDAP, Shingrix, RSV, PCV 20
- Control of Co-Morbidities, Palliative care need (if appropriate)
- Address/screen for depression/anxiety

Reference
1.Agusti, A, et.al. GOLD 2025 Report. Pages 1-215. Available online at: https://goldcopd.org/2025-gold-report/