**Chronic Obstructive Pulmonary Disease,**

1. In all patients presenting with symptoms of prolonged or recurrent cough, dyspnea, or decreased exercise tolerance, especially those who also have a significant smoking history, suspect the diagnosis of COPD.

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| **Risk Factors** | **DDX of COPD** |
| Environmental   * Tobbaco Smoke \*\* Primary RF\*\* * Chemicals * Fumes * Dust   Genetics   * **α-1 Antitrypsinn deficiency** * First degree relatives   Demographics   * Low BMI * Male * Hx of pediatric resp Infections * Low socioeconomic Status | * Asthma * CHF * TB * Obliterative Bronchiolitis * Bronchiectasis * Diffuse panbronchiolitis |

NOTE : Asthma may be a risk factor but evidence is not conclusive.

2. When the diagnosis of COPD is suspected, seek confirmation with PFTs (e.g. FEV1).

* Chest X-ray is usually done to exclude co-morbidities (A chest X-ray may suggest COPD, but the definitive diagnosis of COPD requires spirometry)
* **As per guidelines…. the Diagonosis of COPD** is:
  + postbronchodilator, FEV1/FVC <0.7
* FEV1 assists with staging/severity.
* New guidelines do not focus on the difference between Chronic Bronchitis and Emphysema as treatment does not differ…but just in case:
  + **Chronic Bronchitis:** obstruction due to airway lumen narrowing by mucosal thickening, excess mucous
    - PFTs: normal TLC, normal or increased Dco
  + **Emphysema:** dilation, destruction of airspaces distal to terminal bronchiole without obvious fibrosis; decreased elastic recoil
    - PFTs: increased lung volume, decreased Dco

3. In patients with COPD, use pulmonary function tests periodically to document disease progression.

Disease management is based largely on symptomatology but serial PFTs is clearly indicated.

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| **COPD Stage** | **Spiromtery (post-bronchodilator)** |
| Mild | FEV1 ≥ 80% predicted, FEV1/FVC <0.7 |
| Moderate | FEV1 50 – 79% predicted, FEV1/FVC <0.7 |
| Severe | FEV1 30 – 49% predicted, FEV1/FVC <0.7 |
| Very Severe | FEV1 < 30% predicted, FEV1/FVC <0.7 |

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| **COPD Stage** | **Symptoms** |
| Mild | SOB from COPD when hurrying on the level or walking up a slight hill |
| Moderate | SOB from COPD causing the patient to stop after walking approximately 100m on the level |
| Severe | SOB from COPD resulting   * in the patient being too breathless to leave the house * breathlessness when dressing or undressing * presence of chronic resp failure * clinical signs of right heart failure |

4. Encourage smoking cessation in all patients diagnosed with COPD.

* This is KEY!!!
* **Total pack years = (cigarettes/day ÷20) x years of smoking**
  + A Hx of >10 pack years should raise the index of suspicion for COPD
  + Smoking > 40 pack years increases likelihood ratio to 8.3
* See Smoking Cessation key features

5. Offer appropriate vaccinations to patients diagnosed with COPD (e.g. influenza/pneumococcal vaccination).

* ***Annual influenza vaccine; Pneumovax (initially and a booster in 5 years)***

6. In an apparently stable patient with COPD, offer appropriate inhaled medication for treatment (eg. anticholinergics/bronchodilators if condition is reversible, steroid trial).

* ***Goals of treatment:***
  + ***Prevent progression***
  + ***Relieve symptoms***
  + ***Minimize S/E of medications***
  + ***Prevent exacerbations***
* Lifestyle considerations
  + **Exercise training programs** improve Sx
  + **Education**
    - Smoking cessation
    - Coping skills – strategies to avoid dyspnea
    - Self-management
    - COPD action plan
  + **Pulmonary Rehab –** see below

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| **MILD** | **MODERATE** | **SEVERE** |
| SABD prn  ↓  LAAC + SABA prn  ***or***  LABA + SABD prn | LAAC ***or*** LABA + SABA prn  ↓ persistent Sx  LAAC + LABA + SABA prn  ↓ persistent Sx  LAAC + ICS/LABA + SABA prn | LAAC + ICS/LABA + SABA prn  ↓ Persistent Sx  LAAC + ICS/LABA + SABA prn  ±  Theophylline |

SABD – short-acting bronchodilator, SABA – short-acting beta agonist, LABA- long acting beta agonist, LAAC- long-acting anticholinergic , ICS- inhaled corticosteroid

* If patient is having frequent **Acute exacerbation >1 per year – treat as severe.**
* Consideration for O2:
  + Severe Hypoxemia PaO2 ≤60mmHg
  + Bilat. Ankle Edema
  + Cor pulmonale
  + Hematocrit > 56%

**Summary of Treatment**



7. Refer appropriate patients with COPD to other health professionals (e.g. a respiratory technician or pulmonary rehabilitation personnel) to enhance quality of life.

* Indicated when
  + Onset at early age
  + Sx are severe or progress rapidly
  + Exacerbations are severe or recurrent
  + Response to standard therapy inadequate
  + Consideration being given to
    - pulmonary rehab
    - O2
    - Surgery
* **Pulmonary Rehab**

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| **Indication** | **Benefits** |
| * Restore Exercise Capacity * Meds are not effective | * Reduces Dyspnea * Improves Exercise Capacity * Improves quality of life * Reduces number and length of hospital admissions |

8. When treating patients with acute exacerbations of COPD, rule out co-morbidities (e.g. MI, CHF, systemic infections, anemia).

* Acute exacerbation: episode of increased dyspnea, coughing, change in sputum volume/purulence
* Etiology:

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| **Common** | **DON’T MISS** |
| Viral URTI 25 – 50%  Bacterial | MI  PE  CHF |

* Management: ABCs; consider assisted ventilation if decreasing LOC/poor ABGs
  + **Supplemental O2** (controlled FiO2): **target 88-92% SaO2** for CO2 retainers
  + **Neb bronchodilators**: salbutamol + ipratropium bromide x 3 back to back
  + **Systemic corticosteroids:**
    - IV solumedrol 1-2 mg/kg q6-12 hrs IV x 3 days
    - Prednisone 30-40 mg qd x 7-10 days, not necessary to taper
  + **Antibiotics:** indicated if 2/3 – 1) increased SOB 2) increased sputum vol or 3) purulence
    - **Duration:** 3-7 days

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| Group | Sx and RF | Pathogen | 1st Choice |
| Simple | Increased sputum and SOB | H. Influ,  Strep. Pneumo  Moraxella | Macrolide (azithromycin, clarithromycin)  2nd or 3rd gen Cephalosporin (i.e. cefuroxime)  Doxycycline  Septra |
| Complex | Simple plus:  FEV1 <50%  >3 exacerbations/yr  IHD  Home O2 | Klebsiella  Gram –ve  Pseudomonas | Moxifloxacin  Amoxicillin/Clavulanate |

* + **ICU admission:** 
    - for life-threatening exacerbations
    - vent support: non-invasive (NIPPV, CPAP, BiPAP), conventional mech vent

9. In patients with end-stage COPD, especially those who are currently stable, discuss, document, and periodically re-evaluate wishes about aggressive treatment interventions.

- Natural progression of COPD:

- 40s – chronic productive cough

- 50s – first acute chest illness

- 60s – dyspnea on exertion, increasing sputum production; more frequent acute exacerbations

- Late Stage – hypoxemia with cyanosis, polycythemia, hypercapnia (morning headache), hypoxemia, cor pulmonale

- Prognostic Factors: **severity of airflow limitation (FEV1) single best predictor**

- 5-year survival: FEV1 < 1 L = 50%, < 0.75 L = 33%