The Columbia 75: Approach to COPD Exacerbations

- **Core Knowledge**
  - **Hallmarks:** Dyspnea and either increased sputum production or purulence

- **Differential Diagnosis**  
  - CHF, PE, PNA

- **Risk Factors**
  - More frequent exacerbations as GOLD class increases
  - More frequent exacerbations in active smokers

- **Triage**
  - CXR
  - ABG if appears at all unstable

- **Management**
  - **O2**
    - Target SPO2 90-94% (PaO2 60-70 mmHg). Be cautious of higher saturations, as they can precipitate hypercapnia:
      - Increased V/Q mismatch (most important effect)
      - Increased O2 decreases affinity of hemoglobin for CO2 via Haldane effect
      - Patients with chronic respiratory acidosis dependent on hypoxia for respiratory drive
    - Remember that nebulizers can be given with air rather than O2 if receiving frequent nebulizers and hypercapnia a concern
  - **Non-invasive positive pressure ventilation**
    - NIPPV reserved for hypercapnia, refractory hypoxemia, or comorbid heart failure.
    - Relatively contraindicated in patients with altered mental status (though an empiric trial may be worthwhile, particularly if hypercapnic encephalopathy suspected)
    - Not a substitute for a secure airway - move quickly to intubate if you think patient is unable to protect airway or is fatiguing. Also must re-assess frequently; patients should not remain on uninterrupted NIPPV without signs of improvement - place them on NIPPV, repeat the ABG in 30 minutes, and reconsider intubation if they are not headed in the right direction
  - Bronchodilators (SABA, anticholinergics)
Mainstays of acute management are scheduled ipratropium (typically 500mcg q4h) and PRN albuterol (q1-4h, though “stacked nebs” with 2-3 treatments of albuterol within the first hour is a common tactic if not limited by tachycardia)

Nebulizers preferred over MDI’s in the acute setting for multiple reasons, including reliable drug delivery and patient perceived effect

Scheduled albuterol preferred over PRN if patient at a high risk for “falling behind” and not asking for treatment as symptoms worsen

Corticosteroids

Strong RCT data supporting steroids for acute exacerbations

Oral prednisone is rapidly absorbed and readily bioavailable; no data to support IV over oral steroids, however many use IV methylprednisolone in severe exacerbations. Likewise, no data to support high dose over low dose, but similarly many use higher doses for more severe exacerbations

Duration of therapy varies widely. Small randomized trial data shows superior improvement in FEV1 and PaO2 with use of a 10 day course over a 3 day course but did not reduce exacerbation rates at 6 months.

Regarding tapering: Little risk for precipitating adrenal insufficiency with short courses of therapy, main concern is for recrudescent exacerbation if steroids acutely stopped

Example regimens:
- Moderate exacerbation: prednisone 30-40mg PO x 10 days, then stopped without taper
- Severe exacerbation: Initial high dose therapy with methylprednisonolone 60mg IV 1-4 x / daily, convert to PO once improving

Antibiotics

2012 Cochrane review showed strong and consistent effect for empiric antibiotics in COPD exacerbations admitted to the ICU (including reduction in mortality), however, effects less clear for inpatients (no definitive evidence for reduced mortality or length of stay)

Consider for patients with dyspnea and increased sputum production or purulence

Due to poor quality of data, many choose azithromycin as an intermediate measure (given its long-term modest effects on exacerbation frequency)

Order set should simplify this in the future

Prognosis
- 14% of patients admitted for COPD exacerbation die within 3 months of admission

- Careful discharge planning
  - Maintenance outpatient regimen is critical to prevent re-admission. See outpatient COPD talk for details
  - Careful medication instruction, particularly MDI's
  - Quick outpatient follow-up
  - Smoking cessation
  - Pulmonary rehab