

# COPD Diagnosis and Management Algorithm

## A. Patient presents with respiratory symptoms or ask patient about the following:

Shortness of breath at rest or on exertion, activity limitation, cough, sputum production, smoker (current or past), regular respiratory tract infections.

OR

## B. Screen smokers or ex-smokers over 40 years old who answer "YES" to any question below:

1. Do you cough regularly?
2. Do you cough up phlegm regularly?
3. Do even simple chores make you short of breath?
4. Do you wheeze when you exert yourself or at night?
5. Do you get frequent colds that persist longer than those of other people?

**COPD SUSPECTED**

### Patient Assessment & Monitoring

#### History/Risk Factors:

- ◆ History: smoking, occupational, medical ◆ Assess for orthopnea
- ◆ Second-hand smoke exposure ◆ Indoor/outdoor air pollution
- ◆ Symptoms: shortness of breath at rest or on exertion, activity limitation, cough, sputum production (amount, colour, consistency), wheezing, chest tightness

#### Physical Examination:

- ◆ Auscultation
- ◆ Signs of lung hyperinflation, accessory muscle use
- ◆ Signs of generalized muscle wasting
- ◆ Ankle swelling (right heart failure)
- ◆ Cachexia, malnutrition: body mass index [underweight < 18.5 kg/m<sup>2</sup>; overweight ≥ 25 kg/m<sup>2</sup>; obese ≥ 30 kg/m<sup>2</sup>]

#### Assess Severity:

##### Medical Research Council (MRC) dyspnea scale:

- Grade 1: Not troubled by breathlessness except with strenuous exercise
- Grade 2: Troubled by shortness of breath when hurrying on the level or walking up a slight hill
- Grade 3: Walks slower than people of the same age on the level because of breathlessness or has to stop for breath when walking at own pace on the level
- Grade 4: Stops for breath after walking about 100 yards (90 m) or after a few minutes on the level
- Grade 5: Too breathless to leave the house or breathless when dressing or undressing

##### Classification by impairment of lung function (postbronchodilator spirometry):

- Mild: FEV<sub>1</sub> ≥ 80% predicted, FEV<sub>1</sub>/FVC < 0.7
  - Moderate: 50% ≤ FEV<sub>1</sub> < 80% predicted, FEV<sub>1</sub>/FVC < 0.7
  - Severe: 30% ≤ FEV<sub>1</sub> < 50% predicted, FEV<sub>1</sub>/FVC < 0.7
  - Very severe: FEV<sub>1</sub> < 30% predicted, FEV<sub>1</sub>/FVC < 0.7
- [FEV<sub>1</sub> = forced expiratory volume in 1 second; FVC = forced vital capacity]

##### COPD Assessment Test (CAT): [www.catestonline.org](http://www.catestonline.org)

#### Tests:

- ◆ Pulmonary function testing:
  - ⇒ Spirometry every 1-2 years after initial diagnosis
  - ⇒ Additional pulmonary function and exercise tests PRN
- ◆ CBC PRN to rule out polycythemia
- ◆ Consider blood gas if FEV<sub>1</sub> < 40% predicted (if resting SpO<sub>2</sub> < 90%)
- ◆ Alpha-1-Antitrypsin (AAT):
  - ⇒ If atypical features (early onset, family history of COPD, disabled in early 40s or 50s), send for AAT testing:
    - If serum blood level ≤ 1.5 g/L or below the normal mean for the testing laboratory, screen for AAT phenotype (Pi Type)
    - Do not test during acute exacerbation

**Assess for and Manage Comorbidities:** anemia, anxiety/depression, cancer, congestive heart failure, glaucoma/cataracts, ischemic heart disease, metabolic syndrome, osteopenia, osteoporosis, peripheral muscle dysfunction

#### Acute Exacerbation of COPD (AECOPD):

- ◆ Frequency, severity, purulent/non-purulent
- ◆ Hospitalizations, emergency department visits, systemic corticosteroid use
- ◆ Sputum gram stain & culture when purulent AECOPD if: very poor lung function, AECOPD > 3/year, or has been on antibiotics in last 3 months

**Resources:** COPD Care Map for Primary Care: [www.olapep.ca/resources](http://www.olapep.ca/resources)

### Confirm Diagnosis with Spirometry

Air flow limitation:

Post-bronchodilator FEV<sub>1</sub> / FVC < 0.70

FEV<sub>1</sub> = forced expiratory volume in 1 second  
FVC = forced vital capacity

Spirometry resources: [www.olapep.ca/spirometry](http://www.olapep.ca/spirometry)

**COPD NOT CONFIRMED**

### Differential Diagnosis

- ◆ Asthma
- ◆ Cardiovascular or pulmonary vascular disease
- ◆ Obesity
- ◆ Severe deconditioning
- ◆ Anemia
- ◆ Interstitial lung disease
- ◆ Neuromuscular disease

### Consider Referral to Specialist

- ◆ Not certain of the diagnosis
- ◆ Symptoms not proportional to level of airway obstruction
- ◆ Accelerated decline of lung function (FEV<sub>1</sub> declines 80 ml or more per year over a two year period)
- ◆ Symptom onset at a young age (< 40 years)
- ◆ Suspect alpha-1-antitrypsin deficiency
- ◆ Not responding to therapy
- ◆ Severe or recurring acute exacerbations

### Non-Pharmacologic Management

#### COPD Education - provide or refer to program/Certified Respiratory Educator (CRE):

- ◆ Smoking cessation (Resources: [www.on.lung.ca/journey](http://www.on.lung.ca/journey))
- ◆ Pathophysiology and treatment rationale
- ◆ Inhaler technique (Inhaler Device CD: [www.olapep.ca/resources](http://www.olapep.ca/resources))
- ◆ Self-management education with written action plan ([www.COPDActionPlan.com](http://www.COPDActionPlan.com))
- ◆ Identify and reduce/remove risk factors
- ◆ Acute exacerbation recognition and treatment
- ◆ Managing dyspnea, energy conservation
- ◆ Advance care directive, end of life discussions
- ◆ Educational resources

**Exercise:** Encourage all COPD patients to be active.

#### Pulmonary Rehabilitation:

- ◆ Refer clinically stable patients who remain dyspneic and have limited exercise capacity despite optimal pharmacotherapy
- ◆ Exercise training and self-management education

#### Follow-Up Care:

- ◆ Schedule regular follow-up care
- ◆ Repeat MRC dyspnea scale, COPD Assessment Test: [www.catestonline.org](http://www.catestonline.org)

#### End of Life Care:

- ◆ COPD is progressive and disabling and may lead to respiratory failure and death
- ◆ Discuss end-of-life issues with patients at an increased risk of dying in the near future

### Pharmacologic Management

#### Bronchodilators:

- ◆ Bronchodilators are the mainstay of pharmacotherapy. They reduce air trapping and improve dyspnea and quality of life even if there is no improvement in spirometry
- ◆ Short-acting bronchodilator PRN
- ◆ Long-acting beta-agonist ◆ Long-acting anticholinergic

#### Inhaled Corticosteroid (ICS)/Long-Acting Beta-Agonist (LABA) Combination:

- ◆ For moderate to severe COPD
- ◆ If infrequent AECOPD (average < 1 per year) and persistent dyspnea despite optimal bronchodilator therapy, use lower dose ICS/LABA
- ◆ If frequent dose ICS/LABA
- ◆ PDE4 inhibitor ◆ Theophylline

#### Other Medicines:

Assess patient response to therapy; if inadequate benefit, consider dose adjustment, inhaler technique, and assess compliance.

**Long-Term Oxygen Therapy** can improve survival and function in appropriately chosen, stable COPD patients with chronic hypoxemia (PaO<sub>2</sub> of 55 mm Hg or lower), or when PaO<sub>2</sub> is less than 60 mm Hg in the presence of bilateral ankle edema, right heart failure or hematocrit > 56%.

#### Influenza & Pneumonia Vaccinations:

- ◆ Annual influenza vaccine
- ◆ Pneumococcal vaccine given at least once and repeated in 5 to 10 years

#### Acute Exacerbation of COPD:

- ◆ Oxygen therapy PRN (to maintain oxygen saturation at 88% - 92%)
- ◆ Inhaled bronchodilators to treat dyspnea
- ◆ Oral/parenteral steroids should be considered

