



This optimal usage guide is intended for health professionals. It is provided for information purposes only and should not replace the clinician's judgement. The recommendations were developed using a systematic approach and are supported by the scientific literature and the knowledge and experience of Québec clinicians and experts. For further details, go to iness.qc.ca.

GENERAL INFORMATIONS

IMPORTANT CONSIDERATIONS

- ▶ Chronic obstructive pulmonary disease (COPD) is diagnosed by the presence of bronchial obstruction measured by spirometry ($FEV_1/FVC^1 < 0.7$).
- ▶ The severity of respiratory function impairment in COPD patients is based on the FEV_1 result: *mild* ($FEV_1 \geq 80\%$ of the predicted value), *moderate* (FEV_1 between 50 and 79%), *severe* (FEV_1 between 30 and 49%) or *very severe* ($FEV_1 < 30\%$).
- ▶ Pulmonary function in patients who regularly experience an acute exacerbation of COPD (AECOPD) deteriorates faster, and their prognosis is poor.

PATHOGENIC AGENTS

AECOPD can have an infectious (mainly bacterial, but also viral) or environmental cause.
NOTE: Approximately 30% of AECOPDs are of unknown causes.

Bacteria

In patients with mild to moderate COPD ($FEV_1 \geq 50\%$):

- *Haemophilus influenzae*
- *Streptococcus pneumoniae*
- *Moraxella catarrhalis*

Other bacteria may play an important role in patients with severe COPD ($FEV_1 < 50\%$) or who experience frequent exacerbations:

- *Pseudomonas aeruginosa*
- Other Gram-negative bacteria

Viruses

Adenovirus, coronavirus, influenza, parainfluenza, rhinovirus and syncytial respiratory virus

¹ FEV_1 : forced expiratory volume in 1 second; FVC: forced vital capacity.

DIAGNOSIS

An **AECOPD** is defined as:

- An acute, sustained (> 48 hours) worsening of respiratory symptoms, such as dyspnea and expectoration, beyond the usual day-to-day variations associated with the underlying COPD.
- ▶ Review the patient's respiratory symptoms, check his/her adherence to maintenance medications, and check that he/she is using inhalers properly.
- ❗ There is generally no fever during an AECOPD. A fever should indicate the possibility of another diagnosis (e.g., influenza or pneumonia).
- ▶ Consider ordering a chest x-ray if you suspect another disease (e.g., pneumonia or heart failure). Routine test in hospitalized patients.

An AECOPD is assumed to be **bacterial** and requires antibiotic therapy if there is:

- Colored sputum (purulent)

and if at least **one** of the following two criteria is present:

- Increased dyspnea;
- An increase in the quantity of sputum.

Note: Identifying the infectious agent could prove useful in certain situations in hospitalized patients or in cases of repeated infections.

CLASSIFICATION OF AECOPD

- ▶ Bacterial AECOPD can be divided into two categories, each requiring a different antibiotic therapy.
 - **Simple** : Presence of 2 or 3 of the criteria for a bacterial AECOPD listed above
 - **Complex** : Simple AECOPD with a least **one** of the following risk factors:
 - $FEV_1 < 50\%$
 - Frequent exacerbations (> 3 per year)
 - Significant comorbidity (e.g., heart disease or lung cancer)
 - Oxygen therapy
 - Chronic oral corticosteroid therapy
 - Use of antibiotics in the past month

TREATMENT PRINCIPLES

- ▶ The decision to refer a patient to a hospital is based on several factors, such as his/her overall condition, saturation, dyspnea, autonomy, and the availability of help at home.
- ▶ **Bronchodilator** : Increase the dose or dosing frequency of short-acting β_2 -agonist (SABA) bronchodilators.
- ▶ **Systemic corticosteroids** : Using systemic corticosteroids can improve lung function and oxygenation and shorten the length of the exacerbation and of the hospital stay. They should be used routinely when the patient is referred to a hospital or during severe exacerbations (prednisone 25 to 50 mg/day for 5 to 10 days).

ANTIBIOTIC THERAPY

ACUTE EXACERBATION OF COPD (AECOPD)

ANTIBIOTIC THERAPY FOR TREATING A BACTERIAL AECOPD		
	Antibiotic ¹	Recommended duration
FIRST-LINE ANTIBIOTIC THERAPY		
! It is important to switch to a different class of antibiotics² between AECOPD episodes		
Simple AECOPD	Amoxicillin³ 500 mg PO TID OR	7 days
	Cefuroxime axetil³ 500 mg PO BID OR	5 days
	Cefprozil^{3,4} 500 mg PO BID OR	5 days
	Clarithromycin 500 mg PO BID OR	7 days
	Clarithromycin XL 1000 mg PO daily OR	7 days
	Doxycycline 100 mg PO BID OR	7 days
	Trimethoprim-sulfamethoxazole 160/800 mg PO BID OR	7 days
Complex AECOPD	Azithromycin⁵ 500 mg PO daily on the first day, then 250 mg PO daily from day 2 to day 5	5 days
	Amoxicillin-clavulanate^{3,6} 875/125 mg PO BID OR	7 days
	Levofloxacin 500 mg PO daily OR Moxifloxacin 400 mg PO daily	7 days 5 days
SECOND-LINE ANTIBIOTIC THERAPY		
Indication: Failure of first-line therapy		
Simple AECOPD	Amoxicillin-clavulanate^{3,6} 875/125 mg PO BID OR	7 days
	Levofloxacin 500 mg PO daily OR	7 days
	Moxifloxacin 400 mg PO daily	5 days
Complex AECOPD	Do a medical reevaluation, look for the pathogenic ⁷ agent and consult a specialist, if necessary.	

- The antibiotics are listed in alphabetical order by generic name.
- The classes in question are the cephalosporins, macrolides, penicillins, quinolones, sulfonamides and tetracyclines (AHFS classification).
- For a patient with a history of penicillin allergy, consult the [decision-making tool in case of allergy to penicillins](#).
- Cefprozil has not been approved by Health Canada for the treatment of AECOPD. However, it is commonly prescribed for this purpose and, in the experts' opinion, constitutes a valid treatment option. It does, in fact, have this indication in the United States.
- Vanderkooi and collaborators found in their cohort a significantly lower risk of emerging macrolide resistance with the use of clarithromycin than with the use of azithromycin.
- The 7:1 formulation (875/125 mg) of amoxicillin-clavulanate PO BID is preferred because of its better gastrointestinal tolerance.
- Ciprofloxacin (750 mg PO BID x 7-10 days) can be used as second-line treatment for a complex AECOPD if a *P. aeruginosa* infection is detected.**

FOLLOW-UP

- ▶ If there is a worsening of symptoms 72 to 96 hours after treatment, consider a medical reevaluation.
- ▶ Remind the patient to continue with the maintenance therapy and the usual medical follow-up.
- ▶ A medical follow-up should be done in all patients newly diagnosed with COPD.

MEASURES FOR PREVENTING FUTURE AECOPDs

- ▶ **Review and optimization of maintenance medication and the use of inhalers when frequent exacerbations are experienced**
- ▶ **Smoking cessation**
 - Stopping smoking is the most important preventive measure in COPD patients for improving and slowing the deterioration of their respiratory function and reducing the risk of death.
 - Smoking cessation should be encouraged during each visit because in the general population:
 - A brief smoking cessation intervention (< 20 min.) compared to no intervention significantly increases the cessation rate (RR: 1.66; 95% CI [1.42-1.94]).
 - A more intensive intervention (> 20 min.) has a greater impact on the cessation rate (RR: 1.86; 95% CI [1.60-2.15]).
 - When a pharmacological treatment is used in conjunction with an intensive intervention, a significant increase in the cessation rate is observed compared to an intensive intervention alone (RR: 2.53; 95% CI [1.83-3.50]).
- ▶ **Vaccination**
 - COPD patients should be encouraged to get vaccinated against influenza and *S. pneumoniae* to reduce the risk of AECOPDs and pneumonia. Consult the [Protocole d'immunisation du Québec \(PIQ\)](#).
 - During a visit or hospitalization, plan, with the patient, the different vaccinations that he/she could receive to reduce the risk of AECOPDs.
- ▶ **Support program**
 - Consider referring the patient to a COPD clinic or a pulmonary rehabilitation program, if such services are available in his/her community.
- ▶ **Self-management plan (also referred to as an "action plan")**
 - Consider having the patient use a self-management plan, which teaches patients how to recognize the warning signs of an AECOPD and to react to control it.
 - ❗ The use of anticipatory prescriptions (for antibiotics or oral corticosteroids) in a self-management plan should be strictly limited and reserved solely for patients who are likely to use them properly.

CRITERIA FOR REFERRING THE PATIENT TO A RESPIROLOGIST

- ▶ **Refer the patient to a specialist in any of the following cases:**
 - The patient has experienced more than 3 AECOPDs in the past year;
 - For an assessment of his/her oxygen requirements;
 - A rapid decline in his/her respiratory function (FEV₁);
 - The need to initiate or reevaluate prophylactic antibiotic therapy;
 - The presence of COPD in a patient under 40 years of age.

MAIN REFERENCES

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It should be noted that other references were consulted.