

COVID-19 Guidance Document for Antimicrobial Prescribing and Stewardship

Recommendations for antibiotic prescribing in immunocompetent patients with suspected and documented COVID-19 infection are summarized in the following tables.

Immunocompromised patients with respiratory illness and/or fever should be managed as per usual practice; this should now include diagnosis and management considerations for COVID-19. Refer to the Guidance documents for COVID-19 in Heart Transplant, Solid Organ Transplant and Malignant Hematology & BMT Patients (in EPIC Resources) for additional information. COVID-19 may resemble PJP and Legionella; these alternate etiologies should be considered in immunocompromised patients with severe respiratory illness.

Patients presenting with undifferentiated lower respiratory tract infection¹⁻⁹
<p><i>Current literature indicates the incidence of bacterial co-infection in patients with COVID-19 is uncommon, at approximately 5%.⁷⁻¹⁴</i></p> <p>Perform appropriate microbial testing on admission, including</p> <ul style="list-style-type: none"> • COVID-19 PCR • Influenza/RSV Triplex PCR during influenza season • Sputum cultures (when possible) • Blood cultures (if indicated e.g., sepsis or severe pneumonia) • If COVID-19 infection is the most likely diagnosis* <ul style="list-style-type: none"> ○ no empiric antibiotic therapy is indicated • If Influenza (or other viral pneumonia) is suspected* <ul style="list-style-type: none"> ○ Initiate oseltamivir while awaiting results of triplex PCR <ul style="list-style-type: none"> ▪ Discontinue oseltamivir if influenza ruled out ▪ If antibiotics initiated, consider discontinuation if influenza confirmed, early clinical stability and no consolidation on chest X-ray • If bacterial CAP is the most likely diagnosis or high suspicion for bacterial co-infection* <ul style="list-style-type: none"> ○ Initiate antibiotic therapy as per the TOH Clinical Pathway for Community-acquired Pneumonia <ul style="list-style-type: none"> ▪ If mild illness, a 5-day course of oral antibiotics can be prescribed ○ Re-assess antibiotic therapy at 48-72h. Consider transition from IV to PO as indicated by clinical evolution. If COVID-19 or other viral infection diagnosed, reassess need for any ongoing antibiotic therapy. • If AECOPD is the most likely diagnosis, with new or worsening purulent sputum: <ul style="list-style-type: none"> ○ Initiate a 5-day oral antibiotic course as per the TOH Clinical Pathway for Antibiotics in COPD Exacerbation

* Refer to table 1 below for clues for differentiating viral and bacterial pneumonia

Patients with confirmed COVID-19 infection (pre or post-admission)^{1,2,5,6,8}

Current literature indicates the incidence of bacterial co-infection in patients with COVID-19 is uncommon at approximately 5%.⁷⁻¹³

Antibiotics are not indicated in the management of COVID-19 infection.

Routine use of antibiotics is not recommended in the context of non-severe COVID illness.

- Perform Influenza/RSV Triplex PCR (during influenza season) if not recently performed
- Discontinue antibiotics (if started), unless bacterial co-infection diagnosed
- If antibiotics continued:
 - consider transition to oral therapy (if applicable; regardless of ongoing fever) within 48 h
 - limit duration to 5-7 days

Hospitalized patients with COVID-19 and clinical worsening^{1,4}

If there is secondary clinical deterioration, hospital-acquired infection should be considered and investigated. The incidence of hospital-acquired secondary infection varies, with an estimate of 16%^{7,9-11} Worsening of respiratory symptoms/chest imaging is often due to progression of COVID-19.

- Perform usual clinical assessment, microbiologic cultures and investigations for infectious and non-infectious causes of clinical deterioration
- Consider empiric therapy based on potential sources of infection, duration in hospital and prior antimicrobial therapy as per TOH pathways and TOH Guidelines for Empiric Antibiotic Therapy
- At 48-72 hours reassess need for ongoing antibiotics:
 - if new infection not identified, consider discontinuation of antibiotics
 - if antibiotics continued, consider 'de-escalation' of therapy[#]
 - adhere to recommended antibiotic treatment durations based on site of infection

[#] Examples of de-escalation include discontinuation of vancomycin (if started) in the absence of positive cultures for gram-positive organisms and patient's MRSA swab is negative; change to narrower-spectrum antibiotic in the absence of positive cultures for *Pseudomonas aeruginosa*, etc.

COVID-19 patients in the ICU setting^{4,5,7-9,15,16}

The incidence of bacterial co-infection in patients with COVID-19 is reported to be approximately 5%.⁷⁻¹⁴ The incidence of hospital-acquired secondary infections varies, with an estimate of 16%, and may be higher in ICU patients.^{7,8,10-12,16}

- Perform Influenza/RSV Triplex PCR (during influenza season) if not recently performed
- Start empiric antibiotics in patients admitted to ICU with new or worsening severe respiratory illness (including suspected or documented COVID-19) according to the TOH Clinical Pathway for CAP, HAP or VAP, as applicable
- If bacterial pneumonia is suspected, non-invasive sampling (including urine for Legionella antigen) is recommended prior to antibiotics to support diagnosis and guide antibiotic therapy. A bronchoscopy, where safe to do so, should be considered for pathogen sampling
- Perform daily assessment for antibiotic de-escalation[#] or discontinuation based on imaging, culture results, the patient's clinical status and recommended duration of antibiotic therapy
- In patients who deteriorate despite optimal supportive care, consider
 - Secondary infection (pulmonary and non-pulmonary)
 - Risk of strongyloides, in steroid-treated patients, if not addressed
 - Diagnostic testing (e.g., bronchoscopy) to rule out invasive fungal infection (sporadic cases of pulmonary aspergillosis in critically ill COVID-19 patients have been reported)

[#] Examples of de-escalation include discontinuation of vancomycin (if started) in the absence of positive cultures for gram-positive organisms and patient's MRSA swab is negative; change to narrower-spectrum antibiotic in the absence of positive cultures for *Pseudomonas aeruginosa*, etc.

Table 1: Clues for differentiating viral and bacterial pneumonia^{5,6,17,18}

Presentation more indicative of:

COVID-19	Influenza or other viral illness	Bacterial pneumonia
<ul style="list-style-type: none"> • Presence of typical COVID-19 symptoms for approx. 1 week prior to presentation/worsening • Fever typically precedes cough (and other symptoms including nausea/vomiting, diarrhea). • Loss of smell or taste • Severe myalgias • Lymphopenia • Known or suspected exposure to COVID-19 • Breathlessness in absence of pleuritic chest pain • Peripheral/bilateral interstitial infiltrates on imaging 	<ul style="list-style-type: none"> • Sudden onset of symptoms including cough, myalgias, headache, fatigue, chills, fever 	<ul style="list-style-type: none"> • More rapid deterioration (within days) following onset of symptoms • Leukocytosis/neutrophilia • Pleuritic chest pain • Purulent sputum • Focal infiltrate on imaging

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