

Chronic Obstructive Pulmonary Disease & COVID-19 Update

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Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease resulting in persistent respiratory symptoms, such as a chronic productive cough, breathlessness, wheeze and airflow limitation primarily caused from extensive exposure to cigarette smoking and other noxious gases. The development of COPD is further influenced by host factors such as genetics, childhood abnormal lung development and aging¹. After ischaemic heart disease and stroke, COPD is the third leading cause of all deaths worldwide (6%)². In Ireland, COPD is the second commonest cause of respiratory death (5.6%) after lung cancer. It is estimated that there are 500,000 people aged 40 years and greater who could have COPD in Ireland with 200,000 of these likely to have moderate to severe disease³. Furthermore, COPD has the highest hospital admissions rates in Ireland, (395 per 100,000 population) in comparison to other countries within the organisation for economic cooperation and development (OECD) average, of 201 per 100,000 population. While this may reflect different coding systems regarding hospitalisations among different countries it is not fully understood why COPD hospitalisation rates in Ireland are the highest in the OECD³.

The coronavirus-19 (COVID-19 or SARS-CoV-2) pandemic has led to an unprecedented surge in patients hospitalised with a viral pneumonia or an acute

lung injury resulting in 2,244,713 deaths to date worldwide⁴. The clinical manifestations of COVID-19 infection varies, ranging from asymptomatic to symptomatic atypical pneumonia, a hyperinflammatory phenotype, respiratory failure requiring respiratory support such as high flow nasal oxygen (HFNO), continuous positive airway pressure (CPAP) or non-invasive ventilation (NIV) or invasive mechanical ventilation (IMV) for acute respiratory distress syndrome (ARDS). Furthermore, there has been a rising incidence of pulmonary thromboembolic disease associated with COVID-19⁵ (Figure 1).

COVID-19 has had a significant health impact on patients with underlying respiratory disease such as COPD. It is unknown if COPD increases the risk of contracting COVID-19 however, COPD has been associated with a fourfold increased risk of developing severe COVID-19 disease resulting in respiratory failure, ARDS and an increased risk of death^{5,6}. There is a need to implement protective strategies to prevent COPD patients in contracting COVID-19.

Protective strategies to prevent COVID-19 in COPD patients:

As per the advice from the national emergency public health team and the Health Service Executive, COPD patients should stay at home, limit their social interactions, wear a mask



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and wash their hands regularly to protect themselves from contracting COVID-19. COPD patients aged less than 64 years of age are assigned to group seven proposed by the Department of Health to be vaccinated against COVID-19 along with other chronic conditions such as heart disease, diabetes mellitus, chronic kidney disease, immunosuppression, chronic liver disease and a raised body mass index greater than 40 kg/m². COPD patients aged 65-69 years are in group five and those aged 70 and older are in group three to be vaccinated against

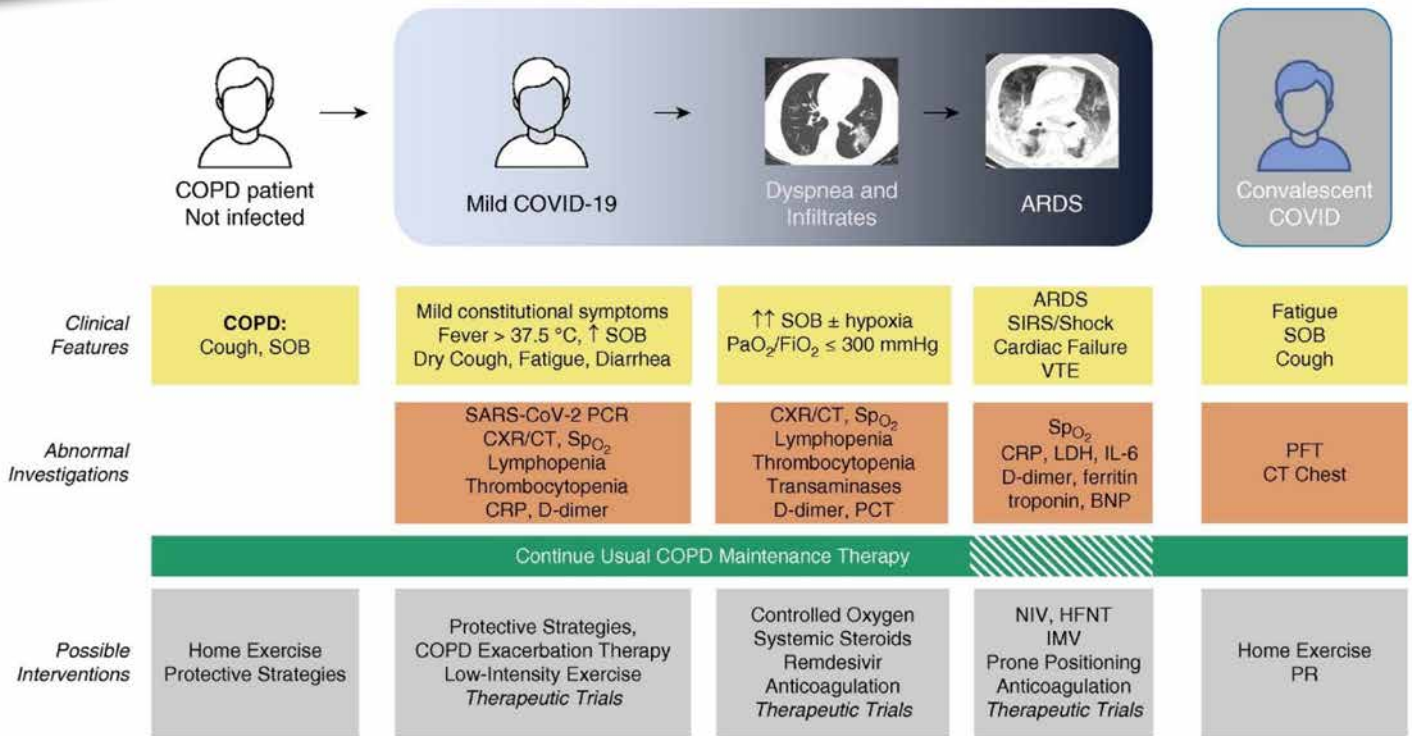
COVID-19. COPD patients should continue with maintaining stable COPD pharmacological treatment such as inhaled corticosteroid, long-acting bronchodilators, macrolides, oxygen or NIV therapy as prescribed.

How to recognise signs of COVID-19 in COPD patients

It is challenging to differentiate the symptoms of COVID-19 from the typical symptoms of a COPD exacerbation. COVID-19 symptoms can be mild initially however, can progress rapidly in worsening of



Figure 1: COPD and COVID19⁵



Chronic obstructive pulmonary disease and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection: clinical features, abnormal investigations, and possible interventions at different stages of the disease. ARDS = acute respiratory distress syndrome; BNP = brain natriuretic peptide; COPD = chronic obstructive pulmonary disease; COVID-19 = coronavirus disease; CRP = C-reactive protein; CT = computed tomography; CXR = chest radiograph; HFNT = high-flow nasal therapy; IMV = invasive mechanical ventilation; LDH = lactate dehydrogenase; NIV = noninvasive ventilation; PCT = procalcitonin; PFT = pulmonary function tests; PR = pulmonary rehabilitation; SIRS = systemic inflammatory response syndrome; SOB = shortness of breath; SpO₂ = peripheral oxygen saturation; VTE = venous thromboembolism.

respiratory symptoms resulting in ARDS (Figure 1). A high index of suspicion for COVID-19 needs to be maintained in patients with COPD who demonstrate symptoms of an exacerbation, worsening breathlessness, respiratory failure, fever, anosmia, ageusia or gastrointestinal symptoms.

Home pulse oximeters devices are a useful tool and should be considered in the management of COPD patients particularly those on long term oxygen therapy during the pandemic to assess for stability or low oxygen levels thereby prompting early medical treatment.

Treatment for COPD patients with COVID-19

COPD patients who present with asymptomatic or mild COVID-19 should be followed with the usual COPD protocols. To date evidence supports maintaining stable COPD pharmacological treatment such as inhaled corticosteroid, long-acting bronchodilators, macrolides or roflumilast for COPD patients who contract COVID-19. For COPD patients with COVID-19 who are self-isolating at home and have home nebulisers should be advised to use the nebuliser in the absence of other people in the room and near an open

window to increase ventilation in the room⁵. Similarly, domiciliary NIV or CPAP should be used at home as prescribed in the absence of other people in the room as it is considered as an aerosol generating procedure (AGP).

COPD patients hospitalised with moderate-to-severe COVID-19 pneumonia, should be considered for treatment if appropriate with evolving pharmacotherapeutic approaches such as remdesivir⁷, dexamethasone⁸ and anticoagulation⁵. Given that a subgroup analysis on COPD patients has not been presented in clinical trials it is recommended that COPD patients with COVID-19 to be treated with the same standard of care as other patients with COVID-19 (Figure 1).

Although nebulisers are not considered an AGP it is recommended the use of bronchodilators through a spacer for COPD patients with COVID-19 where feasible. This allows for shorter duration of administration and patients can self-administer inhalers without health care providers in the room. If nebulisation is required where feasible should be performed in a single room. Also nebulisers can be delivered

through an in-line connector if using an NIV facemask in a single side room and health care providers are required to wear full personal protective equipment (PPE) consisting of a full length sleeved gown, gloves, goggles and FFP2 face mask as per local infection control guidelines. Critically unwell patients receiving mechanical ventilation support are administered bronchodilators through metered dose inhalers in a closed circuit.

Managing acute respiratory failure should include appropriate and controlled oxygen supplementation, respiratory support such as HFNO or CPAP, prone positioning, NIV, and protective lung strategy in patients with COPD and severe ARDS. As HFNO, CPAP and NIV are considered as AGP, patients requiring this treatment require a single room and healthcare providers must wear full PPE such as full length sleeved gown, gloves, goggles and FFP2 as per local infection control policy. Furthermore, COPD patients requiring respiratory support or NIV as result of COVID-19 pneumonia, should have a multi-disciplinary meeting regarding the severity of the COPD, the use of long term oxygen therapy, domiciliary NIV,

performance status, advance directives in combination with the patient wishes to determine the ceiling or escalation of care for that patient.

Hospitalised COPD patients with COVID-19 are particularly at risk for poor nutritional status and skeletal muscle loss therefore allied health professionals such as dieticians and physiotherapists should be included in their care to optimise dietary intake and rehabilitation⁵.

There are no clear follow up guidelines for patients with COPD and COVID-19 and is based on expert opinion but will be guided by the severity of the COVID-19 episode, the requirement for oxygen therapy or NIV for ventilatory failure and radiological abnormalities not resolved at discharge. However, it is recommended that patients are referred to pulmonary rehabilitation 6-8 weeks after discharge. The COPD assessment tool (CAT) provides an insight into the severity of symptoms experienced by COPD patients and should be considered in assessing ongoing symptoms following a hospitalisation from COVID-19⁹.

References available on request