

IRISH ASSOCIATION FOR  
EMERGENCY  
MEDICINE



# Emergency Department Management of Suspected or Confirmed SARS-CoV-2 (COVID- 19)

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## DISCLAIMER

IAEM recognises that patients, their situations, Emergency Departments and staff all vary. These guidelines cannot cover all clinical scenarios. The ultimate responsibility for the interpretation and application of these guidelines, the use of current information and a patient's overall care and wellbeing resides with the treating clinician.

## GLOSSARY OF TERMS

AGP	Aerosol Generating Procedure
ARDS	Acute Respiratory Distress Syndrome
CXR	Chest X-ray
ED	Emergency Department
EM	Emergency Medicine
EMEWS	Emergency Medicine Early Warning Score
EMP	Emergency Medicine Programme
HSPC	Health Protection Surveillance Centre
IMEWS	Irish Maternity Early Warning system
IPC	Infection Prevention and Control
MERS	Middle East Respiratory syndrome
NEWS	National Early Warning Score
PEEP	Positive End-expiratory Pressure
PPE	Personal Protective Equipment
PEW	Paediatric Early Warning system
RSI	Rapid Sequence Intubation
SARS	Severe Acute Respiratory Syndrome

## DISCLAIMER

The knowledge regarding the epidemiology, pathology and clinical management of SARS-CoV-2 is evolving. The clinical management has very little evidence base yet and is mainly based on observational data, case series and consensus expert opinion. It is accepted that some of the guidance is of a pragmatic nature.

For all phases and at all times, healthcare workers are advised to consult the Health Service Executive's (<https://www.hse.ie/eng/>) and the Health Protection Surveillance Centre's websites (<https://www.hpsc.ie/>), which provides up to date guidance on the diagnosis and care of this condition.

# Emergency Department Management of Suspected or Confirmed SARS-CoV-2 (COVID-19)

## INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a respiratory tract infection caused by a newly emergent coronavirus, SARS-CoV-2, that was first recognized in Wuhan, China, in December 2019.

Technically, the virus is supposed to be called “SARS-CoV-2” and the clinical illness is called “COVID-19.” Both terms will be used in this summary.

## PARAMETERS

Target audience: This clinical summary is intended for all ED staff managing patients with a possible/ confirmed SARS-CoV-2 (COVID-19).

Patient population: The target patient population is patients presenting to the ED with possible/ confirmed SARS-CoV-2 (COVID-19).

## AIM

To provide guidance based on currently available evidence for the assessment and management of patient presenting to the Emergency Department with a possible or confirmed SARS-CoV-2 (COVID-19).

## TRANSMISSION

COVID-19 is transmitted when the virus is shed in small droplets from the respiratory tract of infected people when coughing, sneezing or talking. Most droplets fall onto surfaces quickly. The principle route of transmission is considered to be touching the surfaces contaminated by the virus and then the transfer of the virus to the mucosa by contaminated hands. Infection can also occur if droplets impact directly on the mucosa. Transmission by the airborne route (inhalation) is considered unlikely other than when aerosol generating procedures are performed.

**There is good evidence that spread of infection is reduced by following Standard Precautions (especially hand hygiene, respiratory hygiene, cough etiquette and environmental cleaning).**

## EPIDEMIOLOGY

### Risk factors

- Age > 60 years
- Male sex
- Medical co-morbidities
  - Chronic pulmonary disease
  - Cardiovascular disease (including hypertension and coronary artery disease)
  - Cerebrovascular disease
  - Diabetes Mellitus
  - Cancer
  - Immunocompromised

## PATHOPHYSIOLOGY

### ARDS

The primary pathology is ARDS, characterized by diffuse alveolar damage.

### Cytokine storm

Emerging evidence suggests that some patients may respond to COVID-19 with an exuberant “cytokine storm” reaction.

## GENERAL EMERGENCY DEPARTMENT MANAGEMENT

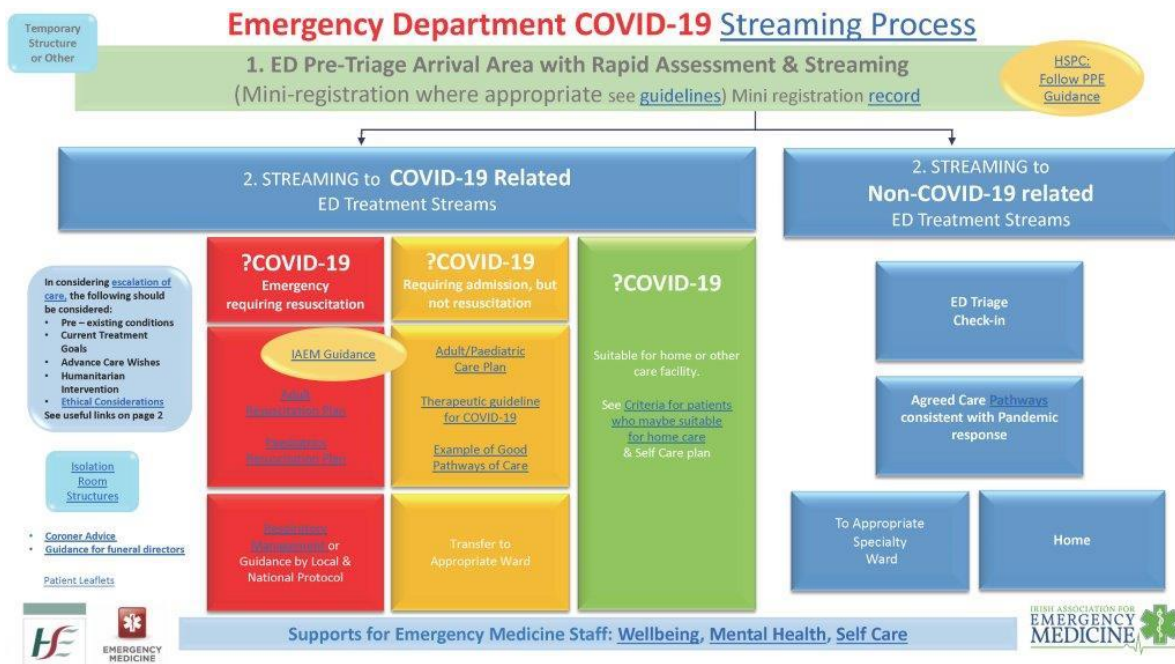
Patients with suspected or confirmed Covid-19 should be cohorted separately from those without the illness (please refer to algorithm/ click on the hyperlink below)

Follow HSPC PPE guidance when dealing with this cohort of patients

Steps in managing patients with suspected COVID-19

1. ED pre-triage arrival area and mini-registration
2. Rapid assessment and screening
3. Patients with possible/known COVID-19 streamed separately
4. Isolation
5. Investigations
6. Involve critical care early
7. Agreed on the resuscitation/ care plan for individual patient
8. Disposition-
  - a. Admission- identify high risk patients and patient requiring respiratory support and ICU admission.
  - b. Discharge (provide patient with **patient information sheet for self-isolation at home**).

Figure 1. ED COVID-19 screening process



[Click for live document](#)

## PERSONAL PROTECTIVE EQUIPMENT

It is imperative to follow HSPC and local IPC advice. As an example, [Appendix 1](#) depicts local guidance from Sligo University Hospital.

## CLINICAL PRESENTATION

### Signs and Symptoms

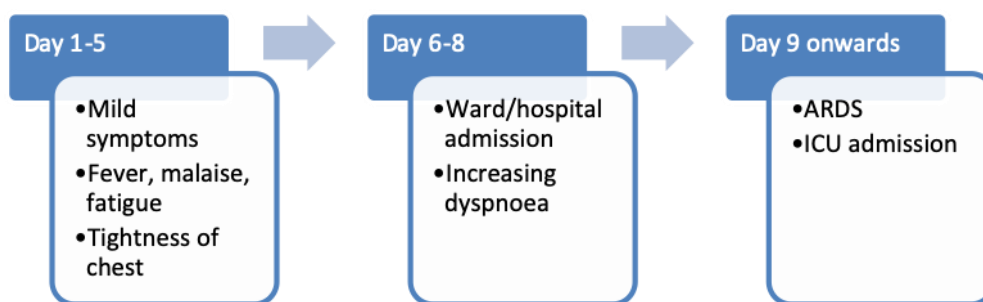
*Most common symptoms:* Cough, Dyspnoea, Myalgia, Fatigue, Fever

*Less common symptoms:* Anorexia, Sputum Production, Sore Throat, Dizziness, Headache, Rhinorrhoea, Chest pain, Haemoptysis, Diarrhoea, Nausea/vomiting, Abdominal pain and Conjunctival congestion.

These symptoms usually develop on average 5-6 days after infection (mean incubation period 5-6 days, range 1-14 days). In general, those who get the virus break down into three groups:

- 80% of patients present with mild illness
- 14% present with severe illness
- 5% present with critical illness.

Figure 2. Typical evolution of severe disease



## DIAGNOSIS

Specimen sample is a viral nasopharyngeal and oropharyngeal swab. Testing is based on HSPC guidance.

Investigations in all patients with severe illness

- Pulse oximetry
- ABG (as indicated to detect hypercarbia or acidosis)
- Full blood count
  - note WBC count tends to be normal but lymphopenia is common
- Other blood tests: Renal Profile, LFT, Coagulation screen, CRP, Procalcitonin, Troponin, Lactate dehydrogenase and Creatine kinase
- Swab and Cultures



- CXR

May also consider

- CT Thorax
  - Consider in patients with suspected pneumonia who have a normal CXR due to greater sensitivity to detect infiltrates
- Lung Ultrasound
  - Scattered/ confluent B-lines
  - Irregular/ thickened pleural line

## MONITORING

Monitor patients closely for signs of clinical deterioration using EMEWS\*/PEWS/IMEWS as appropriate.

\* where EMEWS has not been introduced to a department, consideration should be given to using another early warning score eg. NEWS

## CRITICAL CARE REFERRAL

The following indicate high likelihood of need for invasive ventilatory support and should prompt urgent critical care review:

1. SpO<sub>2</sub> < 90% on non-rebreather mask **or**
2. Respiratory acidosis pH <7.2 **or**
3. Respiratory rate > 40 **or**
4. Inability to protect or maintain airway

Patients exhibiting signs of shock also require urgent critical care review

1. Systolic blood pressure < 90 mm Hg
2. Clinical evidence of shock:
  - Altered level of consciousness
  - Decreased urine output refractory to volume resuscitation

## SUPPORTIVE THERAPIES

### Respiratory Support

Give supplemental oxygen to patients with respiratory distress, hypoxaemia or shock. Titrate flow rates to reach a target SpO<sub>2</sub> ≥90%.

Involve critical care promptly- early intubation is advisable as patient presenting with respiratory distress is likely to deteriorate rapidly.

Once intubated there is reduced risk of aerosol generation and thus less exposure to health care workers.

## Non-invasive ventilation (NIV)

Initial data from China suggested that NIV for COVID-19 hypoxic respiratory failure is associated with a high failure rate and delayed intubation. However some data from Italy suggests that CPAP may be of benefit to patients earlier on in the disease process than first thought and may prevent deterioration of some patients to the extent of them not going on to need invasive ventilation.

There is also a concern of possibly increased risk of aerosolisation with poor mask fit and is therefore not recommended outside of a negative pressure isolation room.

Helmet CPAP may be associated with less aerosol production.

## Fluids

Manage fluids conservatively in patients with severe acute respiratory infection when there is no evidence of shock as aggressive fluid resuscitation may exacerbate the condition.

## Airway management

The airway should be managed by the most experienced person available. An ED COVID RSI checklist should be followed. See [Appendix 3](#).

## Invasive Mechanical Ventilation

Tidal volumes should be targeted to a lung-protective range (4-6 ml/kg ideal body weight).

Patients require high levels of PEEP.

Permissive hypercapnia will likely be extremely important when ventilating these patients. The safe extent of permissive hypercapnia is unknown, but as long as haemodynamics are

adequate, a pH of >7.1 or >7.15 may be tolerable (hypercapnia is preferred over lung-injurious ventilation).

## Anti-Viral Therapy

There is a paucity of clinical evidence for any disease-specific treatment. Treat empirically for community acquired pneumonia as per local guidelines and consider antivirals as below (Table 1).

Table 1: Pharmacological management of patients with confirmed COVID-19 Infection (Adapted from HSE. Specific Antiviral Therapy in the Clinical Management of Acute Respiratory Infection with SARS-CoV-2 (COVID-19). 13 Mar 2020)

	Treatment
Confirmed COVID-19 Infection	<p>The following are experimental COVID-19 treatment options (used as monotherapy) in adults:</p> <p>There is no paediatric dosing available at this time. Where clinically appropriate, children <math>\geq 12</math> years may be considered for adult dosing.</p> <p>Listed alphabetically:</p> <ul style="list-style-type: none"> <li>- <b>Chloroquine</b> (oral): 500mg TWICE daily for 10days.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>- <b>Hydroxychloroquine</b> (oral): Day 1: 400mg TWICE a day, then Days 2-5: 200mg TWICE a day (total duration 5 days).</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>- <b>Lopinavir/ritonavir</b> (oral) 400mg/100mg TWICE daily up to a maximum of 14 days.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>- <b>Remdesivir</b> (intravenous): 200mg ONCE daily on Day 1, then 100mg ONCE daily for a total of 10days.</li> </ul>

Clinical judgment will be required for all cases; specialist consultation with local Infectious Disease and Microbiology teams is recommended for those cases not meeting criteria listed in Table 2.

Table 2: Criteria for Specific Antiviral Therapy in SARS-CoV-2 (COVID-19) (Adapted from Health Service Executive. Specific Antiviral Therapy in the Clinical Management of Acute Respiratory Infection with SARS-CoV-2 (COVID-19). 13 Mar 2020)

1.	Confirmed COVID-19 disease <b>and</b> Critical Care Admission
2.	Confirmed COVID-19 disease <b>and</b> NEWS Score $\geq 5$ Consider treatment in patients with NEWS Score $\geq 4$ and significant co-morbidities or risk factors for severe disease, including: <ul style="list-style-type: none"> <li>• Cardiovascular Disease</li> <li>• Diabetes Mellitus</li> <li>• Immunocompromised</li> <li>• Chronic Kidney Disease</li> <li>• Pre-existing Respiratory Disease</li> </ul>

Tocilizumab is an experimental medicine in the context of management of severe COVID-19 disease and should only be considered in patients who have severe COVID-19 with suspected hyperinflammation following multidisciplinary specialist input.

### Anti-bacterial therapy

There may be concerns regarding the possibility of a superimposed bacterial pneumonia. When in doubt, obtain bacterial cultures, prior to initiation of empiric (as per local guidance) antibiotic therapy. Based on culture and procalcitonin results, antibiotics might be discontinued in <48 hours if there isn't evidence of a bacterial infection.

## Steroids

Steroid should not generally be used. Steroids haven't demonstrated benefit in prior SARS or MERS epidemics. Steroid may increase viral shedding and morbidity.

## DISPOSITION

### Discharge home for self-isolation

The vast majority of patients with coronavirus will recover spontaneously, without requiring any medical attention.

Patients with mild symptoms can generally be discharged home, with instructions to isolate themselves.

Please click on the link below regarding [patient information sheet for self-isolation at home](#).

## SPECIAL CONSIDERATIONS

### COVID-19 cardiac arrest

Staff to wear recommended PPE

#### Airway

- apply oxygen mask and open patient's airway
- Avoid oropharyngeal airways and bag valve mask

#### Breathing

- Breathing assessed by looking (do NOT listen or feel)

#### CPR

- Compressions only

#### Defibrillate

- Defibrillate at a distance
- Stop oxygen flow but leave mask on patient
- Re-start oxygen flow when compressions start

#### Early intubation

- Perform only after airborne PPE applied
- Use video laryngoscopy
- Early discussion of goals

## Safe handling of bodies of deceased persons with suspected or confirmed COVID-19

The potential risk of transmission related to the handling of bodies of deceased persons with suspected or confirmed COVID-19 is considered low.

However, those in direct contact with deceased cases of COVID-19 (both suspected or confirmed) should be protected from exposure to infected bodily fluids, contaminated objects, or other contaminated environmental surfaces through wearing of appropriate PPE.

For patients who were intubated, the ET tube must stay in place but must be clamped before disconnecting it from the ventilatory circuit. Once clamped the circuit can be disconnected and sleek tape secured at the end of the ET tube sealing off the port. Once sealed the clamp can be removed.

The coroner must be informed that the deceased person was suspected to have had suspected or confirmed COVID-19 as applicable.

### References

- European Centre for Disease Prevention and Control. Considerations related to the safe handling of bodies of deceased persons with suspected or confirmed COVID-19. Stockholm: ECDC; 2020.
- World Health Organisation. Infection Prevention and Control for dead body management in the context of COVID-19: Interim guidance. March 2020.

### Staffing

Maintaining fully staffed rotas is challenging. Some departments have elected to run with 120% over capacity rotas to compensated for predicted sick leave.

It is important that psychological support is provided by the hospital to ED staff.



Staff are also strongly advised to look after their own wellbeing as far as possible ([Appendix 2: EM wellbeing](#))

## Simulation training

Multidisciplinary simulation training is ideal for:

- Donning and doffing PPE using a buddy system
- COVID-19 intubation scenario

Consider including pre-hospital and critical care teams in ED based simulation training.

## Older age

For older people with probable or suspected COVID-19, provide person-centred assessment, including not only conventional history taking, but a thorough understanding of the person's life, values, priorities, and preferences for health management.

Involve caregivers and family members in decision-making and goal-setting throughout the management of older COVID-19 patients.

## COMPANION DOCUMENTS

[References/ bibliography](#)

[Appendix 1: Personal Protective Equipment \(Guidance from Sligo University Hospital\)](#)

[Appendix 2: EM Wellbeing](#)

[Appendix 3: IAEM EMP ED COVID RSI checklist](#)