Management of COVID-19 Patients in the ED

Risk Factors and Red Flags

Epidemiological risk factors for hospitalisation include include:

- Age >60 years
- Coronary artery disease
- Hypertension
- Diabetes
- COPD

Transmission

Three possible types:

1. Large droplet transmission
    a. Risk limited to ~1.5-2m from the patient
    b. Typical for many respiratory viruses including influenza
    c. Prevented using standard surgical mask
2. Airborne transmission
    a. Controvesial
    b. WHO guidelines recommend recommend using N95 masks (standard protection for airborne viruses) for aerosol-generating procedures only
        i. Intubation/extubation
        ii. NIV
        iii. HHFNP
        iv. CPR prior to intubation
        v. BVM
        vi. Bronchoscopy/tracheostomy
3. Contact transmission
    a. Can be disrupted using
        i. Regular environmental cleaning
        ii. Hand hygiene
        iii. Avoidance of touching your face

Timing of transmission:

1. Incubation period 4 days (inter quartile range 2-7d)

Symptoms

Common (>50%)

- Fever
- Cough
- Myalgia and weakness

Possible (10-50%)

- Dyspnoea
- Sputum

Rare (<10%)

- Rhinorrhoea
- Sore throat
- Headache
- Nausea/vomiting
- Diarrhoea

Evolution

- Clinical deterioration typically in the second week
- 20-30% of hospitalised patients require ICU/Critical care for respiratory support
- Development of ARDS- median onset from symptoms 8 days
- Complications:
    - ARDS
    - Secondary sepsis
    - Multi-organ failure
    - Myocarditis and sudden cardiac arrest

Mortality

Age	Mortality
Children < 9yrs*	0%
<60yrs	0.8%
60-69yrs	3-4%
70-79yrs	8%
>80 yrs	14%

* Mostly mild Resp/GI symptoms, some croup/bronchiolitis, many asymptomatic; 1 x death 14y year old (rare sepsis)

Clinical Investigations

Should be reserved for unwell patients requiring hospital admission (will aid inpatient care and assessment).

The following clinical have been shown to be useful

CXR	Ground glass opacities bilaterally, peripheral initially
CT	Specific clinical indication only ie DDx CTPA, or comorbid trauma etc
FBE	Lymphopenia suggest poor prognosis, neutrophilia suggests secondary bacterial infection
CRP	Very high indicates poor prognosis
D-Dimer	Elevation poor prognosis
ALT AST LDH	Transaminitis suggests poor prognosis
VBG	Lactate is generally not elevated on COVID-19, and not useful prognostically; may aid diagnosis if elevated, as it may indicate secondary sepsis. Elevated CO2 -Type 2 rep failure suggests bronchospasm or respiratory fatigue

Key Supportive Care

There are no specific evidence based treatments for patients with COVID-19 other than good supportive care. This should be performed in the same way as it would be done with any patient with severe viral community acquired pneumonia, taking into account some key differences:

1. Cover with antibiotics as per eTG, taking into account clinical severity
    a. Some patients will have bacterial pneumonia as their primary illness
    b. Some patients will have COVID-19 with secondary bacterial infection
2. Aim for restrictive fluid management
    a. As for ARDS or pneumonitis patients
    b. Avoid maintenance fluids
    c. Minimise fluid boluses to <1000mL
    d. Use inotropes early
3. Avoid NSAIDs: there is limited evidence but some case studies suggest poorer outcomes
4. Avoid steroids: early administration of steroid may increase viral shedding, so avoid use unless indicated for co-morbid conditions (COPD, Asthma, Croup)
5. Avoid aerosolised procedures that might constitute an infection control risk:
    a. HHFNP
        i. Adults: use is supported by ANZIC
            1. Prior to use, exhaust all medical and oxygen therapy options
            2. Involve FACEM in decision making process
            3. Place the patient in a negative pressure or single room
        ii. Paediatrics:
            1. Only when required for bronchiolitis or asthma
            2. Exhaust all medical and oxygen therapy first
            3. Involve FACEM in decision making process
            4. Place patient in negative pressure or single room
    b. NIV (BiPAP): Avoid
            1. Leads to inappropriate deferral of intubation

2. Indications for intubation:
    a. Respiratory failure nor responding to medical and oxygen therapy

c. BVM: Avoid use during RSI prior to intubation
    i. If required, use a HEPA filter between the mask and the bag
d. Nebulised medications: Avoid
    i. May be considered if the patient is in extremis (FACEM decision only)
    ii. Consider alternative routes of administration
        1. MDI and spacer
        2. IV salbutamol
        3. IV adrenaline
        4. IV magnesium

6. Experimental therapies: several therapies have been postulated to improve outcomes and are currently being explored. These will not be commenced in ED due to either lack of evidence of efficacy, or lack of availability, or both. This is an area that is rapidly evolving, and advice may change.

Disposition

- Mild symptoms, appears well, no red flags: Discharge home. Treat with symptomatic management as an outpatient; no investigation required.
- Moderate symptoms or red flags: Consider admission if unwell. CXR and baseline bloods.
- Severe oxygen requirement (SaO2<95%), abnormal vital signs: Admission. CXR, bloods.
- Critical: Admission critical care. CXR and bloods, consider early intubation. Treat co-morbid conditions

Common Pitfalls

- Delayed consideration of COVID-19 as a diagnosis, leading to delayed precautions
- Excess use of intravenous fluids for management of presumed sepsis
- Inadequate attention to contact precautions particularly hand hygiene and surface cleaning
- Admission of COVID-19 patients that could safely be managed as outpatients
- Use of the ED as a COVID-19 screening area
- Trying to use anything other than the usual treatment approaches for viral pneumonia- they key is high-quality supportive care