

Rapid evidence checks are based on a simplified review method and may not be entirely exhaustive, but aim to provide a balanced assessment of what is already known about a specific problem or issue. This brief has not been peer-reviewed and should not be a substitute for individual clinical judgement, nor is it an endorsed position of NSW Health.

## Assessment and management of COVID-19 patients in the emergency department (ED)

### Rapid review question

What is the evidence for the assessment and management of suspected or confirmed COVID-19 patients presenting to the Emergency Department (ED)?

### In brief

- Guidance on the assessment and management of patients with suspected or confirmed COVID-19 in the ED consistently prioritises limiting the spread of infection, identifying all cases, and estimating disease severity.
- Consistent with other guidance, the European Society for Emergency Medicine recommends that access to ED should be limited to those with severe respiratory symptoms or other organ compromises. Current World Health Organization guideline states that where possible, mild to moderate cases without other known risk factors can be managed in the community with advice on self-management of symptoms and self-isolation.(1)
- The Australian Medical Association recommends that patients and healthcare professionals alert the hospital prior to the arrival of suspected cases to facilitate the preparation of appropriate safety controls and patient management. When patients directly present to the ED, it is recommended they are given a surgical mask, and screened and triaged away from other patients.
- Guidance consistently prescribe that assessment of suspected COVID-19 patients should occur in a dedicated single isolated room, to screen for the presence and severity of clinical symptoms (e.g. fever, coughing, shortness of breath), epidemiological risk factors (e.g. illness onset, travel history, previous contact with cases), potential known risk factors for more severe illness (e.g. old age, comorbidities), and differential diagnoses such as influenza.
- From the ED, patients are triaged and transferred based on their severity of illness to appropriate care settings, such as the community, in the general ward or intensive care unit (ICU).
- The Australian National COVID-19 Clinical Taskforce recommends that staff refer to local diagnostic testing criteria for SARS-CoV-2, noting that they may differ between states and territories. Diagnostic tests that have been shown to be informative in the ED, including nasopharyngeal or oropharyngeal swab polymerase chain reaction (PCR) tests. The Taskforce recommends performing further testing on all cases admitted to hospital, including laboratory testing, haematology, electrocardiogram (ECG) tests, and chest X-rays.

- National guidelines from Australia advise that local public health units should be notified of suspected (likely to be confirmed) or confirmed cases.
- Based on guidance from the Australasian College for Emergency Medicine, treatment of patients in the ED include the use of oxygen supplementation, non-invasive ventilation, mechanical ventilation and provision of supportive care.

## Methods (Appendix 1)

Pubmed, Google and snowball sampling were conducted on 11-12 May 2020. Australian and international government and research organisation websites were reviewed and results on guidance and clinical pathways were included. Results specific to COVID-19 were included.

## Limitations

Evidence on this topic is emerging rapidly. Guidelines and protocols for patient care will vary by jurisdictions based on their individual acute care organisation and system.

## Results

The Australasian College for Emergency Medicine (ACEM) advises that ‘treatment should be provided and escalated in accordance with patients’ needs and wishes, anticipated progress, prognosis and goals of care’.(2) While care pathways for suspected COVID-19 cases may vary by jurisdictions, based on guidelines from multiple sources, the patient assessment and management in the ED typically comprise the following.

### 1) Arrival of patient

Scenario One: Patient with possible COVID-19 symptoms is assessed (virtually or in-person) and referred to the ED by a healthcare professional. The hospital is alerted of the arrival of a potential case and prepares for safe and appropriate management of patient and protection of staff and other patients. This is the recommended approach.(3-5)

Scenario Two: Patient presents to ED directly. Current guidelines prioritise the quick identification of potential cases through an established protocol, as well as safe triaging and minimal contact with other patients.(2, 6-8) If possible, it is recommended that patients are screened and triaged by staff prior to entry into the ED for safety measures and to limit patient inflow.(9, 10)

Guidance advises that patients should be given surgical masks and isolated in a single closed room, or if an aerosol generating procedure (AGP) is required, in a negative pressure isolation room.(5, 11)

### 2) Patient assessment

At the hospital, patients are assessed in a single isolated room and screened for the following:(6, 12)

Symptoms and signs (13)	Date of onset of symptoms; Key symptoms: fever, shortness of breath (respiratory rate and effort), dry cough, muscle aches, tiredness; Other symptoms: sore throat, headache, runny nose, diarrhoea and nausea
Epidemiological risk factors (11, 13)	In the 14 days prior to illness onset: <ul style="list-style-type: none"> <li>• Close or casual contact with a confirmed or probable case of COVID-19</li> <li>• International or interstate travel</li> <li>• Passengers and crew who have travelled on a cruise ship</li> <li>• Healthcare, aged or residential care workers and staff with direct patient contact</li> <li>• People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities.</li> </ul>

Potential known risk factors for more severe illness (13)	Old age, Indigenous status, history of smoking, comorbidities (e.g. respiratory and cardiovascular disease, immunocompromised states)
Symptom severity (13, 14)	Degree of breathlessness, distress and pain. Assess oxygen saturation (SaO <sub>2</sub> )
Differential diagnoses (4, 13)	e.g. Influenza, bacterial pneumonia, meningitis and sepsis

Based on these criteria, individuals are considered a **suspected case** if they:

- have bilateral severe community-acquired pneumonia (critically ill) and no other cause is identified (11, 15-17), or
- have one or more epidemiological risk factors and have a fever or acute respiratory infection (e.g. shortness of breath or cough) with or without fever.(3, 5, 11, 13, 15-17)

### 3) Triage and transfer of patients to appropriate care settings

The Australian National COVID-19 Clinical Evidence Taskforce recommends hospital admission of those with likely or confirmed COVID-19 if they are hemodynamically unstable, hypoxemic (SaO<sub>2</sub> on room air  $\leq$ 92%), have comorbidities, or an unsuitable home environment.(18) Based on the severity of illness and care needs, patients are transferred from the ED to the following care settings:

- Their home or community, in those with no or mild symptoms (roughly 80% of all cases) (19), or moderate cases with no other known risk factors.(1)
- Hospitalisation in the general ward or ED short stay units (EDSSUs), to manage moderate to severe cases.
- The intensive care unit (ICU) for those who require urgent and critical care.(20-22)\*

\*Defined as those who are hemodynamically unstable, have rapidly worsening tachypnoea or hypoxaemia, or require  $\geq$ 40% FiO<sub>2</sub> to maintain SaO<sub>2</sub>  $\geq$ 92% (or acceptable saturations in those with lower baselines).(18)

### 4) Further evaluation and diagnostic (laboratory) testing

Testing is recommended to be undertaken according to local testing criteria for COVID-19, which may differ between states and territories.(11) Diagnostic tests that have been shown to be informative in the ED include polymerase chain reaction (PCR) tests from nasopharyngeal or oropharyngeal swab and sputum specimen.(20) The National Taskforce recommends performing further testing on all cases admitted to hospital, including laboratory testing, haematology, electrocardiogram (ECG) tests, and chest X-rays to scan for bilateral infiltrates.(18)

### 5) Notification to the local public health unit

Notify the local public health unit of suspected (likely to be confirmed) or confirmed cases.(5, 11, 13)

### 6) Treatment and management of patient in the ED

Patients should be monitored continuously for clinical deterioration.(12) The ACEM recommends the following treatment guidelines for ED clinicians:(2)

1. **Respiratory support:** Oxygen supplementation provided to those with severe acute respiratory infection & distress, hypoxaemia (SaO<sub>2</sub>  $\leq$ 92%) or shock. Oxygen can be supplied with AGP with appropriate infection control procedures, non-rebreather mask and nasal cannula. Underlying symptoms such as COPD should be considered in determining level of supplementary oxygen provided. Provision of oxygen using early proning has been shown to improve oxygen saturation levels in awake hypoxic patients in the ED.(23)
2. **Non-invasive ventilation:** Perform in a negative-pressure room. Use in patients with exacerbation of COPD or heart failure, in the absence of resources or to delay intubation. Early intubation and

invasive mechanical ventilation should be performed in cases of clinical deterioration plus worsening hypoxia despite oxygen supplementation.

3. **Management of ventilation for adults:** Use lung-protective mechanical ventilation in patients with worsening hypercapnia, acidaemia, hypoxaemia, respiratory fatigue, haemodynamic instability or those with altered mental state. Use viral filters and closed inline suction catheters. Other precautions have been detailed in **Table 1** (under *Clinical guidelines for the management of COVID-19 in Australasian emergency departments*).
4. **Supportive care:** Anticipate and address complications such as arrhythmias, cardiac impairment, sepsis and multiorgan dysfunction and address these using existing standards of care. Use a restrictive fluid management strategy, aiming to reduce extravascular lung water. Use metered dose inhalers with avoidance of nebulisers wherever possible.

Additionally, the Australian National Taskforce recommends that anti-virals and other disease-modifying treatments should only be administered in the context of randomised trials with appropriate ethical approval.(18) Other treatments such as antibiotics and prophylactic doses of anticoagulants should be used with care and consideration for clinical risk (e.g. heavy bleeding).

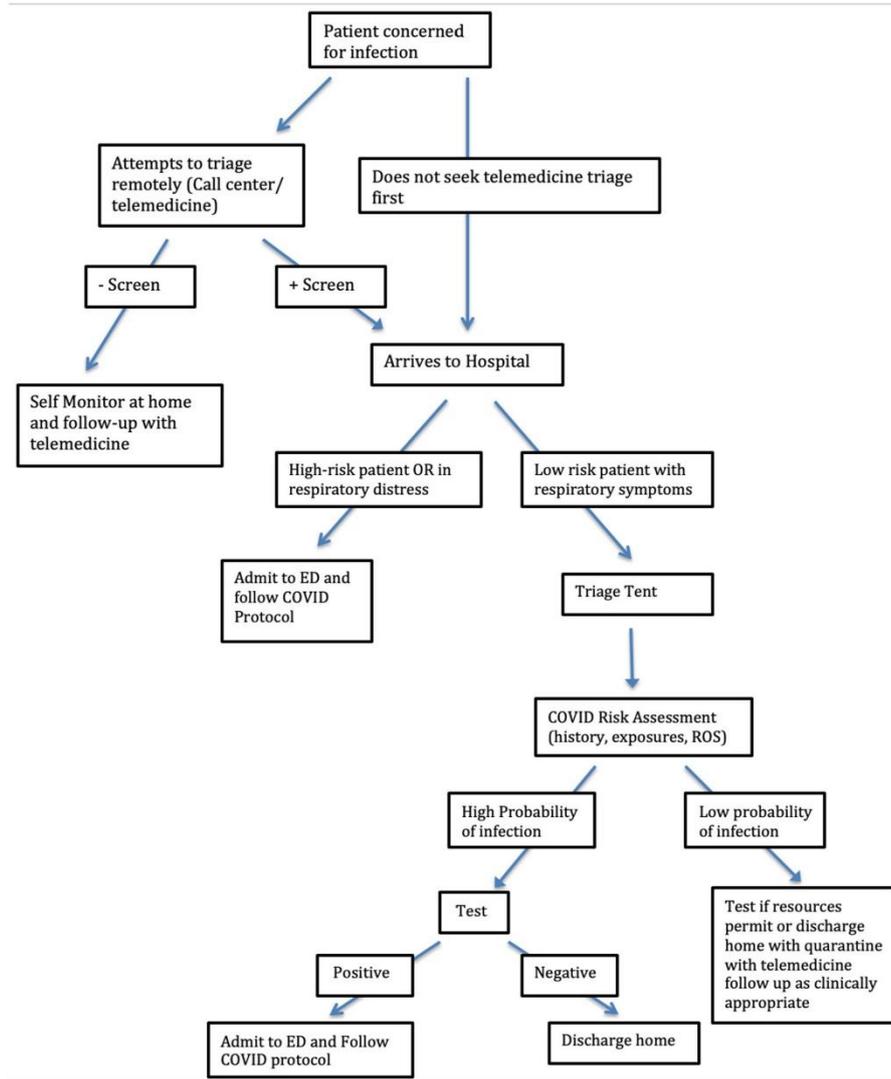
### **Infection and safety controls at the hospital (concurrent):**

Current guidance recommends limiting staff in patient care rooms to only essential healthcare professionals, using appropriate PPE and exercising hygiene measures and precautions (e.g. airborne, droplets) at all times and performing routine environmental cleaning and disinfection in accordance with institutional standards.(4, 15)

### **Minimising overcrowding in ED:**

Crowding in ED has dangerous implications for the safety of patients and staff, and has been associated with avoidable mortality, decreased patient satisfaction and treatment delays.(24-28) During infectious respiratory disease outbreaks such as COVID-19, crowded ED rooms can turn into vectors for accelerated transmission.(29) Minimising ED crowding during outbreaks has thus been reported as a high priority for healthcare workers.(30, 31)

In their recent position statement, the Royal College of Emergency Medicine in the UK called it 'a moral imperative' to prevent overcrowding in EDs during and beyond the COVID-19 pandemic.(32) It recommended strategies to increase ED capacity and diminish the effects of crowding, including physical redesign of facilities, implementing rigid hospital policies around visitations and social distancing and establishing more efficient systems of triaging and care delivery. George Washington University Hospital in the US attempted to address this issue by establishing triage points before and upon ED arrival and diverting low-risk patients with respiratory symptoms to an external medical tent.(10) This protocol to structure patient flow is outlined below:



Source: Whiteside et al. 2020

The evidence on the impacts of COVID-19 pandemic on ED overcrowding and patient outcomes is currently not well established. However, there is risk that subsequent waves of COVID-19 outbreak may coincide with a seasonal flu epidemic, leading to a surge in patient volumes.(30, 32) Without an appropriate response plan in place, there is concern that hospitals and EDs may become overwhelmed and unable to meet patient care needs in a timely manner.

**Table 1: Clinical assessment and management of COVID-19 patients in ED**

Source title and author	Country	Findings	Source link
<b>Peer reviewed journals</b>			
Early Self-Prone in Awake, Non-intubated Patients in the Emergency Department: A Single ED's Experience During the COVID-19 Pandemic  Caputo et al. 2020 (23)	US	The purpose of this study was to describe the use of <b>early proning</b> of awake, non-intubated patients in the emergency department (ED) during the COVID-19 pandemic. The study was carried out in a single urban ED in New York City. Patients suspected of having COVID-19 with hypoxia on arrival were included. A standard pulse oximeter was used to measure SpO <sub>2</sub> . SpO <sub>2</sub> measurements were recorded at triage and after five minutes of proning. <b>Supplemental oxygenation methods included non-rebreather mask (NRB) and nasal cannula.</b> Fifty patients were included. Overall, the median SpO <sub>2</sub> at triage was 80% (IQR 69 to 85). After application of supplemental oxygen was given to patients on room air it was 84% (IQR 75 to 90). After five minutes of proning, SpO <sub>2</sub> improved to 94% (IQR 90 to 95). Comparison of the pre- to post-median by the Wilcoxon Rank-sum test yielded P = 0.001. Thirteen patients (24%) failed to improve or maintain their oxygen saturations and required <b>endotracheal intubation</b> within 24 hours of arrival to the ED. Awake early self-prone in the emergency department demonstrated improved oxygen saturation in COVID-19 positive patients.	<a href="#">Click here</a>
Coronavirus Disease (COVID-19): A primer for emergency physicians  Chavez et al. 2020 (4)	International	Emergency physicians should focus on identifying patients at risk, isolating suspected patients, and informing hospital infection prevention and public health authorities. Patients with suspected COVID-19 should be asked to wear a facemask. Respiratory etiquette, hand washing and personal protective equipment are recommended for all healthcare personnel caring for suspected cases. Disposition depends on patient symptoms, hemodynamic status and patient ability to self-quarantine.	<a href="#">Click here</a>
Onsite telemedicine strategy for coronavirus (COVID-19) screening to limit exposure in ED  Chou et al. 2020	US	A protective physical barrier was constructed in the ED with telemedicine technology to limit COVID-19 exposure in a large urban community hospital. The patient exam room was equipped with intercom and iPad for telecommunication. The authors used a telemedicine screening protocol for physicians to conduct a visual physical examination on stable patients via intercom or videoconference. The implementation of this intervention can be a promising protocol in making ED care more cost-effective and efficient during the COVID-19 pandemic and beyond.	
Conservative Management of COVID-	International	Assessment of suspected COVID-19 patients needs to be concise and quick as patients can deteriorate rapidly. Assessment guidelines and treatment plans for patients who are not suitable for life-sustaining therapies need to be shared with emergency department staff as patients present in ED, and palliative care teams may not be able to assess in time.	<a href="#">Click here</a>

Source title and author	Country	Findings	Source link														
<p>19 Patients-Emergency Palliative Care in Action</p> <p>Fusi-Schmidhauser et al. 2020 (14)</p>		<p>Assessments are tailored to the additional time required because of limited contact due to infection control nursing requirements and reducing risk of contamination.</p> <p>A COVID-19 specific assessment tool was developed locally, the <b>3D-Ticino 2019-nCov Score (Fig. 1)</b>, which focuses on key symptoms observed in this population, such as dyspnea, distress, and discomfort (pain).</p> <table border="1" data-bbox="734 459 1659 711"> <tr> <td data-bbox="734 459 913 560">                       3D                      Dyspnea                      Distress                      Discomfort (pain)                 </td> <td data-bbox="913 459 1023 560">0</td> <td data-bbox="1023 459 1133 560">1 – 2</td> <td data-bbox="1133 459 1261 560">3 – 4</td> <td data-bbox="1261 459 1368 560">5 – 6</td> <td data-bbox="1368 459 1500 560">7 – 8</td> <td data-bbox="1500 459 1659 560">9 – 10</td> </tr> <tr> <td></td> <td data-bbox="913 560 1023 711">None</td> <td data-bbox="1023 560 1133 711">Mild</td> <td data-bbox="1133 560 1261 711">Moderate</td> <td data-bbox="1261 560 1368 711">Severe</td> <td data-bbox="1368 560 1500 711">Very severe</td> <td data-bbox="1500 560 1659 711">Worst possible</td> </tr> </table> <p data-bbox="913 746 1473 783">Fig. 1. 3D-Ticino 2019-nCov Score.</p> <p data-bbox="712 815 1818 874">The authors also offer management guidance on Stable, Unstable, and End-of-Life patients in Table 1:</p>	 3D Dyspnea Distress Discomfort (pain)	0	1 – 2	3 – 4	5 – 6	7 – 8	9 – 10		None	Mild	Moderate	Severe	Very severe	Worst possible	
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		<p style="text-align: center;"><i>Table 1</i></p> <p style="text-align: center;"><b>Recommendations for Conservative and Palliative Care Management of COVID-19 Patients (3D-TiCoS)</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Phase of Illness</th> <th style="width: 30%;">Monitoring (Nursing)</th> <th style="width: 40%;">Drugs for Symptom Control</th> </tr> </thead> <tbody> <tr> <td>Stable: EWS<sup>1</sup>: ≤7 RR: ≤25/minute O<sub>2</sub> Sat: &gt;88% (with Venturi mask up to 60%)</td> <td> <ul style="list-style-type: none"> <li>• 3D assessment and vital signs once per shift</li> <li>• Evaluate pressure areas &amp; need for pressure relieving mattress</li> <li>• Intensify communication with the family and prepare that sick enough to die</li> </ul> </td> <td>                     Dyspnea/pain: Morphine PO 2–5 mg, 4 hourly with rescue doses (10%–20% of the total daily dose) or PRN                      Anxiety: Lorazepam sublingual 1–2.5 mg, 8 hourly or PRN or Levomepromazine PO 5–10 mg, 6 hourly or PRN                      Fever: Paracetamol PO 1 g, 6 hourly or PRN                      Shivers: Morphine 2–5 mg IV/SC PRN or Pethidine 25–50 mg SC PRN                      Prescribing opioids in renal insufficiency: choose Hydromorphone (accordingly to palliative care consultation) Temporary de-prescribing of usual drugs                 </td> </tr> <tr> <td>Unstable: EWS<sup>1</sup> &gt;7 RR: &gt;25/minute O<sub>2</sub> Sat: &lt;88%</td> <td> <ul style="list-style-type: none"> <li>• 3D assessment twice per shift and stop vital signs measurement</li> <li>• O<sub>2</sub> delivery maximum 4 L</li> <li>• Observe respiratory effort</li> <li>• Inform the family that patient now unstable and propose visit</li> </ul> </td> <td>                     Dyspnea/pain: Morphine IV/SC 5 mg, 2–4 hourly with rescue doses (10%–20% of the total daily dose) or PRN                      Anxiety/delirium/distress: Diazepam 2.5–5 mg IV or rectal 10 mg 8–12 hourly with rescue doses PRN or chlorpromazine 12.5–25 mg IV PRN or levomepromazine 6.25–25 mg SC PRN                      Fever: Diclofenac 75 mg IV with rescue doses PRN or paracetamol rectal 600 mg, 6 hourly                      Shivers: Morphine 5 mg IV/SC PRN or pethidine 25–50 mg SC PRN                      Hydration maximum 250 mL/day                      Suspend futile treatments                      Terminal dyspnea–Respiratory distress:                     <ul style="list-style-type: none"> <li>• Morphine IV/SC 5 mg (up to every hour) with rescue doses (10%–20% of the total daily dose) or PRN. 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<p>EUSEM Position paper on Emergency Medical Systems response to COVID-19</p> <p>Garcia-Castrillo et al. 2020 (3)</p>	<p>International (EU)</p>	<p>Clinical care of suspected patients with COVID-19 should focus on early recognition and immediate isolation, as well as appropriate infection prevention measures and control (IPC) measures with care taken to optimise supportive care. Although the ED may be considered the logical direction for those affected by this epidemic, it is often crowded with patients seeking care for other illnesses. Few official recommendations have identified the roles of the ED and of EMS during outbreaks. The most important actions should focus on limiting the spread of infection, identifying all cases, and estimating disease severity.</p> <p>EDs should prepare a plan for rapid identification and strict isolation procedures. Recommendations should include the following:</p> <ul style="list-style-type: none"> <li>• An informative, coordinated campaign for public and health professionals, focused on mechanisms of contagion, personal protection equipment (PPE) use, and a clinical pathway for the suspected COVID-19 patients.</li> </ul>	<p><a href="#">Click here</a></p>												

Source title and author	Country	Findings	Source link
		<ul style="list-style-type: none"> <li>• Development of a validated fast point-of-care diagnostic kit for early detection. A rapid diagnostic test will facilitate patient management considerably.</li> <li>• The identification and availability of isolated rooms, ideally with negative air pressure.</li> <li>• Due to the risk of the dissemination of droplets, providers must favour physical barriers between patients.</li> <li>• An additional supply of PPE and the implementation of strict internal discipline, with different levels of protection according the setting.</li> <li>• The development and implementation of cleaning protocols, considering that coronavirus has been isolated on inanimate objects and healthcare workers were infected by SARS, even without direct contact with sick patients.</li> <li>• Clinical management protocols must coordinate different services such as EMS, ICU, infectious disease, pulmonary, administrative, and admission services.</li> </ul>	
<p>Novel 2019 Coronavirus SARS-CoV-2 (COVID-19): An Updated Overview for Emergency Clinicians</p> <p>Giwa et al. 2020 (33)</p>	<p>US</p>	<p>The development of ARDS and respiratory decompensation plays a central role in the pathogenesis of COVID-19. In this sense, the following treatment principles are key in managing COVID-19 patients:</p> <ul style="list-style-type: none"> <li>• Hemodynamic management, with vasopressor support if necessary</li> <li>• Nutritional support</li> <li>• Blood glucose control</li> <li>• Expeditious evaluation and treatment of nosocomial or concomitant bacterial pneumonia</li> <li>• Prophylaxis against deep vein thrombosis and gastrointestinal bleeding</li> <li>• Proper patient positioning to aid oxygenation and ventilation</li> </ul>	<p><a href="#">Click here</a></p>
<p>Emergency Department COVID Management Policies: One Institution's Experience and Lessons Learned (4/28/2020)</p> <p>Leibner et al. 2020 (34)</p>	<p>US</p>	<p>The authors provide a comprehensive guide on the management of COVID-19 patients in the emergency department, based on the experiences of Mount Sinai Hospital in New York. Recommendations on the following topics are provided:</p> <ul style="list-style-type: none"> <li>• Laboratory testing and imaging</li> <li>• Disposition/admission criteria</li> <li>• Cardiac arrest protocol</li> <li>• Medication treatment guidelines</li> <li>• Anticoagulation protocol</li> <li>• Intubation protocol</li> <li>• Nonaerosolised asthma protocol</li> <li>• Acute dyspnea/palliative care treatment</li> <li>• Death management talking points</li> <li>• COVID-19 smart phrase/discharge plan for likely COVID-19 patients</li> <li>• Guidelines for prone positioning of nonintubated patients</li> <li>• Critical Care for ED COVID-19 patients</li> </ul>	<p><a href="#">Click here</a></p>

Source title and author	Country	Findings	Source link
<p>How emergency departments prepare for virus disease outbreaks like COVID-19</p> <p>Möckel et al. 2020 (6)</p>	<p>Germany</p>	<p>In the early phase of the spread of a new disease like COVID-19, three factors are most important for the ED:</p> <ol style="list-style-type: none"> <li>1. The definition of cases must be recognised by all members of the staff. The challenge of the situation is the very fast and dynamic change. Therefore, if not already implemented, EDs need to update all members of the team, digitally and/or online. An interprofessional routine, called a ‘team time out’ at the beginning of every shift, which lasts only a few minutes, can be used to update everybody with ‘must know’ information.</li> <li>2. Potential patients must be recognised at the door and isolated immediately at triage. If feasible, patients approaching the ED should be guided with signs to a separate room even before triage in order to prevent contact with other patients waiting for triage.</li> <li>3. A set of measures and information needs to be prepared and made available for all potential patients. The recommendations for risk stratification of the diagnostic measures are very dynamic and change daily. Thus, flowcharts should be accessed online when needed rather than printed to avoid the circulation of outdated information.</li> </ol>	<p><a href="#">Click here</a></p>
<p>Epidemiology and clinical features of emergency department patients with suspected COVID-19: Initial results from the COVID-19 Emergency Department Quality Improvement Project (COVED-1)</p> <p>O’Reilly et al. 2020</p>	<p>Australia</p>	<p>In the period 1–14 April 2020, 240 (16%) of 1508 patients presenting to The Alfred Emergency and Trauma Centre met inclusion criteria for this study. Of these, 11 (5%) tested positive for SARS-CoV-2. The mean age of patients was 60 years and the most common symptoms were acute shortness of breath (n = 122 [67%]), cough (n = 108 [56%]) and fever (n = 98 [51%]). Overseas travel or known contact with a confirmed case was reported by 24 (14%) and 16 (10%) patients, respectively. Fever or hypoxia was recorded in 23 (10%) and 11 (5%) patients, respectively.</p> <p>There were 205 (85%) patients who had a chest X-ray radiograph, 18 (9%) of which were reported by a radiologist as having bilateral infiltrates. According to blood tests performed in the ED, 75 (33%) had a leucocytosis and 53 (27%) had a C-reactive protein of greater than 50.</p> <p><b>Mechanical ventilation was commenced in the ED for 11 (5%) patients but none had a positive result for SARS-CoV-2.</b> From the ED, 127 (53%) patients were admitted to the general ward, 12 (5%) to the ICU and 42 (18%) were discharged home. During the study period, 12 (5%) patients died in hospital, of which none had tested positive for SARS-CoV-2.</p>	<p><a href="#">Click here</a></p>
<p>Containing COVID-19 in the emergency room: the role of improved case</p>	<p>Singapore</p>	<p>Over a 3-month period, an ED aimed to minimise nosocomial transmission by using broader suspect case criteria for better detection and using appropriate personal protective equipment (PPE) for healthcare workers. A total of 1,841 cases presenting with respiratory syndromes</p>	<p><a href="#">Click here</a></p>

Source title and author	Country	Findings	Source link
detection and segregation of suspect cases  Wee et al. 2020 (35)		required admission over the study period. Among these, 70 cases of COVID-19 were subsequently confirmed. The majority (84.2%, 59/70) were detected at ED triage because they fulfilled suspect case criteria. Of these, 34 met the official screening criteria; an additional 25 were detected by the broader internal screening criteria. Over the 12-week period, the cumulative sensitivity of internal screening criteria was 84.3% (95% confidence interval [CI] = 73.6% to 91.9%), whereas the sensitivity of the official screening criteria was 48.6% (95% CI = 36.4% to 60.8%). <b>Given the broadened internal criteria, the pre-existing ED ‘fever area’ was insufficient and had to be expanded.</b> However, there were no cases of nosocomial transmission from intra-ED exposure, despite extensive surveillance. Frontline physicians need to be given leeway to decide on the disposition of cases based on clinical suspicion during an ongoing outbreak of COVID-19. <b>If a broader criterion is used at ED triage, ED facilities and isolation facilities need to be readied to accommodate a surge of suspect cases. Usage of appropriate PPE is essential in minimising nosocomial transmission.</b>	
<b>Grey literature</b>			
Clinical guidelines for the management of COVID-19 in Australasian emergency departments  Australasian College for Emergency Medicine 2020 (2)	Australia and New Zealand	<p><b>Indications for oxygen supplementation:</b></p> <ol style="list-style-type: none"> <li>Supplemental oxygen therapy is provided to patients with severe acute respiratory infection and respiratory distress, hypoxaemia or shock with a target SpO<sub>2</sub> of 92-96%.</li> <li>Lower SpO<sub>2</sub> (88-92%) can be targeted in patients with pre-existing lung disease, for example chronic obstructive pulmonary disease (COPD) or pulmonary fibrosis.</li> </ol> <p>Providers are alert to appropriate infection prevention and control procedures for aerosol generating procedures.</p> <p>The following escalation of oxygen therapy is recommended:</p> <ol style="list-style-type: none"> <li>Nasal oxygen: titrated to response. Maximum 6L/min.</li> <li>Mask: if nasal oxygen supplementation does not maintain adequate oxygenation (SpO<sub>2</sub> &gt;94%), applying oxygen via face mask with a reservoir bag with flow rates of 10-15L/min is recommended.</li> <li>Use high flow nasal oxygen (HFNO) therapy (at lowest FiO<sub>2</sub> possible) for hypoxia associated with COVID-19 disease unresponsive to above methods, as long as staff are wearing optimal airborne PPE.</li> <li>If a patient’s oxygen requirements change such that a different delivery mechanism is required, delivery device should be retained with patient to support reuse at different points in patient care.</li> </ol>	<a href="#">Click here</a>

Source title and author	Country	Findings	Source link
		<p><b>Use of non-invasive ventilation (NIV)</b></p> <p>Use of NIV does have the potential to generate aerosols. As such, it should be performed in a negative-pressure (Class N) room; if unavailable, a single (class S) room should be used. NIV may be considered appropriate, for example, in patients with a clear exacerbation of COPD or heart failure, as a ceiling of care, as a technique to delay intubation, or in situations where resources are limited.</p> <p>It is recommended:</p> <ol style="list-style-type: none"> <li>1. That patients with suspected or confirmed COVID-19 infection and clinical deterioration plus worsening hypoxia despite optimal oxygen supplementation are considered for early endotracheal intubation and invasive mechanical ventilation.</li> <li>2. That where clinicians decide to use NIV, COVID-19 infection should be assumed and NIV provided using similar precautions as for HFNO.</li> <li>3. That where clinicians decide to use NIV, continuous positive airway pressure (CPAP) is used in preference to bilevel positive airway pressure (BiPAP), as lung compliance is generally normal in COVID-19.</li> </ol> <p><b>Management of ventilation for adults</b></p> <p>Patients with worsening hypercapnia, acidaemia, hypoxaemia, respiratory fatigue, haemodynamic instability or those with altered mental state will need ventilation. It is recommended for lung-protective mechanical ventilation be employed using the following principles:</p> <ol style="list-style-type: none"> <li>1. Low tidal volume strategy (4-8ml/kg predicted body weight).</li> <li>2. Limiting plateau pressures to less than 30cmH<sub>2</sub>O.</li> <li>3. Permissive hypercapnia is usually well-tolerated and may reduce volutrauma.</li> <li>4. Higher levels of positive end-expiratory pressure (PEEP) (greater than 15cmH<sub>2</sub>O) may be needed but should be used with caution.</li> <li>5. Alternate modes of ventilation such as airway pressure release ventilation (APRV) may be considered based on clinician preference and local experience.</li> </ol> <p>The following practices when mechanical ventilation is employed is recommended:</p>	

Source title and author	Country	Findings	Source link
		<ol style="list-style-type: none"> <li>1. Viral (rather than heat and moisture exchanger) filters should be utilised and circuits should be maintained for as long as allowable (as opposed to routine changes).</li> <li>2. Use of closed inline suction catheters. Any disconnection of the patient from the ventilator should be avoided to prevent lung decruitment and aerosolisation. If necessary, the endotracheal tube should be clamped and the ventilator disabled (to prevent aerosolisation).</li> <li>3. Neuromuscular blockade (NMB) may be considered in the setting of worsening hypoxia or hypercapnia and in situations where the patient’s respiratory drive cannot be managed with sedation alone, resulting in ventilator dys-synchrony and lung decruitment.</li> </ol> <p><b>Supportive care</b></p> <p>It is recommended:</p> <ol style="list-style-type: none"> <li>1. Anticipating and addressing complications, which include arrhythmias, cardiac impairment, sepsis and multi-organ dysfunction, using existing standards of care.</li> <li>2. A restrictive fluid management strategy, aiming to reduce extravascular lung water. Where possible avoid ‘maintenance’ intravenous fluids, high volume enteral nutrition, and fluid bolus for hypotension.</li> <li>3. Preferential use of metered dose inhalers with avoidance of nebulisers wherever possible.</li> </ol>	
<p>ACEP COVID-19 Field Guide</p> <p>American College of Emergency Physicians 2020 (12)</p>	<p>US</p>	<p><u>Patient management:</u></p> <p><b>Moderate COVID-19 disease</b></p> <ul style="list-style-type: none"> <li>• Since patients with moderate COVID-19 infection can rapidly deteriorate, most of these individuals should be admitted to a healthcare facility for close monitoring.</li> <li>• If bacterial pneumonia or sepsis is suspected, appropriate empiric antibiotic treatment should be initiated but if there is no evidence of bacterial infection, de-escalate or stop antibiotics.</li> <li>• Currently, there is insufficient data to recommend either for or against any antiviral or immunomodulatory therapy in patients with moderate disease.</li> <li>• Other therapeutic options under investigation for COVID-19 are presented with clinical data at the National Institute of Health’s (NIH) COVID-19 website.</li> </ul> <p><b>Severe COVID-19 disease</b></p>	<p><a href="#">Click here</a></p>

Source title and author	Country	Findings	Source link
		<ul style="list-style-type: none"> <li>• Since patients with severe COVID-19 infection can rapidly deteriorate, these individuals should be admitted to a healthcare facility for close monitoring to a single-person negative-pressure room.</li> <li>• If secondary bacterial pneumonia or sepsis is suspected, administer empiric antibiotics, re-evaluate daily, and if there is no evidence of bacterial infection, de-escalate or stop antibiotics.</li> <li>• Oxygen therapy should be instituted immediately using nasal cannula or high-flow oxygen with a target O<sub>2</sub> saturation of ≥94% (sea level).</li> <li>• Currently, there is insufficient data to recommend either for or against any antiviral or immunomodulatory therapy in patients with moderate disease.</li> <li>• Evaluation should include pulmonary imaging (chest X-ray, ultrasound, or if indicated, CT) and ECG, if indicated. Laboratory evaluation includes CBC with differential and metabolic profile, including liver and renal function tests. Measurements of inflammatory markers such as CRP, D-dimer, and ferritin, while not part of standard care, may have prognostic value.</li> <li>• Other therapeutic options under investigation for COVID-19 are presented with clinical data at the NIH's COVID-19 website.</li> </ul> <p><b>Critical COVID-19 disease</b></p> <ul style="list-style-type: none"> <li>• Currently, there is limited information to suggest that the critical care management of patients with COVID-19 should differ substantially from the management of other critically ill patients.</li> <li>• Special caution about environmental contamination by SARS-CoV-2 is warranted.</li> <li>• Currently, there is insufficient data to recommend either for or against any antiviral or immunomodulatory therapy in patients with moderate disease.</li> </ul>	
<p>Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings</p>	<p>US</p>	<p>Recommendations include:</p> <ol style="list-style-type: none"> <li>1. Minimise chance for exposures</li> <li>2. Adhere to standard and transmission-based precautions (e.g. PPE use)</li> <li>3. Patient placement (e.g. assess need for hospitalisation)</li> <li>4. Take precautions when performing aerosol generating procedures</li> <li>5. Collection of diagnostic respiratory specimens</li> <li>6. Manage visitor access and movement within the facility</li> </ol>	<p><a href="#">Click here</a></p>

Source title and author	Country	Findings	Source link
Centers for Disease Control and Prevention 2020 (36)		7. Implement engineering controls 8. Monitor and manage healthcare personnel 9. Train and educate healthcare personnel 10. Implement environmental infection control 11. Establish reporting within and between healthcare facilities and to public health authorities	

## Appendix 1

Pubmed search: (((manage\*[Title/Abstract] OR management[Title/Abstract] OR care[Title/Abstract] OR assess\*[Title/Abstract] OR assessment[Title/Abstract] OR test\*[Title/Abstract])) AND (2019-nCoV[title/abstract] or nCoV\*[title/abstract] or covid-19[title/abstract] or covid19[title/abstract] OR "covid 19"[title/abstract] OR "coronavirus"[MeSH Terms] OR "coronavirus"[title/abstract] OR sars-cov-2[title/abstract] OR "severe acute respiratory syndrome coronavirus 2"[Supplementary Concept])) AND (emergency service[Title/Abstract] OR emergency medical services[Title/Abstract] OR emergency medicine[Title/Abstract] OR hospitals[Title/Abstract] OR hospital units[Title/Abstract] OR emergency department[Title/Abstract] OR emergency hospital[Title/Abstract] OR emergency hospitals[Title/Abstract] OR emergency medical service[Title/Abstract] OR emergency medicine[Title/Abstract] OR emergency room[Title/Abstract] OR emergency service\*[Title/Abstract] OR emergency unit[Title/Abstract] OR emergency units[Title/Abstract] OR emergency ward[Title/Abstract])

Google search:

- COVID 19 patients present at ED
- COVID 19 patient management guidelines
- Clinical assessment and management COVID 19 emergency department
- Clinical presentation and management of COVID 19
- Emergency presentation of patients with COVID

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