

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 This brief has not been peer-reviewed and should not be a substitute for individual clinical judgement, nor is it an endorsed position of NSW Health.

## Triage tools for intensive care unit admission during COVID-19

### Rapid review question

What triage tools are available to guide decisions about admission to intensive care unit (ICU) during COVID-19?

### In brief

- There is little evidence and no gold standard of triage for admission to ICU during the COVID-19 pandemic.<sup>1,2</sup>
- A systematic review on how to manage patients admitted to ICU for mechanical ventilatory support during COVID-19 found limited consensus on allocating ICU beds and ventilators. Nine relevant guidelines were reviewed and covered broad themes including:
  - use of ethical frameworks
  - criteria for ICU admission and discharge
  - adaptability of criteria as demand changes
  - equality across health conditions and healthcare systems
  - decision-making processes
  - communication of decisions
  - guideline development processes.<sup>2</sup>
- Other proposals for triage protocols include algorithms based on clinical estimations of survival benefit (life-years saved) or triage based on ethical criteria.<sup>3,4</sup>
- A summary of triage tools is provided in Table 2.

### Limitations

The literature is predominantly descriptive and there is limited empirical evidence on the use of triage tools for ICU admission during COVID-19.

### Background

As the COVID-19 pandemic continues, ICUs must be prepared for potential surges of critically ill patients.<sup>5</sup> Triage tools may guide decisions about admission to ICU during COVID-19 and assist to ensure fairness, enhance consistency, and decrease provider moral distress.<sup>3</sup>

## Methods (Appendix 1)

PubMed and grey literature were searched on 13 August 2021.

**Table 1: Systematic reviews or evaluation studies**

Source	Summary
<b>Peer reviewed sources</b>	
<p><a href="#">Triage protocol for allocation of critical health resources during the COVID-19 health emergency. A review</a></p> <p>Iacorossi, et al. 2020 <sup>1</sup></p>	<ul style="list-style-type: none"> <li>• A narrative review describing the ICU triage protocols, tools, criteria, ethical justification, and framework for ICU triage tools presented in the literature between January 2006 and July 2020.</li> <li>• The review highlighted three aspects.                             <ul style="list-style-type: none"> <li>○ A gold standard of triage does not exist for the adult or paediatric population.</li> <li>○ Triage tools alone, without ethical support, do not guarantee protective standards for all those involved in a pandemic.</li> <li>○ Applying a multi-principle allocation strategy can be a good guide for decision-making during a pandemic, but it is not simple, and the boundary between ethics and clinic is not always clear.</li> </ul> </li> <li>• The findings suggest setting up clinical ethics committees in hospitals to ensure that the decision is not left to the sole judgment of health practitioners.</li> </ul>
<p><a href="#">Adult ICU triage during the coronavirus disease 2019 pandemic: who will live and who will die?</a></p> <p>Sprung, et al. 2020 <sup>3</sup></p>	<ul style="list-style-type: none"> <li>• This article provides practical guidance to frontline physicians forced to make critical rationing decisions through proposing a triage algorithm based on clinical estimations of the incremental survival benefit (saving the most life-years) provided by ICU care.</li> <li>• The algorithm has four prioritisation categories: performance score, ASA score, number of organ failures, and predicted survival.</li> <li>• The report suggested having a separate triage officer or committee for making admission and discharge triage decisions depending on the magnitude of the crisis.</li> </ul>
<p><a href="#">Ethical criteria for the admission and management of patients in the ICU under conditions of limited medical resources</a></p> <p>Tambone, et al. 2020 <sup>4</sup></p>	<ul style="list-style-type: none"> <li>• Proposed five ethical criteria for the triage of patients in conditions of limited resources, such as the COVID-19 pandemic. The criteria are based on interdisciplinary and intercultural dialogue between specialists from different disciplines.                             <ul style="list-style-type: none"> <li>○ The good of a single patient should be considered in the framework of the common good. No-one must be abandoned or discriminated against for any reason. Before denying a necessary referral of a patient to an ICU it is required to consider alternatives both for the immediate case and, based on the experience gained, for similar future cases.</li> <li>○ Appropriate assistance to any person in need of medical care should be provided whenever possible.</li> </ul> </li> </ul>

Source	Summary
<b>Peer reviewed sources</b>	
	<ul style="list-style-type: none"> <li>○ Triage must be carried out on a case-by-case basis, with reference not only to the patient’s clinical condition but also to the availability of resources in the hospital.</li> <li>○ Inappropriate treatments are not acceptable.</li> <li>○ Adequate forms of palliative and spiritual care must be assured, where necessary.</li> </ul>
<p><a href="#">Managing intensive care admissions when there are not enough beds during the COVID-19 pandemic: a systematic review</a></p> <p>Tyrrell, et al. 2020 <sup>2</sup></p>	<ul style="list-style-type: none"> <li>● A systematic review to understand how to manage patients admitted to ICU and how the patients should receive mechanical ventilatory support during periods of high demand during the COVID-19 pandemic.</li> <li>● Nine relevant guidelines were included.                             <ul style="list-style-type: none"> <li>○ Six guidelines were national or transnational level guidance (United Kingdom, Switzerland, Belgium, Australia and New Zealand, Italy, and Sri Lanka)</li> <li>○ One was state level (Kansas,USA)</li> <li>○ One international (Extracorporeal Life Support Organization)</li> <li>○ One specific to military hospitals (Department of Defense, USA).</li> </ul> </li> <li>● The guidelines covered several broad themes.                             <ul style="list-style-type: none"> <li>○ Use of ethical frameworks</li> <li>○ Criteria for ICU admission and discharge</li> <li>○ Adaptation of criteria as demand changes</li> <li>○ Equality across health conditions and healthcare systems</li> <li>○ Decision-making processes</li> <li>○ Communication of decisions</li> <li>○ Guideline development processes.</li> </ul> </li> <li>● The review found limited consensus on how to allocate the finite resource of ICU beds and ventilators, and a lack of high-quality evidence and guidelines on resource allocation during the pandemic.</li> </ul>

**Table 2: Summary of tools**

Tool	Source and country	Date	Population group
<a href="#">Prioritisation of ICU treatments for critically ill patients in a COVID-19 pandemic with scarce resources</a> <sup>6</sup>	Commentary, <i>Anaesth Crit Care Pain Med.</i> France	May 2020	ICU
<a href="#">Position paper: triage decisions for severely ill patients during the COVID-19 pandemic</a> <sup>7</sup>	Israeli Joint Commission, <i>Rambam Maimonides Med J.</i> Israel	July 2020	ICU
<a href="#">Mitigating inequities and saving lives with ICU triage during the COVID-19 pandemic</a> <sup>8</sup>	Commentary, <i>Am J Respir Crit Care Med.</i> USA	Feb 2020	ICU
<a href="#">Admission decisions to intensive care units in the context of the major COVID-19 outbreak: local guidance from the COVID-19 Paris-region area</a> <sup>9</sup>	Review, <i>Critical Care.</i> France	May 2020	ICU: Severely hypoxemic COVID-19 patients
<a href="#">The Italian document: decisions for intensive care when there is an imbalance between care needs and resources during the COVID-19</a> <sup>10</sup>	Reference standard, <i>Ann Intensive Care.</i> Italy	June 2021	ICU
<a href="#">Triage decisions in the context of COVID-19: Old burden, new challenge—the structured approach for intensive care unit triage (SAINT) protocol</a> <sup>11</sup>	Protocol, <i>Military Medicine.</i> USA	February 2021	ICU, military medical treatment facilities All patients
<a href="#">COVID-19 clinical management: living guidance</a> <sup>12</sup>	World Health Organization	January 2021	All patients
<a href="#">Algorithm for COVID-19 triage and referral: patient triage and referral for resource-limited settings during community transmission</a> <sup>13</sup>	World Health Organization, Western Pacific Region	March 2020	All patients
<a href="#">Strengthening the health systems response to COVID-19: technical guidance #2: creating surge capacity for acute and intensive care</a> <sup>14</sup>	World Health Organization, Regional Office for Europe	April 2020	ICU

<a href="#">NSW adult intensive care services pandemic response planning</a> <sup>15</sup>	NSW Health. Australia	July 2021	ICU
<a href="#">Standard operating procedure (SOP) for triage of suspected COVID-19 patients in non-US healthcare settings: early identification and prevention of transmission during triage</a> <sup>16</sup>	Centers for Disease Control and Prevention. USA	February 2021	All patients
<a href="#">Crisis standards of care planning guidance for the COVID-19 pandemic</a> <sup>17</sup>	The Commonwealth of Massachusetts, USA  Executive Office of Health and Human Services.  USA	October 2020	ICU
<a href="#">COVID-19 guidelines</a> <sup>18</sup>	Australian and New Zealand Intensive Care Society (ANZICS)	October 2020	ICU
<a href="#">Provisional clinical practice guidelines on COVID-19 suspected and confirmed patients</a> <sup>19</sup>	Ministry of Health, Sri Lanka	March 2020	All patients
<a href="#">Preparing for COVID-19: early experience from an intensive care unit in Singapore</a> <sup>5</sup>	Correspondence, <i>Critical Care</i> . Singapore	March 2020	ICU
<a href="#">Ethical principles concerning proportionality of critical care during the COVID-19 pandemic: advice by the Belgian Society of IC medicine</a> <sup>20</sup>	Belgian Society of Intensive Care Medicine. Belgium	March 2020	ICU
<a href="#">Clinical ethics recommendations for the allocation of intensive care treatments in exceptional, resource-limited circumstances: the Italian perspective during the COVID-19 epidemic</a> <sup>21</sup>	Editorial, <i>Critical Care</i> . Italy	April 2020	ICU
<a href="#">Ethical considerations: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement</a> <sup>22</sup>	American College of Chest Physicians (CHEST). USA	October 2014	ICU

<a href="#">Triage: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement</a> <sup>23</sup>	American College of Chest Physicians (CHEST). USA	October 2014	ICU
<a href="#">Lower mortality of COVID-19 by early recognition and intervention: experience from Jiangsu Province</a> <sup>24</sup>	Correspondence, <i>Annals of Intensive Care</i> . China	March 2020	ICU
<a href="#">Daniel Sokol: The life and death decisions of COVID-19</a> <sup>25</sup>	Blog, <i>BMJ</i>	March 2020	ICU
<a href="#">A framework for rationing ventilators and critical care beds during the COVID-19 pandemic</a> <sup>26</sup>	Commentary, <i>JAMA</i>	March 2020	ICU
<a href="#">Too many patients...a framework to guide statewide allocation of scarce mechanical ventilation during disasters</a> <sup>27</sup>	Review, <i>Contemporary Reviews in Critical Care Medicine</i>	April 2019	ICU
<a href="#">Preparing intensive care for the next pandemic influenza</a> <sup>28</sup>	Review, <i>Critical Care</i>	October 2019	ICU
<a href="#">Performance of influenza-specific triage tools in an H1N1-positive cohort: P/F ratio better predicts the need for mechanical ventilation and critical care admission</a> <sup>29</sup>	Review, <i>Critical Care</i>	June 2015	ICU
<a href="#">The Simple Triage Scoring System (STSS) successfully predicts mortality and critical care resource utilization in H1N1 pandemic flu: a retrospective analysis</a> <sup>30</sup>	Observational study, <i>Critical Care</i>	January 2011	ICU
<a href="#">A multicentre evaluation of two intensive care unit triage protocols for use in an influenza pandemic</a> <sup>31</sup>	Multicentre study, <i>MJA</i>	August 2012	ICU

## Appendix

### PubMed search terms

PubMed Search string: (((((((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]))) AND ("triage"[MeSH Terms] OR "triage"[title/abstract])) AND (("intensive care"[title/abstract] OR "ICU"[title/abstract] OR "critical care"[title/abstract] OR "Intensive Care Units"[MeSH Terms]))

PubMed Search string: ("pandemics"[MeSH Terms] OR pandemic\*[title/abstract]) AND (((("intensive care"[title/abstract] OR "ICU"[title/abstract] OR "critical care"[title/abstract] OR "Intensive Care Units"[MeSH Terms])) AND ("triage"[MeSH Terms] OR "triage"[title/abstract]))

### Google search terms

COVID-19 AND triage AND intensive care AND protocol

### Inclusion and exclusion criteria

Inclusion	Exclusion
<ul style="list-style-type: none"> <li>Published in English</li> </ul>	<ul style="list-style-type: none"> <li>Not in English</li> <li>Abstract only</li> <li>Paediatric or neonate populations</li> </ul>

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Search dates	Updates
27 March 2020 and 13 April 2020	<ul style="list-style-type: none"> <li>• Original search</li> </ul>
16 August 2021	<ul style="list-style-type: none"> <li>• Search re-run</li> <li>• New relevant publications added to two tables:                             <ul style="list-style-type: none"> <li>○ systematic reviews and evaluation studies</li> <li>○ tools</li> </ul> </li> <li>• In-brief updated to reflect new evidence</li> </ul>

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