

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 This brief has not been peer-reviewed and should not be a substitute for individual clinical judgement, nor is it an endorsed position of NSW Health.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.^{1,2}
- 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.²
- Other proposals for triage protocols include algorithms based on clinical estimations of survival benefit (life-years saved) or triage based on ethical criteria.^{3,4}
- 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.⁵ Triage tools may guide decisions about admission to ICU during COVID-19 and assist to ensure fairness, enhance consistency, and decrease provider moral distress.³

Methods (Appendix 1)

PubMed and grey literature were searched on 13 August 2021.

Table 1: Systematic reviews or evaluation studies

Source	Summary
Peer reviewed sources	
<p>Triage protocol for allocation of critical health resources during the COVID-19 health emergency. A review</p> <p>Iacorossi, et al. 2020 ¹</p>	<ul style="list-style-type: none"> • 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. • The review highlighted three aspects. <ul style="list-style-type: none"> ○ A gold standard of triage does not exist for the adult or paediatric population. ○ Triage tools alone, without ethical support, do not guarantee protective standards for all those involved in a pandemic. ○ 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. • 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.
<p>Adult ICU triage during the coronavirus disease 2019 pandemic: who will live and who will die?</p> <p>Sprung, et al. 2020 ³</p>	<ul style="list-style-type: none"> • 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. • The algorithm has four prioritisation categories: performance score, ASA score, number of organ failures, and predicted survival. • The report suggested having a separate triage officer or committee for making admission and discharge triage decisions depending on the magnitude of the crisis.
<p>Ethical criteria for the admission and management of patients in the ICU under conditions of limited medical resources</p> <p>Tambone, et al. 2020 ⁴</p>	<ul style="list-style-type: none"> • 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"> ○ 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. ○ Appropriate assistance to any person in need of medical care should be provided whenever possible.

Source	Summary
Peer reviewed sources	
	<ul style="list-style-type: none"> ○ 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. ○ Inappropriate treatments are not acceptable. ○ Adequate forms of palliative and spiritual care must be assured, where necessary.
<p>Managing intensive care admissions when there are not enough beds during the COVID-19 pandemic: a systematic review</p> <p>Tyrrell, et al. 2020 ²</p>	<ul style="list-style-type: none"> ● 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. ● Nine relevant guidelines were included. <ul style="list-style-type: none"> ○ Six guidelines were national or transnational level guidance (United Kingdom, Switzerland, Belgium, Australia and New Zealand, Italy, and Sri Lanka) ○ One was state level (Kansas,USA) ○ One international (Extracorporeal Life Support Organization) ○ One specific to military hospitals (Department of Defense, USA). ● The guidelines covered several broad themes. <ul style="list-style-type: none"> ○ Use of ethical frameworks ○ Criteria for ICU admission and discharge ○ Adaptation of criteria as demand changes ○ Equality across health conditions and healthcare systems ○ Decision-making processes ○ Communication of decisions ○ Guideline development processes. ● 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.

Table 2: Summary of tools

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

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

Triage: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement ²³	American College of Chest Physicians (CHEST). USA	October 2014	ICU
Lower mortality of COVID-19 by early recognition and intervention: experience from Jiangsu Province ²⁴	Correspondence, <i>Annals of Intensive Care</i> . China	March 2020	ICU
Daniel Sokol: The life and death decisions of COVID-19 ²⁵	Blog, <i>BMJ</i>	March 2020	ICU
A framework for rationing ventilators and critical care beds during the COVID-19 pandemic ²⁶	Commentary, <i>JAMA</i>	March 2020	ICU
Too many patients...a framework to guide statewide allocation of scarce mechanical ventilation during disasters ²⁷	Review, <i>Contemporary Reviews in Critical Care Medicine</i>	April 2019	ICU
Preparing intensive care for the next pandemic influenza ²⁸	Review, <i>Critical Care</i>	October 2019	ICU
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 ²⁹	Review, <i>Critical Care</i>	June 2015	ICU
The Simple Triage Scoring System (STSS) successfully predicts mortality and critical care resource utilization in H1N1 pandemic flu: a retrospective analysis ³⁰	Observational study, <i>Critical Care</i>	January 2011	ICU
A multicentre evaluation of two intensive care unit triage protocols for use in an influenza pandemic ³¹	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"> Published in English 	<ul style="list-style-type: none"> Not in English Abstract only Paediatric or neonate populations

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

SHPN: (ACI) 210853 | ISBN: 978-1-76081-934-7 | TRIM: ACI/D20/2511-37 | Edition 2



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