

Triage and Allocation of Health Care Resources in a Surge Crisis

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ventilator, triage, surge, crisis, COVID, ICU, disability, discrimination, SOFA, reallocation



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Guiding Principles

The medical profession holds that patients have a right to appropriate medical care delivered without discrimination as to their person or perceived social worth, and that physicians have a paramount and fundamental duty to care for and protect the well-being of the individual patient. Medical professionals recognize that these rights and duties hold at all times, even in the most severe of crises. (Appendix A).

Crisis and disaster may produce exigencies in which available health-care resources are insufficient to fully meet the medical needs of all patients presenting for care. In such circumstances, triage and allocation decisions may be morally founded and ethically indicated, but must build upon recognition of the inherent dignity of the human person and the principles of justice and fairness.

Crisis Standards of Care

The National Academy of Medicine describes a medical surge as an imbalance between health care resource availability and demand, which triggers activation of a facility emergency operations plan (Institute of Medicine, 2013, p. 2).^[1]

During a pandemic, the surge is systematically pervasive and accompanied by a formal governmental declaration (Ibid, p. 14). Under these circumstances a surge may gradually develop in what the National Academy of Medicine describes as a continuum of capacity from *conventional* to *contingency* to *crisis*, with progressively increasing disruption of resource availability and provision of care (Institute of Medicine, 2010, p. 13).

Each stage in the continuum requires health care provision at a characteristic standard of care. Under conventional surge conditions the increased demand results in full utilization of available resources, but with delivery of usual care. With contingency surge conditions, facilities, staffing and supplies must be extended, adapted, and conserved but the care delivered is functionally equivalent to usual care. In crisis surge conditions, facilities, staffing, and supplies are insufficient to meet demand, and crisis standards of care are adopted. The National Academy of Medicine notes that at this point of overwhelming demand the duty to care and the duty to steward resources come into conflict (Institute of Medicine, 2012, pp. 1-73, 74). In surge crisis, population benefit and individual patient benefit become competing foci of care (Institute of Medicine, 2013, p. 1). It is under these conditions that formal triage and allocation become appropriate. (Appendix B).

Triage and Resource Allocation Decisions

The National Academy of Medicine reports that the aim of a triage program is “to rapidly screen, evaluate, and sort patients based on their medical status and likely outcome” (Institute of Medicine, 2010, p. 17) This may involve allocation decisions for life-sustaining resources and interventions.

The move to implement triage and resource allocation decision-making should be formalized and should be based on specified implementation criteria. The National Academy of Medicine describes such criteria as including a declared state of emergency and the exhaustion of contingency attempts to adapt available resources and infrastructure, with no expectation of timely importation of resources, and no feasible option to transfer patients (Appendix B).

Triage and resource allocation decisions must be normative and based on clinical judgment informed by objective medical criteria. The World Medical Association holds that, “In selecting the patients who may be saved, the physician should consider only their medical status and predicted response to the treatment, and should exclude any other consideration based on non-medical criteria” (World Medical Association, 2017). In allocation of limited health care resources, the American Medical Association states that the “physician’s primary ethical obligation is to promote the well-being of their patients” (American Medical Association, 2017, p. 185).

Such decisions must be non-discriminatory. The World Medical Association holds that allocation of scarce medical resources must be made in a fair process based on medical criteria and without discrimination (Appendix A). Although eschewing allocation decisions based on social worth, the American Medical Association does allow consideration of “change in quality of life” (Appendix A).

Triage and resource allocation decisions do not encompass the routine decisions of physicians and other health care providers that care may or may not be indicated or appropriate. Such decisions rest on the judgment of the provider. The American Medical Association states that such decisions should be medically appropriate, reflect considered judgment of risks and benefits as informed by patient goals of care, and carry a reasonable expectation of clinical benefit and achievement of goals of care (Appendix A).

Although federal Section 1135 waivers may modify Emergency Medical Treatment and Active Labor Act (EMTALA) screening medical examination requirements, such relaxed requirements should not be applied to patients presenting with illness that qualifies for triage in surge crisis conditions. Likewise, patient inability to pay for services should not prevent triage and assignment of care under these conditions.

Mechanisms of Triage and Resource Allocation

The National Academy of Medicine notes that “plans and protocols that shift desired patient care outcomes from the individual to the population must be grounded in the ethical allocation of resources, which ensures fairness to everyone (Institute of Medicine, 2012, p. 1-6). The National Academy of Medicine specifically notes that fairness concerns require particular attention to the needs of at-risk and marginalized persons, including the poor and persons with disabilities.

The goal of prudent use of resources to save the most lives effectuates survival-based protocols that utilize objective physiologically-based scoring systems. The reports of the National Academy of Medicine rely upon the [Sequential Organ Failure Assessment \(SOFA\) scoring system](#), which assesses the function of the respiratory, cardiovascular, hepatic, hematopoietic, renal, and neurologic systems (Appendix D). This is the most commonly used tool for triage of mechanical ventilators (Institute of Medicine, 2012, p. 4-21). A score of 0 to 4 is assigned by specified medical criteria for each of the six organ systems, and thus total SOFA score may range from 0 to 24. SOFA scores are most helpful at the extremes. Low SOFA scores are associated with low mortality. In the initial study describing the SOFA score, a maximal total SOFA score of greater than 15 indicated a 90% intensive care unit (ICU) mortality rate (Vincent, et al., 1998). The National Academy of Medicine set a SOFA score of greater than 15 as a criterion for triage away from ICU care and mechanical ventilation in surge crisis (Institute of Medicine, 2010, p. 20). Low SOFA scores may also be a criterion for triage away from ICU care. Small differences in SOFA scores are not useful in differentiating mortality (Institute of Medicine, 2010, p. 18). In situations in which multiple patients have presented with similar SOFA scores and estimated mortality, fair resource allocation may require a first-come, first-served or lottery approach (Institute of Medicine, 2012, p. 1-26).

Though validated retrospectively, the SOFA score has less certain prospective validity and seems most accurate when the mortality rate of the underlying disease process is high (Institute of Medicine, 2012, p. 4-21). Thus, clinical scoring systems inform but do not completely replace clinical judgment and physician assessment of disease-specific factors in triage and resource allocation decisions.

However, as a purely physiologic scoring system, the SOFA is both conceptually and operationally blind to non-medical factors. The SOFA scoring system makes no provision for age, pre-existing condition, or disability, and applies no weight for or against these considerations. Detrimental impacts of such conditions may reflect in adverse physiology, which is then scored accordingly in an unbiased fashion. Operationally, a person with cystic fibrosis who is equally as ill as a person with no pulmonary disability receives the same SOFA score, and under conditions of surge triage would be allocated care with neither advantage nor disadvantage. It is this objective physiologic assessment, which is tied to ICU mortality, that gives the SOFA score a “most lives saved” operability while preserving nondiscriminatory principles of fairness and justice.

It is important that triage decisions be revisited periodically and upon request of the treating physician. In particular, patients with low initial physiologic scoring may deteriorate and then have a more pressing need for ICU care. For patients with very severe illness, the National Academy of Medicine specifically recommends an urgent clinical appeal process when a treating physician believes that patient improvement would alter the triage decision (Institute of Medicine, 2012, p. 5-20).

In the National Academy of Medicine templates, pre-triage exclusion criteria are allowed, such that a patient may not reach the triage decision-making stage. The National Academy of Medicine states that, “Exclusion criteria should be limited if utilized, and may include factors, such as age extremes or organ system failure with extreme life span limitations or severe, irreversible neurologic compromise, that the community agrees upon” (Institute of Medicine, 2012, p. 4-23). These criteria are hard stops, and as such must be carefully scrutinized. Although some proposed exclusion criteria are clearly suspect (age greater than 85), others seem ethically founded (hospice care patients, and patients with existing orders not to resuscitate or with an advance directive that prohibits any mechanical ventilation) (Institute of Medicine, 2012, p. 1-81).

Triage Officers and Triage Teams

Consistent with the policies of medical associations that the treating physician has a paramount fundamental duty of care to the patient, the National Academy of Medicine recommends that under surge crisis conditions a triage officer or triage team be appointed to make triage and allocation decisions for ICU care and life-saving resources such as mechanical ventilators. These teams may be at the facility level if feasible, but may also be constituted more regionally if needed. Triage teams optimally have an odd number of members. These teams utilize prognostic tools such as the SOFA score to determine if significant differences in prognosis exist among patients in need of resources, and recommend assignment of patients accordingly. If patients have similar prognosis, then resources are assigned on a first-come, first-served or lottery basis. The decisions are recorded in the medical record and are reported to a medical director, who then implements the recommendations (Institute of Medicine, 2012, pp. 1- 49, 50).

Reserving and Reallocation

Questions related to triage and resource allocation arise as to whether scarce resources may be held in reserve and as to whether resources assigned to a patient may be removed and reallocated. In general, if resources are available, they should be deployed as indicated, regardless of prognosis of the patient at hand. The National Academy of Medicine notes that, “Decision tools should not be used to exclude patients preemptively from use of life-saving resources when these resources are available” (Institute of Medicine, 2012, p. 4-22).

Reallocation of life-sustaining resources is much more problematic. Here reallocation is the procedure during surge crisis by which scarce life-sustaining resources may be removed from patients to whom they previously have been allocated if the patient has subsequently critically worsened or has an expected poor short-term survival. Those life-saving resources will then be assigned to other individuals who are felt to have a more favorable prognosis or a higher potential of benefit. It is understood that the person from whom the resource is removed is at high risk of death. While recognizing that this procedure is a full shift to a population-based ethic and represents a worst-case scenario, the National Academy of Medicine nonetheless has promulgated exclusion criteria allowing possible reallocation of life-saving resources (Appendix F). Absent a properly executed advance directive or decision of a properly authorized surrogate, such reallocation decisions are a non-consensual withdrawal of life-supportive care.

Non-consensual reallocation of life-sustaining resources involves an active, intentional, and direct taking from a vulnerable person incapable of resisting. Non-consensual withdrawal of life-supportive care is recognized in only one jurisdiction in the United States. In Texas such actions may be taken in a protocol defined by the Texas Advance Directives Act (Texas Health and Safety Code § 166.046, 2020). Absent specific legislative or judicial authorization, non-consensual withdrawal of life-supportive care is of questionable legality and should not occur.

It is important to recognize that during a surge crisis, and apart from any reallocation process, the usual course of many ICU patients will reach a point at which the patient is felt to be terminally and irreversibly ill with no reasonable hope of recovery. All fifty states and the District of Columbia have statutes recognizing living wills or advance directives that may direct withdrawal of life-supportive care under these circumstances (FindLaw.com, 2020). During a surge crisis, physicians withdrawing care pursuant to these directives may consider consultation with the hospital ethics service in order to avoid misunderstandings. Triage teams should have no role in the care of these patients nor in the withdrawal of care process taken in accordance with their advance directives.

Recommendations

In surge crisis with the implementation of crisis standards of care, the following recommendations should apply:

1. Surge capacity should trigger a formalized facility emergency operations plan.
2. Surge crisis standards of care should be implemented in the context of a declared emergency and according to objective implementation criteria.
3. In the setting of surge crisis, triage and resource allocation decisions should be formalized.
4. The treating physician or health care provider has a paramount duty to care for the individual patient and to seek

- appropriate and indicated care for that patient. This duty persists in surge crisis.
5. The capacity and need for the treating physician to reach routine decisions and recommendations regarding the indications for and appropriateness of care is not altered by surge crisis and is not vitiated by triage and resource allocation constraints.
 6. The duty to steward life-saving resources as to triage and resource allocation decisions which may apply to an individual patient is the responsibility of parties other than the treating physician, and may best be accomplished through a triage officer or triage team.
 7. Objective physiologic scoring systems should inform clinical judgment and should be an integral part of triage and resource allocation decision-making by triage officers and teams.
 8. Pre-triage exclusion criteria, if utilized at all, should be strictly construed, ethically defensible, and non-discriminatory.
 9. Triage and resource allocation decisions must be based in principles of fairness and justice, and must not be based on subjective assessments of social worth or non-medical criteria, nor involve discrimination based on disability, age, or other social or demographic factors.
 10. Scarce life-saving resources should be fully deployed during surge crisis, and should not be reserved. Reallocation decisions involving non-consensual removal of life-supportive resources in order to accomplish triage or resource allocation should not occur.

Appendix A. Medical Association Policies

Rights of the Patient

World Medical Association

1. Right to medical care of good quality
 1. Every person is entitled without discrimination to appropriate medical care.
 1. Every patient has the right to be cared for by a physician whom he/she knows to be free to make clinical and ethical judgements without any outside interference.

Excerpted from the *World Medical Association Declaration of Lisbon on the Rights of the Patient* (World Medical Association, 2015).

American Medical Association

Our AMA acknowledges: (1) that enjoyment of the highest attainable standard of health, in all its dimensions, including health care is a basic human right; and (2) that the provision of health care services as well as optimizing the social determinants of health is an ethical obligation of a civil society.

Policy H-65.960 – Health, In All Its Dimensions, Is a Basic Right (American Medical Association, 2019).

Duty to Care

World Medical Association

A physician shall act in the patient's best interest when providing medical care.

A physician shall owe his/her patients complete loyalty and all the scientific resources available to him/her.

Excerpted from *World Medical Association International Code of Medical Ethics 2006* (World Medical Association, 2006)

The health and well-being of my patient will be my first consideration...

I will not permit considerations of age, disease or disability, creed, ethnic origin, gender, nationality, political affiliation, race, sexual orientation, social standing or any other factor to intervene between my duty and my patient...

I will not use my medical knowledge to violate human rights and civil liberties, even under threat....

Excerpted from the *World Medical Association Declaration of Geneva* (World Medical Association, 2017).

American Medical Association

A physician shall, while caring for a patient, regard responsibility to the patient as paramount.

Excerpted from *American Medical Association Principles of Medical Ethics* (American Medical Association, 2017, p. 2).

As professionals dedicated to protecting the well-being of patients, physicians have an ethical obligation to provide care in cases of medical emergency. Physicians must also uphold ethical responsibilities not to discriminate against a prospective patient on the basis of race, gender, sexual orientation or gender identity, or other personal or social characteristics that are not clinically relevant to the individual's care. Nor may physicians decline a patient based solely on the individual's infectious disease status.

Excerpted from *Code of Medical Ethics Policy 1.1.2 – Prospective Patients* (American Medical Association, 2017, p. 9).

Physicians should only recommend and provide interventions that are medically appropriate—i.e., scientifically grounded—and that reflect the physician's considered medical judgment about the risks and likely benefits of available options in light of the patient's goals for care. Physicians are not required to offer or to provide interventions that, in their best medical judgment, cannot reasonably be expected to yield the intended clinical benefit or achieve agreed-on goals for care. Respecting patient autonomy does not mean that patients should receive specific interventions simply because they (or their surrogates) request them.

Excerpted from *Code of Medical Ethics Policy 5.5 – Medically Ineffective Interventions* (American Medical Association, 2017, p. 82).

Non-Discrimination

World Medical Association

In circumstances where a choice must be made between potential patients for a particular treatment that is in limited supply, all such patients are entitled to a fair selection procedure for that treatment. That choice must be based on medical criteria and made without discrimination.

Excerpted from the *World Medical Association Declaration of Lisbon on the Rights of the Patient* (World Medical Association, 2015).

American Medical Association

Physicians' primary ethical obligation is to promote the well-being of their patients. Policies for allocating scarce health care resources can impede their ability to fulfill that obligation, whether those policies address situations of chronically limited resources, such as ICU (intensive care unit) beds, medications, or solid organs for transplantation, or "triage" situations in times of scarcity, such as access to ventilators during an influenza pandemic.

As professionals dedicated to protecting the interests of their patients, physicians thus have a responsibility to contribute their expertise to developing allocation policies that are fair and safeguard the welfare of patients.

Individually and collectively through the profession, physicians should advocate for policies and procedures that

allocate scarce health care resources fairly among patients, in keeping with the following criteria:

(a) Base allocation policies on criteria relating to medical need, including urgency of need, likelihood and anticipated duration of benefit, and change in quality of life. In limited circumstances, it may be appropriate to take into consideration the amount of resources required for successful treatment. It is not appropriate to base allocation policies on social worth, perceived obstacles to treatment, patient contribution to illness, past use of resources, or other non-medical characteristics.

(b) Give first priority to those patients for whom treatment will avoid premature death or extremely poor outcomes, then to patients who will experience the greatest change in quality of life, when there are very substantial differences among patients who need access to the scarce resource(s).

(c) Use an objective, flexible, transparent mechanism to determine which patients will receive the resource(s) when there are not substantial differences among patients who need access to the scarce resource(s).

(d) Explain the applicable allocation policies or procedures to patients who are denied access to the scarce resource(s) and to the public.

Code of Medical Ethics Policy 11.1.3 – Allocating Limited Health Care Resources (American Medical Association, 2017, p. 185).

Euthanasia

American Medical Association

Euthanasia is the administration of a lethal agent by another person to a patient for the purpose of relieving the patient's intolerable and incurable suffering.

Euthanasia is fundamentally incompatible with the physician's role as healer, would be difficult or impossible to control, and would pose serious societal risks. Euthanasia could readily be extended to incompetent patients and other vulnerable populations.

The involvement of physicians in euthanasia heightens the significance of its ethical prohibition. The physician who performs euthanasia assumes unique responsibility for the act of ending the patient's life.

Excerpted from *Code of Medical Ethics Policy 5.8 – Euthanasia* (American Medical Association, 2017, p. 85).

Appendix B. The Continuum of Surge Capacity

Institute of Medicine 2010. *Crisis Standards of Care: Summary of a Workshop Series*. Washington, DC: The National Academies Press, p. 79.

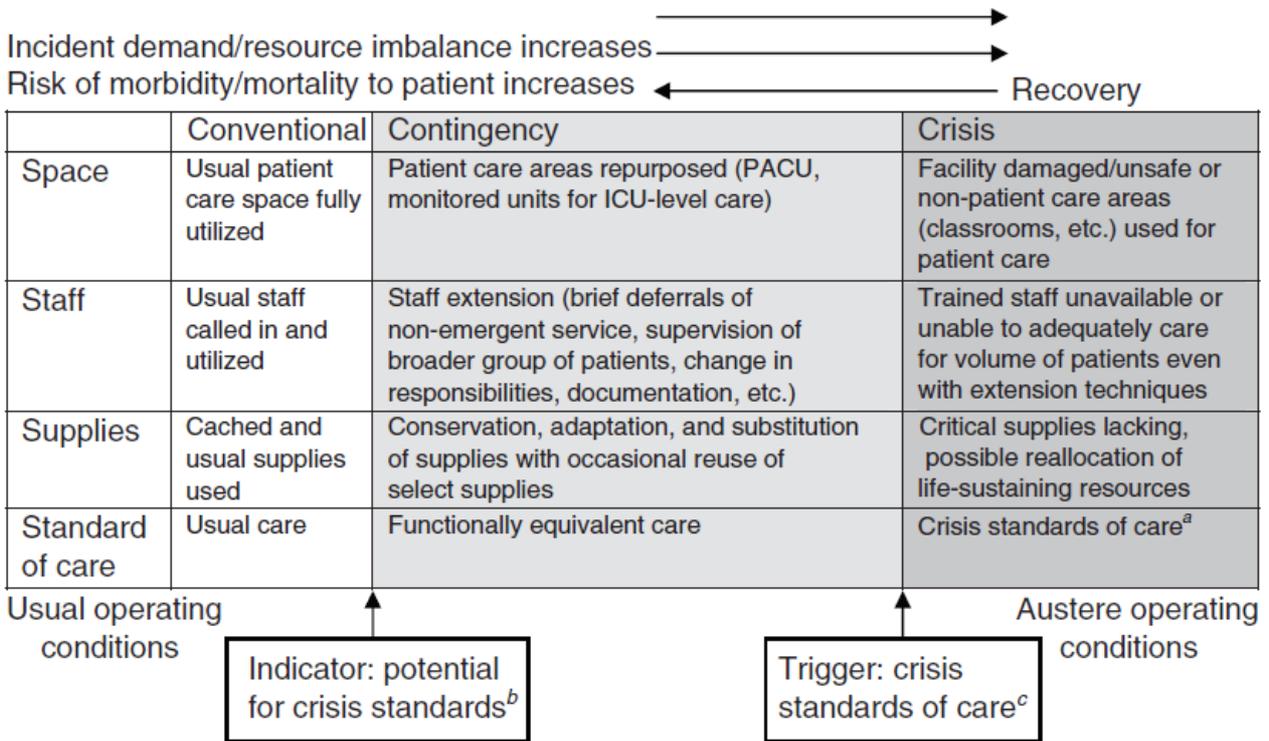


FIGURE B-1 Continuum of incident care and implications for standards of care.

Appendix C. Crisis Standards of Care Implementation Criteria

Institute of Medicine 2010. *Crisis Standards of Care: Summary of a Workshop Series*. Washington, DC: The National Academies Press, p. 85.

Crisis Standards of Care Implementation Criteria

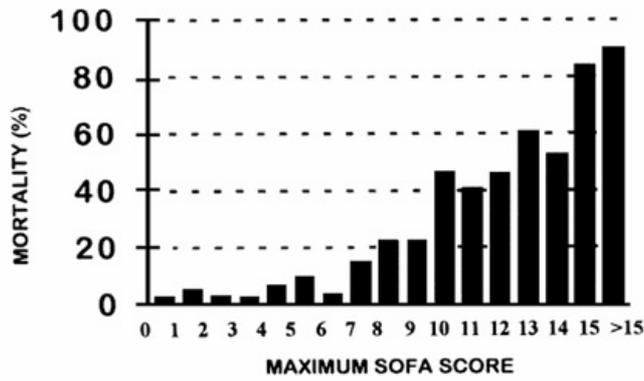
Prior to implementation of formal resource triage, the following conditions must be met or in process (Devereaux et al., 2008):

- Identification of critically limited resources and infrastructure
- Surge capacity fully employed within healthcare facility
- Maximal attempts at conservation, reuse, adaptation, and substitution performed
- Regional, state, and federal resource allocation insufficient to meet demand
- Patient transfer or resource importation not possible or will occur too late to consider bridging therapies
- Request for necessary resources made to local and regional health officials
- Declared state of emergency (or in process)

Appendix D. The Sequential Organ Failure Assessment (SOFA) Scoring System

	SOFA Score				
	0	1	2	3	4
Respiration					
Pao ₂ /Fio ₂ (torr)	>400	≤400	≤300	≤200 With respiratory support	≤100 With respiratory support
Coagulation					
Platelets (×10 ⁹ /mm ³)	>150	≤150	≤100	≤50	≤20
Liver					
Bilirubin (mg/dL)	<1.2	1.2–1.9	2.0–5.9	6.0–11.9	>12.0
(μmol/L)	<20	20–32	33–101	102–204	>204
Cardiovascular					
Hypotension	No hypotension	MAP <70 mm Hg	Dopamine ≤5 or dobutamine (any dose)*	Dopamine >5 or epi ≤0.1 or norepi ≤0.1*	Dopamine >15 or epi >0.1 or norepi >0.1*
Central Nervous System					
Glasgow Coma Score	15	13–14	10–12	6–9	<6
Renal					
Creatinine (mg/dL)	<1.2	1.2–1.9	2.0–3.4	3.5–4.9	>5.0
(μmol/L)	<110	110–170	171–299	300–440	>440
or urine output				or <500 mL/day	or <200 mL/day

epi, epinephrine; norepi, norepinephrine.
 *Adrenergic agents administered for at least 1 hr (doses given are in μg/kg/min).
 To convert torr to kPa, multiply the value by 0.1333.



Vincent, J. L., et al. (1998). Use of the Sofa Score to Assess the Incidence of Organ Dysfunction/Failure in Intensive Care Units: Results of a Multicenter, Prospective Study. *Critical Care Medicine*, 26(11), 1793-1800. With permission.

Appendix E. National Academy of Medicine Surge Capacity Triage Algorithm

Institute of Medicine 2010. *Crisis Standards of Care: Summary of a Workshop Series*. Washington, DC: The National Academies Press: _____, p. 19.

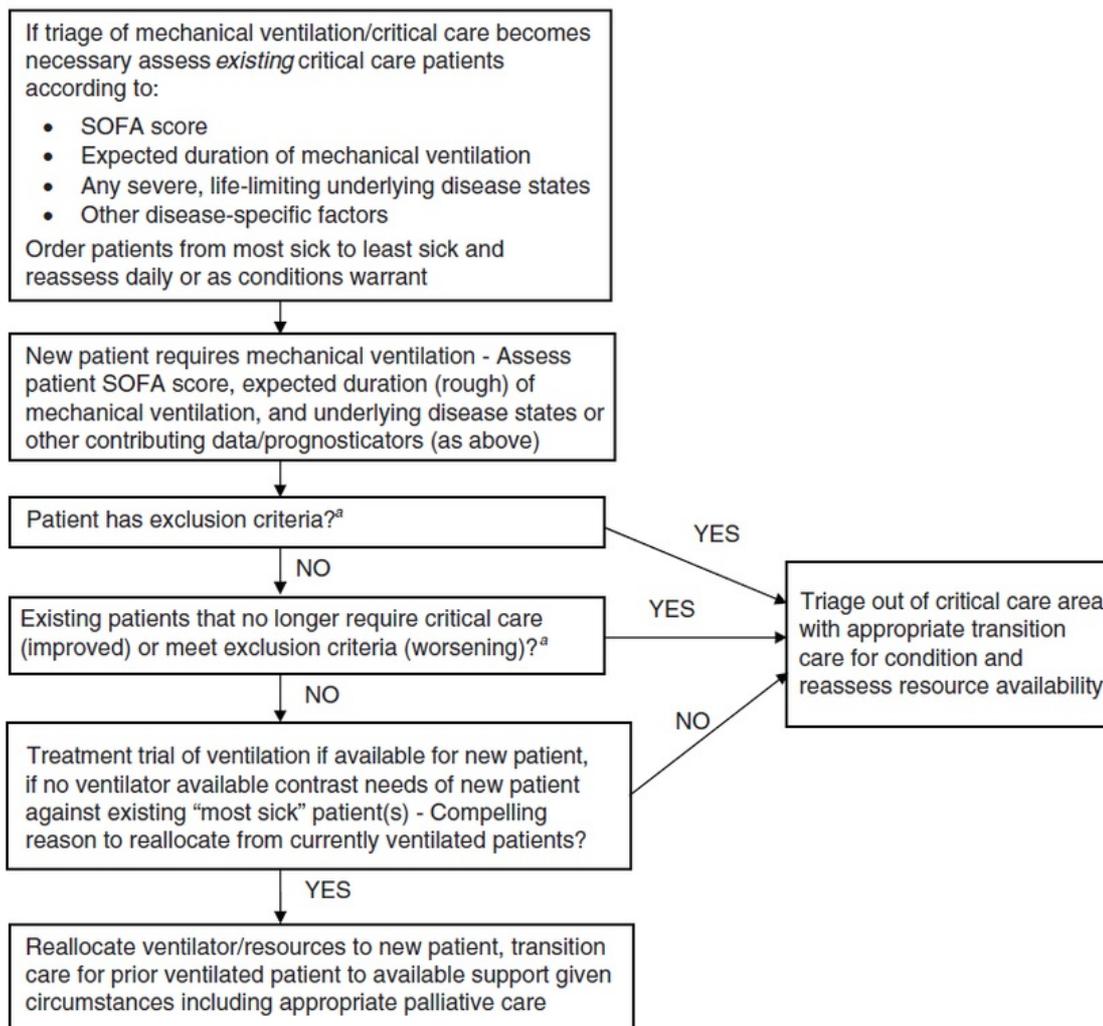


FIGURE B-3 Triage algorithm process.

^aExample exclusion criteria include severe, irreversible organ failure (congestive heart failure, liver, etc.), severe neurologic compromise, extremely high or not improving SOFA scores, etc.

Appendix F. Proposed Criteria for Reallocation of Life-saving Resources

Institute of Medicine 2010. *Crisis Standards of Care: Summary of a Workshop Series*. Washington, DC: The National Academies Press, p. 90.

BOX B-2
Exclusion Criteria Prompting Possible Reallocation of Life-Saving Interventions

Sequential Organ Failure Assessment (SOFA) score criteria: patients excluded from critical care if risk of hospital mortality > 80%

- A. SOFA > 15
- B. SOFA > 5 for >5 d, and with flat or rising trend
- C. > 6 organ failures

Severe, chronic disease with a short life expectancy

- A. Severe trauma
- B. Severe burns on patient with any two of the following:
 - i. Age > 60 yr
 - ii. > 40% of total body surface area affected
 - iii. Inhalational injury
- C. Cardiac arrest
 - i. Unwitnessed cardiac arrest
 - ii. Witnessed cardiac arrest, not responsive to electrical therapy (defibrillation or pacing)
 - iii. Recurrent cardiac arrest
- D. Severe baseline cognitive impairment
- E. Advanced untreatable neuromuscular disease
- F. Metastatic malignant disease
- G. Advanced and irreversible neurologic event or condition
- H. End-stage organ failure (for details see Devereaux et al., 2008)
- I. Age > 85 yr (see Lieberman et al., 2009)
- J. Elective palliative surgery

SOURCE: Adapted from Devereaux et al. (2008).

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[1] The Institute of Medicine, founded in 1970, was reconstituted as the National Academy of Medicine in 2015.

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