

North Carolina Protocol for Allocating Scarce Inpatient Critical Care Resources in a Pandemic

January 11, 2021



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**



NCIOM



North Carolina Medical Society



North Carolina
Healthcare Association



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Office for Civil Rights

North Carolina Protocol for Allocating Scarce Inpatient Critical Care Resources in a Pandemic

Executive Summary

Introduction: The COVID-19 pandemic has necessitated the revival of efforts by North Carolina experts to develop a statewide protocol for the allocation of scarce critical care resources, to be effective only during a Governor's declared state of emergency (NCGS §166A) due to a pandemic, and when demand for critical care resources exceeds supply. To this end, on Thursday, March 26, 2020, the North Carolina Institute of Medicine (NCIOM), the North Carolina Medical Society (NCMS), and the North Carolina Healthcare Association (NCHA) convened a Scarce Critical Care Resource Allocation Advisory Group (advisory group) to raise awareness, obtain stakeholder input, and synthesize feedback on a draft revised protocol for allocating scarce inpatient critical care resources during the crisis stage of a pandemic. On March 31, 2020, NCIOM, NCMS, and NCHA convened an additional group (health care stakeholder group), comprised of representatives from most major health systems in the state, for additional discussion and review. Representatives from the convening organizations further revised the draft protocol in January 2021 at the request of the U.S. Department of Health and Human Services Office of Civil Rights.

The recommended protocol has been developed in extensive consultation with state experts in several clinical specialties (including intensive care, pediatrics, palliative care, emergency medicine, family medicine, psychiatry, infectious disease, nephrology, and anesthesiology), nursing, spiritual care, ethics, law, and public health. Advisors also included representatives from community and advocacy groups representing racial and ethnic minorities, vulnerable populations, people with disabilities, older adults, and faith communities. The role of the convening organizations (NCIOM, NCMS, and NCHA) was to facilitate discussion and synthesize feedback from these groups to inform the development of a recommended protocol consistent with other state and federal protocols for allocating scarce critical resources during a pandemic.

One goal of these efforts is to recommend a North Carolina protocol, based on the latest science and review of other protocols, to the Secretary of the North Carolina Department of Health and Human Services for subsequent presentation to the Governor for adoption as an annex to State emergency response plans for a pandemic.¹

This document is the recommended *North Carolina Protocol for Allocating Scarce Inpatient Critical Care Resources in a Pandemic*. The protocol will be in effect when 1) the Governor has declared a state of emergency (NCGS §166A) due to a pandemic (such as the current COVID-19 pandemic), and 2) critical care resources are, or shortly will be, overwhelmed.

The primary purpose of this protocol is to provide recommendations for the triage of all adult inpatients in the event that a pandemic creates demand for critical care resources (e.g., ventilators, critical care beds) that outstrips the supply. Key recommendations include:

- 1) the creation and utilization of triage teams and review committees to promote objectivity;
- 2) use of accepted criteria, methodologies, and processes for initial allocation of critical care resources;

- 3) periodic individualized reassessment using best objective medical evidence to determine whether ongoing provision of critical care treatment is likely to result in improvement for individual inpatients; and
- 4) appropriate, effective, and meaningful communication with patients and their representatives under the protocol, including regarding goals of care and treatment preferences as well as allocation decision-making processes and results, utilizing methods of communication as described below and required in compliance with applicable civil rights laws.

Given the current need for additional recommendations with regard to other inpatient populations (e.g., pediatric populations), as well as the ongoing need to account for advances in the care of patients in a pandemic emergency generally, it is anticipated that additional protocol modifications, including, without limitation, amendments and appendices, will continue to be recommended for presentation and adoption as an annex to State emergency response plans. Health care facilities, health care professionals, and other personnel acting in accordance with the recommendations in this protocol, as modified from time to time, are deemed to be in compliance with all applicable criminal and civil laws and standards of practice.

Section 1. Creation of triage teams: Patients' treating clinicians should not make final triage decisions. Instead, each hospital should designate an acute care physician triage officer or group of triage officers, supported, if resources allow, by other team members as described below, who will apply the critical care resources allocation processes described in this protocol. The separation of the triage role from the clinical role is intended to promote objectivity, avoid conflicts of commitments, and minimize moral distress. The triage officer(s) will also be involved in patient or family appeals of triage decisions and in collaborating with the attending physician to disclose triage decisions to patients and families.

Section 2. Allocation criteria for ICU admission/critical care resources: Consistent with accepted standards during public health emergencies, the overall goal of these inpatient critical care resources allocation process is to maximize benefit to populations of patients, specifically by maximizing survival to hospital discharge for as many patients as possible. There are no baseline process exclusion criteria. All adult inpatients who meet the medical indications for ICU beds and services will be individually assessed using best objective medical evidence and assigned a priority score using a 1-8 scale (lower scores indicate higher likelihood of benefit from critical care), derived from patients' likelihood of surviving to hospital discharge, assessed with an objective and validated measure of acute physiology (i.e., the SOFA or modified SOFA score); (**Table 1**). This raw priority score may be converted to three color-coded priority groups (e.g., high, intermediate, and low priority) if needed to facilitate streamlined implementation in individual hospitals (**Table 2**). Available critical care resources will be allocated according to priority score, such that the availability of these services will determine how many patients will receive critical care. Patients who are triaged to not receive ICU beds or critical care services will be offered medical care including intensive symptom management and psychosocial support. Where available, specialist palliative care teams will provide additional support and consultation.

Section 3. Reassessment for ongoing provision of critical care resources: The triage team should conduct periodic individualized reassessments, using best objective medical evidence, of all adult inpatients receiving critical care services while this protocol is in effect (i.e., not merely those initially triaged under the crisis standards). The timing of reassessments should be based on evolving understanding of typical disease trajectories and of the severity of the pandemic. A multidimensional assessment should be used to quantify changes in patients' conditions, such as recalculation of severity of illness scores, appraisal of new complications, and treating clinicians' input. Patients showing improvement will continue to receive critical care services until the next assessment. Patients showing substantial clinical deterioration that portends a very low chance for survival to hospital discharge will have critical care discontinued. These patients will receive medical care including intensive symptom management and psychosocial support. Where available, chaplain services and specialist palliative care teams will provide additional support and consultation.

Hospitals may not allocate or re-allocate a personal ventilator (defined as a ventilator brought by the patient to the acute care facility at admission to continue the patient's pre-existing personal use with respect to a disability or pre-existing condition).

Introduction

The purpose of this protocol is to provide recommendations for the triage of all adult inpatients in the event that a pandemic creates demand for critical care resources (e.g., ventilators, critical care beds) that outstrips the supply. This protocol will be in effect when 1) the Governor has declared a state of emergency (NCGS §166A) due to a pandemic (such as the current COVID-19 pandemic), and 2) critical care resources are, or shortly will be, overwhelmed. Health care facilities, health care professionals, and other personnel acting in accordance with the recommendations in this protocol, as modified from time to time, are deemed to be in compliance with applicable criminal and civil laws and standards of practice.

These inpatient critical care resources allocation processes are grounded in ethical obligations that include the duty to care, distributive and procedural justice, inclusivity and equity, and transparency. Consistent with accepted standards during public health emergencies, the overall goal of the critical care resources allocation processes is to maximize benefit to populations of patients, often expressed as doing the greatest good for the greatest number.^{2,3} It should be noted that this goal is different from the traditional focus of medical ethics, which is centered on promoting the wellbeing of individual patients.⁴ As described below, the inpatient critical care resources allocation processes operationalize the broad public health goal by giving priority for critical care resources to patients who are most likely to survive to hospital discharge. The development of this protocol has been informed by extensive consultation with state experts in several clinical specialties (including intensive care, pediatrics, palliative care, emergency medicine, family medicine, psychiatry, infectious disease, nephrology, and anesthesiology), nursing, spiritual care, ethics, law, and public health. Advisors also included representatives from community and advocacy groups representing racial and ethnic minorities, vulnerable populations, people with disabilities, older adults, and faith communities.⁵ The protocol also reflects input from the U.S. Department of Health and Human Services Office of Civil Rights.

Providers are strongly encouraged to solicit patient goals of care and treatment preferences through conversations with the patient or their representative. Pandemic circumstances do not alter providers' obligations to adhere to professional codes of ethics in conducting these conversations.^a Patients receiving hospice care or who express a preference to forgo critical care resources should be excluded from these processes. The method of communication used shall comply with civil rights laws (as described below) and shall be documented in the medical record. Patients who do not receive critical care resources will receive medical care that includes intensive symptom management, psychosocial support, and chaplain services. Where available, specialist palliative care teams will be available for consultation. Where palliative care specialists are not available, the treating clinical teams should provide primary palliative care.

No patients are categorically excluded from eligibility for critical care resources under this protocol, including due to race, color, national origin, disability, age, or sex. All patients needing critical care beds and services will be individually assessed and will receive a priority score. The availability of critical care resources determines how many priority groups can receive them.⁶

^a American Medical Association Advance Care Planning Code of Medical Ethics Opinion 5.1. <https://www.ama-assn.org/delivering-care/ethics/advance-care-planning>. Accessed January 5, 2021. "Physicians must recognize, however that patients and families approach decision making in many different ways, informed by culture, faith traditions, and life experience, and should be sensitive to each patient's individual situations and preferences when broaching discussion of planning for care at the end of life."

Key recommendations of this protocol include: 1) the creation and utilization of triage teams and review committees to promote objectivity; 2) use of accepted criteria, methodologies, and processes for initial allocation of critical care resources; 3) periodic reassessment to determine whether ongoing provision of critical care treatment is likely to result in improvement for individual patients; and 4) appropriate, effective, and meaningful communication with patients and their representatives under the protocol, including regarding goals of care and treatment preferences as well as allocation decision-making processes and results, utilizing methods of communication as described below and required in compliance with applicable civil rights laws.

Providers must provide effective communication to patients and patient representatives with disabilities and must take reasonable steps to provide meaningful language access to programs under this protocol to persons with limited English proficiency. This may, under applicable civil rights law, include consulting with the patient or representative on what methods of communication will be effective, the provision of communication aids or interpretation services for persons with visual, hearing, or cognitive impairments, providing access for designated support persons, and the provision of real-time language translations in person or through language access lines where reasonably achievable under the circumstances.

Section 1. Creation of triage teams

The purpose of this section is to provide recommendations to create a local triage team at each hospital whose responsibility is to implement the critical care resources allocation processes described in Sections 2 and 3. It is important to emphasize that patients' treating providers should not make final triage decisions. Rather, those decisions should be made by a triage team consistent with the critical care resources allocation processes in this protocol. The separation of the triage role from the clinical role is intended to enhance objectivity, avoid conflicts of commitments, and minimize moral distress. Triage teams should strive to safeguard process integrity by maintaining the focus on clinical factors included in this protocol, without use of principles or beliefs that are not included in this protocol.

Providers are strongly encouraged to solicit patient goals of care and treatment preferences through conversations with the patient or their representative, early in treatment and throughout the course of care, consistent with applicable state and federal law. Pandemic circumstances do not alter providers' obligations to adhere to professional codes of ethics in conducting these conversations. Providers have an ethical and legal responsibility to advise patients regarding their rights to make decisions concerning medical care, including the availability of life-saving care, the right to accept or refuse medical or surgical treatment, and the right to formulate advance directives, consistent with the federal Patient Self Determination Act and other federal and state laws governing advanced care planning and decision-making. Providers may not impose blanket Do Not Resuscitate policies for reasons of resource constraint. Providers may not exert undue influence on patients to consent to a particular Advanced Care Planning decision in order to continue to receive services from a facility. Patients who express a preference to forgo critical care resources should be excluded from these inpatient critical care resources allocation processes. The method of communication of such wishes shall be documented in the medical record. Patients who are not triaged to receive critical care resources will receive medical care that includes intensive symptom management and psychosocial support. Where available, specialist palliative care teams will be available for consultation. Where palliative care specialists are not available, the treating clinical teams should provide primary palliative care.

Triage Officer

A group of triage officers should be appointed. Desirable qualities of triage officers include being a physician with established expertise in the management of critically ill patients, strong leadership ability, expertise in health equity, and effective communication and conflict resolution skills. This individual will oversee the triage processes, assess all patients, assign a level of priority for each, communicate with treating physicians, and direct attention to the highest-priority patients. The triage officer should be expected to make decisions according to the inpatient critical care resources allocation processes

described below, which are designed to benefit the greatest number of patients. The triage officer should have the responsibility and authority to apply the principles and processes of this protocol to make decisions about which patients will receive the highest priority for receiving critical care. The triage officer is also empowered to make decisions regarding reallocation of critical care resources that have previously been allocated to patients, again using the principles and processes in this protocol. In making these decisions, the triage officer should not use principles or beliefs that are not included in this protocol.

A roster of approved triage officers should be maintained that is large enough to ensure that triage officers will be available on short notice at all times, and that they will have sufficient rest periods between shifts.

Triage Team

In addition to the triage officer, if resources allow, the triage team should also consist of a licensed health care provider with acute care (e.g., critical care or emergency medicine) experience and one administrative staff member who will conduct data-gathering activities, documentation and record keeping, and assistance with liaising with a hospital Command Center or bed management. The role of triage team members is to provide information to the triage officer and, to help facilitate and support objectivity and equity in the decision-making process. A representative from hospital administration should also be linked to the team, in order to supervise maintenance of accurate records of triage scores and to serve as a liaison with hospital leadership. Team decisions and supporting documentation should be reported daily to appropriate hospital leadership and incident command.

Triage Mechanism

The triage officer and the triage team will use the inpatient critical care resources allocation process, detailed in Section 2, to determine priority scores of all patients eligible to receive the scarce critical care resource. For patients already being supported by the scarce resource, the evaluation will include reassessment to evaluate for clinical improvement or worsening at pre-specified intervals, as detailed in Section 3. The triage officer will review the comprehensive list of priority scores for all patients and will communicate with the clinical teams immediately after a decision is made regarding allocation or reallocation of a critical care resource.

Communication of triage decisions to patients and families

Although the *authority* for triage decisions rests with the triage officer, there are several potential strategies to *communicate* triage decisions to patients and their loved ones, to the fullest extent permitted by law. Communication or disclosure of such triage decisions to patients and/or their authorized family members/representatives is a required component of an allocation process that provides respect for persons.⁷ The triage officer should first inform the affected patient's attending physician about the triage decision. Those two physicians should collaboratively determine the best approach to inform the individual patient and authorized family/representatives. Suggestions for who may communicate the decision include: 1) solely the attending physician; 2) solely the triage officer; or 3) a collaborative effort between the attending physician and triage officer. The best approach will depend on a variety of case-specific factors, including the dynamics of the individual provider-patient-family relationship and the preferences of the attending physician. If the attending physician is comfortable with disclosing, this approach is useful because the communication regarding triage will bridge naturally to a conveyance of prognosis, which is a responsibility of bedside physicians, and because it may limit the number of clinicians exposed to a circulating pathogen. The third (collaborative) approach is useful because it may lessen moral distress for individual clinicians and may augment trust in the process, but these benefits must be balanced against the risk of greater clinician exposure. Under this approach, the attending physician would first explain the severity of the patient's condition in an emotionally supportive way, and then the triage officer would explain the implications of those facts in terms of the triage decision. The triage officer would also emphasize that the triage decision was not made by the attending physician but is instead one that arose from the extraordinary emergency circumstances and reflect a public health

decision. Regardless of who communicates the decision, it may be useful to explain the medical factors that informed the decision, as well as the non-clinical factors that were not relevant. The method of communication used shall comply with civil rights laws (as described above). If resources permit, appropriate services should be made available to provide ongoing treatment and emotional support to the patient and authorized family/representatives. Designated support persons may also be granted physical access in accordance with applicable law and hospital policy.

Appeals process for individual triage decisions

It is possible that patients, families/representatives, or clinicians will challenge individual triage decisions. Procedural fairness requires the availability of an appeals mechanism to resolve such disputes. On practical grounds, different appeals mechanisms are needed for the initial decision to allocate a scarce resource among individuals, none of whom are currently using the resource, and the decision whether to withdraw a scarce resource from a patient. This is because initial triage decisions for patients awaiting the critical care resource, as well as appeals of those decisions, will likely be made in highly time-pressured clinical circumstances. Accordingly, for the initial triage decision, the only permissible appeals are those based on a claim that an error was made by the triage team in the calculation of the priority score or use/non-use of a tiebreaker (as detailed in Section 2). The process of evaluating the appeal should include the triage team verifying the accuracy of the priority score calculation by recalculating it. The treating clinician or triage officer should be prepared to explain the calculation to the patient or authorized family/representatives on request.

The process for appealing decisions to withdraw a scarce resource, such as mechanical ventilation^b, from a patient should be more robust. Elements of this appeals process should include:

- The individuals appealing the triage decision should explain to the triage officer the grounds for their appeal. Appeals based solely on a general objection to the idea or concept of critical care resource allocation, this protocol, or one or more protocol processes should not be granted.
- The triage team should explain the grounds for the triage decision that was made.
- Appeals based in considerations other than general objection to the idea or concept of critical care resource allocation, this protocol, or one or more protocol processes, should immediately be brought to a Triage Review Committee that is independent of the triage officer/team and of the patient's care team (see below for recommended composition of this body).
- The appeals process must occur quickly enough to minimize harm to other patients who are in the queue for scarce critical care resources currently being used by the patient who is the subject of the appeal.
- The decision of the Triage Review Committee or subcommittee for a given hospital will be final.
- Periodically, the Triage Review Committee should retrospectively review protocol processes to 1) ensure appropriate documentation of resource allocation decisions and rationale and 2) identify and evaluate opportunities for process improvement.

The Triage Review Committee should be made up of at least three individuals, recruited from the following groups or offices: Chief Medical Officer or designee, Chief Nursing Officer or other nursing leadership, a member of hospital Ethics Committee or Consult Service, members of an institution's ethics faculty, and/or an off-duty triage officer. In addition, facilities should consider inclusion of other hospital medical staff members or employees who function to promote principles of health equity in triage team and triage review committee decision-making. This committee should be supported by hospital resources, such as legal counsel or others, as needed. Committee decisions may be made by a quorum of three members, and may be made by telephone/teleconference or in person, and the outcome will be promptly communicated to the appellant.

^b Note: As stated on page 8, hospitals may not re-allocate a personal ventilator (defined as a ventilator brought by the patient to the acute care facility at admission to continue the patient's pre-existing personal use with respect to a disability or pre-existing condition).

Section 2. Allocation process for ICU admission/allocation of critical care resources

The purpose of this section is to describe the inpatient critical care resources allocation process that should be used to make initial triage decisions for adult inpatients who present with illnesses that typically require critical care resources (*i.e.*, illnesses that cannot be managed on a hospital ward in that hospital). The scoring system applies to all patients presenting with any critical illness, not merely those with the disease or disorders that caused or resulted from the pandemic. This process involves two steps, detailed below:

1. Calculating each adult inpatient's priority score based on the critical care resources allocation methodology; and
2. Determining each day how many priority groups will receive access to critical care interventions.

Providers should perform the immediate stabilization of any inpatient in need of critical care, as they would under normal circumstances. Along with stabilization, temporary ventilatory and other support may be offered to allow the triage officer to conduct an initial triage assessment of the patient for initial critical resource allocation. Every effort should be made to complete the initial triage assessment within 90 minutes of the recognition of the likely need for critical care resources.

Ethical goal of the inpatient critical care resources allocation processes. Consistent with accepted standards during public health emergencies, the primary goal of the inpatient critical care resources allocation processes is to maximize benefit for populations of patients, often expressed as “doing the greatest good for the greatest number.” This is operationalized as allocating resources based on clinical judgment of patient likelihood of survival to hospital discharge. Resource intensity and long-term survival beyond hospital discharge should not be used as criteria.

STEP 1: Calculate each patient's priority score using the critical care resources allocation methodology. This inpatient critical care resources allocation process is based on the principle of saving the most lives. Patients who are more likely to survive to hospital discharge with intensive care are therefore prioritized over patients who are less likely to survive to hospital discharge with intensive care. Multiple critical care studies have identified acute physiologic derangements and the presence of chronic severe conditions that affect vital organ function as predictors of hospital mortality.^{8,9} Consequently, as summarized in **Table 1**, the Sequential Organ Failure Assessment (SOFA) score or Modified Sequential Organ Failure Score (MSOFA) and presence of severe chronic conditions affecting vital organ function are used to determine patients' prognoses for hospital survival.

Table 1. Individualized Strategy to Allocate Critical Care Resources During a Pandemic

Specification	Point System*			
	1	2	3	4
Physiologic Derangement (SOFA or MSOFA)^{c,d}	SOFA/MSOFA score < 6	SOFA/MSOFA score 6-8	SOFA/MSOFA score 9 -11	SOFA/MSOFA score ≥12
Chronic medical conditions affecting chances of hospital survival even if critical care resources provided	...	Major chronic medical condition causing dysfunction of a vital organ that substantially reduces chances of hospital survival even if critical care resources provided	...	One or more major chronic medical conditions causing dysfunction of vital organs that make hospital survival unlikely regardless of provision of critical care resources

*Scores range from 1-8, and persons with the lowest score would be given the highest priority to receive critical care beds and services. Scoring related to chronic medical conditions affecting chances of hospital survival even if critical care resources provided should be based on a spectrum of clinical presentation of major chronic conditions in regard to not merely the existence of the chronic condition but also the level of severity of the chronic condition. Level of severity should be captured in individualized assessment using best objective medical evidence.

Points are assigned according to the patient’s SOFA/MSOFA score (range from 1 to 4 points) plus the presence or absence of conditions that substantially affect chances of hospital survival (2 points for a single major chronic condition that substantially reduces chances of hospital survival even if critical care resources provided, 4 points for one or more major chronic conditions that make hospital survival unlikely regardless of provision of critical care resources). As part of each patient’s individualized assessment, triage officers and triage teams would need to review the best available objective medical evidence in exercising their clinical judgment in identifying chronic conditions and assessing the likelihood of hospital survival as described above. These points would then be added together to produce a total priority score, which ranges from 1 to 8. Lower scores indicate higher likelihood of benefiting from critical care, and priority would be given to those with lower scores.

SOFA/MSOFA may be utilized in connection with an individualized assessment of the patient based on the best available objective medical evidence. However, assessment tools, such as the SOFA/MSOFA, or the priority scoring process may need reasonable modifications with respect to disabilities, pregnancy, or pre-existing conditions not related to their likelihood of surviving treatment. For example, the Glasgow Coma Scale, a tool for measuring acute brain injury severity in the SOFA/MSOFA, adds points to the SOFA score when a patient cannot articulate intelligible words or has difficulty with purposeful movement. Under such circumstances, reasonable modifications to the SOFA/MSOFA or similar clinical instruments should be made to ensure that disability-related characteristics unrelated to hospital survival do not worsen the patient’s score.

^c [Sequential Organ Failure Assessment \(SOFA\).](#)

^d [Modified Sequential Organ Failure Assessment \(MSOFA\).](#)

Other special scoring considerations:

Tiebreaker:

When two patients cannot be distinguished after the individualized assessments based on best objective medical evidence conducted in Step 1, one or more tiebreakers may need to be used in order to determine which patient receives limited critical care resources, as follows:

First tiebreaker: When two patients are apparently the same on all other measures at a given point in time, if one patient's clinical trajectory is declining more rapidly than the other patient needing the same limited critical care resources, the limited resources should be assigned to the patient with the less rapid rate of clinical decline, and thus the greatest prospect of survival to hospital discharge.

Second tiebreaker: When two patients remain tied after assessment of their respective clinical trajectories, a judgment should be made of which patient has the greater prospect of survival to hospital discharge based on additional clinical judgment of patient's record and overall presentation of relevant symptoms, so long as this judgment is not based on any unlawful considerations of race, color, national origin, disability, age, or sex.

Personal Ventilators:

Hospitals may not allocate or re-allocate, under this Step 1 or Step 2 or Section 3 below, a personal ventilator (defined as a ventilator brought by the patient to the acute care facility at admission to continue the patient's pre-existing personal use with respect to a disability or pre-existing condition).

STEP 2: Make daily determinations of how many priority groups can receive the scarce resource.

Hospital leaders and triage officers should make determinations at least daily, or more frequently if needed, about what priority scores will result in access to critical care services. These determinations should be based on available real-time knowledge of the degree of scarcity of the critical care resources, as well as information about the predicted volume of new cases that will be presenting for care over the near-term (several days).

There are at least two reasonable approaches to group patients: 1) according to their raw score on the 1-8 allocation strategy; and 2) by creating 3 priority categories based on patients' raw priority scores (e.g., high priority, intermediate priority, and low priority). Using the full 1-8 scale avoids creating arbitrary cut-points on what is a continuous scale and allows all the information to be used from the priority score. Using priority categories is consistent with standard practices in disaster medicine and avoids allowing marginal differences in scores on an inpatient critical care resources allocation framework that has not been extensively tested to be the determinative factor in allocation decisions. Both approaches are reasonable. The best choice depends on institutional preferences and comfort with different ways to operationalize triage protocols on the front lines of clinical care.

Instructions on how to assign patients to color-coded priority groups. For those institutions who prefer to create broader, color-coded priority groups, this section provides instructions on how to do so.

Once a patient's priority score is calculated using the scoring system described in **Table 1**, each patient should be assigned to a color-coded triage priority group, which should be noted clearly on their chart/EHR (**Table 2**). This color-coded assignment of priority groups is designed to allow triage officers to create operationally clear priority groups to receive critical care resources, according to their score on the multi-principle inpatient critical care resources allocation methodology. For example, individuals in the red group have the best chance to benefit from critical care interventions and should therefore receive priority over all other groups in the face of scarcity. The orange group has intermediate priority and should receive critical care resources if there are available resources after all patients in the red group have been allocated critical care resources. The yellow group has lowest priority and should receive critical care resources if

there are available resources after all patients in the red and orange groups have been allocated critical care resources.

Table 2. Assigning Patients to Color-coded Priority Groups

Use Raw Score from Scoring System to Assign Priority Category	
Level of Priority and Code Color	Priority Score from Scoring System
RED Highest priority	Priority score 1-3
ORANGE Intermediate priority (reassess as needed)	Priority score 4-5
YELLOW Lowest priority (reassess as needed)	Priority score 6-8

It is important to reiterate that all patients will be *eligible* to receive critical care beds and services regardless of their priority score. The availability of critical care resources will determine how many eligible patients will receive critical care.

Appropriate clinical care of patients who cannot receive critical care. Patients who are not triaged to receive critical care resources should receive medical care that includes intensive symptom management, psychosocial support, and spiritual care. They should be reassessed daily to determine if changes in resource availability or their clinical status warrant provision of critical care services. Where available, specialist palliative care teams will be available for consultation. Where palliative care specialists are not available, the treating clinical teams should provide primary palliative care.

Section 3. Reassessment for ongoing provision of critical care resources

The purpose of this section is to describe the process the triage team should use to conduct reassessments on adult inpatients who are receiving critical care services in order to determine whether s/he continues to receive those services.

Ethical goal of reassessments of adult inpatients who are receiving critical care services. The ethical justification for such reassessment is that, in a public health emergency when there are not enough critical care resources for all, the goal of maximizing population outcomes would be jeopardized if patients who were determined to be unlikely to survive to hospital discharge were allowed indefinite use of scarce critical care services. In addition, periodic reassessments lessen the chance that arbitrary considerations, such as when an individual develops critical illness, unduly affect patients’ access to treatment.

Approach to reassessment

All adult inpatients who are allocated critical care services will be allowed a therapeutic trial of a duration to be determined by the clinical characteristics of the individual patient’s disease. The trial duration should be modified as appropriate if subsequent data emerge that suggest the trial duration should be longer or shorter. Although patients should generally be given the full duration of a trial, if patients experience a

precipitous decline (e.g., refractory shock and DIC) or a highly morbid complication (e.g., massive stroke) which portends a very poor prognosis for survival to hospital discharge, the triage team may decide before the completion of the specified trial length that the patient is no longer eligible for critical care treatment.

The triage team will conduct periodic reassessments, based on best objective medical evidence, of all patients receiving critical care resources. A multidimensional assessment should be used to quantify changes in patients' conditions, such as recalculation of severity of illness scores, appraisal of new complications, and treating clinicians' input. Patients showing improvement will continue with critical care resources until the next assessment. If there are patients in the queue for critical care services, then patients who upon reassessment show substantial clinical deterioration as evidenced by worsening SOFA/MSOFA scores should have critical care withdrawn, including discontinuation of mechanical ventilation, after this decision is disclosed to the patient and/or authorized family/representatives.

Appropriate clinical care of patients who cannot receive critical care

Patients who are no longer eligible for critical care treatment should receive medical care including intensive symptom management and psychosocial support. Where available, chaplain services and specialist palliative care teams should provide additional support and consultation. Where palliative care specialists are not available, the treating clinical teams should provide primary palliative care.

References

1. White DB. A Model Hospital Policy for Allocating Scarce Critical Care Resources. University of Pittsburgh School of Medicine. Published March 23, 2020. Accessed March 25, 2020. <https://ccm.pitt.edu/?q=content/model-hospital-policy-allocating-scarce-critical-care-resources-available-online-now>
2. Childress JF, Faden RR, Gaare RD, et al. Public health ethics: mapping the terrain. *J Law Med Ethics* 2002;30:170-8.
3. Gostin L. Public health strategies for pandemic influenza: ethics and the law. *Jama* 2006;295:1700-4.
4. Beauchamp TL, Childress JF. *Principles of Biomedical Ethics*. 6th ed. ed. New York, NY: Oxford University Press; 2009.
5. Daugherty Biddison EL, Gwon H, Schoch-Spana M, et al. The community speaks: understanding ethical values in allocation of scarce lifesaving resources during disasters. *Annals of the American Thoracic Society* 2014;11:777-83.
6. White DB, Katz MH, Luce JM, Lo B. Who should receive life support during a public health emergency? Using ethical principles to improve allocation decisions. *Ann Intern Med* 2009;150:132-8.
7. Young MJ, Brown SE, Truog RD, Halpern SD. Rationing in the intensive care unit: to disclose or disguise? *Crit Care Med* 2012;40:261-6.
8. Afshin GB, Hassan S, Abolfazl F, et al, Comparison of Proposed Modified and Original Sequential Organ Failure Assessment Scores in Predicting ICU Mortality: A Prospective, Observational, Follow-Up Study, *Scientifica*, vol. 2016. <https://doi.org/10.1155/2016/7379325>
9. Grisson CK, Brown SM, Kuttler Kg et al. A modified sequential organ failure assessment (MSOFA) score for critical care triage. *Disaster Med Public Health Prep* 2010 Dec; 4(4).