Allocation of Scarce Critical Care Resources During a Public Health Emergency

Executive Summary

This document provides guidance to [HEALTH SYSTEM] national and regional leadership, hospital leadership, hospital ethics committees, and frontline healthcare professionals for the triage of critically ill patients when a public health emergency creates demand for critical care resources (e.g., ventilators, critical care beds) that outstrips available supply. It distinguishes two phases of response to crisis conditions, *surge*, which is a time for preparation that precedes actual crisis, and *crisis*, when a regional-level authority has declared an emergency.

The allocation framework under both conditions is grounded in ethical obligations that include the *duty to care, duty to steward resources, distributive and procedural justice, reciprocity,* and *transparency* (Section 1). It is consistent with existing public health ethics frameworks[1] and recommendations for how to allocate scarce critical care resources during a public health emergency.[2] From this ethical framework, a structure for supporting triage teams (Section 2) and a fair decisionmaking process follow (Section 3). The process is designed to be attentive to the traumas likely to follow from widespread allocation decision making across the [HEALTH SYSTEM] enterprise, and especially for frontline providers, decision makers, and patients, including scripting for communicating allocation decisions with loved ones (Section 4) and a mechanism for allowing stakeholders to appeal allocation decisions (Section 5).

1. Ethical Framework

It is imperative that the teams who take on the awesome task of allocating scarce critical care resources are supported by an explicit and comprehensive ethical framework. [HEALTH SYSTEM]'s rests on these principles:

Duty to Care
Healthcare professionals have a duty to care, even at personal risk. This includes a commitment to delivering the best care possible given the available resources. In a crisis, every patient should receive compassionate care, whether aimed at maximizing survival or supporting a dignified death.

Duty to Steward Resources
In crisis, all resources are potentially scarce, and all clinicians have a duty to protect them. All resources should be carefully allocated according to their known scarcity, likelihood of renewal, and the extent to which they can be replaced or reused.

Distributive and Procedural Justice
A system of allocation during crisis must be applied consistently and broadly, to maximize the chances of fairness and minimize the influence of biases such as ageism, sexism, racism, or ableism. Allocation decisions should seek to support access to care for all, regardless of their insurance status, and especially the most vulnerable or those who suffer disproportionately.

Reciprocity
Health care professionals, by virtue of the healing relationships they support through their work, may be justly given preference for scarce critical care resources under some circumstances.

Transparency
To the extent practically feasible, allocation plans should be communicated as efficiently, widely, and comprehensively as possible across the healthcare system and moral community, inclusive of government agencies, nearby healthcare facilities, staff, patients, and other stakeholders. Such transparency is likely to minimize actual and vicarious trauma to patients, loved ones, staff, and members of the public after the crisis has abated.

2. Creation of Triage Teams

Facilities across [HEALTH SYSTEM] have different levels of care, bed sizes, staffing, and leadership cultures. In real time, the need to triage will arise and present itself differently for these reasons. This section provides guidance on

how to create local triage teams during surge conditions that ensures a single approach across the enterprise, while also allowing for tailored local implementation during crisis conditions (for example depending upon the ability to care for hospitalized pediatric patients). **It is important to emphasize that patients' treating physicians should not make allocation decisions**; **a triage team with expertise and training in the allocation framework will make allocation decisions**. The separation of the triage role from the clinical role is intended to ensure quality decision making, enhance objectivity, avoid conflicts of commitments, and minimize moral trauma and distress.

Triage Teams

A triage team reports to a medical staff or bioethics committee. Triage teams should be implemented no later than in surge conditions. Each team is led by a Triage Officer. This individual will oversee the processes of (i) forming and educating triage team members during surge conditions, and (ii) making allocation decisions during crisis, which includes assessing all patients, assigning a level of priority for each, communicating with treating physicians, and directing attention to the highest-priority patients. A Triage Team should consist of one or both co-chairs of the hospital ethics committee and should include a minimum of two physicians from: critical care, pulmonology, infectious diseases, emergency medicine, or internal medicine. The triage team should also include allied healthcare professionals, such as a nursing representative and a representative from respiratory therapy. Additional members are also recommended, such as a palliative care physician, a community member of the bioethics committee, and a social medicine representative.

Executive Support

Local senior leaders, including physicians and senior vice presidents, are responsible for appointing members of triage teams, preferably no later than during surge conditions. A roster of approved triage committee members should be maintained that is large enough to ensure that they will always be available on short notice; that team members work in shifts lasting no longer than 13 hours; that team members will have sufficient rest periods between shifts; and that the rationale for all allocation decisions is comprehensively documented in the medical chart/EHR and in ways that facilitate rapid, real-time reporting as described herein. Senior leadership should provide the triage team with support staff to collect, analyze, and distribute information about the team's work. The support staff member must be allocated appropriate time and provided with appropriate computer and IT support to maintain updated databases of patient priority levels and scarce resource usage (total numbers, location, and type). Leadership can reformat the guidance given here to the extent necessary to rapidly get approval by local policymaking mechanisms, including making minor revisions or adding addenda to further specify workflows aligned with local conditions.

Triage Mechanism

During crisis conditions, the triage team will use an explicit allocation framework to determine priority scores of all patients eligible to receive scarce critical care resources. For patients already being supported by a scarce resource, the evaluation will include reassessment to evaluate for clinical improvement or worsening at pre-specified intervals. 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.

Quality Assessment, Oversight, and Reporting

As widespread acute care triage would be novel at [HEALTH SYSTEM], if this policy is implemented and triage teams perform allocation decision making in multiple institutions over a prolonged time period, [APPROPRIATE AUTHORITY] is responsible for rapidly developing and deploying a method of tracking the implementation of this policy, defining and describing quality performance of Triage Teams, and longitudinally analyzing their performance. Under such a scenario, [APPROPRIATE AUTHORITY] is responsible for allocating a quality analyst or individual with equivalent capabilities, to be overseen by the [APPROPRIATE AUTHORITY] Co-Chairs, to process the data emerging from local triage team activities, so that it can be regularly reported to [HEALTH SYSTEM] [APPROPRIATE AUTHORITY] for the purposes of oversight.

3. Allocation Process for Scarce Critical Care Resources

Under crisis conditions only, a clinical assessment algorithm is coupled with a decision-making process to produce an allocation framework for making initial triage decisions for patients who present with illnesses that typically require critical care resources. **The framework must be applied to all patients presenting with critical illness, not simply those with the disease or disorders that arise from the public health emergency.** This process involves several steps, detailed below:

  I.   Calculating each patient's priority score based on the multi-principle allocation framework;
  II. Assigning each patient to a priority group (Red, Orange, Yellow, or Green); and
  III. Determining, on a daily basis, how many priority groups will receive access to critical care interventions.
  IV. Deciding, as needed, which patients will receive access to critical care resources in the setting of a tie within a priority group receiving daily priority.

In many crisis conditions, first responders and bedside clinicians should perform the immediate stabilization of any patient in need of critical care, as they would under normal circumstances. Along with stabilization, temporary ventilatory support may be offered to allow the triage officer to assess the patient for critical resource allocation. Every effort should be made to complete the initial triage assessment within 90 minutes of the recognition of the need for critical care resources.

Under some crisis conditions, the duty to care may be offset by other duties, such as the duty to steward resources like personal protective equipment. Under these conditions, it may be appropriate to issue a directive across a facility to attempt immediate stabilization, as one would under normal conditions, but to limit escalation of emergency care such that no cardiopulmonary resuscitation be performed upon patients who would receive it under normal circumstances in an emergency department. Whether such conditions exist should be determined by senior hospital leaders, including physicians and senior vice presidents, in collaboration with the triage team.

Step 1: Priority Score Calculation

During crisis conditions, patients who are more likely to survive with intensive care are prioritized over patients who are less likely to survive with intensive care using an **MPS Score**. Patients who do not have serious comorbid illness are given priority over those who have illnesses that limit their life expectancy. As summarized in Table 1, the Sequential Organ Failure Assessment (SOFA) score is used to characterize patients' prognosis for hospital survival. The presence of life-limiting comorbid conditions is also used to characterize patients' longer-term prognosis. Points are assigned according to the patient's SOFA score (range from 1 to 4 points); and the presence of comorbid conditions (2 points for major life-limiting comorbidities, 4 points for severely life-limiting comorbidities (Table 2)). These points are then added together to produce a total priority score, which ranges from 1 to 8. Lower scores indicate higher likelihood to benefit from critical care; **priority will be given to those with lower scores**.

Table 1. Multi-Principle Strategy to Allocate Critical Care/Ventilators During a Public Health Emergency

Purpose	Clinical Assessment	MPS Point Scoring System*			
		1	**2**	**3**	**4**
Prognosis for Hospital Survival	SOFA score	SOFA score < 6	SOFA score 6-9	SOFA score 10-12	SOFA score > 12
Prognosis for Long Term Survival	Assessment of Comorbidities	…	Major comorbid conditions	…	Death likely within 1 year

SOFA= Sequential Organ Failure Assessment
* Patients with the lowest cumulative score are prioritized for receiving scarce critical care resources during crisis conditions.

Prognostication under normal circumstances is difficult. However, under crisis conditions, it is likely that physicians will be able to more accurately prognosticate about a patients' long term chances of term survival with meaningful recovery, because the generalized resource scarcity entails that fewer people are likely to receive adequate healthcare to recover under crisis conditions than under normal conditions. Therefore, during crisis, more people will be likely to have a lower chance of long term survival than in normal conditions. Yet prognostication requires

discernment and clinical judgment. The following examples of major comorbid conditions and indicators of morbidity within one year used to score patients in Step 1 should be adapted to local conditions by triage teams using the best available evidence.[3]

Table 2. Examples of Major Comorbidities and Indicators of Morbidity Within One Year Used for Scoring

Major Comorbidities	Indicators of Morbidity Within One Year
- Moderate Alzheimer's disease or related dementia - Malignancy with a < 10 year expected survival - New York Heart Association (NYHA) Class III heart failure - Moderately severe chronic lung disease (e.g., COPD, IPF) - End stage renal disease - Severe, inoperable multi-vessel CAD	- Severe Alzheimer's disease or related dementia - Metastatic cancer receiving only palliative treatments - New York Heart Association (NYHA) Class IV heart failure - Severe chronic lung disease with FEV1 < 25% predicted, TLC < 60% predicted, or baseline PaO2 < 55mm Hg - Cirrhosis with MELD score ≥20 - Unwitnessed cardiac arrest with delayed or no cardiopulmonary resuscitation

Triage Teams are expected to evaluate, revise, and circulate their lists of major comorbidities and indicators of morbidity within one year during their operations and regular report outs at the local and regional levels.

Step 2: Assign Patients to Color-Coded Priority Groups

Once a patient's MPS Score is calculated using the system described in Table 1, each patient is assigned to a color-coded triage priority group (Table 3). This must should be noted clearly on their chart/HER by their attending physician. Using these priority groups enables triage teams to create operationally clear priority groups to receive critical care resources, according to their MPS score. 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 crisis conditions. 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.

It is important to note 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. Patients who are not allocated critical care, mechanical ventilation, or both will receive medical care that includes intensive symptom management and psychosocial support. They should also be reassessed at least 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.

Table 3. Color-Coded Priority Groups Based on MPS Score

Priority Assignments Based on MPS Score	
Level of Priority and Code Color	**MPS Score**
RED – Highest priority Manage with critical care resources if available and periodically reassess	**MPS: 1-3**
ORANGE – Intermediate priority Manage with critical care resources if available and periodically reassess	**MPS: 4-5**
YELLOW – Lowest priority Manage with critical care resources if available and periodically reassess	**MPS: 6-8**
GREEN Manage without scarce critical care resources and periodically reassess	**No Score** No significant organ failure or no requirement for critical care resources

The daily operations of triage teams should include reconciling the amount of available scarce critical care resources with recent trends in the volume of patients who present that are likely to need assessment for critical care. Each day that allocation decisions are anticipated, a member of the triage team should produce an easily readable grid diagram to indicate which MPS-tiers are likely to receive scarce critical care resources, so that hospital and physician leaders are able to communicate with appropriate staff which MPS groups are unlikely to receive critical care resources. Yet, this communication must not supersede decision making by the triage teams, as described herein.

Step 3: Reassessment

Under crisis conditions, the triage team should receive periodic reassessments of patients who are receiving critical care services by the patient's attending physician, in order to determine whether it is appropriate to reallocate scarce critical care resources to a patient in a higher priority MPS group. 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 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.

All patients who are allocated critical care services will be allowed a therapeutic trial of a duration to be determined by the clinical characteristics of the disease. The decision about trial duration will ideally be made as early in the public health emergency as possible, when data becomes available about the natural history of the disease. The trial duration should be modified as appropriate as subsequent relevant data emerges.

Periodic reassessments of patients receiving critical care resources will involve re-calculating SOFA scores, assessing changes in the patient's clinical trajectory, and documenting this in the medical chart/EHR. Patients showing improvement will continue to receive their allocated 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 scores or overall clinical judgment, then the triage team will determine whether it is appropriate to reallocate the scarce resources they are receiving. 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, the triage team may make a decision before the completion of the specified trial length that the patient is no longer eligible for critical care treatment.

Patients who are no longer eligible for critical care treatment should receive medical care including intensive symptom management and psychosocial support. Where available, specialist palliative care teams will be available for consultation.

Additional Considerations

While allocation decision making is not unprecedented, its widespread implementation across civil society would be. Therefore, it is impossible to predict what other ethical or clinical considerations would warrant consideration in the event triage in such a scenario. The following additional considerations, as well as others not specified here, should be considered to guide allocation decision making in the event of a widespread, prolonged, public health emergency. In the event that any of these additional considerations are appealed to as reasons for making allocation decisions, they should be explicitly documented, recorded, and integrated into the normal reporting by triage committees described above.

1. Resolving "Ties" Between Patients Within MPS Groups.

In the event that there are 'ties' in priority scores between patients and not enough critical care resources for all patients with the lowest priority score, it is ethically defensible to prioritize should go to younger patients. The ethical justification for this is that it is a valuable goal to give individuals equal opportunity to pass through the stages of life—childhood, young adulthood, middle age, and old age.[4] Younger individuals would receive priority because they have had the least opportunity to live through life's stages. There is a precedent for incorporating life-cycle considerations into pandemic planning. The U.S. Department of Health and Human Services' plan to allocate vaccines and antivirals

during an influenza pandemic prioritizes infants and children over adults.[5] Empirical data suggest that, when individuals are asked to consider situations of absolute scarcity of life sustaining resources, most believe younger patients should be prioritized over older ones.[6] Public engagement about allocation of critical care resources during an emergency also supported the use of the lifecycle principle for allocation decisions.[7]

If there are still ties after applying priority based on life cycle considerations, a lottery (i.e., random allocation) should be used to break the tie.

2. Categorical Exclusion Criteria:

A central feature of this allocation framework is that it avoids the use of categorical exclusion criteria to indicate individuals who should not have access to critical care services under any circumstances during a public health emergency. Categorical exclusion may be interpreted by the public that some groups are "not worth saving," leading to perceptions of unfairness. In a public health emergency, public trust will be essential to ensure compliance with restrictive measures. Thus, an allocation system should make clear that all individuals are "worth saving." One way to do this is to keep all patients who would receive mechanical ventilation during routine clinical circumstances eligible but allow the availability of ventilators to determine how many eligible patients receive it.

It should be noted that there are some conditions that lead to immediate or near-immediate death despite aggressive therapy such that during routine clinical circumstances clinicians do not provide critical care services (e.g., cardiac arrest unresponsive to appropriate ACLS, overwhelming traumatic injuries, massive intracranial bleeds, intractable shock). During a public health emergency, the duty to care and duty to steward resources align in underscoring physicians' obligations to make clinical judgments about the appropriateness of critical care use, based on the same criteria one would apply during normal clinical practice. Similarly, during crisis conditions, the duty to care, duty to steward resources, and commitment to procedural justice also align in support of physicians' obligations to appropriately respond to loved ones' requests for potentially inappropriate treatment, which may include refusing such requests after a fair procedure for responding to them has been implemented.[8]

3. Reciprocity: Prioritizing Those Who are Central to the Public Health Response.

Individuals who perform tasks that are vital to the public health response, including all those whose work directly supports the provision of acute care to others, will be given heightened priority. This category should be broadly construed to include those individuals who play a critical role in the chain of treating patients and maintaining societal order. The specifics of how to operationalize this consideration will depend on the exact nature of the public health emergency. Options include subtracting points from the priority score for these individuals or using it as a tiebreaker criterion. However, broadly speaking, it be inconsistent with distributive and procedural justice, and inappropriate under any circumstances to prioritize front-line *physicians* and not prioritize other front-line clinicians, such as nurses and respiratory therapists, and other key personnel such as maintenance staff and those who disinfect hospital rooms for new patients.

4. Communicating Allocation Decisions

Although the authority for allocation decisions rests with the triage team, there are several potential strategies to communicate allocation decisions to patients and families. Upon identifying that it a [HEALTH SYSTEM] region or facility is likely to experience surge conditions, it is incumbent upon [APPROPRIATE AUTHORITY] to support [APPROPRIATE AUTHORITY] in developing and distributing scripting to support appropriate communication by triage team members that fits each of the following envisioned communication scenarios.

The triage officer or delegated triage team member should first inform the affected patient's attending physician about the allocation decision, then they should collaboratively determine the best approach to inform the individual patient and family. Options for who should communicate the decision include: 1) solely the triage officer or team member; 2) solely the attending physician; 3) a collaborative effort between the triage officer, team member, and the attending physician or all three. The best approach will likely depend on a variety of local factors, including the dynamics of the individual doctor-patient-family relationship and the preferences of the attending physician. In general,

communications about allocation decisions should explain the severity of the patient's condition in an emotionally supportive way, explain the implications of those facts in terms of the allocation decision, and explain the palliative therapies available for the patient. It should also be emphasized that the allocation decision was not made by the attending physician but is instead one that arose from the extraordinary emergency circumstances and reflected a public health decision. It may also be appropriate to explain the medical factors that informed the decision, as well as the factors that were not relevant (e.g., race, ethnicity, insurance status, perceptions of social worth, immigration status, etc). Palliative care clinicians or social workers should be made available to provide ongoing emotional support to the patient and family.

During surge conditions, in anticipation of a crisis requiring widespread triage, personnel should be allocated by appropriate leaders at the regional or [APPROPRIATE AUTHORITY] level to develop communication for dissemination across all spans and layers, including appropriately to stakeholders outside of [HEALTH SYSTEM], such as governmental agencies, the media, and the public. These efforts cannot be the responsibility of members of local triage teams, as they will be preparing for the work of making allocation decisions.

5. Appeals Process for Allocation Decisions

In the event a patient's loved one or healthcare professional challenges individual allocation decisions, appeals mechanism is required 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 to withdraw a scarce resource from a patient who is clinically deteriorating.

For the initial allocation decision, it is recommended that 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. The process of evaluating the appeal should consist of the triage team verifying the accuracy of the priority score calculation by recalculating the score.

Decisions to withdraw a scarce critical care resource from a patient who is already receiving it may cause heightened moral concern and also depend on more clinical judgment than initial allocation decisions. Therefore, a more robust appeal process should be implemented for them, so long as the conditions of allocation decision making permit doing so. If appeals take up sufficient time that they impede other awaiting allocation decisions, then they should be limited only to verifying that the priority scoring was accurately calculated by recalculating the score. Time permitting, the more robust appeals process includes:

- The appeal should be immediately brought to a Triage Committee.
- The individuals who are appealing the allocation decision should explain their disagreement with the decision. An appeal may not be brought based on an objection to the overall allocation framework.
- The triage team should explain the grounds for the allocation decision that was made.
- The appeals process must occur quickly enough that the appeals process does not harm patients who are in the queue for the scarce resource. If this is untenable, simple verification priority scoring should be offered.
- The decision of the Triage Review Committee or subcommittee for a given hospital will be final.
- Periodically, the Triage Review Committee should retrospectively assess whether the review process is consistent with effective, fair, and timely application of the allocation framework.

An adaptation of a Model Hospital Policy by Douglas White, by Thomas V. Cunningham (tvc.hps@gmail.com), March 21, 2020

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