

Crisis Standard of Care Resource Allocation in Conditions of Absolute Scarcity

Principles and Guidelines
COVID-19 Outbreak
Washington Hospital

Executive Summary

Introduction: The purpose of this document is to provide guidance on a triage allocation system during a public health emergency in the event that the demand for critical care resources (beds, ventilators, etc.) overwhelms the supply available within our region. These triage recommendations will be enacted only if: 1) critical care resources are to the point of becoming overwhelmed regionally despite taking all appropriate steps, including transferring to other facilities, to increase surge capacity to care for critically ill patients; and 2) the Public Health Officer or other regional authority has declared a public health emergency. This allocation framework is grounded in ethical obligations that include the duty to care, duty to steward scarce resources to optimize population health, distributive and procedural justice and transparency. It is consistent with existing national recommendations for how to allocate scarce resources in a crisis standard of care.

This document describes 1) the creation of triage teams to ensure consistent and unbiased decision making; 2) allocation criteria for initial allocation decisions and 3) reassessment criteria to determine whether ongoing provision of scarce critical care resources are justified for individual patients.

Section 1. Creation of triage teams: An impartial, objective and multidisciplinary team appears to be a universally accepted and encouraged form of making decisions regarding allocation of resources nationwide in settings of a public health emergency. Washington Hospital supports such a team to remove the burden of rationing decisions from the bedside care team. The following document will outline the roles and responsibilities of the triage teams.

Section 2. Allocation criteria for utilization of scarce resources: Consistent with current and accepted standards during public health emergencies, the primary goal of this allocation framework is to maximize survival of the greatest number of people to hospital discharge. All patients who meet usual medical indications for critical care services will be assigned a priority score using a 1-8 scale (lower scores indicate higher likelihood of benefit from critical care resources and will be given priority). The scoring system is derived from 1) likelihood of surviving to hospital discharge, assessed with an objective and validated measure of acute physiology (e.g., the SOFA score); and 2) likelihood to survive a critical illness based on the presence of major and severely life-limiting comorbidities. Once priority scores have been calculated patients will be assigned to color-coded priority groups. All patients will be eligible to receive critical care services in accordance with their stated goals and wishes, regardless of their priority scores. Available critical care resources will be allocated according to priority

groups with the availability of resources determining how many priority groups will receive critical care. Patients who are triaged to not receive ICU beds or services will be offered medical care including intensive symptom management and psychosocial support.

Section 3. Reassessment for ongoing provision of critical care resources:

The triage team will conduct periodic reassessments of all patients receiving critical care services during times of crisis (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 crisis. A multidimensional, individualized 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 will have critical care discontinued. These patients will receive medical care including intensive symptom management and psychosocial support. Where available, specialist palliative care teams will provide additional support and consultation.

Introduction and Ethical Considerations

Introduction: Washington Hospital anticipates a surge in seriously and critically ill patients related to the Novel Coronavirus Disease-2019 (Covid19). This increase in demand of ICU-level care and services may result in shortages of these highly utilized resources, including materials, staffing and space. In response to this demand, Washington Hospital leadership, in conjunction with the Ethics Committee, has outlined a triage system to ensure equitable and just allocation of resources. The hospital has already begun to ensure identification of scarce resources, acquisition of additional supplies and personnel, and conservation of the materials identified with controlled distribution and re-allocation of resources when necessary. The hospital is also actively working on alternatives and work arounds for scarce resources.

When critical resources become substantially reduced or depleted, the adoption of crisis standard of care must follow. In this scenario, it is imperative that ethical standards remain at the cornerstone of decisions surrounding criteria for access to (and discharge from) ICU level of care. These criteria will not only be decided upon based on clinical appropriateness, but also by principles and concepts outlined below. These principles are a culmination of articles and statement pieces from various medical societies and healthcare systems and adopted here for use at Washington Hospital. It is our hope that similar guidelines and policies are utilized at the county and regional level in order to assure just allocation of resources throughout our community. It is also important that all patients be treated equally, regardless of disease, age, race, ethnicity, gender, disability, perceptions of quality of life, insurance or socioeconomic status, perceptions of social worth, immigration status, etc. as we have a duty and moral obligation to care for our marginalized population.

If crucial resources become so scarce that they need to be allocated on a case-by-case basis, such decisions will be made by the System Triage Team. This Triage Team will consist of physicians, nurses and members of the Ethics Committee none of whom are intimately involved in the care of the patient. Roles and responsibilities, along with steps to activate said team are discussed in more detail below.

Ethical principles of the allocation framework: Consistent with accepted standards during public health emergencies, a goal of the allocation framework is to achieve benefit for populations of patients, often expressed as doing the greatest good for the greatest number. 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. In addition, the framework is designed to achieve the following:

1. To create meaningful access for all patients. All patients who are eligible for ICU services during ordinary circumstances remain eligible, and there are no exclusion criteria based on age, disabilities, or other factors.
2. To ensure that all patients receive individualized assessments by clinicians, based on the best available objective medical evidence.
3. To ensure that no one is denied care based on stereotypes, assessments of quality of life, or judgments about a person’s “worth” based on the presence or absence of disabilities or other factors.

The four main guiding ethical principles in resource allocation during a public health emergency, which are universally accepted and will be the driving concepts embedded within this statement piece center around our *duty to care, duty to steward resources, distributive and procedural justice and transparency.*

Ethical Principle	Ethical Obligation
Duty to Care	Fundamental obligation shared by providers to care for all patients.
Duty to Steward Resources	Providers duty to responsibly manage resources during periods of true scarcity
Distributive Justice	Requires that an allocation system be applied broadly and consistently to be fair to all
Transparency	Ensures that the process is open to feedback and revision, and promotes public trust

The allocation framework is guided by the ethical mandate to maximize the number of lives saved while ensuring meaningful access for all patients and individualized patient assessments based on objective medical knowledge. Patients who are more likely to survive with intensive care are prioritized over patients who are less likely to survive with intensive care. Patients who

do not have a severely limited near-term prognosis are given priority over those who have major comorbid conditions and severely life-limiting conditions that correlate with reduced short-term survival. The assessment of severely limited life expectancy is based on individualized clinical judgment drawing on the best available objective medical evidence.

The allocation framework does not incorporate long-term life expectancy into priority scores. The reason is that doing so would unfairly disadvantage patients with a decreased long-term life expectancy from disabilities or from diseases exacerbated by social inequalities. Instead, the framework incorporates prognosis for near-term survival. An implication of this design choice is that the framework treats as equal all patients who are not in the late stages of a severe condition. For example, a patient expected to live 5 more years would receive equal priority for ICU treatment as a patient expected to live 65 more years. This step was taken to affirmatively diminish the impact of disabilities and social inequalities that negatively impact patients' life expectancy.

No use of categorical exclusion criteria:

The allocation framework does not categorically exclude any patients who, in usual circumstances, would be eligible for critical care resources. Instead, all patients are treated as eligible to receive critical care resources and are prioritized based on potential to benefit from those resources; the availability of critical care resources determines how many priority groups can receive critical care. There are compelling reasons to not use exclusion criteria. Washington Hospital wants to make clear that all individuals are “worth saving” and we have a duty and obligation to provide the best possible care in all instances. Moreover, categorical exclusions are too rigid to be used in a dynamic crisis, when ventilator demand will likely surge and decline episodically during the pandemic. In addition, such exclusions violate a fundamental principle of public health ethics: use the means that are least restrictive to individual liberty to accomplish the public health goal. Categorical exclusions are not necessary because less restrictive approaches are feasible, such as allowing all patients to be eligible and giving priority to those most likely to benefit.

In times of public health emergencies, Washington Hospital is committed to ensuring that the triage system does not disproportionately impact marginalized and vulnerable groups. Furthermore, this triage system will be utilized at the system level and affect all patients, not just those suffering from COVID-19.

Code Status for Critically Ill Patients:

It is recognized that there is a highly controversial and charged debate regarding the effectiveness and utility of CPR in critically ill patients, specifically those suffering from acute respiratory failure associated with COVID-19. **Washington Hospital does not endorse a blanket DNR policy for COVID-19 patients.**

The ethical framework that helps guide shared-decision making during normal situations should still hold true in a public health emergency. However, there are ethical obligations that go

beyond the individual in such extraordinary circumstances. Factors that take into account the safety and well-being of healthcare workers performing CPR along with the effectiveness of the treatment modality should be analyzed on a case-by-case basis. In situations in which the treating physician determines that the potential risks to staff along with the potential burden to the patient outweigh the potential benefits to such an intervention, then this treatment modality should not be offered. In this situation, informed assent, in which the treating physician asks the patient, or surrogate decision maker when appropriate, to allow them to make the code decision based on an individualized assessment of the persons' disease process, comorbidities and anticipated clinical course may be more helpful and therapeutic than the traditional informed consent.

For patients with known or suspected COVID-19 infection, the benefits and burdens are even more nuanced. All patients who are Full Code deserve high quality CPR and post-ROSC care in order to make the intervention as effective as possible. Similarly, all responders who are performing duties surrounding BLS/ACLS protocols must be given access to and should wear all appropriate PPE (in accordance with hospital policy) in order to protect themselves and others from becoming ill. If one or both of these two priorities cannot be met, then CPR should not be undertaken.

Even if it may not be possible to provide critical care services to all patients who might be in need, our goal is to align with patients and their families and loved ones to demonstrate our commitment to their care and well-being by emphasizing empathetic, direct, and transparent communication, proactively engaging in goals of care conversations, and actively utilizing the services of the palliative and spiritual care teams.

Section 1: Triage Team Composition, Activation, Process, Communication of Decision Making, and Appeals Process

The Washington Hospital Triage Team will have responsibility to implement the allocation framework outlined in this policy. It is important to emphasize that patients' treating physicians should not make triage decisions. The separation of the triage role from the clinical role is intended to enhance objectivity, avoid conflicts of commitments, and minimize moral distress. Similarly, Triage Team members will be recused from participating in any triage discussions or decisions if they have a loved one hospitalized at Washington Hospital in need of critical care services.

Triage Team Composition

The triage team will be composed of:

- One attending physician with general knowledge of critical care
- One nurse leader
- One physician member of the Ethics Committee

Within this group, Triage Officer(s) could be appointed and would take call to help make decisions that are more time sensitive than would be allowable for an entire assembly of the Triage Team. Any decisions made by the Triage Officer, without the entire Team, will be reviewed as soon as a meeting with the entire Triage Team is able to be coordinated.

Washington Hospital will maintain a collective group of physicians, nurses and Ethics Committee members with familiarity with the ethical implications associated with these delicate triage decisions.

Washington Hospital recognizes that Triage Team members may be personally affected by the crisis, or suffering moral distress due to the demands of their role. If at any point in time a Triage Team member feels they are unable to fulfill their role, they can request to be excused from the Triage Team.

Activation of the Triage Team

Step 1: Public Health Officer or Command Center activates “**Crisis Standard of Care**”

Defined by lack of critical care beds, ventilators or other scarce resource throughout the region and to begin allocation of said resources on a triage basis

Step 2: The ICU attending(s) will assign all critical care patients a raw priority score and give them the appropriate Color Code

Step 3: Command Center activates the Triage Team

Triage Team Process

- Triage Team convenes to discuss triage options and make triage decisions by consensus.
- The Triage Team will be given information about availability of resources, priority scores, and priority groupings.
- The Triage Team will be given only clinically relevant and non-identifying information of all patients who are currently requiring ICU level of care.
- The Triage Team will meet (remotely if needed) to discuss the above patients and triage them with a multi-principle approach.
- The team will make decisions about withholding, withdrawing, initiating, and continuing ICU level of care for each patient
- Once a decision has been made, a member of the Triage Team will notify the team, patient, and surrogate decision maker as appropriate.
- Documentation will be done by the Triage Team

Communication of triage decisions to patients and surrogate decision makers

Although the *authority* for triage decisions rests with the triage team, there are several potential strategies to *disclose* triage decisions to patients and surrogate decision makers.

Communicating triage decisions to patients and/or their surrogate decision makers is a required component of a fair allocation process that provides respect for persons. The triage team 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/or surrogate decision maker. Options for who should communicate the decision include: 1) solely the attending physician; 2) solely the triage team; or 3) a collaborative effort between the attending physician and triage team. The best approach will depend on a variety of case-specific factors, including the dynamics of the individual doctor-patient relationship and the preferences of the attending physician. If the attending physician is comfortable with undertaking the disclosure, 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 a triage team member would explain the implications of those facts in terms of the triage decision. A triage team member 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 reflects 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 factors that were not relevant (e.g., disease, age, race, ethnicity, gender, disability, perceptions of quality of life, insurance or socioeconomic status, perceptions of social worth, immigration status, among others). If resources permit, palliative care, spiritual care, and social work may also be helpful to provide ongoing emotional support to the patient and loved ones.

Appeals process for individual triage decisions

It is possible that patients, surrogate decision makers, 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 who is not clearly benefiting from that resource. This is because initial triage decisions for patients awaiting the critical care resource will likely be made in highly time-pressured circumstances. Therefore, an appeal will need to be adjudicated in real time to be operationally feasible. 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. 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 team should be prepared to explain the calculation to the patient or surrogate decision maker on request.

Decisions to withdraw a scarce resource such as mechanical ventilation from a patient who is already receiving it may cause heightened moral concern. Furthermore, such decisions depend

on more clinical judgment than initial allocation decisions. Therefore, there should be a more robust process for appealing decisions to withdraw or reallocate critical care beds or services. Elements of this appeals process should include:

- The individuals appealing the triage decision should explain to the triage team the grounds for their appeal. Appeals based in an objection to the overall allocation framework should not be granted.
- The triage team should explain the grounds for the triage decision that was made.
- Appeals based in considerations other than disagreement with the allocation framework should immediately be brought to the Command Center is independent of the triage team and of the patient's care team.
- The appeals process must occur quickly enough that the appeals process does not harm 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 Command Center or their designees will be final.
- Periodically, the Ethics Committee should retrospectively evaluate whether the review process is consistent with effective, fair, and timely application of the allocation framework.

Section 2: Allocation Process under Crisis Standard of Care

The purpose of this section is to describe the allocation framework that should be used to make initial triage decisions for patients 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 critical illness, not merely those with the disease or disorders that have caused the public health emergency. For example, in the setting of a severe pandemic, those patients with respiratory failure from illnesses not caused by the pandemic illness will also be subject to the allocation framework. This process involves two steps, detailed below:

1. Calculating each patient's priority score based on the allocation framework;
2. Determining each day how many priority groups will receive access to critical care interventions.

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 team to assess the patient for critical resource allocation.

Step 1: Calculation of each patient's priority score using the multi-principle allocation framework

As outlined in **Table 1** below, points are assigned according to the patient’s Sequential Organ Failure Assessment (SOFA) score and according to SOFA clinical parameters outlined in **Table 2** below, as well as a determination that a patient has a medical comorbidity or chronic condition that limit short-term survival (**Table 3**) These are then 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 will be given to those with lower scores.

Of note, some examples of conditions for which there is significant evidence regarding low likelihood of short-term survival or risks of short-term mortality from critical illness are included in Tables 3, but these are not intended to be exhaustive lists. The conditions in Tables 3 appear only because they help predict short-term survival: the fact that someone will, for example, have less than 5-year expected survival is not alone a reason to add triage points unless that fact correlates with short-term mortality. Moreover, among the conditions that correlate with reduced short-term survival, more priority points are assigned to severely life-limiting comorbidities than to major comorbidities, since the former have a greater influence on short-term mortality than the latter, such that even in the absence of critical illness they shorten survival. Assumptions about post-hospitalization quality of life should not be included in the individualized assessment of patients’ prognoses.

In addition, in order to maximize the number of lives saved, assessments will be made of immediate catastrophic illness or injury that portends low likelihood of short-term survival (**Table 4**). Patients assessed to have an immediate catastrophic illness or injury are not categorically excluded from critical care, but are assigned to a different priority category based on their extremely high risk of death.

Table 5 outlines groups of patients for whom special considerations may apply in the form of temporary exemptions and point adjustments.

Pregnant patients will be assigned a priority score based on the same framework used for non-pregnant patients. If a pregnant patient is at or beyond the usual standards for fetal viability, the patient will be given a two-point reduction, giving her a higher priority score.

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

Principle	Specification	Point System*			
		1	2	3	4
Current Overall Clinical	Prognosis for acute survival (SOFA score [#])	SOFA score < 6	SOFA score 6-9	SOFA score 10-12	SOFA score > 12

Status					
Co-occurring conditions that moderate mortality	Co-occurring conditions that influence acute survival	...	Major comorbid condition(s)	...	Severely life-limiting condition(s)

Table 2. Sequential Organ Failure Assessment (SOFA) Scoring System

Variable	SOFA Score				
	0	1	2	3	4
PaO ₂ /FiO ₂ mm Hg	>400	301-400	201-300	101-200	<100
Platelets, x10 ³ /μL	>150	101-150	51-100	21-50	≤20
Bilirubin, mg/dL (μmol/L)	<1.2 (<20)	1.2-1.9 (20-32)	2.0-5.9 (33-100)	6.0-11.9 (101-203)	>12 (>203)
Hypotension	None	MABP <70mmHg	Dop <5	Dop 6-15 <i>or</i> Epi ≤0.1 <i>or</i> Norepi < 0.1	Dop >15 <i>or</i> Epi > 0.1 <i>or</i> Norepi > 0.1
Glasgow Coma Score	15	13-14	10-12	6-9	<6
Creatinine, mg/dL (μmol/L)	<1.2 (<106)	1.2-1.9 (106-168)	2.0-3.4 (169-300)	3.5-4.9 (301-433)	>5 (>434 or anuric)

*FIO₂=fraction of inspired oxygen; MAP mean arterial pressure; PaO₂ partial pressure of oxygen

**Hypotension:

- MABP=mean arterial blood pressure in mm Hg [diastolic + 1/3(systolic-diastolic)]
- Dop=dopamine in micrograms/kg/min
- Epi=epinephrine in micrograms/kg/min
- Norepi=norepinephrine in micrograms/kg/min

Table 3: Medical comorbidities and chronic conditions that limit short-term survival

Major comorbidities that are associated with increased risk of short-term mortality from critical illness	Severely life-limiting comorbidities associated with high mortality even in absence of critical illness (survival typically ≤ 1 year), and which are correlated with significantly increased risk of short-term mortality from critical illness
<ul style="list-style-type: none"> ● Pre-existing neurological condition (dementia, stroke, other neurodegenerative disease) with baseline modified Rankin Score > 4 ● ACC/AHA Stage C heart failure, NYHA Class II-IV ● Severe, inoperable multi-vessel coronary artery disease or valvular disease ● WHO Class 3 pulmonary hypertension (symptomatic with minimal exertion, asymptomatic only at rest) ● Moderately severe chronic lung disease (e.g., COPD, IPF) but not requiring chronic oxygen or ventilation ● End stage renal disease on dialysis ● Cirrhosis with MELD <20 and history of prior decompensation 	<ul style="list-style-type: none"> ● Minimally conscious or unresponsive wakeful state from prior neurological injury ● ACC/AHA Stage D heart failure ● WHO Class 4 pulmonary hypertension ● Severe chronic lung disease with FEV1 < 20% predicted, FVC < 35% predicted, or in absence of PFTs, chronic home O2 at rest or mechanical ventilation ● Cirrhosis with MELD score ≥20 ● Metastatic cancer with expected survival ≤1 year despite treatment ● Refractory hematologic malignancy (resistant or progressive despite conventional initial therapy) ● Terminal illness with Clinical Frailty Scale Score ≥8

It should be noted that these conditions appear on these lists only because they help predict short-term survival in critical illness: the fact that someone will, for example, have less than a 5-year expected survival is not alone a reason to add triage points unless that fact correlates with short-term mortality. Moreover, among the conditions that correlate with reduced short-term survival, more priority points are assigned to those severely life-limiting comorbidities than to major comorbidities, since the former have a greater influence on short-term mortality than the latter, such that even in absence of critical illness they shorten survival.

Table 4: Catastrophic medical conditions with low likelihood of short-term survival present at presentation

Refractory cardiac arrest	<ul style="list-style-type: none"> ● Any unwitnessed out of hospital cardiac arrest without ROSC prior to arrival ● Any witnessed cardiac arrest with inability to obtain ROSC after 60 minutes from onset without a shockable rhythm present
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Hypoxic-ischemic brain injury after cardiac arrest	<ul style="list-style-type: none"> ● Coma (inability to respond to verbal commands) after ROSC from cardiac arrest with non-shockable rhythm without confounding drugs, toxins, or metabolic derangements
Severe burns	<ul style="list-style-type: none"> ● American Burn Association expected mortality $\geq 90\%$ (Table 7 in Appendix 1)
Severe trauma	<ul style="list-style-type: none"> ● Trauma Injury Severity Score predicting $\geq 90\%$ mortality (Table 8 in Appendix 1)
Severe neurological injury (rule out confounders to clinical assessment such as sedation, transient seizure, or treatable hydrocephalus)	<ul style="list-style-type: none"> ● Non-traumatic intracerebral hemorrhage with max-ICH Score > 9 (Table 9 in Appendix 1) ● Aneurysmal subarachnoid hemorrhage with HAIR Score = 8 (Table 10 in Appendix 1) ● Traumatic brain injury with $> 90\%$ predicted death on IMPACT score²⁵ ● Coma in ischemic stroke with brainstem infarction due to basilar artery occlusion which is non-revascularized or without clinical improvement after revascularization.

Table 5: Special considerations for triage allocation: exemptions and point adjustments

Group	Initial Triage	First reevaluation	Second reevaluation	Reevaluations thereafter
Pregnant person (If estimated gestational age ≥ 24 weeks; if intrauterine fetal demise or delivery, then triage as usual)	Triage as usual, deduct 4 points	Triage as usual, deduct 4 points	Triage as usual, deduct 4 points	Triage as usual, deduct 4 points
Acute illness which portends < 48 hours of utilization of	Exempt for 48 hours, then initial triage at that time as usual, start triage clock at time 0	Triage as usual	Triage as usual	Triage as usual

scarce resource (examples include: need for emergent surgery, acute overdose, etc)				
Post-operative, complex non- transplant surgery	Exempt for 120 hours, then initial triage at that time as usual, start triage clock at time 0	Triage as usual	Triage as usual	Triage as usual
Pre-transplant, active organ offer	Exempt only during time offer being evaluated, start triage clock at time of pause	Triage as usual	Triage as usual	Triage as usual

Step 2: Assign patients to color-coded priority groups

Once a patient’s priority score is calculated using the multi-principle scoring system described in Table 1, each patient should be assigned to a color-coded triage priority group (**Table 6**). This color-coded assignment of priority groups is designed to allow the Triage Team to create operationally clear priority groups to receive critical care resources, according to their score on the multi-principle allocation framework. 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 6. Assigning Patients to Color-coded Priority Groups

Triage Categories	Assessment of Mortality
<p style="text-align: center;">Red</p> <p>Highest priority for critical care services, higher likelihood of survival. Use life-saving resources as available.</p>	<p style="text-align: center;">Allocation Score 1-3</p>
<p style="text-align: center;">Orange</p> <p>Intermediate priority for critical care services, intermediate likelihood of survival.</p>	<p style="text-align: center;">Allocation Score 4-6</p>
<p style="text-align: center;">Yellow</p> <p>Lower priority for critical care services, higher risk of death. Use life-saving resources as available.</p>	<p style="text-align: center;">Allocation Score 7-8</p>
<p style="text-align: center;">Green</p> <p>Critical care not currently needed due to clinical stability. Use alternative forms of medical intervention or defer or discharge. Reassess as needed.</p>	<p style="text-align: center;">No significant organ failure AND/OR No requirement for life- saving</p>
<p style="text-align: center;">Blue</p> <p>Lowest priority for critical care services due to extremely high risk of death. Use alternative forms of medical intervention and/or palliative care or</p>	<p style="text-align: center;">Acute catastrophic condition (Criteria from Table 2)</p>
<p style="text-align: center;">Violet</p> <p>Temporary exemption from triage allocation scoring. Continue to use critical care resources until exemption lapses.</p>	<p style="text-align: center;">See criteria in Table 5</p>

Step 3: Make daily determination of how many priority groups can receive the scarce resource

The triage team will make determinations daily, or more frequently if needed, about which priority groups will have access to critical care services based on the availability of those resources. These determinations should be based on 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). For example, if there is clear evidence that there is imminent shortage of critical care resources (i.e., few ventilators available and large numbers of new patients daily), only patients in the highest priority group (Red group) should receive the scarce critical care resource. As scarcity subsides, more priority groups (e.g., first Orange group, then Yellow group) should have access to critical care interventions.

Resolving “ties” between patients.

All patients within each color-coded group are considered equal, regardless of their raw score. In the event there are not enough resources for all patients within a certain triage bracket, then a random lottery will be utilized to resolve these ties. Use of a random lottery is supported in other triage guidelines/protocols throughout the region, state and country.

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/ventilation will receive medical care that includes intensive symptom management and psychosocial support. 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/ventilator support

The purpose of this section is to describe the process the Triage Team should use to conduct reassessments on patients who are receiving critical care services, in order to determine whether s/he continues with the treatment.

Ethical goal of reassessments of patients 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 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 patients who are allocated critical care services (other than those who receive critical care briefly to allow for initial triage by the Triage Team and are subsequently determined to be unable to receive critical care based on priority assignment) will be allowed a therapeutic trial of a duration to be determined by the clinical characteristics of the patient’s disease and the expected trajectory of recovery. To the extent that the public health emergency involves a novel disease, the decision about trial duration for patients with that novel disease will ideally be made as early in the public health emergency as possible, when data become available about the natural history of the disease. The trial duration for such patients should be modified as appropriate if subsequent data emerge which suggest the trial duration should be longer or

shorter. Trial duration will also need to be tailored for other non-pandemic diseases and patient contexts, given the concern that patients with certain disabilities may need longer trials to determine benefit. Patients who present for acute care and are already using a ventilator chronically for pre-existing respiratory conditions (e.g., home ventilation or ventilation at a skilled nursing facility) should NOT be separated from their chronic ventilator to reallocate it to other patients.

The triage team will conduct periodic reassessments of patients receiving critical care/ventilation based on information provided by the clinical team. 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/ventilation 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 should have critical care withdrawn, including discontinuation of mechanical ventilation, after this decision is disclosed to the patient or surrogate decision maker. 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.

Rapid reassessment of patients unable to be triaged initially

Those patients who receive critical care services (e.g. mechanical ventilation) emergently in order to allow time for initial triage by the triage team, but who are subsequently determined to be unable to receive critical care based on priority assignment, will receive medical care including intensive symptom management and psychosocial support. They will not receive a full trial of critical care as described above. By way of example, this might include patients intubated in the field, patients intubated emergently in the emergency department, patients with severe trauma stabilized in the emergency department and brought to the ICU, and patients resuscitated on a medical floor in a code situation. The appeals process for withdrawal of critical care described above will not apply to these patients.

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, 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.

This is a working document and one that will be continually updated as more becomes understood surrounding the public health emergency and the disease severity within our community.

APPENDIX 1

Table 7: American Burn Association mortality estimates (Taylor et al., 2014)

Age (yrs)	Burn Size (% total body surface area)									
	0-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91%+
5.0 - 19.9	Out-patient	Very high	Very high	High	High	High	Medium	Medium	Medium	Low
20.0 - 29.9	Out-patient	Very high	Very high	High	High	Medium	Medium	Medium	Low	Low
30.0 - 39.0	Out-patient	Very high	Very high	High	Medium	Medium	Medium	Medium	Low	Low
40.0 - 40.9	Out-patient	Very high	Very high	Medium	Medium	Medium	Medium	Low	Low	Low
50.0 - 59.9	Out-patient	Very high	Very high	Medium	Medium	Medium	Low	Low	Low/Expectant	Low/Expectant
60.0 - 60.9	Very high	Very high	Medium	Medium	Low	Low	Low	Low/Expectant	Low/Expectant	Low/Expectant
70.0 +	Very high	Medium	Medium	Low	Low	Low/Expectant	Expectant	Expectant	Expectant	Expectant

Outpatient: Survival and good outcome expected, without requiring initial admission.
Very high: Survival and good outcome expected with limited/short-term initial admission and resource allocation (straightforward resuscitation, length of stay < 14 – 21 days, 1 – 2 surgical procedures).
High: Survival and good outcome expected (survival ≥ 90%) with aggressive and comprehensive resource allocation, including aggressive fluid resuscitation, admission ≥ 14 – 21 days, multiple surgeries, prolonged rehabilitation.
Medium: Survival 50 – 90% and/or aggressive care and comprehensive resource allocation required, including aggressive resuscitation, initial admission ≥ 14 – 21 days, multiple surgeries and prolonged rehabilitation.
Low: Survival < 50% even with long-term aggressive treatment and resource allocation.
Expectant: Predicted survival ≤ 10% even with unlimited aggressive treatment.

Table 8: Trauma Injury Severity Score Survival Probabilities (Boyd et al., 1987, Domingues et al., 2018)

Trauma Score	Probability of Survival
16	99%
15	98%
14	95%
13	91%
12	83%
11	71%

10	55%
9	37%
8	22%
7	12%
6	7%
5	4%
4	2%
3	1%
2	0%
1	0%

Table 9 Determination of the max-ICH Score

Component	Points
NIH Stroke Scale score	
0-6	0
7-13	1
14-20	2
≥21	3
Age (years)	
< 69	0
70-74	1
75-79	2
≤ 80	3
Intraventricular hemorrhage	
No	0
Yes	1
Oral Anticoagulation	
No	0
Yes	1
Lobar ICH volume, cm ³	
< 30	0
≥ 30	1
Nonlobar ICH volume, cm ³	
< 10	0

> 10	1
Total max-ICH score	0-10

Abbreviations: ICH=intracerebral hemorrhage; NIHSS=NIH Stroke Scale. All components indicate measures on initial examination or initial CT/MRI. Lobar ICH was defined as ICH originating at the cortex and cortical–subcortical junction. Nonlobar ICH included deep, cerebellar, and brainstem origin. Deep ICH location was defined as ICH exclusively involving basal ganglia, thalamus, internal capsule, and deep periventricular white matter. ICH encompassing both deep and lobar location should be scored according to the location that ICH most likely originated from. Thus, more than 1 point referring to ICH volume can only be reached by the rare event of 2 distinct ICH (1 large lobar and 1 large nonlobar ICH).

Reference:

Sembill JA, Gerner ST, Volbers B, et al. Severity assessment in maximally treated ICH patients: The max-ICH score. *Neurology* 2017;89:423-31.

Table 10 Determination of the subarachnoid hemorrhage (HAIR) score

Component	Points
Hunt-Hess Scale score	
5	4
4	1
1-3	0
Age (years)	
≥80	2
60-80	1
< 60	0
Intraventricular hemorrhage	
Yes	1
No	0
Re-bleed within 24 hours	
Yes	1
No	0
Total HAIR score	0-8

Reference:

Lee VH, Ouyang B, John S, et al. Risk stratification for the in-hospital mortality in subarachnoid hemorrhage: the HAIR score. *Neurocrit Care* 2014;21:14-9.

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