

Hospitals and Clinics Administration

ENTERPRISE # 0123

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TO: Enterprise Employees, Contractors, Medical Staff, and Volunteers

FROM: Paul E. Lorenz
Chief Executive Officer, Enterprise

SUBJECT: Crisis Standards of Care During a Public Health Emergency

Location (includes hospital and all inpatient and outpatient locations and subacute facilities of the hospital, unless otherwise indicated)	
Enterprise Wide	X
O'Connor Hospital	
Santa Clara Valley Medical Center	
St. Louis Regional Hospital	

This document provides guidance to SCVHHS Enterprise, hospital leadership, hospital ethics committees, and frontline healthcare professionals for the triage of critically ill patients when a public health emergency creates demand for resources (e.g., ventilators, critical care beds, medications) that outstrips the 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. This plan will only be activated when all resources in the county have reached the crisis level and critical resources are unavailable county wide. This policy applies to patients in all hospitals throughout the Enterprise. **A separate triage scoring process applies to children age 0-17 and is attached as Appendix A Pediatric and Neonatal Crisis Standards of Care During a Public Health Emergency.**

Ethical Framework

It is imperative that the teams who take on the difficult task of allocating scarce resources are supported by an explicit and comprehensive ethical framework. The Enterprise's plan 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. The California Department of Public Health (CDPH) has issued Pandemic Crisis Guidelines, including a table with Strategies for Scarce Resource Situations (see Appendix B, CDPH Strategies for Scarce Resource Situations for reference). Appendix B may be consulted for strategies from CDPH, which may be updated from time to time. Every effort shall be made to move patients and resources throughout the Enterprise to avoid exhausting scarce resources. When usual supply chain sources are exhausted, the Hospital Incident Command (HICS) shall issue supply resource requests through the local Medical and Health Operational Area Coordinator (MHOAC), who in turn will attempt to fill these requests through regional and state level stores of supplies and various procurement capability. During declared disasters CDPH and the state Emergency Medical System authorities track health care resources including hospital med/surge and ICU surge capacity, ventilators, and other supplies and will help coordinate the allocation and distribution or re-distribution of those scarce resources.

Distributive and Procedural Justice

SCVHHS's approach to crisis standards of care is that such tragically difficult decisions must be based on criteria that ensure that every patient has equitable access to any care from which they might benefit. **Allocation criteria must be as clear, transparent, and objective as possible, and must be based on biological factors related only to the likelihood and magnitude of benefit from a scarce resource.** Factors that have no bearing on the likelihood or magnitude of benefit, including but not limited to race, disability, gender, sexual orientation, gender identity, ethnicity, ability to pay, socioeconomic status, perceived social worth, perceived quality of life, immigration status, incarceration status, housing status or past or future use of resources, are irrelevant and will not be considered by those making allocation decisions. A system of allocation during crisis must be applied consistently and broadly, to maximize the opportunity for fairness and to 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 for the most vulnerable or those who suffer disproportionately.

Transparency

To the extent practically feasible, crisis care plans should be communicated as efficiently, widely, and comprehensively as possible across the healthcare system and within the community, inclusive of government agencies, nearby healthcare facilities, staff, patients, and other stakeholders. Such transparency is intended to build stakeholder trust and to minimize actual and vicarious negative impacts on patients, loved ones, staff, and members of the public after the crisis has abated.

Creation of Triage Teams and Triage Oversight and Review Committee

Definition of Triage Teams

The SCVHHS Enterprise shall establish triage teams whose responsibility it is to implement the allocation framework in this policy. The triage teams will be created under each hospital's medical

director or physician executive. The triage team is a group of healthcare workers and community members who are not involved in the clinical care of patients that are being triaged. The goal of creating the triage team is to relieve the moral distress of having the treating physicians be required to choose who receives an allocated resource and avoid ad hoc decisions. **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.**

Definition of Triage Oversight and Review Committee

The Triage Oversight and Review Committee should be made up of at least three individuals, recruited from the following groups or offices: Medical Director or designee, Chief Nursing Officer or designee, County Counsel (as a non-voting member), hospital Ethics Committee or Consult Service, and/or an off-duty triage team member. In addition, the Triage Oversight and Review Committee should have representation consistent with the patient population being served. Three committee members are needed for a quorum to render a decision, using a simple majority vote.

Executive Support

Local senior leaders, including physicians and Hospital Administration, are responsible for appointing members of triage teams, and Triage Oversight and Review Committee, preferably no later than during surge conditions. A roster of approved triage team should be maintained that is large enough to ensure that a team will always be available on short notice; that team members will 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).

Responsibility of Triage Teams

A triage team reports to the medical director or physician executive. Triage teams should be implemented no later than in surge conditions. Each team is led by a Triage Leader who shall be the intensivist, hospitalist, or physician with the highest level of training in critical care on the triage team. 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 include a physician with intensivist or hospitalist background, a representative from critical care nursing, representative from social services, a member of the ethics committee and a community member of the Ethics Committee or volunteer approved by the medical director. In the event of shortages, at a minimum a physician (intensivist or hospitalist) critical care nurse and one other member must participate.

Responsibility of Triage Oversight and Review Committee

The Triage Oversight and Review Committee reports to the Enterprise Chief Medical Officer, or designee. The Triage Oversight and Review Committee shall decide appeals for withdrawal of scarce recourse, and periodically evaluate whether the review process is consistent with effective, fair and timely application of the allocation framework. The appeal review process can happen by telephone or in person, and the outcome should be promptly communicated to whomever brought the appeal.

Activation of Triage Team

During crisis conditions, the triage team will be activated by the HICS. Once activated, teams will use the explicit allocation framework described in this policy to determine priority grouping for all patients eligible to receive scarce resources (see Appendix C Triage Workflow for detailed process). 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 Leader 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 scarce resource.

Quality Assessment, Oversight, and Reporting

As widespread crisis care triage would be novel at SCVHHS Enterprise, if this policy is implemented and as triage teams perform allocation decision making in multiple sites over a prolonged time period, the HICS 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, HICS is responsible for allocating a quality analyst or individual with equivalent capabilities, to be overseen by the Medical Director and /or hospital physician executive, to process the data emerging from local triage team activities, so that it can be regularly reported to SCVHHS Enterprise HICS for the purposes of oversight.

Procedure for Activation of Crisis Care Protocol

1) Assumptions-

- The wide spread of infectious disease may result in a surge of patients requiring medical care that could overwhelm local and regional resources.
- Healthcare facilities may experience extreme resource challenges that may include: inadequate inpatient or outpatient care space, supply and equipment shortages, and/or lack of sufficient trained personnel, and may become overwhelmed with persons seeking care.
- Coordination among response partners at all levels (facility, local, regional, state, and federal) is expected to best meet medical surge needs.
- Crisis standards of care are to be activated only in extraordinary circumstances when the level of demand for medical care exceeds available resources and crisis operations will be in effort for a sustained period.

- 2) **Initiation of Crisis Care Protocol** -Potential Triggers to initiate Crisis Care Protocol include but are not limited to:
- a) Lack of critical equipment/supplies including but not limited to:
 - i) Mechanical ventilators or other oxygen delivery devices
 - ii) Beds
 - iii) Medical gases
 - iv) Antibiotics
 - v) Vasopressors and critical care medications
 - vi) Crystalloid and blood products
 - vii) Operating room equipment
 - viii) Antiviral Medication
 - ix) Dialysis equipment and supplies
 - b) Lack of critical infrastructure, including but not limited to:
 - i) Respiratory therapists
 - ii) Personal protective equipment
 - iii) Decontamination equipment
 - iv) Power
 - v) Staff support (food, housing, medication)
 - c) Inability to transfer patients to another facility
 - d) Lack of adequate support staff and healthcare workers (MD, RN, RT, etc.)

During activation of the crisis care protocol, 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 respiratory support should be offered to allow the triage team 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 scarce resources.

Chronic ventilator patients are subject to the crisis care protocol. However, chronic ventilator patients using their own ventilators will not have their ventilators reallocated.

Overview of Procedure

A patient's attending physician cares for his/her patient and performs all clinical evaluations. A triage team examines a patient's clinical data and determines the patient's level of medical need for a scarce resource (i.e., who is eligible for and/or continues to have access to scarce resource). The protocol consists of two steps: (1) assessment of mortality risk, and (2) periodic clinical assessments ("time trials"). Based on these initial and ongoing assessments, patients will be placed in one of 4 priority groups. Priority groups will receive care beginning with the highest priority and ending with the lowest priority. As patients with higher priority enter the system, patients in lower priority groups may lose access to the resource (i.e. ventilator, ICU care).

Procedure for Triage Team's Operations

- 1) Triage Team: Working under the HICS, the following members will be activated and comprise the triage team. The triage team works closely with the medical director or physician executive and HICS at each hospital. At a minimum, the team will include a physician as described below, critical care nurse and one other member. If possible, each team will have one of the following members:
 - a) Intensivist or Hospitalist with Critical Care Background
 - b) Representative from Critical Care Nursing
 - c) Member of the Ethics Committee
 - d) Representative from Social Services
 - e) Community member (either a community member of the Ethics Committee, retired member of the medical staff, or chaplain)
- 2) Duties of the Triage Team
 - a) Receives number of scarce resource available and determination of which numerical group, following the scoring process below, will have access to the resource from HICS.
 - b) Evaluates patients in need of scarce resource (i.e. critical care, ventilatory support, medications).
 - c) Performs reassessment at weekly intervals for two weeks and then every three days for all patients receiving a critical resource. Between these intervals, the treating team can notify the triage team of any significant change in the clinical picture, which prompts a reassessment by the triage team. Standard care will be followed between these intervals, which may include withdrawing resource prior to next evaluation.
 - d) Advises and assists the healthcare system to carry out the mission during a public health emergency through resolution of uncertainties and disputes over the healthcare systems capacity.
 - e) Reviews all triage decisions retrospectively to create a routine quality review process.
 - f) Is involved in the real-time appeals process regarding triage decisions.

Procedure for Triage and Allocation of Scarce Resources. The triage framework must be applied to all patients presenting with critical illness and needing a scarce resource, not simply to those with the disease or disorder that arise from the public health emergency. (See Appendix A for the scoring process for children age 0-17)

- 1) **Patients shall receive a Sequential Organ Failure Assessment (SOFA) score based on established guidelines.**

This score will be automatically calculated within the electronic medical record.

Sequential Organ Failure Assessment (SOFA) Score Scale

Santa Clara Valley Medical Center Adapted SOFA Score

SOFA Score					
Variables	0	1	2	3	4
<i>Respiratory</i>					
PaO ₂ /FI _O ₂ [†]	>400	≤400	≤300	≤200	≤100
<i>Coagulation</i>					
Platelets (10 ³ /mm ³)	>150	≤150	≤100	≤50	≤20
<i>Liver</i>					
Bilirubin (mg/dL)	<1.2	1.2 - 1.9	2.0 - 5.9	6.0 - 11.9	>12.0
<i>Cardiovascular[‡]</i>					
Hypotension	MAP ≥70 mmHg	MAP <70 mmHg	NE [†] <0.05, or PE [†] <40	NE [†] 0.05 - 0.1, or PE [†] 40 - 100, or EPI [‡] ≤0.1	NE [†] >0.1, or PE [†] >100, or EPI [‡] >0.1
<i>CNS</i>					
Glasgow Coma Score	15	13 - 14	10 - 12	6 - 9	<6
<i>Renal</i>					
Cr (mg/dL) or Urine output (mL/day)	<1.2	1.2 - 1.9	2.0 - 3.4	3.5 - 4.9 or <500	>5.0 or <200

MAP = mean arterial pressure; CNS = central nervous system; SaO₂ = peripheral arterial oxygen saturation; Cr = creatinine

ABW = actual body weight; IBW = ideal body weight; ADW = adjusted weight [= IBD + 0.4 x (ABW – IBW)]

Additional Clinical Information regarding SOFA Glasgow Coma Scale Score Criteria

Criteria	Adults	Score	Criteria Score
Best Eye Response (1 – 4)	No eye opening	1	
	Eye opens to painful stimulus	2	
	Eye opens to verbal command	3	
	Eyes open spontaneously	4	
Best Verbal Response (1 – 5)	No verbal response	1	
	Incomprehensible sounds	2	
	Inappropriate words	3	
	Confused	4	
	Oriented	5	
Best Motor Response (1 – 6)	No motor response	1	
	Extension to painful stimulus	2	
	Flexion to painful stimulus	3	
	Withdraws from painful stimulus	4	
	Localizes to painful stimulus	5	
	Obeys commands	6	
Total Score (add three subscores, range from 3 to 15):			

- 2) The Glasgow Coma Scale score should not add points to the SOFA score when a patient cannot articulate intelligible words, even if this condition is due to a pre-existing speech disability or chronic ventilation. Clinicians should use clinical judgment to adjust SOFA scores downward where appropriate to account for chronic baseline levels of physiological functional impairment, including for any temporary elevation of a score or score element caused by any patient inability to access a regularly used stabilizing device or treatment (such as a CPAP or BiPAP unit, dialysis, or specific medications).
- 3) **Using the Multi-Principle Strategy** (See table below) calculate patient’s score from 1-8 based on SOFA score and comorbidities
 - a) Enter patient’s SOFA score into the MPS Scoring system to determine score from 1-4

- b) The primary physician will perform an assessment of patient’s comorbidities (see Appendix D MPS Scoring/Comorbidity Table for scoring) and assign a score of 0, 2 or 4 for comorbid conditions. This will be documented in the EHR.
 - i) Under crisis conditions, it is expected 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.
- c) Using Table 1 below, calculate the MPS Score (1-8) based on the SOFA score combined with the comorbidities score.

Table 1. Multi-Principle Strategy for Allocation of Scarce Resources During a Public Health Emergency

Principle	Specification	Point System*			
		1	2	3	4
Short-term survival	Prognosis for short-term survival (SOFA score [#])	SOFA score < 6	SOFA score 6-8	SOFA score 9-11	SOFA score ≥12
Long-term survival	Prognosis for longer-term survival (medical assessment of prospects for survival after hospital discharge)	...	Life expectancy < 5 years despite successful treatment of acute condition	...	Death likely within 1 year despite successful treatment of acute condition

[#]SOFA= Sequential Organ Failure Assessment; note that another measure of acute physiology that predicts in-hospital mortality, such as LAPS2 score, could be used in place of SOFA, but should similarly be divided into 4 ranges.

*Scores range from 1-8, and persons with the lowest score would be given the highest priority to receive critical care beds and services.

- 4) **After calculating the MPS Score**, the score is provided to the triage team who examines the information and assigns the patient a numerical code as follows:
 - **#1 Highest Priority.** Patients in this group have the highest level of access to scarce resources because they are most likely to recover with treatment (and not likely to recover without it) and have a moderate risk of mortality.
 - **#2 Intermediate Priority.** They will have access to scarce resources if available after each patient in the # 1 group has received access.

- #3 Lowest Priority. Those assigned the number 3 are patients who potentially have the worst outlook for survival, even with aggressive therapy, and therefore have lowest access.
- 0 - manage without scarce resource as it is not needed at this time

If scarce resources become available patients are reassessed and may become eligible for scarce resource.

Priority Assignments Based on MPS Score

Level of Priority	MPS Score	Group #
Highest Priority	MPS: 1-3	1
Intermediate Priority	MPS: 4-5	2
Lowest priority	MPS: 6-8	3
Manage without scarce resource	No score – patients do not need resource	0

- 5) When there are not enough resources to treat an entire group with the allocated resource the following procedure is followed as a tiebreaker:
 - a) If further stratification within a group is required the raw MPS score can be used to differentiate among group members
 - b) Finally, simple lottery, or random allocation, is used.

It is important to reiterate that all patients will be *eligible* to receive scarce resources regardless of their priority score. The availability of scarce resources will determine how many eligible patients will receive those resources.

- 6) **During Crisis Allocation**, patients who are receiving the allocated resource must undergo periodic assessments: at one week, at two weeks and then every three days using the identical MPS scoring system.
 - a) The patient’s attending physician performs the necessary clinical assessments involved in recalculating the SOFA and MPS Score and documents this number in the chart.
 - b) The results of the clinical reassessments are provided to the triage team to assign a numerical code (0,1,2,3) to the patient.
 - c) If a patient’s overall MPS score is higher than patients who are awaiting the critical resource, the patient will no longer have access to that resource so that patients with a statistically higher chance of survival may benefit from the resource.
- 7) **Procedure for Ongoing Allocation of Resource:** Triage teams will make daily, or twice daily, determinations about how many priority groups can receive scarce resources based on information about available resources from the HICS.
 - a) Based on real time knowledge about the degree of scarcity of resource.

- b) Based on predictions about the expected volume of new cases that will be presenting for care.

8) Communication of Allocation Decisions

- a) Triage team will notify the Attending Physician about all decisions regarding allocation of resources.
- b) The Attending Physician will notify the patient/family members about the triage team's decision.
- c) In isolated circumstances, the triage team may assist in communication with the family.
- d) During all situations requiring the triage of resources, the HICS will oversee the distribution of appropriate communication to patients, family members and the public.

9) Decision-Making Process for Withdrawing the Scarce Resource

- a) Occurs when an incoming group #1 patient requires the allocated resource and one or more patients in the group #2 category are currently receiving that resource. The below procedure is followed
 - i) Review of MPS Scores/numerical group for all patients receiving care
 - ii) If #1 coded patients enter the healthcare system and are eligible for care, they are to receive that care in lieu of patients from #2 and #3 numerical groups
 - iii) Patients from the same numerical group as an incoming patient will not have the resource withdrawn to accommodate a patient in the same numerical group
 - iv) Patients in a lower prognosis group (i.e. Group #2 and Group #3) will have the resource removed to accommodate a patient in a better prognosis category. Families will be notified about these triage decisions.
 - v) Disagreement related to this redistribution should be brought to the Triage Oversight and Review Committee.

10) Process for appeals

It is possible that patients, families, 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 clearly not benefiting from that resource. This is because initial triage decisions for patients awaiting the scarce resource will likely be made in highly time-pressured circumstances.

- a) Appeal of initial scoring assessment.

Appeal of the initial scoring assessment 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 or use/non-use of a tiebreaker. 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 Leader should be prepared to explain the calculation to the patient or family on request.

- b) Appeals for withdrawal of scarce resource.
 - i) The appeal should be immediately brought to a Triage Oversight and Review Committee.
 - ii) The individuals who are appealing the withdrawal decision should explain their disagreement with the decision. An appeal may not be brought based on an objection to the overall triage framework. The Triage Oversight and Review Committee should review the SOFA score, comorbidity score, overall MPS score and numerical group assignment to ensure that no errors have been made.
 - iii) The Triage Oversight and Review Committee should explain the grounds for the withdrawal decision that was made.
 - iv) 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.
 - v) The decision of the Triage Oversight and Review Committee will be final.

11) **Palliative care and/or alternative forms of medical intervention** are provided to those who are waiting for or are not eligible for scarce resources. Goals of care conversations and review of advance directives should occur on admission and as frequently as clinically indicated.

12) **Reassessments Throughout the Entire Period(s) of Allocation**

The triage process requires regular reassessments of the status of the healthcare crisis, available resources, and of all patients. As new data and information become available during a pandemic, the adult allocation protocol may be revised accordingly to ensure that triage decisions are made commensurate with updated clinical criteria.

ATTACHMENTS:

1. Appendix A – Pediatric and Neonatal Crisis Standards of Care During a Public Health Emergency
2. Appendix B – California Department of Public Health Pandemic Crisis Guidelines: 2020 Strategies for Scarce Resource Situations
3. Appendix C – Triage Work Flow
4. Appendix D – MPS Scoring/Comorbidity Table

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Appendix A

Pediatric and Neonatal Crisis Standards of Care During a Public Health Emergency

This document provides the framework that applies to children age 0-17 if crisis standards of care are activated by the Hospital Incident Command. Every effort should be made to transfer pediatric patients to a Children's hospital during the surge and crisis process if resources are available at those facilities. Scoring systems that are meaningful for adult critical care patients do not apply to pediatric patients and newborns. For that reason, the Enterprise has developed the following scoring and priority allocation procedures for children age 0-17.

Goals of care discussions should be had with all families- if at any time the family chooses to redirect care the patient will be taken out of the triage system and the triage committee informed.

Pediatric Intensive Care Unit (PICU) Mortality Risk Assessment for this Hospitalization Using Physician Clinical Judgment

Summary Physician clinical judgment by a PICU physician, not on the active treating team is used to assess the patient's risk of mortality and assign a group. The triage team extracts the group from the chart and allocates the restricted resource according to a patient's mortality risk. There are no exclusion criteria delineated for pediatric patients – all patients will be assessed by the PICU attending physician to determine risk mortality and classified as below.

1. Physician PICU Clinical Judgment

Until a pediatric clinical scoring system is developed and clearly validated in the field for triage use, the physician judgment based on clinical expertise will be used to evaluate the likelihood of survival, and determine where the pediatric patient is grouped for restricted resource/ therapy. Physician clinical judgment considers only specific clinical factors based on available medical evidence and not personal values or subjective judgments, such as quality of life. Although the clinical assessment does not provide a numerical score (unlike the adult protocol that provides a quantitative SOFA score), it offers a rational framework to make group allocation decisions in a uniform manner. In order to make informed decisions, a PICU physician can work with the triage team if needed.

The physician's evaluation is based solely on clinical criteria, including the acute severity of a patient's current medical condition, the epidemiology of the disease, and the existence and status of any severe underlying diseases or medical conditions (co-morbidities) that may hinder recovery. A mortality risk prediction is based on whether a patient could survive the acute medical episode that necessitates restricted resource/therapy. It is not focused on whether a patient survives in the long-term e.g. years after the pandemic. Physicians should use all appropriate and available medical tools to conduct the most thorough examination possible in emergency circumstances. Given the potential constraints associated with a pandemic, mortality risk predictions should be based on the best clinical evidence available. Physicians may also consider severe, end-stage chronic medical conditions when assessing mortality risk.

The presence of comorbidities complicates a patient’s ability to survive and may also cause the patient’s acute illness to be more severe. However, existence of such a condition should not, by itself, preclude a patient from being eligible for a restricted resource. Instead, physicians should examine a patient’s overall health to evaluate the patient’s current health status. Even for a patient diagnosed with a fatal condition, periods of relatively good health are possible, and the mere presence of a grave illness should not necessarily preclude the patient from receiving a restricted resource. In some circumstances, a patient with a severe medical condition may require restricted resource therapy because of e.g.influenza/COVID and not because of the chronic care disease itself. For example, a child with a serious condition may not have a long-term survival prognosis, but if the patient’s health is relatively stable, the child may still be eligible for restrictive/therapy, i.e., be placed in group 1 or 2. However, if the same child was in failing health, this patient would be placed in group 3 and given alternative forms of medical intervention and/or palliative care rather than a ventilator. When examining chronic comorbidity, severe comorbidity is functionally defined as significant chronic impairment/deteriorating of health prior to the acute illness/injury. Moderate comorbidity is functionally defined as significant chronic impairment of health but a patient is in a steady health state prior to the acute illness/injury. Of note intubation for control of the airway (without lung disease) is not considered lung failure.

The physician will put the group in the patient’s chart i.e. 0, 1, 2, 3, and the triage team will review the information and determine the patient’s level of access to the restricted resource.

Patients in Group ZERO (defer/discharge) are those who do not need the restricted resource/therapy. Group ONE patients (highest access) are those who have the highest priority for the restricted resource/treatment because they are most likely to recover with treatment (and likely to not recover without it) and have a moderate risk of mortality. Prioritizing these patients for the restricted resource, ideally, increases the number of survivors by ensuring that patients receiving restricted therapy are those who have a high likelihood of recovering. Patients in Group TWO are those who are very sick and their likelihood of survival is intermediate and/or uncertain. These patients may or may not benefit (i.e., survive) with the restricted resource or therapy. They will receive such treatment if the restricted resource is available after all patients in Group ONE receive them. Group THREE patients (lowest access/palliate/ discharge) are those who have a high risk of mortality and are the last group to receive the restricted resource after the resource has been made available to Groups ONE and TWO. If the restricted resource is unavailable for group THREE they will instead receive alternative forms of medical intervention and/or palliative care.

2. Triage Chart

A triage team allocates restricted resources according to the group assigned.

Mortality Risk Assessment Using Physician Clinical Judgment Numerical Code and Level of Access

Zero
Use alternative forms of medical intervention as not needed or defer or discharge. Reassess as needed.
One

Assessment of Mortality Risk/Organ Failure

LOW risk of mortality associated with acute illness/injury (including epidemiology of the disease, if known).

MODERATE risk of mortality, such as single organ failure, associated with acute

Highest Priority Use restricted resource as available.	illness/injury (including epidemiology of the disease, if known).
Two Intermediate Priority Use restricted resource as available.	HIGH/UNCERTAIN risk of mortality associated with acute illness/injury (including epidemiology of the disease, if known).
Three Use resource until unavailable Use alternative forms of medical intervention and/or palliative care or discharge. Reassess if the restricted resource become available.	HIGHEST risk of mortality associated with acute illness/injury (including epidemiology of the disease, if known).

3. Periodic Reassessment in PICU

The clinical team will reassess the need for the restricted resource daily on rounds and will follow the triage team's reassessment as per the policy.

NICU

Mortality Risk Assessment for this Hospitalization Using Physician Clinical Judgment

Summary: Neonatal patients are infants less than 44 weeks post menstrual age and include babies born prematurely.

Physician clinical judgment by a NICU attending physician not on the current treatment team is used to assess the patient's risk of mortality in this hospitalization and assign a group 0,1,2,3. The triage team examines the group in the chart and allocates the restricted resource/therapy.

Exclusion criteria delineated for neonatal patients include medical conditions that result in immediate or near-immediate mortality even with aggressive therapy; conditions when goals of care of the family are supported; includes all those situations where Neonatal Resuscitation Program (NRP) is not offered.

Until a Neonatal clinical scoring system is developed and clearly validated in the field for triage use, the physician judgment, based on clinical expertise, will be used to evaluate the likelihood of survival and to determine whether a newborn is eligible for the restricted resource/ therapy by group. Physician clinical judgment will consider only specific clinical factors based on available medical evidence and not personal values or subjective judgments, such as quality of life. Although the clinical assessment does not provide a numerical score, it offers an organized, rational framework to make allocation decisions in a uniform manner. Gestational age may be used as a factor to evaluate a neonate's mortality risk, because there is a high correlation between young gestational age and mortality, but such information may not always be available, or accurate. Finally, birth weight is also a strong indicator of survival; however, it may be difficult to determine an exact birth weight cutoff that could be used as a triage criterion. The NICU physician may work with the triage team if needed.

The process for grouping is defined in the PICU protocol. This includes the rational and the Triage group chart.

4. Periodic Reassessment of NICU Patients

For neonates assigned the resource:

1. Daily reassessments of the patients need for that resource will be performed by the clinical team that includes a Neonatologist. All efforts will be continued to try to obtain the resource and provide that resource if it is still needed.
2. Morbidity and Mortality reevaluation will be done by a group of Neonatologists during clinical rounds, they will not be on the current treating team and will share with the triage team as per protocol.
3. Trials off ventilation, if the resource is a ventilator, should not result in the resource being lost for 24 hours, as this may lead to fear of Extubation trials and a prolonged unnecessary use of resource.

Appendix B

California Department of Public Health
Pandemic Crisis Guidelines
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STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis												
Inhaled Medications <ul style="list-style-type: none"> Restrict the use of oxygen-driven nebulizers when inhalers or air-driven substitutes are available. Minimize frequency through medication substitution that results in fewer treatments (6 - 12 hour instead of 4 - 6 hour applications). 	Substitute & Conserve															
High-Flow Applications <ul style="list-style-type: none"> Restrict the use of high-flow cannula systems as these can demand flow rates in excess of 40 liters per minute (LPM). Restrict the use of simple and partial rebreathing masks to 10 LPM maximum. Restrict use of Gas Injection Nebulizers as they generally require oxygen flows between 10 LPM and 75 LPM. Eliminate the use of oxygen-powered venturi suction systems as they may consume 15 to 50 LPM. Place patients on ventilators as soon as possible to avoid prolonged use of bag-valve ventilation at high oxygen flow rates 	Conserve															
Air-Oxygen Blenders <ul style="list-style-type: none"> Eliminate the low-flow reference bleed occurring with any low-flow metered oxygen blender use. This can amount to an additional 12 LPM. Reserve air-oxygen blender use for mechanical ventilators using high-flow non-metered outlets. (These do not utilize reference bleeds). Disconnect blenders when not in use. 	Conserve															
Oxygen Conservation Devices <ul style="list-style-type: none"> Use reservoir cannulas at 1/2 the flow setting of standard cannulas. Replace simple and partial rebreather mask use with reservoir cannulas at flow rates of 6-10 LPM. 	Substitute & Adapt															
Oxygen Concentrators if Electrical Power is Present <ul style="list-style-type: none"> Use hospital-based or independent home medical equipment supplier oxygen concentrators if available to provide low-flow cannula oxygen for patients and preserve the primary oxygen supply for more critical applications. 	Substitute & Conserve															
Monitor Use and Revise Clinical Targets <ul style="list-style-type: none"> Employ oxygen titration protocols to optimize flow or % to match targets for SpO₂ or PaO₂. Minimize overall oxygen use by optimization of flow. Discontinue oxygen at earliest possible time. <table border="1"> <thead> <tr> <th>Starting Example</th> <th>Initiate O₂</th> <th>O₂ Target</th> </tr> </thead> <tbody> <tr> <td>Normal Lung Adults</td> <td>SpO₂ <90%</td> <td>SpO₂ 90%</td> </tr> <tr> <td>Infant & Peds</td> <td>SpO₂ <90%</td> <td>SpO₂ 90-95%</td> </tr> <tr> <td>Severe COPD History</td> <td>SpO₂ <85%</td> <td>SpO₂ 90%</td> </tr> </tbody> </table> <p>Note: Targets may be adjusted further downward depending on resources available, the patient's Presentation, or measured PaO₂</p>	Starting Example	Initiate O ₂	O ₂ Target	Normal Lung Adults	SpO ₂ <90%	SpO ₂ 90%	Infant & Peds	SpO ₂ <90%	SpO ₂ 90-95%	Severe COPD History	SpO ₂ <85%	SpO ₂ 90%	Conserve			
Starting Example	Initiate O ₂	O ₂ Target														
Normal Lung Adults	SpO ₂ <90%	SpO ₂ 90%														
Infant & Peds	SpO ₂ <90%	SpO ₂ 90-95%														
Severe COPD History	SpO ₂ <85%	SpO ₂ 90%														
Expendable Oxygen Appliances <ul style="list-style-type: none"> Use terminal sterilization or high-level disinfection procedures for oxygen appliances, small & large-bore tubing, and ventilator circuits. Bleach concentrations of 1:10, high-level chemical disinfection, or irradiation may be suitable. Ethylene oxide gas sterilization is optimal but requires a 12-hour aeration cycle to prevent ethylene chlorohydrin formation with polyvinyl chloride plastics. 	Re-use															
Oxygen Re-Allocation <ul style="list-style-type: none"> Prioritize patients for oxygen administration during severe resource limitations. 	Re-Allocate															

Resource: [Consideration for Oxygen Therapy in Disasters](#). This ASPR TRACIE fact sheet provides information on the types of oxygen therapy and the type of oxygen supplies generally available, as well as various oxygen storage methods.

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RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
<p>Staff and Supply Planning</p> <ul style="list-style-type: none"> Assure facility has process and supporting policies for disaster credentialing and privileging - including degree of supervision required, clinical scope of practice, mentoring and orientation, electronic medical record access, and verification of credentials. Encourage employee preparedness planning (www.ready.gov and other resources). Cache adequate personal protective equipment (PPE) and support supplies. Educate staff on institutional disaster response. Educate staff on community, regional, and state disaster plans and resources. Develop facility plans addressing staff's family / pets or staff shelter needs. 	Prepare			
<p>Focus Staff Time on Core Clinical Duties</p> <ul style="list-style-type: none"> Minimize meetings and relieve administrative responsibilities not related to event. Implement efficient medical documentation methods appropriate to the incident. Cohort patients to conserve PPE and reduce staff PPE donning/doffing time and frequency. 	Conserve			
<p>Use Supplemental Staff</p> <ul style="list-style-type: none"> Bring in equally trained staff (burn or critical care nurses, Disaster Medical Assistance Team, other health system or Federal sources). Equally trained staff from administrative positions (nurse managers). Adjust personnel work schedules (longer but less frequent shifts, etc.) if this will not result in skill/PPE compliance deterioration. Use family members/lay volunteers to provide basic patient hygiene and feeding if infection control strategies allow for it - releasing staff for other duties. 	Substitute			
	Adapt			
<p>Focus Staff Expertise on Core Clinical Needs</p> <ul style="list-style-type: none"> Personnel with specific critical skills (ventilator, burn management) should concentrate on those skills; specify job duties that can be safely performed by other medical professionals. Have specialty staff oversee larger numbers of less-specialized staff and patients (e.g., a critical care nurse oversees the intensive care issues of 9 patients while 3 medical/surgical nurses provide basic nursing care to 3 patients each). Limit use of laboratory, radiographic, and other studies, to allow staff reassignment and resource conservation. Limit availability/indications for non-critical laboratory, radiographic, and other studies. Reduce documentation requirements. Restrict or cease elective appointments, surgeries, procedures, and screening tests. 	Conserve			
<p>Use Alternative Personnel to Minimize Changes to Standard of Care</p> <ul style="list-style-type: none"> Use less trained personnel with appropriate mentoring and just-in-time education (e.g., health care trainees or other health care workers, Medical Reserve Corps, retirees). Use less trained personnel to take over portions of skilled staff workload for which they have been trained. Provide just-in-time training for specific skills. Divert credentialed staff from routine to emergency duties including in-hospital or assisting public health at external clinics/screening/dispensing sites. 	Adapt			

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RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
<p>Food</p> <ul style="list-style-type: none"> • Maintain hospital supply of inexpensive, simple to prepare, long-shelf life foodstuffs as contingency for at least 96 hours without resupply, with additional supplies according to hazard vulnerability analysis (e.g., grains, beans, powdered milk, powdered protein products, pasta, and rice). Access existing or devise new emergency/disaster menu plans. • Maintain hospital supply of at least 30 days of enteral and parenteral nutrition components and consider additional supplies based on institution-specific needs. Review vendor agreements and their contingencies for delivery and production, including alternate vendors. • Note: A 30-day supply based on usual use may be significantly shortened by the demand of a disaster. Infant feeding: Support breastfeeding; use local women, infants, and children (WIC) agencies to provide telephone lactation support; assure adequate stocks of formula for those babies who need it. 	Prepare			
<p>Water</p> <ul style="list-style-type: none"> • Stock bottled water sufficient for drinking needs for at least 96 hours if feasible (for staff, patients and family/visitors), or assure access to drinking water apart from usual supply. Potential water sources include food and beverage distributors. • Consider weight and dispensing issues if using 5-gallon bottles. • Ensure there is a mechanism in place to verify tap water is safe to drink. 	Prepare			
<p>Staff/Family</p> <ul style="list-style-type: none"> • Plan to feed additional staff, patients, and family members of staff/patients in select situations (ice storm as an example of a short-term incident, an epidemic as an example of a long-term incident). Consider having staff bring own food if practical and safe to do so. 	Prepare			
<p>Planning</p> <ul style="list-style-type: none"> • Work with stakeholders to encourage home users of enteral and parenteral nutrition to have contingency plans and alternate delivery options. Home users of enteral nutrition typically receive delivery of 30-day supply and home users of parenteral nutrition typically receive a weekly supply. Anticipate receiving supply requests from home users during periods of shortage. Work with vendors regarding their plans for continuity of services and delivery. • Identify alternate sources of food supplies for the facility should prime vendors be unavailable (including restaurants - which may be closed during epidemics). Consider additional food supplies at hospitals that do not have food service management accounts. • Determine if policy on family provision of food to patients is in place, and what modifications might be needed or permitted in a disaster. • Liberalize diets and provide basic nutrients orally, if possible. Total parenteral nutrition (TPN) use should be limited and prioritized for neonatal and critically ill patients. • Non-clinical personnel serve meals and may assist preparation. • Follow or modify current facility guidelines for provision of food/feeding by family members of patients. • Anticipate and have a plan for the receipt of food donations. If donated food is accepted, it should be non-perishable, prepackaged, and preferably in single serving portions. • Collaborate with pharmacy and nutrition services to identify patients appropriate to receive parenteral nutrition support vs. enteral nutrition. Access premixed TPN and partial parenteral nutrition (PPN) solutions from vendor if unable to compound. Refer to Centers for Disease Control (CDC) fact sheets and American Society for Parenteral and Enteral Nutrition (ASPEN) Guidelines. Substitute oral supplements for enteral nutrition products if needed. • Eliminate or modify special diets temporarily. • Use blenderized food and fluids for enteral feedings rather than enteral nutrition products if shortages occur. 	Prepare			
	Substitute			
	Adapt			
	Substitute & Adapt			
	Adapt			

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STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis												
<p>Cache/Increase Supply Levels*</p> <p>* Patients should have at least 30-day supply of home medications and obtain 90-day supply if pandemic, epidemic, or evacuation is imminent. Examine formulary to determine commonly used medications and classes that will be in immediate/ high demand. This may involve coordination with pharmacies.</p> <table border="1"> <tr> <td>Analgesia</td> <td>• Morphine, other narcotic and non-narcotic (non-steroidal, acetaminophen) class - injectable and oral</td> </tr> <tr> <td>Sedation</td> <td>• Particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables, ketamine, and anti-psychotic agents.</td> </tr> <tr> <td>Anti-infective</td> <td>• Narrow and broad-spectrum antibiotics for pneumonia, skin infections, open fractures, sepsis (e.g.: cephalosporins, quinolones, tetracyclines, macrolides, clindamycin, penam class and extended spectrum penicillins, etc.), select antivirals.</td> </tr> <tr> <td>Pulmonary</td> <td>• Metered dose inhalers (albuterol, inhaled steroids), oral steroids (dexamethasone, prednisone).</td> </tr> <tr> <td>Behavioral Health</td> <td>• Haloperidol, other injectable and oral anti-psychotics, common anti-depressants, anxiolytics.</td> </tr> <tr> <td>Other</td> <td>• Sodium bicarbonate, paralytics, induction agents (etomidate, propofol), proparacaine/tetracaine, atropine, prali-doxime, epinephrine, local anesthetics, antiemetics, insulin, common oral anti-hypertensive, diabetes medications, tetanus vaccine and tranexamic acid, anti-epileptics (IV and oral), hypertonic saline, and antidiarrheals</td> </tr> </table> <p>• Increase supply levels or cache critical medications - particularly for low-cost items and analgesics. Key examples include:</p>	Analgesia	• Morphine, other narcotic and non-narcotic (non-steroidal, acetaminophen) class - injectable and oral	Sedation	• Particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables, ketamine, and anti-psychotic agents.	Anti-infective	• Narrow and broad-spectrum antibiotics for pneumonia, skin infections, open fractures, sepsis (e.g.: cephalosporins, quinolones, tetracyclines, macrolides, clindamycin, penam class and extended spectrum penicillins, etc.), select antivirals.	Pulmonary	• Metered dose inhalers (albuterol, inhaled steroids), oral steroids (dexamethasone, prednisone).	Behavioral Health	• Haloperidol, other injectable and oral anti-psychotics, common anti-depressants, anxiolytics.	Other	• Sodium bicarbonate, paralytics, induction agents (etomidate, propofol), proparacaine/tetracaine, atropine, prali-doxime, epinephrine, local anesthetics, antiemetics, insulin, common oral anti-hypertensive, diabetes medications, tetanus vaccine and tranexamic acid, anti-epileptics (IV and oral), hypertonic saline, and antidiarrheals	Prepare			
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<p>Use Equivalent Medications</p> <p>• Obtain medications from alternate supply sources (pharmaceutical distributors, pharmacy caches).</p> <table border="1"> <tr> <td>Pulmonary</td> <td>• Metered dose inhalers instead of nebulized medications.</td> </tr> <tr> <td>Analgesia/ Sedation</td> <td>• Consider other medications (e.g. benzodiazepines, dexmedetomidine etc.) for propofol substitution (and other agents in short supply) • ICU analgesia/ sedation drips Morphine 4-10mg IV load then 2mg/h and titrate e/re-bolus as needed usual 3-20mg g/h; lorazepam 2-8mg or midazolam 1-5mg IV load then 2-8mg/h drip.</td> </tr> <tr> <td>Anti-infective</td> <td>• Examples: cephalosporins, gentamicin, clindamycin substitute for unavailable broad-spectrum antibiotic • Target therapy as soon as possible based upon organism identified.</td> </tr> <tr> <td>Other</td> <td>• Beta blockers, diuretics, calcium channel blockers, ace inhibitors, anti-depressants, anti-infectives.</td> </tr> </table> <p>• Explore options to compound or obtain from compounding pharmacies.</p>	Pulmonary	• Metered dose inhalers instead of nebulized medications.	Analgesia/ Sedation	• Consider other medications (e.g. benzodiazepines, dexmedetomidine etc.) for propofol substitution (and other agents in short supply) • ICU analgesia/ sedation drips Morphine 4-10mg IV load then 2mg/h and titrate e/re-bolus as needed usual 3-20mg g/h; lorazepam 2-8mg or midazolam 1-5mg IV load then 2-8mg/h drip.	Anti-infective	• Examples: cephalosporins, gentamicin, clindamycin substitute for unavailable broad-spectrum antibiotic • Target therapy as soon as possible based upon organism identified.	Other	• Beta blockers, diuretics, calcium channel blockers, ace inhibitors, anti-depressants, anti-infectives.	Substitute							
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Other	• Beta blockers, diuretics, calcium channel blockers, ace inhibitors, anti-depressants, anti-infectives.															
<p>Reduce Use During High Demand</p> <p>Restrict use of certain classes if limited stocks likely to run out (restrict use of prophylactic/empiric antibiotics after low risk wounds, etc.) Decrease dose; consider using smaller doses of medications in high demand/likely to run out (reduce doses of medications allowing blood pressure or glucose to run higher to ensure supply of medications adequate for anticipated duration of shortage). • Allow use of personal medications (inhalers, oral medications) in hospital. • Do without - consider impact if medications not taken during shortage (statins, etc.).</p>	Conserve															

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RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
<p>Modify Medication Administration</p> <ul style="list-style-type: none"> Emphasize oral, nasogastric, subcutaneous routes of medication administration. Administer medications by gravity drip rather than IV pump if needed: <i>IV drip rate calculation - drops/minute= amount to be infused x drip set/time (minutes) (drip set= qts/mL - 60, 10, etc.).</i> Rule of 6: pt wgt (kg) x 6 = mg drug to add to 100ml fluid = 1mcg/kg/min for each 1 ml/hour NOTE: For examples, see http://www.dosagehelp.com/iv_rate_drop.htm Consider use of select medications beyond expiration date**, especially tablets/capsules Consider use of veterinary medications when alternative treatments are not available** 	Adapt			
<p>Restrict Allocation of Select Medications</p> <ul style="list-style-type: none"> Allocate limited stocks of medications with consideration of regional/state guidance and available epidemiological information (e.g., anti-viral medications such as oseltamivir). Determine patient priority to receive medications in limited stock. 	Re-Allocate			
	Re-Allocate			

*Resources:
 • [ASPR TRACIE Hospital Disaster Pharmacy Calculator](#). This tool estimates the number of patients that should be planned for based on the size of the emergency department and the role of the hospital.
 • [ASPR TRACIE Factsheet: Drug Shortages and Disasters](#). This factsheet can help health care providers prepare for and respond to drug shortages that may arise during and after a disaster.
 ** Legal protection such as Food and Drug Administration approval or waiver required.

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RECOMMENDATIONS		Strategy	Conventional	Contingency	Crisis
Cache Additional Intravenous (IV) Cannulas, Tubing, Fluids, Medications, and Administration Supplies		Prepare			
Use Scheduled Dosing and Drip Dosing When Possible • Reserve IV pump use for critical medications such as sedatives and hemodynamic support.		Conserve			
Minimize Invasive Monitoring • Substitute other assessments (e.g., clinical signs, ultrasound) of central venous pressure (CVP). • When required, assess CVP intermittently via manual methods using bedside saline manometer or transducer moved between multiple patients as needed, or by height of blood column in CVP line held vertically while patient supine.		Substitute & Conserve			
Emphasize Oral Hydration Instead of IV Hydration When Possible		Substitute			
Utilize appropriate oral rehydration solution	Oral rehydration solution: 1 liter water (5 cups) + 1 tsp salt+ 8 tsp sugar, add flavor (e.g., ½ cup orange juice, other) as needed. Rehydration for moderate dehydration 50-100mL/kg over 2-4 hours				
Pediatric hydration	Pediatric maintenance fluids: • 4 ml /kg/h for first 10kg of body weight (40 ml/h for 1st 10 kg) • 2 ml /kg/h for second 10kg of body weight (20 ml/h for 2nd 10kg = 60 ml/h for 20kg child) • 1 ml /kg/h for each kg over 20kg (example - 40 kg child= 60 ml/h plus 20 ml/h = 80 ml/h) Supplement for each diarrhea or emesis				
NOTE: Clinical (urine output, etc.) and laboratory (BUN, urine specific gravity) assessments and electrolyte correction are key components of fluid therapy and are not specifically addressed by these recommendations. NOTE: For further information and examples, see Rehydration Project: http://rehydrate.org/					
Provide Nasogastric Hydration Instead of IV Hydration When Practical • Patients with impediments to oral hydration may be successfully hydrated and maintained with nasogastric (NG) tubes. • For fluid support, 8-12F (pediatric: infant 3.5F, < 2yrs 5F) tubes are better tolerated than standard size tubes.		Substitute			
Substitute Epinephrine for Other Vasopressor Agents • For hemodynamically unstable patients who are adequately volume-resuscitated, consider adding 6mg epinephrine (6ml of 1:1000) to 1000ml NS on minidrip tubing and titrate to target blood pressure. • Epinephrine 1:1000 (1mg/ml) multi-dose vials available for drip use.		Substitute			
Re-use CVP, NG, and Other Supplies After Appropriate Sterilization/Disinfection • Cleaning for all devices should precede high-level disinfection or sterilization. • High-level disinfection for at least twenty minutes for devices in contact with body surfaces (including mucous membranes); glutaraldehyde, hydrogen peroxide 6%, or bleach (5.25% diluted 1:20 (2500 ppm) are acceptable solutions. NOTE: chlorine levels reduced if stored in polyethylene containers - double the bleach concentration to compensate). • Sterilize devices in contact with bloodstream (e.g., ethylene oxide sterilization for CVP catheters).		Re-use		(disinfection - NG, etc)	(sterilization - central line, etc)

Appendix C Triage Work Flow

Activation

1. HICS: Surge is identified and possible need for allocation of resources is identified
2. HICS via medical director requests triage teams to begin assessments. No actions to be taken at this time. Meaning resources continue to be allocated as per clinical need as determined by patient's primary attending provider.
3. Crisis is identified. HICS activates triage teams to begin to allocate resources.

Allocation of Resources

1. HICS determines the remaining available resource and notifies the Triage Committees. Triage Committees determine which priority level of patients (1,2,3) will continue to have access to the restricted resource. When the resource is no longer available for all three levels of patients and patients continue to present for care, resource allocation will occur as outlined below.
2. HICS will notify hospital staff that resource allocation is occurring in order to expedite triage decisions and patient transfer within the hospital.
3. Triage teams using prescribed method will calculate MPSⁱ (Multi Principle Strategy) score for all patients. See below for triage team details.
4. Triage team to categorize the patient into the described patient triage groups (see below for triage team workflow details).
5. HICS determines the remaining available resource and notifies the Triage Committees. Triage committee uses this information about current resources available to determine what priority group will receive resources. The patients who do not fall into that determined group(s) will be excluded from critical care and alternative medical therapy or palliative care will be provided.
6. Triage team to notify primary attending physicians and HICS of specific patients who will not be allocated the resources.
7. Primary team attending physician to notify patient and/or family.
8. Appeals process can be initiated by the primary team if they deem necessary. See details of appeals process in full document.
9. Current patients who are using resources will be re-evaluated at 7 days, then 14 days after initial allocation, then every 3 days after that.
10. If they no longer meet criteria for critical resources, the triage team will notify the attending physician who will notify the family.

If resources become available those in other color groups may become eligible for critical resources.

Palliative care services will be available for all patients throughout this process.

Patient's Primary Attending Role

1. When surge is initially identified, the primary team's assessment of the patient is expected to be completed expeditiously for all patients at risk for intubation. This will enable triage team sufficient time to complete their assessments.
2. Primary team to review patient's comorbidities in HealthLink. Ensure all sections are filled out. If a patient does not have a certain comorbidity you are still expected to document that they do not have it.
3. Triage team will contact the primary team attending to confirm the MPS score and assign the patient to the priority group. The goal is for triage assessments to be done within 90 minutes of the process being triggered.
4. The primary team attending will notify the patient/ family members about triage team's decision.
5. Appeals process can be initiated by the primary team if they deem necessary. See details of appeals process in full document. If the primary team wants to appeal, they should communicate with the triage team immediately.
6. Primary team can consider social work or palliative care consult for assistance with difficult situations.

Triage Team Workflow

1. HICS via medical director to reach out to the head of triage committee to communicate the beginning of the health system surge to activate triage teams. This will then be communicated to triage team leaders who will communicate to their triage team.
2. HICS will be responsible for reaching out to the head of the triage committee to indicate when escalation from surge to crisis.
3. Individual triage team leader to activate triage process. Meanwhile patient's attending physician shall concurrently assess comorbidities and completing triage notes. Once this is completed the triage team work process can be started.
4. Guidance for Multi-Principle Strategy (MPS) score is found in Table 1.

The two rows in the Table are independent point values that are then totaled. The process includes the following:

- a. Determine SOFA score, assign point value in the column header. (e.g. SOFA 10 = 3 points). MPS per SOFA score can range from 1-4. If baseline MAP is <70 remove 1 from the SOFA score calculated prior to placing into MPS score.
- b. Then, no matter the SOFA score or point total for step one, determine the comorbidity burden and assign either 0, 2 or 4 points based on existing comorbidities. (e.g. cirrhosis with a MELD score > 20 = severely life limiting comorbidity= 4 additional points).

Tips for MPS score calculation for comorbidities can be seen in the comorbidities document. A summarized version can be found in Table 2.

Example of how to calculate comorbidities. If a patient has more than one comorbidity that fits the categories they get one score for the highest MPS scoring item. Eg. if a patient has malignancy with a life expectancy of 6 years that counts as a "major comorbidity" and should score 2 points. If the same patient has cirrhosis with a MELD score of 28. Then that counts as an "indicator of morbidity within 1 year" and therefore they score 4 MPS points.

In this example the patient gets 2 MPS points for malignancy or 4 MPS points for cirrhosis. Given that we pick the highest number the only comorbidity score will end up being 4. (we do not count the 2 anywhere at this stage)

- c. Total the two point values (in our example above 3 + 4= 7). I.e. the points for SOFA score (must be between 1-4) + points for comorbidities (must be either 0,2 or 4)
- d. Group into priority groups 1, 2, 3 and 0 according to this total.
- e. The maximum point total for these additions is 8. If it is more than 8, recheck your calculations.

5. If not told otherwise by HICS at this point, communicate the result to the primary team attending. There must be a confirmation by the primary attending of the result, a “warm handoff” is preferred.
6. If communicated to triage team by HICS that a certain priority group has resources only for a limited number of patients then the team will proceed to apply the following as a tiebreaker:
 - a. If further stratification within a group is required the raw MPS score can be used to differentiate among group members.
 - b. Finally, simple lotteries, or random allocation, is used.
7. Reassessments of patients including recalculation of their MPS Score will be done periodically. Per ICU guidelines for treatment of COVID-19 the timeline has been established to be at 7 days, 14 days and every 3 days after that. HealthLink will be configured to trigger a reassessment at these time points.
8. Triage team leader is responsible for running a triage report (a list of everyone’s priority groups) every day to ensure that patients’ current priority group is still accurate based on the latest automatically calculated MPS score. If there is a discrepancy between the priority group and MPS score, then triage team leader to start recalculation of MPS as outlined in HealthLink triage team tip sheet.
9. If a patient’s MPS score changes upon reassessment the patient may be assigned to a different priority group and resources reallocated within the new groups.

Communication within triage committee

1. Initial communication that triage team is activated will be done by head of triage teams via email AND preferred cell phone or pager a response is expected immediately. After the first day that initial surge is declared further shift times will be communicated at least 24 hours in advance.
2. Shifts will be 13 hours and will be available day and night.

Appendix D
MPS Scoring/Comorbidity Table
1. Alzheimer's or Related Dementia Scoring Scale

DEMENTIA SEVERITY	STAGE	CHARACTERISTICS	COMORBIDITY SCORE
Normal Aging	1	No subjective memory deficits	0
Age associated memory impairment	2	Subjective memory deficits. Forgetting names. No objective memory deficits	
Mild cognitive impairment	3	a) Gets lost going to unfamiliar locations b) Poor work performance c) Concentration deficit	
Mild Dementia	4	IADLs become affected bill paying, cooking, cleaning, traveling	
Moderate Dementia	5	a) Cannot survive without assistance b) Can't recall major relevant aspects of life eg. address, names of close family Needs help selecting proper attire c) DO NOT NEED HELP with toileting or eating	2
Severe Dementia (moderately-severe)	6a	Needs help putting on clothes	4
	6b	Needs help bathing	
	6c	Needs help toileting	
	6d	Urinary incontinence	
	6e	Fecal incontinence	
Severe Dementia	7a	Loss of verbal abilities -speaks 5-6 words during day	
	7b	Speaks only 1 word clearly	
	7c	Can no longer walk	

	7d	Can no longer sit up	
	7e	Can no longer smile	
	7f	Can no longer hold up head	

"The Global Deterioration Scale for Assessment of Primary Degenerative Dementia." American Journal of Psychiatry, vol. 139, no. 9, 1982, pp. 1136–39. Crossref, doi:10.1176/ajp.139.9.1136.

2. Heart Failure Classification - New York Heart Association

CLASS	NYHA Functional Classification	Comorbidity Score
I	Patients with cardiac disease but without resulting limitations of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.	0
II	Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain.	0
III	Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary physical activity causes fatigue, palpitations, dyspnea or anginal pain.	2
IV	Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms can occur at rest without any physical activity.	4

The Criteria Committee of the New York Heart Association. Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels, 9th ed, Little, Brown & Co, Boston, 1994. p.253.

3. Other Cardiac Comorbidities

	Comorbidity Score
Coronary artery disease with stenting or CABG	0
Severe inoperable multi-vessel CAD	2
Unwitnessed cardiac arrest with delayed or no CPR	4

4. Chronic Lung Disease Classification

A. Chronic Obstructive Pulmonary Disease (COPD)

Stage	Severity	FEV1 % predicted	Comorbidity Score
GOLD 1	Mild	≥80%	0
GOLD 2	Moderate	50-79%	2
GOLD 3	Severe	30-49%	4
GOLD 4	Very Severe	<30%	4

From the Global Strategy for the Diagnosis, Management and Prevention of COPD 2017, © Global Initiative for Chronic Obstructive Lung Disease (GOLD), www.goldcopd.org. Adapted with permission. The content within this table is still current as of the 2019 GOLD report.

B. Restrictive Lung Diseases

Severity	TLC % predicted	Comorbidity Score
Mild	70 - 79%	0
Moderate	60 - 69%	2
Severe	<60%	4

*Pulmonary Arterial Hypertension:
 Use NYHA functional classification for scoring as in heart failure classification.*

C. Chronic Hypoxic Respiratory Failure

Severity	Supplemental O2 Requirement	Comorbidity Score
Mild	≤2 LPM	0
Moderate	3 - 4 LPM	2
Severe	>4 LPM	4

D. Chronic Hypercapnic Respiratory Failure

Severity	Baseline PaCO ₂	Comorbidity Score
Mild	>50 mmHg	0
Moderate	50 - 60 mmHg	2
Severe	>60 mmHg	4

5. Chronic Kidney Disease Classification

GFR category	GFR	Comorbidity Score
Stage I	>90	0
Stage II	60-89	
Stage III	30-59	
Stage IV	15-29	
Stage V (usually on dialysis)	<15	2

National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. Am J Kidney Dis 2002; 39 (Suppl 1):S1.

6. Cirrhosis Classification

Calculate the MELD score. Patients equal or above 20 get a score of 4 under indicators of morbidity

Use HealthLink MELD calculator by typing MELD

MELD	Comorbidity Score
> or = 20	4
<20	0 Points

7. Malignancy/ Cancer

Varies depending on cancer type.

Prognosis	Comorbidity Score
> greater than 10 year survival	0 points
< 10-year survival	2 points
Metastatic cancer receiving only palliative treatments	4

Online SOFA Score Calculator

<https://clinicalcalc.com/lcuMortality/SOFA.aspx>

† If arterial blood gas (ABG) results are not available, PaO₂/FiO₂ (PF) ratio may be determined by SpO₂ measurements based on the following table¹. PF ratio is determined by finding the intersect cell for the combination of SpO₂ row and FiO₂ column.

eTable 2: Imputed PF ratio (cells) for combinations of SpO₂ (rows) and FiO₂ (columns)

	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
80%	148	127	111	98	89	81	74	68	63	59	55	52	49	47	44
81%	151	129	113	101	91	82	76	70	65	60	57	53	50	48	45
82%	155	132	116	103	93	84	77	71	66	62	58	55	52	49	46
83%	158	136	119	106	95	86	79	73	68	63	59	56	53	50	47
84%	162	139	122	108	97	89	81	75	70	65	61	57	54	51	49
85%	167	143	125	111	100	91	83	77	71	67	63	59	56	53	50
86%	171	147	129	114	103	94	86	79	73	69	64	61	57	54	51
87%	177	151	132	118	106	96	88	81	76	71	66	62	59	56	53
88%	182	156	137	121	109	99	91	84	78	73	68	64	61	58	55
89%	189	162	141	126	113	103	94	87	81	75	71	67	63	60	57
90%	196	168	147	130	117	107	98	90	84	78	73	69	65	62	59
91%	203	174	153	136	122	111	102	94	87	81	76	72	68	64	61
92%	213	182	159	142	128	116	106	98	91	85	80	75	71	67	64
93%	223	191	168	149	134	122	112	103	96	89	84	79	74	71	67
94%	236	202	177	157	142	129	118	109	101	94	89	83	79	75	71
95%	252	216	189	168	151	138	126	116	108	101	95	89	84	80	76
96%	273	234	205	182	164	149	136	126	117	109	102	96	91	86	82

1. Brown SM, Grissom CK, Moss M, et. Al. Nonlinear Imputation of PaO₂/FiO₂ From SpO₂/FiO₂ Among Patients With Acute Respiratory Distress Syndrome. *Chest* 2016; 150 (2): 307 - 313 (suppl).

ⁱ MPS Score = Multi Principle Strategy Score
 HICS = Hospital Incident Command Center