

Los Angeles Department of Health Services Guidance for Allocation of Scarce Critical Care Resources During a Public Health Emergency

Introduction.

The course of the COVID-19 pandemic has shown that a surge of COVID-19 patients that overwhelms an area's or system's ability to care for all the patients in need of care is not only possible, but likely. As such, hospitals and systems must consider how to allocate clinical care resources of all kinds among patients, when the need for the resources far outstrips the available resources.

This document provides principle-based guidance to the Los Angeles County Department of Health Services (DHS) and its facilities regarding the triage of critically ill patients and allocation of resources when a public health emergency creates demand for critical care resources (e.g., ventilators, critical care services, staffing, space, etc.) that outstrips available supply.

Ethical decision making regarding whether to admit patients and whether to withhold or withdraw care is common in intensive care settings.¹ Even so, it must be noted that in contrast to many private provider systems, the fact that DHS is a public safety-net system means that it is very often in the situation of having demand for more resources than it has. As such, decisions of how best to allocate resources during a crisis are likely to be an extension of decisions and decision processes that DHS already engages in, rather than a decision-making process that is wholly foreign. The existence of this document recognizes that at a time of *crisis* level care, clinicians providing direct care to patients should not be expected to make ethically difficult decisions regarding allocation of care resources, alone.

This document is informed by the California SARS-CoV-2 Pandemic Health Care Surge Crisis Care Guidelines,² a nationally published framework for allocation of scarce resources during crisis care,³ and other nationally recognized sources. It describes a continuum of standard of care from "*conventional*", to "*contingency*" standards of care which are often associated with "surge" conditions, and "*crisis*", when a facility activates the "top" tier of its surge plan, and indicates the inability to deliver typical standards of care.⁴

It also includes a reference (Appendix A) that is intended to provide information about how to extend resources and how they might be used during a crisis, and how to prepare for that process. These may be seen as related to the "operational" planning for a surge in resource demand, however, they are inherently linked to scarce resource allocation decisions and decision-making, and to the extent that they are not provided in other DHS planning documents, it is appropriate to place them here for reference.⁵

The resource allocation guidance herein is grounded in ethical principles that include *public health ethics, duty to care, duty to steward resources, distributive and procedural justice, reciprocity, and transparency*. It is consistent with public health ethics frameworks.^{6,7} and recommendations for how to allocate scarce critical care resources during a public health emergency.^{8,9} From this ethical framework, it provides guidance for selection of Triage Officers and engaging in an effective and fair decision-making process, guidance for communicating allocation decisions with patients and families, documenting decisions, and a mechanism for allowing stakeholders to appeal allocation decisions.

Although this guidance is aligned in principle with the guidelines set forth and used by many other state, local, and private entities, it deviates from them in that most of them rely primarily or solely on a prioritization scheme based on acuity scores such as Sequential Organ Failure Assessment (SOFA) scores.¹⁰ In the process of doing table top exercises intended to plan for operationalization of such

plans, and based on observations from other areas in the United States that have reported their experiences or anticipated crisis levels of surge,^{11,12} it is clear that the commonly proposed prioritization plan would be difficult to implement under true crisis care conditions, does not provide meaningful separation among care candidates,¹³ and cannot effectively address the myriad permutations of resources to be allocated when scarce.

As such, DHS has relied on ensuring principled collaborative decision-making by clinician administrators working closely with providers directly responsible for providing care to patients. This is to be accomplished by appointing Triage Officers at each hospital, who will work with ICU, hospital and Emergency Department (ED) leadership to understand what scarcities exist, what the apparent demands are, and the various ways in which they can be addressed. Once this assessment is conducted, the Triage Officer will have the authority and responsibility to decide how resources should be allocated, and should document such decisions. Decisions made by the Triage Officers will always be informed by, at a minimum, the physician and nursing director of the unit where decisions are being made, as well as input from relevant clinical and ancillary services acquainted with the affected patient(s). Decisions may also be informed by objective criteria such as SOFA scores, but they are not the focus or a necessary component of this plan. Clinicians and patient families will have the ability to seek further information about and request reconsideration of the decisions made by the organization.

This approach will provide the necessary flexibility to act quickly in a crisis and will accommodate more complex and nuanced decision-making. In addition to being more operationally expedient and flexible, it shares advantages with other decision-making such as the absence of exclusion criteria that would categorically eliminate some people from eligibility to receive scarce resources.¹⁴

DHS is committed to providing the best care it can to all and will not discriminate based on protected classes such as sex, race, color, religion, ancestry, national origin, ethnicity, ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, gender, gender identity, sexual orientation or immigration status. This document is consistent with the “Guidance Relating to Non- Discrimination in Medical Treatment for Novel Coronavirus 2019 (COVID-19)” issued by the California Department of Health Care Services on March 30, 2020.¹⁵

In this context, the over-arching guiding principle of care decision-making will be to do the greatest good for the greatest number of people.

Continuum of Care

In general, it is helpful to think of standards of care and related operational practices to be on a continuum.

At one end is “conventional care” during which a normal community standard of care is intended, and services are provided, and space is utilized according to routine and standard operating procedures. Conventional care will include maximization of usual resources.^{16,17}

Beyond conventional care is “contingency care” during which a normal community standard of care is intended but may not always be achievable. Means and methods employed at this level are generally not typical for the entity or the community (e.g. boarding of critical care patients in the emergency department or post-anesthesia areas, using alternative medications, or limiting access to medical interventions that are desired by the treating teams but of uncertain benefit¹⁸), but are used to optimize the use of existing resources in effort to provide normal standard of care to the fullest extent possible. As such, contingency care may present slightly increased risk to patients.¹⁹

Finally, “crisis care” describes a situation in which it is impossible to provide a normal community standard of care to all patients because resources simply will not allow for it. Examples of crisis care

might include providing care in areas not generally intended for that level of care, providing staffing that significantly varies from routine or required staffing, or making decisions about rationing of resources of proven medical benefit or triage of patients because the supply is insufficient to treat every patient who might need a specific resource.^{20,21,22}

As such, crisis care represents a necessary shift from considering how to provide the best care for every patient to providing the best care for the population at large. It should be clearly stated that during a crisis care situation, some compromise of standard of care is unavoidable; it is not that an entity, system, or locale chooses to limit resources, it is that the resources are clearly not available to provide care in a regular manner. In this environment, compromises to the care of some or all individuals will have to be made and it is important to ensure that decisions about those compromises be made in a principled and deliberate manner.

Ethical and Guiding Principles

When faced with a demand for care that clearly overwhelms one or more available resources, difficult decisions to allocate or limit resources should be supported by clear and compelling ethical principles, acknowledging that there may be significant tension among these principles. The following are key guiding principles of crisis care allocation decision making^{23 24}:

Maximization of Public Health

These guidelines and their allocation framework are grounded in public health ethics. Their primary goal is to maximize benefit to populations in a time of crisis; in other words, doing the most good for the most people (or conversely, minimizing the amount of harm to a population).²⁵ This may mean saving the most individual lives; in many plans, this is focused on maximizing survival to hospital discharge and beyond for as many patients as possible.^{26,27} In contrast the traditional ethical goals in medical care are generally focused on autonomy and doing what is best for each individual patient. To that end, the basic principles of medical ethics should apply, but may be altered by the context of a public health emergency.²⁸

Duty to Care²⁹

Health care professionals have a duty to care for patients, even at a reasonable 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. Although the duty of care indicates that health care professionals have an obligation to their patients, it is not without limit. For example, in the event of extreme crisis, when appropriate personal protective equipment is not available, it would be ethically justifiable for the health care providers to not provide potentially life-saving treatments such as CPR to patients in respiratory isolation as it would expose the staff to disproportionate risk of infection.³⁰

Duty to Steward Resources

In crisis, all resources are potentially scarce, and all workforce 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.³¹

Distributive and Procedural Justice (Equity)

A system of allocation during crisis must be applied consistently and broadly, to maximize the chances of fairness and equity, and minimize the influence of biases such as ageism, sexism, racism, or ableism. Allocation decisions should seek to support access to care for all, regardless of their insurance or immigration status, and especially the most vulnerable or those who suffer disproportionately. In this plan there are no categorical exclusions based on identity or pre-existing disability or medical condition – everyone who would be eligible for care or resources during conventional care should be considered

when making decisions about resource allocation. There should be equity of resource allocation among all patients, meaning that allocation of resources should be indifferent to whether the patient's needs arise from COVID-19 or another condition. Triage Officers should also be mindful of bias and preconceived notions of quality of life for individuals, particularly when considering patients with disabilities as well as patients who are elderly.

Autonomy

Autonomy describes an individual's right to make decisions for themselves. During a period of crisis care, the principle of autonomy may be offset by other principles. Nonetheless, patients should always be treated with dignity and respect.

Reciprocity

During public health emergencies such as pandemics, health care professionals put themselves and often their families at risk in order to care for patients. In emergencies of long or unknown duration, it is also possible that a health care professional who falls ill may get well in time to resume providing care to others (i.e., preserving scarce staffing resources). In light of these things, it is reasonable to afford front-line healthcare workers (interpreted broadly to include all professions and support personnel) some preference in the allocation of scarce resources.

Transparency

To the extent practically feasible, when in crisis, the potential for triage and resource allocation should be explained to patients and families when they present to the hospital for care, and individual decisions should be explained when called for. Likewise, staff should be informed when a facility is in crisis status and triage and resource allocation are in effect beyond usual practice. Such transparency is intended to enhance accountability, and minimize actual and vicarious trauma to patients, loved ones, staff, and members of the public after the crisis has abated.

Beneficence

Patients who are not allocated scarce resources will receive medical care that includes intensive symptom management and psychosocial support. They should also be reassessed at least daily to determine if changes in resource availability or their clinical status warrant provision of the resource. Symptom management may include the administration of narcotics or other sedative, which as a side effect, may hasten a patient's death. However, they will never be administered or prescribed with the purpose of causing death.

Resource limitation and decisions to be made

Although much work has been focused on allocation of ventilators and PPE during a pandemic,³² it is clear from the experiences in DHS hospitals and the experiences of other locales around the country, that the likely resource shortage will not be ventilators or other physical objects that can be used in patient care. Instead, the resource shortage is likely to be staffing,³³ particularly Respiratory Therapy, skilled ICU nursing, or critical care physicians.

When the scarce resource is a single object whose mechanism of benefit is the same for each potential recipient, it is easier to compare recipients directly to determine which should receive the resource. It is more difficult to decide how to distribute resources such as staffing because they can be deployed multiple different ways and the effect their deployment has may vary from patient to patient. For

example, an ICU nurse may be assigned to run Continuous Renal Replacement Therapy (CRRT) for patient A or to staff an additional ICU bed for ventilated patient B. The decision to be made involves comparing the potential benefit of CRRT to patient A v. the potential benefit of ICU care to patient B. The resource is the same (the nurse), but the potential benefit to each patient may be very different. Where each falls in the standard of care may be different as well. ICU care with ventilation is considered a basic part of normal standards of care, while current literature indicates that CRRT is of unclear benefit, as no controlled trials have found that initiation of CRRT improves mortality in an ICU setting, suggesting that it may be considered beyond a normal standard of care.^{34 35}

Similarly, in a time of scarcity, there may not be enough RTs to care for all ventilated patients within a normal staffing ratio, even after calling in help, if such help is available. In that case, the team must decide how to allocate the RTs. They may decide to increase workload so that each patient on a ventilator receives care and management from an RT, even though each RT would likely have a workload so large that their ability to care for any single patient would be limited or significantly compromised. Doing so may also increase burnout leading to increased shortage of RTs in the future as staff call out due to stress. The latter problem may conflict with the duty to steward resources.

Alternately, the team may decide that RTs should be given a reasonable workload and assigned to care for the patients with complex or changing ventilator settings, while physicians will take over ventilator management for patients with simpler ventilator settings. This plan may more effectively ensure retention of RT staffing, and normal standard of care for those very sick patients who will have their ventilator managed by an RT, but potentially increases the risk to patients whose ventilators will be managed by physicians who are less technically skilled at that work.

Either plan may be an appropriate choice based on the specific circumstances, and the decision will necessarily be informed by the number and complexity of ventilated patients, and the availability of other personnel who can take over some of the work. In this scenario, there are potentially two decisions to be made: (1) The decision of which staffing model to use at the moment; and (2) if the second staffing model is used, which patients will be given RTs to manage their ventilator, and which will have their ventilator managed by a physician until normal care can be resumed. The Triage Officer should be the decision-maker for both the decision of what approach to use, and as applicable, who should be allocated what resource.

It should be noted that there are some conditions that lead to immediate or near-immediate death despite aggressive therapy such that, even during conventional care circumstances, clinicians would not provide critical care services (e.g., cardiac arrest unresponsive to appropriate ACLS, overwhelming traumatic injuries, massive intracranial bleeds, intractable shock). In crisis conditions, the duty to care, the duty to steward resources align in underscoring physicians' obligations to make clinical judgments about the appropriateness of critical care use, based on the same criteria one would apply during normal clinical practice, and in support of physicians' obligations to appropriately respond to loved ones' requests for potentially inappropriate treatment, which may include refusing such requests after a fair process for responding to them has been implemented.³⁶

Under crisis conditions, it may be necessary to take scarce resources away from patients who appear not to be benefitting significantly from them, so they can be re-allocated to another patient. The ethical justification for such reassessment and reallocation 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 resources. In addition, periodic reassessments lessen the chance that arbitrary considerations,

such as when an individual develops critical illness, unduly affect patients' access to treatment. *During times of contingency care, when resources are not absolutely scarce, triage officers may prevent patients from receiving care but may not remove care from patients.*

Triage Officers

This section provides guidance on how facilities should identify Triage Officers and other personnel responsible for assisting in the triage/resource allocation process in order to ensure a single approach across the enterprise, while also allowing for tailored local implementation during crisis conditions (e.g., based on the size and/or census of a facility). The separation of the triage role from the clinical role is intended to ensure quality decision making, enhance objectivity, avoid conflicts of commitments, and minimize moral trauma and distress. It is important to emphasize that at a time of crisis care, whenever possible, a Triage Officer should make scarce resource allocations, rather than patients' treating physicians.

Designation of Triage Officers

The Triage Officer has the responsibility and authority to apply the principles and processes of this document to make decisions about which patients will have the highest priority for receiving critical care and regarding reallocation of critical care resources that have previously been allocated to patients. In many situations, the hospitals already employ some type of informal triage evaluation process to make end of life and other clinical decision, even during times of conventional care. To the extent appropriate, facilities should consider building upon the existing practices and personnel to serve in a crisis care triage situation.

Prior to a facility reaching surge levels of care, the Chief Medical Officer (CMO) and Chief Executive Officer (CEO) of each facility shall appoint a number of Triage Officers who will oversee the triage process and be the primary decision makers of resources allocation during a crisis, including prioritization of patients awaiting resources. Their work will be in conjunction with and informed by hospital clinical leadership, including medical and nursing directors of the ICUs, hospital wards, and emergency department, along with patients' attending physicians, Social Work, and Spiritual Care, among others.

The roster of Triage Officers and back-up support should be large enough to ensure that Triage Officers will be available on short notice at all times, and assignment should be such that they can be assigned shifts with sufficient rest periods and overlapping time for sign-out in between.

Desirable qualities of Triage Officers include being a clinician with appropriate knowledge of the management of critically ill patients (generally, critical care and emergency medicine physicians), strong leadership ability, and effective communication and conflict resolution skills. The Triage Officer also should have at least a general understanding of patient flow, bed distribution, and resources available to the facility.

Triage Officer Support

In addition to the Triage Officer, to the extent resources allow, facilities may choose to designate one or more support personnel to help the Triage Officer in obtaining and reviewing records, data-gathering

activities, documentation and record keeping, and liaising with a hospital Command Center or bed management.

The facility's Helping Healers Heal (H3) Team, Ethics Committee, General Counsel, and Risk Manager, as well as the DHS-wide Clinical Risk Manager and Chief Legal Advisor should be informed of the Activation of Triage Officer and the initiation of triage, and should be available to provide support to the Triage Officer and other staff as necessary.

Triage Officer Training

Implicit bias awareness training.

Basic training for ethics.

Allocation Process for Scarce Critical Care Resources

Activation

The Triage Officers should be activated at or before the facility reaches crisis level of care. Triage Officer activation and de-activation should be made by the DHS-wide Surge Planning Committee, based on available data about hospital census, and imminent or current demand for care, staffing, equipment, or supplies. It is possible for Triage Officers at one facility alone to be activated, such as when there is a very local surge or temporary demand increase at just that facility. However, the default should be that Triage Officers at all facilities that have them, will be activated simultaneously. Triage Officers should be de-activated when facilities return to their typical census and demands, such that routine decision-making is appropriate.

Decision Making

When activated, the Triage Officer has the responsibility and authority to apply the principles and processes of this document to make decisions at their facility about how scarce resources will be distributed amongst all of the patients eligible to receive them, including reallocation of critical care resources that have previously been allocated to patients, if it becomes clear that another patient is more likely to benefit.

Resource allocation must be applied to all patients presenting with critical illness or in need of the scarce resource(s) in question, not simply those with the disease or disorders that arise from the public health emergency, in this case COVID-19.

Once activated, the Triage Officer should proactively engage first with the facility's Chief Medical Officer and the Chief Nursing Officer, and then with the ICU medical directors, the ICU unit nursing managers, and their counterparts in the ED and hospital wards to notify them of activation, determine the overall picture of the census, demand for care, and what resources are available, and which are limited. The Triage Officer should then work with the appropriate people to devise an effective strategy for maximizing the limited resource(s). This planning will include consideration of various combinations of care provision, and how they will interact with the patients currently in need.

With regard to resource limitation, the resources that are likely to become scarce during a crisis are staff such as nurses, respiratory therapists, and physicians experienced in providing intensive care, space appropriate to provide intensive care (e.g., space that would be used during a contingency phase, such as a PACU or ED room), equipment, medication, blood/blood products and PPE. Leaders and clinicians in the ICU and ED are encouraged to contact the TO as necessary. However, acknowledging that they may be overwhelmed with immediate demands of care and management, the TO should plan to contact these units regularly to offer assistance.

Because the allocation of a scarce resource is highly dependent on the nature of the resource, the nature and significance of its scarcity, the nature and volume of patients/ needs, and the nature of available alternatives, the Triage Officer will necessarily engage in a dynamic decision making process with the people described above to allocate the scarce resource in keeping with the principles identified in this document. Decision making and prioritization should be based on assessment of current clinical status, significant medical history, existing comorbid conditions, and other factors that may indicate the patient's likelihood of benefitting from the scarce resource, and the degree to which they might benefit. Although not the focus of these guidelines, Triage Officers may find objective clinical scoring such as SOFA scores to be helpful in determining to whom resources should be allocated.

All patients who are allocated a scarce resource or critical care service should be allowed an initial therapeutic trial of 12-48 hours, followed by periodic reassessment every subsequent 12- 48 hours to determine whether utilization of the scarce resource should continue or be re-allocated to another patient. The duration and frequency of reassessment shall be determined by the Triage Officer in conjunction with ICU and ED leadership. Reassessments of patients receiving critical care resources should involve assessing changes in the patient's clinical trajectory. Patients showing improvement should continue to receive their allocated resources until the next assessment. If there are patients in the queue for scarce resources or patients who, upon reassessment, show substantial clinical deterioration as assessed by the care team and the Triage Officer, then the Triage Officer will determine whether it is appropriate to reallocate the scarce resources they are receiving. Although patients should generally be given the full duration of a trial, if patients experience a precipitous decline (e.g., refractory shock and DIC) or a highly morbid complication (e.g., massive stroke) which portends a very poor prognosis, the Triage Officer and care team may make a decision before the completion of the specified trial length that the patient is no longer eligible for critical care treatment.

Communicating Allocation Decisions

Communication or disclosure of triage decisions to the care team, patients, and their families is a necessary component of a fair and respectful allocation process.³⁷ Given the nature of these discussions, it is advised that the person communicating decisions be an attending level provider. The Triage Officer should first inform the affected patient's attending physician about the triage decision. The patient's attending physician shall inform the patient and/or patient's family/surrogate of the decision. If the attending and Triage Officer agree and circumstances permit, the Triage Officer may choose to join the attending physician for this discussion. The attending physician should explain the severity of the patient's condition in an emotionally supportive manner and then discuss the implications of those facts in terms of the triage decision. It should be emphasized that the triage decision was made by an "independent" Triage Officer not by the attending physician, and is instead one that arose from the extraordinary emergency circumstances and reflect a public health decision.

Regardless of who communicates the decision, it may be useful to explain the medical factors that informed the decision, as well as the factors that were not relevant (e.g., sex, race, color, religion, ancestry, national origin, ethnicity, ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, gender, gender identity, sexual orientation or immigration status). To the extent that resources permit, palliative care clinicians, social workers, and/or chaplains should be present or available to provide ongoing emotional support to the patient and family.

During crisis standards of care, it should be made clear to the patient and/or family that allocation of resources in this situation is temporary and subject to further re-allocation according the principles listed here. (See Appendix B for additional communication guidance).

The Triage Officer is responsible for ensuring appropriate communication with facility leadership and the

facility's Emergency Command Center.

Documentation

To the extent reasonably possible, decisions that may cause or represent deviations from the standard of care due to scarcity of resources, should be documented by the Triage Officer in the patient's chart. Documentation should explain that the facility is under crisis care conditions, identify the scarce resource being allocated, describe the patient's relevant medical history, and explain the decision made. Sample notes are provided in Appendix C.

Reconsideration of Allocation Decisions

It is likely that there will be cases in which there is disagreement with an individual allocation decision. In the event that a patient, family member, or care team member disagrees with an individual allocation decision, that disagreement should be immediately brought to the attention of the Triage Officer.³⁸ The Triage Officer will gather information regarding the disagreement and explain the basis of the decision to the person requesting reconsideration. If, after that discussion, reconsideration is still desired, the Triage Officer shall confer with the facility CEO or their designee, who is responsible for making a final decision. When circumstances permit, the CEO or their designee should be willing to speak to a family regarding the decision if requested.

Care Prior to Resource Allocation

Initial Episode of Care and Review of Goals of Care

During crisis and high-level surge conditions, triage should begin as a history is taken in the emergency department. All patients should be screened for existing advance directives, POLST, or DNR/DNI orders.

Following this screening, goals of care and code status should be discussed for all patients. This conversation should include explanation of the following:

- The facility, like many or most others in the area, is becoming overwhelmed by the demand for care related to the current surge of people with COVID-19, and that as a result, this facility, like many others, is in the situation of not being able to provide "normal" care to all patients.
- Due to this demand, the facility is temporarily forced to alter the way some services are delivered, and in some cases, will have to choose who will get certain services (e.g. a ventilator or highly specialized critical care services), and who will not.
- In such situations, the health care system, including this hospital, must focus on doing the most good for the most people, which unfortunately will have an impact on the care of some people.
- This hospital (system) has established a "neutral" Triage Officer who works with the doctors caring for patients to understand what resources are limited, and how and to whom they should be given, using their clinical judgment to decide who is most likely to benefit from receiving a scarce resource, relying on ethical principles to ensure fairness.
- If the patient chooses to forgo a scarce resource, that resource will be available to someone else. If the patient chooses to forgo certain treatments, they will not be abandoned – the facility will still follow their wishes regarding treatment that it is able to provide and will make them as comfortable as possible under the circumstance.

Every effort should be made to ensure appropriate comfort and palliative care to patients who need it, and/or who choose minimal intervention or comfort care. This will likely need to be done by the primary inpatient medical teams in consultation with the facility's palliative care service.

Stabilization of Patients

All unstable patients desiring care should be stabilized according to the resources immediately available in the ED, in compliance with EMTALA requirements, and prioritized according to standard ED triage processes. In most crisis conditions, first responders and bedside clinicians should perform the

immediate stabilization of any patient in need of critical care and resources that may be or are scarce, as they would under normal circumstances. Along with stabilization, and if available, temporary ventilatory support may be offered to allow the Triage Officer time to assess the patient for critical resource allocation. When this occurs during crisis conditions, the clinicians initiating care should be particularly mindful of informing patients and families that the intervention may be temporary, based on overall availability of resources.

Conclusion

It is impossible for any concise set of guidelines to anticipate and provide specific instruction for every possible circumstance that might arise in the context of an overwhelming surge of demand leading to crisis standards of care. As such, rather than provide rigid instructions that can be seen as objective, but may not be easily applied, we have opted for a principle-based approach to decision making regarding allocation of scarce resources. We recognize that doing so puts additional burden on the Triage Officers, and it is incumbent on Triage Officers and those working with them to be mindful of the potential for bias and discrimination in decision making, and be very deliberate in their considerations. If at any time, a Triage Officer or any other party engaged in resource allocation has concerns about the fairness or appropriateness of decisions being made, they should consult with leaders at the facility and DHS levels to re-examine the process and specific resulting decisions as necessary.

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¹⁸ Hick, J. L. Hanfling, D. & Cantrill, S. V. (2012). Allocating Scarce Resources in Disasters: Emergency Department Principles. *Annals of Emergency Medicine*, 59(3), p 178

¹⁹ California Department of Public Health. California SARS-CoV-2 Pandemic Health Care Surge Crisis Care Guidelines. June 8, 2020. Available at: http://healthimpact.org/wp-content/uploads/2020/06/California-SARS-CoV-2-Crisis-Care-Guidelines-June-8-2020_rs.pdf. Last accessed 11/23/20.

²⁰ Hick, J. L. Hanfling, D. & Cantrill, S. V. (2012). Allocating Scarce Resources in Disasters: Emergency Department Principles. *Annals of Emergency Medicine*, 59(3), p 178

²¹ California Department of Public Health. California SARS-CoV-2 Pandemic Health Care Surge Crisis Care Guidelines. June 8, 2020. Available at: http://healthimpact.org/wp-content/uploads/2020/06/California-SARS-CoV-2-Crisis-Care-Guidelines-June-8-2020_rs.pdf. Last accessed 11/23/20.

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- ²² California Department of Public Health. California SARS-CoV-2 Pandemic Health Care Surge Crisis Care Guidelines. June 8, 2020. Available at: http://healthimpact.org/wp-content/uploads/2020/06/California-SARS-CoV-2-Crisis-Care-Guidelines-June-8-2020_rs.pdf. Last accessed 11/23/20.
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Appendix A – Strategies for Scarce Resource Maximization

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis												
<p>Inhaled Medications</p> <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). 	<i>Substitute & Conserve</i>															
<p>High-Flow Applications</p> <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 50LPM. Place patients on ventilators as soon as possible to avoid prolonged use of bag-valve ventilation at high oxygen flowrates 	<i>Conserve</i>															
<p>Air-Oxygen Blenders</p> <p>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).</p> <ul style="list-style-type: none"> Disconnect blenders when not in use. 	<i>Conserve</i>															
<p>Oxygen Conservation Devices</p> <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 flowrates of 6-10 LPM. 	<i>Substitute & Adapt</i>															
<p>Oxygen Concentrators if Electrical Power Is Present</p> <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. 	<i>Substitute & Conserve</i>															
<p>Monitor Use and Revise Clinical Targets</p> <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" data-bbox="137 954 935 1079"> <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%	<i>Conserve</i>			
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Normal Lung Adults	SpO ₂ <90%	SpO ₂ 90%														
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Severe COPD History	SpO ₂ <85%	SpO ₂ 90%														
<p>Expendable Oxygen Appliances</p> <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. 	<i>Re-use</i>															
<p>Oxygen Re-Allocation</p> <ul style="list-style-type: none"> Prioritize patients for oxygen administration during severe resource limitations. 	<i>Re-Allocate</i>															

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.

Appendix A – Strategies for Scarce Resource Maximization

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. 	<i>Prepare</i>			
<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. 	<i>Conserve</i>			
<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. 	<i>Substitute</i>			
	<i>Adapt</i>			
<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. 	<i>Conserve</i>			
<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. 	<i>Adapt</i>			

Appendix A – Strategies for Scarce Resource Maximization

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. 	<i>Prepare</i>			
<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. 	<i>Prepare</i>			
<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. 	<i>Prepare</i>			
<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. 	<i>Prepare</i>			
	<i>Substitute</i>			
	<i>Adapt</i>			
	<i>Substitute & Adapt</i>			
	<i>Adapt</i>			

Appendix A – Strategies for Scarce Resource Maximization

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis												
<p>Cache/Increase Supply Levels*</p> <ul style="list-style-type: none"> 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. <table border="1" data-bbox="209 293 1513 797"> <tr> <td>Analgesia</td> <td>• Morphine, other narcotic and non-narcotic (non-steroidals, acetaminophen) class - injectable and oral</td> </tr> <tr> <td>Sedation</td> <td>• Particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables, ketamine, and ant i- 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> <ul style="list-style-type: none"> Increase supply levels or cache critical medications - particularly for low-cost items and analgesics. Key examples include: 	Analgesia	• Morphine, other narcotic and non-narcotic (non-steroidals, acetaminophen) class - injectable and oral	Sedation	• Particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables, ketamine, and ant i- 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	<i>Prepare</i>			
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<p>Use Equivalent Medications</p> <ul style="list-style-type: none"> Obtain medications from alternate supply sources (pharmaceutical distributors, pharmacy caches). <table border="1" data-bbox="209 948 1561 1192"> <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 3-20m 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> <ul style="list-style-type: none"> Explore options to compound or obtain from compounding pharmacies. 	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 3-20m 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.	<i>Substitute</i>							
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	<i>Substitute</i>															
<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).</p> <ul style="list-style-type: none"> Allow use of personal medications (inhalers, oral medications) in hospital. Do without - consider impact if medications not taken during shortage (statins, etc.). 	<i>Conserve</i>															

Appendix A – Strategies for Scarce Resource Maximization

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= qtts/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.html Consider use of select medications beyond expiration date**, especially tablets/capsules Consider use of veterinary medications when alternative treatments are not available** 	<i>Adapt</i>			
	<i>Adapt</i>			
<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. 	<i>Re-Allocate</i>			
	<i>Re-Allocate</i>			

*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		<i>Prepare</i>							
Use Scheduled Dosing and Drip Dosing When Possible <ul style="list-style-type: none"> Reserve IV pump use for critical medications such as sedatives and hemodynamicsupport. 		<i>Conserve</i>							
Minimize Invasive Monitoring <ul style="list-style-type: none"> 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. 		<i>Substitute & Conserve</i>							
Emphasize Oral Hydration Instead of IV Hydration When Possible <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 5px;">Utilize appropriate oral rehydration solution</td> <td style="padding: 5px;">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</td> </tr> <tr> <td style="padding: 5px;">Pediatric hydration</td> <td style="padding: 5px;">Pediatric maintenance fluids: <ul style="list-style-type: none"> 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 </td> </tr> </table> <p>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/</p>		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: <ul style="list-style-type: none"> 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 	<i>Substitute</i>			
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Provide Nasogastric Hydration Instead of IV Hydration When Practical <ul style="list-style-type: none"> 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. 		<i>Substitute</i>							
Substitute Epinephrine for Other Vasopressor Agents <ul style="list-style-type: none"> 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. 		<i>Substitute</i>							
Re-use CVP, NG, and Other Supplies After Appropriate Sterilization/Disinfection <ul style="list-style-type: none"> 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). 		<i>Re-use</i>		(disinfection - NG, etc)	(steriliza- tion - central line, etc)				

Appendix A – Strategies for Scarce Resource Maximization

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
<p>Intraosseous/Subcutaneous (Hypodermoclysis) Replacement Fluids</p> <ul style="list-style-type: none"> • Consider as an option when alternative routes of fluid administration are impossible / unavailable. • Intraosseous route preferred over subcutaneous. Intraosseous • Intraosseous infusion is not generally recommended for hydration purposes but may be used until alternative routes are available. Intraosseous infusion requires pump or pressure bag. Rate of fluid delivery is often limited by pain of pressure within the marrow cavity. This may be reduced by pre-medication with lidocaine 0.5 mg / kg slow IV push. <p>Hypodermoclysis Cannot correct more than moderate dehydration via this technique. Many medications cannot be administered subcutaneously. Common infusion sites: pectoral chest, abdomen, thighs, upper arms. Common fluids: normal saline (NS), D5NS, D5 1/ 2 NS (Can add up to 20-40 mEq potassium if needed.) Insert 21/24 gauge needle into subcutaneous tissue at a 45 degree angle, adjust drip rate to 1-2 ml per minute. (May use 2 sites simultaneously if needed.) Maximal volume about 3 liters / day; requires site rotation. Local swelling can be reduced with massage to area. Hyaluronidase 150 units / liter facilitates fluid absorption but not required; may not decrease occurrence of local edema</p>	<i>Substitute</i>			
<p>Consider Use of Veterinary and Other Alternative Sources for Intravenous Fluids and Administration Sets</p>	<i>Adapt</i>			

**Appendix B – Scarce Resource Allocation Decision – Triage Officer Documentation
Sample Notes**

#1:

Due to a surge of patients across LA County presenting to the hospital with COVID-19, the LA County Department of Health Services has initiated a system-wide triage process to ensure the stabilization of inpatient care for the County. This triage process is based on core principles, which are being applied to the care of this patient. Those principles are to do the greatest good for the greatest number of people, and to do so in an equitable way, not informed by patient financial status, protected class, or immigration status.

The decisions regarding care for the current patient have been made using best medical judgment, incorporating expert input from the [FILL IN PRIMARY TEAM] care team, with additional input from [list additional input, e.g., nursing, social services, consulting medical/surgical services]]. These decisions have been made solely based on medical considerations, and have not been informed by financial considerations, or any considerations of sex, race, color, religion, ancestry, national origin, ethnicity, ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, gender, gender identity, sexual orientation and immigration status.

[LIST SUMMARY OF CLINICAL CONDITION WITH PLAN OF THE DAY AND RATIONALE FOR TRIAGE DECISION]

Mr. X is receiving mechanical ventilation as a treatment for respiratory failure due to COVID-19. He has been on stable ventilator settings for 48 hours, with oxygenation relatively stable, and the vent settings standard, and not requiring complex ventilatory maneuvers. Discussion with the critical care expert team confirms that Mr. X will not derive substantive clinical benefit from focused attention from respiratory therapy today, given these stable ventilator settings. Other patients in the hospital are currently requiring very complex ventilatory maneuvers that do require focused respiratory therapy attention. Therefore, as triage officer I am authorizing [re]deployment of the respiratory therapist to these other patients, for whom medical experts confirm greater good will be achieved by this step, and Mr. X's ventilator will be managed by his physicians today.

[Enter Triage Officer's name]

**Appendix B – Scarce Resource Allocation Decision –
Triage Officer Documentation
Sample Notes**

#2:

Due to a surge of patients across LA County presenting to the hospital with COVID-19, the LA County Department of Health Services has initiated a system-wide triage process to ensure the stabilization of inpatient care for the County. This triage process is based on core principles, which are being applied to the care of this patient. Those principles are to do the greatest good for the greatest number of people, and to do so in an equitable way, not informed by patient financial status, protected class, or immigration status.

The decisions regarding care for the current patient have been made using best medical judgment, incorporating expert input from the [FILL IN PRIMARY TEAM] care team, with additional input from [list additional input, e.g., nursing, social services, consulting medical/surgical services]]. These decisions have been made solely based on medical considerations, and have not been informed by financial considerations, or any considerations of sex, race, color, religion, ancestry, national origin, ethnicity, ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, gender, gender identity, sexual orientation and immigration status.

Mr. X is suffering from end-stage, widely metastatic lung cancer, and has suffered multiple organ failure due to this, including hypoxic respiratory failure and hypoxic brain injury. His cancer is incurable and will ultimately cause his death within a matter of weeks to months. He has no chance of recovering meaningful functional status, and will ultimately succumb to his underlying disease, irrespective of short-term changes in his respiratory status. Furthermore, the care he is receiving is invasive and painful, requiring constant sedation to the point of unconsciousness to prevent discomfort. It also creates risk of further harm from high pressure in the lung, such as pneumothorax necessitating chest tube management, blood clots, pressure ulcers, various infection types, etc. ICU level care is therefore not providing meaningful benefit to Mr. X and is exposing him to real potential harm, and other patients during this COVID-19 surge are in critical need of ICU level care for which meaningful benefit can be delivered. Therefore, as triage officer I am authorizing initiation of comfort care for this patient, with movement to a private room outside the ICU and medical goal of focusing on comfort and compassion, as opposed to painful and invasive procedures that will ultimately not be of benefit.

[Enter Triage Officer's name]

Appendix C – Resource Allocation Decision Communication Protocol

We designed this protocol as a guide to use during patient / family meetings for patients with COVID 19 when resources are scarce. Think of the steps as signposts—you might find that certain things do not apply to your patient and meeting.

(ICU/Intubation Eligible)

Family Meeting Steps	Sample Phrases
Show the guideline	<ul style="list-style-type: none"> • Our system is doing everything we can for patients in your situation. We’re trying to do the most good for the most people by directing scarce treatments where they can do the most good. We wish there was enough of everything for everyone but there isn’t.
Headline what it means for this patient, and stress what you will do before you talk about what you won't	<ul style="list-style-type: none"> • For you, this means we will admit you to the ICU, give you oxygen through a ventilator, doing everything we can to help you fight this illness. What we won’t do is keep this treatment going if your body shows us it can’t get better even with this level of support. This is called a time limited trial.
Affirm the care you will provide:	<ul style="list-style-type: none"> • We’ll be watching you closely to see how you respond and reassessing the resources to use everything available to us to get you through this.
Respond to emotions	<ul style="list-style-type: none"> • I know you’re really (worried, scared, concerned.....) which is totally understandable. This is very stressful time for all of us. I wish things were different.
Emphasize the same rules apply to everyone	<ul style="list-style-type: none"> • I want you know we are using the same rules for every patient in this hospital and in this system. The rules conform to state and national standards, and get applied by an impartial person called a triage officer who can't be influenced, so no one doctor decides on their own. Who gets what is based only on medical factors, never on legally protected categories including age, race, sex, national origin, religion, gender, nationality, ethnicity, or disability, among others.¹

¹ The entire list given in the Guidelines consists of: sex, race, color, religion, ancestry, national origin, ethnicity, ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, gender, gender identity, sexual orientation and immigration status

(Not ICU/Intubation Eligible)

Family Meeting Steps	Sample Phrases
Show the guideline	<ul style="list-style-type: none">• Our system is doing everything we can for patients in your situation. We're trying to do the most good for the most people by directing certain scarce treatments to the people who can get the most good out of it. We wish there was enough of everything for everyone but there isn't, so we're doing the best we can to save as many people as we can.
Headline what it means for this patient, and stress what you will do before you talk about what you won't	<ul style="list-style-type: none">• For you, this means we will admit you to the hospital, give you oxygen, medication and monitoring, doing everything we can to help you fight this illness. What we can't do is transfer you to the ICU or do CPR if your heart stops.
Affirm the care you will provide:	<ul style="list-style-type: none">• We'll be watching you closely to see how you respond, and reassessing the resources to use everything available to us to get you through this.
Respond to emotions	<ul style="list-style-type: none">• I know you're really (worried, scared, concerned.....) which is totally understandable. This is very stressful time for all of us. I wish things were different.
Emphasize the same rules apply to everyone	<ul style="list-style-type: none">• I want you know we are using the same rules for every patient in this hospital and in this system. The rules were agreed on by a national group of experts and community advocates, and get applied by in impartial person who can be influenced, so no one doctor decides on their own. Who gets what is based only on medical factors, never on legally protected categories including age, race, sex, national origin, religion, gender, nationality, ethnicity, or disability, among others.²

² The entire list given in the Guidelines consists of: sex, race, color, religion, ancestry, national origin, ethnicity/ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, gender, gender identity, sexual orientation and immigration status