



UCHealth Guidance: Triage for Crisis Standards of Care

v. 4/10/2020

Preface

While one hopes to never experience a catastrophic circumstance when demand for critical resources (whether beds, equipment, or staff) outstrips the ability to provide needed services, it would be irresponsible to assume this will never occur. Healthcare providers have a [duty to plan](#) for worst case crisis scenarios, even if every possible measure to avoid experiencing them is taken.

Through the Incident Command structure, UCHealth is actively engaged in *contingency planning* to mitigate critical resource shortages, such as by halting elective procedures, bringing in additional resources, using alternative resources for the one(s) in shortage, and moving resources from one location to another. Contingency planning comprises steps taken to prevent the need for making triage decisions under crisis conditions.

If after all contingency options have been exhausted there remains the need to apply triage, this guidance would be used. That is, “crisis triage” in this guidance refers to the processes and criteria that would be used to make resource allocation decisions in the event of *extreme scarcity*, when needed critical resources such as ventilators and the staff, space and supplies necessary to use them are in such great demand that not all patients who might benefit from them will be able to receive them. This guidance does not address the day-to-day triage that takes place in emergency departments, clinics and elsewhere based on usual medical decision-making criteria around providing optimal care despite time and other common constraints.

In an *extreme scarcity* situation, the goal will be to provide the best care for the most patients, and to do so in ways that sustain social cohesion, trust in our healthcare system, and our ability as a community to come together and heal in the wake of the crisis. That is, if we are forced to decide who can have access to limited critical resources, we need to be ready to make these decisions in ways that are transparent, respectful and fair. Appendix A describes the set of ethical values that underlie this guidance.

The crisis triage criteria and processes below are derived from expert guidance from the [National Academies of Sciences Engineering and Medicine](#), the US Department of Health and Human Services [Assistant Secretary for Planning and Response](#), the US Department of Homeland Security Office for Civil Rights and Civil Liberties, Office of Civil Rights of the Department of Health and Human Services, the US Department of Justice, and the [state of Colorado](#), as well as [clinical](#) and [ethics](#) guidance [from experts](#) and reflections on proposed disaster triage criteria from [the US public](#). It was reviewed in draft form by experts in diverse fields including bioethics, critical care, nursing, public health, infectious diseases, guidance development, pastoral care, social work and more. We received valuable feedback and comments from patients and families, including people with disabilities and their advocates and other members of the public. Recognizing that implementation of crisis standards of care is an evolving field, we consider this guidance to be a living document and expect it will continue to evolve in the tragic event that it ever needs to be implemented.

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Executive Summary

v.4/10/2020

This guidance is to be activated only in the event of the need for “crisis triage,” defined as the need to make resource allocation decisions due to *extreme scarcity*, when needed critical resources such as ventilators and the staff, space and supplies necessary to use them are in such great demand that not everyone who might benefit from them will be able to receive them. In such an *extreme scarcity* situation, the goal will be to provide the best care for the most patients, and to do so in ways that sustain social cohesion, trust in our healthcare system, and our ability as a community to come together and heal in the wake of the crisis. The guidance is in alignment with the [Colorado Crisis Standards of Care Guidelines for Hospitals in the COVID-19 Pandemic](#).

Guiding Ethical Principles

Fairness: this guidance will apply to all patients, in recognition of the fact that every human being is equally worthy and valuable, without regard to underlying race, ethnicity, disability, color, national origin, English proficiency, gender, gender expression/identity, religion, sexual orientation, immigration status, “VIP” status, criminal history, or one’s ability to pay.

Transparency: resource allocation decisions must be made using processes and criteria that are open and transparent.

Respect: in conditions of extreme scarcity not every patient who wants and might benefit from critical resources will be able to receive them, yet patients’ or their surrogates’ wishes will be elicited and accommodated to the greatest extent possible.

A detailed description of the ethical foundations of this guidance is provided in Appendix A.

Use of Crisis Triage Teams

To preserve the patient/clinician relationship and ensure equity and efficiency in triage decisions, the patient’s primary clinical team should not make crisis triage decisions. Each region is to have a *Crisis Triage Team*, comprising (1) an attending physician familiar with critical care (e.g., hospitalist or critical care physician), (2) a representative of nursing staff, and (3) a representative of institutional leadership. The work of these teams will be overseen by a *System-Level Triage Team*, comprising the System CMO, CNE, Legal Counsel and an Ethicist.

All triage team members will follow strict conflict of interest guidance, including recusal from decision making on any patient with whom they have a pre-existing relationship. These teams will closely coordinate with the state Unified Command Center, Medical Operations Command to ensure that no patient is triaged to not receive a resource when that resource is available at another facility. Triage teams will undertake blinded review when making decisions; information about patients will be provided to the triage teams from the chart, abstracted by Clinical Quality Specialists or a trained chart abstractor, and will not include the patient’s race, ethnicity, age, disability, ability to pay or other factors not relevant to triage decision making.

Crisis Triage Process and Scoring System

The crisis triage process is for use in acute illness only and will not be used to non-electively remove stable patients on chronic life support.

Emergent Triage will apply for patients in emergent circumstances (e.g., presenting in extremis to the Emergency Department), who will be treated as usual and stabilized until the prospective triage process (below) can be completed. If CPR and emergent intubation are medically inappropriate because they would be non-beneficial interventions, these interventions may be withheld under the UCHealth [Non-beneficial Intervention](#) policy.

Prospective Triage will take place for all hospitalized patients, using a multi-component clinical scoring system that initially combines the Sequential Organ Failure Assessment (SOFA) score, to assess acute illness severity, and data from a modified Charlson Comorbidity Index (mCCI), to assess comorbidities that affect near-term (1 year) survival. UCHealth is testing adding further clinical elements to this multi-component score to enhance predictive accuracy. This multi-component scoring system will generate a continuous measure – the Comprehensive SOFA (CO-SOFA) score – which will be used to rank all hospitalized patients as best to worst candidate for likelihood of survival if they were to require use of critical care resources. Depending on the level of scarcity those at the bottom of this list might be triaged to not receive the scarce resource in favor of others with a greater chance of benefit. Ongoing efforts to improve CO-SOFA scoring system performance will include assessment of predictive accuracy as new elements are added and also tracking of any potential bias toward particular groups of patients.

Reassessment Triage will take place at pre-defined mileposts – based on the duration of a therapeutic trial for the patient’s condition – once a patient is receiving the resource that is in shortage. Reassessment evaluations will use the CO-SOFA score as well as information about the patient’s clinical trajectory (stable, improving or worsening). These patients will be ranked best to worst candidate for continued use of the resource, and depending on the level of scarcity those at the bottom may have the resource reassigned to others with a greater chance of benefit.

Use of tiebreakers and random allocation

In the event that multiple patients have the same CO-SOFA score, conferring an equivalent likelihood of benefit from receiving a scarce resource, triage teams may take the following criteria into account.

Minor children: Pediatric patients (≤ 17 years of age) have the unique ability to be transferred emergently to a pediatric hospital where critical care resources might be more available.

Multiplier effect and reciprocity: it can be appropriate to consider the likelihood that saving a given patient might have a [multiplier effect](#), if that person can return to service and thereby save additional lives.

Based on state level guidance, several other factors might be considered by triage teams when patients remain tied after consideration of the above factors (e.g., a nurse and a firefighter with equivalent CO-SOFA scores).

- Pregnancy – priority for a scarce resource may be given to a near-term pregnant patient over a non-pregnant patient.

- Life-Years Saved - priority for a scarce resource can be given to a patient with more life years to be saved, based on age or underlying illness.
- Additional Multiplier Effect Considerations - priority for a scarce resource may be appropriate for patients who are the sole caregiver to a dependent child or elderly family member.

If following use of the scoring systems and tiebreakers above there remain two or more patients who need the same resource and have the same CO-SOFA scores and tiebreaker considerations, then the regional crisis triage team will use a random allocation method to determine which patients will be provided a therapeutic trial of using the scarce resource.

A. GENERAL PRINCIPLES FOR CRISIS TRIAGE

1. *Fairness*: **All** patients needing scarce critical care resources will be considered using the same process and criteria.
 - a. Every human being is equally worthy and valuable, without regard to underlying race, ethnicity, disability, color, national origin, English proficiency, gender, gender expression/identity, religion, sexual orientation, immigration status, “VIP” status, criminal history, or one’s ability to pay.
 - b. Community members including representatives of and advocates for underserved populations must be involved in the development of crisis triage protocols, recognizing the need to respect and balance the values and preferences of multiple and diverse communities.
 - c. If crisis triage is required, it will be applied to all patients needing critical care resources during a pandemic, not just those infected with the pandemic agent.
2. *Transparency*: Patients and the public must be informed as soon as possible when it appears the health system might be approaching the need to operate in circumstances of extreme scarcity. To make crisis triage decisions ethically, the processes and criteria that will be used for making these decisions must be open and transparent.
 - a. Patients and family members should be made aware of the crisis triage process as early as possible, including the fact that allocation decisions are contingent on ongoing assessments of clinical prognosis and resource availability. See the *Communicating with Patients, Families and Care Teams* section below.
3. *Respect for informed decision making*: The first consideration prior to making any crisis triage decision should be to determine whether a given patient wants to receive the specific service or item that is in shortage. For instance, as in normal times, patients who make an informed choice to avoid intubation and placement on a ventilator should not be placed on a ventilator. In a crisis, this would hold true even if an individual’s reasons for avoiding use of a ventilator include altruistic concerns about the availability of critical care resources for others.
 - a. Goals of care and code status should be solicited and documented for **every** patient; efforts to ensure this happens should be redoubled under circumstances of extreme scarcity.
 - b. This does not mean that patients who want to receive non-beneficial interventions will receive them – existing UHealth policies ([Non-beneficial Intervention](#), [End of Life](#) and [DNAR](#)) and [ethics guidance](#) describe medical decision making around potentially non-beneficial interventions.
 - c. In conditions of extreme scarcity, this also does not mean that every patient who wants and could potentially benefit from access to critical care resources will automatically receive them – in the circumstances in which this process would be invoked some people will not be able to get all the services they might want and from which they could potentially benefit– but patients or their surrogates who choose not to receive such services will have their wishes respected.
 - d. Patients with an advance directive, such as a DNR order or a completed MOST form, should not automatically receive low priority for all services; rather, patients should be considered for

receiving services that are in accord with their previously articulated preferences, values and priorities and from which they could potentially benefit.

- e. As in usual practice, patients with capacity or their surrogates may change their minds about preferences as the situation evolves.
 - f. Palliative care and ethics consultation services play valuable roles in providing resources to help teams ensure that accurate and timely goals of care conversations, tailored to current circumstances, take place with all relevant patients and their families.
4. *Legal protections:* If forced choice decisions around critical care resource allocation are imminent, state authorities will be notified by the system incident command center to seek the potential legal protections available under our state's [Crisis Standards of Care plan](#).
- a. With or without legal liability protections however, the nature of forced choice decisions is that a decision must be made. For example, choosing to keep one patient on a ventilator means another patient will necessarily be denied access to that service.
 - b. Because the nature of crisis triage decisions is that some people must be denied services that might have helped them survive, our aim cannot be to avoid all potential legal repercussions for these tragic decisions. Rather, our aim must be to have a well-reasoned process and thoughtful criteria in place in advance of the need to make such decisions, enabling the most clinically and ethically justifiable decisions under catastrophic circumstances.

B. CRISIS TRIAGE TEAM: RATIONALE, COMPOSITION AND WORK PROCESSES

1. Independence of crisis triage process: Whenever possible, crisis triage decisions made necessary by extreme scarcity should not be made by members of a patient's primary clinical team or those directly involved in making other clinical decisions about the patient's care.

The patient's care team members are obligated by professional ethics and law to advocate for their patients' best interests. Also, to make the most ethically and clinically defensible decisions, those making decisions about allocation of scarce resources must be informed about the availability of resources across the facility, region and system – in other words, they must have deep and broad situational awareness, which most bedside clinicians will not have. Therefore, it would be both inhumane and unwise to force individual clinicians at the bedside to make crisis triage choices regarding extremely scarce resources between their patients.

2. *Regional crisis triage teams:* In preparation for the possibility that crisis triage decisions around the care of individual patients might need to be made, each region will establish one or more crisis triage teams charged with making these decisions. These teams will be activated by the system Incident Command when it appears crisis triage is reasonably likely to be necessary.

Members of the regional crisis triage teams should be respected leaders in the region, capable of remaining calm and deliberative under pressure. Regional crisis triage teams should comprise:

- (1) a physician familiar with critical care (e.g., hospitalist or critical care physician),
- (2) a representative of nursing staff, and

(3) a representative of institutional leadership.

Ethics and Palliative Care experts play roles in oversight of the entire process, including as part of the System-Level Triage Team described below, and are required as members of the Triage Communication Teams.

The regional crisis triage team will call upon subject matter experts as needed for evaluating specific cases, including experts in domains of critical care, infectious diseases, epidemiology and public health, cardiology, pastoral care, and so on.

3. *System-level crisis triage team:* A coordinating crisis triage team at the system level is charged with facilitating, guiding and supporting the regional crisis triage teams in implementing the crisis triage processes and criteria below. The system-level team comprises:
 - System Chief Medical Officer and a backup
 - System Chief Nursing Executive and a backup
 - Director, CU Center for Bioethics and Humanities and a backup
 - UCHealth legal counsel
4. *Situational awareness:* The regional and system triage teams must have excellent access to up to date knowledge of the critical care resources available in the local setting as well as statewide, regionally and nationally (e.g., to access the [Strategic National Stockpile](#) if resources are available there), including regular communication with the state Unified Command Center, Medical Operations Command.
5. *Addressing stresses on crisis triage team members:* As far as possible, crisis triage teams will work in shifts, to avoid overly long hours of making very difficult decisions while ensuring there is a crisis triage team available 24/7. Crisis triage team members will receive psychological and physical supports as needed and available during and after their time on duty.
6. *Conflicts of interest:* All crisis triage team members (both regional and system-level) will be required to affirm their willingness to implement the triage criteria and decision-making process in a non-discriminatory manner, without favor to themselves or their loved ones. Individual crisis triage team members will recuse themselves from all aspects of decision-making regarding services provided to patients with whom they have a pre-existing personal or clinical relationship or where any other conflict of interest might exist.

C. CRISIS TRIAGE PROCESSES: OVERVIEW

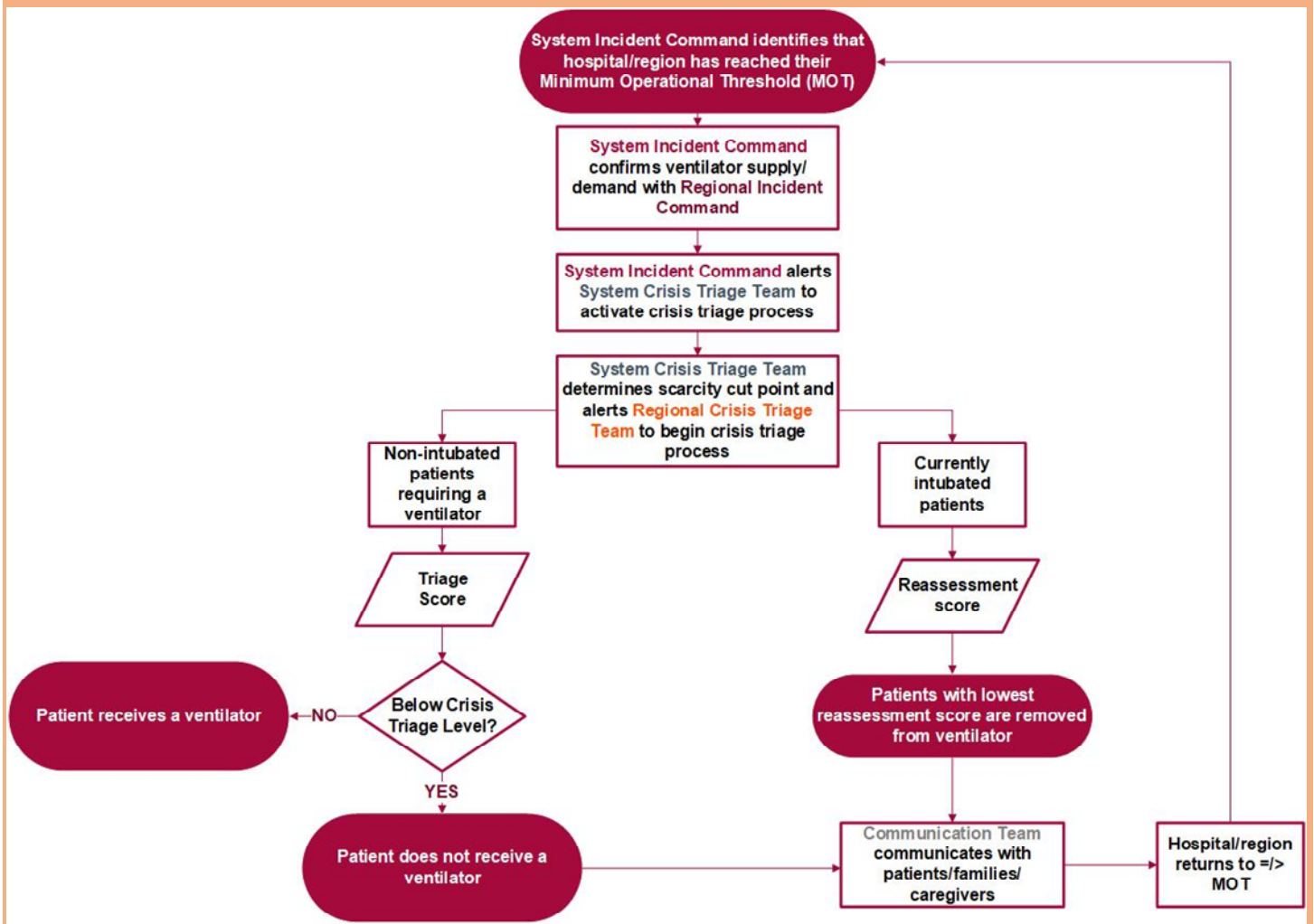


Figure. Process Map for Implementation of Crisis Triage (NOTE: figure uses ventilators as the example scarce resource)

1. *Timing and 3 types of crisis triage processes:* For a given patient, crisis triage might need to take place at three different time points in the care process; each point demands a somewhat different process to achieve optimal outcomes and ensure fairness. These are described in brief below and in more detail in subsequent sections.

a. Emergent Triage: This process will apply to any patient who has not yet been assessed in the crisis triage process, such as those presenting to the emergency department (ED) in extremis or hospitalized patients for whom clinical elements necessary to perform crisis triage are not yet available.

i. These patients are to be treated as usual, irrespective of scarcity level, until a rapid triage process can be completed.

- ii. Exceptions might be made for narrow categories of patients for whom CPR and emergent intubation would be medically inappropriate as they are considered [non-beneficial interventions](#).
- a. **Prospective Triage**: This process will use scoring systems applied to all admitted patients for whom necessary information to carry out crisis triage has been collected. Initial scores will be calculated using data using a multi-component clinical scoring system that initially combines the Sequential Organ Failure Assessment (SOFA) score, to assess acute illness severity, and data from a modified Charlson Comorbidity Index (mCCI), to assess comorbidities that affect near-term (1 year) survival (see Technical Guidance document). UHealth is testing adding further clinical elements to this multi-component score to enhance predictive accuracy. This multi-component score, or Comprehensive SOFA (CO-SOFA) score, will generate a continuous score that will be used to rank all hospitalized patients from best to worst candidate for likelihood of survival with use of critical care resources. Depending on the level of scarcity those at the bottom of this list might be triaged to not receive the scarce resource in favor of others with a greater chance of benefit. Ongoing efforts to improve CO-SOFA scoring system performance will include assessment of predictive accuracy and also tracking of any potential bias toward particular groups of patients.
 - i. Crisis Triage Teams will make daily determinations of the regional level of resource scarcity to generate a cut point for receipt of the resource in shortage (see Technical Guidance document).
 - ii. The regional crisis triage team will review the 50 patients nearest the cut-point (25 above and 25 below) daily to ensure no misapplication of the cut-point, to move resources or patients to optimize outcomes, and to be prepared to apply tiebreaker criteria if needed.
- b. **Reassessment Triage Process**: This process will apply to patients already receiving the scarce critical care resources (e.g. mechanical ventilation, etc.).
 - i. Patients receiving the scarce critical care resource will have Reassessment CO-SOFA Scores examined at pre-determined mileposts based on diagnoses.
 - ii. In conjunction with the daily scarcity level for the resource, patients being reassessed may be assigned by the regional crisis triage team to ongoing use of the resource or to re-allocation of the resource.

D. TIERS OF PROSPECTIVE AND REASSESSMENT CRISIS TRIAGE

1. *Need for accurate and complete information*: Regional Crisis Triage Team(s) charged with making resource allocation decisions must have the most up to date information available, including [best available](#) clinical prediction tools, access to relevant subject matter experts, and access to information on current and predicted resource availability across the system and the state, including regular communication with the UHealth system and regional Command Centers and the Colorado Unified Command Center (UCC), Medical Operations Command.
2. *Avoiding information that might generate biased decisions*: To the extent possible, information that is not necessary for decision making and that might bias decision making, even unintentionally, should

not be available to or considered by decision makers. See the sections below on *Blinded review* and *Criteria not to be considered*.

3. *Tiers of crisis triage decision making*: The regional crisis triage teams will be charged with applying the following triage criteria sequentially, as needed.
 - a. First, the CO-SOFA score;
 - b. Second, a set of tie-breaker considerations, using State guidance for their application; and
 - c. Third, a random allocation process.

INITIAL CRISIS TRIAGE SCORE BASED ON LIKELIHOOD OF INPATIENT SURVIVAL

1. *General considerations*
 - a. *Use of best-available clinical information*: Clinical scoring systems should take into account the latest research on patients with various conditions requiring critical care.
 - b. *Non-discrimination in scoring*: Except for considerations of physiologic futility, scoring systems should not have exclusionary cut-offs based on a single criterion such as age, disability or underlying comorbidities, which would effectively exclude entire groups of patients from access to critical care resources. Rather, scoring systems should aim to consider all clinically relevant factors while excluding clinically irrelevant factors.
 - c. *Application to acute illness only*: the crisis triage scoring system is not to be applied to non-acute illness. In particular, the crisis triage process will not be used to non-electively remove stable patients on chronic ventilatory support or long-term dialysis. All patients with acute critical illness, regardless of underlying conditions, will be scored using the same criteria.
 - d. *Avoid false precision in scoring*: Survival of individual patients receiving critical care is notoriously difficult to predict and cannot be determined with granular precision, perhaps especially for patients with COVID-19 early in the pandemic when knowledge of the disease and its treatment are rapidly evolving.
 - i. The CO-SOFA score will generate a continuous measure with 95% confidence intervals (CI) around specific patient scores. Patients whose CIs don't overlap are significantly different.
 - ii. Patients with overlapping CIs will be considered as groups, and when setting the triage cut point the Crisis Triage Team will examine all patients with scores within the 95% CI for the cut point score (above and below) to ensure accuracy and be prepared to employ tie breakers if needed.
 - iii. As a learning health care system, the initial scoring system in use at UHealth will be assessed regularly and is expected to evolve as more is learned about its use and application.
 - e. *Blinded chart review*: Review of specific cases will be undertaken by the regional Crisis Triage Teams using data provided to them from the chart, abstracted by Clinical Quality Specialists or other trained chart abstractors, and blinded as far as possible regarding factors that should not be considered in triage decision making (see "*factors not to be considered in decision making*" below). There are several reasons for this process:
 - i. Chart review rather than in-person examination of cases helps to preserve personal protective equipment;
 - ii. Blinded chart review helps ensure that inappropriate factors are not implicitly incorporated into crisis triage decision making;

- iii. Blinded chart review is more rapid and efficient;
 - iv. Under the anticipated time constraints in which this process would be invoked, it would not be realistic for the Crisis Triage Teams to visit every affected patient and care team in-person.
- f. *Patient-based, not disease-based assessments*: Survivability estimates will be made for patients as a whole, not for each disease the patient might have.
- i. For example, a patient who requires both acute dialysis and intubation will be scored according to overall needs, rather than receiving 2 separate scores, one for dialysis and one for ventilation.
2. *Initial Crisis Triage Score*: An initial CO-SOFA Score will be calculated for every admitted adult¹ patient and updated as new information becomes available. The primary triage criterion is that resources should be allocated to those most likely to survive if *and only if* they are provided critical care resources. The CO-SOFA Score is therefore designed to assess likelihood of inpatient survival in the event of deterioration and the need for critical care.
- a. Patients with higher predicted mortality, who are less likely to experience inpatient survival regardless of whether they receive additional resources, will be assigned lower priority for critical care resources.
 - b. Some proposed triage systems recommend using only the Sequential Organ Failure Assessment (SOFA) score or its adaptations (mSOFA, qSOFA) as the triage scoring system, but the [SOFA score alone may be inaccurate for the current circumstances and improved scoring systems are urgently needed](#).
 - c. The UHealth composite CO-SOFA score will therefore start with the widely-used SOFA score, and will aim to enhance predictive accuracy by adding elements and assessing them for improved predictive accuracy. Additional predictive elements will be added to the CO-SOFA score as they are validated.
 - i. Acute illness severity: this will be estimated initially using the SOFA score. As our analytics team tests and validates additional elements these will be added, taking advantage of our electronic medical record system and the data therein as well as emerging knowledge about predictors of mortality specific to COVID-19.
 - ii. Comorbidities that affect near-term survival: estimated using a [modified Charlson Comorbidity Index \(CCI\)](#)² – the modified CCI will be included directly in calculation of the CO-SOFA and further validated and adapted to optimize performance over time.
 - iii. Baseline (pre-illness) performance status: the Palliative Performance Scale (PPS) is a validated tool to estimate likelihood of near-term mortality – this element of assessing short term mortality may be added to the CO-SOFA scoring process if it is validated and improves predictive accuracy of the combined score.
 - d. Weighting of score elements: the initial CO-SOFA score will combine the SOFA plus the modified CCI; as additional elements are added, score elements will be weighted to produce optimal predictive value (see **Technical Guidance** document).

¹ This general framework can also be used for pediatric allocation problems, but the scoring systems will need to be adapted. The triage system is not intended for use in neonates.

² Note the modified CCI does NOT include HIV infection per se, only [AIDS](#), and it includes only hemiplegia resulting from CVA, among other modifications to improve its accuracy at predicting 1 year survival.

REASSESSMENT BASED ON ILLNESS SEVERITY + TRAJECTORY AND INTENSITY MEASURES

1. *Allocation decisions are not permanent:* Both patient needs and resource shortages can fluctuate daily or even more frequently. Changing resource availability might allow for patients with higher scores (i.e., higher acuity of illness and lower likelihood of benefit) to receive services that were previously unavailable, and a patient with a low initial score might later score higher, either due to deterioration (service is no longer beneficial) or improvement (service is no longer needed).
 - a. A patient who initially scores low and receives a trial of therapy on that basis might later score higher and need to have services withdrawn if the scarce resource is no longer likely to provide benefit and is needed to save other lives.
 - b. Re-assessment will occur following a therapeutic trial (see below) and at subsequent pre-set mileposts, but may also occur more often in the event of a significant change in patient condition, availability of additional resources, or as a result of a change in goals of care.
 - c. Patients, family members and staff should be made aware as early as possible that under crisis standards of care all use of critical care resources is on a trial basis. Ideally, this communication should take place in advance of any crisis triage decisions. See *Communicating with Patients, Families and Care Teams* section below.
 - d. Allocation decisions made at each reassessment milepost are carried through until the next milepost in the absence of substantial clinical deterioration, improvement or change in goals of care that might merit early reassessment.
2. *Duration of therapeutic trials:* There is a possibility that removing critical care resources from a person who is not doing well prior to an adequate therapeutic trial [could result in increased overall mortality](#) of whom have access for long enough to alter their survival prospects. Similarly, removing critical care supports too early from a patient who is improving could lead to that patient's rapid decline.
 - a. This is a particular risk in conditions that have a relatively long duration of need for the service, as has been seen with COVID-19 and the need for prolonged mechanical ventilation.
 - b. There must be careful attention to not removing support prior to an adequate trial of therapy (unless dictated by a patient or a surrogate reflecting the patient's values).
 - i. The time comprising an adequate therapeutic trial will be determined by the average time on a ventilator for patients with similar underlying conditions plus 24 hours OR 72 hours, whichever is longer. For example, respiratory failure due to COVID-19 will require a longer therapeutic trial duration while acute pulmonary edema due to volume overload will require a shorter therapeutic trial.
 - c. Specific guidance on adequate duration of therapeutic trials for various common ICU conditions will be provided to the regional Crisis Triage Teams based on best-available evidence.
3. *Re-scoring process and criteria:* On re-scoring, 3 additional sources of information may be available: the patient's clinical trajectory, their relative intensity of resource utilization, and any possible change in the patient/surrogate's goals of care and preferences for treatment.
 - a. *Clinical trajectory:* Based on change in SOFA (or CO-SOFA) score over time.
 - b. *Goals of care and treatment preferences:* if the patient/surrogate wishes to forego further intensive care, that preference should be respected.

- c. If all of the above are equal and a service must be reallocated, it is acceptable to look at the intensity of resource utilization: e.g., prone positioning, CRRT, and/or >1 pressor as a tiebreaker

If, following the clinical scoring or re-scoring process by the regional crisis triage team, two or more patients want and need the same resources and have equivalent CO-SOFA scores and treatment preferences, then the crisis triage team [per guidance from the State of Colorado](#), may take the following tiebreaker criteria into account.

E. TIEBREAKERS

1. *Minor children*: Pediatric patients (≤ 17 years of age) merit special consideration. Most will have a very low CO-SOFA Score and will take priority for critical resources. Pediatric patients also have the unique ability to be transferred to a pediatric hospital where critical resources might be more available. In the event of a tie between an adult and a pediatric patient in the initial scoring, pediatric patients should receive priority.
2. *Multiplier effect and reciprocity*: when two or more patients have the same clinical survival prospects, as a secondary criterion it may be appropriate to consider the likelihood that saving a given patient might have a [multiplier effect](#), such as if that person can return to service and thereby save additional lives.
 - a. This criterion will not be applied until there is more specific guidance on defining groups with a presumed multiplier effect by the State.
3. *Additional considerations*: Based on expert and community engagement, [the state has recommended](#) that several other factors may be considered when patients remain tied after consideration of the above factors (e.g., a nurse and a firefighter, with equivalent CO-SOFA scores). As above, these may not be applied until further guidance is provided by the State.
 - a. Pregnancy – priority for a scarce resource may be given to a near-term pregnant patient over a non-pregnant patient.
 - b. Life Years Saved - priority for a scarce resource can be given to a patient with more life years to be saved.
 - c. Additional Multiplier Effect Considerations - priority for a scarce resource may be given to patients who are the sole caregiver to a dependent child or elderly family member.

F. FINAL DECISION PROCESS – RANDOM ALLOCATION

1. *Use of random allocation*: If there remain two or more patients who need the same resources and have equivalent CO-SOFA scores and the same multiplier effect and other considerations above, then the regional Crisis Triage Team will use a random allocation method to determine which patients will be provided a therapeutic trial of using the scarce resource.
2. *Duration of trials of therapy assigned by random allocation*: Trials of therapy determined by random allocation will be long enough to ensure the patient receiving the service has a fair chance for benefit.
 - a. As noted above, the duration of a fair trial may vary depending on the resource in question and the clinical rationale for which it is needed.

3. *Random allocation assignment is not permanent:* The patient’s reassessment scores will be regularly re-calculated along with others receiving scarce resources and these patients may subsequently have the resource withdrawn. In other words, obtaining access to the scarce resource by random allocation does not guarantee continuing access to the scarce resource in question if that would harm many others; rather, it provides access to a fair therapeutic trial (see above).

G. CRITERIA AND PROCESSES NOT TO BE USED

1. *Ethically inappropriate allocation criteria:* Criteria, factors, or methods of administration that are not clinically or ethically relevant to the decision and that have the effect of subjecting individuals to discrimination should NOT be used in making decisions about critical care resource allocation. For instance, care and consideration will be taken to assure that intentional and unintentional actions do not exclude groups of people based on race, ethnicity, disability, color, national origin, English proficiency, gender, gender expression/identity, religion, sexual orientation, immigration status, “VIP” status, criminal history, or one’s ability to pay, as these are not clinically or ethically relevant factors to consider.
 - a. Age is not a specific criterion for access to scarce resources, though age often indirectly ties into the clinical criteria above since age-related co-morbidities can make a patient less likely to benefit from therapy.
 - b. Chronic disability status is not a specific criterion for access to scarce resources. Like age, some disabilities might indirectly tie into the clinical criteria above.
 - i. For example, a patient who is blind, deaf, cognitively impaired or who uses a wheelchair would have the same opportunity to benefit from critical care services as patients without such disabilities and conditions; a patient with underlying chronic lung dysfunction, where lung dysfunction affects survival prospects with a respiratory pathogen would, like others, have lung function included in their clinical assessment.
 - c. People with disabilities that affect communication should receive effective communication (information that is accessible, understandable, and timely) or information comparable in content and detail that is provided to people without communication disabilities.
 - d. People with limited English proficiency should have equal access to critical care and services.
2. *Reasons not to use first come, first served:* An allocation process of “first come, first served” is often used when admitting patients to intensive care under usual circumstances, but this criterion would neither be equitable nor optimize health outcomes in the event of a catastrophic system overload requiring implementation of this crisis triage process.
 - a. It would be inequitable because early arrivals to care might be more privileged individuals who face fewer physical, financial and social barriers to seeking and receiving hospital care.
 - b. It would be inefficient because the first to arrive might not be the most likely to survive or to derive greatest benefit from use of scarce critical care resources.

I. CARE FOR PATIENTS TRIAGED TO RECEIVE SUPPORTIVE CARE

1. *Continuing care that is not critical care:* in all instances, the aim is to relieve pain and suffering and provide the best care possible to every patient within available resources. Patients triaged to receive supportive care will continue to receive care other than the identified scarce critical care resource and will be re-assessed regularly as noted above.
2. *Comfort-focused care:* Patients triaged to receive supportive care (i.e., not to receive critical care resources in shortage) should be prioritized for receiving comfort care as far as this is available.
 - a. These patients should receive comfort focused care guided by the Epic end of life order set.
 - b. Palliative care consultation should be sought for patients where potentially beneficial services are being withdrawn due to scarcity and over the objections of the patient's surrogate.
3. *Role of ethics consultation:* Ethics service consultation for care teams may also be of value to help explain the ethical underpinnings of crisis triage processes.

J. ACCOUNTABILITY MECHANISMS

1. *Need for accountability:* To ensure the fairness, justice and trustworthiness of the process for making critical and potentially controversial decisions about resource allocation, mechanisms for accountability in the process are required.
2. *Transparency and process improvement:* In view of the novel and difficult circumstances in which this guidance would be invoked, it should be seen as a living document; feedback from professionals, other staff, patients and the public might result in changes to the guidance over time.
3. *Case-based due process mechanisms:* Under the time and resource constraints envisioned if this crisis triage process were to be invoked, it would not be possible to have lengthy due process and appeal mechanisms for each case.
 - a. The only permissible appeals are those based on a claim that an error was made by the regional crisis triage team in the calculation of scores; appeals may not be brought based on an objection to the overall allocation framework.
 - b. The process of evaluating the appeal will consist of the regional crisis triage team verifying the accuracy of the priority score calculation by recalculating the score.
 - c. Patient or family appeals of the triage decision may be made through the bedside care team (e.g., attending physician), who may then submit the appeal to the regional crisis triage team if the bedside team member believes the appeal may have merit.
4. *Record keeping and retrospective review process:* Records will be kept of all decisions made by regional and system-level Crisis Triage Teams and a retrospective review process, including mortality review, will be established under the leadership of the UHealth Senior Quality Group, which will review allocation decisions made based on scarcity to facilitate ongoing accountability and quality improvement in the process.
 - a. Documentation should include the involved health professionals, MRN of the patient and the clinical information provided as well as the final Committee decision.

K. COMMUNICATION OF CRISIS TRIAGE DECISIONS

1. *Early communication that crisis standards of care are in place:* If crisis standards are care are needed, the primary treating team should make patients and families aware of this as early in the admission

process as is feasible and if at all possible prior to admission to an intensive care unit. Guidance on compassionate and respectful ways to communicate this information is available on The Source.

2. *Communication challenges:* Communication with family members of patients receiving care for COVID-19 presents unique challenges, as patients are in isolation and not allowed visitors. Additionally, as volume and acuity increase over the course of the pandemic, critical care teams may not have sufficient time to discuss triage decisions with the family.
3. *Crisis Triage Communication Teams:* To ensure consistency in communication, each region will establish a Crisis Triage Communication Team, comprising care providers with expertise in communicating bad news who are not “on-service.” These teams each include 2 people drawn from local experts in palliative care and ethics.
4. *Communication flows:* The process of communication of these difficult decisions about resource allocation from the triage team to the bedside team and to patients, surrogates and others must be a collaborative effort.
 - a. *Communication of crisis triage decisions to clinical teams:* Decisions by the Regional Crisis Triage Team regarding withholding or withdrawal of critical resources will be communicated from the triage team directly to the primary clinical team. A member of the regional Crisis Triage Team will be available to meet with the clinical team to discuss triage decisions, if possible and as required.
 - b. *Communication of crisis triage decisions with patients and families:* To ensure consistency in communication, the Crisis Triage Communication Team should generally take the lead on communication with patients/surrogate about triage decisions involving the withholding or withdrawal of critical care resources. The bedside team may be present for these conversations and at the discretion of the attending physician a primary clinical team member may lead the conversation with direct support from the Crisis Triage Communication Team.
5. *Optimizing patient/surrogate voice:* triage decisions by their nature do not strictly allow for following all patient or surrogate preferences, but patients or surrogates can and should be treated with respect and compassion.
 - a. Whenever a decision that a patient will not receive a resource that is in shortage needs to be made without the patient or surrogate’s consent, efforts should be made to seek patient or surrogate and family understanding of the need to make these difficult decisions as well as of the criteria and processes used in decision making.
 - b. Refusal to agree to or even acknowledge the legitimacy of a triage decision does not change the decision, but the opportunity to understand the triage process and criteria should be offered before implementing the decision whenever this is feasible.

Appendix A

Ethical Considerations for Critical Care Resource Allocation under Crisis Standards of Care

At all times, the ethical obligation of health professionals is to adhere to core ethical principles and seek to provide the best quality of care possible under given circumstances. This document includes a description of the goal of resource allocation, a description of key ethical commitments and ethical principles, and a table of ethical norms and processes.

GOAL: Crisis circumstances are far from normal. In catastrophic circumstances – i.e., when critical care resources are in such short supply that not everyone who could benefit from receiving critical care services can receive them – the goal of resource allocation processes should be to provide the most benefit to as many people as possible, and to do so in ways that sustain social cohesion, trust in the healthcare system, and our ability as a community to come together and heal in the wake of the crisis. For health professionals, our goal is to make the best decisions we can so that we can make it through an unbelievably difficult time with our empathy, compassion and sense of service intact.

Importantly, the goal of providing the most benefit to as many people as possible cannot be achieved if one continues to use the usual model of first come/first served for critical care resource allocation.

ETHICAL COMMITMENTS: To put the health, dignity, and safety of patients first by developing guidance for allocation of resources that:

- is transparent and accountable to patients, families, health care professionals and communities;
- promotes fidelity, solidarity, trust and mutual responsibility;
- responds to needs fairly, effectively and efficiently;
- values the voices/perspectives of multiple communities both within and outside of the health system.

The **Foundational Ethical Principles** that underlie these commitments are:

1. **Benefitting patients and not harming them:** Resource rationing should only be used as a last resort. The operating assumption is that all appropriate measures to conserve resources, increase their supply and prevent the spread of disease have been undertaken; then follows a general shift to a utilitarian approach in which patients who are less likely to benefit from a particular resource are de-prioritized in terms of access to the scarce resource. Teams must identify and weigh harms and risks associated with clinical treatments as well as triage plans and staff management plans.
2. **Trustworthiness:** An understanding that decisions made during times of crisis and rationing should attempt to foster public trust in the healthcare system, paying special attention to relationships that differ in terms of power, voice, and influence, and attending specifically to the inclusion of patients and communities that may have been previously disempowered. Recommendations for rationing of resources must be made prospectively, transparently and consistently across the institution and

region. Trustworthiness also requires that the institution proactively share information with patients and families about crisis standards of care, including when and how they would be implemented and what criteria are and are not being used to make difficult allocation decisions.

3. Fidelity to and non-abandonment of patients, staff, and community: Patients who do not meet criteria for receiving critical care resources that are in shortage should continue to receive other services to help them recover and address their suffering to the best of the health system’s ability. Staff should receive appropriate staff management plans, safe working environments, and support for injury/illness/emotional and moral distress. The community also should be well informed on the criteria and process for implementing crisis standards of care and offered decision support resources as well as emotional support.
4. Equity, fairness, and justice: An obligation to develop fair processes for the distribution of scarce goods (e.g., staff, ICU beds, ventilators, Personal Protective Equipment, antivirals, vaccines, or palliative care). Apportionment of goods should be according to transparent and prospectively determined ethical frameworks that embrace a commitment to fairness and a proscription against rationing based on non-clinical factors such as race, gender, sexual orientation, disability, religious beliefs, citizenship status, “VIP” status, socioeconomic status or insurance status.
5. Stewardship of resources: An obligation to protect and conserve the resources of the health system and also to acknowledge that the health system is a significant part of the larger community, because regional sharing and cooperation is critical to ensuring equity of access to critical care resources in a crisis.
6. Privacy/Confidentiality: Maintaining privacy by preventing unwanted/unauthorized intrusions (e.g., into patient room, into medical record). Maintaining confidentiality by preventing unwanted/unauthorized disclosures and sharing information about a patient only with those who need to know (e.g., clinicians, care partners, governmental agencies, or when required by law).
7. Solidarity and Accountability: As members of a moral community, all employees, leaders and other members of health care institutions are responsible to and for each other. This obligation of solidarity also extends to the communities that are served by the institutions.

Table: Ethical Principles to Guide Epidemic and Bioterror Preparedness and Response

While it is common in biomedical ethics to think in terms of just 4 principles of ethics (autonomy, justice, beneficence and nonmaleficence), a number of more detailed and often overlapping principles often come into play in catastrophic disasters, and some of the traditional 4 principles tend to get reduced in emphasis – especially respect for patient autonomy. This table augments and simplifies the above discussion by presenting principles often used in addressing ethical issues in disaster planning and response. Note that these principles may be in tension depending on the scenario and ethics consultation can be helpful in developing ethical approaches to complex problems.

Substantive Principles: Ethical norms to guide decisions

Fairness	<ul style="list-style-type: none"> ● Seek fair allocation of resources, fair distribution of benefits and burdens ● Give special attention to vulnerable communities more likely to suffer excess harm in disasters ● Ensure fairness of decision making processes (below), recognizing the inevitability of some unequal outcomes
Duty	<ul style="list-style-type: none"> ● Accept the professional duty to treat, even at some risk to oneself ● Promote respect for the dying, treat them as you would wish to be treated ● Deliver best care possible given available resources
Leadership	<ul style="list-style-type: none"> ● Recognize the role of a leader involves stewardship of shared resources, which may be very limited ● Make decisions with input from others, don't make difficult ethical decisions alone ● Promote respect for responders and other professionals, who are working under extreme stress
Proportionality	<ul style="list-style-type: none"> ● Ensure good situational awareness before making triage or other rationing decisions ● Restrictions of liberty should be commensurate with expected benefits ● Use best-available data to assess benefits and harms
Protection	<ul style="list-style-type: none"> ● Strive to maintain social order during the disaster, role model civility and mutual respect ● Seek to ensure continuation of a good society after the disaster, recovery starts with preparation and response ● Minimize the economic impact of the disaster, use best-available data about short and long-term costs
Procedural Principles: Ethical processes to follow when making decisions	
Inclusion	<ul style="list-style-type: none"> ● Engage affected stakeholders in both planning and response to the extent possible given the circumstances ● Update and share knowledge with relevant stakeholders as the situation evolves
Transparency	<ul style="list-style-type: none"> ● Develop and share principles for guiding difficult decisions with all stakeholders, both before, during and after a disaster ● Openly acknowledge that autonomy, ownership of resources, and fidelity in the patient-professional relationship are often less dominant (but still not ignored) values during catastrophic disasters
Consistency	<ul style="list-style-type: none"> ● Use the same decision process over time when possible; the information used in decision making will evolve ● Like circumstances should be treated alike, while differences are respected and integrated in decisions only when relevant

Accountability	<ul style="list-style-type: none"> ● Optimize due process, use formal notice of decisions and provide opportunities to voice objections to a neutral arbiter ● Be clear about who is responsible for making specific decisions ● Balance personal accountability with compassion for those forced to make heart-wrenching decisions
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Appendix A Authors

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Appendix B.

Sequential Organ Failure Assessment Scoring Algorithm³

Variables	POINTS				
	0	1	2	3	4
Respiratory P _a O ₂ /FiO ₂ , mmHg	>400	≤400	≤300	≤200 ^A	≤100 ^A
Coagulation Platelets x 103/μL	>150	≤150	≤100	≤50	≤20
Liver Bilirubin, mg/dL	<1.2	1.2-1.9	2.0-5.9	6.0-11.9	>12.0
Cardiovascular Hypotension ^B	None	MAP<70 mm Hg	Norepi ≤0.03 Dop< 5 OR dobut any dose	Dop ≤5 OR Epi≤0.1 OR Norepi ≤0.1	Dop ≥15 OR Epi >0.1 OR Norepi ≥0.1
Central Nervous System GCS	15	13-14	10-12	6-9	<6
Renal Creatinine, mg/dL OR UOP (mL/day)	<1.2	1.2-1.9	2.0-3.4	3.5-4.9 OR UOP<500	>5 OR UOP <200

Abbreviations: P_aO₂ - partial pressure of oxygen in the arterioles, FiO₂ – fraction of inspired oxygen, MAP – mean arterial pressure, UOP – urine output, GCS – Glasgow Coma Scale

^AWith mechanical ventilation or other form of artificial ventilation

^BOn vasopressor for at least 1 hour. Doses are given as μg/kg/min

Predicted Mortality

Initial SOFA Score	30-Day Mortality
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³ See Ferreira FL, Bota DP, Bross A, Melot C, Vincent JL. Serial evaluation of the SOFA score to predict outcome in critically ill patients. *Jama*. 2001;286(14):1754-1758; Minne L, Abu-Hanna A, de Jonge E. Evaluation of SOFA-based models for predicting mortality in the ICU: A systematic review. *Crit Care*. 2008;12(6):R16; Vincent JL, Moreno R, Takala J, et al. The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction/failure. On behalf of the Working Group on Sepsis-Related Problems of the European Society of Intensive Care Medicine. *Intensive care medicine*. 1996;22(7):707-710.

0-1	0.0%
2-3	6.4%
4-5	20.2%
6-7	21.5%
8-9	33.3%
10-11	50.0%
12-14	95.2%
>14	95.2%

Appendix C.

Modified⁴ Charlson Comorbidity Index

Variable	Score
Age	
<50	+0
50-59	+1
60-69	+2
70-79	+3
≥80	+4
Chronic Heart Failure	+2
Dementia	+2
Chronic Pulmonary Disease	+1
Connective Tissue Disease	+1
Liver Disease^A	
Mild	+2
Moderate or Severe	+4
Diabetes Mellitus with Chronic Complications	+1
Hemiplegia^B	+2
Renal Disease	+1
Metastatic Solid Tumor	+6
Any active malignancy including leukemia/lymphoma	+2
AIDS^C	+4

^ASevere=cirrhosis, portal hypertension, history of variceal bleeding. Moderate=cirrhosis, portal hypertension, Mild=chronic hepatitis or cirrhosis without portal hypertension including NASH and NAFLD,

^BHemiplegia only if due to cerebrovascular accident

^CAIDS defined as: Current CD4 count<200, Opportunistic infection in the last 1 month, active AIDS defining illness such as lymphoma or Kaposi's Sarcoma

Condition definitions

Myocardial Infarction	History of MI requiring chronic medical management (antiplatelet, statin, or BB), positive stress test or coronary angiography
CHF	Symptomatic CHF on therapy (i.e.: ACEI, BB, diuretic) or LVEF < 45% or mean pulmonary artery pressure > 25 by right heart cath
COPD	COPD requiring maintenance medications (i.e.: ICS or LABA), chronic O2, documented FEV1 < 1.5L, or hx of intubation for COPD/asthma
Peripheral Vascular Disease	Intermittent claudication, past peripheral bypass surgery, untreated thoracic or abdominal aneurysm (>6cm), positive ankle brachial index or angiograph with symptoms
CVA or TIA	History of cerebrovascular accident with minor or no residual and/or transient ischemic attacks
Dementia	Chronic cognitive deficit requiring assistance with IADL/ADLs

⁴ The CCI has been modified to remove comorbidities less likely to be related to near-term (1-year) mortality risk, including HIV infection alone (without an active AIDS diagnosis). See, Quan H, Li B, Couris CM, et al. Updating and validating the Charlson comorbidity index and score for risk adjustment in hospital discharge abstracts using data from 6 countries. *Am J Epidemiol.* 2011;173(6):676-682.

Connective Tissue Disorder	Inherited or autoimmune: SLE, RA, mixed CTD, scleroderma, etc
Peptic Ulcer Disease	Any history of treatment for ulcer disease or history of ulcer bleeding Exclude: non-ulcerative GERD
Liver Disease	Mild=chronic hepatitis, cirrhosis without portal hypertension, NASH, NAFLD, fatty liver disease Moderate=cirrhosis and portal hypertension but no variceal bleeding history Severe=cirrhosis and portal hypertension but no variceal bleeding history
Diabetes Mellitus	None= no medications Uncomplicated=controlled with oral agents End organ=IDDM, neuropathy, retinopathy, nephropathy
Hemiplegia	History of stroke resulting in hemiplegia or paraplegia
Moderate to severe CKD	Moderate= creatinine > 3 mg/dL Severe= HD status post kidney transplant, uremic syndrome
Solid Tumor	None: No tumor history, removal of tumor and presumed cancer free Exclude: nonmelanomatous skin cancers and in situ cervical carcinoma
Leukemia	CML, CLL, AML, ALL, PV (active disease undergoing therapy or s/p BMTx)
Lymphoma	NHL, Hodgkin's, Multiple Myeloma, Waldenstrom (active disease undergoing therapy or s/p BMTx)
AIDS	CD4 < 200, current OI or KS