

# **Guidelines for Allocation of Life Saving Or Critical Resources in a Pandemic**

**WORKING DRAFT**

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Pandemic Planning Committee  
Ethics Team**

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NOTE: This document was compiled by members of the UMHHC Pandemic Ethics Team in an effort to provide guidance to decision makers and clinicians in the event of a pandemic. This document has been approved by the Executive Committee on Clinical Affairs.

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## EXECUTIVE SUMMARY

Pandemic influenza has been characterized by epidemiologists, medical experts and the U.S. government as one of the most lethal prospective threats facing the world today. The recent H5N1 avian influenza and H1N1 novel influenza outbreak have underscored the need for planning in advance of such events.

This document addresses the aspect of planning concerned with the allocation of scarce resources: medications, medical supplies, staff, and intensive care services, by hospitals and health care providers (at UMHHC), during a pandemic by providing:

- An ethical framework for allocating scarce resources which includes:
  - Professional obligations to individual patients
  - Professional and institutional obligations of competence
  - Professional and institutional obligations of honesty, transparency, and public discourse
  - Distributive justice
  - Fair procedures
  - Accountability and legitimacy
  
- A resource allocation decision process which includes descriptions of:
  - Trigger points for resource levels which when reached may prompt a decision by Incident Management to activate a committee to identify, triage and allocate scarce resources such as a Scarce Resource Allocation Committee (SRAC)
  - The composition and function of the SRAC
  - The role of Triage Officers, assigned to oversee triage decisions for an inpatient floor or unit
  - The composition and function of the Clinical Review Committee (CRC), which serves as a consultative body and an appeals forum for clinical triage decisions of the Triage Officers

This document also outlines ethical guidelines to help navigate through difficult decisions regarding allocation of staffing resources, antibiotic/antiviral resources, ventilator/respiratory care/ICU resources, and palliative care resources. The recommendations made for inclusion and exclusion criteria are based on protocols and tools developed by experts in the field. Notably, this document distinguishes itself from other existing triage guidelines for infectious disease disasters, by including specific recommendations for pediatric resource allocation in the event of a pandemic.

## INTRODUCTION

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The U.S. Department of Homeland Security “views pandemic influenza as both the most likely and most lethal of all threats facing the United States<sup>1</sup>”. The ongoing H5N1 avian influenza outbreak in Southeast Asia and the recent novel influenza A (swine-origin influenza) outbreak, have raised concern about a worldwide influenza pandemic and the need to plan in advance for such an event. During a pandemic, certain resources will become scarce such as medications, medical supplies, staff, and intensive care services. When a pandemic progresses, these resources will need to be assigned and conserved carefully allocated for patients who meet the criteria for care. Some patients who would currently qualify for intensive care may not be eligible. Hospitals and health care providers must be prepared with ethical guidelines that inform decisions about allocation of scarce resources.

These recommendations are based on a review of the literature, protocols that have been developed in New York, Minnesota, Wisconsin, and Canada and by the Department of Health and Human Services; and extensive discussions among content experts in clinical medicine, public health, ethics, and administrative disciplines at the University of Michigan Health System. The principles outlined in this document may be applicable in other large scale emergency situations in which resources are scarce.

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<sup>1</sup> J. M. Barry, *The Great Influenza: The Story of the Deadliest Pandemic in History*, (New York: Penguin Books, 2004, 460.

## BACKGROUND

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### Seasonal Influenza:

Seasonal influenza causes illness in 5-20% of the U.S. population each year. In the U.S., about 200,000 hospitalizations and 35,000-45,000 deaths occur each year as a result of influenza. Seasonal influenza is responsible for about 10,000,000 outpatient visits and may cost from \$1-3 billion annually. Most serious illness and death occur among the very old, the very young or the immunocompromised person. The impact of seasonal influenza can be ameliorated with vaccine.

### Pandemic Influenza:

An influenza pandemic occurs every 20-30 years and is caused by an influenza strain against which most humans have no immunity. This type of influenza will sicken 25-40% of the population and more hospitalizations and deaths will occur. In addition, mortality may be higher among healthy young adults as occurred during the 1918 pandemic. It is assumed that no specific vaccine will be available when a pandemic occurs because vaccines take 4-6 months to develop. In this time span, a pandemic will have already traveled around the world. The most devastating pandemic occurred in 1918 and killed an estimated 40-50 million people worldwide, including up to 500,000 in the US. The ongoing avian influenza (H5N1) outbreak in Southeast Asia and the 2009 novel influenza A (H1N1) pandemic have heightened concern about the ability of our health care system to respond to increased infection rates, hospitalizations, and deaths<sup>2 3</sup>. Table 1 summarizes the potential impact on the US with a moderate and severe pandemic.

**TABLE 1. Case projections: based on statistics from previous pandemics (1918 [severe] and 1956-68 [moderate]) the table below illustrates the projected impact of a pandemic on the current U.S. population (300,000,000)\***

Characteristic	Moderate (1958/68-like)	Severe (1918-like)
Infection rate	90 million (30%)	90 million (30%)
Outpatient medical care	45 million (50%)	45 million (50%)
Hospitalization	865,000	9,900,000 (22%)
ICU care	128,750	1,485,000 (15% of admissions)
Mechanical ventilation	64,875	745,500 (50% of ICU)
Deaths	209,000	1,903,000 (3% of ill)

- percentages in table refer to percent of U.S. population.

<sup>2</sup> CDC Update: Novel Influenza A (H1N1) Virus Infections --- Worldwide, May 6, 2009. May 8, 2009 / 58(17);453-458

<sup>3</sup> Gambotto A, Barratt-Boyes SM, de Jong MD, et al. Human infection with highly pathogenic H5N1 influenza virus. Lancet 2008;;371:1464-75

## Assumptions for pandemic planning:

The following are assumptions that UMHS made in preparing for a pandemic. Table 2 summarizes the calculated impact on UMHS of a 1918-type pandemic over 12 weeks with different infection rates:

- An initial 12-week pandemic outbreak with subsequent waves and estimated impact to the U.S. between 6 months to 2 years
- High rate of severe influenza illness (20-35% of population)
- Case/fatality rate (CFR) of 2-3% (0.1%-0.4% CRF with seasonal flu)
- Limited availability of necessary supplies and resources including: antiviral medications, personal protection equipment, ventilators, hospital bed space
- Minimal or no available vaccine
- Travel restrictions, quarantined areas, restricted public gatherings
- Altered standards of patient care will be necessary
- Population of UMHHC service area is about 750,000
- At the peak of a pandemic, it is expected that we will have only 1 ICU bed for every 4 patients who need one and only 1 ventilator for every 2 patients who need one
- The Scarce Resource Allocation Committee will be triggered by the declaration of a state of public health emergency (county or state) or by an equivalent decision by the hospital Incident Management System (in collaboration with such resources as public health).

**TABLE 2. Potential influenza patient volume at UMHHC (over a 12 week period) based on projected infection rates in service area of 750,000 patients**

<b>Infection rate</b>	<b>10%</b>	<b>15%</b>	<b>25%</b>	<b>35%</b>
Phone Triage	44,263	66,394	110,657	154,919
Outpatient	28,771	43,156	71,927	100,697
Flu Clinic	9,812	14,717	24,529	34,340
ED Visits	11,582	17,373	28,955	40,537
IV Infusion	14,483	21,724	36,207	50,690
Admissions	8,021	12,031	20,052	28,073
ICU	1,203	1,805	3,008	4,211
Deaths	863	1,295	2,813	3,937

## ETHICAL FRAMEWORK

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An ethical framework that proposes to allocate scarce resources fairly includes attention to justice as well as to professionals' ethical obligations to patients. A just rationing plan cannot evolve from technical considerations alone, such as survival probabilities and resource estimates<sup>4</sup>. In day-to-day health care in the U.S., the preferences of capable patients generally determine whether recommended treatments will or will not be initiated. However, patient preference is not and cannot be the primary factor in devising a rationing system for scarce resources in a pandemic. A public health disaster, such as a pandemic, with severe resource scarcity, will impose harsh limits on decision-making autonomy for patients and providers. Allocation guidelines must reflect those limits. The clinical parameters of a pandemic, including predictors of infection or survival, duration and severity of symptoms, and duration of the pandemic are uncertain. Competent planning requires guidelines for allocating scarce resources that can operate within a range of predicted circumstances for this foreseeable public health emergency.

The following ethical framework supports this specific effort to allocate scarce resources in the event of a pandemic:

### **Ethical Framework for Allocating Scarce Resources**

*Listed in no particular order*

- Professional obligations to individual patients
- Professional and institutional obligations of competence
- Professional and institutional obligations of honesty and transparency
- Distributive justice, including equal treatment, utility
- Fair procedures, including in planning and implementation
- Accountability and legitimacy

### **Professional obligations to individual patients:**

An ethical scarce allocation scheme must respect the fundamental obligation of health care professionals to care for patients, sustaining rather than eroding relationships between patient and provider. Physicians and nurses must not abandon patients, and patients should not fear abandonment.

Even under everyday circumstances, healthcare providers judge whether the estimated benefit of an intervention merits the use of scarce resources. Clinicians will need to balance obligations to save the greatest possible number of lives against

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<sup>4</sup> 10 University of Toronto Joint Centre for Bioethics Pandemic Influenza Working Group, "Stand on Guard for Thee: Ethical considerations in preparedness planning for pandemic influenza," November 2005. See also L. Rubinson, et al. "Augmentation of hospital critical care capacity after bioterrorist attacks or epidemics: Recommendations of the Working Group on Emergency Mass Critical Care," *Critical Care Medicine*, 2005, 33(10):E1-13. See also J. D. Arras, "Ethical Issues in the Distribution of Influenza Vaccines," *Hastings Center Report*, In Press.

obligations to care for each single patient. As the number of affected patients increase, accommodating these two goals will require more and more difficult decisions.

Professional obligations to individual patients, however important, must not undermine a just distribution of scarce resources, for instance, by overly zealous advocacy. Rather, professionalism serves to constrain misrepresentation of clinical condition or circumstances that would lead to systematically unfair treatment. Even more important, health care providers must not seek priority for friends, family or colleagues. Likewise, organizations have obligations to individuals based on established relationships, traditions, ownership (e.g. state or community) and or contracts.

### **Professional and institutional obligations of competence:**

Competent planning and institutional and professional obligations motivate prospective design of an allocation system. An absence of guidelines leaves challenging allocation decisions to exhausted, over-taxed, healthcare providers, who already bear a disproportionate burden in a disaster. A failure to plan for a foreseeable crisis amounts to a failure of responsibility and administrative competence, and could lead to unequal or unfair treatment. Planning for a pandemic identifies actions (e.g. workforce training) that need to occur prior to the disaster. Guidelines for rationing developed before they are needed allow time for reflection and public deliberation, and should minimize arbitrary decisions that could inevitably lead to perceptions of unfair and unequal treatment.

### **Professional and institutional obligations of honesty, transparency and public discourse:**

During planning and implementation, it is imperative that healthcare providers and administrators honestly communicate information to patients, their families, and the public. Clear and honest communication about the expected level of scarcity of resources can prepare the community for altered standards of care during a pandemic. Transparent, public and explicit assumptions and reasoning about rationing decisions will give members of the community the opportunity to understand how and why difficult decisions are made and help engender trust in the institution.

During planning, organizations should promote public dialog on allocation of scarce resources. While engaging the public in difficult decision-making will add complexity, public engagement also adds an important element of legitimacy to the decision-making process and ultimately, allocation decisions.

### **Distributive justice:**

A fair distribution of potentially life-saving treatment requires that persons and communities be treated equally when they are equal in morally relevant ways. Hence, severity of illness and likelihood of benefit (e.g. prognosis with or without ventilator assistance) can be considered morally relevant features, while social or economic standing would not.

A just distribution of scarce resources must be applied broadly, both within and among communities. Allocation schemes and criteria that differ substantially from hospital to hospital, for instance, could allow for more expansive access for wealthier communities<sup>5</sup> and more restrictive access for poorer facilities or poorer communities. Substantially different policies could also encourage informed residents to “shop around” for greater access to scarce resources, as has occurred for scarce solid organs. Cooperation, not competition, led by healthcare institutions and professionals, must prevail during a public disaster. The allocation of scarce resources from state and federal stockpiles must take into account the ratio of local populations to available resources, the severity of the pandemic (e.g., infection rate) and supplement local resources according to such indicators of need.

The principle of utility (maximizing benefit) increases in importance during conditions of extreme scarcity, when optimal treatment for all is impossible. The framework proposed primarily aims to maximize the benefit achieved using dramatically limited resources. To some degree, maximal utility is achieved through assuring essential functioning of society<sup>6</sup>. Benefits include lives saved, life years saved, and relief of suffering<sup>7</sup>. Although the framework proposed emphasizes utility, other ethical foundations, including fidelity to patients, equity, and fair procedures, for instance, balances the principle of utility.

Any guidelines a healthcare institution devises will be imperfect, both ethically and medically. Ethically sound responses to disaster must not exacerbate, and should help ameliorate, disparities in access to care even if they cannot repair prior inequities. Use of a “first come, first served” policy, for instance, favors those who are better informed and more mobile, and would exacerbate existing disparities. Planners must designate appropriate resources for the most vulnerable who will suffer the greatest impact in any disaster. For example, some public health departments incorporate training of neighborhood health workers and improving baseline health in disadvantaged populations in their disaster preparations.

### **Fair procedures:**

An ethical framework must clarify not only the principles underlying decisions but also delineate fair processes for such decisions. Processes for allocating scarce resources must provide explicit, publicly available rationales, incorporate public input, include a mechanism for resolving disputes, remain transparent during implementation, and include enforcement to assure consistency in implementation.

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<sup>5</sup> Silveira MJ. Restrictive hospice operating practices in Michigan. in preparation.

<sup>6</sup> Kass NE, Otto J, O'Brien D, Minson M. Ethics and severe pandemic influenza: maintaining essential functions through a fair and considered response. *Biosecur Bioterror*. 2008 Sep;6(3):227-36

<sup>7</sup> White, DB, Katz, MH, Luce, JM and Jo, B. 2009. Who should receive life support during a public health emergency? Using ethical principles to improve allocation decisions. *Ann Internal Med* Vol. 150(2): 132-138.

## **Accountability and Legitimacy:**

Given that a coordinated response to a pandemic will use public and private resources and affect the health and lives of many, practitioners and policymakers need to be accountable to members of the public and to the community they serve for the decisions they make and the actions they take. This framework establishes professional and institutional obligations to be responsible to the public for decisions and actions taken in response to a pandemic. Transparency in the process of allocating scarce resources will be essential, that is, making public and explicit assumptions, justifications and reasoning, and will contribute to establishing accountability which is essential to engender the public's trust. Oversight and enforcement of a predetermined triage system will enable trust in the system should it need to be implemented.

Even the most deliberative, thoughtful, and transparent allocation schemes will encounter disputes when implemented. Resolving disputes needs to balance respect for diverse points of view and openness to criticism with the need for consistent application and the need to avoid using valuable human resources in reviewing decisions. Hence, we propose that reviews of allocation decisions only occur when: a) review is requested by a patient, family member, or clinician; b) at least one clinician (not necessarily a clinician involved in the patient's current care) agrees that a review is reasonable; and c) the decision, if implemented, will likely result in death. Those requesting a review must provide justifications for an exception to usual decisions. Since it is likely that criteria b and c would be easier for well-off patients to meet, clinicians and the Scarce Resource Allocation Committee should ensure that disadvantaged patients and families (e.g. those with limited English speaking proficiency or low literacy) are equally able to request reviews as those without such disadvantages.

## **Pitfalls:**

In building an ethical framework, there are pitfalls that an allocation system must avoid. A rationing system does not alleviate the need to plan for and provide adequate resources; the problem of scarcity should always prompt an examination of the possible means to alleviate the scarcity as well as apportion the current resources. A just system will seek to avoid unnecessary rationing by first implementing less drastic means of limiting and deferring the use of scarce resources. Examples of appropriate steps include the prior purchase of supplemental ventilators, cancellation of elective surgeries, and staff training. Triage should not be lightly implemented, but must be reserved for situations of true scarcity.

Guidelines for scarce resource allocation in a pandemic must avoid covert or social value judgments about those patients with pre-existing mental or physical impairments. Guidelines must reflect our common duty to protect the rights of the disabled and marginalized populations, using ethically sound justification that will withstand public scrutiny.

Taking into account this ethical framework, parameters for an allocation system for scarce resources emerges. Patients with the highest probability of mortality may be denied scarce resources in order to benefit patients with a higher likelihood of survival.

The issues of social utility and expected longevity<sup>8</sup> are generally to be avoided in scarce resources allocation as they may be highly subjective. The issues of social utility and expected longevity<sup>9</sup> are generally to be avoided in scarce resources allocation as they may be highly subjective. An important exception to this remains the prioritization of resources to persons who are needed to respond to the pandemic and ensure the continued basic functioning of society<sup>10</sup>. While some health care providers fall into this group, other personnel also serve vital functions. Examples include utility and communications workers, those working on vaccine development and manufacturing, those providing supplies and support to health care institutions (e.g., food delivery, sanitation), and those providing other basic goods (e.g., food production, delivery and sales, fuel delivery and sales). This is an area for ongoing community and professional discussion and research.

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<sup>8</sup> Doug White/length of life expect

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<sup>10</sup> Kass NE, Otto J, O'Brien D, Minson M., Ethics and severe pandemic influenza: maintaining essential functions through a fair and considered response. *Biosecur Bioterror*. 2008 Sep;6(3):227-36

## **RESOURCE ALLOCATION DECISION PROCESS**

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This section describes the composition and function of the Scarce Resource Allocation Committee (SRAC), Triage Officers for each hospital floor or unit, and the Clinical Review Committee (CRC) which serves as an appeals forum.

When scarce resources must be allocated, fair and legitimate processes will be required. It will be important for hospitals to establish a decision making process for allocating scarce resources. Care givers, physicians, and administrators will need clear guidance regarding how to distribute resources, and family members will need to know that a just and thoughtful process is in place.

### **Trigger Points**

When a public health emergency is imminent, or has been declared by a relevant public health agency, the Medical Care Director, or his/her designee as predetermined in the Incident Management System, will direct the Hospital Pandemic Preparedness Committee (or its equivalent) to do the following:

- Identify resources which are likely to become scarce
- Develop a method (or implement a previously developed method) for tracking such resources
- Establish trigger points which indicate when conservation of a particular resource(s) is necessary

The trigger point depends on the imminent depletion of a certain resource and will vary depending on the resource and the severity of the situation. The trigger point will be established based on the current and projected demand for a resource, and the current supply of this resource. As an example, during the 2009 novel influenza A (H1N1) outbreak, it became clear early on that N95 masks and antiviral medications would quickly become scarce and decisions on usage needed to occur immediately. On the other hand, given the low morbidity and mortality associated with this virus, staffing resources, beds, and ventilators did not need to be considered as scarce resources during this early period.

### **Scarce Resource Allocation Committee (SRAC)**

Once the trigger point is reached for a particular resource, the Incident Management Team must decide whether to activate the Scarce Resource Allocation Committee (SRAC) as shown in Figure 1.

**FIGURE 1: Scarce Resource Allocation Committee (SRAC) Description**

<b>Statement of Purpose</b>	SRAC will have the full authority to make necessary allocation decisions to assign or conserve resources for patient care.
<b>Objectives</b>	In the event of a shortage of services, supplies, or staffing, the SRAC will determine when and how these resources should be allocated or conserved. In addition, the SRAC will have responsibility for determining when Triage Protocols will be activated and deactivated.
<b>Scope</b>	All supplies, equipment, staffing (faculty and staff) and any other resource of the UMHHC
<b>Membership</b>	<p>In the event of a disaster declaration and/or the establishment of an Incident Management System (IMS), the SRAC structure should be consistent with this system. At this point, the Incident Commander (or designee) will chair the SRAC.</p> <p>The SRAC composition will include appropriate adult and pediatric representation from each of the following eight groups:</p> <ul style="list-style-type: none"> <li>• Medical Care Director, e.g. Chief of Staff or designee</li> <li>• Nursing Care Director, e.g. Director of Nursing or designee</li> <li>• Ambulatory Care Medical Director or designee</li> <li>• ICU Medical Director(s) or designees, e.g. Critical Care Committee Chairs</li> <li>• Respiratory Therapy Medical Director and Technical Director or designees</li> <li>• Emergency Medicine Medical Director or designee</li> <li>• Admissions/Bed Capacity Manager or designee</li> <li>• Ethicist</li> </ul>
<b>Timeline</b>	May be activated upon determination of one or more scarce resources.
<b>Progress Reports</b>	SRAC should attempt to meet face-to-face, however, conference calls will suffice as long as minutes are documented. All decisions made by the SRAC should be documented in meeting minutes, including the rationale for those decisions.

These particular groups have been recommended because they represent the leadership in clinical care (Chief of Staff, Nursing Director), the leadership in areas most likely to be faced with scarce resources (ICU Directors, Respiratory Care, Emergency Medicine, Admissions/Bed Coordination Center, Ambulatory Care Directors), and experts in the ethics of health care delivery (ethicists).

In the event that consensus among members of SRAC cannot be reached regarding the assignment or conservation of a scarce resource, the Incident Commander will call for a vote. Voting will consist of one vote for the Incident Commander and one vote for each of the eight groups for a total of nine votes. A majority vote will be required. Ad hoc advisors may be invited by SRAC members to provide expertise as needed. Ad hoc advisors may include representatives from the Office of the General Counsel,

Pharmacy, Material Services, Epidemiology, Infection Control, Human Resources, etc. Ad hoc advisors will not be permitted to vote in matters to be decided by the SRAC.

During a mild pandemic, the SRAC may only need to meet intermittently and some decisions on specific resource allocation may be left to specialty groups. For example, during the mild 2009 novel influenza A (H1N1) outbreak, decisions regarding antiviral distribution for treatment and prophylaxis within UMHC were left to a small group including Infectious Diseases, Employee Health, and Infection Control. On the other hand, a severe pandemic with more hospitalizations and a higher mortality rate might necessitate daily meetings of the SRAC to make recommendations for allocation of multiple scarce resources.

### **Triage Officers**

During a severe pandemic that leads to multiple scarce resources, a Triage Officer will be assigned to oversee an entire inpatient floor or unit. Triage Officers will be selected from available adult and pediatric Hospitalists, ICU specialists, Emergency Medicine physicians, Anesthesiologists, and others as assigned by the Medical Care Director. Triage Officers will be selected by SRAC in consultation with the Chairs and/or Service Chiefs. Potential Triage Officers will be identified by the Department Chairs based on the individual's leadership capabilities and clinical skills to meet the needs of the role. Pre-identification of Triage Officers is recommended. Selected Triage Officers will be responsible for reading this document in its entirety and familiarizing him or herself with the Triage Protocols.

The Triage Officer will have the responsibility to assure that the physician caring for the patient performs an assessment for triage purposes at 48 and 120 hours after admission and daily thereafter using the Triage Protocols. Day-to-day clinical care decisions for individual patients will continue to be made by the physician caring for the patient.

If Triage Protocols needed to be implement to manage a scarce resource (i.e. ICU care or ventilators), the Triage Officer will notify the physicians within their assigned units to report Triage Protocol assessments daily. The Triage Officer will assess the needs of all patients within their assigned units. If a patient is not improving, this should be brought to the attention of the Triage Officer. Using the Triage Protocols, the Triage Officer will determine which patients no longer meet criteria for the use of a scarce resource. When a patient no longer meets criteria for a particular resource, the Triage Officer will advise the physician to discontinue its use. Decisions to discontinue *any* intervention based on resource conservation will only occur after the SRAC has determined that conservation of that particular resource is necessary.

### **Clinical Review Committee**

While decisions to discontinue life sustaining interventions will be made by the Triage Officer, in consultation with the physician caring for the patient, any patient, family member or clinician (including the Triage Officer) can request consultation with the Clinical Review Committee (CRC) as shown in Figure 2. The CRC will have two functions:

- 1) It will serve as a consultative body that will advise clinicians regarding clinical decision making in complex patient care situations and identify principles that will serve as guidelines for triage officers.
- 2) It will be the final decision making body for the appeal of Triage Officer clinical decisions. Decisions made by the CRC will be final, and will be determined based on a review of available medical information.

**FIGURE 2: Clinical Review Committee**

<b>Statement of Purpose</b>	To act as an advisory body for requested consults from the Triage Officer and act as a final decision making body for all appealed Triage Officer decisions.
<b>Objectives</b>	Consultation: <ul style="list-style-type: none"> <li>• Advise regarding clinical decision making in complex patient care situations</li> <li>• Identify principles that serve as a guide for the Triage Officer Appeals:</li> </ul> Appeals: <ul style="list-style-type: none"> <li>• Resolve disputed cases of allocation of any scarce clinical resources</li> </ul>
<b>Scope</b>	Any resource allocation decisions that require resolution.
<b>Membership</b>	The CRC will consist of appropriate adult and pediatric providers including the following: <ul style="list-style-type: none"> <li>• Medical Care Director, e.g. Chief of Staff or designee</li> <li>• Triage Officer for that unit (non-voting)</li> <li>• Adult Triage Officer from another unit</li> <li>• Pediatric Triage Officer from another unit</li> <li>• Respiratory Therapy Medical Director or designee</li> <li>• Emergency Medicine Medical Director or designee</li> <li>• Nursing Director or designee (non-voting)</li> <li>• Ethicist, ad hoc advisor (non-voting)</li> <li>• Office of the General Counsel, ad hoc advisor (non-voting)</li> </ul>
<b>Timeline</b>	Ad hoc activation
<b>Progress Reports</b>	All decisions will be documented in the patient's medical record. Additionally, the CRC will maintain a list of all patient names, registration numbers, and rendered decision.

These particular groups have been recommended because they represent expertise in relevant areas in order to make final clinical resource decisions. In the event that consensus among members of CRC cannot be reached, regarding life sustaining interventions, the Medical Care Director will call for a vote. A majority vote will be required. All decisions will be documented in the patient's medical record. Additionally, the committee shall maintain a record of all patient names, registration numbers, and the particular decision rendered by the CRC. Ad hoc advisors may be invited by CRC members to provide expertise as needed. Ad hoc advisors will not be permitted to vote in matters to be decided by the CRC.

## STAFFING RESOURCES

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Personnel may be the most important scarce resource in a pandemic. Equipment, medications, and vaccines cannot treat or prevent illness without trained personnel to prescribe, administer and oversee their use. Unlike material goods such as medicines, masks, and ventilators, personnel cannot be “stockpiled;” indeed, shortfalls in personnel will be exacerbated by pandemic-related absenteeism.

While other planning committees (UMHS Pandemic Staffing Committee, Office of Clinical Affairs, and Department of Internal Medicine) have the primary responsibility for planning for human resource needs and strategies, the following ethical guidelines may be useful for allocating scarce human resources during a pandemic:

1. As is the case for material resources, institutions should increase the “supply” of scarce human resources by prospectively training individuals whose current roles will be less urgently required during a pandemic to work in areas of likely shortfall, and consider training community members as well.
2. Professional ethics for clinicians generally discourage or prohibit practice outside the scope of one’s expertise. Similarly, legal and ethical standards often prohibit laypersons from providing health services. During conditions of extreme scarcity of trained personnel, however, standards of competence may justifiably be lower than during normal conditions. Employing, for instance, a clinician who normally works in a specialty to instead work in primary care, or providing community volunteers with focused training to administer vaccine could expand capacity and alleviate some of the scarcity of personnel.
3. Individuals who assume the risks and burdens of working during a pandemic (e.g., extended hours and quarantine) should:
  - a. Receive appropriate protection (e.g., vaccine, protective gear) to minimize their risk of infection
  - b. Receive priority for antivirals, antibiotics and other mid-level scarce resources, with the exception of life-sustaining interventions such as ventilators (for which they would not receive special priority)
  - c. Individuals whose contracts or agreements clearly described expectations of continuing to work despite risk, but who failed to adhere to those agreements, should expect appropriate action.
4. The allocation of scarce human resources should adhere to the guidelines for other resources.

## ANTIBIOTIC / ANTIVIRAL RESOURCES

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### Antibiotic Resources

During a pandemic, antibiotics will be necessary to treat secondary bacterial pneumonias. There is some evidence that many, if not most, of the deaths in the 1918 pandemic could be attributed to secondary bacterial pneumonias with *Streptococcus pneumoniae* and *Staphylococcus aureus*<sup>11</sup>. These are still the most likely pathogens, however, we now need to plan for infections with resistant strains of *S pneumoniae* and methicillin resistant *S aureus*. Antibiotics for bacterial pneumonia include: amoxicillin/clavulanate, fluoroquinolones (levofloxacin, gatifloxacin, moxifloxacin), doxycycline, third generation cephalosporins (ceftioxone and cefotaxime) and macrolides (azithromycin, clarithromycin). In addition vancomycin, linezolid, rifampin, and tigecycline will be required for resistant bacteria<sup>12</sup>.

There are currently no national guidelines on how to allocate antibiotics during a pandemic. It has been estimated that 15-20% of influenza patients developed pneumonia during the three pandemics of the 20<sup>th</sup> century<sup>13</sup>. Using these estimates, a 1918-type pandemic might lead to as many as 20-30,000 UMHC patients needing antibiotic treatment for pneumonia in a 12 week period. UMHC has stockpiled some antibiotics, particularly ciprofloxacin and doxycycline, for use during a bioterrorist attack. However, ciprofloxacin is not as active as other fluoroquinolones against *S pneumoniae* and, although doxycycline is useful for mild-moderate pneumonias, it is not a first-line agent for severe pneumonias. Other antibiotics would quickly run out during a pandemic. The Strategic National Stockpile (SNS) also contains antibiotics but this cache could not be relied upon as it would be needed in all parts of the country.

During a pandemic, antibiotics should only be used in patients who have suspected or proven bacterial pneumonia. There is no indication for prophylactic use of antibiotics to prevent bacterial pneumonia and this practice should be discouraged. Certain high risk patients (COPD, immunocompromised) might be given antibiotics to start immediately if antivirals fail to prevent worsening of respiratory symptoms. Generally, antibiotics should be allocated to those who are most ill and who have the greatest likelihood for survival. For the sickest inpatients (ICU/Ventilated patients) we recommend distribution of antibiotics based on SOFA scores. For example, patients with a SOFA > 11 (blue range) should not receive antibiotics if these are in short supply. Other hospitalized patients should only receive antibiotics when pneumonia is highly suspected or proven based on clinical symptoms, radiologic procedures, and laboratory data. Clinical case definitions based solely on symptoms and exam findings will be

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<sup>11</sup> Morens DM, Taubenberger JK, Fauci AS. Predominant role of bacterial pneumonia as a cause of death in pandemic influenza: Implications for pandemic influenza preparedness. *J Infect Dis* 2008;198:1-10

<sup>12</sup> Mandell LA, Wunderink RG, Azueto A, et al. Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults. *Clin Infect Dis* 2007;44:S27-72.

<sup>13</sup> Gupta RK, George R, Nguyen-Van-Tam JS. Bacterial pneumonia and pandemic influenza planning. *Emerg Infect Dis*. 2008 Aug;14(8):1187-92

developed as needed in case radiology and laboratory services are overextended. Separate definitions will be required for adolescent/adult and pediatric patients. Outpatients will also only receive antibiotics for suspected or proven bacterial pneumonia or other bacterial complications of influenza. Clinical case definitions will be crucial in this population because limited resources and staffing will not allow for a full work-up with labs and X-rays. The use of cheaper and more available oral antibiotics like doxycycline, ciprofloxacin, and amoxicillin will be necessary in the outpatient setting, even if these are less effective than intravenous antibiotics (ceftriaxone, vancomycin) and more expensive oral antibiotics (moxifloxacin, linezolid).

Beyond prioritizing antibiotics for patients who have a proven or suspected pneumonia and are likely to survive, it does not make sense to stratify people further. Patients with bacterial pneumonias who go untreated are very likely to get worse and die. Denying antibiotics to anyone in this situation seems ethically unsound if that person is likely to survive with the treatment. This is in contrast to the use of antivirals. Antivirals, as treatment, would be used in patients with influenza symptoms regardless of the presence of pneumonia. Prioritizing can be justified because most people (97%) are expected to survive influenza with no treatment in a 1918-like scenario. Antiviral treatment is most likely to help high-risk groups.

## Antiviral Resources

Antivirals including oseltamivir, zanamivir, rimantadine, and amantadine have been shown to decrease the duration of influenza symptoms, decrease hospitalization rates, decrease antibiotic use, and decrease mortality due to influenza<sup>14 15 16</sup>. Furthermore, these drugs have been used as chemoprophylaxis to prevent acquisition of influenza either after exposure to a case or pre-exposure during the entire influenza season<sup>17</sup>. The most effective antivirals for both treatment and chemoprophylaxis are the neuraminidase inhibitors, oseltamivir and zanamivir, and, as such, the CDC has recommended that these drugs be stockpiled for a potential pandemic and the agency has proposed priority groups that should receive these drugs in the event of an influenza pandemic<sup>18</sup>.

While treatment and post-exposure chemoprophylaxis with antivirals are financially feasible strategies for protecting our health care workers, pre-exposure prophylaxis of our entire workforce at UMHHC is financially prohibitive. As a result UMHHC has developed the following protocol for the use of antivirals for our staff:

Assumptions:

- No vaccine will be available to protect staff exposed to influenza patients.

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<sup>14</sup> Bowles SK, Lee W, Simor AE, et al. Use of oseltamivir during influenza outbreaks in Ontario nursing homes, 1999-2000. *J Am Geriatr Soc* 2002;50:608-16

<sup>15</sup> Kaiser L, Wat C, Mills T, Mahoney P, Ward P, Hayden F. Impact of oseltamivir treatment on influenza-related lower respiratory tract complications and hospitalizations. *Arch Intern Med* 2003;163:1667-72

<sup>16</sup> Whitley RJ, Hayden FG, Reisinger KS, et al. Oral oseltamivir treatment of influenza in children. *Pediatr Infect Dis J* 2001;20:127-33

<sup>17</sup> Ward P, Smith I, Small J, Suter P, Dutkowski R. Oseltamivir (Tamiflu<sup>®</sup>) and its potential for use in the event of an influenza pandemic. *J Antimicrob Chemother* 2005;55(Suppl S1):i5-i21

<sup>18</sup> <http://www.hhs.gov/pandemicflu/plan/appendixd.html>

- Personal Protective Equipment will provide adequate protection against influenza if used properly.
- Antivirals have little effect if administered 48 hours after the onset of influenza symptoms (fever, myalgias, and cough).
- Of the 10,000 UMHHC employees, approximately 7,000 will have high risk exposure to infected patients.
- 2,500-3,000 (35%-40%) of the above workers will get infected with influenza.
- Certain staff on flu wards, in the ED and at the Alternate Care Centers (ACCs) will be at a much higher risk of becoming infected.
- Staff might not present to work if they are not afforded adequate protection.
- The state of Michigan is pre-purchasing enough antiviral medications to cover 25% of the state.
- Approximately 25-30% of the population will become infected with the pandemic influenza strain.

### **Antiviral Distribution Protocol:**

UMHHC intends to stockpile enough antivirals to treat and give chemoprophylaxis to its at-risk workers. The state (MDCH) has committed to stockpile enough antivirals for 25% of the population and thus UMHHC does not plan to add additional stockpiles for patients. The hospital intends to use onsite stockpiles for treatment of patients until the state stockpile is distributed.

- Pre-exposure prophylaxis- UMMHC intends to stockpile enough courses to offer 8 weeks of daily chemoprophylaxis for 500 of the highest risk staff caring for influenza patients including ED, ACC, and influenza ward caregivers. This will constitute 4,000 courses of antivirals. Pre-exposure prophylaxis will be distributed weekly to designated staff and if stores run short during a pandemic, pre-exposure prophylaxis may be discontinued in order to supply drug to other staff or patients.
- Treatment/Post-exposure prophylaxis-UMHHC will stockpile enough antiviral medication to treat 3000 staff or give post-exposure prophylaxis. Post-exposure prophylaxis will be given to caregivers who have an unprotected exposure (e.g., not wearing personal protective equipment) to patients infected with pandemic influenza. This will constitute approximately 2,500 courses. Plans for distribution of treatment and post-exposure prophylaxis have been developed by the UMHHC Pandemic Influenza Planning Committee.
- UMHHC plans to stockpile 4300 courses of antivirals (Oseltamivir/Zanamivir)
- At this time, UMHHC does not have the ability to cover the family members of employees and, as such, if these individuals will be covered using the state's stockpile of antivirals.

## VENTILATOR / RESPIRATORY CARE / ICU RESOURCES

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### Ventilator/ICU Resources

During a severe pandemic respiratory illness, we expect that the number of existing ventilators / ICU beds will be inadequate to meet the needs of patients. There have been several proposed mechanisms for initial triage of patients to critical care units, ventilator use or transport to ED / definitive care.

Hicks<sup>19</sup>, proposed a triage system for ventilator assignment during an infectious disease disaster for adults. This system uses only clinical and not laboratory assessments and includes a reassessment of resource use for each patient with a requirement for improvement to continue use of the ventilator. Another proposal<sup>20</sup> used the Sequential Organ Failure Assessment (SOFA) score for adult patients in a similar respiratory pandemic scenario to create triage criteria for critical care admission. The SOFA scores require both laboratory and radiology resources. Talmor<sup>21</sup> suggested criteria for ICU admission during a pandemic respiratory disease disaster which used age and clinical criteria for adults over 18 years of age. Other triage criteria for acute mass casualty trauma such as START<sup>22</sup> & JumpStart<sup>23</sup> or SALT<sup>24</sup> do not completely address the circumstances covered in this section.

After the SARS epidemic in Toronto, Christian<sup>25</sup> proposed a triage system for ventilator access based on pre-existing health status and SOFA scores. The New York Department of Health is the first U.S. governmental body to issue a proposed triage system for ventilator access during a pandemic influenza event<sup>26</sup>. This system is similar to the Toronto proposal but has fewer exclusion criteria. None of the triage criteria designed for infectious disease disasters have included pediatric specific recommendations and this will be addressed in a subsequent section.

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<sup>19</sup> Hick, J.L. and D.T. O'Laughlin, *Concept of operations for triage of mechanical ventilation in an epidemic*. Acad Emerg Med, 2006. **13**(2): p. 223-9.

<sup>20</sup> Christian, M.D., et al., *Development of a triage protocol for critical care during an influenza pandemic*. CMAJ, 2006. **175**(11): p. 1377-81.

<sup>21</sup> Talmor, D., et al., *Simple triage scoring system predicting death and the need for critical care resources for use during epidemics*. Crit Care Med, 2007. **35**(5): p. 1251-6.

<sup>22</sup> Benson, M., K.L. Koenig, and C.H. Schultz, *Disaster triage: START, then SAVE--a new method of dynamic triage for victims of a catastrophic earthquake*. Prehosp Disaster Med, 1996. **11**(2): p. 117-24

<sup>23</sup> Romig, L.E., *Pediatric triage. A system to JumpSTART your triage of young patients at MCIs*. JEMS, 2002. **27**(7): p. 52-8, 60-3.

<sup>24</sup> SALT reference

<sup>25</sup> Christian, M.D., et al., *Development of a triage protocol for critical care during an influenza pandemic*. CMAJ, 2006. **175**(11): p. 1377-81.

<sup>26</sup> Is this the New York reference? Powell, T., K.C. Christ, and G.S. Birkhead, *Allocation of Ventilators in a Public Health Disaster*. Disaster Med Public Health Preparedness, 2008. **2**(1): p. 20-26.

## **Clinical Evaluation:**

When implementation of a scarce resource allocation plan is required, equipment such as ventilators and supplemental oxygen will require a consistent and predictable approach to utilization. Part of the concern will be to have established criteria to determine how implementation of these resources can minimize morbidity and mortality in a population that requires them. Evaluation criteria to predict this potential morbidity and mortality should be discussed, vetted, and adopted prior to their needed utilization and should use simple and straightforward criteria that will not have to place profound additional demands on other scarce resources to calculate.

As the physiology of adult and pediatric patients is often quite different, we have determined that separate triage tools are required to evaluate adults and pediatric patients. To comply with the need for equitable access to care, we have used the same expected mortality criteria for both groups.

When a patient presents to the ED, or a decision is required for admission to ICU, or the patient is determined to need ventilator support, the appropriate triage tool will be used to determine whether the patient is allocated a ventilator. We have also included a requirement to systematically review the clinical progress of each patient who is currently receiving mechanical ventilation or ICU care with a requirement of improvement at 48 hours, 120 hours, and daily thereafter. This tool is meant to be a starting place for further clinical decision making tools as conditions evolve in any mass casualty or pandemic event.

In the event of a severe shortage of ventilators or ICU beds, not all patients will be eligible for mechanical ventilation or ICU care. The following inclusion and exclusion criteria are recommended (Table 3). These criteria have been informed by both the Toronto triage tool and the New York tool. Initiation of ventilatory support should be determined by the following inclusion and exclusion criteria:

**TABLE 3: Inclusion and Exclusion Criteria for Mechanical Ventilation**

<b>Inclusion Criteria</b>	
The patient must have one of the following:	
A.	Requirement for invasive ventilatory support <ul style="list-style-type: none"> <li>• Refractory hypoxemia (SpO2 &lt; 90% on non-rebreather mask or FIO2 &gt; 0.85)</li> <li>• Respiratory acidosis (pH &lt; 7.20)</li> <li>• Clinical evidence of impending respiratory failure</li> <li>• Inability to protect or maintain airway</li> </ul>
B.	ADULTS: Hypotension (systolic blood pressure < 90 mm Hg or relative hypotension) with clinical evidence of shock (altered level of consciousness, decreased urine output, or other evidence of end-organ failure) refractory to volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting PEDS: Hypotension (systolic BP < 70 + 2x age (years)) or clinical shock state (as evidenced by altered level of consciousness, decreased urine output, or other evidence of end-organ failure) refractory to volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting

<b>Exclusion Criteria</b>	
The patient is excluded from admission or transfer to critical care if <i>any</i> of the following is present:	
A.	Severe trauma
B.	Severe burns of patient with any 2 of the following: <ul style="list-style-type: none"> <li>• Age &gt; 60 yr</li> <li>• &gt; 40% of total body surface area affected</li> <li>• Inhalation injury</li> </ul>
C.	Cardiac arrest <ul style="list-style-type: none"> <li>• Unwitnessed cardiac arrest</li> <li>• Witnessed cardiac arrest, not responsive to electrical therapy (defibrillation or pacing)</li> <li>• Recurrent cardiac arrest</li> </ul>
D.	Metastatic malignant disease with poor prognosis
E.	Advanced and irreversible immunocompromise
F.	Severe and irreversible neurologic event or condition with highly expected mortality
G.	End-stage organ failure meeting the following criteria: <p><i>Heart</i></p> <ul style="list-style-type: none"> <li>• NYHA class III or IV heart failure</li> </ul> <p><i>Lungs</i></p> <ul style="list-style-type: none"> <li>• Severe chronic lung disease with FEV1 &lt; 25% predicted, baseline PaO2 &lt; 55 mm Hg, or secondary pulmonary hypertension</li> <li>• Previously diagnosed primary pulmonary hypertension with NYHA class III or IV heart failure, or mean pulmonary arterial pressure &gt; 50 mm Hg</li> </ul> <p><i>Liver</i></p> <ul style="list-style-type: none"> <li>• Child–Pugh score <sup>3</sup> 7 or Meld scored of &gt; 20</li> </ul>

Allocation of scarce resources will not only need to have a clear determination of criteria for initiation, but also clear criteria to determine if patients currently using resources are obtaining the needed benefit to insure the lowest morbidity and mortality for the population at risk. When patients are not progressing to the desired outcomes, these resources may need to be reallocated to insure the stated goal.

Periodic reassessment of the patient’s risk for mortality is recommended at specific time points during the course of care to determine if reallocation of resources is the most appropriate available option. Patients will be evaluated for worsening potential for mortality at 48 hours and 120 hours by the following adult and pediatric criteria.

These decisions will be both difficult and necessary, and to insure their fairness there will be a monitoring and appeals process along with these standardized criteria to best insure a cautious and moderated approach to these decisions.

### Triage of eligible patients:

Once a patient is deemed eligible for triage by meeting the above inclusion criteria, the appropriate adult or pediatric triage tool will be used to determine initial and continuing use of mechanical ventilation and/or ICU care.

### Adults:

It is recommended that for adult care the triage tools proposed by the Toronto and New York guidelines are used. These rely on the use of the Sequential Organ Failure Assessment Score (SOFA score) to determine likelihood of recovery if given adequate treatment. The SOFA score is determined by a multi-organ failure model and includes the measures of respiratory, hematologic, liver, cardiovascular, neurologic and renal function (see Figure 1).

**FIGURE 3: Sequential Organ Failure Assessment (SOFA) Score**

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

Dopamine [Dop], epinephrine [Epi], norepinephrine [Norepi] doses in ug/kg/min SI units in brackets

## Pediatric Protocol:

There have been several proposed mechanisms for initial triage of adult patients to critical care units, ventilator use or transport to ED / definitive care as discussed above. Unfortunately, the prior triage guidelines presented by other researchers and groups have not specifically addressed pediatric patients. As children have significantly different physiology we determined the need to use a pediatric prognosis scoring system for the basis of the pediatric triage tool for children under 18 years of age.

A review of the pediatric critical care literature for scoring systems for multi-system organ failure revealed several scoring systems for pediatric ICU mortality prediction. The PRISM III-APS system<sup>27</sup> uses 59 ranges of 21 variables to determine a score which corresponds to mortality probability. The drawbacks of this scoring system include a large laboratory burden and little prospective validation in a multi-center trial. The Pediatric Logistic Organ Dysfunction (PELOD) system<sup>28</sup> uses values in each of 7 organ systems to create a score from 0-71. Advantages of this system are that the laboratory burden is less (labs required include only creatinine, arterial blood gases, (ABG), white blood cell count (WBC), platelet count (PLT) and aspartateaminotransferase (AST), prothrombine time (PT). This system has also been validated using a multi-center trial<sup>29</sup>. A recent conference on pediatric sepsis reviewed the existing organ dysfunction scoring systems for pediatric patients and determined that no single system was perfect for use in pediatric sepsis, but, determined criteria for organ dysfunction based on the PELOD system with the addition of need for pressors. The sepsis conference definition for determining organ dysfunction did not include a scoring system or a prediction of mortality.

At this time, our recommendation is to base the pediatric triage ventilator guidelines on the PELOD scoring system<sup>30</sup> which is found in Figure 4. We match the triage level for mortality with the adult SOFA mortality scoring to allow parity of triage guidelines for pediatric and adult patients.

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<sup>27</sup> Pollack, M., K. Patel, and U. Ruttimann, *The pediatric risk of mortality III-Acute physiology score (PRISM III-APS): A method of assessing physiologic instability for pediatric intensive care unit patients*. J. Pediatrics, 1997. **131**: p. 575-81.

<sup>28</sup> Leteurtre, S., et al., *Development of a pediatric multiple organ dysfunction score: use of two strategies*. Medical Decision Making, 1999. **19**: p. 399-410.

<sup>29</sup> Leteurtre, S., et al., *Validation of the paediatric logistic organ dysfunction (PELOD) score: prospective, observational, multicentre study*. Lancet, 2003. **362**: p. 192-97.

<sup>30</sup> PELOD

**FIGURE 4: PELOD Scoring System**

Organ system	Variable	SCORE				Max score
		0	1	10	20	
Neurologic						20
	Glascow coma score	12-15	7-11	4-6	3	
		AND		OR		
	Papillary reaction	Both reactive		Both fixed		
Cardiovascular						20
	Heart rate					
	< 12 yrs	≤ 195 bpm		> 195 bpm		
	> 12 yrs	≤ 150 bpm		>150 bpm		
		AND		OR		
	Systolic blood pressure					
	< 1 month	> 65 mmHg		35-65mmHg	< 35 mmHg	
	≥ 1month & < 1yr	> 75 mmHg		35-75mmHg	< 35 mmHg	
	≥ 1 yr & < 12 yr	>85 mmHg		45-85 mmHg	< 45 mmHg	
	≥ 12 yr	> 95 mmHg		55-95 mmHg	< 55 mmHg	
Renal						10
	Creatinine					
	< 7 days	< 1.59 mg/dl		≥1.59 mg/dl		
	≥ 7 days & < 1 yr	<0.62 mg/dl		≥ 0.62 mg/dl		
	≥ 1 yr & < 12 yrs	< 1.13 mg/dl		≥ 1.13 mg/dl		
	≥12 yrs	< 1.59 mg/dl		≥ 1.59 mg/dl		
Pulmonary						10
	PaO2/FiO2 ratio	> 70mmHg		≤ 70mmHg		
		AND		OR		
	PaCO2	≤ 90 mmHg		>90 mmHg		
		AND				
	Mechanical vent	No	Yes			
Hematologic						
	WBC	≥ 4.5K	1.5-4.4 K	<1.5		
		AND	OR			
	Platelets	≥ 35 K	< 35			
Hepatic						1
	AST	< 950 IU/L	≥ 950 IU/L			
		AND				
	Prothrombin time	> 60%	≤ 60%			

The calculation for determining predicted likelihood of mortality is shown in Table 4. Using this calculation if the PELOD score is > 26 the predicted mortality is 53%; in the validation study a PELOD score >26 had a mortality of 100%. Table 5 gives the

predicted PELOD score associated with different mortality probability. To use the PELOD scoring system on a daily basis, the score is calculated as at presentation. If new data is not available (i.e. new laboratory values) the value can either be assumed to be unchanged or normal depending on the physician's clinical judgment.

**TABLE 4: Calculation for determining predicted likelihood of mortality**

$$P = \frac{1}{1 + \exp(7.64 - 0.3 \times \text{PELOD score})}$$

**TABLE 5: Predicted mortality levels for a given PELOD score**

PELOD Score	Predicted Mortality probability	Predicted Mortality Rate
< 10	0.009	<1%
15	0.04	4%
20	0.1625	16%
22	0.26	26%
24	0.3917	40%
25	0.46	
26	0.53	53%
27	0.61	
28	0.68	68%
30	0.98	98%

Using similar mortality levels for pediatric and adult patients leads to using a PELOD score of 26 as a reasonable proxy for a SOFA score of 11. The calculated probability of mortality at 26 is 53% however the validation study showed a 100% mortality at this score. This seems a reasonable compromise since to use a score of 29 (approximately 85% mortality) may prioritize some children who would receive futile allocation of scarce resources. Likewise, a PELOD score of 21 has a predicted mortality of 20% which is similar to the SOFA score of < 8 and will be used similarly.

## Critical Care Triage Tool – PEDIATRIC PATIENTS (<18 yrs)

Color Code	Initial Assessment		48 Hour Assessment		120 Hour Assessment	
	Criteria	Priority/Action	Criteria	Priority/Action	Criteria	Priority/Action
Blue	Exclusion Criteria* or PELOD $\geq$ 26*	Medical Mgmt +/- Palliate & d/c	Exclusion Criteria or PELOD > 26 or PELOD 21-26 & no $\Delta$	Palliate & d/c from CC	Exclusion Criteria ** or PELOD > 26 ** or PELOD 21-26 no $\Delta$	Palliate & d/c from CC
Red	PELOD < 21 or Single Organ Failure	Highest	PELOD < 26 and decreasing	Highest	PELOD < 26 and decreasing progressively	Highest
Yellow	PELOD 21-26	Intermediate	PELOD < 21 no $\Delta$	Intermediate	SOFA PELOD < 21 minimal decrease (< 3 point decrease in past 72 hrs)	Intermediate
Green	No significant organ failure	Defer or d/c, reassess as needed	No longer ventilator dependant	d/c from CC	No longer ventilator dependant	d/c from CC

\*If exclusion criteria or PELOD > 26 occurs at any time from the initial assessment to 48 hours change triage code to Blue and palliate.

\*\* If exclusion criteria or PELOD > 26 occurs at anytime from 48 – 120 hours change triage code to Blue and palliate.

$\Delta$  = change

CC = critical care

d/c = discharge

- **Blue:** High probability of mortality; should be discharged from critical care and should receive medical management and palliative care as appropriate
- **Red:** Highest priority for critical care
- **Yellow:** Intermediate priority for critical care
- **Green:** Low probability of mortality; defer admission/ discharge from critical care

## ADULT Critical Care Triage Tool

	Initial Assessment		48 Hour Assessment		120 Hour Assessment	
Color Code	Criteria	Priority/Action	Criteria	Priority/Action	Criteria	Priority/Action
Blue (EXPECTANT)	Exclusion Criteria* or SOFA > 11*	Medical Mgmt +/- Palliate & d/c	Exclusion Criteria or SOFA > 11 or SOFA 8 – 11 no Δ	Palliate & d/c from CC	Exclusion Criteria ** or SOFA > 11 ** or SOFA 8 – 11 no Δ	Palliate & d/c from CC
Red	SOFA < 7 or Single Organ Failure	Highest	SOFA < 11 and decreasing	Highest	SOFA score < 11 and decreasing progressively	Highest
Yellow	SOFA 8 - 11	Intermediate	SOFA < 8 no Δ	Intermediate	SOFA < 8 minimal decrease (< 3 point decrease in past 72 hrs)	Intermediate
Green	No significant organ failure	Defer or d/c, reassess as needed	No longer ventilator dependant	d/c from CC	No longer ventilator dependant	d/c from CC

\*If exclusion criteria or SOFA > 11 occurs at any time from the initial assessment to 48 hours change triage code to Blue and palliate.

\*\* If exclusion criteria or SOFA > 11 occurs at anytime from 48 – 120 hours change triage code to Blue and palliate.

Δ = change

CC = critical care

d/c = discharge

- **Blue:** High probability of mortality; should be discharged from critical care and should receive medical management and palliative care as appropriate
- **Red:** Highest priority for critical care
- **Yellow:** Intermediate priority for critical care
- **Green:** Low probability of mortality; defer admission/ discharge from critical care

The initiation of other more sophisticated methods of ventilatory support, such as ECMO or HFOV, will be evaluated and allocated using the same criteria as conventional ventilatory support. There is concern that these already scarce resources will become more frequently requested interventions, but their use strains the efficient and maximal use of all available resources and thus will be limited by established medical criteria.

There will be no change in our external transfer protocols based on any scarce resource. External transfers have been based on availability of our resources and decisions have always been based on medical necessity and our resource availability and this will not change.

The above triage tools were designed to address a pandemic severe respiratory illness. As information about the illness is obtained, the criteria will need to be reviewed and refined. We have also not specifically addressed other mass casualty events which may also result in resource scarcity.

### **Oxygen Therapy:**

Given that in the worse case scenario, 15-20% of influenza patients may acquire pneumonia<sup>31</sup> during a pandemic, it is likely that oxygen therapy will be in great demand. We estimate that UMHC may see 20-30,000 people with pneumonia during an influenza pandemic. In addition, the current needs for oxygen supplementation for COPD, heart failure, cystic fibrosis, and other respiratory diseases will remain the same. As such rationing decisions may need to be implemented.

If rationing of oxygen therapy is required; oxygen will be administered based on the following guidelines:

- Ventilated patients
- Adult patients with oxygen saturation < 86% on room air
- Pediatric patients > 1 year with oxygen saturation <88% on room or respiratory rate of >40
- Pediatric patients with oxygen saturation <88% on room air or respiratory rate >60
- Hypoxia patients with pneumonia

It is unlikely that oxygen supplies will be depleted because of the storage capacity of hospitals and the ease of delivery by vendors. If oxygen supplies or personnel required to administer oxygen therapy become scarce, those patients categorized as Blue (expectant) who are not eligible for ventilators will also not be eligible for oxygen therapy. Every effort will be made using other therapeutic means to keep these dying patients' comfortable (see Palliative Care Section).

Patients who are discharged requiring supplemental oxygen will go home with the oxygen masks or nasal cannulas used during their inpatient stay. Outpatients who currently receive home oxygen therapy will be resupplied based on oxygen availability and the guidelines listed above. If oxygen is only used during exertional activities, it should not be renewed.

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<sup>31</sup> Gupta RK, George R, Nguyen-Van-Tam JS. Bacterial pneumonia and pandemic influenza planning. *Emerg Infect Dis.* 2008 Aug;14(8):1187-92

No specific group should have priority for receiving oxygen therapy. Although direct care providers are a priority group for vaccines and antivirals, oxygen will not, by itself, improve survival and it is not likely to help staff return to work more quickly. As such, there will be no oxygen priority for patients on the basis of occupation.

Establishing the capability of providing oxygen delivery to the 250 bed ACC will require the utilization of a mobile cryogenic bulk oxygen system. A micro-bulk cryogenic oxygen vessel with an 850 gallon capacity would support the 250 bed ACC for 4.06 days based on a utilization rate of 2-4 lpm per bed. Re-supply would be coordinated with current vendor. Maintaining the operation of this system would also require additional supplies and equipment

### **Additional Equipment and Supplies**

- GP45 Cryogenic O2 vessels (backup to micro-bulk supply): 2 each on carts
- External Vaporizers: 2 – 4 each
- Various shutoff valves (~ 6 each)
- 1” Steel Braid transfer hoses (to be specified by bulk supplier)
- Pressure regulating manifold (1 ea)
- Pressure Adjustable regulators (2 each)
- ½” Steel Braid hoses (2 – 60 each)
- 70 each 12’ high pressure hoses
- 125 each TEE adapters
- 500 each ¼ check valves
- 120 each “Y” blocks with integrated Dial-A-Flow O2 flowmeters
- Backup supply of size E O2 cylinders – up to 1 cylinder per bed
- O2 regulators for E O2 cylinders
- Cylinder wrenches to connect and remove O2 regulators onto O2 cylinders
- 2-wheeled cylinder carriers to transport O2 cylinders: ~100 + each
- 24 – 36 bank O2 cylinder racks to store O2 cylinders: ~ 5 – 8 racks

## PALLIATIVE CARE RESOURCES

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Regardless of modeling or assumptions, a major pandemic event will require significant resources to care for dying patients and their families. Minimum expected CFR up to 3% based on historical influenza pandemic data. The impact of pandemic death (Table 1) will stress all parts of our system and require clear, executable strategies for supporting very large numbers of patients and their families through the end of life.

The ethical imperative to provide pandemic palliative care is well-supported under the framework used to create these guidelines for ventilator allocation; specifically, our obligations to individual patients, institutional competence and utility. Planning for palliative care resource allocation must also be guided by justice and fair distribution of resources, and administered honestly and transparently with specific processes for accountability to patients and families, institutional partners and state and community stakeholders.

In addition to the ethical imperative, and in contrast to prior pandemics, palliative care is now recognized as a core institutional competency by multiple organizations including the Joint Commission (JCAHO) and the National Quality Forum (NQF). Palliative Medicine is also now a recognized American Board of Medical Specialties (ABMS) subspecialty, co-sponsored by ten member boards including Internal Medicine, Family Medicine, Pediatrics, Surgery, Emergency Medicine, Obstetrics and Gynecology and others. Perhaps more importantly, formal palliative care clinical services are now present in 70% of larger U.S. hospitals, creating not only an infrastructure for palliative care delivery, but also an expectation from patients, families and communities of available, responsive and competent care for patients through end of life.

Formal palliative care clinical guidelines have been developed and widely endorsed (*available at [nationalconsensusproject.org](http://nationalconsensusproject.org)*), and stress the importance of care in four key areas: physical symptom management (pain, dyspnea, nausea, etc); psychological symptom management (anxiety, depression, agitation, delirium); support for family and close persons; and spiritual care for patients and loved ones. Quality palliative care is also to be delivered by an interdisciplinary team skilled in integrating services across these domains, frequently consisting of physicians and advanced-practice nurses, social workers, and spiritual care providers.

As with all clinical resources mobilized for pandemic care, palliative care providers are limited and will need to be allocated based upon need and availability. Unlike some resources that can be concentrated geographically (i.e. ventilators, critical care providers), palliative care support will be needed across all care settings, including inpatient and intensive care, the alternative care center (ACC), and outpatient and community contact points. It should be assumed that patients with life-threatening illness could (and will) receive care in all parts of the system, which creates a formidable task to source palliative care throughout.

The broad need for palliative care during a pandemic does not dictate that resources be distributed evenly among settings, but that reasonable efforts be made to provide support likely to be most useful in each. For instance, it is expected that patients who require mechanical ventilation (whether or not they receive it) by definition have life-limiting illness, and thus a high mortality risk. In fact, those who require mechanical ventilation but do not receive it (per established protocols or CRC action) are most likely to require prompt, competent palliative care. The distribution of palliative care resources is thus closely connected to ventilator allocation, and should be integrated into the universal triage process for pandemic response.

## **Palliative Care Resource Allocation**

Pandemic palliative care resources can broadly be divided into personnel and non-personnel categories. Non-personnel resources include oxygen, space (particularly private space) and medications for control of anticipated symptoms among those severely ill with influenza (e.g. opioids for breathlessness, benzodiazepines for anxiety/restlessness, anticholinergic medications for respiratory secretions, etc.). It is reasonable to assume that patients sufficiently ill to succumb to pandemic influenza may also have other substantive illness (advanced cancer, congestive heart failure, dementia, etc.) which expands the list of probable symptoms to include significant pain, nausea/vomiting, and agitation, as well as other significant clinical events such as non-respiratory infections, congestive heart failure exacerbations, myocardial infarctions, seizures, and others.

As many of these resources are finite, if not scarce, it is possible (and perhaps likely) that allocation for palliative care will compete with allocation for potentially curative care. Oxygen is a good candidate for such a conflict, if supplies become critically low. There is a fairly sound argument for allocating oxygen to those patients with the highest likelihood of survival, assuming that oxygen supplementation improves survival. Since alternative resources can ease the suffering of those who might benefit from palliation, prioritizing oxygen to probable survivors can be justified, if sufficient medications (e.g. opioids, benzodiazepines, anti-cholinergics, etc.) are available to manage the dying patients' distress acceptably. As with all potential scarce resources, distribution will be guided by SRAC.

But what if a patient with advanced cancer requires large doses of morphine to manage both severe pain and breathlessness? Such utilization would surely impact the availability of relief for others, but remains a clear duty to the individual who is suffering. Moreover, is it reasonable for patients expected to survive to receive less than complete symptom relief, so that those who are dying can have their distress more aggressively managed? While such decisions may be obviated by sufficient supplies of necessary resources, processes must be in place to address such conflicts in a prompt, fair and transparent manner.

Personnel specifically trained in Palliative Care are still quite few, though many more have skills and experience in caring for patients through end-of-life. The factors affecting availability of personnel to support palliative care are similar to those affecting all (illness, willingness to work, etc). Allocating available personnel will need to be coordinated along with other SAC functions, and will be guided by need and patterns of

volume. It is possible for much end-of-life care to be delivered by unit-based providers (see below), with palliative care personnel serving to support unit staff as needed for more challenging situations. It may be reasonable to identify one or two staff from each unit to serve as pandemic palliative care 'leads' to facilitate training and serve as resources in preparation and execution of a mass care plan.

### **Palliative Care Protocols**

Given the personnel constraints described above, it will be necessary to develop written palliative care protocols to help unit providers care for patients and families through the end of life. These protocols would provide concise but complete descriptions of assessments and interventions for symptom management and support. Several such protocols and order sets already exist in our system, so this is a familiar process to most inpatient providers and staff. Training and acclimation to these protocols will need to occur as part of routine pandemic preparedness training for staff.

## LIABILITY ISSUES IN PANDEMIC MANAGEMENT

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When considering the potentially hectic and perhaps even chaotic conditions under which medical care would be provided during a pandemic, health care providers raise the concern of potential liability. Concisely, liability and payments for any damages are well managed under existing University insurance and employee indemnification policies. None-the-less, procedures and practices actually used during a pandemic could markedly reduce potential losses to the University.

“Liability” is a legal term of art which means a duty, or legal requirement, which if not met, and if damages follow, the result is an obligation to pay. In the context of a hospital or medical care facility, this “liability” can arise from medical care, from general non-medical acts, from contracts or from statutory/regulatory obligations.

Contracts with other health care facilities, referring providers or with the potential patients themselves, through UM Premier Care is a potential basis for assertions of liability. Standard contract drafting typically includes clauses that allow suspension of contractual obligations in emergencies not created by the obligated party.

As contracts are made and renewed, inclusion of a clause addressing contract obligations during a pandemic emergency is recommended. Where the University contracts to provide health care professionals to third parties, the clause should allow the legal right to curtail contracted services in an emergency. Exercise of that right must weigh the impact on the third party’s needs and expectations with the urgency of need to have the health care professionals available at other locations. Where the University has contracted with potential patients or organizations to provide certain treatments and services, the contracts should avoid promising that various treatments and services will be available in all circumstances as a matter of right. The SRAC is properly positioned to consider and weigh the need to invoke contractual rights to curtail services and reallocate resources.

Statutory/regulatory obligations may be suspended under emergency conditions. For example, the Emergency Medical Treatment and Labor Act (EMTALA)<sup>32</sup> require affected hospitals to provide stabilizing care to anyone presenting at its dedicated emergency intake. But, in situations where a Public Health Emergency Declaration has been issued, under recently revised rules, these statutory and regulatory requirements are suspended<sup>33</sup>. Further, if the emergency is a pandemic, the suspension continues until a declaration is issued that the emergency is terminated.

Liability for non-medical acts (general negligence) remains, but the actual analysis would give deference to the difficult circumstances existing during a pandemic management situation. The legal test for general negligence has been described as: “The failure to exercise the standard of care that a reasonably prudent person would have exercised in a similar situation”<sup>34</sup>. Furthermore, in many of the possible situations where a non-medical claim may arise, the University and its employees would be immune from a general negligence lawsuit. Even if a lawsuit was allowed to proceed,

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<sup>32</sup> Emergency Medical Treatment and Active Labor Act

<sup>33</sup> 42 CFR 489.24(a)(2)

<sup>34</sup> *Black’s Law Dictionary*, 1061 (Bryan A. Garner ed., 8<sup>th</sup> ed., West 2004)

the University itself is insured for such claims and employees are indemnified through SPG 601.09.

Analysis of potential liability for medical acts, too, would give deference to the difficult circumstances of a pandemic situation. To establish liability for negligent provision of medical care (medical malpractice), the claimant “. . . must prove the following elements: (1) the applicable standard of care, (2) breach of that standard, (3) injury, and (4) proximate causation between the alleged breach and the injury.”<sup>35</sup> Typically medical malpractice defense begins with identifying and defining the appropriate standard of care and showing that the standard was met.

The applicable standard of care in a pandemic (the triage process, in particular) would likely rely heavily upon the protocols developed for pandemic management. If the protocols are medically appropriate and are followed, the standard of care would be met and there would be no liability.

Showing that a protocol was followed necessarily will rely upon the memory of the participants or the charting that is done to document the medical situation, decisions and actions. The more complete the memory or the charting, the more likely it will be that the University can show that the standard of care was actually met. Attention to ensuring that the medical chart for a person seeking treatment during a pandemic follows the person as he or she may be moved from one treatment location to another is advised. Successful implementation would allow more complete information to be available for medical personnel at the time decisions regarding the patient must be made.

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<sup>35</sup> Velez v. Tuma, 283 Mich. App. 396 (April 16, 2009)

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## **REVIEW / APPROVAL PROCESS**

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### **Internal:**

- UMHHC Approval
  - Executive Committee on Clinical Affairs – approved August 11, 2009
  - Senior Management Team – reviewed August 25, 2009
  - Mott Executive Committee
  - Critical Care Committee
  - HHCEB
- UMHS or UM Approval
  - EVPMA
  - Executive Officers
  - Regents

### **Governmental:**

- Washtenaw County Health Emergency Response Coalition
  - Region 2 South Bio-Medical Defense
  - Michigan Department of Community Health Ethics Committee
- 

### **Public Discourse:**

- Patient Family Center Care—Kelly Parent
- MICH—Molly White
- Washtenaw County Public Health—Adrian Waller

## **APPENDIX**

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### **CLINICAL TOOLS FOR TRIAGE:**

The clinical tools pages are meant to be distributed widely among the clinical staff caring for patients both in ambulatory, inpatient and alternate care sites. We have included an information sheet appropriate for dissemination to lay persons, the media and to patients and families. Included in these pages are:

- 1) SOFA score calculation sheet
- 2) PELOD score calculation sheet
- 3) Exclusion / inclusion criteria worksheet
- 4) Adult triage tool
- 5) Pediatric triage tool
- 6) Community / patient information sheet

## SOFA Score Calculation Sheet Adult ( $\geq 18$ years old)

Variable	0	1	2	3	4	Score
PaO <sub>2</sub> /FiO <sub>2</sub> (mmHg)	>400	$\leq 400$	$\leq 300$	$\leq 200$	$\leq 100$	
Platelets, x 10 <sup>3</sup> / $\mu$ (x 10 <sup>6</sup> /L)	> 150 (>150)	$\leq 150$ ( $\leq 150$ )	$\leq 100$ ( $\leq 100$ )	$\leq 50$ ( $\leq 50$ )	$\leq 20$ ( $\leq 20$ )	
Bilirubin, mg/dL ( $\mu$ mol/L)	<1.2 (<20)	1.2-1.9 (20 – 32)	2.0-5.9 (33 – 100)	6.0-11.9 (101 – 203)	>12 (> 203)	
Hypotension	None	MABP < 70 mmHg	Dop $\leq 5$	Dop > 5, Epi $\leq 0.1$ , Norepi $\leq 0.1$	Dop > 15, Epi > 0.1, Norepi >0.1	
Glasgow Coma Score	15	13 - 14	10 - 12	6 - 9	<6	
Creatinine, mg/dL ( $\mu$ mol/L)	< 1.2 (<106)	1.2-1.9 (106 – 168)	2.0-3.4 (169 - 300)	3.5–4.9 (301 – 433)	>5 (> 434)	
<b>TOTAL SOFA SCORE FOR PATIENT (RANGE 0-24)</b>						

**PELOD Score Calculation Sheet  
Pediatric (< 18 years of age)**

Organ system	Variable	SCORE				Max score
		0	1	10	20	
Neurologic						20
	Glascow coma score	12-15	7-11	4-6	3	
		AND		OR		
	Papillary reaction	Both reactive		Both fixed		
Cardiovascular						20
	Heart rate					
	< 12 yrs	≤ 195 bpm		> 195 bpm		
	> 12 yrs	≤ 150 bpm		>150 bpm		
		AND		OR		
	Systolic blood pressure					
	< 1 month	> 65 mmHg		35-65mmHg	< 35 mmHg	
	≥ 1month & < 1yr	> 75 mmHg		35-75mmHg	< 35 mmHg	
	≥ 1 yr & < 12 yr	>85 mmHg		45-85 mmHg	< 45 mmHg	
	≥ 12 yr	> 95 mmHg		55-95 mmHg	< 55 mmHg	
Renal						10
	Creatinine					
	< 7 days	< 1.59 mg/dl		≥1.59 mg/dl		
	≥ 7 days & < 1 yr	<0.62 mg/dl		≥ 0.62 mg/dl		
	≥ 1 yr & < 12 yrs	< 1.13 mg/dl		≥ 1.13 mg/dl		
	≥12 yrs	< 1.59 mg/dl		≥ 1.59 mg/dl		
Pulmonary						10
	PaO2/FiO2 ratio	> 70mmHg		≤ 70mmHg		
		AND		OR		
	PaCO2	≤ 90 mmHg		>90 mmHg		
		AND				
	Mechanical vent	No	Yes			
Hematologic						
	WBC	≥ 4.5K	1.5-4.4 K	<1.5		
		AND	OR			
	Platelets	≥ 35 K	< 35			
Hepatic						1
	AST	< 950 IU/L	≥ 950 IU/L			
		AND				
	Prothrombin time	> 60%	≤ 60%			

## Inclusion /Exclusion Tool (Adult and Pediatric)

<b>Inclusion Criteria</b>	
The patient must have 1 of the following:	
A.	Requirement for invasive ventilatory support <ul style="list-style-type: none"> <li>• Refractory hypoxemia (SpO<sub>2</sub> &lt; 90% on non-rebreather mask or FIO<sub>2</sub> &gt; 0.85)</li> <li>• Respiratory acidosis (pH &lt; 7.2)</li> <li>• Clinical evidence of impending respiratory failure</li> <li>• Inability to protect or maintain airway</li> </ul>
B.	ADULTS: Hypotension (systolic blood pressure < 90 mm Hg or relative hypotension) with clinical evidence of shock (altered level of consciousness, decreased urine output or other evidence of end-organ failure) refractory to volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting PEDS: Hypotension (systolic BP < 70 + 2x age (years)) or clinical shock state (as evidenced by altered level of consciousness, decreased urine output or other evidence of end-organ failure) refractory to volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting

<b>Exclusion Criteria</b>	
The patient is excluded from admission or transfer to critical care if <i>any</i> of the following is present:	
A.	Severe trauma
B.	Severe burns of patient with any 2 of the following: <ul style="list-style-type: none"> <li>• Age &gt; 60 yr</li> <li>• &gt; 40% of total body surface area affected</li> <li>• Inhalation injury</li> </ul>
C.	Cardiac arrest <ul style="list-style-type: none"> <li>• Unwitnessed cardiac arrest</li> <li>• Witnessed cardiac arrest, not responsive to electrical therapy (defibrillation or pacing)</li> <li>• Recurrent cardiac arrest</li> </ul>
D.	Metastatic malignant disease with poor prognosis
E.	Advanced and irreversible immunocompromise
F.	Severe and irreversible neurologic event or condition with highly expected mortality
G.	End-stage organ failure meeting the following criteria: <p><i>Heart</i></p> <ul style="list-style-type: none"> <li>• NYHA class III or IV heart failure</li> </ul> <p><i>Lungs</i></p> <ul style="list-style-type: none"> <li>• Severe chronic lung disease with FEV<sub>1</sub> &lt; 25% predicted, baseline PaO<sub>2</sub> &lt; 55 mm Hg, or secondary pulmonary hypertension</li> <li>• Previously diagnosed primary pulmonary hypertension with NYHA class III or IV heart failure, or mean pulmonary arterial pressure &gt; 50 mm Hg</li> </ul> <p><i>Liver</i></p> <ul style="list-style-type: none"> <li>• Child–Pugh score <sup>3</sup> 7 or Meld scored of &gt; 20</li> </ul>

## Adult Triage Tool

If at any time patient meets inclusion criteria AND meets an exclusion criteria – Patient is triaged to the BLUE category

If patient meets the inclusion criteria then follow the chart below:

Color Code / (Priority level)	Initial Assessment		48 Hour Assessment		120 Hour Assessment	
	Criteria	Action	Criteria	Action	Criteria	Action
Blue (EXPECTANT)	SOFA > 11*	1) Discontinue Ventilator / ICU care  2) Medical Mgmt +/- Palliate	SOFA > 11 or SOFA 8 – 11 with no Δ from prior	1) Discontinue Ventilator / ICU care  2) Medical Mgmt +/- Palliate	SOFA > 11 ** or SOFA 8 – 11 with no Δ from prior	1) Discontinue Ventilator / ICU care  2) Medical Mgmt +/- Palliate
Red (HIGHEST)	SOFA < 7 or Single Organ Failure	Highest – initiate ventilator and /or ICU care if able	SOFA < 11 and decreasing	Highest – continue ventilator and /or ICU care if able	SOFA score < 11 and decreasing progressively	Highest – continue ventilator and /or ICU care if able
Yellow (INTERMEDIATE)	SOFA 8 - 11	Intermediate	SOFA < 8 and no Δ	Intermediate	SOFA < 8 minimal decrease (< 3 point decrease in past 72 hrs)	Intermediate
Green (LOW)	No significant organ failure	Defer or d/c, reassess as needed	No longer ventilator dependant	d/c from CC	No longer ventilator dependant	d/c from CC

\*If exclusion criteria or SOFA > 11 occurs at any time from the initial assessment to 48 hours change triage code to Blue and palliate.

\*\* If exclusion criteria or SOFA > 11 occurs at anytime from 48 – 120 hours change triage code to Blue and palliate.

Δ = change

CC = critical care

d/c = discharge

- **Blue:** High probability of mortality; should be discharged from critical care and should receive medical management and palliative care as appropriate
- **Red:** Highest priority for critical care
- **Yellow:** Intermediate priority for critical care
- **Green:** Low probability of mortality; defer admission/ discharge from critical care

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## Pediatric Triage Tool

If at any time patient meets inclusion criteria AND meets an exclusion criteria – Patient is triaged to the BLUE category  
 If patient meets the inclusion criteria then follow the chart below:

Color Code/ Priority	Initial Assessment		48 Hour Assessment		120 Hour Assessment	
	Criteria	Priority/Action	Criteria	Priority/Action	Criteria	Priority/Action
Blue / Expectant	PELOD $\geq$ 26*	1) do not initiate ventilator / ICU care  2) Medical Mgmt +/- Palliate	PELOD > 26 or PELOD 21-26 & no $\Delta$	1) Discontinue Ventilator / ICU care  2) Medical Mgmt +/- Palliate	PELOD > 26 ** or PELOD 21-26 with no $\Delta$	1) Discontinue Ventilator / ICU care  2) Medical Mgmt +/- Palliate
Red/ Highest	PELOD < 21 or Single Organ Failure	Highest – initiate ventilator and /or ICU care if able	PELOD < 26 and decreasing	Highest – continue ventilator and /or ICU care if able	PELOD < 26 and decreasing progressively	Highest – continue ventilator and /or ICU care if able
Yellow / Intermediate	PELOD 21-26	Intermediate	PELOD < 21 no $\Delta$	Intermediate	PELOD < 21 (with < 3 point decrease in past 72 hrs)	Intermediate
Green / Low	No significant organ failure	Defer or d/c, reassess as needed	No longer ventilator dependant	d/c from ICU care	No longer ventilator dependant	d/c from ICU care

\*If exclusion criteria or PELOD > 26 occurs at any time from the initial assessment to 48 hours change triage code to Blue and palliate.

\*\* If exclusion criteria or PELOD > 26 occurs at anytime from 48 – 120 hours change triage code to Blue and palliate.

$\Delta$  = change

CC = critical care

d/c = discharge

- **Blue:** High probability of mortality; should be discharged from critical care and should receive medical management and palliative care as appropriate
- **Red:** Highest priority for critical care
- **Yellow:** Intermediate priority for critical care
- **Green:** Low probability of mortality; defer admission/ discharge from critical care

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## Potential Patient Handout

### To our patients, families and community:

We presently have a public health emergency which has overwhelmed our supply of some medical resources. Because of shortages, we will need to conserve resources. Patients who have the best chance of recovery will receive prioritized resources; dying patients will receive symptomatic treatment and supportive care. Please know that we care deeply about you and your family's well being and are doing our utmost to protect and serve you and our community.

### What this means for you and your family:

- 1) If you (or a family member) becomes ill and your medical provider believes that you require specialized care in an Intensive Care Unit (ICU) or Mechanical Ventilation (breathing machine) you will be assessed for eligibility based only on your medical condition.
- 2) Some patients will be extremely sick and very unlikely to survive their illness even with specialized care. Treating these patients would diminish resources for patients who might otherwise survive.
- 3) Flu patients who are ineligible for ICU or ventilator care will be prioritized for pain control and comfort measures. In addition to flu, other conditions that are likely to make you ineligible include:
  - a. Severe heart, lung, or liver failure
  - b. Terminal cancers
  - c. Severe trauma or burns
- 4) Patients who are initially treated with a ventilator or ICU care may have these treatments withdrawn if they do not improve over a specified period of time. Failure to improve means that the patient has a poor chance of surviving the illness – even if the care was continued. **This decision will be based only on medical condition** and not on other factors such as age, race, gender, health insurance status, ability to pay for care, sexual orientation, employment status or immigration status.
- 5) **Patients who have ventilator or ICU care withdrawn will receive pain control and comfort measures.**
- 6) If you or your family members are considered to be ineligible for specialized care– that decision may be appealed to a team of medical experts. If you feel this is necessary – please discuss this with your physician.