

Florida Department of Health

Pandemic Influenza: Triage and Scarce Resource Allocation Guidelines

DRAFT

Pandemic Influenza Technical Advisory Committee

Version 8
March 11, 2009

INTRODUCTION

In the event of a pandemic influenza or other public health emergency, the demand for healthcare resources and services will dramatically increase. Out of necessity, scarce resources and patient care will have to be allocated so as to “do the greatest good for the greatest number”. Towards this end, the Florida Department of Health has prepared this guidance document to assist medical and healthcare agencies statewide in dealing with such events.* The Department’s responsibilities in such events include: 1) development and coordination of a State Pandemic Influenza Response Plan and other health/medical emergency response annexes included in the State Comprehensive Emergency Management plan (See Appendix 9), 2) epidemiology surveillance/situational awareness, and investigation, 3) implementation of Governor and Surgeon General directives, 4) coordination of resource requests through Emergency Support Function (ESF) 8 at the State Emergency Operations Center (EOC), 5) provision of recommended actions for healthcare facilities in a pandemic, and 6) issuance of patient triage and care recommendations.

The recommendations shown below: 1) identify a triage methodology that enables healthcare institutions to make decisions on patient admission and treatment, and 2) make use of charts that identify needed actions at particular levels of a pandemic and also aid in the allocation of scarce resources.

Working together, medical and healthcare agencies across Florida can help ensure a successful response to any emergency or disaster situation that may occur.

* We would like to thank and acknowledge the Utah Department of Health, the Utah Hospital and Health Systems Association, the Minnesota Department of Health and the Colorado Department of Health for the incorporation of several of their documents into these Florida Draft Guidelines.

PURPOSE

These guidelines were developed by the Florida Department of Health (FDOH). Their purpose is to provide **preliminary** guidance on patient triage and care during a pandemic or other public health emergency when the demand for resources and/or services dramatically exceeds supply.

GOALS

These guidelines seek to:

- 1) Provide the “greatest good for the greatest number”,
- 2) Foster coordinated efforts between facilities and agencies,
- 3) Help allocate scarce resources,
- 4) Reduce or eliminate healthcare worker liability,
- 5) Provide a common ethical framework for patient care and resource allocation,
- 6) Encourage actions that are operationally focused, and
- 7) Promote communication to the public during pandemics or other public health emergencies.
- 8) Promote the coordination of community control with clinical activities.

BASIC PREMISES

An influenza pandemic will impose substantial burdens on society. Given current planning assumptions, medical resources will need to be rationed. Resources will be limited, and even when allocated fairly, providing resources to some residents of Florida means withholding from others. The plan to ration resources should be ethically defensible, either in terms of agreement about substantive values, or in terms of agreement about a process for decision-making. Ethical goals informing the department's recommendation to ration resources include: reducing harms and promoting benefits; respecting equal liberty and human rights; ensuring that the burdens imposed by rationing are shared fairly and do not fall disproportionately on some of Florida's residents. Public officials and healthcare workers should be professional and accountable, and their decision-making process should be transparent and in the sunshine, and sustain public trust. The department recommends focusing on the treatment that would most likely be lifesaving and on those whose functional outcome would most likely improve with treatment. The ethical rationale for this recommendation is that it most likely secures the ethical goals of public health emergency preparedness, including rationing resources, and most likely minimizes the burdens that would likely result if decisions were made based on social worth or social role. Regardless of how scarce the resource, the ethical goal remains the same: focusing on treatment most likely to be lifesaving and on those whose functional outcome will most likely improve with treatment, while minimizing burdens on others.

The principles embodied in this pandemic influenza plan can also provide broad guidance for resource allocation in other public health emergency settings, especially those due to other infectious diseases. It is essential to stress the importance of prevention and control in the community. Prevention may serve to mitigate, though not eliminate the need for rationing.

SCOPE / ACTIVATION

These guidelines have been developed to be applicable to all healthcare professionals and healthcare facilities in the state of Florida and should be activated during a pandemic influenza event or other public health emergency declared by the Governor of the state of Florida.

NON-HOSPITAL HEALTH CARE SERVICES AND STAFF PLANNING

Each community must plan for health care services that are delivered outside of acute care hospitals. The planning for both non-hospital based care and hospital care must be congruent, complementary, and consistent with the existing health care delivery system of the community. Each health care provider needs to address questions of staff shortages, surge capacity and continuity of operations. Non-hospital providers need clear, regular information on hospital admission criteria and hospital bed capacity. A non-inclusive list of community-based providers includes pre-hospital EMS, home health agencies, hospice, outpatient medical offices (including private primary care offices), long-term care facilities, outpatient surgery centers, county health departments, and community health centers.

HOSPITAL AND MEDICAL STAFF PLANNING

Each hospital should establish a peer-based structure for the review of hospital admission, ICU admission, and termination of care. Consideration should be given to the development of a team of at least three individuals to include an intensivist and two or more of the following: the hospital medical director, a nursing supervisor, a board member, an ethicist, a pastoral care representative, and one or more independent physicians. Also, an action team should be established to provide counseling / care coordination and to work with the families of loved ones who have been denied care. Medical staff should establish a method of providing peer support and expert consultation to physicians making these decisions.

Each hospital should also have in place a plan for managing exposed employees and patients, and managing visitors to minimize the chances of an ill health care worker or visitor infecting patients and visitors, or of a patient developing influenza and infecting others while hospitalized for another reason. Such a plan would take into account the immune status of the employees (e.g. susceptible, vaccinated, recovered), and would include provisions for screening of workers arriving for their shifts.

SITUATION LEVELS

In a pandemic influenza event it will be important to determine which people need hospitalization and which people can be cared for at other facilities or at home. To apply “inclusion” and “exclusion” criteria, it is necessary to identify what circumstances will be evident at various stages of the pandemic. The chart below identifies three situations and what surge, resource level, and absenteeism will likely be in the three stages (early, worsening, worst case scenario) of a pandemic. Note that this chart will be referenced in subsequent detailed guidance in this document.

SITUATION	Early Pandemic	Worsening Pandemic	Worst-case Scenario
SURGE STATUS	Hospitals realize the need to surge bed capacity.	Emergency departments are overwhelmed and hospitals have surged to maximum bed capacity.	Hospitals have already implemented crisis standards of care regarding healthcare team/patient ratios and have already expanded capacity by adding patients to occupied hospital rooms. AMTS strategies are applied. Community health care facilities have been requested to surge.
RESOURCE LEVEL	Emergency departments are experiencing increased numbers and increased demand for resources.	There are not enough beds to accommodate all patients needing hospital admission, and not enough ventilators to accommodate all patients with respiratory failure. Resources are becoming scarce.	Resource levels are at a critical stage, necessitating triage along with conservation, reallocation, and reuse strategies.
STAFF ABSENTEEISM	Hospital staff absenteeism is not a problem NOTE: In the event of a severe and rapidly progressing pandemic, start with Worsening Pandemic.	Hospital staff absenteeism is 20-30%	Hospital staff absenteeism is 30-40%+

PREHOSPITAL SETTINGS

HOME CARE

- Applies to people at home who are contemplating hospital admission or home care guidance.
- Implemented by household members or friends.
- Used to encourage people to stay at home, if at all possible, thus limiting exposure and reducing surge at hospitals and other medical care facilities.

TELEPHONE TRIAGE

- Applies to people at home or who request care from physician offices, clinics, or community healthcare facilities
- Implemented by physicians, clinic staff, pre-screening staff
- Used as a tool to provide guidance on the appropriate location (home, physician office, clinic, community healthcare facility, alternative medical treatment site, etc.) for people, along with instructions and direction for additional care or screening
- Implemented at all three “triage levels”
- Relies on a “telephone triage tool” that assesses a person’s condition and needs [“**TELEPHONE TRIAGE TOOL**”, or question-and-answer matrix, needs to be written]

EMS

- Used to provide guidance on patient care location, evaluate patients before they are sent to a hospital facility, and to provide those sent home with instructions for care
- Triage Level 1 – Use **PRE-HOSPITAL TRIAGE TOOL** to evaluate patients before sending to hospital ED
Triage Levels 2 & 3 – Continue to use **PRE-HOSPITAL TRIAGE TOOL**, Use **EXCLUSION CRITERIA** for hospital admission to evaluate patients. Patients not meeting exclusion criteria should not be sent to the hospital for treatment. Send or keep patients home with care instructions. [“**PRE-HOSPITAL TRIAGE TOOL**”, or question-and-answer matrix, needs to be written]

PALLIATIVE AND HOSPICE CARE

- *Palliative care* refers to the comprehensive management of physical, social, spiritual and existential needs of patients, in particular those with incurable, progressive illness.
- *Hospice care* can be defined as a program that provides a continuum of palliative and supportive care for the terminally-ill patient and his / her family.
- When conducting palliative care and hospice operations, the aim of actions is to keep existing health care delivery systems operational and to deliver acceptable quality of care. Anticipated support needs include additional health care workers and support staff to care for the surge in patients requiring comfort care, medical equipment / supplies and medications used for symptom control.

LONG-TERM CARE AND OTHER INSTITUTIONAL FACILITIES

- Applies to patients in institutional facilities
- Implemented by institutional facility staff
- Used to provide guidance on patient care for those in long-term care facilities
- Ensure that all liquid oxygen tanks are at full capacity and limit visitation to control infection
- All Triage Levels – Use **EXCLUSION CRITERIA** for hospital admission to evaluate patients. Do not transfer patients meeting exclusion criteria to the hospital for treatment. Give palliative care and supportive care in place.

EXCLUSION CRITERIA (for hospital admission)

The patient is excluded from hospital admission or transfer to critical care if ANY of the following is present:

- 1) **Known “Do Not Resuscitate” (DNR) status per 64J-2.018, Florida Administrative Code**
- 2) **Severe and irreversible chronic neurologic condition** with persistent coma or vegetative state.
- 3) Acute severe neurologic event with minimal chance of functional neurologic recovery (physician judgment.) This includes traumatic brain injury, severe hemorrhagic stroke, hypoxic ischemic brain injury, and intracranial hemorrhage.
- 4) **Severe acute trauma** with a **Revised Trauma Score < 2.** (See Appendix 2)) **GCS:** _____ **SBP:** _____ **RR:** _____ **RTS:** _____
- 5) **Severe burns** with **< 50% anticipated survival** (patients identified as **“Low” or worse on the Triage Decision Table for Burn Victims** (Appendix 4) . Burns not requiring critical care resources may be cared for at the local facility (e.g. burns that might have been transferred to a burn center under normal circumstances). Score: _____
- 6) **Cardiac arrest** not responsive to ACLS interventions within 20-30 minutes.
- 7) **Advanced untreatable neuromuscular disease** (such as amotrophic lateral sclerosis, end stage multiple sclerosis, or spinal muscular atrophy) requiring assistance with activities of daily living or requiring chronic ventilator support.
- 8) **Known chromosomal or untreatable disorders** that are uniformly fatal in the first 2 years of life.
- 9) **Incurable metastatic malignant disease.**
- 10) **End-stage organ failure** meeting the following criteria:
 - Heart: NYHA class III or IV heart failure** (Appendix 6).

Lung: (any of the following)

- COPD with Forced Expiratory Volume in one second (FEV₁) < 25% predicted baseline, PaO₂ < 55 mm Hg, or severe secondary pulmonary hypertension.
- Cystic fibrosis with post-bronchodilator FEV₁ < 30% or baseline PaO₂ < 55 mm Hg.
- Pulmonary fibrosis with VC or TLC < 60% predicted, baseline PaO₂ < 55 mm Hg, or severe secondary pulmonary hypertension.
- Primary pulmonary hypertension with NYHA class III or IV heart failure, right atrial pressure > 10 mm Hg, or mean pulmonary arterial pressure > 50 mm Hg.

Liver: Pugh score > 7, when available (Appendix 5). Includes bili, albumin, INR, ascites, encephalopathy. Total score: _____

11) Those patients who meet "low priority" criteria (MSOFA score= 0) as defined in Table 1.

ICU / Ventilator INCLUSION CRITERIA

Patient must have **NO EXCLUSION CRITERIA AND at least one of the following INCLUSION CRITERIA:**

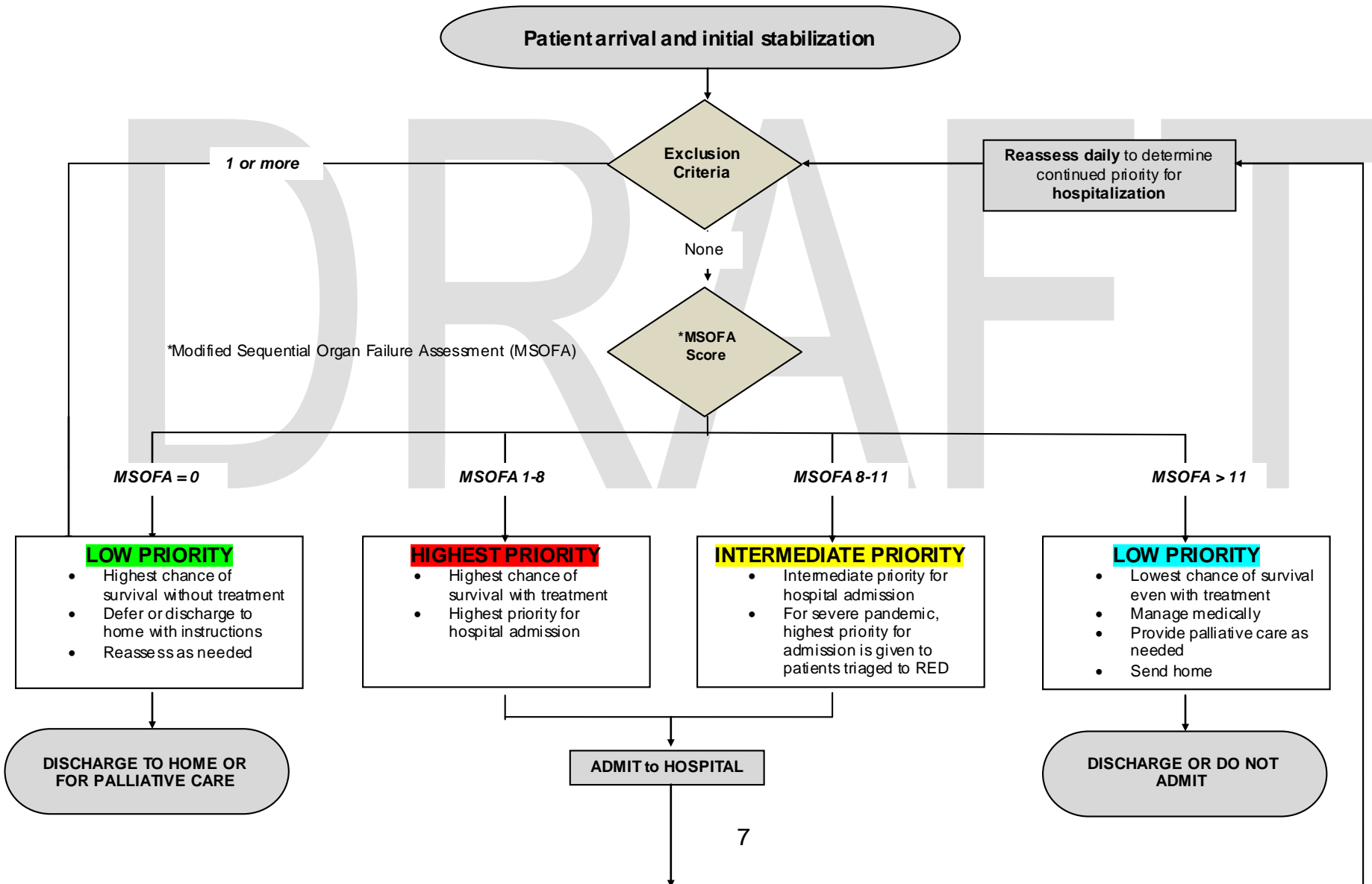
1) **Requirement for invasive ventilator support (reasonable expectation of short-term use)**

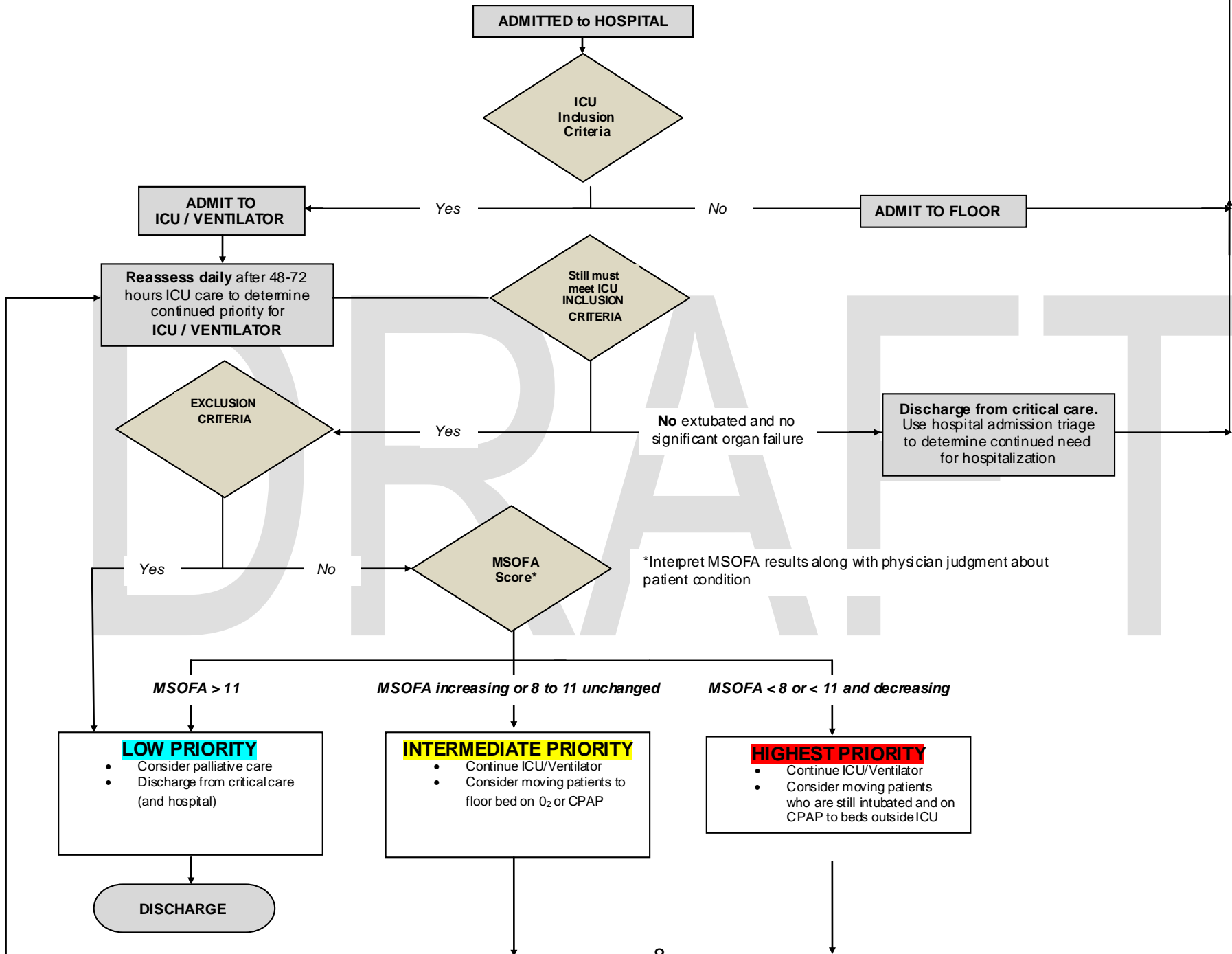
- Refractory hypoxemia (SpO₂ < 90% on non-re-breather mask or FIO₂ > 0.85)
- Respiratory acidosis (pH < 7.2)
- Clinical evidence of impending respiratory failure

2) **Hypotension* with clinical evidence of shock* refractory to volume resuscitation, and requiring vasopressor or inotrope support that cannot be managed in a ward setting.**

***Hypotension** = Systolic BP, <90 mm Hg for patients > 10 years old, or < 70 + (2 x age in years) for patients ages 1 – 10, or relative hypotension;
Clinical evidence of shock = altered level of consciousness, decreased urine output, or other evidence of end-organ failure.

Table 1: HOSPITAL ADMISSION AND ICU/VENTILATOR TRIAGE MODEL





Pandemic Recommend Actions for Healthcare Facilities by Event Stage

GREEN	BLUE	YELLOW	ORANGE	RED
<p><i>Pre-pandemic period – No current pandemic activity but moderate to high potential exists</i> WHO 3</p>	<p><i>Pandemic has begun but no cases are reported in Florida</i> WHO 4</p>	<p><i>Sporadic community cases of Pandemic Influenza have been confirmed in Florida but are few in number</i> WHO 5</p>	<p><i>Widespread community cases of Pandemic Influenza in Florida</i> WHO 6</p>	<p><i>Overwhelming number of local cases beyond the capacity of the Florida healthcare system</i> WHO 6</p>
<p><u>Administration/Planning</u></p> <ul style="list-style-type: none"> -Establish and maintain emergency notification list of key personnel. -Discuss at facility and regional level, contingencies for scarce resource situations [see AHRQ document at www.ahrq.gov/research/mce/] including involvement of ethics committee members, administration, and medical staff on a facility Clinical Care Committee that will determine which services may be offered during a pandemic. -Conduct Continuity of Operations Planning (COOP) for pandemic situations – assume schools may be out and staff may need housing during pandemic. -Write pandemic annex to all-hazards emergency response plan. -Develop security plans for buildings including augmentation of staff and ingress/egress control -Stockpile personal protective equipment and create contingencies for when supplies run low. 	<p><u>Administration/Planning</u></p> <ul style="list-style-type: none"> - Cancel or deny employee travel/leave, as appropriate. -Conduct education about staff protection and healthcare facility expectations. -Activate clinical care committee to examine situation and determine when and how to change services provided (e.g., canceling elective surgeries/appointments) based on the severity and expected arrival time of the pandemic. Determine triggers to move from this level to yellow level and further adaptive strategies. -Track financial impact (direct and indirect) and staff time carefully for reimbursement. 	<p><u>Administration/Planning</u></p> <ul style="list-style-type: none"> -Have Clinical Care Committee determine (on a daily basis) which (if any) modifications in facility services are necessary. Conduct appropriate case-finding and reporting. -Open staff housing areas, as needed; open auxiliary rest, clinical care, and family areas as needed. -Begin limiting non-urgent surgeries and procedures. -Implement access controls and institute visitor and family member policies according to institutional procedures. 	<p><u>Administration/Planning</u></p> <ul style="list-style-type: none"> -Have Clinical Care Committee determine each day the administrative and clinical changes needed to cope with demand for resources; this may include appointment of triage team to decide which patients receive certain therapies (e.g., ventilators) based on prognosis; conduct bed management to move beds and patients with authority of administration. -Set up Multi-Agency Coordination (MAC) with public health agencies, other hospitals, and EMS; determine when to open on-site and/or off-site alternate care sites, as needed and as staffing and resources are available. 	<p><u>Administration/Planning</u></p> <ul style="list-style-type: none"> -Triage team appointed by Clinical Care Committee makes medical allocation decisions. Clinical Care Committee continues to make daily decisions about which hospital services can be maintained. Cohorting of patients no longer possible-emphasis on respiratory hygiene and masks, based on clinical situations and ethical standards.

GREEN	BLUE	YELLOW	ORANGE	RED
<p><i>Pre-pandemic period – No current pandemic activity but moderate to high potential exists</i> WHO 3</p>	<p><i>Pandemic has begun but no cases are reported in Florida</i> WHO 4</p>	<p><i>Sporadic community cases of Pandemic Influenza have been confirmed in Florida but are few in number</i> WHO 5</p>	<p><i>Widespread community cases of Pandemic Influenza in Florida</i> WHO 6</p>	<p><i>Overwhelming number of local cases beyond the capacity of the Florida healthcare system</i> WHO 6</p>
<p>-Determine staff expectations -Plan for surge capacity, including accommodating patients in non-traditional areas both on-site and off-site. -Contact local public health agencies and area hospitals to formulate regional plans for capacity, including alternate care sites, as determined by regional needs. -Encourage employees to have personal emergency plans in place, including emergency day-care arrangements and family communications.</p>				
<p><u>Operations</u> -Stress good infection control practices.</p>	<p><u>Operations</u> -Partially activate the Hospital Command Center and begin daily planning cycle and information updates. -Have staff wear PPE when treating suspected cases and place in isolation room, per infection control recommendations. -Separate suspected cases in ED and clinics; follow FDOH case definitions and protocols. Provide masks for all suspect cases and post signage for patients regarding respiratory hygiene. -Review number of elective appointments and procedures and prepare to surge by</p>	<p><u>Operations</u> -Isolate or cohort cases. -Determine whether staff wears PPE for all patient encounters.</p>	<p><u>Operations</u> -Fully activate Hospital Command Center with action-planning cycles for next operational period. -Mask all patients and visitors presenting to facility; staff wear PPE continuously to prevent exposure. Triage use of ED, clinic, and in-patient resources as required (e.g. what conditions will be evaluated in the ED? What surgeries will be done today?).</p>	<p><u>Operations</u> -Work with area hospitals, clinics, and public health to open alternate care sites when possible to reduce burden on hospitals, based on clinical situations and ethical standards. -Concentrate critical care in hospitals; work with homecare and public health to assure appropriate homecare instructions are being given.</p>

GREEN	BLUE	YELLOW	ORANGE	RED
<p><i>Pre-pandemic period – No current pandemic activity but moderate to high potential exists</i> WHO 3</p>	<p><i>Pandemic has begun but no cases are reported in Florida</i> WHO 4</p>	<p><i>Sporadic community cases of Pandemic Influenza have been confirmed in Florida but are few in number</i> WHO 5</p>	<p><i>Widespread community cases of Pandemic Influenza in Florida</i> WHO 6</p>	<p><i>Overwhelming number of local cases beyond the capacity of the Florida healthcare system</i> WHO 6</p>
	<p>canceling electives when necessary. -Assess supplies and vendor inventory, place orders as needed; communicate with partner agencies about supply needs.</p> <p>-Screen patients and visitors prior to building entry, assigning infectious or suspect cases to appropriate care areas with appropriate PPE and respiratory hygiene.</p>			
<p><u>Communications</u></p>	<p><u>Communications</u></p> <p>-Communicate plans and expectations to clinical and business units, as well as to patients and families. -Coordinate messages with community and regional leaders and partners.</p>	<p><u>Communications</u></p> <p>-Communicate on a daily basis among hospitals and agencies (e.g., through conference calls). -Conduct employee and public information campaigns; update daily.</p>	<p><u>Communications</u></p> <p>-Update the hospital employees and the public regularly on what services the hospital is offering. When should patients come to the hospital? What can they do at home?</p>	<p><u>Communications</u></p> <p>-Staff, patient, and patient / provider family behavioral health and security issues become critical - assure support and safety. -Update the hospital employees and the public regularly on what services the hospital is offering. When should patients come to the hospital? What can they do at home?</p>

GREEN	BLUE	YELLOW	ORANGE	RED
<p><i>Pre-pandemic period – No current pandemic activity but moderate to high potential exists</i> WHO 3</p>	<p><i>Pandemic has begun but no cases are reported in Florida</i> WHO 4</p>	<p><i>Sporadic community cases of Pandemic Influenza have been confirmed in Florida but are few in number</i> WHO 5</p>	<p><i>Widespread community cases of Pandemic Influenza in Florida</i> WHO 6</p>	<p><i>Overwhelming number of local cases beyond the capacity of the Florida healthcare system</i> WHO 6</p>
<p>Pre-event Training/education</p> <ul style="list-style-type: none"> -Encourage personal preparedness planning. -Provide pandemic education to employees and fit-test personnel, and/or have ability to provide just-in-time fit testing for N95 or other appropriate respirators. -Promote “Cover Your Cough” campaign. -Conduct exercises to practice pandemic responses; stress long-term response and incident action planning cycles consistent with Hospital Incident Command System (HICS) and National Incident Management System (NIMS). 	<p>Pre-event Training/Education</p> <ul style="list-style-type: none"> -Conduct just-in-time education for employees, including fit-testing when required. Work with public health agencies and hospitals to craft public messages about symptoms and when (and when not) to come to hospitals/clinics. 	<p>Pre-event Training/Education</p>	<p>Pre-event Training/Education</p>	<p>Pre-event Training/Education</p>
<p>Public Health Agency Responsibilities</p> <ul style="list-style-type: none"> -Immunization: Encourage participation in seasonal influenza and pneumonia vaccines. -Surveillance: Test and exercise surveillance systems. -Community Intervention <ul style="list-style-type: none"> - Implement state protocol containment measures appropriate for WHO Phases. 	<p>Public Health Agency Responsibilities</p> <ul style="list-style-type: none"> -Immunization: Promote pneumonia vaccine. -Surveillance: Alert seasonal flu sentinel physicians to begin reporting flu-like illnesses. -Physician Offices/Clinics: Promote pneumonia vaccination to broader audience. -Long-Term Care Settings <ul style="list-style-type: none"> - Promote pneumonia vaccination to broader audience. 	<p>Public Health Agency Responsibilities</p> <ul style="list-style-type: none"> -Immunization: Make it a HIGH priority to promote pneumonia vaccine. -Case Intervention: Ensure aggressive investigation and ensure containment measures are being taken consistent with rapid response and containment protocol. -Surveillance: Make routine contact with hospital EDs to increase speed of reporting. 	<p>Public Health Agency Responsibilities</p> <ul style="list-style-type: none"> -Immunization: Continue making it a HIGH priority to receive pneumonia vaccine. -Community Intervention: Coordinate actions with regional and state FDOH offices. -Surveillance: Shift focus from “individual containment” measures to “community containment” measures. Obtain daily reports from hospitals on number of people admitted with 	<p>Public Health Agency Responsibilities</p> <ul style="list-style-type: none"> -Immunization: Continue pneumonia vaccinations and introduce pan-flu vaccinations when vaccine becomes available. -Surveillance: Continue reporting aggregate number of cases, hospital bed availability, community resources, alternate medical treatment site status, etc. -Community Intervention: Support all healthcare facilities with limited staffing, equipment,

GREEN	BLUE	YELLOW	ORANGE	RED
<p><i>Pre-pandemic period – No current pandemic activity but moderate to high potential exists</i> WHO 3</p>	<p><i>Pandemic has begun but no cases are reported in Florida</i> WHO 4</p>	<p><i>Sporadic community cases of Pandemic Influenza have been confirmed in Florida but are few in number</i> WHO 5</p>	<p><i>Widespread community cases of Pandemic Influenza in Florida</i> WHO 6</p>	<p><i>Overwhelming number of local cases beyond the capacity of the Florida healthcare system</i> WHO 6</p>
	<p>-Hospital - Promote pneumonia vaccination to broader audience. -Community Intervention - Vaccinate high-risk non-immune contacts with pneumonia vaccine.</p>	<p>-Physician Offices/Clinics -Advise physician and patient of results and prescribe oseltamivir only if novel strain per containment protocol. -Long-Term Care Settings -Advise physician and patient of results and prescribe oseltamivir only if novel strain per containment protocol. -Hospital (ED) -Advise physician and patient of results and prescribe oseltamivir only if novel strain per containment protocol. -Community Intervention -Issue oseltamivir to all home contacts if positive for novel strain. - Fully implement rapid response and containment protocol.</p>	<p>influenza-like illness and the number dying from influenza-like illness within the facility. Work with hospitals to obtain specimens for culture for selected persons with influenza-like illness to monitor what strains are circulating. -Medical Infrastructure -CHDs will collect reports daily on primary care capacities for adults and children in the local community. -Receive daily reports from CMS on care capacities for eligible children. -Community Intervention - Implement enhanced surveillance protocols for rapid identification of focal outbreaks.</p>	<p>and supplies. -Long-Term Care Settings -Identify any shortages of supplies. -Hospital (ED) - Identify any shortages of Supplies. -Medical Infrastructure - Implement daily reporting of health assets through ESS. - Identify diversion at healthcare facilities when known through ESS. - Implement reporting structure for non-ESS providers through FHCA and APD. - Receive daily reports of CHD capability - Implement Tier 1 structure in CHD.</p>
<p><u>General Public Responsibilities</u> Prevention: Obtain seasonal influenza and pneumonia vaccinations. Treatment of Ill at Home Public Information/Education</p>	<p><u>General Public Responsibilities</u> Prevention: Treatment of Ill at Home: Finalize plans for caring for the sick at home. Public Information/Education</p>	<p><u>General Public Responsibilities</u> Prevention: Obtain pneumonia vaccination. Treatment of Ill at Home: Isolate the ill in separate rooms and stockpile medications and medical supplies. Public Information/Education: Monitor official Public Health</p>	<p><u>General Public Responsibilities</u> Prevention: Continue to isolate the ill, use personal protective equipment, wash hands and soiled patient items often and thoroughly. Treatment of Ill at Home: Monitor health care supplies and medications for early</p>	<p><u>General Public Responsibilities</u> Prevention: Continue to isolate the ill, use personal protective equipment, wash hands and soiled patient items often and thoroughly. Treatment of Ill at Home: Monitor public health messages for where and how to access</p>

GREEN	BLUE	YELLOW	ORANGE	RED
<p><i>Pre-pandemic period – No current pandemic activity but moderate to high potential exists</i> WHO 3</p>	<p><i>Pandemic has begun but no cases are reported in Florida</i> WHO 4</p>	<p><i>Sporadic community cases of Pandemic Influenza have been confirmed in Florida but are few in number</i> WHO 5</p>	<p><i>Widespread community cases of Pandemic Influenza in Florida</i> WHO 6</p>	<p><i>Overwhelming number of local cases beyond the capacity of the Florida healthcare system</i> WHO 6</p>
		<p>recommendations and instructions.</p>	<p>replenishment. Public Information/Education: Monitor official Public Health recommendations and instructions. Monitor public health messages about who should receive care at home and who should go to a hospital.</p>	<p>emergency medications and medical supplies. Public Information/Education: Continue to monitor official Public Health recommendations and instructions.</p>

DRAFT

Patient Care Strategies for Scarce Resource Situations

Resource	Strategy	Tactic
Oxygen	Conservation	Use minimum liter flow to keep O ₂ saturation > target (85-95% depending on situation). Use O ₂ conserving cannulas (Oxymizer™). No oxygen driven nebs. Eliminate or reduce equipment with high O ₂ consumption. See more complete oxygen document.
	Re-use	Appropriately disinfect and re-use cannulas, masks, and tubing.
	Re-allocation	May have to base therapy on triage decision tool similar to ventilator allocation.
Medication Administration	Substitution	Use alternative inexpensive medications (morphine, lorazepam, doxycycline) that are easily stockpiled prior to the event.
	Adaptation	Use morphine and benzodiazepines for sedation drips when possible; run drips via gravity rather than IV pumps if needed. Administer more medications via subcutaneous or intramuscular route than intravenous.
	Conservation	Give adjunctive non-steroidal and other analgesics / medications including orally when possible.
	Re-allocation	Last resort – palliative and hospice care demands adequate pain control / sedation – focus should be on stockpiling inexpensive options in advance of event.
Hemodynamic Support and IV Fluids	Substitution	Use alternative vasopressor agents such as epinephrine (inexpensive)
	Adaptation	May have higher threshold to initiate vasopressors, may use gravity drips (e.g.: 1 mg epi in 100cc NS) instead of infusion pumps. Consider nasogastric fluid replacement rather than IV.
	Conservation	Minimize invasive monitoring.
	Re-use	Consider reusing central venous catheters, other tubes and catheters with appropriate sterilization / disinfection.
Mechanical Ventilation	Adaptation	Use of anesthesia machines, BiPAP, short-term manual ventilation and other strategies
	Conservation	Adjust threshold for intubation, decrease elective surgeries to free up ventilators / anesthesia machines.
	Re-use	Re-use of ventilator circuits after appropriate sterilization / disinfection.
	Re-allocation	Last resort, allocating ventilators to patients who can most benefit / will use least resources – must be according to pre-planned process using decision support tool and expert clinical judgment.
Nutrition	Adaptation	Have family or ancillary staff provide meals. Simpler meals, fewer choices for those that can take oral intake. Tube feedings in preference to TPN. May delay feedings longer than usual.
	Conservation	See above.
	Re-use	May need to re-use NG and other feeding equipment with appropriate disinfection / sterilization.
Staffing	Substitution	Outside, equally-qualified staff brought in to institution via compact agreements or other mechanism (DMA I, Medical Reserve Corps, other local, regional, state, federal sources). Use family or non-professional staff to provide basic patient care (non-clinical).
	Adaptation	Less qualified staff from sources as above or volunteers provide basic patient care with critical care nursing and physician staff monitoring larger number of patients. Just-in-time training and orientation to job duties. Change shift duration. Use family or non-professional staff to provide some clinical care with training / in-service.
	Conservation	Reduce administrative demands (teaching and administration, documentation, etc.)

Oxygen Use Strategies for Scarce Resource Situations

Potential Trigger Events	Strategy	Recommendations												
<p>INTERNAL DISRUPTION OF HOSPITAL MEDICAL GAS SYSTEMS</p> <p>INTERNAL SURGE TO HOSPITAL CAPACITY</p> <p>EXTERNAL NOTIFICATION BY GAS SUPPLIER OF DELAYS OR SHORTAGES</p> <p>EXTERNAL NOTIFICATION BY FLORIDA DEPARTMENT OF HEALTH</p> <p>Oxygen</p>	Substitute	<p>1. Oxygen Conservation Devices</p> <ul style="list-style-type: none"> Use oxygen conservation type cannulas at 1/2 the flow setting of standard cannulas. Replace simple & partial rebreather mask use with oxygen conservation cannulas at flow rates of 6-10 LPM. 												
		<p>2. Inhaled Medications</p> <ul style="list-style-type: none"> Restrict the use of Small Volume Nebulizers when inhaler substitutes are available. Restrict continuous nebulization therapy. Minimize frequency through medication substitution that result in fewer treatments (6h-12h instead of 4h-6h applications). 												
	Substitute and Conserve	<p>3. Oxygen Concentrators if Electrical Power Is Present</p> <ul style="list-style-type: none"> Use hospital-based or independent home medical equipment supplier oxygen concentrators, if available; use to supplement low-flow cannula use, and preserve the primary oxygen supply for more critical applications. 												
	Conserve	<p>4. Monitor Use and Revise Clinical Targets</p> <ul style="list-style-type: none"> Employ oxygen titration protocols to optimize flow or % to match targets for SPO₂ or PaO₂. Minimize overall oxygen use by optimization of flow. Discontinue oxygen at earliest possible time. <p>Starting Example</p> <table border="1"> <thead> <tr> <th></th> <th>Initiate O2</th> <th>O2 Target</th> </tr> </thead> <tbody> <tr> <td>Normal Lung Adults</td> <td>SPO₂ <89%</td> <td>SPO₂ 90%</td> </tr> <tr> <td>Infants & Peds</td> <td>SPO₂ <90%</td> <td>SPO₂ 91-94%</td> </tr> <tr> <td>COPD History</td> <td>SPO₂ <88%</td> <td>SPO₂ 90%</td> </tr> </tbody> </table> <p>Note: Targets may be adjusted further downward depending on resources available, the patient's clinical presentation, or measured PaO₂ determination.</p>		Initiate O2	O2 Target	Normal Lung Adults	SPO ₂ <89%	SPO ₂ 90%	Infants & Peds	SPO ₂ <90%	SPO ₂ 91-94%	COPD History	SPO ₂ <88%	SPO ₂ 90%
			Initiate O2	O2 Target										
		Normal Lung Adults	SPO ₂ <89%	SPO ₂ 90%										
	Infants & Peds	SPO ₂ <90%	SPO ₂ 91-94%											
	COPD History	SPO ₂ <88%	SPO ₂ 90%											
<p>5. High-Flow Applications</p> <ul style="list-style-type: none"> Restrict the use of high-flow adult cannula systems (Vapotherm™ type) as these can demand 12 to 40 LPM flows. Restrict the use of simple and partial rebreathing masks to 10 LPM maximum. Restrict use of Gas Injection Nebulizers as they generally require oxygen flows between 10 LPM and 75 LPM. Eliminate the use of oxygen-powered venturi suction systems as they may consume 15 to 50 LPM 														
<p>6. Air-Oxygen Blenders</p> <ul style="list-style-type: none"> Eliminate the low-flow reference bleed occurring with any low-flow metered oxygen blender use. This can amount to an additional 12 LPM. Reserve air-oxygen blender use for mechanical ventilators using high-flow non-metered outlets. (These do not utilize reference bleeds). Disconnect blenders when not in use. 														
Re-use	<p>7. Expendable Oxygen Appliances</p> <ul style="list-style-type: none"> Use terminal sterilization or high-level disinfection procedures for oxygen appliances, small & large-bore tubing, and ventilator circuits. Bleach concentrations of 1:10, high-level chemical disinfection, or irradiation may be suitable. Ethylene oxide gas sterilization is optimal, but requires a 12-hour aeration cycle to prevent ethylene chlorhydrin formation with polyvinyl chloride plastics. 													
Re-allocate	<p>8. Oxygen Re-Allocation Implementation</p> <ul style="list-style-type: none"> Prioritize patients for oxygen administration during severe resource limitations. 													

Medication Utilization Strategies for Scarce Resource Situations

Potential Trigger Events	Strategy	Recommendations
Medications MASS CASUALTY EVENT INFRASTRUCTURE DAMAGE OR LOSS INTERRUPTION IN SUPPLY CHAIN PANDEMIC INFLUENZA OR OTHER EPIDEMIC	Prepare	1. Cache / Increase Supply Levels for Common Medications <ul style="list-style-type: none"> • Patients should have at least 30 days supply of home medications and obtain 90 day supply if pandemic imminent. • Examine formulary to determine commonly-used medications and classes that will be in immediate / high demand. • Increase supply levels or cache critical medications - particularly for low-cost items and analgesics. Key classes include: Analgesia morphine, other narcotic and non-narcotic (non-steroidals, acetaminophen) class - injectable and oral (narcotic conversion tool at http://www.globalph.com/narcoticconv.htm) Sedation particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables Anti-infectives narrow and broad spectrum antibiotics for pneumonia, skin infections, open fracture care, sepsis (cephalosporins, fluoroquinolones, doxycycline, gentamicin, dindamycin, metronidazole), select antivirals Pulmonary metered-dose inhalers (albuterol, inhaled steroids), oral steroids (dexamethasone, prednisone) Behavioral Health haloperidol, other injectable and oral anti-psychotics, common anti-depressants, anxiolytics Other sodium bicarbonate, paralytics, induction agents (etomidate, propofol), proparacaine/tetracaine, atropine, pralidoxime, epinephrine, local anesthetics, antiemetics, insulin, common oral anti-hypertensive and diabetes medications
	Conserve	2. Reduce Use During High Demand <ul style="list-style-type: none"> • Restrict use of certain classes if limited stocks likely to run out (restrict use of prophylactic / empiric antibiotics after low risk wounds, etc.). • Decrease dose; consider using smaller doses of medications in high demand / likely to run out (reduce doses of medications allowing blood pressure or glucose to run higher to ensure supply of medications adequate for anticipated duration of shortage). • Allow use of personal medications (inhalers, oral medications) in hospital. • Do without - consider impact if medications not taken during shortage (statins, etc.).
	Substitute	3. Use Equivalent Medications <ul style="list-style-type: none"> • Obtain medications from alternate supply sources (pharmaceutical representatives, pharmacy caches). Analgesia/ • consider lorazepam for propofol substitution. Sedation • ICU analgesia/sedation drips morphine 4-10mg IV load then 2mg/h and titrate / re-bolus as needed (usual 3-20mg/h); lorazepam 2-8mg or midazolam 1-5mg IV load then 2-8mg/h drip • refractory agitation add haloperidol 5-10mg IV (may repeat q30min) then final dose scheduled q6h (5-20mg/dose usual) Anti-infective • examples: cefazolin, gentamicin, dindamycin for broad-spectrum antibiotics • Target therapy as soon as possible based upon organism identified. Pulmonary • metered dose inhalers instead of nebulized medications Other • beta blockers, diuretics, calcium channel blockers, ace inhibitors, anti-depressants, anti-infectives
	Adapt	4. Modify Medication Administration <ul style="list-style-type: none"> • Emphasize oral, nasogastric, rectal, subcutaneous routes of medication administration. • Administer medications by gravity drip rather than IV pump if needed: IV drip rate calculation - drops / minute = amount to be infused x drip set / time (minutes) (drip set = qts / mL - 60, 10, etc.).

<h1>Medications</h1>	Adapt	<ul style="list-style-type: none"> • Rule of 6: pt wgt (kg) x 6 = mg drug to add to 100ml fluid = 1mcg / kg / min for each 1 mL / hour • Consider use of select medications beyond expiration date. • Consider use of veterinary medications when alternative treatments are not available. <p>NOTE: For further information and examples, see http://www.dtyofsomerset.com/ems/IV%20Drug%20Calculations.pdf</p>
	Re-allocate	<p>5. Restrict Allocation of Select Medications</p> <ul style="list-style-type: none"> • Allocate limited stocks of anti-viral medications with consideration of regional/state guidance and available epidemiological information. • Allocate limited stock to support other re-allocation decisions (ventilator use, etc.). • Unit dose or sealed medications from patients.

Hemodynamic Support and IV Fluids Strategies for Scarce Resource Situations

Potential Trigger Events	Strategy	Recommendations
<h1>Hemodynamic Support and IV Fluids</h1>	Prepare	1. Cache Additional Intravenous (IV) Cannulas, Tubing, Fluids, Medications, and Administration Supplies
	Conserve	<p>2. Use scheduled dosing and drip dosing when possible</p> <ul style="list-style-type: none"> • Reserve IV pump use for critical medications such as sedatives and hemodynamic support. <p>3. Minimize invasive monitoring</p> <ul style="list-style-type: none"> • Substitute other assessments of central venous pressure (CVP). • When required, assess CVP intermittently via manual methods using bedside saline manometer or transducer moved between multiple patients as needed, or by height of blood column in CVP line held vertically while patient supine.
	Substitute	<p>4. Emphasize oral hydration instead of IV hydration when possible</p> <p>Utilize appropriate oral rehydration solution</p> <ul style="list-style-type: none"> • Oral rehydration solution: 1 liter water (5 cups) + 1 tsp salt + 8 tsp sugar, add flavor (e.g., 1/2 cup orange juice, other) as needed. • Rehydration for moderate dehydration 50-100mL / kg over 2-4 hours <p>Supplement for each diarrhea or emesis</p> <ul style="list-style-type: none"> • Pediatric maintenance fluids: 4 mL/kg/h for first 10kg of body weight (40 mL/h for 1st 10 kg) 2 mL/kg/h for second 10kg of body weight (20 mL/h for 2nd 10kg = 60 mL/h for 20kg child) 1 mL/kg/h for each kg over 20kg (example - 40 kg child = 60 mL/h plus 20 mL/h = 80 mL/h) <p>NOTE: Clinical (urine output, etc.) and laboratory (BUN, urine specific gravity) assessments and electrolyte correction are key components of fluid therapy and are not specifically addressed by these recommendations.</p> <p>NOTE: For further information and examples, see http://rehydrate.org and http://www.bt.cdc.gov/disasters/hurricanes/pdf/dguidelines.pdf.</p> <p>5. Provide nasogastric or subcutaneous hydration Instead of IV hydration when practical</p> <ul style="list-style-type: none"> • Patients with impediments to oral hydration may be successfully hydrated and maintained with nasogastric (NG) tubes.

Hemodynamic Support and IV Fluids		<ul style="list-style-type: none"> • For fluid support, 8-12F (pediatric: infant 3.5F, < 2yrs 5F) tubes are better tolerated than standard size tubes. <p>6. Substitute epinephrine for other vasopressor agents</p> <ul style="list-style-type: none"> • For hemodynamically unstable patients who are adequately volume-resuscitated, consider adding 6mg epinephrine (6mL of 1:1000) to 1000mL NS on minidrip tubing and titrate to target blood pressure. • Epinephrine 1:1000 (1mg/mL) multi-dose vials available for drip use.
	Adapt	<p>7. Consider use of veterinary and other alternative sources for intravenous fluids and administration sets</p>
	Re-allocate	<p>8. Re-use CVP, NG, and other supplies after appropriate sterilization / disinfection</p> <ul style="list-style-type: none"> • Cleaning for all devices should precede high-level disinfection or sterilization. • High-level disinfection for at least twenty minutes for devices in contact with body surfaces (including mucous membranes); glutaraldehyde, hydrogen peroxide 6%, or bleach (5.25%) diluted 1:20 (2500 ppm) are acceptable solutions. <p>NOTE: chlorine levels reduced if stored in polyethylene containers - double the bleach concentration to compensate.</p> <ul style="list-style-type: none"> • Sterilize devices in contact with bloodstream (ethylene oxide sterilization for CVP catheters).

Mechanical Ventilation Strategies for Scarce Resource Situations

Potential Trigger Events	Strategy	Recommendations																																									
<p>PANDEMIC INFLUENZA</p> <p>OTHER EVENT THAT OVERWHELMS VENTILATOR CAPACITY</p> <p style="font-size: 2em; font-weight: bold;">Mechanical Ventilation</p>	Prepare	1. Increase hospital stocks of ventilators, ventilator circuits and related supplies, and suction equipment/supplies for both adults and children																																									
	Substitute	2. Access alternative sources for ventilators <ul style="list-style-type: none"> Obtain ventilators from vendors / healthcare partners / Federal stockpiles via usual emergency management processes. 																																									
	Adapt	3. Use alternative respiratory support technologies <ul style="list-style-type: none"> Use transport ventilators with appropriate alarms - especially for stable patients without complex ventilation requirements. Use anesthesia machines for mechanical ventilation as appropriate. Use bi-level equipment to provide mechanical ventilation. Consider bag-valve ventilation as temporary measure while awaiting definitive solution (as appropriate to situation). 																																									
	Conserve	4. Decrease demand for ventilators <ul style="list-style-type: none"> Increase threshold for intubation / ventilation. Decrease elective procedures that require post-operative intubation. Decrease elective procedures that utilize anesthesia machines. Use non-invasive ventilatory support when possible. 																																									
	Re-use	5. Sterilize ventilator circuits after cleaning. <ul style="list-style-type: none"> If using gas (ethylene oxide) sterilization, allow full 12 hour aeration cycle to avoid toxic byproducts from accumulating on surface. Use chemical sterilization, irradiation, or other techniques as appropriate. 																																									
	Re-allocate	<p>6. Assign limited ventilators to patients most likely to benefit if no other options are available Step one: assess patient acuity using SOFA scoring table.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 20%;">Organ System</th> <th style="width: 10%;">Score=0</th> <th style="width: 10%;">1</th> <th style="width: 10%;">2</th> <th style="width: 10%;">3</th> <th style="width: 10%;">4</th> </tr> </thead> <tbody> <tr> <td>RESPIRATORY PaO₂ / FIO₂</td> <td>>400</td> <td>≤400</td> <td>≤300</td> <td>≤200 w resp. sup</td> <td>≤100 w resp. sup</td> </tr> <tr> <td>HEMATOLOGIC Platelets</td> <td>>150</td> <td>≤150</td> <td>≤100</td> <td>≤50</td> <td>≤20</td> </tr> <tr> <td>HEPATIC Bilirubin(mg/dL)</td> <td><1.2</td> <td>1.2-1.9</td> <td>2.0-5.9</td> <td>6-11.9</td> <td>≥12</td> </tr> <tr> <td>CARDIOVASCULAR Hypotension</td> <td>None</td> <td>Mean Arterial Pressure <70mm/Hg</td> <td>Dopamine ≤ 5 or any Dobutamine</td> <td>Dopamine > 5 or Epi < 0.1 or Nor-Epi ≥ 0.1</td> <td>Dopamine > 15 or Epi > 0.1 or Nor-Epi > 0.1</td> </tr> <tr> <td>CENTRAL NERVOUS SYSTEM Glasgow Coma</td> <td>15</td> <td>13-14</td> <td>10-12</td> <td>6-9</td> <td>≤ 6</td> </tr> <tr> <td>RENAL Creatinine</td> <td><1.2</td> <td>1.2-1.9</td> <td>2.0-3.4</td> <td>3.5-4.9</td> <td>≥ 5.0</td> </tr> </tbody> </table>	Organ System	Score=0	1	2	3	4	RESPIRATORY PaO ₂ / FIO ₂	>400	≤400	≤300	≤200 w resp. sup	≤100 w resp. sup	HEMATOLOGIC Platelets	>150	≤150	≤100	≤50	≤20	HEPATIC Bilirubin(mg/dL)	<1.2	1.2-1.9	2.0-5.9	6-11.9	≥12	CARDIOVASCULAR Hypotension	None	Mean Arterial Pressure <70mm/Hg	Dopamine ≤ 5 or any Dobutamine	Dopamine > 5 or Epi < 0.1 or Nor-Epi ≥ 0.1	Dopamine > 15 or Epi > 0.1 or Nor-Epi > 0.1	CENTRAL NERVOUS SYSTEM Glasgow Coma	15	13-14	10-12	6-9	≤ 6	RENAL Creatinine	<1.2	1.2-1.9	2.0-3.4	3.5-4.9
Organ System	Score=0	1	2	3	4																																						
RESPIRATORY PaO ₂ / FIO ₂	>400	≤400	≤300	≤200 w resp. sup	≤100 w resp. sup																																						
HEMATOLOGIC Platelets	>150	≤150	≤100	≤50	≤20																																						
HEPATIC Bilirubin(mg/dL)	<1.2	1.2-1.9	2.0-5.9	6-11.9	≥12																																						
CARDIOVASCULAR Hypotension	None	Mean Arterial Pressure <70mm/Hg	Dopamine ≤ 5 or any Dobutamine	Dopamine > 5 or Epi < 0.1 or Nor-Epi ≥ 0.1	Dopamine > 15 or Epi > 0.1 or Nor-Epi > 0.1																																						
CENTRAL NERVOUS SYSTEM Glasgow Coma	15	13-14	10-12	6-9	≤ 6																																						
RENAL Creatinine	<1.2	1.2-1.9	2.0-3.4	3.5-4.9	≥ 5.0																																						

Mechanical Ventilation

Re-allocate

STEP TWO: Compared to other patient(s) requiring and awaiting mechanical ventilation, does this patient have significant differences in prognosis or resource utilization in one or more categories below that would justify re-allocation of the ventilator? Factors listed are in order of importance / weight.

1. Organ System function+	Ventilator re-directed High Potential for death (SOFA score ≥ 12)	—————> Intermediate potential for death (SOFA score 8-11)	Patient keeps ventilator Low potential for death (SOFA score ≤ 7)
2. Duration of benefit / prognosis	a. Poor prognosis based upon epidemiology of specific disease/injury (e.g. pandemic influenza) b. Severe underlying disease with poor short-term (e.g. <1 year) prognosis++	a. Indeterminate / intermediate prognosis based upon epidemiology of specific disease/injury b. Severe underlying disease with poor long-term prognosis and/or ongoing resource demand (e.g. home oxygen dependent, dialysis dependent) and unlikely to survive more than 1-2 years.	a. Good prognosis based upon epidemiology of specific disease/injury b. No severe underlying disease
3. Duration of need	Long duration – e.g. ARDS, particularly in setting of pre-existing lung disease (estimate >7 days on a ventilator)	Moderate duration – e.g. pneumonia in healthy patient (estimate 3-7 days on ventilator)	Short duration – flash pulmonary edema, chest trauma, other conditions anticipating <3 days on ventilator
4. Response to mechanical ventilation	Worsening ventilator parameters over time+++	Stable ventilator parameters over time	Improving ventilator parameters over time

+ The Sequential Organ Failure Assessment (SOFA) score is the currently preferred assessment tool but other predictive models may be used depending on the situation / epidemiology. Note: SOFA scores were not designed to forecast mortality, and thus single or a few point difference between patients may not represent a 'substantial difference' in mortality, but larger differences and trends can be extremely helpful in determining resource assignment.

- ++ Examples of underlying diseases that predict poor short-term survival include (but are not limited to):
1. Congestive heart failure with ejection fraction < 25% (or persistent ischemia unresponsive to therapy or non-reversible ischemia with pulmonary edema)
 2. Severe chronic lung disease including pulmonary fibrosis, cystic fibrosis, obstructive or restrictive diseases requiring continuous home oxygen use prior to onset of acute illness
 3. Central nervous system, solid organ, or hematopoietic malignancy with poor prognosis for recovery
 4. Cirrhosis with ascites, history of variceal bleeding, fixed coagulopathy or encephalopathy
 5. Acute hepatic failure with hyperammonemia

+++ Changes in Oxygenation Index over time may provide comparative data, though of uncertain prognostic significance.
 $OI = MAWP \times FiO_2 / PaO_2$ where: OI = oxygenation index MAWP= Mean Airway Pressure FiO_2 = inspired oxygen concentration
 PaO_2 = arterial oxygen pressure (May be estimated from oxygen dissociation curve if blood gas unavailable.)

STEP THREE: Re-allocate ventilator only if patient presenting with respiratory failure has significantly better chance of survival / benefit as compared to patient currently receiving ventilation. Follow additional regional and state/federal guidance and institutional processes for scarce resource situations.

Staffing Strategies for Scarce Resource Situations

Potential Trigger Events	Strategy	Recommendations
STAFF UNABLE TO REPORT STAFF ILLNESS AT HOME WITH FAMILY UNABLE TO GET TO FACILITY STAFFING LEVELS INADEQUATE FOR DEMANDS OF DISASTER Staffing	Prepare	1. Staff and supply planning <ul style="list-style-type: none"> • Encourage employee preparedness planning (www.codeready.org and other resources). • Cache adequate personal protective equipment (PPE) and support supplies. • Educate staff on institutional disaster response and requirements. • Educate staff on community, regional, state disaster plans and resources. • Develop facility plans addressing staff's family / pets or staff shelter needs. • Just in time training for respiratory care, oral rehydration and basic patient care.
	Substitute	2. Use supplemental staff <ul style="list-style-type: none"> • Bring in equally trained staff (burn or critical care nurses, other health system, or Federal sources). • Equally trained staff from administrative positions (nurse managers).
	Adapt	3. Use alternative personnel to minimize changes to standard of care <ul style="list-style-type: none"> • Use less-trained personnel with appropriate mentoring and just-in-time education (e.g., healthcare trainees or other health care workers, Medical Reserve Corps, retirees). • Use less-trained personnel to take over portions of skilled staff workload for which they have been trained. • Provide just-in-time training for specific skills. • Adjust personnel work schedules (longer but less frequent shifts, etc.) if this will not result in skill / PPE compliance deterioration. • Use family members/lay volunteers to provide basic patient hygiene and feeding – releasing staff for other duties.
	Conserve	4. Focus staff time on core clinical duties <ul style="list-style-type: none"> • Minimize meetings and relieve administrative responsibilities not related to event. • Use personnel with specific critical skills (ventilator, burn management) to concentrate on those skills; define other job duties that can be safely performed by other medical professionals. • Have specialty staff oversees larger numbers of less-specialized staff and patients (for example, a critical care nurse oversees the intensive care issues of 9 patients while 3 medical/surgical nurses provide basic nursing care to 3 patients each). • Reduce documentation requirements. • Limit use of laboratory, radiographic, and other studies, to allow staff reassignment and resource conservation. • Reduce availability of non-critical laboratory, radiographic, and other studies. • Cohort patients to conserve PPE and reduce staff PPE donning/doffing time and frequency. • Restrict elective appointments and procedures.
	Re-allocate	5. Divert staff to emergency response <ul style="list-style-type: none"> • Cancel most sub-specialty appointments, endoscopies, etc. and divert staff to emergency duties including in-hospital or assisting public health at external clinics/screening/dispensing sites.

Appendices

- 1) Modified Sequential Organ Failure Assessment
- 2) Revised Trauma Score
- 3) Glasgow Coma Score (adult and pediatric)
- 4) Triage Decision for Burn Victims
- 5) Pugh Score
- 6) New York Heart Association Stages of Heart Failure
- 7) Emergency Medical Treatment and Active Labor Act
- 8) Sample Governor Executive Orders
- 9) Alignment Between Key State Public Health & Medical Emergency Management Plans

(1) MODIFIED SEQUENTIAL ORGAN FAILURE ASSESSMENT (MSOFA)

The MSOFA requires only one lab value that can be obtained using beside point-of-care testing (creatinine obtained through ISTAT). (add reference source for table)

MSOFA Scoring Guidelines						
Variable	Score 0	Score 1	Score 2	Score 3	Score 4	Score for each row
SpO ₂ / FIO ₂ Ratio Or Nasal cannula or mask O ₂ required to keep SpO ₂ > 90%	SpO ₂ / FIO ₂ >400 or Room air SpO ₂ > 90%	SpO ₂ / FIO ₂ 316-400 or SpO ₂ > 90% at 1-3 L/min	SpO ₂ / FIO ₂ 231-315 or SpO ₂ > 90% at 4-6 L/min	SpO ₂ / FIO ₂ 151-230 or SpO ₂ > 90% at 7-10 L/min	SpO ₂ / FIO ₂ ≤ 150 or SpO ₂ > 90% at >10 L/min	_____
Bilirubin (mg/dL)	<1.2 or no scleral icterus	1.2 – 1.9	2.0 – 5.0 or scleral icterus	6.0-11.9 or clinical jaundice	≥12	_____
Hypotension +	None	MABP <70	DOP <5	DOP 5-15 or EPI ≤ 0.1 or NOR-EPI ≤ 0.1	DOP > 15 or EPI > 0.1 or NOR-EPI > 0.1	_____
Glasgow Coma Score	15	13-14	10-12	6-9	<6	_____
Creatinine Level, mg / dL	< 1.2	1.2 – 1.9	2.0 – 3.4	3.5 – 4.9 or urine output <500 mL in 24 hours	>5 or urine output <200 mL in 24 hours	_____
MSOFA score = total scores from all rows: _____						

*SpO₂ / FIO₂ ratio:

SpO₂ = Percent saturation of hemoglobin with oxygen as measured by a pulse oximeter and expressed as % (e.g., 95%); FIO₂ = Fraction of inspired oxygen (e.g., ambient air is 0.21) Example: If SpO₂=95% and FIO₂=0.21, the SpO₂/FIO₂ ratio is calculated as 95/0.21=452

+Hypotension

MABP = mean arterial blood pressure in mm HG (diastolic + 1/3 (systolic-diastolic))

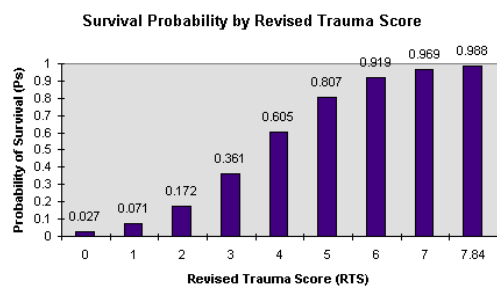
DOP = dopamine in micrograms/kg/min

EPI = epinephrine in micrograms/kg/min

NOR-EPI = norepinephrine in micrograms/kg/min

(2) REVISED TRAUMA SCORE (RTS)

Values for the Revised Trauma Score (RTS) range from 0 to 7.8408. The RTS is heavily weighted towards the Glasgow Coma Score (GCS) to compensate for major head injury without multisystem injury or major physiological changes. The RTS correlates well with the probability of survival. A Revised Trauma Score of <2 is an **EXCLUSION CRITERIA** for hospital admission during a pandemic influenza at triage Levels 2 and 3.



Revised Trauma Score Calculation				
Criteria	Score	Coded value	Weighting	Adjusted Score
Glasgow Coma Score	3	0	x0.9368	_____
	4 to 5	1		
	6 to 8	2		
	9 to 12	3		
	13 to 16	4		
Systolic Blood Pressure (SBP)	0	0	x0.7326	_____
	1 to 49	1		
	50 to 75	2		
	76 to 89	3		
	>89	4		
Respiratory Rate (RR) in breaths per minute (BPM)	0	0	x0.2908	_____
	1 to 5	1		
	6 to 9	2		
	>29	3		
	10 to 29	4		
Revised Trauma Score (add 3 adjusted scores)				_____

(3) GLASGOW COMA SCORE

A Glasgow Coma Score (GCS) of < 6 is an **EXCLUSION CRITERIA** for hospital admission in the case of pandemic influenza at triage Levels 2 and 3.

Glasgow Coma Scoring Criteria				
Criteria	Adults and Children	Infants and Young Toddlers	Score	Criteria Score
Best Eye Response (4 possible points)	No eye opening	No eye opening	1	_____
	Eye opens to pain	Eye opens to pain	2	
	Eye opens to verbal command	Eye opens to speech	3	
	Eyes open spontaneously	Eyes open spontaneously	4	
Best Verbal Response (5 possible points)	No verbal response	No verbal response	1	_____
	Incomprehensible sounds	Infant moans to pain	2	
	Inappropriate words	Infant cries to pain	3	
	Confused	Infant is irritable and continually cries	4	
	Oriented	Infant coos or babbles (normal activity)	5	
Best Motor Response (6 possible points)	No motor response	No motor response	1	_____
	Extension to pain	Extension to pain	2	
	Flexion to pain	Abnormal flexion to pain	3	
	Withdraws from pain	Withdraws from pain	4	
	Localizes to pain	Withdraws from touch	5	
	Obeys commands	Moves spontaneously or purposefully	6	
Total Score (add 3 sub-scores; range 3 to 15)				_____

(4) TRIAGE DECISION FOR BURN VICTIMS

A burn score of “Low” or worse on this table is an **EXCLUSION CRITERIA** for hospital admission in the case of pandemic influenza at triage Levels 2 and 3.

Age (years)	Burn Size (%TBSA)									
	0 – 10%	11 – 20%	21 – 30%	31 – 40%	41 – 50%	51 – 60%	61 – 70%	71 – 80%	81 – 90%	91%+
0 – 1.9	Very high	Very high	Very high	High	Medium	Medium	Medium	Low	Low	Low/expectant
2.0 – 4.9	Outpatient	Very high	Very high	High	High	High	Medium	Medium	Low	Low
5.0 – 19.9	Outpatient	Very high	Very high	High	High	High	Medium	Medium	Medium	Low
20.0 – 29.9	Outpatient	Very high	Very high	High	High	Medium	Medium	Medium	Low	Low
30.0 – 39.9	Outpatient	Very high	Very high	High	Medium	Medium	Medium	Medium	Low	Low
40.0 – 49.9	Outpatient	Very high	Very high	Medium	Medium	Medium	Medium	Low	Low	Low
50.0 – 59.9	Outpatient	Very high	Very high	Medium	Medium	Medium	Low	Low	Low/expectant	Low/expectant
60.0 – 69.9	Very high	Very high	Medium	Medium	Low	Low	Low	Low/expectant	Low/expectant	Low/expectant
70.0+	Very high	Medium	Medium	Low	Low	Low/expectant	Expectant	Expectant	Expectant	Expectant

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

(5) PUGH SCORE

A Total Pugh Score > 7 is an **EXCLUSION CRITERIA** for hospital admission in the case of a pandemic influenza at triage Levels 2 and 3.

Scoring Criteria			
Criteria	Value	Points	Total for Criteria
Total Serum Bilirubin	< 2 mg/dL	1	
	2 – 3 mg/dL	2	
	> 3 mg/dL	3	
Serum Albumin	> 3.5 g/dL	1	
	2.8 – 3.5 g/dL	2	
	<2.8 g/dL	3	
INR	<1.70	1	
	1.71 – 2.20	2	
	>2.20	3	
Ascites	None	1	
	Controlled medically	2	
	Poorly controlled	3	
Encephalopathy	None	1	
	Controlled medically	2	
	Poorly controlled	3	
		Total Pugh Score	
Score Interpretation			
Total Pugh Score	Class		
5 – 6	A		Life expectancy 15 – 20 years Abdominal surgery peri-operative mortality 10%
7 – 9	B		Liver transplant evaluation indicated Abdominal surgery peri-operative mortality 30%
10 - 15	C		Life expectancy 1 – 3 years Abdominal surgery peri-operative mortality 82%

(6) New York Heart Association (NYHA) Stages of Heart Failure

The NYHA functional classification system relates symptoms to everyday activities and the patient's quality of life. NYHA Class III or IV heart failure are **EXCLUSION CRITERIA** for hospital admission in the case of pandemic influenza at triage Levels 2 and 3.

NYHA Classes	
Class	Patient Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitations, or dyspnea.
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitations, or dyspnea.
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest but less than ordinary activity causes fatigue, palpitations, or dyspnea.
Class IV (Severe)	Unable to carry out physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

Used with permission from www.abouthf.org

(7) EMERGENCY MEDICAL TREATMENT AND ACTIVE LABOR ACT (EMTALA)

EMTALA provisions may be waived by the Secretary of Health and Human Services during a declared public emergency and under the Stafford Act. The Secretary can issue a Section 1135 waiver to waive sanctions for the “transfer of an individual who has not stabilized for both transfers and redirection for a medical screening examination”. Waivers are generally limited to a 72 hour period beginning with implementation of a hospital disaster protocol, unless the waiver arises out of a public health emergency involving a pandemic. If related to a pandemic, the waiver terminates upon the first to occur of either the termination of underlying declaration of a public health emergency or 60 days after being first published. If the waiver terminates because of the latter, the Secretary may extend it for subsequent 60 day periods.

(8) SAMPLE GOVERNMENT EXECUTIVE ORDERS (adapted from the Colorado Department of Health) (subject to revision by Legal)

Florida Governor Executive Orders will be needed for various purposes in a pandemic influenza event or other public health emergency. Sample Governor Executive Orders from the State of Colorado are shown below:

Executive Order 0.0 Declaring a State of Public Health Disaster. This executive order declares a disaster emergency of an epidemic type. The Governor's Expert Emergency Epidemic Response Committee would meet and advise the governor that an emergency exists. The governor would then issue this order, which is good for 30 days and sets the stage for other orders directing specific actions to meet the emergency.

Executive Order 1.1 Ordering Hospitals to Transfer or Cease the Admission of Patients to Respond to the Current Disaster Emergency. In directly authorizing hospitals to cease admissions and transfer patients, this order permits hospitals to determine on their own without central guidance whether they have reached their capacity to examine and treat patients. It further grants immunity from civil or criminal liability to those hospitals, physicians, and emergency service providers who act in good faith to comply with the executive order. The order takes the position that the Emergency Medical Treatment and Labor Act (EMTALA) requirements do not preempt this order.

Executive Order 2.0 Concerning the Procurement and Taking of Certain Medicines and Vaccines Required to Respond to the Current Disaster Emergency. This order authorizes the seizure of certain named drugs from public and private outlets listed in the State's pharmacy statutes, and embargoes the supply of those drugs. At the same time, it exempts from seizure those supplies that certain facilities are required to keep on hand for the chemoprophylaxis of their employees. It provides for keeping records of drugs embargoed and for compensating the outlets at the cessation of the emergency.

Executive Order 3.0 Concerning the Suspension of Certain Statutes and Regulations to Provide for the Rapid Distribution of Medication in Response to the Current Disaster Emergency. This order implements Florida's Strategic National Stockpile Plan

and suspends certain pharmacy statutes to facilitate the rapid distribution of medicines and vaccines in response to an emergency epidemic. The order further authorizes named officials to direct listed health care providers to participate in this effort and explicitly permits the limited participation in that effort by nonmedical personnel. The order is not intended for application in response to a chemical event.

Executive Order 4.0 Concerning the Suspension of Physician and Nurse Licensure Statutes to Respond to the Current Disaster Emergency. This order permits physicians and nurses who hold a license in good standing in another State, or who hold an unrestricted but inactive Florida license, to practice under the supervision of a Florida-licensed physician during the emergency, provided they do so without charge to the State or any individual patient or victim. This order would permit more physicians and nurses to be available to treat infected persons during the emergency.

Executive Order 5.0 Concerning the Suspension of Certain Licensure Statutes to Enable More Florida-Licensed Physician Assistants and Emergency Medical Technicians to Assist in Responding to the Current Disaster Emergency. Under normal conditions, physician assistants (PAs) and emergency medical technicians (EMTs) licensed in Florida can practice only in association with or under the supervision of physicians by prior agreement. This order permits PAs and EMTs to practice under the supervision of any licensed physicians in order to afford treatment to the greatest number of infected individuals. The PAs, EMTs, and physicians involved are granted immunity from civil or criminal liability if they act in good faith to meet the terms of the order.

Executive Order 6.0 Concerning the Isolation and Quarantining of Individuals and Property in Response to the Current Disaster Emergency Epidemic. This order empowers the Florida Department of Health to establish, maintain, and enforce isolation (of infected individuals) and quarantine of (exposed individuals) as needed to protect the public health in an epidemic situation. It further grants similar powers to local boards of health to combat infectious disease epidemics.

Executive Order 7.0 Ordering Facilities to Transfer or Receive Patients with Mental Illness and Suspending Certain Statutory Provisions to Respond to the Current Disaster Emergency. This order permits the transfer of mentally ill persons from a designated facility to some other facility as necessary to treat them for the infectious disease causing the epidemic. It further specifies requirements related to required services and use of identifying personal information, and provides for immunity from civil or criminal liability for any facility acting in good faith under the order.

Executive Order 8.0 Concerning Suspension of Certain Statutes Pertaining to Death Certificates and Burial Practices in Response to the Current Disaster Emergency. This order suspends the statutory timing requirements for filing death certificates and authorizes the State Surgeon General of the Florida Department of Health to direct the disposition of dead bodies in a manner that will protect the public health.

REFERENCES AND RESOURCES

Utah Pandemic Influenza Hospital and ICU Triage Guidelines, Utah Department of Health and the Utah Hospitals and Health Systems Association, Draft document, 8/12/08 - http://www.pandemicflu.utah.gov/plan/med_triage120707.pdf

Minnesota Healthcare System Preparedness Program- Standards of Care for Scarce Resources, Minnesota Department of Health, 2008 - <http://www.health.state.mn.us/sep/healthcare/standards.pdf>

Mass Medical Care with Scarce Resources: A Community Planning Guide, (Sample Colorado Governor Executive Orders) Agency for Healthcare Research and Quality, 2007 - <http://www.ahrq.gov/research/mce/>