

HOSPITAL SETTINGS

Hospital Administrative Roles - General (refer to page 8 for definitions of elective surgery categories)

Triage Level 1:

- 1) **Preserve bed capacity** by:
 - Canceling all category 2 and 3 elective surgeries, and advising all category 1 elective surgery patients of the risk of infection.
 - Canceling any elective surgery that would require postoperative hospitalization.

Note: Use standard operation and triage decision for admission to ICU since there are still adequate resources to accommodate the most critically ill patients.
- 2) **Preserve oxygen capacity** by:
 - Phasing out all hyperbaric medicine treatments.
 - Ensuring that all liquid oxygen tanks are full.
- 3) **Improve patient care capacity** by transitioning space in ICUs to accommodate more patients with respiratory failure.
- 4) **Control infection** by limiting visitation (follow hospital infection control plan).

Triage Level 2:

- 1) **Preserve bed capacity** by:
 - Canceling all elective surgeries unless necessary to facilitate hospital discharge.
 - Evaluating hospitalized category 1 elective surgery patients for discharge using same criteria as medical patients.
- 2) **Preserve oxygen capacity** by stopping all hyperbaric treatments.
- 3) **Improve patient care capacity** by implementing altered standards of care regarding nurse/patient ratios and expanding capacity by adding patients to already occupied hospital rooms.
- 4) **Provide emotional support** by initiating pre-established action team to provide counseling and care coordination and to work with the families of loved ones who have been denied life-sustaining treatment.

Triage Level 3:

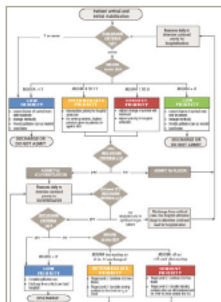
- 1) **Preserve bed capacity** by limiting surgeries to patients whose clinical conditions are a serious threat to life or limb, or to patients for whom surgery may be needed to facilitate discharge from the hospital.

Emergency Department, Hospital, and ICU - Clinical Triage

Use **HOSPITAL AND ICU/VENTILATOR ADMISSION TRIAGE** algorithm and tools (pages 4 and 5) to determine which patients to send home for palliative care or medical management and which patients to admit or keep in hospital or ICU. Note that the *lowest* priority for admission is given to patients with the lowest chance of survival with *or* without treatment, and to patients with the highest chance of survival *without* treatment.

Physician judgment should be used in applying these guidelines. Other factors to consider when applying triage guidelines include:

- Whether the patient is homeless or has someone to care for them at home
- Whether the patient is in the 2nd or 3rd trimester of a pregnancy



See pages 4 and 5 for triage algorithm and supporting tools.

Triage Level 2:

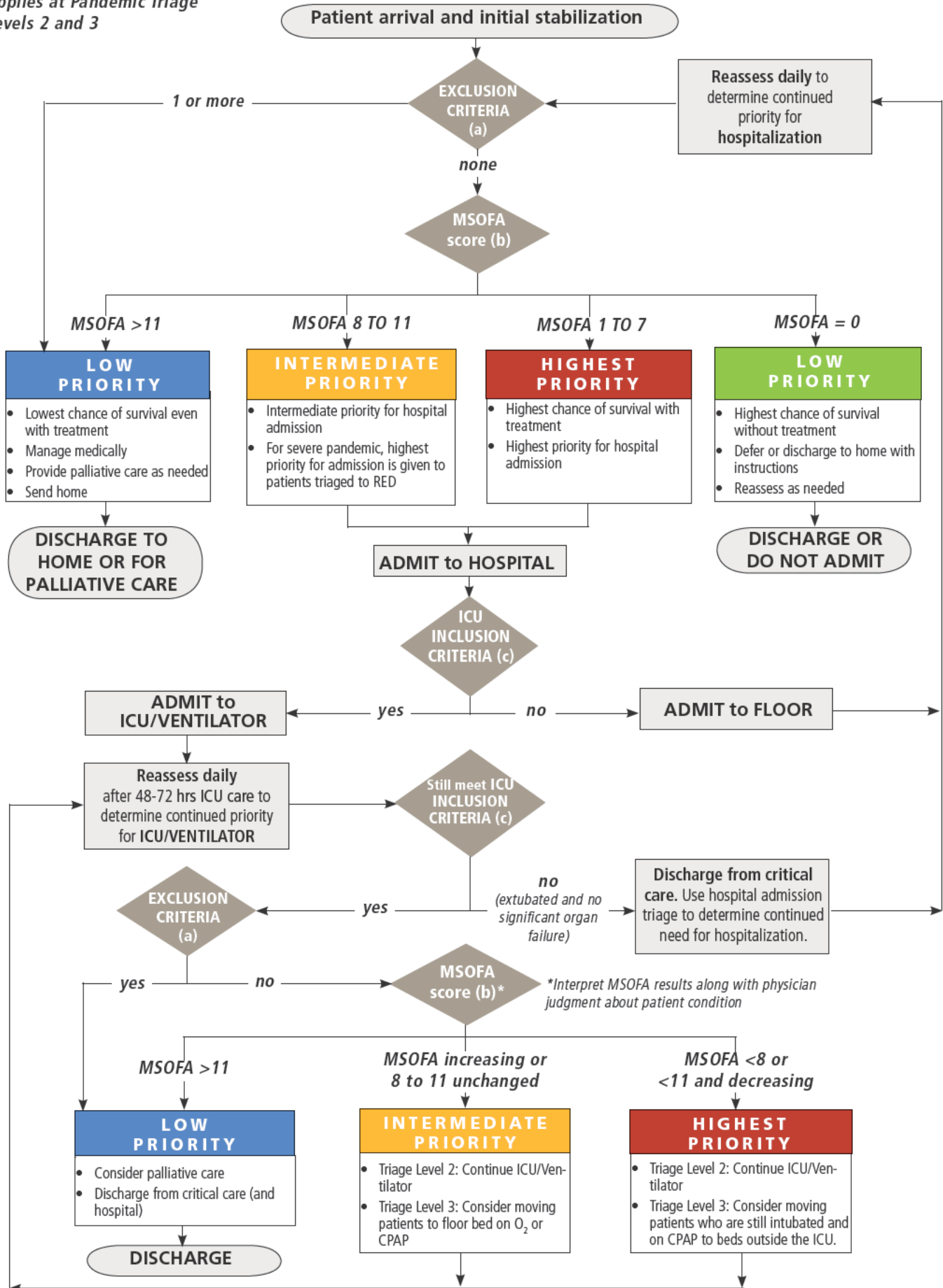
- Initiate **HOSPITAL AND ICU/ VENTILATOR ADMISSION TRIAGE** algorithm (page 4) to determine priority for ICU admission, intubation, and/or mechanical ventilation.
- Reassess need for ICU/ventilator treatment daily after 48-72 hours of ICU care.

Triage Level 3:

- Continue to use **HOSPITAL AND ICU/ VENTILATOR ADMISSION TRIAGE** algorithm (page 4) to determine priority for ICU, intubation, and/or mechanical ventilation.
- Triage more **yellow** patients to floor on oxygen or CPAP.
- Triage more **red** patients who are intubated and on CPAP to floor.

ALGORITHM: HOSPITAL AND ICU/VENTILATOR ADMISSION TRIAGE

Applies at Pandemic Triage Levels 2 and 3



TRIAGE TOOLS AND TABLES

(a) 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.
- (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). Includes traumatic brain injury, severe hemorrhagic stroke, and intracranial hemorrhage.
- (4) Severe acute trauma with a REVISED TRAUMA SCORE <2 (see (d) and (e))
GCS: _____ SBP: _____ RR: _____
Revised trauma score: _____
- (5) Severe burns with <50% anticipated survival (patients identified as "Low" or worse on the TRIAGE DECISION TABLE FOR BURN VICTIMS (f)). Burns not requiring critical care resources may be cared for at the local facility (e.g., burns that might have been transferred to the University of Utah Medical Center Burn Center under normal circumstances). Score: _____
- (6) Cardiac arrest not responsive to ACLS interventions within 20-30 minutes.
- (7) Known severe dementia medically treated and requiring assistance with activities of daily living.
- (8) Advanced untreatable neuromuscular disease (such as ALS or end-stage MS) requiring assistance with activities of daily living or requiring chronic ventilatory support.
- (9) Incurable metastatic malignant disease.
- (10) End-stage organ failure meeting the following criteria:
 - Heart: NEW YORK HEART ASSOCIATION (NYHA) FUNCTIONAL CLASSIFICATION SYSTEM Class III or IV (g). Class: _____
 - Lung (any of the following):
 - Chronic Obstructive Pulmonary Disease (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 (g), right atrial pressure >10 mm Hg, or mean pulmonary arterial pressure >50 mm Hg.
 - Liver: PUGH SCORE >7 (h), when available. Includes bili, albumin, INR, ascites, encephalopathy.
Total score: _____
- (11) Age:
 - Triage Level 1: >95 years
 - Triage Level 2: >90 years
 - Triage Level 3: >85 years

(b) Modified Sequential Organ Failure Assessment (MSOFA)

The MSOFA requires only one lab value, which can be obtain using bedside point-of-care testing (creatinine obtained through ISTAT). MSOFA has not been validated in children, but is currently under study.

MSOFA scoring guidelines						
Variable	Score 0	Score 1	Score 2	Score 3	Score 4	Score for each row
SpO ₂ /FIO ₂ ratio* <i>or</i> nasal cannula or mask O ₂ required to keep SpO ₂ >90%	SpO ₂ /FIO ₂ >400 <i>or</i> room air SpO ₂ >90%	SpO ₂ /FIO ₂ 316-400 <i>or</i> SpO ₂ >90% at 1-3 L/min	SpO ₂ /FIO ₂ 231-315 <i>or</i> SpO ₂ >90% at 4-6 L/min	SpO ₂ /FIO ₂ 151-230 <i>or</i> SpO ₂ >90% at 7-10 L/min	SpO ₂ /FIO ₂ ≤150 <i>or</i> SpO ₂ >90% at >10 L/min	_____
Jaundice	no scleral icterus			clinical jaundice/ scleral icterus		_____
Hypotension†	None	MABP <70	dop <5	dop 5-15 <i>or</i> epi ≤0.1 <i>or</i> norepi ≤0.1	dop >15 <i>or</i> epi >0.1 <i>or</i> norepi >0.1	_____
Glasgow Coma Score	15	13-14	10-12	6-9	<6	_____
Creatinine level, mg/dL (use ISTAT)	<1.2	1.2-1.9	2.0-3.4	3.5-4.9 <i>or</i> urine output <500 mL in 24 hours	>5 <i>or</i> 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
norepi = norepinephrine in micrograms/kg/min

(c) ICU/Ventilator INCLUSION CRITERIA

Patient must have NO EXCLUSION CRITERIA (a) and at least one of the following INCLUSION CRITERIA:

- (1) Requirement for invasive ventilatory support
 - Refractory hypoxemia (SpO₂ <90% on non-rebreather mask or FIO₂ >0.85)
 - Respiratory acidosis (pH <7.2)
 - Clinical evidence of impending respiratory failure
 - Inability to protect or maintain airway
- (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 or relative hypotension
 - **Clinical evidence of shock = altered level of consciousness, decreased urine output, or other evidence of end-stage organ failure

See Appendix B for a Patient Worksheet based on the above Exclusion and Inclusion Criteria.

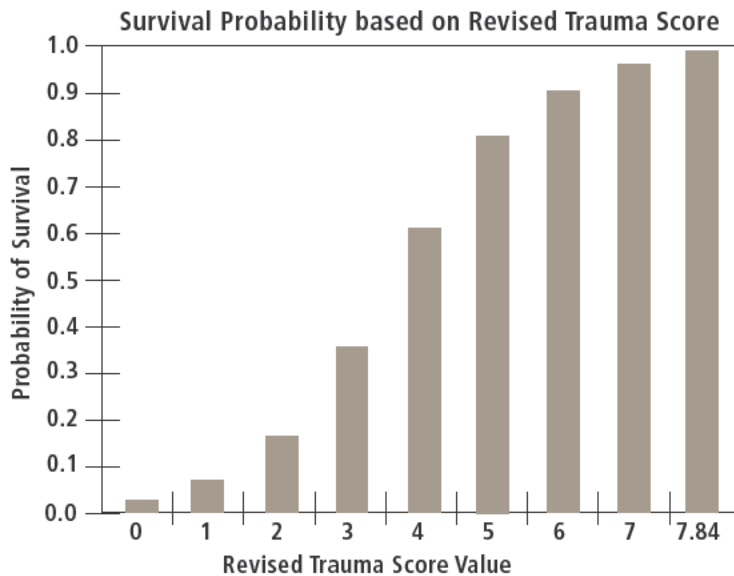
(d) GLASGOW COMA SCORE (GCS)

The GCS is used as part of the REVISED TRAUMA SCORE (RTS) in determining exclusion criteria for hospital admission in the case of pandemic flu at triage levels 2 and 3.

Glasgow Coma Scoring Criteria			
Criteria		Score	Criteria Score
Best Eye Response (4 possible points)	No eye opening	1	_____
	Eye opens to pain	2	
	Eye opens to verbal command	3	
	Eyes open spontaneously	4	
Best Verbal Response (5 possible points)	No verbal response	1	_____
	Incomprehensible sounds	2	
	Inappropriate words	3	
	Confused	4	
	Oriented	5	
Best Motor Response (6 possible points)	No motor response	1	_____
	Extension to pain	2	
	Flexion to pain	3	
	Withdraws from pain	4	
	Localizes to pain	5	
	Obeys commands	6	
Total Score (add 3 subscores; range 3 to 15):			_____

(e) 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 criterion for hospital admission during a pandemic flu at triage levels 2 and 3.



Revised Trauma Score Calculation				Adjusted Score
Criteria	Score	Coded value	Weighting	
Glasgow Coma Score	3	0	x 0.9368	_____
	4 to 5	1		
	6 to 8	2		
	9 to 12	3		
	13 to 16	4		
Systolic Blood Pressure (SBP)	0	0	x 0.7326	_____
	1 to 49	1		
	50 to 75	2		
	76 to 89	3		
	>89	4		
Respiratory Rate (RR) in breaths per minute (BPM)	0	0	x 0.2908	_____
	1 to 5	1		
	6 to 9	2		
	>29	3		
	10 to 29	4		
Revised Trauma Score (add 3 adjusted scores):				_____

(f) TRIAGE DECISION TABLE FOR BURN VICTIMS

A burn score of "Low" or worse on this table is an exclusion criterion for hospital admission in the case of pandemic flu at triage levels 2 and 3.

Age (yrs)	Burn Size (% total body surface area)									
	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 ≥90%) with aggressive and comprehensive resource allocation, including aggressive fluid resuscitation, admission ≥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 ≥14-21 days, multiple surgeries and prolonged rehabilitation; **Low:** Survival <50% even with long-term aggressive treatment and resource allocation; **Expectant:** Predicted survival ≤10% even with unlimited aggressive treatment.

(g) NEW YORK HEART ASSOCIATION (NYHA) FUNCTIONAL CLASSIFICATION SYSTEM

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 flu 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.

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(h) PUGH SCORE

A total PUGH SCORE >7 is an exclusion criterion for hospital admission in the case of pandemic flu 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 perioperative mortality 10%	
7 to 9	B	Liver transplant evaluation indicated Abdominal surgery perioperative mortality 30%	
10 to 15	C	Life expectancy 1-3 years Abdominal surgery perioperative mortality 82%	