Colorado Crisis Standards of Care

Colorado Medical Society

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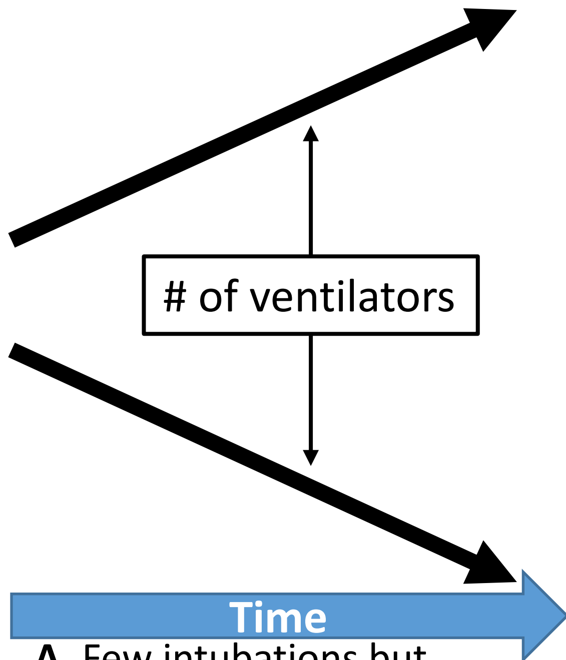
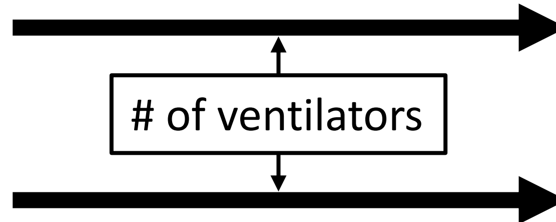
Core Principles

- Developed in the hope of never needing them
- Factors not clinically or ethically relevant to the triage process (e.g. race, gender, disability status, primary language, HIV status, criminal history, etc.) should not be considered.
- Triage begins when approaching Minimum Operating Capacity (MOC)
- Primary medical team should NOT make triage decisions.
- CSC Triage Team established for purpose of making triage decisions
- Tiered triage approach with focus on blinding the triage team to factors not relevant to the triage process
- Triage process is meant to eliminate within institution variation and minimize between institution variation in process

Trajectory of Ventilator Utilization

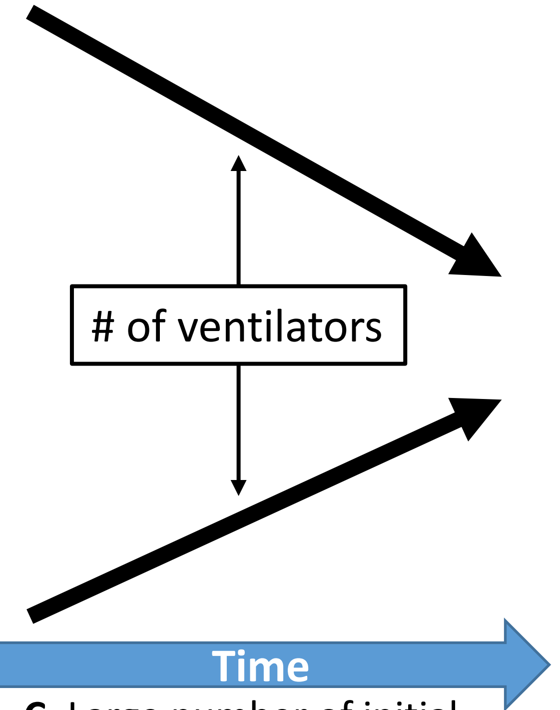


A. Few intubations but almost no extubations leads to increasing ventilator utilization due to duration of ventilation. I>>E



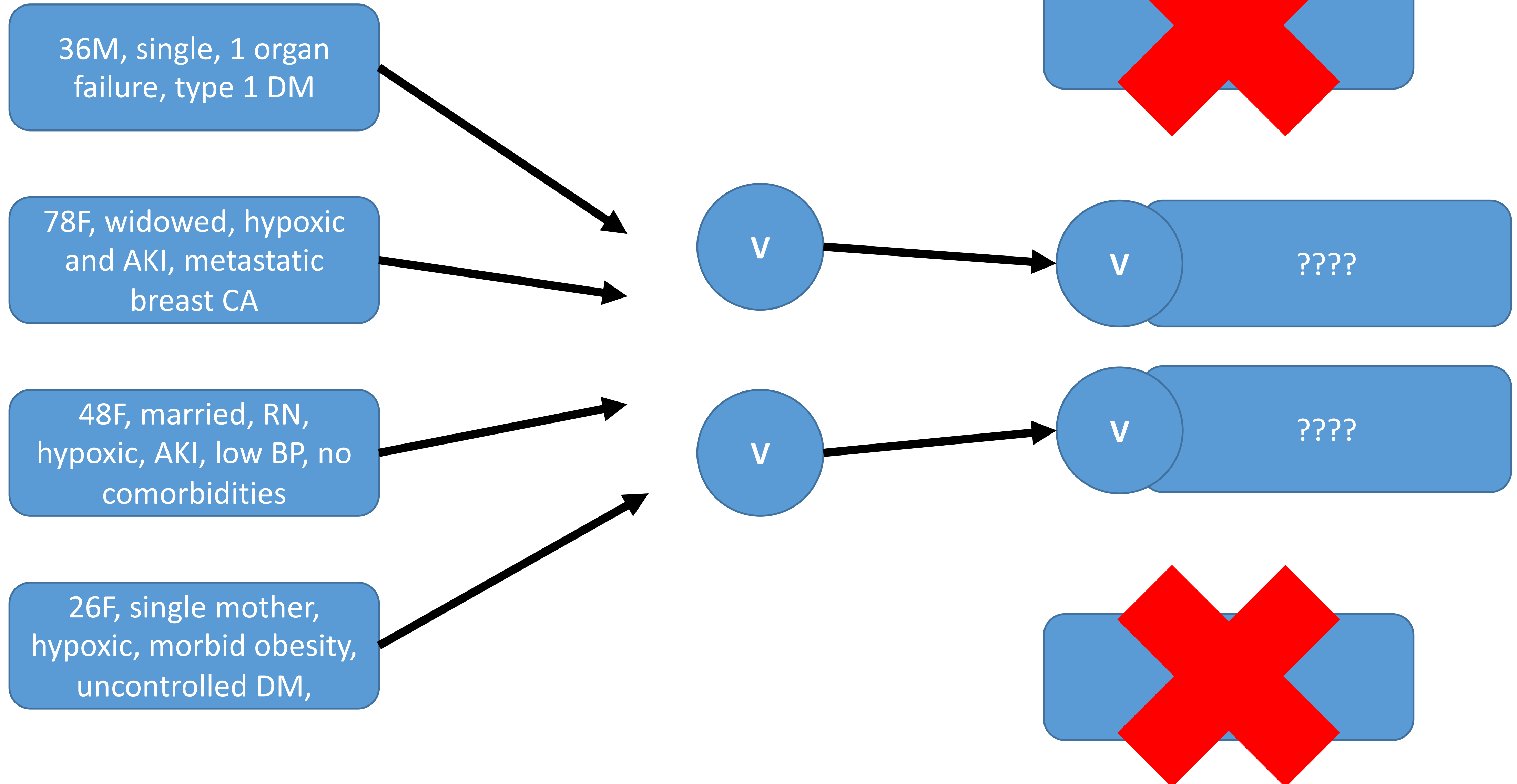
Time

B. Steady stream where intubations equal number extubated/die. I=E

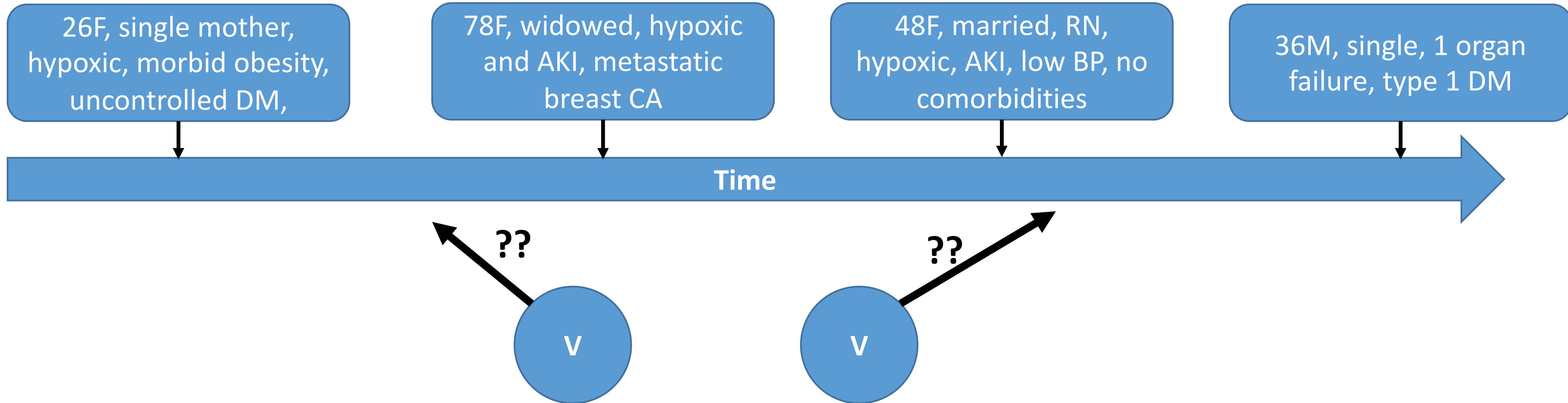


C. Large number of initial intubations but high numbers of extubations or deaths. I<<E

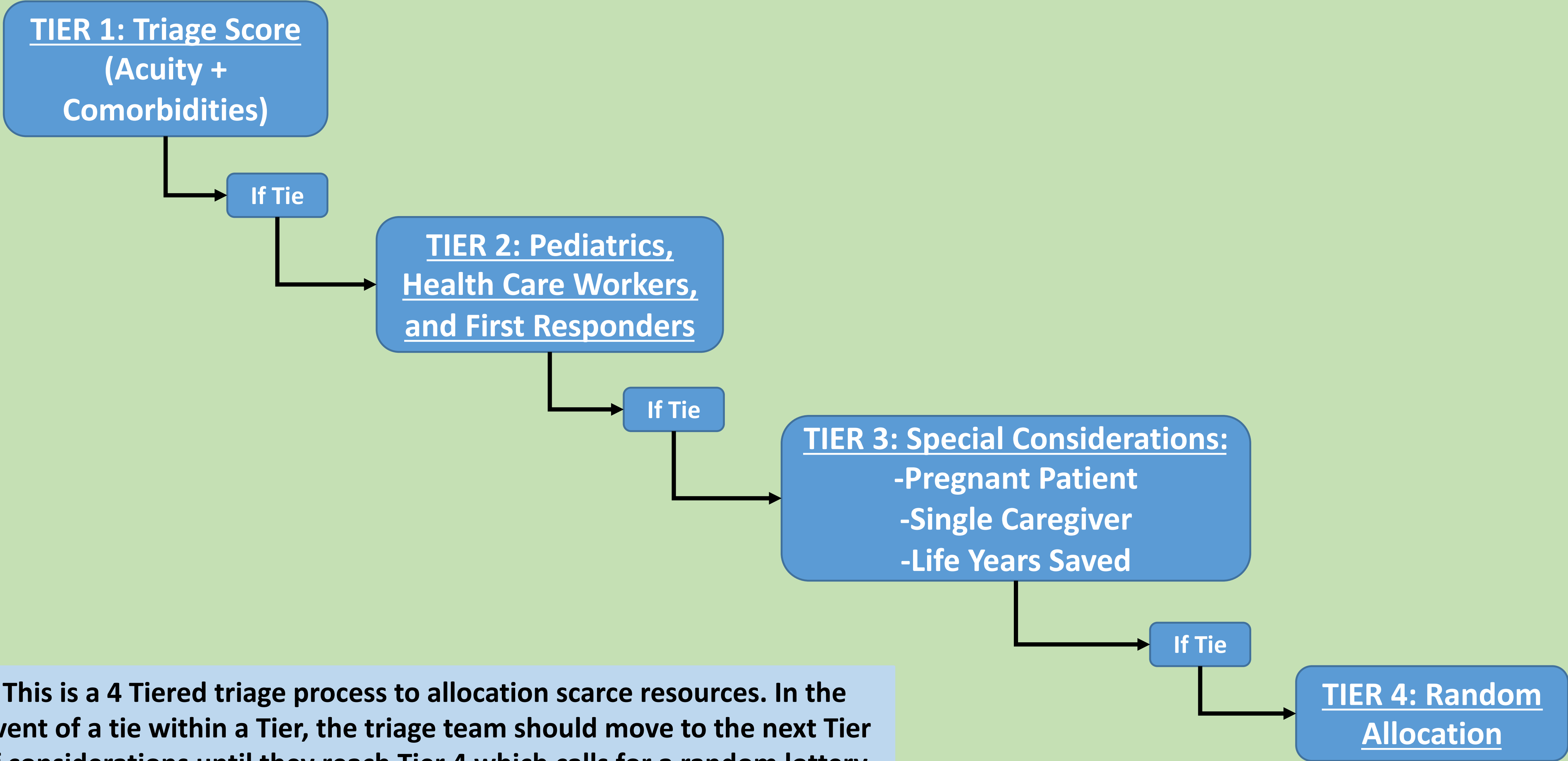
How people are talking about it



What we are really seeing



Crisis Standards of Care Triage Framework for Scarce Resources



CSC Triage Scoring Systems

Example 1

Principle	Specification	Point System[A]				
		0	1	2	3	4
Save the most lives	Prognosis for short-term survival (SOFA score[B])	X	SOFA score < 6	SOFA score 6-9	SOFA score 10-12	SOFA score > 12
Save the most life-years	Prognosis for near-term survival (Modified Charlson Comorbidity Index Score[C,D])	0	1-2	3-5	6-7	$\geq$8

Example 2

Principle	Specification	Point System[A]			
		1	2	3	4
Save the most lives	Prognosis for short-term survival (SOFA score[B])	SOFA score < 6	SOFA score 6-9	SOFA score 10-12	SOFA score > 12
Save the most life-years	Prognosis for near and long-term survival (medical assessment of comorbid conditions)	…	Major comorbid conditions with substantial impact on long-term survival	…	Severely life-limiting comorbid conditions; death likely within 1 year

Adult SOFA Score (Adults ≥18 years)

	POINTS				
Variables	**0**	**1**	**2**	**3**	**4**
Respiratory P_aO_2/FiO_2, mmHg	>400	≤400	≤300	≤200[A]	≤100[A]
Coagulation Platelets x $10^3/\mu L$	>150	≤150	≤100	≤50	≤20
Liver Bilirubin, mg/dL	<1.2	1.2-1.9	2.0-5.9	6.0-11.9	>12.0
Cardiovascular Hypotension[B]	No Hypotension	MAP<70 mm Hg	Norepinephrine ≤0.03 Dopamine≤ 5 OR dobutamine any dose	Dopamine >5 OR Epinephrine≤0.1 OR Norepinephrine ≤0.1	Dopamine ≥15 OR Epinephrine >0.1 OR Norepinephrine >0.1
Central Nervous System Glasgow Coma Scale	15	13-14	10-12	6-9	<6
Renal Creatinine, mg/dL OR UOP (mL/day)	<1.2	1.2-1.9	2.0-3.4	3.5-4.9 OR UOP<500	>5 OR UOP <200

Abbreviations: P_aO_2 - partial pressure of oxygen in the arterioles, FiO_2 – fraction of inspired oxygen, MAP – mean arterial pressure, UOP – urine output

[A]With mechanical ventilation or other form of artificial ventilation

[B]On vasopressor for at least 1 hour. Doses are given as μg/kg/min

Modified Charlson Comorbidity Index

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

[A]Severe=cirrhosis, portal hypertension, history of variceal bleeding. Moderate=cirrhosis, portal hypertension, Mild=chronic hepatitis or cirrhosis without portal hypertension
[B]AIDS defined as: Current CD4 count<200, Opportunistic infection in the last 1 month, active AIDS defining illness such as lymphoma of Kaposi’s Sarcoma

CSC Triage Team

- Role
  - Assign CSC Triage Score to patients
  - Determine CSC Triage Score Cutoff based on need and resources
  - Meet daily (at minimum)
  - ON CALL for rapid triage
  - Primary for all triage and re-allocation decisions
  - Blinded as much as possible to factors not relevant to triage

- Suggested Team Members
  - Physician (e.g. hospitalist, ICU)
  - Nurse representative
  - Ethicist/Palliative care specialist
  - Hospital leadership representative
- Identify Team Leader

The process and decisions are hard. We strongly recommend triage teams be formed before they are needed and practice with mock cases.

Types of Triage

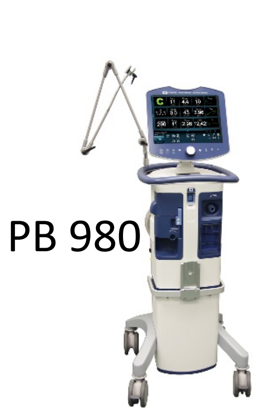
- Emergent Triage
  - ED
    - Cardiac arrest
    - Extremis
    - No information "found down"
  - Admitted
    - Sudden decomp. no prior triage
    - Floor cardiac arrest

- Prospective Triage
  - Identify population triaged daily
    - ICU
    - IMCU/SDU
    - All patients (EMR score)
  - Decompensation with time
    - Triage team ON CALL

- Re-Allocation Triage
  - Therapeutic failure
    - Duration of MV
    - Progressive MSOF
    - Imminent death despite treatment
  - Stabilization without improvement
    - Full vs Partial Vent

Re-Allocation: Extending the Supply

Full Ventilators


PB 980

PB 840

Hamilton G5

Draeger V500

Partial Ventilators

Philips V60

Trilogy 202

Disposable Resuscitator
e.g. Vortran GO2VENT

Anesthesia Machines
Transport Ventilators

Ethical Principles of CPR

- Prior to CSC, care should proceed as usual*
- Even with CSC, unilateral DNRs for populations (e.g. all COVID pts) not appropriate
- Withholding CPR
  - Risks to HCW excessively high
    - ***NO CPR WITHOUT APPROPRIATE AND SUFFICIENT PPE***
  - Futile/Non-beneficial care
  - Lack of resources (e.g. no ICU bed, no ventilators, insufficient staff)

Questions?

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Supplementary Slides

Determining CSC Cutoff Scores

Example 1

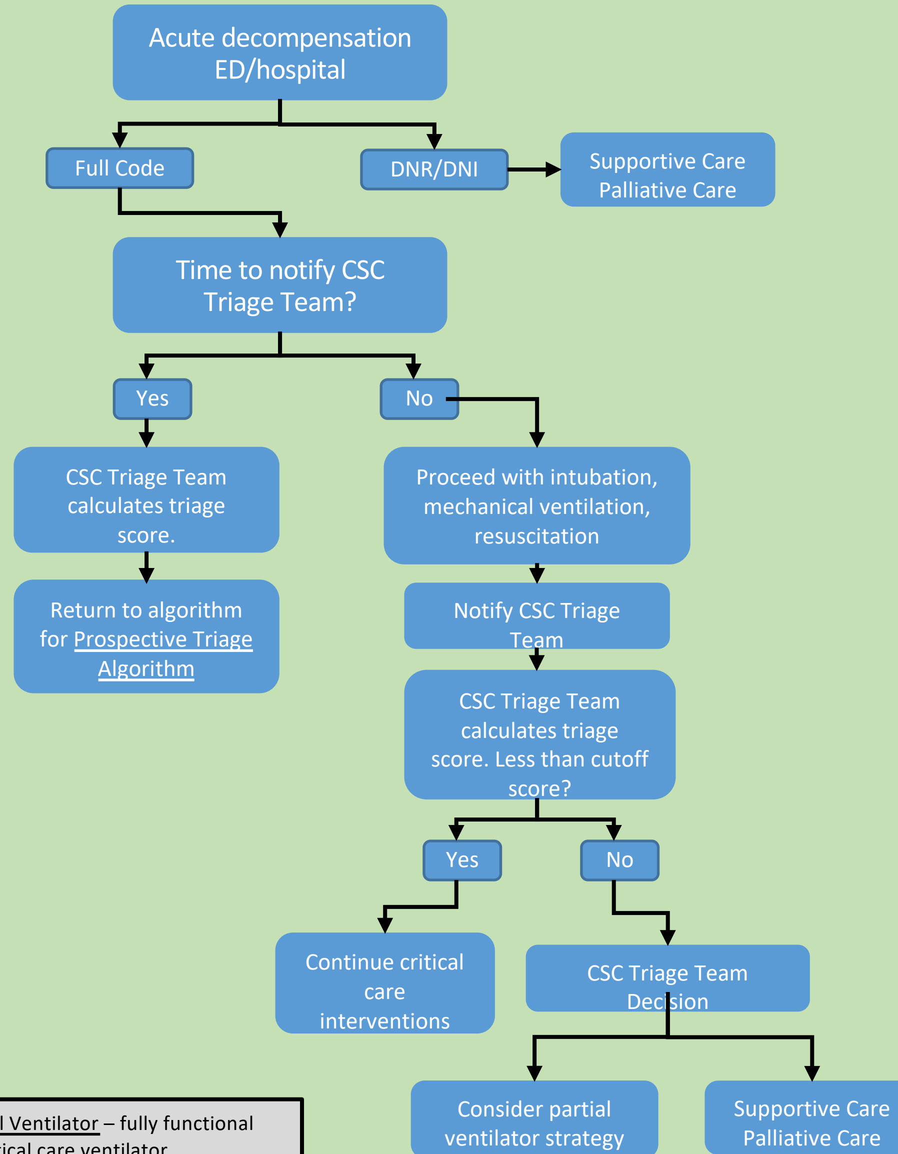
Number of Critical Care Ventilators Available	3
Number of Critical Care Ventilators Expected to Become Available	2
Average CSC Triage Score of Patients at Time of Intubation in last 3 Days	4
Average Number of Patients Intubated Per Day in Last 3 days	4

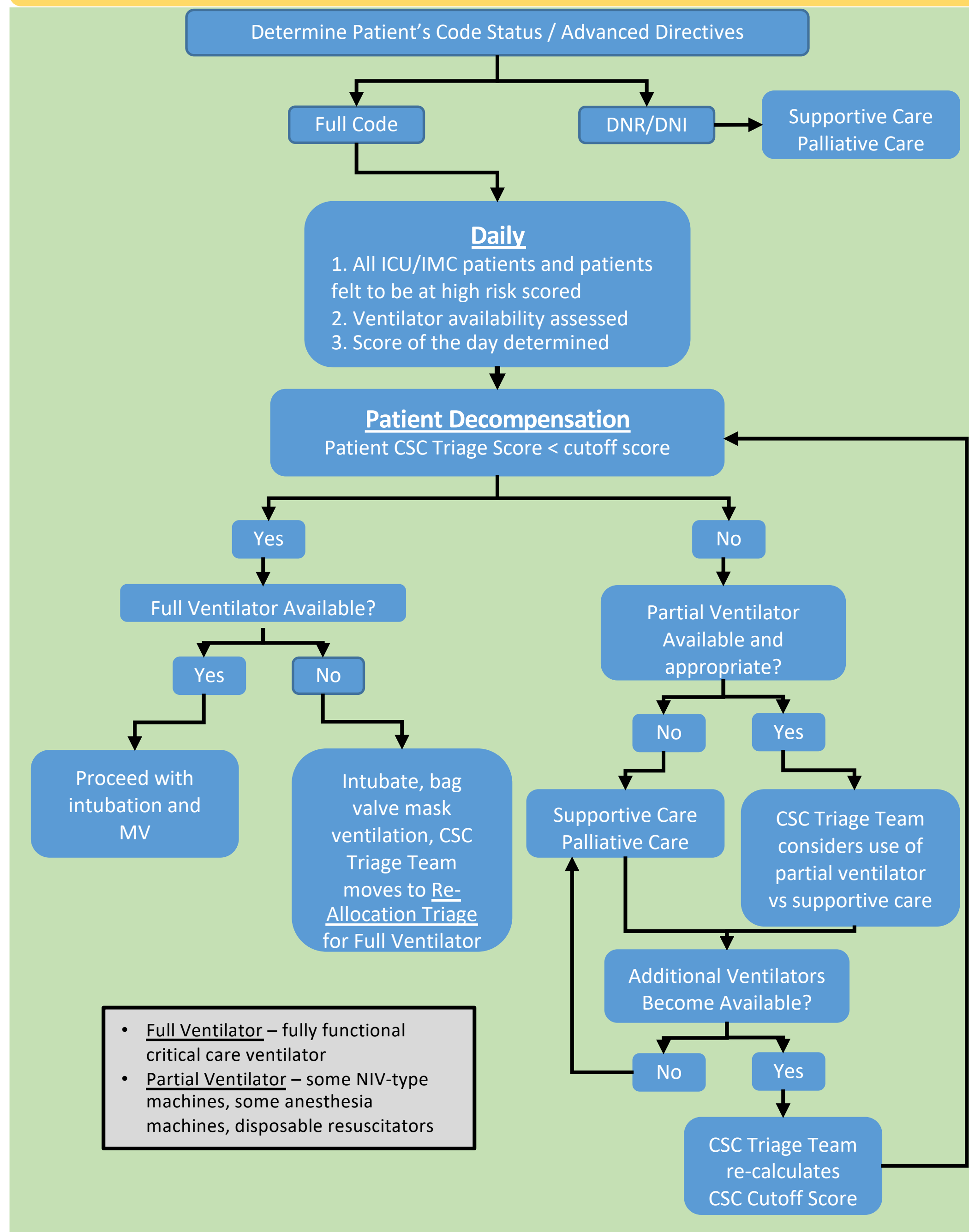
In this scenario there are expected to be 5 ventilators for the day but 2 may not be available until later in the day. If the rates for intubation are stable or slightly increasing, a CSC Triage Score cutoff could be set at 5. Patients with a score of 5 and above (much sicker than those presenting in the prior 3 days) would either be triaged to a less standard ventilator or would receive a ventilator but would be rapidly re-triaged if less sick patients presented.

Example 2

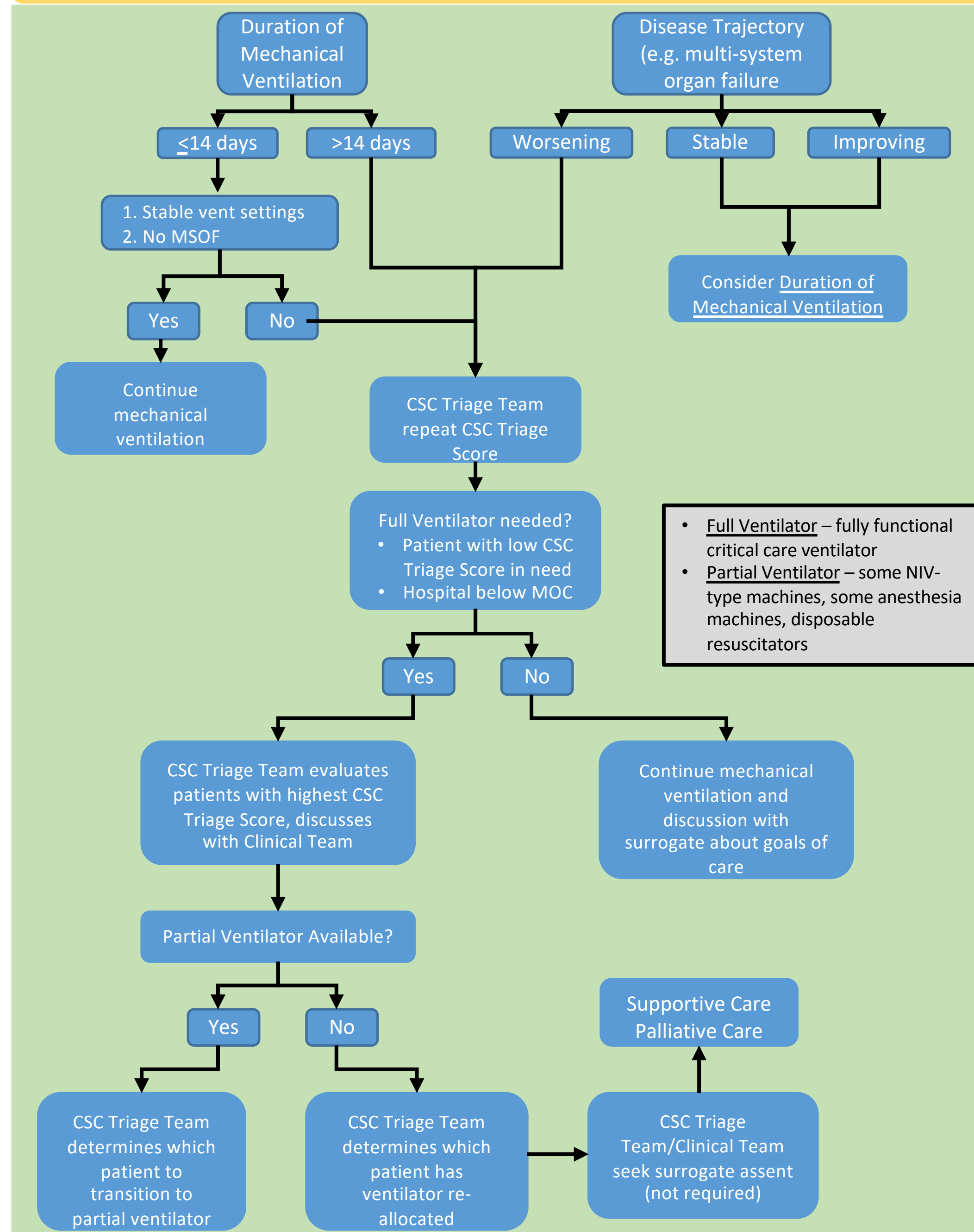
Number of Critical Care Ventilators Available	1
Number of Critical Care Ventilators Expected to Become Available	1
Average CSC Triage Score of Patients at Time of Intubation in last 3 Days	4
Average Number of Patients Intubated Per Day in Last 3 days	4

In this scenario, only 2 ventilators are expected to become available for the day with an expected need of 4. In this scenario a CSC Triage Score cutoff of 3 or 4 could be used. Given that patients with a score of 3 are not very sick, it could prompt a discussion of re-allocation of a ventilator from a patient that has failed a therapeutic trial or consideration for transfer to an institution with more resources. It would also indicate that patients with high triage scores (e.g. $\geq$6) would not receive a ventilator.


Crisis Standards of Care: Emergent Triage Process
Acute decompensation ED/hospital
Full Code
DNR/DNI
Supportive Care Palliative Care
Time to notify CSC Triage Team?
Yes
No
CSC Triage Team calculates triage score.
Return to algorithm for Prospective Triage Algorithm
Proceed with intubation, mechanical ventilation, resuscitation
Notify CSC Triage Team
CSC Triage Team calculates triage score. Less than cutoff score?
Yes
No
Continue critical care interventions
CSC Triage Team Decision
Consider partial ventilator strategy
Supportive Care Palliative Care
Full Ventilator – fully functional critical care ventilator
Partial Ventilator – some NIV-type machines, some anesthesia machines, disposable resuscitators



Crisis Standards of Care: Prospective Triage Process
Determine Patient's Code Status / Advanced Directives
Full Code
DNR/DNI
Supportive Care
Palliative Care
Daily
1. All ICU/IMC patients and patients felt to be at high risk scored
2. Ventilator availability assessed
3. Score of the day determined
Patient Decompensation
Patient CSC Triage Score < cutoff score
Yes
No
Full Ventilator Available?
Yes
No
Proceed with intubation and MV
Intubate, bag valve mask ventilation, CSC Triage Team moves to Re-Allocation Triage for Full Ventilator
Partial Ventilator Available and appropriate?
No
Yes
Supportive Care
Palliative Care
CSC Triage Team considers use of partial ventilator vs supportive care
Additional Ventilators Become Available?
No
Yes
CSC Triage Team re-calculates CSC Cutoff Score
Full Ventilator – fully functional critical care ventilator
Partial Ventilator – some NIV-type machines, some anesthesia machines, disposable resuscitators


Crisis Standards of Care: Re-Allocation Triage
Duration of Mechanical Ventilation
Disease Trajectory (e.g. multi-system organ failure
<14 days
>14 days
Worsening
Stable
Improving
1. Stable vent settings
2. No MSOF
Consider Duration of Mechanical Ventilation
Yes
No
Continue mechanical ventilation
CSC Triage Team repeat CSC Triage Score
Full Ventilator needed?
Patient with low CSC Triage Score in need
Hospital below MOC
Full Ventilator – fully functional critical care ventilator
Partial Ventilator – some NIV-type machines, some anesthesia machines, disposable resuscitators
Yes
No
CSC Triage Team evaluates patients with highest CSC Triage Score, discusses with Clinical Team
Continue mechanical ventilation and discussion with surrogate about goals of care
Partial Ventilator Available?
Supportive Care
Palliative Care
Yes
No
CSC Triage Team determines which patient to transition to partial ventilator
CSC Triage Team determines which patient has ventilator re-allocated
CSC Triage Team/Clinical Team seek surrogate assent (not required)