Allocation of Scarce Critical Care Resources During the COVID-19 Public Health Emergency in South Africa

CCSSA
CRITICAL CARE SOCIETY OF SOUTHERN AFRICA

SASA COVID-19 UPDATE
ENDORSED

Referral of any patient to ICU (COVID-19 + non-COVID-19)

Does the patient need to be admitted?
Critically ill needing ventilatory support/other organ support only in ICU?

YES

Has the patient expressed wish NOT to be admitted to ICU?

NO

Is the patient likely to benefit from being admitted to ICU?

YES

Frailty Assessment Scale
Assess function 1-2 weeks prior to presentation

SCORE < 6

RE-REFER

NO

YES

NO

SCORE ≥ 6

DETERIORATION

Management Plan excl. ICU
e.g. Isolation COVID-19 ward.
Advise on O_2 Rx, IPC.
e.g.non-COVID-19 patient in HCU/ward

Management Plan excluding ICU

e.g. Isolation COVID-19 ward.
Advise on O_2 Rx, IPC.

e.g.non-COVID-19 patient in HCU/ward

Discuss end-of-life issues with next-of-kin

No Response *or* Worsening

End-of-life care
(palliative care teams to provide additional support & consultation)

Calculate Priority Score(= SOFA + Co-morbidity)

Principle	Specification	Point System*			
		1	2	3	4
Save most lives	Prognosis for short-term survival	SOFA score < 6	SOFA score 6-8	SOFA score 9-11	SOFA score ≥12
Save most life-years	Prognosis for long-term survival (medical assessment of comorbid conditions)		Major comorbid conditions with substantial impact on long-term survival		Severely life-limiting conditions; death likely within 1 year

SOFA – Sequential Organ Failure Assessment
* Add points for SOFA category to points for Co-morbidity category. Point score between 1-8

RE-CLASSIFY

Improvement in clinical status and/or resource availability

Reassess daily for changes in resource availability or clinical status

No Response *or* Worsening

Transfer to Appropriate Site

- COVID-19 patients in Isolation ward
- Non-COVID-19 patients in high care/other site

Management Plan excl. ICU

- Medical care incl. intensive symptom management
- Advise on O_2 Rx, IPC
- Psychosocial support.
- Discuss end-of-life issues with next-of-kin

Patients triaged to not receive ICU bed/ventilation

RED
Priority Score 1-3
Highest priority for ventilator
Receive priority over all other groups in face of scarce resources

ORANGE
Priority Score 4-5
Intermediate priority for ventilator
Receive resources if available after all patients in red group allocated

YELLOW
Priority Score 6-8
Lowest priority for ventilator
Receive resources if available after all patients in red & orange groups allocated

If there are ties within the same colour group, rank as follows:

1. Patient age groups (years) in following order: 12-40; 41-60; 61-75; > 75.
2. Individuals whose work supports provision of acute care to others
3. Lower raw priority score from above (1-8)

Admit referrals sequentially from red to orange to yellow groups.
- Determinations daily of what priority scores will result in access to ventilators/beds
- Based on real-time knowledge of degree of scarcity of resources & prediction of volume of new cases over near-term

Patients in non-COVID-19 ICUs

Patients in COVID-19 ICU

Assess all patients admitted to ICU at 48 hours

- Quantify changes in patients' conditions
- Reclassify as per: i) recalculated SOFA scores; ii) new complications & iii) treating clinicians' input

RED
Highest priority for ventilator

ORANGE
Intermediate priority for ventilator

YELLOW
Lowest priority for ventilator

Subsequently assess all patients admitted to ICU at least every 24 hours

- Quantify changes in patients' conditions
- Reclassify as per: i) recalculated SOFA scores; ii) new complications & iii) treating clinicians' input

RED
Highest priority for ventilator

ORANGE
Intermediate priority for ventilator

YELLOW
Lowest priority for ventilator

Patients with substantial clinical deterioration & very low chance for survival

Discussion amongst team and then with next-of-kin

Critical care to be discontinued

End-of-life care

(palliative care teams to provide additional support & consultation)

References:
- Halpern S, White D. Allocation of Scarce Critical Care Resources During a Public Health Emergency. Univ Pittsburgh, Pennsylvania. 23 March 2020
- COVID-19 rapid guideline: critical care. NICE guideline. 20 March 2020. www.nice.org.uk/guidance/ng159
- Emanuel EJ, Persad G, Upshur R, et al. Fair Allocation of Scarce Medical Resources in the Time of Covid-19. NEJM. 2020. DOI: 10.1056/NEJMsb2005114
- COVID-19 pandemic triage for intensive-care treatment under resource scarcity. Swiss Med Wkly. 2020;150:w20229. doi:10.4414/smw.2020.20229
- Joynt GM, Gopalan PD, Argent A, et al. The Critical Care Society of Southern Africa Consensus Statement and Guideline on ICU Triage and Rationing (ConICTri). S Afr J Crit Care. 2019;35(1):36-65 and S Afr Med J 2019;109(8):613-642.

Note: This document is to be read in conjunction with the accompanying CCSSA "Allocation of Scarce Critical Care Resources During the COVID-19 Public Health Emergency in South Africa" document

Allocation of Scarce Critical Care Resources During the COVID-19 Public Health Emergency in South Africa

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Clinical Frailty Scale*



1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



2 Well – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.



3 Managing Well – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.



4 Vulnerable – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.



5 Mildly Frail – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



6 Moderately Frail – People need help with **all outside activities** and with **keeping house.** Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.



7 Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.



9 Terminally Ill - Approaching the end of life. This category applies to people with **a life expectancy <6 months,** who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

TABLE. Examples of comorbidities to be used for Priority Scoring

Examples of Major comorbidities (associated with significantly decreased long-term survival)	Examples of Severely Life Limiting Comorbidities (commonly associated with survival < 1 year)
• Moderate Alzheimer's disease or related dementia • Malignancy with a < 10 year expected survival • New York Heart Association Class III heart failure • Moderately severe chronic lung disease (e.g., COPD, IPF) • End-stage renal disease in patients < 75 • Severe multi-vessel CAD • Cirrhosis with history of decompensation • Current AIDS defining illness (*or* viral load >10000 copies/ml despite Rx *or* recent HIV diagnosis not on Rx with CD4+ < 50)	• Severe Alzheimer's disease or related dementia • Cancer being treated with only palliative interventions (including palliative chemotherapy or radiation) • New York Heart Association Class IV heart failure plus evidence of frailty • Severe chronic lung disease plus evidence of frailty • Cirrhosis with MELD score ≥20, ineligible for transplant • End-stage renal disease in patients older than 75

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score[a]

	Score				
System	0	1	2	3	4
Respiration					
Pao_2/Fio_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose)[b]	Dopamine 5.1-15 or epinephrine ≤0.1 or norepinephrine ≤0.1[b]	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1[b]
Central nervous system					
Glasgow Coma Scale score[c]	15	13-14	10-12	6-9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

Abbreviations: Fio_2, fraction of inspired oxygen; MAP, mean arterial pressure; Pao_2, partial pressure of oxygen.

[a] Adapted from Vincent et al.[27]

[b] Catecholamine doses are given as μg/kg/min for at least 1 hour.

[c] Glasgow Coma Scale scores range from 3-15; higher score indicates better neurological function.

Vincent JL, Moreno R, Takala J, et al. The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction/failure. On behalf of the Working Group on Sepsis-Related Problems of the European Society of Intensive Care Medicine. Intensive Care Med. 1996 Jul;22(7):707-10.

Note: In the absence of measured blood values for parameters needed for the SOFA score, it is suggested that clinical assessment of signs (such as bleeding for platelet value and jaundice for bilirubin value) by the managing doctor be performed to place the patient in the appropriate category for that parameter.