

Appendix 4: COVID management indicators' reference sheet

Indicator name	Numerator	Denominator	Type	Indicator elements
Level of care: All admission levels				
1. Timely anticoagulation prophylaxis	No of patients received anticoagulation prophylaxis within 24 hr of admission	All discharged COVID patients	Process	<ul style="list-style-type: none"> • Date and time of admission • Date and time of receiving prophylactic anticoagulant • Number of discharges
2. Effective anticoagulation therapy	No of patients whom their antiXa achieved the target within 48 hrs of starting anticoagulation therapy	All discharged COVID patients received therapeutic anticoagulation for more than 48 hrs	outcome	<ul style="list-style-type: none"> • Date and time of admission • Date and time of receiving therapeutic anticoagulant • Date and time of first antiXa achieved the target • Number of discharges
3. Timely Dexamethasone therapy	No of patients received Dexamethasone therapy within 24 hr of admission	All discharged COVID patients	Process	<ul style="list-style-type: none"> • Date and time of admission • Date and time of receiving Dexamethasone • Number of discharges
4. Appropriate Tocilizumab indication	No of patients received Tocilizumab whom their modified H score was > 132 and has no contraindications	All discharged COVID patients received Tocilizumab therapy	Process	<ul style="list-style-type: none"> • Date and time of receiving Tocilizumab • Patient's Modified H score
Level of care: Wards/ intermediate care units				
5. Appropriate patient allocation to the ward according to MEWS Score	No of patients scored 1-6 whom admitted to ward	All newly admitted to ward COVID patients	Process	<ul style="list-style-type: none"> • MEWS score on admission • Location • Number of admissions • Days since admission
6. Appropriate patient allocation to the HDU/ Intermediate Care Unit according to MEWS Score	No of patients scored > 6 whom admitted to HDU/ Intermediate Care Unit	All newly admitted to HDU/ Intermediate Care Unit COVID patients	Process	<ul style="list-style-type: none"> • MEWS score on admission • Location • Number of admissions • Days since admission
7. Self-proning position compliance	No of observations where patients were compliant with self-proning position	All observation opportunities of discharged COVID patients	Process	<ul style="list-style-type: none"> • Self-proning compliance • Number of discharges • Days in ward/ intermediate care • Type of ward

Indicator name	Numerator	Denominator	Type	Indicator elements
8. Self-proning position compliance reflected on oxygen saturation	No of observations where patients were compliant with self-proning position whom their SpO ₂ = 92-96 (88-92 in COPD)	All observations of patients compliant with self-proning position	Outcome	<ul style="list-style-type: none"> Self-proning compliance Number of discharges Days in ward/ intermediate care Oxygen saturation Type of ward
9. Good oxygenation on O ₂ nasal cannula	No of observations where patients were receiving oxygen via nasal cannula whom their SpO ₂ = 92-96 (88-92 in COPD) and have no ↑ in work of breathing	All observations of patients receiving oxygen via nasal cannula	Outcome	<ul style="list-style-type: none"> Oxygen supplement Oxygen saturation Work of breathing
10. Good oxygenation on O ₂ mask	No of observations where patients were receiving oxygen via O ₂ mask whom their SpO ₂ = 92-96 (88-92 in COPD) and have no ↑ in work of breathing	All observations of patients receiving oxygen via O ₂ mask	Outcome	<ul style="list-style-type: none"> Oxygen supplement Oxygen saturation Work of breathing
11. Good oxygenation on non-rebreathing mask	No of observations where patients were receiving oxygen via non-rebreathing mask whom their SpO ₂ = 92-96 (88-92 in COPD) and have no ↑ in work of breathing	All observations of patients receiving oxygen via non-rebreathing mask	Outcome	<ul style="list-style-type: none"> Oxygen supplement Oxygen saturation Work of breathing
12. Good oxygenation on High Flow Nasal Cannula	No of observations where patients were receiving oxygen via High Flow Nasal Cannula whom their SpO ₂ = 92-96 (88-92 in COPD) and have no ↑ in work of breathing	All observations of patients receiving oxygen via High Flow Nasal Cannula	Outcome	<ul style="list-style-type: none"> Oxygen supplement Oxygen saturation Work of breathing
13. Good oxygenation on CPAP	No of observations where patients were receiving oxygen via CPAP whom their SpO ₂ = 92-96 (88-92 in COPD) and have no ↑ in work of breathing	All observations of patients receiving oxygen via CPAP	Outcome	<ul style="list-style-type: none"> Oxygen supplement Oxygen saturation Work of breathing
14. Transfer to ICU	No of patients transferred from wards/ intermediate care units to ICU	All discharged from ward/ intermediate care unit COVID patients	Outcome	<ul style="list-style-type: none"> Patient destination Total discharges
15. Ward mortality rate of COVID patients	No of mortality COVID patients in wards	All discharged from ward/ intermediate care unit COVID patients	Outcome	<ul style="list-style-type: none"> Patient destination Total discharges
16. Average stay in wards/ Intermediate care units	No of all days of wards/ Intermediate care units stay	All discharged from ward/ intermediate care unit COVID patients	Outcome	<ul style="list-style-type: none"> Total discharges Admission date Discharge date
Level of care: ICU				

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Haemodynamic Management				
17. Fluid responsiveness test compliance	No of observations of performing fluid responsiveness test	No of opportunities to perform fluid responsiveness test of discharged COVID patients	Process	<ul style="list-style-type: none"> Fluid responsiveness test Contraindications to do the test
18. Fluid responsiveness test-guided haemodynamic management	Number of days where fluid responsiveness test was done at least twice and the patients have fluid balance 0 to -500 ml/day and MAP > 65 mmHg with adequate tissue perfusion	All ICU days of discharged COVID patients where fluid responsiveness test was done at least twice	Outcome	<ul style="list-style-type: none"> MAP Fluid balance Capillary refilling Fluid responsiveness test
19. Successful haemodynamic management	Number of days where the patients have fluid balance 0 to -500 ml/day and MAP > 65 mmHg with adequate tissue perfusion	All ICU days of discharged COVID patients	Outcome	<ul style="list-style-type: none"> MAP Fluid balance Capillary refilling ICU admission date ICU discharge date
20. % of Acute Kidney Injury	Number of discharged patients who needed dialysis with no previous history of RF	All ICU discharged COVID patients	Outcome	<ul style="list-style-type: none"> ICU discharges Patient needed dialysis Location Patient Renal function Patient distention
Intubation/ mechanical ventilation				
21. Timely intubation	No of intubated patients within 2 hrs after positive signs of NIV failure	All intubated COVID patients	Process	<ul style="list-style-type: none"> Intubation episodes Date and time of intubation RR ↑ Work of breathing SpO₂ Tv Date and time of positive signs of NIV failure
22. Uncomplicated intubation	No of intubations of patients whom their intubation went smoothly	All episodes of intubation of COVID patients	Outcome	<ul style="list-style-type: none"> Intubation episodes Intubation outcome
23. Proper driving pressure	No of observations of discharged weaned patients whom their driving pressure < 15 cm H ₂ O	All observations of discharged weaned COVID patients	Outcome	<ul style="list-style-type: none"> ICU discharges Driving pressure Intubation status

Indicator name	Numerator	Denominator	Type	Indicator elements
24. Patient proning compliance	Number of days where patients were in prone position for 16 hrs whom their PaO ₂ /FiO ₂ < 150	All ICU days of discharged weaned COVID patients whom their PaO ₂ /FiO ₂ < 150	Process	<ul style="list-style-type: none"> • ICU discharges • Indication for proning • PaO₂ • FiO₂ • Date and time of intubation • Date and time of weaning
25. Proper weaning	No of weaned patients who fulfilled the weaning criteria	All trials for weaning of discharged COVID patients	Process	<ul style="list-style-type: none"> • ICU discharges • Weaning criteria
26. Successful weaning	No of weaned patients who are stable	All trials for weaning of discharged COVID patients	Outcome	<ul style="list-style-type: none"> • ICU discharges • ICU admission date • ICU discharge date • Result of weaning trial • PaO₂ • PaCO₂ • BP • HR • SpO₂
27. Average days of mechanical ventilation	No of all days of mechanical ventilation	No of all discharges of weaned COVID patients	Outcome	<ul style="list-style-type: none"> • ICU discharges • Date and time of intubation • Date and time of weaning
28. ECMO use	No of ECMO patients	All discharges of weaned COVID patients	Outcome	<ul style="list-style-type: none"> • ICU discharges • ECMO patients
29. Average stay in ICU	No of all days of ICU stay	No of all discharged from ICU COVID patients	Outcome	<ul style="list-style-type: none"> • ICU discharges • ICU admission date • ICU discharge date
30. ICU mortality rate of COVID patients	No of mortality COVID patients in ICU	All discharged from ICU COVID patients	Outcome	<ul style="list-style-type: none"> • ICU discharges • Patient destination