



## COVID-19 Outbreak Control and Prevention State Cell

Health & Family Welfare Department

Government of Kerala

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### **ADVISORY REGARDING RATIONAL USE OF OXYGEN DURING COVID PANDEMIC**

**NO: 23/31/F2/2020/Health- 2<sup>nd</sup> May 2021**

The country and the state of Kerala is experiencing worst phase of COVID pandemic. The state is taking concerted efforts to contain the epidemic and to provide efficient health care and support to the patients. Oxygen management is one of the most important aspects in the treatment management of the COVID patients. In order to optimize demand side oxygen usage, the following guidelines are issued.

A. Administrative level:

1. Oxygen audit committee shall maintain an inventory of Oxygen requirement, daily usage, stock available on a 6-12 Hr basis
2. Storage facility to be upgraded to store next two days anticipatory requirement.
3. Arrange for refilling well in advance to ensure atleast 50% of storage capacity is always in stock
4. Shall track incoming supply of Oxygen
5. Daily audit of Oxygen uses in ICUs / Ward
6. Available Oxygen to be diverted to Emergency care and ICUs.

B. Clinical:

1. Oxygen prescription: (Written-like any other drug, mention flow rate, end points in terms of SpO<sub>2</sub>/ PaO<sub>2</sub>)

Goals:

- a. SpO<sub>2</sub>: 90-94%, if not having increased work of breathing.
- b. Monitor SpO<sub>2</sub> continuously in ICUs, make necessary changes so as to meet the Oxygenation goals.

*Note: The World Health Organisation (WHO) recommends an oxygen therapy during resuscitation of COVID-19 patients to achieve an SpO<sub>2</sub> of 94% or more, and 90% or more when stable (non-pregnant patients).*

*Surviving sepsis guideline for COVID-19 pneumonia suggests starting supplemental oxygen if the SpO<sub>2</sub> is less than 92% and recommended to*



start supplemental oxygen if the  $SpO_2$  is less than 90%. They recommended to target  $SpO_2$  should not be more than 96%.

ARDS.net guideline recommends partial pressure of arterial oxygen ( $PaO_2$ ) of 55-80 mmHg (7.3-10.7 kPa) or a peripheral oxygen saturation ( $SpO_2$ ) of 88-95%.

AllMS protocol recommend a target  $SpO_2$  of 92-96% for moderate disease category

HOT-COVID trial is ongoing

2. Establish plan regarding degree of escalation of therapy based on frailty index score early in the course of treatment
3. De-escalate Oxygen therapy as patient improves clinically
4. Encourage to keep mouth closed during HFNC use
5. Awake repositioning protocol to be started in all hospitalised patients and in those needing supplementary oxygenation as tolerated. Can also be tried in patients at home care.
6. Prone position ventilation, recruitment manoeuvre as indicated on a case-to-case basis after intubation for refractory hypoxemia.

#### C. Equipment:

1. Select the most appropriate equipment and set recommended Oxygen flow so as to maintain Oxygenation goals. Example:

Nasal Cannula: 1-6 LPM

Simple face mask: 5-8LPM

2. Restrict use of HFNC especially with high  $FiO_2$
3. Use Non-Rebreathing Bag with optimally fitting mask (Monitor for air hunger-if so, increase flow rate)
4. Use CPAP machine/BiPAP machine with lower Oxygen flow (higher mean airway pressure can increase Oxygenation) instead of high flow oxygen devices, as tolerated.
5. Ensure adequate fit of right size mask (use templates while selecting interface) in patients receiving Non-invasive ventilation to avoid leakage
6. Ensure right size of Endotracheal tube with optimal cuff pressure so as to minimise leaks
7. Switch to standby mode when disconnecting the ventilator from patient as during feeding. (Supplement Oxygen with nasal prongs/cannula while feeding as needed)



8. Use Closed suction device thus preventing de-recruitment during open suctioning.

D. Technical: (Biomedical team)

1. Wastage of Oxygen through leak sought for daily and rectified early
2. Maintain Base flow in ventilator to minimum if such can be adjusted
3. Ensure closure of valves in pipeline system in "no-use areas"
4. Encourage use of Oxygen concentrators for Home Oxygen treatment
5. Standby by bulk cylinders with conversion kit for use in Critical areas in case central supply fails

E. Training:

1. Regular training to Staff nurses, Nursing Assistants, ICU/OT Technicians regarding the optimal use of Oxygen, the end points of Oxygen therapy, to detect leaks and to follow Oxygen prescription as directed by the Physician.

  
Principal Secretary

Reference:

1. ARDS.net Protocol:  
[http://www.ardsnet.org/files/ventilator\\_protocol\\_2008-07.pdf](http://www.ardsnet.org/files/ventilator_protocol_2008-07.pdf)
2. The LOCO2 Trial: Liberal or Conservative Oxygen Therapy for Acute Respiratory Distress Syndrome.
3. Conservative Oxygen Therapy during Mechanical Ventilation in the ICU: ICU ROX  
<https://www.nejm.org/doi/full/10.1056/NEJMoa1903297>
4. Girardis M, Busani S, Damiani E, Donati A, Rinaldi L, Marudi A, et al. Effect of conservative vs conventional oxygen therapy on mortality among patients in an intensive care unit: the Oxygen-ICU randomized clinical trial. JAMA 2016;316(15):1583–1589. DOI: 10.1001/jama.2016.11993.
5. Chu DK, Kim LH, Young PJ, Zamiri N, Almenawer SA, Jaeschke R, et al. Mortality and morbidity in acutely ill adults treated with liberal versus conservative oxygen therapy (IOTA): a systematic review and meta-analysis. Lancet 2018;391(10131):1693–1705. DOI: 10.1016/S0140-6736(18)30479-3