GOVERNMENT OF KARNATAKA

No: HFW 315 ACS 2020

Karnataka Government Secretariat
Vikasa Soudha
Bengaluru, Date: 21.08.2020

CIRCULAR

There is an unprecedented surge in the demand of Oxygen to treat COVID-19 patients. The Clinical Expert Committee has conducted an analysis of the usage of Oxygen, which reveals that there is a non judicious and excessive use of Oxygen Therapy without proper monitoring. Excessive usage besides having deleterious health effects is resulting in the wastage of precious resource leading to a shortage of the commodity and waste of money.

The Clinical Expert Committee has considered it necessary to issue guidelines for a judicious use of Oxygen as a Therapy to treat COVID-19 patients. The Oxygen Therapy protocol finalized by the Clinical Expert Committee is attached herewith. All the Health Institutions and Doctors are advised to strictly adhere to the recommended protocol.

21/08/2020
(Jawaid Akhtar)
Additional Chief Secretary to Govt.
Health and Family Welfare Department

To:

1) Commissioner, BBMP
2) All Deputy Commissioners
3) All Chief Executive Officer of Zilla Panchayat
4) Commissioner, HFWS
5) Mission Director, NHM
6) Executive Director, SAST
7) Director, HFWS
8) Director, Medical Education.
9) All DHOs
10) All District Surgeons / District Surveillance Officer

Copy to:

1) Chief Secretary to Govt., of Karnataka
2) PS to Hon. Minister for HFW
3) PS to Hon. Minister for Medical Education.

(ANNEXURE-01)

OXYGEN THERAPY IN COVID19 PATIENTS AND ITS JUDICIOUS USAGE in COVID19 PANDEMIC

In view of the present COVID19 pandemic, there is sudden unprecedented demand for Oxygen as a therapy to treat COVID19 patients. But it has also lead to unwanted, excess, injudicious & over usage of Oxygen Therapy without monitoring. Hence, following guidelines should be considered for Oxygen Therapy of COVID19 patients to reduce the unwanted, injudicious usage and save the precious Oxygen for real needy COVID19 patients across the state.

A. **TARGET SATURATION (with lowest FiO2 possible) in COVID19 patients**

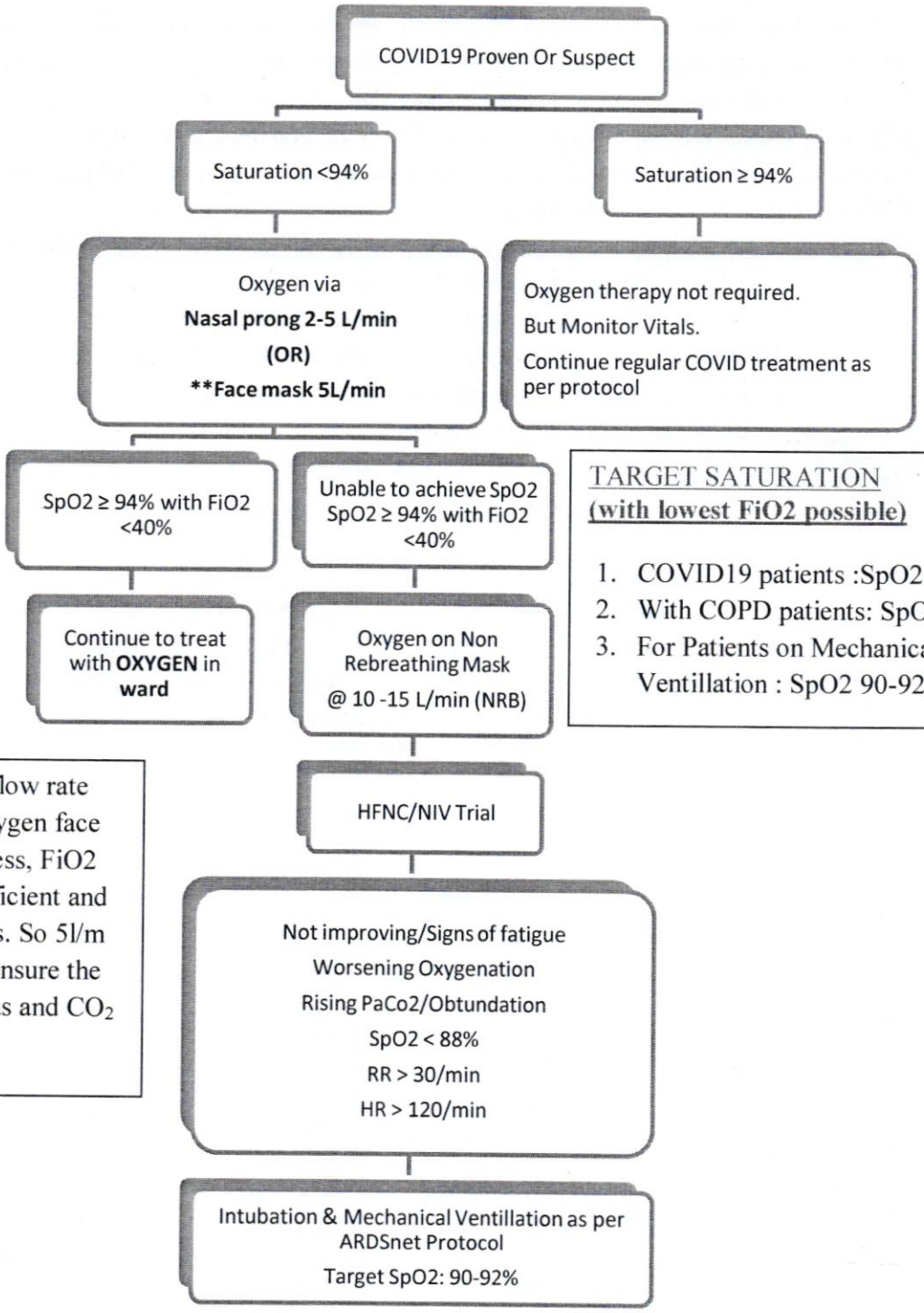
1. COVID19 patients :SpO2 94-96%
2. With COPD patients: SpO2 88-92%
3. For Patients on Mechanical Ventillation : SpO2 90-92%

Target SpO2 cut off is 94-96%, not to aim for SpO2- 100%

B. **Oxygen Delivery Devices And Fio2 Range**

100% O2 Flow Rate	FiO2 (%)
Nasal cannula	
1	24
2	28
3	32
4	36
5	40
6	44
Oxygen Mask	
5-6	40
6-7	50
7-8	60
Mask with Reservoir Bag	
6	60
7	70
8	80
9	90
10	>99
Nonrebreathing Mask 4-10	60-100
Venturi Mask	
3	24
6	28
9	35
12	40
15	50

C. ALGORITHM of OXYGEN THERAPY for COVID19 at TRIAGE



TARGET SATURATION
(with lowest FiO2 possible)

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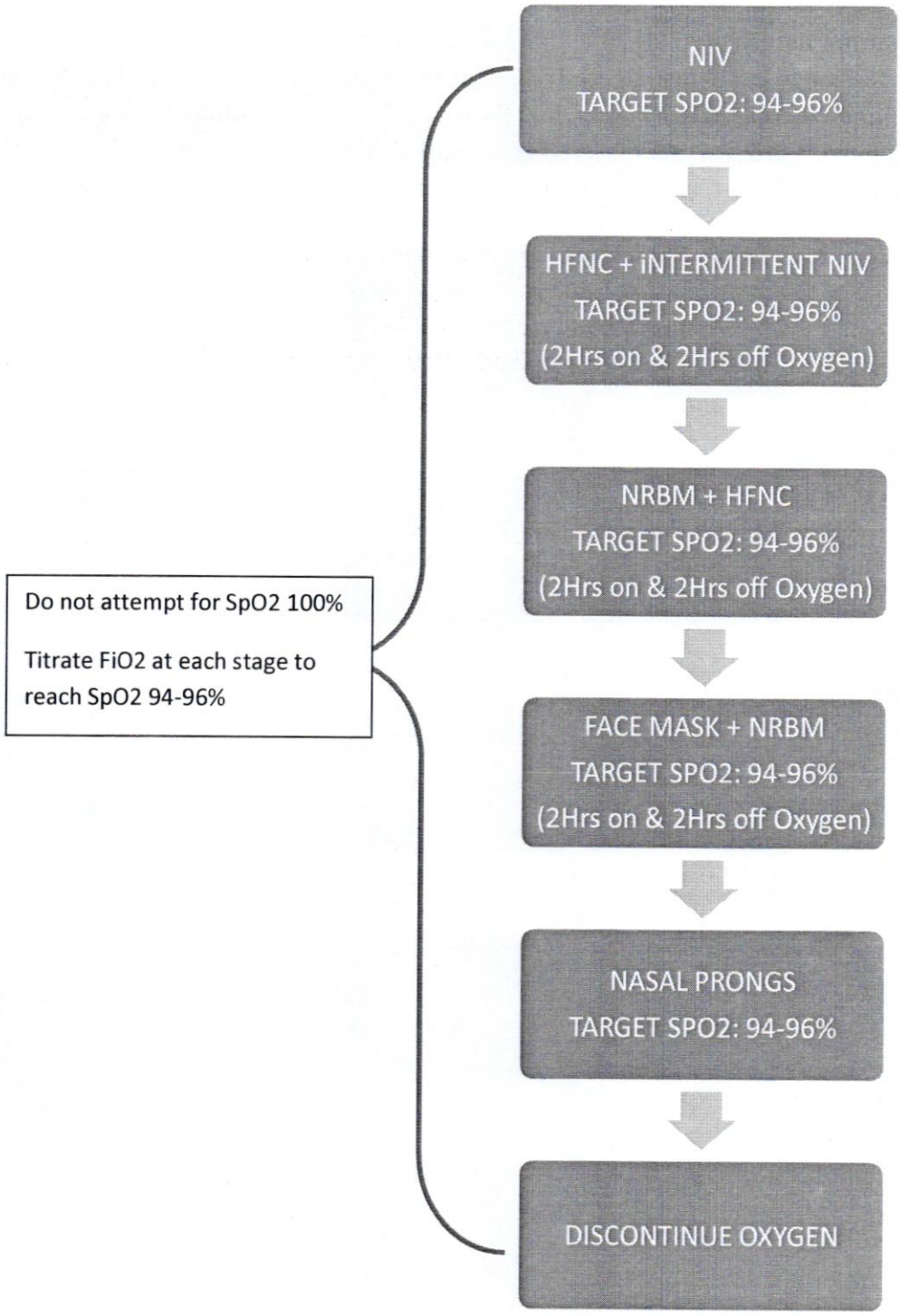
**Minimum oxygen flow rate required for using Oxygen face mask is 5 l/m. If it's less, FiO2 delivery will be insufficient and CO_2 retention happens. So 5l/m and above is must to ensure the washout of exhaled gas and CO_2 retention.

D. Oxygen Delivery And Titration To Be Done As Shown Below In Wards

- Titrate oxygen up or down to maintain the target oxygen saturation
- **This flow chart shows available options for stepping up or down in Wards**
- **Allow at least 5 mins at each dose before adjusting** further upwards or downwards (except with Major and sudden fall in saturation – falls ≥ 3% also require clinical review)
- **Once the patient has adequate and stable saturation on minimal oxygen dose, consider discontinuation of oxygen therapy**

E. WEANING of OXYGEN THERAPY



F. PULMONARY OXYGEN TOXICITY – Adverse events due to excess oxygen therapy

BIOCHEMICAL BASIS OF PULMONARY OXYGEN TOXICITY

- Free radicals – generated due to excess oxygen will damage the lung tissue
- Cellular antioxidants – protects the lung tissue
- Tissue damage – occurs in two phases
  1. Exudative phase and
  2. Proliferative Phase

Recovery from oxygen injury is characterized by interstitial scarring and fairly normal appearing capillary endothelium and alveolar epithelium

CLINICAL MANIFESTATIONS OF PULMONARY OXYGEN TOXICITY

Clinical oxygen toxicity is manifest in several ways. Normal subjects experience a decrease in vital capacity and fall in DlCO. Lung compliance is diminished. Tracheobronchitis, which produces substernal chest pain, may also occur.

Excess oxygen worsens Sepsis induced MODS

Most clinically relevant concerns over oxygen toxicity center around
(1) absorption atelectasis;
(2) hypercapnic respiratory failure in at-risk individuals;
(3) acute respiratory distress syndrome (ARDS); and
(4) hyaline membrane disease, leading to bronchopulmonary dysplasia (BPD) in newborns.

References:

1. *O'Driscoll BR, et al. BTS GUIDELINE FOR OXYGEN USE IN ADULTS IN HEALTHCARE AND EMERGENCY SETTINGS. Thorax 2017;72:i1–i90. doi:10.1136/thoraxjnl-2016-209729*

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3. *Matthew Wemple / Joshua O. Benditt. Oxygen Therapy and Toxicity. Fishman's Pulmonary Diseases and Disorders. Fifth Edition.*

4. *Massimo Girardis 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 Published online October 5, 2016*