From

Additional Chief Secretary to Haryana Government
Health Department

To

1. All the Deputy Commissioners of State
2. All the Civil Surgeons of State

Memo No. 3PM(COVID)/2021/1047-1090 Dated: 28.04.2021

Subject: Protocols to rationalize the hospital beds and oxygen consumption for COVID patients.

With reference to the subject cited above,

In view of recent COVID-19 surge, the number of COVID cases requiring hospitalization and accordingly the demand of oxygen for hospitals have increased manifold. The matter has been discussed in the meeting of Crisis Coordination Committee held on 27.04.2021 and it has been decided that the following protocols to rationalize the hospital beds and oxygen consumption for COVID patients are strictly implemented in the State:

1. The Proposed COVID-19 Management State Protocol-April’2021 (Annexure-A) and revised Discharge Policy, issued by MoHFW (GoI) (Annexure-B) shall be strictly followed in all the Dedicated COVID hospitals for treatment of COVID patients.
2. Patient oxygen consumption norms, issued by MoHFW (GoI) (Annexure-C) shall be followed in letter and spirit.
3. In each district, the hospitals having less than 10 beds shall not be allowed to admit and treat COVID patients, except Gurgaon, Faridabad, Panchkula, Karnal, Hisar and Sonipat, where the minimum number shall be 15-20 beds.

However, it shall be ensured that total No. of beds for COVID patients does not decrease in any district. The number of beds, if decreased by disallowing the hospitals with less than 10-20 beds, as mentioned above, shall be added in the larger hospitals.

It is clarified that no hospital, which is not enlisted on S3 portal, shall be allowed to treat COVID patient, without prior approval; any violation of the same may invoke action under section 188 of Indian Penal Code, exercising the powers conferred under the Epidemic Diseases Act, 1897.

4. The addition of beds or private health facilities for providing treatment to COVID patients shall be done on the basis of requirement of additional health facilities in the district,
availability of prerequisite infrastructure/manpower/oxygen supply/essential drugs/etc. with such health facility, possibility of allocation of oxygen, etc. Formal orders regarding addition/deletion of health facilities shall be issued under intimation to O/o MD-NHM and O/o DGHS, so that the details may be updated on the S3 portal.

5. All the Civil Surgeons shall ensure that a vehicle carrying oxygen concentrator/cylinders (3-4 in No.) is readily available to meet any exigency w.r.t. oxygen supply at any private or Govt. COVID hospital in the district, as a stopgap arrangement till the regular oxygen supply is reinstated.

6. Isolation facilities (DCCC/Hotels/etc.) with oxygen support may be requisitioned and attached with tertiary care institutions for managing pre-admission and recovering patients, which do not require intense hospital care but still cannot be discharged; so that hospital beds are made available for most needy patients.

A District Level Committee to ensure the above is constituted, as follows:

1. Deputy Commissioner, as Chairman
2. Civil Surgeon, as Member Secretary
3. Nodal Officer for oxygen supply

It is reiterated that the Committee shall ensure adequate number of beds in the district for treatment of COVID patients and all the COVID hospitals get regular supply of oxygen and essentials such as drugs, consumables, etc. required for treatment of COVID patients.

Director General Health Services
for: Additional Chief Secretary to Haryana Government
Health Department


A copy is forwarded to the following for kind information:

1. MD-NHM
2. PS/Hon’ble Health Minister, Haryana
3. PS/ACS (Health)

Director General Health Services
for: Additional Chief Secretary to Haryana Government
Health Department
PROPOSED

COVID 19 MANAGEMENT

HARYANA STATE PROTOCOL

April 2021
CYTOKINE RELEASE SYNDROME:

- Unremitting fever (> 100 °F)
- Generalised oedema (capillary leak)
- Skin rashes (bluish discoloration of digits, erythematous lesions, vesicular/petechial lesions)
- CRP > 100mg/L; LDH> 245 U/L; D dimer> 100 ng/ml; IL-6 >40 pg/ml; FERRITIN >300 mcg/L
- MODS
Time line of COVID-19 disease

- Exposure
- Incubation period
- Onset of symptoms
- Symptomatic phase
- Early pulmonary phase
- ICU admission
- Cytokine storm/macrophage activation syndrome/MODS
- Hyperinflammatory phase
- Death
COVID SUSPECT

RAPID ANTIGEN TEST

NEGATIVE

*URGENCY

CBNAAT TRUNAAT

RESULT WITHIN 2 HRS

NO URGENCY

RT-PCR

RESULT IN 8 - 12 HRS

POSITIVE

COVID CASE

*URGENCY
Emergency surgery
Labour room
Dead body

Clinical signs of worsening:
- Unremitting fever/2nd peak
- Cough
- Breathlessness
- Increase in Respiratory rate (>20)
- Decreasing saturation (≤94%)
- Altered sensorium
- Decreased urinary output

COVID-19
Minimal symptomatic/Asymptomatic

Without Risk Factors
- Observation (Monitor symptoms BD)
- Home isolation
- Symptomatic treatment

With Risk Factors
(Age > 60 years/Obesity/Diabetes/Hypertension/Hypothyroidism)
- Close monitoring for clinical worsening*
- Favipiravir (optional)*
- Convalescent Plasma therapy may be used in carefully selected patients.

DAY 5-7
- CBC, CRP, D-dimer, Ferritin, LDH

Warning signs
- Clinical signs of worsening* and/or
- Leucocytosis
- N/L ratio >3.5
- Eosinopenia
  - CRP, d-dimer, ferritin,

HRCT THORAX

*Clinical signs of worsening
- Unremitting fever/2nd peak
- Cough
- Breathlessness
- Increase in Respiratory rate (>20)
- Decreasing saturation (≤94%)
- Altered sensorium
- Decreased urinary output

#Tab Favipiravir 1800mg BD(D1) followed by 800mg BD for 7-14 days

**Ivermectin, HCQs: No role except in trial settings
Role of Ivermectin in COVID-19

• WHO recommend **not to use** ivermectin in patents with COVID-19 except in the context of a clinical trial.

• This recommendation applies to patents with any disease severity and any duration of symptoms.

• The effects of ivermectin on mortality, mechanical ventilation, hospital admission, duration of hospitalization and viral clearance remain uncertain because of very low certainty of evidence addressing each of these outcomes.

*AllIMS guidance- Ivermectin may be considered inpatients with high risk features*
# National Early Warning Score (NEWS)- NEWS 2

To identify patients who are at risk

<table>
<thead>
<tr>
<th>Parameters</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
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<td>Age</td>
<td></td>
<td></td>
<td></td>
<td>&lt;65</td>
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<td>&gt;65</td>
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<tr>
<td>Respiratory Rate</td>
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<td>9-11</td>
<td>12-20</td>
<td>21-24</td>
<td></td>
<td></td>
<td>&gt;25</td>
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<tr>
<td>Oxygen Saturation</td>
<td>&lt;91</td>
<td>92-93</td>
<td>94-95</td>
<td>&gt;96</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Supplemental Oxygen</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
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<td>Systolic Blood Pressure</td>
<td>&lt;90</td>
<td>91-100</td>
<td>101-110</td>
<td>111-120</td>
<td>&gt;200</td>
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<tr>
<td>Heart rate</td>
<td>&lt;40</td>
<td>41-50</td>
<td>51-90</td>
<td>91-110</td>
<td>111-130</td>
<td></td>
<td>&gt;131</td>
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<tr>
<td>Consciousness</td>
<td></td>
<td>Alert</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Drowsy, lethargy, coma Confusion</td>
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<tr>
<td>Temperature</td>
<td>&lt;35</td>
<td>35.1-36</td>
<td>36.1-38</td>
<td>38.1-39</td>
<td>&gt;39</td>
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<td></td>
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<tr>
<td>Score</td>
<td>Risk grading</td>
<td>Warning level</td>
<td>Monitoring frequency</td>
<td>Clinical response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>---------------</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>Q 12 hrly</td>
<td>Routine Monitoring</td>
<td></td>
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<tr>
<td>1-4</td>
<td>Low</td>
<td>Yellow</td>
<td>Q 6 hrly</td>
<td>Doctor to review 12 hrly and Increase monitoring</td>
<td></td>
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<tr>
<td>5-6 or has 3 in one parameter or comorbidity</td>
<td>Medium</td>
<td>Orange</td>
<td>Q 1 hrly</td>
<td>Get Critical Care Review or Transfer to Critical Care Facility. High Flow Oxygen.</td>
<td></td>
<td></td>
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<tr>
<td>&gt;7</td>
<td>High</td>
<td>Red</td>
<td>Needs continuous monitoring in ICU/HDU</td>
<td>Admission in Critical Care. Treatment Plan as per need</td>
<td></td>
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</tr>
</tbody>
</table>
A 6-minute walk test is an established clinical test to look for cardio pulmonary exercise tolerance. This test is used to unmask hypoxia.

Patient with pulse oximeter attached to his finger is asked to walk in confines of his room.

Any drop in saturation below 93%, or an absolute drop of more than 3%, or feeling unwell (light headed, short of breath) while performing the test are significant findings.

Patients with positive 6 minute walk test may progress to become hypoxic and hence early intervention in form of admission to hospital, or shifting to ICU and giving oxygen and +/- Steroids is recommended.

The 6 minutes may be cut short for 3 minutes in patients above 60 years of age.
**Moderate Illness**

- Persistent fever > 7 days
- Reappearance of fever
- Unremitting high grade fever
- Breathlessness

↑ Inflammatory parameters

**With Normal Oxygen Saturation (SPO₂ > 94%)**

- CT severity score > 10/25

**Steroid** (Dexamethasone 0.1-0.2 m/kg daily or Methylprednisolone 1-2 mg/kg or equivalent) for 3-5 days

**Inj. Enoxaparin (1mg/kg BW) S/C OD**

**Remdesivir#**

**With SPO₂ < 94% (or) RR > 24**

**Steroid** (Dexamethasone 0.1-0.2 m/kg daily or Methylprednisolone 1-2 mg/kg or equivalent) x 5-10 days

Gradual tapering over 3 weeks to prevent fibrosis

**Remdesivir#**

**Inj. Enoxaparin (1mg/kg BW) S/C OD as per d-dimer**

**Awake proning**

### Strict control of blood sugars with insulin (Basal-bolus)

#Remdesivir contraindicated in liver (ALT > 5 times normal at baseline or renal dysfunction (eGFR < 30 ml/min)

### Table: ACTIVE PRINCIPLE vs EQUIVALENT DOSE

<table>
<thead>
<tr>
<th>ACTIVE PRINCIPLE</th>
<th>EQUIVALENT DOSE</th>
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<tr>
<td>Hydrocortisone</td>
<td>20 mg</td>
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<tr>
<td>Prednisolone</td>
<td>5 mg</td>
</tr>
<tr>
<td>Methyl prednisolone</td>
<td>4 mg</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>0.75 mg</td>
</tr>
</tbody>
</table>

#JAMA. 2020;324(11):1048-1057
Indication for Convalescent Plasma Therapy

At least one of each sign or symptom in the following two categories for less than 48 hours:
Temperature of at least 37.5°C, unexplained sweating, or chills; and
dry cough, dyspnea, fatigue, myalgia, anorexia, sore throat, dysgeusia, anosmia, or rhinorrhea.

Administered in <72 hours after the onset of symptoms in patients who > 75 irrespective of current coexisting conditions, or 65-74 years with at least one coexisting condition reduced the progression of Covid-19

Convalescent plasma with an IgG titer greater than 1:1000 against SARS-CoV-2 spike (S) (200 ml in single dose).

Early administration of high titre plasma in selected patients may prevent progression to severe covid
Covid positive
- RT PCR +
- Antibody +
- Antigen +

Recovered
- > 18 years
- Males or nulliparous females of wt > 55 kgs
- Complete resolution of symptoms at least 28 days prior to donation (or)
- Complete resolution of symptoms at least 14 days prior to donation with 2 negative NP RT PCR collected 24 hrs apart

DONOR WORK FLOW

Antibody titres
Desired titres for IgG antibodies 1:1024
Neutralizing antibodies 1:40

Informed consent and collection of plasma
**INDICATIONS FOR TOCILIZUMAB/Pulse methyl prednisolone:**
- Rapid deterioration
- RR > 30 bpm,
- SaO2 < 93% on room air & CRP ≥75 mg/L & PaO2/FiO2 < 300 mm Hg in room air, and
- Lung infiltrates > 50% within 24–48 h
- Need of Respiratory or cardiac support

**CONTRAINDICATIONS:**
- Coexistent infection other than COVID-19;
- PaO$_2$/FiO$_2$ > 300 mm Hg; chronic or current glucocorticoid use
- H/O severe allergic reactions to monoclonal antibodies
- ANC < 500 per µL; platelets < 50 x 10$^9$
- Active diverticulitis, IBD, or another symptomatic gastrointestinal tract condition that might predispose patients to bowel perforation;
- Severe haematological, renal, or liver function impairment.

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**Evidence for pulse methyl prednisolone is evolving.** Eur Respir J 2020 Dec; 56(6)

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**Tocilizumab - Not routinely recommended, given on case to case basis (on physician discretion)**

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**Evolving immunomodulators**

**Baricitinib:** consider in combination with remdesivir 4-mg (either orally [two 2-mg tablets] or through a nasogastric tube) for 14 days or until hospital discharge.
SpO₂ On room air < 94%

Nasal cannula @1-6 L/min
NRBM@ 10-15 L/min

Oxygenation not improving
Use of accessory muscles of breathing

HFNC/NIV

Oxygenation not improving
Use of accessory muscles of breathing
Rising PaCO₂ or Obtundation

IMV

ECMO
Nasal canula/NRBM/venturi mask
• 1-6 L/min (NC)
• 6-15 L/min (NRBM)

HFNC/CPAP/NIV
• HFNC - Preferred modality (with triple ply mask)
• Flow rate 60-80 L/min
• FiO₂ to target SpO₂ > 84%
• Consider “Awake Proning”
• If HFNC not available – consider NIV (preferably Helmet mask/FFM)
• Use HME filter between mask and tube and tube and machine
• Look for signs of increased work of breathing (RR, accessory muscle usage)

IMV
• RSI by most experienced doctor
• Preoxygenation with HME filter attached between mask and reservoir bag
• CMV (VCV/PCV) with Low tidal volume strategy (Vt 6-8 ml/PBW)*
• Initial PEEP 5-10 cm H₂O, titrate according PEEP – FiO₂ table or to keep driving pressure < 15 cm H₂O
• Adjust RR (< 35/min)
• Adequate sedation and analgesia (NMBs if necessary)

Proning
• Consider early Proning (Within 36 hours of IMV)
• Mild to moderate ARDS (P/F < 150, FiO₂ > 0.6)
• 14-16 hours/day until improvement in oxygenation

ECMO
• Refractory hypoxemia in spite of Proning and neuromuscular paralysis
• PaO₂/FiO₂ < 60 mmHg for > 6h
• PaO₂/FiO₂ < 50 mmHg for > 3h
• Ph < 7.2 + PaCO₂ > 80 mmHg > 6h

*Dead Space Calculation

VD = P̄ACO₂ - P̄ECO₂
VT
P̄ACO₂
TIMING OF INITIATION OF ANTI INFLAMMATORY THERAPY

CPT

Antiviral Rx  |  Start Anti-inflammatory Rx  |  Escalate Anti-inflammatory Rx

Oxygen Saturation
Viral replication
Inflammatory Response

I. Incubation  |  II. Symptomatic  |  III. Early Pulmonary Phase  |  IV. Late Pulmonary Phase

Severity of illness

Time Course (days)

1  |  5  |  12  |  15  |  28

days

Courtesy: EVMS Critical Care COVID-19 Management Protocol
Covid suspect but RT PCR -ve

Exclusion of other diagnosis:
• Negative influenza PCR test
• Negative respiratory viral panel
• Negative testing for clinically indicated respiratory infections (urine antigen for legionella and streptococcus pneumoniae, blood cultures, sputum cultures or BAL)

HRCT THORAX

ALTERNATIVE DIAGNOSIS

CORADS 4/5

REPEAT RT-PCR

POSITIVE

CLINICAL SUSPICION

HIGH

MANAGE AS COVID

NEGATIVE

CLINICAL SUSPICION

LOW

LOOK FOR ALTERNATIVE DIAGNOSIS

<table>
<thead>
<tr>
<th>CO-RADS*</th>
<th>Level of suspicion COVID-19 infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO-RADS 1</td>
<td>No</td>
</tr>
<tr>
<td>CO-RADS 2</td>
<td>Low</td>
</tr>
<tr>
<td>CO-RADS 3</td>
<td>Indeterminate</td>
</tr>
<tr>
<td>CO-RADS 4</td>
<td>High</td>
</tr>
<tr>
<td>CO-RADS 5</td>
<td>Very high</td>
</tr>
<tr>
<td>CO-RADS 6</td>
<td>PCR 4</td>
</tr>
</tbody>
</table>
REFERENCES

• https://www.icmr.gov.in/pdf/covid/strategy/Advisory_for_rapid_antigen_test_14062020.


• Interleukin-6 Receptor Antagonists in Critically Ill Patients with Covid-19 The REMAP-CAP Investigators DOI: 10.1056/NEJMo2100433

• Tocilizumab in patients admitted to hospital with COVID-19 (RECOVERY): preliminary results of a randomised, controlled, open-label, platform trial RECOVERY Collaborative Group https://doi.org/10.1101/2021.02.11.21249258

• Therapeutics and COVID-19: living guideline – March 31st 2021 WHO

• RECOMMENDATIONS FOR THE MANAGEMENT OF COVID-19 PATIENTS Maharashtra Covid Task Force Date 30/03/2021
**Revised Discharge Policy for COVID-19**

The revised discharge policy is aligned with the guidelines on the 3 tier COVID facilities and the categorization of the patients based on clinical severity (Available at: [https://www.mohfw.gov.in/pdf/FinalGuidanceonManagementofCovidcasesversion2.pdf](https://www.mohfw.gov.in/pdf/FinalGuidanceonManagementofCovidcasesversion2.pdf))

1. **Mild/very mild/pre-symptomatic cases**
   Mild/very mild/pre-symptomatic cases admitted to a COVID Care Facility will undergo regular temperature and pulse oximetry monitoring. The patient can be discharged after 10 days of symptom onset and no fever for 3 days. There will be no need for testing prior to discharge.
   At the time of discharge, the patient will be advised to isolate himself at home and self-monitor their health for further 7 days.
   At any point of time, prior to discharge from CCC, if the oxygen saturation dips below 95%, patient is moved to Dedicated COVID Health Centre (DCHC).
   After discharge from the facility, if he/she again develops symptoms of fever, cough or breathing difficulty he will contact the COVID Care Centre or State helpline or 1075. His/her health will again be followed up through tele-conference on 14th day.

2. **Moderate cases admitted to Dedicated COVID Health Centre (Oxygen beds)**
   2.1. **Patients whose symptoms resolve within 3 days and maintains saturation above 95% for the next 4 days**
   Cases clinically classified as “moderate cases” will undergo monitoring of body temperature and oxygen saturation. If the fever resolve within 3 days and the patient maintains saturation above 95% for the next 4 days (without oxygen support), such patient will be discharged after 10 days of symptom onset in case of:
   - Absence of fever without antipyretics
   - Resolution of breathlessness
   - No oxygen requirement
   There will be no need for testing prior to discharge.
   At the time of discharge, the patient will be advised to isolate himself at home and self-monitor their health for further 7 days.
2.2. **Patient on Oxygenation whose fever does not resolve within 3 days and demand of oxygen therapy continues**

Such patients will be discharged only after

- resolution of clinical symptoms
- ability to maintain oxygen saturation for 3 consecutive days

3. **Severe Cases including immunocompromised (HIV patients, transplant recipients, malignancy)**

Discharge criteria for severe cases will be based on

- Clinical recovery
- Patient tested negative once by RT-PCR (after resolution of symptoms)
Dear All,

This is in reference to letter of even number dated 25th September 2021, wherein guidelines for rational use of Oxygen for management of COVID-19 were shared (enclosed herewith).

In this regard, it is reiterated that in view of rising number of COVID-19 cases across many States/UTs, the guidelines for rational use of Oxygen are to be adhered across all health facilities. The oxygen consumption should be regularly monitored at each hospital/health facility level and oxygen monitoring committees in every hospital will supervise inventory planning, oxygen consumption and regular repair & maintenance of oxygen plants and auxiliaries. Refresher trainings of OT technicians and nurses may also be conducted on proper oxygen administration and monitoring. District Magistrates (DM), assisted by the Chief Medical Officers (CMO) of the districts must also monitor the consumption in all facilities of the district on weekly basis.

You are requested to kindly direct the concerned officials at State and district level to ensure compliance of these guidelines for efficient management of COVID-19 patients. For all issues related to medical oxygen, Prof. (Dr.) Rajiv Garg, Professor of Excellence (email id: rajiv.garg23@gov.in) may be contacted.

Enclosure: As above

Yours sincerely

(D. Manohar Agnani)

To:
Additional Chief Secretary / Principal Secretary / Secretary (Health) - All States/UTs

Copy to:
1. Shri, Pankaj Agrawal, Additional Secretary, Cabinet Secretariat
2. Mission Director (NHM) - All States/UTs
3. State Nodal Officer, Oxygen - All States/UTs
Subject: Guidelines for rational use of Oxygen for management of COVID-19

Dear Sir/Madam,

As you are aware that medical oxygen is one of the mainstays for management of “Moderate” and “Severe” COVID-19 cases. COVID-19 pandemic has led to a need of ensuring adequate supply of oxygen and also the protocols for its rational use.

Keeping above facts in mind, Ministry of Health and Family Welfare has developed new ‘Guidelines for rational use of Oxygen for management of COVID-19’ which are enclosed.

You are requested to instruct all the concerned state and district level officials to strictly follow these Guidelines for creation of Non-ICU oxygen supported beds & ICU beds and for calculation of oxygen requirement for each and every health facilities providing COVID-19 treatment accordingly.

With warm regards,

Yours sincerely

Encl: as above

To: - Additional Chief Secretary / Principal Secretary / Secretary (Health) - All States/UTs

Copy to:
1. Mission Director (NHM) – All States/UTs
2. State Nodal Officer, Oxygen – All States/UTs
GUIDELINES FOR RATIONAL USE OF OXYGEN FOR MANAGEMENT OF COVID-19

These guidelines are being issued based on the recommendations of The Empowered Group 1 (EG – 1) chaired by Dr. V.K. Paul, Member, NITI Aayog, the Joint Monitoring Group (JMG) headed by Director General of Health Services (DGHS) MoHFW and the inputs provided by Prof. (Dr.) Randeep Guleria, Director, AIIMS, New Delhi and Prof. (Dr.) Balram Bhargav, DG ICMR cum Secretary, Department of Health Research.

1. It is assumed that out of the 100 confirmed cases of Covid-19;
   a. 80 cases will be Asymptomatic / Pre-Symptomatic or with “Mild” disease requiring home isolation or admission to Covid Care Center (CCC).
   b. Out of remaining 20 cases:
      i. 17 cases will be of “Moderate” disease requiring hospitalization for 7 days on Non-ICU Oxygen Supported Beds. States / UTs would require to have oxygen storage capacity for all 17 Beds. However, for the purpose of calculation of Daily Oxygen consumption requirement, 50% of these Beds (i.e. 8.5) would be considered for computation purpose.
      ii. 3 will be “Severe” cases requiring ICU Beds for 18 days in ratio of 20% for Invasive Ventilation, 40% for Non-Invasive Ventilation (NIV) / High Flow Nasal Cannula (HFNC) and remaining 40% for oxygen therapy by Non-Re Breathing Mask (NRBM) etc. For the purpose of calculation of Daily Oxygen consumption requirement at each health facility, all the Beds (i.e. 3) would be considered for computation purpose.

2. For Moderate cases (SpO2 level between 94%-90%), the indicative oxygen flow rate is 2-4 Liters/minute by nasal prongs; 6-10 Liters/minute by facemask and 10-15 Liters/minutes by Non-Rebreathing Mask (NRBM).
3. For Severe cases (SpO2 level less than 90%), the indicative oxygen flow rate is 10 Liters/minute by Invasive Mechanical Ventilation; 25-60 Liters/minute by Non-Invasive Ventilation and 10-15 Liters/minutes by NRBM.
4. For rational use of oxygen for COVID 19 management and for monitoring of oxygen consumption, the following action points are suggested to be implemented by the States / UTs:

i. Oxygen is a life-saving essential drug. The target **Oxygen saturation rate should be 94%-95%** for the hospitalized COVID 19 patient. Once this rate is achieved, flow of oxygen may not be increased as it may not provide any additional benefit to the patient.

ii. Oxygen consumption should be regularly monitored at each hospital/health facility level.

iii. **Oxygen Monitoring Committee** may be formed in every hospital which may consist of Additional Medical Superintendent, Head of Anesthesia, Head of Respiratory Medicine (Head of Internal Medicine in case Respiratory Medicine department does not exist) and Nursing Superintendent.

iv. The Oxygen Monitoring Committee may be mandated to supervise inventory planning, oxygen consumptions, regular repair and maintenance of gas pipelines, gas plant, and wall mounted gas outlets etc.

v. A team of one Nurse and one OT Technician may be designated as **Oxygen Monitoring Team** for each shift at each hospital/health facility level.
   a. The team must inspect the gas pipeline, wall mounted gas outlets, as well as gas cylinders to detect and promptly address leakages, if any. Nurse in the team will check the oxygen mask on a regular basis.
   b. Ensure closure of valves during ‘no-use’ at all times.

vi. HFNC device should be used only in ICU setting under supervision of a respiratory physician/physician. Patient should be put on HFNC only after approval of the senior most respiratory physician/physician.

vii. Patients who are on oxygen therapy may be reviewed during daily rounds to evaluate their oxygen requirements as well as oxygen saturation rates.
viii. Regular training of OT Technicians and Nurse should be undertaken on proper oxygen administration and monitoring.

ix. District Magistrate (DM) assisted by the Chief Medical Officer (CMO) of the district must also monitor the consumption including the rational use of oxygen in all facilities of the district on a weekly basis.

***