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Reaching Impact, Saturation,
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AIIMS Bhopal COVID IC Management Plan

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Protocol of COVID ICU/ Suspect ICU

As these patients are going to be on high immunosuppressives, these patients are at very high risk of secondary infection. So all doctors and nursing officers have to maintain complete hygiene practice in the ICU

- Do not touch patient without cleaning hands with alcohol rub or changing gloves
- Do not allow anyone to touch any patient without proper precautions
- PPE is not a sterile dress.
- Date of placing venflon should be written on micropore on it.
- All venflon will be changed after 48 hours
- Daily bed sheets will be changed
- All procedures (even IV injection or venflon placement) will be done with aseptic precautions.
- Any mask/ nasal canula if being not used will be kept in sterile plastic cover.
- Anyone of us if not following strict infection practices can be questioned by anyone (irrespective of his/her position).
- Even when consultant is making mistake, anyone can question him/her. They should not feel offended.
- Do not attempt femoral ABG
- Keep patient bedside clean

Plan for a new patient coming to COVID suspect ICU

1. Stabilize oxygen saturation à spo2 target 94%
2. Send blood sample (to be sent within 10 minutes of patient coming to ICU):
Complete Hemogram, Coagulogram, D Dimer, Fibrinogen, LFT, RFT
3. Sample should reach hematology lab within 10 minutes of sample withdrawal (as it affects the lab values and overall survival of patient)
4. Check the pretest probability of patient being COVID 19:
 - i. Clinical : history of SOB, fever and cough < 12 days
 - ii. Radiology: picture consistent with b/l peripheral shadows
Or
USG chest: b/l B lines +/- consolidation



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- iii. TLC < 12000 and Lymphocytes < 1000
If patient fits all these, then patient is a strong suspect for COVID-19



5. Dose of steroids: early administration of steroid has been found to be the **most important factor** in survival of patient in our analysis. Try to administer first dose of steroid as soon as possible.

Oxygen requirement (target spO ₂ 94%)	First day Steroid dose
1-2 litres	Dexa 8 mg OD or MPS 30 mg OD
2-4 litres	MPS 125 mg OD or Dexa 16 mg BD
>=5 litres	MPS 500 mg

Next 2 days steroid dose will depend upon CRP and Oxygen requirement

Oxygen requirement (LPM)	CRP	Dose of methylprednisolone
	<50	Dexa 8 mg OD
	>50	Dexa 8 mg OD
3-5	<100	Dexa 8 mg BD
	>100	MPS 125 mg OD
>5 litres	<100	MPS 250 mg OD
	>100	MPS 500 mg OD



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From 4th day till 7th -10th day :

Oxygen requirement (LPM)	CRP	Dose of methylprednisolone
1-2	<50	Dexa 8 mg OD
	>50	Dexa 8 mg OD
3-5	<100	Dexa 8 mg BD
	>100	Dexa 8 mg BD
>5 litres	<100	Dexa 8 mg BD
	>100	Dexa 8 mg BD

- a. Steroids has to be continued for 7-10 days, unless there has been significant increase in TLC.
 - b. High Blood sugar was not found to be associated with increased risk of mortality after using Pulse MPS in our analysis. Being diabetic is not a contraindication for steroids; RBS can be easily managed with insulin infusion.
 - c. If starting steroids, add broad spectrum antibiotic (gm negative) empirically.
 - a. Send Blood C/S (and ET aspirate C/S if intubated) whenever there is fever or TLC rises significantly. And add gram positive coverage
 6. At admission, other treatment to be started:
 - a. Tab/Inj Pantoprazole 40 mg BD
 - b. Tab Ecosprin 300 mg stat then 75 mg once a day
 - c. Tab clopidogrel 300 mg stat then 75 mg once a day

} Always Look for Contraindications
 - d. Inj. enoxaparin 0.6 ml s/c BD in ALL patients. (with monitoring of factor Xa levels in obese patients and patients not improving)
 - a. If Platelet count < 50000à only ecosprin 75 mg OD ; no enoxaparin or clopidogrel
 - b. If Platelet count 50K -100Kà enoxaparin OD
 - e. Broad spectrum antibiotic for gram negative coverage
7. If any patient has Fio₂>0.5 and P/F<120 and 5 days of admission: Get urgent D dimer and Fibrinogen done. Get Echo done to see for RA, RV dilatation and TR jet velocity. Please call Dr Abhishek Goyal; 9630098093 for this patient.



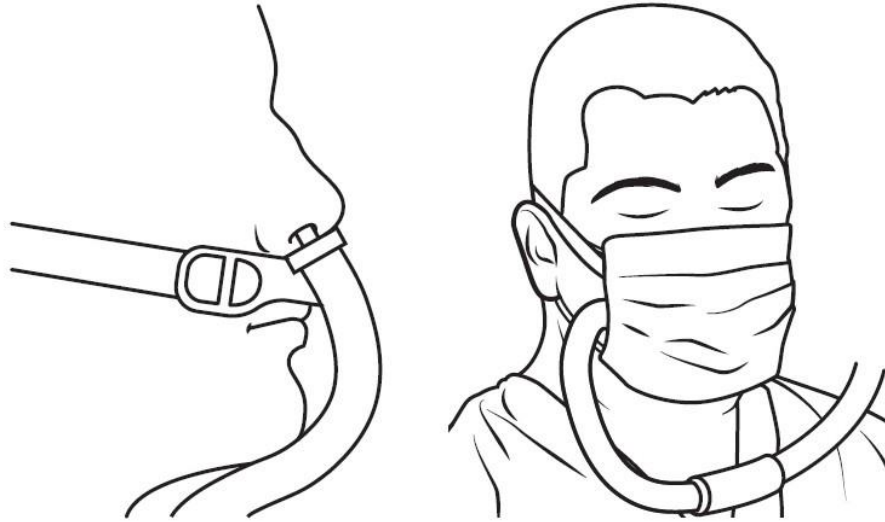
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Please ask the patient to use a surgical mask over the oxygen delivery devices to reduce aerosol generation :

Consider self proning in all patients on oxygen



1. Use nasal cannula with up to 5 litres of oxygen flow.
2. If the patient is not able to achieve target oxygen saturation with nasal cannula, use venturi mask/face mask.
3. Do not use face mask if Oxygen requirement < 5 LPM, it will lead to CO₂ retention.
4. If not able to meet the target oxygen saturation with venturi (FiO₂ of 0.5), use nonrebreather mask with reservoir bag.
5. If not able to maintain oxygen saturation with the above, give a trial of NIV or HFNC. Deliver NIV using the ICU ventilators with double-limb circuit and filter in expiratory port.
6. If a dedicated NIV machine with single limb circuit is used, HME filter will be placed at both proximal and distal ends of the tubing.



Investigations to be sent:

on Admission	Daily	Twice a week
Complete hemogram, RFT, LFT, Mag, K D-dimer, CRP, LDH Triglyceride, PT, PTT, INR Echo, Ferritin, Procalcitonin	CBC, RFT, LFT, electrolytes, TG, CRP, LDH, PT, PTT, INR	Ferritin D-Dimer Procalcitonin

Protocol for hypotension:

Goal is to maintain MAP >65-70 mmHg and/or an hourly urine output of atleast 0.5ml/min.

1. Fluid resuscitation

- a. Resuscitate with 500 mL of fluid (normal saline)
- b. Assess for response (Increase in MAP or reduction in HR by 10% of baseline).
Assessment can also be done by IVC monitoring using ultrasound.
- c. Don't give too much fluid. If not responsive to fluids initiate the vasopressors as below.

2. Vasopressors:

- a. **Indications:** Mean arterial pressure <65 mmHg with or without organ dysfunction despite intravenous fluids to maintain a CVP 6-10 cm of H₂O in patients with ARDS
- b. **Noradrenaline** is the choice of vasopressor. Start with 5 µg/min that is ~2 ml/hour of the noradrenaline solution (8 mg/50 mL)
Increase the dose every 15 minutes in increments of 0.5 to 1 ml till target B.P or a dose of 20 µg/min (~8 ml/hour)
(Noradrenaline 8 mg in 50 ml of 5% dextrose equals a dose of 2.67 µg/min/mL/hour; Maximum dose of Noradrenalin is 3µg/kg/min)



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- c. Add **vasopressin** (20 units/50 mL) to noradrenaline if target B.P is not met in 45 minutes or if noradrenaline is at a dose of >4 ml/hour (20 µg/min). Start with 2 ml/hour (0.01 units/min). Increase by 0.5 to 1 ml/hour every 15 minutes till a maximum dose of 5-6 ml/hour (0.03-0.04 units/min) (Vasopressin 20 units in 50ml of 5% dextrose equal 0.006 units/min; Maximum dose of Vasopressin is 0.04 U/min)
3. Patients not meeting the goals even after noradrenaline (6 mL/hr) and vasopressin (4 mL/hr) may be considered for **steroids** at a dosage of (hydrocortisone 50mg every 6 hours)
4. If goals are still not met consider adding either epinephrine or dopamine.
 - a. **Epinephrine** is administered at a dose similar to Noradrenaline with a maximum dose of 20-25 µg/min.
 - b. **Dopamine** is started at a dose of 5 µg/kg/min to a maximum dose of 20-25 µg/kg/min. The dose increment is done by 2.5 µg/kg/min every 15-20 minutes as per response or till a maximum heart rate of 150 bpm.
5. **Dobutamine** should be considered in patients with septic shock with cardiogenic shock (or evidence of peripheral circulatory failure as evidenced by poor capillary refill time > 3 seconds) and/or venous saturation <70 mmHg and hematocrit >30.
6. Vasopressors added in the last should be tapered first every 20 minutes to maintain a target MAP> 65-70 mmHg.

Vasopressin should be tapered along with Noradrenaline in decremental dose of 0.5 to 1 ml till a noradrenalin dose of 5 µg/min and should then be stopped Noradrenaline should be stopped at the last
7. Fentanyl and Midazolam in 50 ml syringe@2-4 ml/hour change within 12 hours
 - Propofol can lead to very high Triglyceride which can create confusion in monitoring of Cytokine storm.



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Others

1. **Blood sugar:** Target between 150-180 mg/dL (use NPH or glargine) and regular insulin bolus as per the sliding scale for regular insulin RBS < 150, 0 units; RBS 150-180, 2 units; RBS 180-220, 4 units; RBS 220-260, 6 units; RBS 260-300, 8 units; RBS >300, 10 units or insulin infusion with regular sugar monitoring

Calculate the basal insulin dose as 0.1-0.2 U/Kg body weight. Ex body weight 60, then $0.1 \times 60 = 6$ Units

2. **Nebulization for bronchospasm:**

- a. Do not use nebulization as a routine.
- b. MDI with spacer may be used and is preferred in those who are able to tolerate it (Duolin MDI 2 puffs Q 6 hourly).
- c. Use nebulization with asthalin (salbutamol 2.5 mg Q 4-6 hourly) or ipratropium (500 µg 8 hourly) and are unable to use MDI with spacer. Monitor for arrhythmias and serum potassium.