GOVERNMENT OF ASSAM
HEALTH & FAMILY WELFARE DEPARTMENT
DISPUR ::: GUWAHATI-781006

ORDERS BY THE GOVERNOR
NOTIFICATION

Dated Dispur, the 4th September 2020

No.HLA.274/2020/116: The Health & Family Welfare Department hereby notifies the **Revised Treatment Protocol for COVID-19 patients** (Annexure-A), in supersession of the treatment protocol for COVID-19 patients issued vide Health & Family Welfare Department's earlier notification No.HLA.274/2020/33 dated 02/07/2020.

This notification comes into immediate effect.

(Samir K Sinha, IAS)
Principal Secretary to the Government of Assam
Health & Family Welfare Department

Memo No.HLA.274/2020/ 116-A Dated Dispur, the 4th September 2020.

Copy to:

1. The Commissioner & Secretary, Health & Family Welfare Department.
2. Special Secretary, Health & Family Welfare Department.
3. Mission Director, National Health Mission, Assam, Guwahati.
4. The Addl. Secretary, Health & Family Welfare Department, Dispur.
5. The Deputy Commissioner (all districts) cum Chairman, District Registering Authority under Clinical Establishments (Registration and Regulation) Act, 2010.
6. The Director of Medical Education, Assam, Guwahati for necessary action.
7. The Director of AYUSH, Assam, Guwahati for necessary action.
8. The Director of Health Services- Cum - Member Secretary, Assam State Council for Clinical Establishments, Assam for necessary action. He is requested to forward this notification to all concerned including clinical establishments in the private sector.
9. The Director of Health Services (F.W,), Assam, Hengrabari, Guwahati.
10. Principal cum Chief Superintendent/ Superintendent, Medical College & Hospital, GMCH, Guwahati / SMCH, Silchar / AMCH, Dibrugarh / FAAMCH, Barpeta / TMCH, Tezpur / JMCH, Jorhat/ DMC, Diphu for necessary action.
11. Addl. Director of Health Services, Assam-cum- State Nodal Officer for Clinical Establishment, Hengrabari, Guwahati.
12. The Joint Director of Health Services (all districts) cum Convener, District Registering Authority under Clinical Establishments (Registration and Regulation) Act, 2010.
13. P.S. to Hon'ble Chief Minister, Assam, Dispur
14. P.S. to Hon'ble Minister, Health & Family Welfare, Assam.
15. P.S. to Hon'ble Minister of State, Health & Family Welfare, Assam.
16. P.S. to Chief Secretary, Assam, Dispur.
17. Any other concerned.

By order etc.

Deputy Secretary to the Government of Assam
Health & Family Welfare Department

ANNEXURE-A

REVISED TREATMENT PROTOCOL FOR COVID-19 PATIENTS

1. MANAGEMENT OF ASYMPTOMATIC COVID-19 POSITIVE

1.1. Institutional quarantine for a maximum period of 14 days :-

1.1.1. Place the patient in a well-ventilated single room

1.1.2. Limit the movement of the patient in the house and minimize shared space. Ensure that shared spaces (e.g. kitchen, bathroom) are well ventilated.

1.1.3. Visitors should not be allowed until the patient is discharged.

1.1.4. Perform hand hygiene after any type of contact with patients or their immediate environment.

1.1.5. To contain respiratory secretions, a medical mask should be provided to the patient and worn as much as possible, and to be changed daily.

1.1.6. Supportive Treatment-

a. Tab. Zinc 50 mg/day

b. Tab. Vitamin-C 500 mg twice daily

c. Tab. Vitamin-D3 60 K once weekly

d. Tab. Famotidin 20 mg BD

e. Tab Ivermectin- 12 mg twice daily for 5 days

f. Doxycycline- 100 mg twice daily for 5 days

1.1.7. Use dedicated linen and eating utensils for the patien.

1.1.8. Strict regular surface cleaning to be maintained.

1.1.9. If the patient develops symptoms he/she is to be transferred to a dedicated COVID hospital.

1.1.10. Released from institutional isolation (CCC) as per discharge protocol

1.1.11. After discharge from institutional isolation, they are advised home quarantine with following instruction:

a. Continue 7 days of strict home quarantine with self monitoring of symptoms

b. Wear a triple layered surgical mask

c. Live in a single room with good ventilation

d. Avoid close contact with family members

e. Eat separately

f. Keep hands clean and avoid outdoor activities

NB: It is recommended that discharged patients should have follow up visits at 2nd and 4th weeks

2. **MANAGEMENT OF MILD CASES:** Mild cases are those with low grade fever/cough/malaise/rhinorrhea/sore throat WITHOUT any shortness of breath

2.1. Admission in COVID care centers (CCC).

2.2. Contact and droplet precautions, strict hand hygiene

2.3. Symptomatic treatment

a. Paracetamol, cough syruo, Gargle with warm saline

b. Tab. Zinc 50 mg/day

c. Tab. Vitamin-C 500 mg twice daily

d. Tab. Vitamin-D3 60 K once weekly

e. Tab. Famotidin 20 mg BD

f. Tab Ivermectin- 12 mg twice daily for 5 days

g. Doxycycline- 100 mg twice daily for 5 days

h. Other Antibiotics (when required) : Azithromycin 500 mg daily for 5 days or Amoxyclav (500+125) mg 8 hourly for 5 days.

i. Consider Faviparavir in selected cases

2.4. Discharge as per protocol

2.5. Advice after discharge

a. Continue 7 days of home quarantine with self monitoring of symptoms

b. Wear a triple layered surgical mask

c. Live in a single room with good ventilation

d. Avoid close contact with family members

e. Eat separately

f. Keep hands clean and avoid outdoor activities

NB: It is recommended that discharged patients should have follow up visits at 2nd and 4th weeks

3. MANAGEMENT OF MILD CASES WITH SPECIAL SITUATION

3.1. Group A: Patients with Co-morbidity like uncontrolled diabetis, Hypertension, Chronic Kidney disease, Malignency, COAD and elderly > 60 years

3.2. Group B: Patients with ALARM features (Clinical) any one

a. If patients develops tachycardia(>110), Hypotension(SBP <100), Breathlessness on day to day activities

b. Gradually decreasing SpO2, Even if SpO2 values are >94% on room air

c. Positive 6 min walk test

3.3. Group C: Elevated Bio-Markers (Done after 5 to 7 days of symptoms onset (any one): CRP >5 times, Ferritin >5 times, d-Dimer >5 times, IL-6 >5 times and ANC:ALC >3.5

3.4. Group D: Suggestive Radiological finding done after 5 to 7 days of symptoms onset

N.B: These four group of mild cases should be hospitalized in a Dedicated Covid Hospital and treated as Moderate cases

4. MANAGEMENT OF HOSPITALIZED CASES (MODERATE CASES) :

4.1. Indication of Hospitalization :-

a. Respiratory distress

b. Respiratory Rate >24/min

c. Spo2 <94% in Room Air

4.2. General Measures:

4.2.1. Symptomatic Treatment

a. Paracetamol, cough syruo, Gargle with warm saline

b. Tab. Zinc 50 mg/day

c. Tab. Vitamin-C 500 mg twice daily

d. Tab. Vitamin-D3 60 K once weekly

e. Tab. Famotidin 20 mg BD

4.2.2. Antibiotics: Antibiotics as per clinician's discretion (to cover community acquired pneumonia including atypical pneumonia). Inj. Pipercillin + Tezobactum 4.5 mg IV 8 hourly (Modify doses accordingly to creatinin clearance)

4.2.3. Thrombo-Prophylaxis

a. All hospitalized patients should be started on prophylactic LMWH (e.g., Enoxaparin 1 mg/kg per day subcutaneously)/ unfractionated heparin if not contraindicated, and no high risk factors for bleeding are present

b. Extended use of anti-thrombotic agents (Low molecular weight heparin/Apixaban) : After discharge from COVID hospital, the patient may be recommended to prolong the use of ant-thrombotic therapy for a period of **14 days** from the day of discharge.

Eligible candidates

- Age>65 years
- D-Dimer> 2 times upper limit of normal
- Patient with history of previous VTE event
- Patients at high risk of developing VTE eg. Cancer, those requiring prolong immobilization, Obesity

c. Anti-thrombotic agent and dosing

- Apixaban 5mg once daily orally : For serum creatinine> 1.5mg/dl or age>80 years- 2.5mg once daily

OR

- Enoxaparin 40 mg S/C injection once daily

d. Maintain euvolemia, promot oral fluids, avoid IV fluid unless indicated

4.2.4. Corticosteroids:

a. Dexamithasone 6 mg oral/IV daily for 5 to 10 days

b. Methylprednisolone 40 mg IV daily for 5 to 10 days

N.B: Doses of corticosteroid should be increases if patients is in ICU

4.2.5. Remdesivir: If oxygen requirement is increasing start REMDESIVIR

Loading doses 200 mg IV over one hours following by 100 mg IV daily for 5 days. if patients require mechanical ventilation doses should be extended to 10 days.

Remsesivir should not be started in following groups of patients

a. AST/ALT >5 times of ULN

b. eGFR < 30ml/Min

c. Pregnancy and lactating mothers

d. Known to allergy to Remdesivir

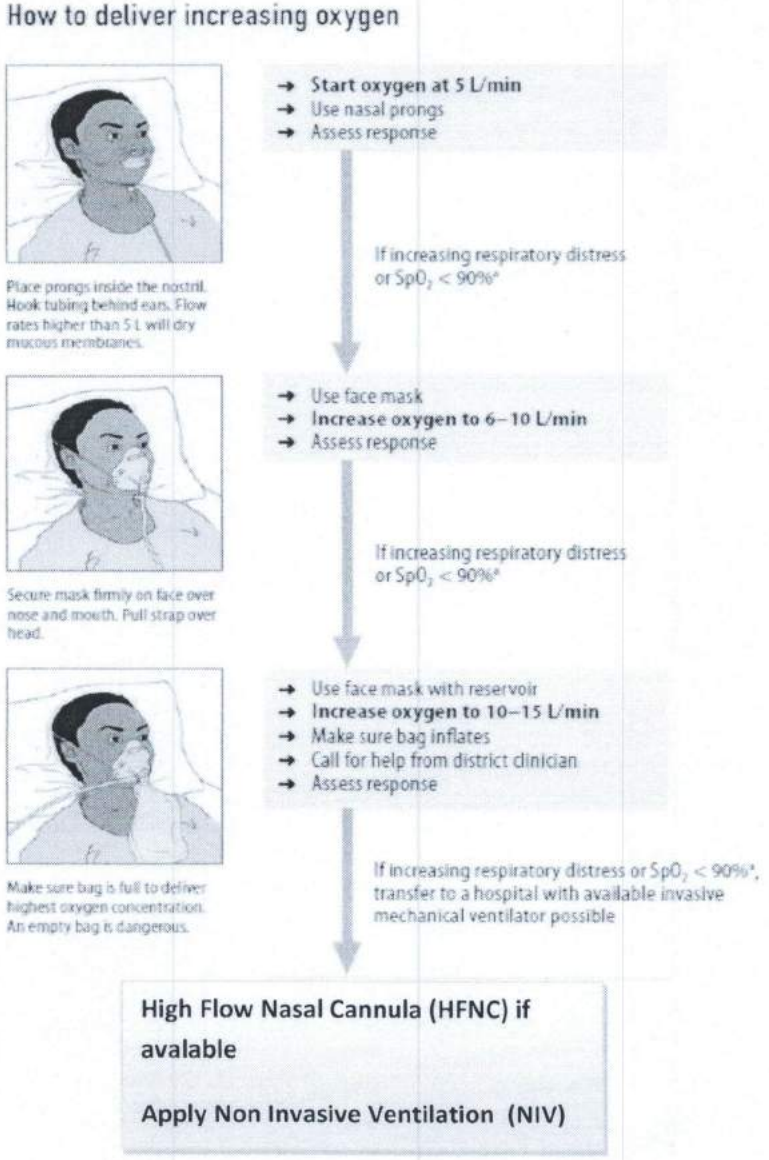
4.2.6. Convalescent Plasma Therapy (CPT): If oxygen requirement is increasing start CPT. Infuse 200 ml state followed by 200ml after 24 hours if required (prefer second doses from different donor)

- **Clinical assessment** to identify those patients who require treatment as severe disease (see definition of severe disease)
  - Tachypnoea (Excessive inspiratory efforts requiring accessory muscles of respiration, larg volum tidal breaths, air hunger)
  - Tachycardia
  - Shallow breathing
  - Increasing Oxygen requirement to maintain SpO2 >94%
  - Impaired sensorium
  - Fall of blood pressure
- **Laboratory Investigation:**
  - Routine : CBC with differentials, AST, ALT, Alk Phosphatase, Creatinine, RBS
  - Predictive of Prognostic markers: CRP, LDH, Ferritin, d-Dimer, Troponin-1, Procalcitonin, and IL-6

4.3. Prone Positioning :

- Awake proning should only be considered if patient:
  - Is able to communicate and co-operate with the procedure
  - Is able to rotate to front and adjust position independently
  - Has no anticipated airway issue
- If patients fulfils criteria for proning, ask the patient to switch positions every 30 min to 2 hours ,while looking for improvement in oxygenation, as follows:
  - Lying on right side
  - Sitting up (30-60 degrees) by adjusting head of the bed
  - Lying on left side
  - Lying prone again

4.4. Oxygen therapy



5. MANAGEMENT OF HOSPITALIZED CASES (SEVERE CASE) :

5.1. Severe Cases (ICU Care): If any two of the following is present, admit in ICU

a. Severe Respiratory distress

b. Respiratory Rate >30/min

c. SpO2 <90% in Room air

d. Altered sensorium

e. Blood pressure <90/60 mm Hg

f. New onset/ worsening organ dysfunction

5.1.1. All treatment modalities for moderate disease to be instituted : -

a) **Tocilizumab / Itolizumab** : If not responding, monitor IL-6, Ferritin, d-Dimer, if increased >5 times of upper limit of normal Consider for Tocilizumab of Itolizumab

I. Contraindication: platelet count <50K

II. Before giving Tosilizumab or Itolizumab rule out other infection, do one Chest X-ray and give broad-spectrum antibiotics and antifungal

III. Dosage: Tosilizumab: 8mg/kg (should not be more than 800mg) in 100 ml normal saline slowly infuse over 1 hour. May be repeated after 12 to 24 hours if indicated.

IV. Itolizumab: 25mg/5 ml vial, Infuse 4 vial slowly with 100 ml normal saline over one hour,

b) **High Flow Nasal Canulla (HFNC):** HFNC with surgical mask on the patients face is benefit in hypoxic COVID-19 patients

c) **Non-invasive ventilation**

- If the target SpO2 is not achieved/maintained with the above mentioned devices, NIV may be given (via helmet interface is preferred)
- Use of NIV requires **intensive monitoring** for any increase in work of breathing and hemodynamic instability
- In NIV start IPAP-8 and EPAP-5 to 6, and gradually increased pressure according to patient requirement.
- When improving titrate the NIV pressure gradually by decreasing 2 of both IPAP and EPAP

o **Note:**

- NIV is associated with high failure rates, particularly in de-novo respiratory failure.

- NIV without helmet interface is associated with greater risks of aerosolisation leading to higher exposure of health care workers
- Placing a Surgical mask over Nasal Cannula (NC) may help in reducing dispersion

d) Ventilatory management:

➢ Indications for intubation:

a. Moderate to severe ARDS

b. Increased work of breathing on non-invasive respiratory support or not tolerating NIV

c. Hemodynamic Instability

➢ Initial ventilator setting

Initial ventilator settings	
Calculate predicted body weight (PBW)	
Male =	50 + 2.3 [height (inches) - 60] **OR**
	50 + 0.91 [height (cm) - 152.4]
Female =	45.5 + 2.3 [height (inches) - 60] **OR**
	45.5 + 0.91 [height (cm) - 152.4]
Set mode to volume assist-control	
Set initial tidal volume to 6 mL/kg PBW	
Set initial ventilator rate ≤35 breaths/min to match baseline minute ventilation	
Subsequent tidal volume adjustment	
Plateau pressure goal: Pplat ≤30 cm H_2O	
Check inspiratory plateau pressure with 0.5 second inspiratory pause at least every four hours and after each change in PEEP or tical volume.	
If Pplat >30 cm H_2O, decrease tidal volume in 1 mL/kg PBW steps to 5 or if necessary to 4 mL/kg PBW.	
If Pplat <25 cm H_2O and tidal volume <6 mL/kg, increase tidal volume by 1 mL/kg PBW until Pplat >25 cm H_2O or tidal volume = 6 mL/kg.	
If breath stacking (autoPEEP) or severe dyspnea occurs, tidal volume may be increased to 7 or 8 mL/kg PBW if Pplat remains ≤30 cm H_2O.	

Arterial oxygenation and PEEP								
Oxygenation goal: PaO_2 55 to 80 mmHg or SpO_2 88 to 95 percent								
Use these FIO_2/PEEP combinations to achieve oxygenation goal:								
FIO_2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PEEP	5	5 to 8	8 to 10	10	10 to 14	14	14 to 18	18 to 24
PEEP should be applied starting with the minimum value for a given FIO_2.								

Figure 8: Protocol for management of ARDS (ARDS.net)

➢ Care of ventilated patient:

- Fresh ventilator circuit to be used for every new patient
- Change circuit only when visibly soiled (not routinely)
- Use two HME filters- one at the patient end close to ETT and another at the ventilator end of expiratory limb of circuit. Do not use heated humidifiers
- HME-F to be changed only when visibly soiled
- Use closed inline suction system(avoid open suctioning)

- Use the same closed suction system to collect ET aspirate sample in a mucus trap chamber for RT-PCR
- Do not disconnect the circuit- push twist all connections
- In case disconnection is unavoidable (like patient transport) use deep sedation/muscle relaxation, put the ventilator on standby mode and clamp the ET tube just before disconnection
- Avoid nebulization (use MDI instead)
- Avoid routine airway suctioning

e) Supportive treatment in critically ill patients:

- Head end elevation (30 to 45 degrees)
- Oral hygiene with mouthwash
- Glycemic control to maintain blood sugar between 140 to 180 mg/dl
- Ulcer prophylaxis with proton pump inhibitors
- LMWH for thromboprophylaxis (as mentioned above)
- Foley's catheter and Ryle's tube placement
- Central venous catheter (CVC) insertion
- Pressure ulcer prevention by position change every 2 hourly

f) Use of r-tpa (recombinant tissue plasminogen activator)

Eligible candidates

(a) Rapid deterioration of hypoxemia with or without hypotension

(b) Severe hypoxia (SPO2<90% in Room Air) with near normal CXR finding

(c) ARDS with SPO2/FiO2<300

Dosage and administration : 1 vial (10 units= 18 mg) slow IV over 2 minutes

2nd dose after 1 hour

Contra indication : Any active bleeding

6. SEPTIC SHOCK:

a) Recognize septic shock in adults when infection is suspected or confirmed AND vasopressors are needed to maintain mean arterial pressure $\geq$ 65 mmHg AND lactate is $\geq$ 2 mmol/L in absence of hypovolemia.

b) Choice of antibiotic as per indication (community acquired Vs hospital acquired) and local antibiogram.

c) To resuscitate in septic shock give 30 ml/ kg of isotonic saline (NS/RL) in first 3 hours, if there is no respond to fluid therapy start vesopressor (Noradrenalin) with a target MAP of >65 mm Hg

d) If signs of poor perfusion and cardiac dysfunction persist despite achieving target MAP, consider Dobutamin.

7. RENAL REPLACEMENT THERAPY:

- Uremic encephalopathy
- Severe metabolic acidosis
- Uremic pericarditis
- Refractory hyperkalemia
- Fluid overload
- Renal replacement therapy to be done whenever necessary as per institutional protocol

8. Use of anti-fibrotic agents (PIRFENIDONE) in COVID-19 induced Pulmonary fibrosis:

Pirfenidone is an anti-fibrotic agents approved for treatment of Idiopathic Pulmonary Fibrosis. Pirfenidone down regulates cytokines like TGF beta, CTGF, PDGF, TNF alpha and also has anti-apoptotic and anti-fibrosis effect. Based on these mechanisms, Pirfenidone has a potential for treatment of COVID-19.

Eligible candidates

(a) Persistent hypoxia (SPO2<92% in Room Air) after 14 days of hospitalization

(b) Chest X-Ray/CT showing pulmonary fibrosis

Contra-indications- eGFR<30, AST and ALT>3 times, CLD, Previous treatment with Pirfenidone , Pregnancy/lactating

Dosing : 400 mg twice daily for a minimum period of 4 weeks

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ANNEXURE-I

PROTOCOL FOR USE OF CONVALESCENT PLASMA FOR TREATMENT OF PATIENTS WITH COVID 19 INFECTION IN MEDICAL COLLEGES & HOSPITALS

1. **Eligibility of Donor**

   The following criteria should be met for potential donors

   a. More than 18years of age
   b. Only males and nuliparous female donors of weight > 55kg will be included.
   c. Prior diagnosis of COVID -19 documented by a laboratory test (RT-PCR) with symptomatic disease and complete resolution of symptoms at least 28 days prior to donation.
   d. One RT-PCR test for COVID 19 to be done before donation and donors with negative test results only to be considered.

   In addition, donor eligibility criteria for whole blood and plasmapheresis donation will be followed in accordance to the Drugs & Cosmetics Act 1940 and rules 1945 therein (as amended till March 2020).

2. Informed consent of donors for donating convalescent plasma.
3. Screening of eligible donor
   a. Donor will be screened, followed by brief physical examination.
   b. Donors not fit to donate blood based on the history and physical examination will be deferred.
   c. Donors who have had transfusion of blood products in last 8 weeks will be excluded.
   d. Donors who have had COVID diagnosis more than 4 months will be excluded from donation.
   e. Two EDTA samples (Smt each) and one plain sample (Sml) will be drawn for the following pre-donation tests *as* required for convalescent plasmapheresis.
      1. Blood group (ABO grouping and Rh phenotyping).
      2. Complete blood count including Hb, Hct,PIatelet count, total and differential leucocyte count. Donors with Hb>12.5/dl, platelet count > 1,50,000 per microliter of blood and TLC within normal limits will be accepted.

ANNEXURE-I(A)

3. Screening for HIV, HBV, and HCV by serology or NAT. Donor negative by either test will be included.
4. Screening for syphilis and malaria by serology. Negative donors will be included.
5. Total serum protein. Donors with total serum protein>6gm/dl will be accepted (as per Drugs and Cosmetics (Second Amendment) Rules,2020.
6. Neutralizing titre of donor plasIna should be above the specific threshold (if the latter is not available, plasma IgG titei- (against S-protein RBD) above 1:640 should be used)
7. Molecular test (RT-PCR) for COVID19 will be done. Donors found to be positive will be deferred.
8. Recipient should be closely monitored for several hours post transfusion for any transfusion related adverse events.
9. Use should be avoided in patients with lgA deficiency or immunoglobulin allergy.
10. Consent of the recipient or guardian should be obtained in the format at Annexure-A
11. Roles and Responsibilities of Institutional Medical Board is at Annextire-B.

Annexure-I(B)

INFORMED CONSENT FOR USE OF CONVALESCENT PLASMA THERAPY (CPT) £Oft COVID-19 PATIENTS

The institutional medical board has informed me that I...../iny relative.....have/has been diagnosed with COVID-19 infection. Further:

- They have clearly explained to me that so far, there is no approved medicine against COVID-19 infection.
- They have informed me/tny relative that I /iny relatIve am / is not adequately responding to the standard treatment protocol .
- They have explained to me in detail that there is some scientific evidence regarding the use of Convalescent Plasma Therapy (CPT) for treating COV I D- 19 infection. This is with the reference to the MoHFW. GOI guideline dated 27-06-2020.
- They have also explained to me that at present a clinical trial is going on in India conducted by ICMR to ascertain the efficacy of CPT in COV1D-19 infection in India, in which CPT has been indicated as "OFF Label" therapy in COV1D-19 patlents.
- They have explained to me that CPT has also been used in the treatment of certain infections like SARS, MERS. Ebola, Influenza etc.
- They have informed me that I/my relative hay benefit by the use of CPT.
- They have explained to me that CPT is yet to be approved as a regular therapeutic option for COVID-19. However, at present the same is to be considered as an investigational therapeutic option.
- They have explained to me about the possible side erfects of CPT.
- They have also made it clear to me/my relative that the standard treatlnent for COVI D 19 will be continued irrespective of my decision regarding the use of CPT.

Now having the full knowledge as above, I agree to give my consent for the application of CPT in the treatment of my/my relative's COVID 19 infection.

Name of declarant:

Relation with patient:

Name of patient:

Signature & Date:

Place:

Acceptance of Institutional Medical Board Members

Annexure-I(C)

ROLES AND RESPONSIBILITIES OF INSTITUTIONAL MEDICAL BOARD

1. Monitoring of the baseline clinical and biochemical parameters should be done and recorded in a case report form. Biochemical parameters ideally should include CRP, D-dimer, LDH, S.ferritin, T-protein prior to convalescent plasma administration and should be repeated every 48hours for a week.
2. All the recorded details should be sent to State Medical Board by the Institutional Medical Board.
3. All the adverse events observed should be reported to State Medical board.

Composition of Boards

Institutional Medical Board:

- Representative of Hospital authority.
- Pulmonologist.
- Physician.
- Blood bank in charge.

State Medical Board:

- Representative of Health and Family welfare department.
- RepresentatiVe of State Blood Transfusion Council.
- Representative of ASACS
- RepresentatiVe of State Drugs Controller.
- Registrar, Assam Council of Medical Registration.

ANNEXURE-II

PROTOCOL FOR CKD:

MANDATORY INVESTIGATIONS

- CBC, RBS, LFT, KFT,VIRAL MARKERS :

  FOR ICU : PATIENTS REPEAT CBC, RBS, LFT, KFT DAILY,

  FOR WARD : REPEAT CBC, RBS, LFT, KFT EVERY 3RD DAY/SOS

- ECG CXR ABG
- BIO-MARKERS: FERRITIN CRP D-DIMER IL-6

NEED FOR DIALYSIS: Same as non-covid

DURATION OF DIALYSIS: Same as non-covid

MODIFICATION IN COVID THERAPIES IN CKB:

STEROID: Can be given in normal dose

If already on steroid (transplant recipient): cont at same dose

IMMUNOSUPPRESANT: Dose adjustment by nephrologist as and when required.

ANTICOAGULATION:

UFH (unfractionated heparin) to be given at dose of 5000 u s/c bd in all CKD (including on HD) except on day of dialysis.

REMDESIVIR:

Can be started at standard dose (irrespective of egfr) if patient is on maintainence dialysis

For CKD not on HD and eGFR<30, remdesivir to be considered after patient counselling and consent

After bolus dose of 200mg on day1, maintenece doses of 100mg to be given on alternate days.

remdesivir to be infused over 4 hours

After remdesivir dose, patient to be considered for hd after 4 hours

CPT:

To be considered as per standard protocol

TREATMENT FOR CKD:

1. Anti hypertensive: standard medications to continue
   (BP not to be lowered <120/80)
2. Antidiabetic
3. Anti-platelet
4. Ifa, Calcium
   has to be continued as before

Erythropoetin to be with-hold during the period of hospitalisation (due to pro-thrombotic risk)

for managing severe anemia (hb<7) blood transfusion (prbc) to be given

DISCHARGE:

All CKD patients shall undergo rt-pcr test before discharge from Hospital.

ANNEXURE - III

USE OF CXR AS AN AID IN DECISION MAKING

For patients clinically stable

(spo2>94% in room air, normal respiratory rate, no dyspnoea)

1. **A typical covid like image** (see description)

   These patients require intensive monitoring and may be considered as candidate for

   - dexamethasone 6 mg daily
   - enoxaparin 40mg sc daily
   - remdesivir 200 mg stat followed by 100mg od for 5 days

2. **Suggestive cxr plus inflammatory markers (any) >3 times**

   these patients require intensive monitoring and may be considered as candidate for

   - dexamethasone 6 mg daily
   - enoxaparin 40mg sc daily
   - remdesivir 200 mg stat followed by 100mg od for 5 days

Interpretation of chest radiograph in covid

1. **normal**: no findings, covid not excluded
2. **classic/probable**: lower lobe predominant, peripheral predominant, multiple bilateral, areas of groung glass opacities +/- peripheral consolidation
3. **indeterminate**: does not fit classic/non-covid description
4. **non-covid**: pneumothorax, lobar pneumonia, pleural effusion, pulmonary edema

THORACIC IMAGING IN COVID 19:GUIDANCE FOR REPORTING RADIOLOGIST, BRITISH SOCIETY OF THORACIC IMAGING, VERSION2, 16TH MAR, 2020

1. **Ground glass densities**

CXR is a less sensitive modality in the detection of COVID-19 lung disease compared to CT, with a reported baseline CXR sensitivity of 69% .

The most common reported CXR and CT findings of COVID-19 include lung consolidation and ground glass opacities.

Ground glass densities observed on CT may often have a correlate that is extremely difficult to detect on CXR

Often, reticular opacities accompanying regions of ground glass attenuation are more easily appreciable on standard CXR

2. **Bilateral lower lobe consolidations**

As opposed to community acquired bacterial pneumonia which tends to be unilateral and involving a single lobe, COVID-19 and other viral pneumonias typically produce lung opacities in more than one lobe. Identifying multifocal air-space disease on CXR can be a significant clue to COVID-19 pneumonia. The air-space disease tends to have a lower lung distribution and is most frequently bilateral.

3. **Peripheral air space opacities**

One of the most unique and somewhat specific features of COVID-19 pneumonia is the high frequency of peripheral lung involvement, often mirroring other inflammatory processes such as organizing pneumonia. Such peripheral lung opacities also tend to be multifocal, either patchy or confluent, and can be readily identified on CX

4.**Diffuse air space disease**

Diffuse lung opacities in patients with COVID-19 have a similar CXR pattern as other widespread infectious or inflammatory processes including acute respiratory distress syndrome (ARDS).
Lung opacities may rapidly evolve into a diffuse coalescent or consolidative pattern within 1–3 weeks of symptom onset, often peaking at around 6–12 days after initial clinical presentation.

5.**Uncommon CXR findings**

Pleural effusions have been reported as exceedingly rare on CXR in COVID-19 infected patients, and when present are most often identified late in the disease course.

Lung cavitation and pneumothorax are also rare findings in COVID-19 patients but can occur.

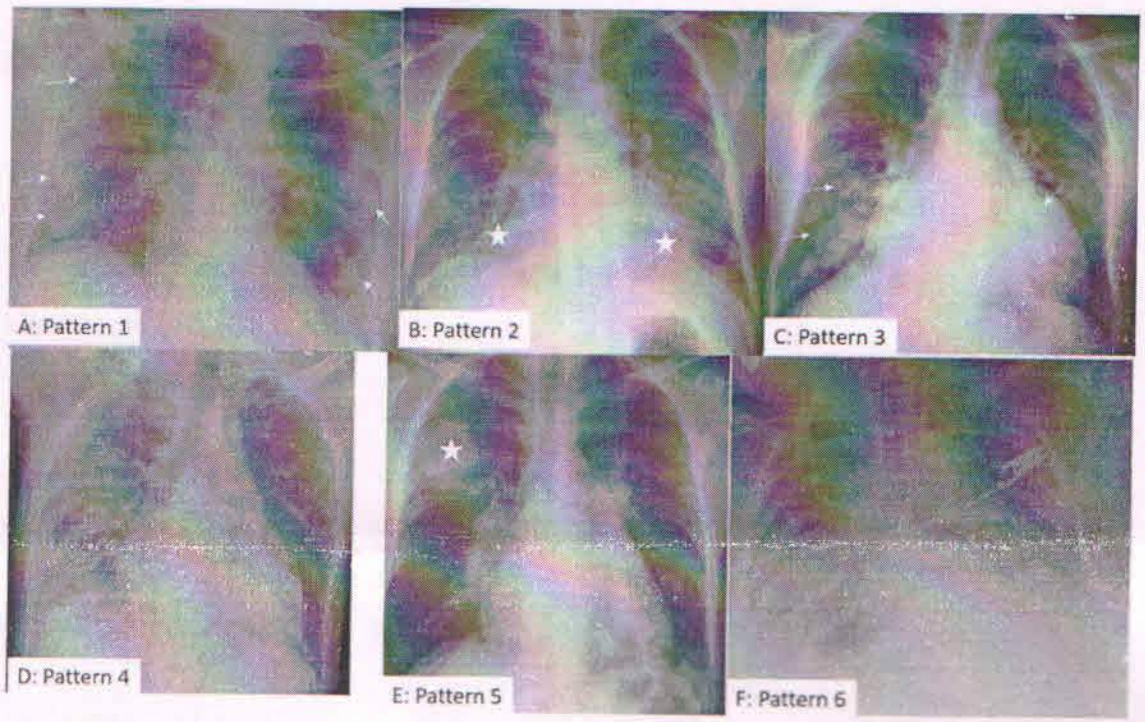
6.Conclusions

Patterns of COVID-19 lung disease can be identified on conventional chest radiography as well as chest CT. Typical verbiage when reporting patients with, or suspected COVID-19 on CXR include terms such as irregular, patchy, hazy, reticular, and widespread ground glass opacities.

Grading disease severity based on total lung involvement is also important to relay to the clinicians.

Portable chest X-ray in coronavirus disease-19 (COVID-19): A pictorial review

Clin Imaging. 2020 Aug; 64: 35–42., Published online 2020 Apr 8. doi: 10.1016/j.clinimag.2020.04.001



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