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Ministry of National Health Services,
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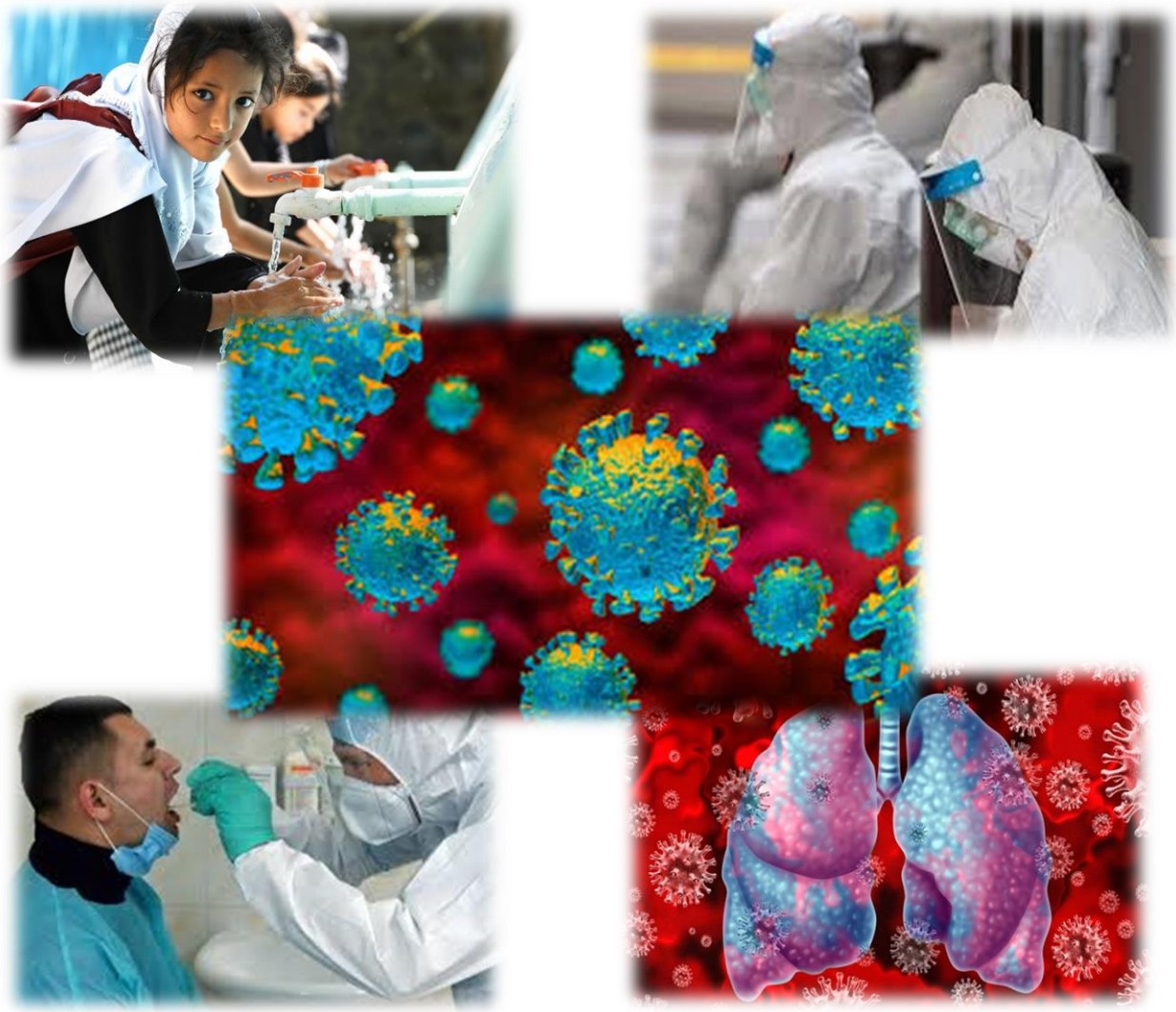
Guidelines

Clinical Management Guidelines for COVID-19 Infections



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Objectives

The objectives of this document are

- To provide public health and health care professionals guidelines regarding the clinical management of the COVID-19 infection
- To provide a protocol on the practical steps to deal with COVID-19 cases
- This guideline is **not intended to override the clinical decisions** that will be made by clinicians providing individualized patient care.
- This guideline will be updated as more information becomes available

Testing Criteria

Viral Lab testing for COVID 19

Testing should be performed using RT-PCR. Preferable samples are nasopharyngeal (NP) or lower respiratory samples. Other samples include oropharyngeal and nasal samples, though these may not be as sensitive and may require 2 or more samples to avoid a false negative test. Serology (IgM/IgG tests) are NOT recommended as primary means for diagnosis. Symptoms will appear 2-14 days after exposure to the virus, however contact history is not required to decide on testing. Individuals with the following symptoms may qualify for testing.

Respiratory symptoms alone

- Cough
- Shortness of breath or difficulty breathing

Or at least two of these symptoms

- Fever
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

Testing is based on symptoms and priority is given to certain individuals

High Priority

- Hospitalized patients with symptoms
- Healthcare workers and workers in congregate living settings with symptoms
- Residents in long-term care facilities or other congregate living settings, including prisons, shelters and hostels, with symptoms
- Patients with radiological features suggestive of COVID even if asymptomatic or without typical symptoms

Priority

- Outpatients with symptoms of potential COVID-19 infection
- Healthcare workers without symptoms, but with a history of exposure to a COVID positive patient
- Persons without symptoms, but with a history of close contact with a COVID positive patient

Clinical classification of suspected or confirmed COVID-19 patients

Patients can be classified into asymptomatic, mild, moderate, severe or critical based on their presentation.

Asymptomatic

SARS CoV2 infection but with no symptoms

Mild

Presence of symptoms consistent with COVID as above without any hemodynamic compromise, need for oxygen or chest x-ray findings.

Oxygen saturation ≥94%

Moderate

Hypoxia (Oxygen saturation <94% but >90%) or chest X-ray with infiltrates involving <50% of the lung fields

No complications and manifestations related to severe condition

Severe

In adults, clinical signs of pneumonia (fever/ cough)

plus, any of the following:

Respiratory rate > 30
Severe respiratory distress;
SpO2 ≤ 90% on room air.
Chest X-ray involving >50% of lung fields

Critical

Any of the three manifestations

1. ARDS

   Onset: Within 1 week of a known clinical insult (i.e. pneumonia) or new or worsening respiratory symptoms.

   Chest imaging: (X-ray or CT scan): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules.

   Origin of pulmonary infiltrates: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of infiltrates/edema if no risk factor presents

   Oxygenation impairment in adults

   - Mild ARDS: PaO2/FiO2: >200 mmHg and ≤ 300 mmHg (with PEEP or CPAP ≥ 5 cmH2O).
   - Moderate ARDS: PaO2/FiO2 ≤ 200 mmHg and >100 mmHg (with PEEP≥ 5 cmH2O).
   - Severe ARDS: PaO2/FiO2 ≤ 100 mmHg (with PEEP ≥ 5 cmH2O)

2. **Multiorgan dysfunction**

Acute life-threatening organ dysfunction caused by a dysregulated host response to suspect or proven viral or bacterial infection.
Signs of organ dysfunction include:

Altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate, or hyperbilirubinemia.

3. **Septic shock**

Persistent hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level > 2 mmol/L

Criteria for admission of suspected or confirmed COVID-19 patients

Asymptomatic and mild disease

Asymptomatic and mild cases can be managed at home with home isolation Criteria for home isolation include (must fulfill all the below)

- Those with a separate room to stay in with a separate bathroom
- Those consenting for isolation

Patients with mild or asymptomatic disease who do not have adequate home arrangements or do not consent to stay at home should be shifted to a dedicated isolation facility (as opposed to a hospital)
However, the following may be considered for hospital admission for observation if resources allow.

- Immunosuppressed (on long term steroids or other immunosuppression)
- Co-morbid conditions: Heart Failure, Decompensated Liver Disease, Structural Lung Disease, Uncontrolled Diabetes, Chronic Kidney Disease

If the patients cannot be admitted, then clear instructions must be given to call if any worsening occurs.

Moderate, severe and critical disease

Patients with the above categories should be admitted to a hospital for further management.

- Moderate disease: Admit to a well-ventilated general ward
- Severe disease: Admit to high dependency unit with negative pressure room
- Critical disease: Admit to ICU with negative pressure room

In all the above wards, it is mandatory that oxygen and pulse oximetry be available.

Management

Prophylaxis

There is no role of prophylactic chloroquine or hydroxychloroquine at this time. Both these drugs are being studied for treatment of COVID. The results thus far are not robust enough that either drugs can be clearly labeled as effective in treatment of COVID. Moreover, given the side- effects associated with use of chloroquine or hydroxychloroquine (especially chronic use), the limited stocks (for moderately sick) and the lack of data showing use will prevent the infection, prophylactic use is **strongly** discouraged.

Management of mild disease

Mild cases should be treated with supportive care only. This includes acetaminophen for fever, oral hydration in case of diarrhea and antihistamines for rhinorrhea.

There is a theoretical risk with the use of NSAIDS or ACE-inhibitors in COVID-19. However, clinical data regarding this is lacking and at this point, a strong recommendation to avoid or to continue these medications cannot be made.

No specific treatment (including chloroquine hydroxychloroquine, azithromycin, ivermectin or, famotidine) is recommended for asymptomatic or mild disease.

Management of moderate, severe, and critical disease

Patients with moderate disease should receive supportive therapy. All patients must be assessed for the Cytokine Release Syndrome (CRS). For this the following investigations are suggested

- CBC
- Ferritin
- C-reactive protein
- Lactate dehydrogenase
- D-Dimer
- Chest X-ray (P.A view)

Additional investigations indicated include

- Liver function tests
- BUN Creatinine and electrolytes
- Blood cultures
- Blood glucose levels
- EKG
- Arterial Blood Gas(for severe and critical cases)
- Serum lactate (for severe and critical cases)
- Respiratory cultures (for severe and critical cases)

Optional investigations include

- Procalcitonin
- Troponin
- Echo
- Pro-BNP
- IL-6
- CT scan chest

NOTE:
Chest radiographs of patients with COVID-19 typically demonstrate bilateral air-space consolidation, though patients may have unremarkable chest radiographs early in the disease. Chest CT images from patients with COVID-19 typically demonstrate bilateral, peripheral ground glass opacities.

Because this chest CT imaging pattern is non-specific and overlaps with other infections, the diagnostic value of chest CT imaging for COVID-19 may be low and dependent upon radiographic interpretation. Patients who present early e.g. within two days of diagnosis may have a normal CT and there might be presence of CT abnormalities in patients prior to the detection of SARS-CoV-2 RNA. Given the variability in chest imaging findings, chest radiograph or CT alone is not recommended for the diagnosis of COVID-19. The American College of Radiology also does not recommend CT for screening or as a first-line test for diagnosis of COVID-19.

Specific therapy

Supportive care

The mainstay of management for COVID-19 is oxygen therapy via nasal cannula or face mask. If available high flow oxygen can also be used to maintain saturation. All patients with low saturations should be placed in the prone position. For those not intubated, voluntary awake prone positioning should be encouraged for as long as the patient can manage. For patients on the ventilator, 12 to 15 hours of prone positioning should be attempted.

Antibiotics

Antibiotics should only be used in cases where a bacterial infection is suspected, for example in cases with an elevated white cell count (in the absence of steroid) or procalcitonin. There is no role of prophylactic antibiotics to prevent a secondary infection.

Hydroxychloroquine and chloroquine

These are no longer recommended given recent studies showing potential harm and lack of clear benefit.

Anticoagulation

As patients with COVID-19 may be hypercoagulable, anticoagulation plays an important role in therapy. For all doses mentioned below, adjustment will be required in case of renal impairment or morbid obesity (BMI $\geq 40 kg/m^2$)

If the patient was already on oral anticoagulation for another indication (such as atrial fibrillation):

- In moderate disease: Continue same
- In severe/critical: Consider switching to parenteral therapy

If the patient was not on anticoagulation at the time of admission

- In moderate disease: Start standard DVT prophylaxis (enoxaparin 40 mg once daily once daily)
- If Severe disease: Start aggressive prophylaxis (Enoxaparin 40mg every 12 hourly)

Indications for therapeutic anticoagulation (any of the following):

- Documented presence of thromboembolic disease (such as ultrasound doppler or CT for PE)
- Strong suspicion for thromboembolic disease when investigation cannot be done
- D-Dimer over 3 times normal upper limits

Dose: Enoxaparin 1mg/kg every 12 hourly

Duration: 1 to 3 months (Switch to rivaroxaban on discharge if diagnosis was presumptive or based on D-dimer elevation

Dose: Rivoxaban10 mg OD (once a day)

If documented VTE follow standard guidelines for duration

Dose adjustment

Acute Renal Failure

Prophylaxis:

Cr Cl >30 ml/min	40mg OD or BD enoxaparin
Cr Cl < 30 and >15 ml/min	30mg OD or BD enoxaparin
Cr Cl < 15 ml/min	Unfractionated Heparin preferred
Dialysis	Unfractionated Heparin preferred
Therapeutic:	
Cr Cl >30 ml/min	1 mg/kg s/c BD enoxaparin
Cr Cl < 30 and >15 ml/min	1 mg/kg s/c OD enoxaparin
Cr Cl < 15 ml/min	Unfractionated Heparin preferred
Dialysis	Unfractionated Heparin preferred

Morbid Obesity (BMI ≥ 40kg/m$^{2)}$
Increase standard doses of both prophylactic and therapeutic anticoagulation by 30%

Remdesivir

Indication: Moderate and severe COVID requiring oxygen therapy regardless of if CRS is present. This can also be given in critical COVID, however, with the available data, it is unlikely to be of benefit in this patient population
Dose:200 mg IV on day 1 followed by then 100 mg IV daily on days 2-5

Therapy in Cytokine Release Syndrome (CRS)

Cytokine Release Syndrome is defined as ANY of the following in the presence of moderate, severe or critical disease

1. Ferritin >1000 mcg/L and rising in last 24 hours
2. Ferritin >2000 mcg/L in patient requiring high flow oxygen or ventilation
3. Lymphopenia <800 cells/ml, or lymphocyte percentage <20% or Neutrophil to lymphocyte ratio of >5

and two of the following

a. Ferritin >700 mcg/mL and rising in the last 24 hours
b. LDH > 300 IU and rising in the last 24 hours
c. D-Dimer >1000ng/mL (or >1mcg/ml) and rising in the last 24 hours
d. CRP >70 mg/L (or >10 hsCRP) and rising in the last 24 hours, in absence of bacterial infection
e. If any 3 presents on admission no need to document rise

Steroids

In early CRS steroids are preferred.
Dose: 0.5 to 1 mg/kg/d of methyl prednisone or equivalent for 5 days
Avoid if no evidence of CRS

Tocilizumab

Reserved for patients in whom worsening occurs despite steroids or those who present as severe/critical disease in CRS. As tocilizumab greatly increases the risk of secondary infection, only use in cases of confirmed CRS
Dose: 4 to 8 mg/kg iv. Not over 800mg (maximum).
Can repeat in 12 hours once only
Weight-based tocilizumab dose

Standard dosing for 80mg vial

Weight	Dose(mg)
30-50kg	320
51-70kg	480
71-90kg	640
>90kg	800

Standard dose for prefilled syringes (IV use) 162mg/0.9 ml

Weight	Dose
30-50kg	2 syringes (324mg)
51-70 kg	3 syringes (486 mg)
71-90 kg	4 syringes (648 mg)
>90 kg	5 syringes (810mg)

Contraindications:

- Active TB
- Zoster
- Sepsis and positive blood culture
- Suspected GI perforation
- Multiple Sclerosis
- Allergy to Tocilizumab
- ALT > 5 times or Bilirubin > 2
- ANC <2000 or Thrombocytopenia <50
- Pregnancy (relative contraindication)

Investigational therapy

Other treatment modalities including (but not limited to) convalescent plasma, ivermectin or famotidine should be used only in the setting of a research protocol which includes consent and safety oversight

Discontinuation of Isolation

There are no data regarding re-infection with SARS-CoV-2 after recovery from COVID-19. Viral RNA shedding declines with resolution of symptoms and may continue for days to weeks. However, the detection of RNA during convalescence **does not** indicate the presence of viable infectious virus. Isolation precautions can therefore be discontinued in the following conditions:

In those who are symptomatic, the following symptom-based strategy is recommended: At least 10 days from the start of symptoms AND at least 3 days after resolution of symptoms (fever and respiratory symptoms)

In those who are asymptomatic, the following time-based strategy is recommended: Ten days from the date of the test

Note: A test to document cure is **not required** in the above-mentioned patients.

However, for the following two consecutive negative PCR tests a minimum of one day apart are required to discontinue isolation

1. Immunocompromised patients
2. Those living in congregations such as jails, dorms or madrasas (if going back to the congregation

3. Healthcare workers dealing with immunocompromised patients

Test-based isolation discontinuation may also be done on the discretion of the treating physician

Disclaimer:

1. This document is a guideline and NOT a substitute for good clinical practice and judgment of clinician for individual cases
2. Literature is rapidly evolving & this document may not necessarily reflect all the updated day to day information.

Note: The above recommendations are being regularly reviewed by the Ministry of National Health Services, Regulations & Coordination and will be updated based on the international & national recommendations and best practices.

The Ministry acknowledges the contribution Dr Syed Faisal Mahmood, Dr Nousheen Nasir, Dr Samreen Sarfaraz, Dr Shehla Baqi, Dr Fyezah Jehan, Dr Farah Qamar, Dr Farheen Ali, Dr Ejaz Ahmed Khan, Dr Muneeba Ahsan, Dr Salma Abbas, Dr Faisal Sultan, Dr Sunil Dodani, Dr Amjad Mahboob, Dr Naseem Akhtar, Dr Asma Adil, Dr Javed Bhutta, Dr Urooj Aqeel and HSA/ HPSIU/ NIH team to compile these guidelines.

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For more information, please contact:

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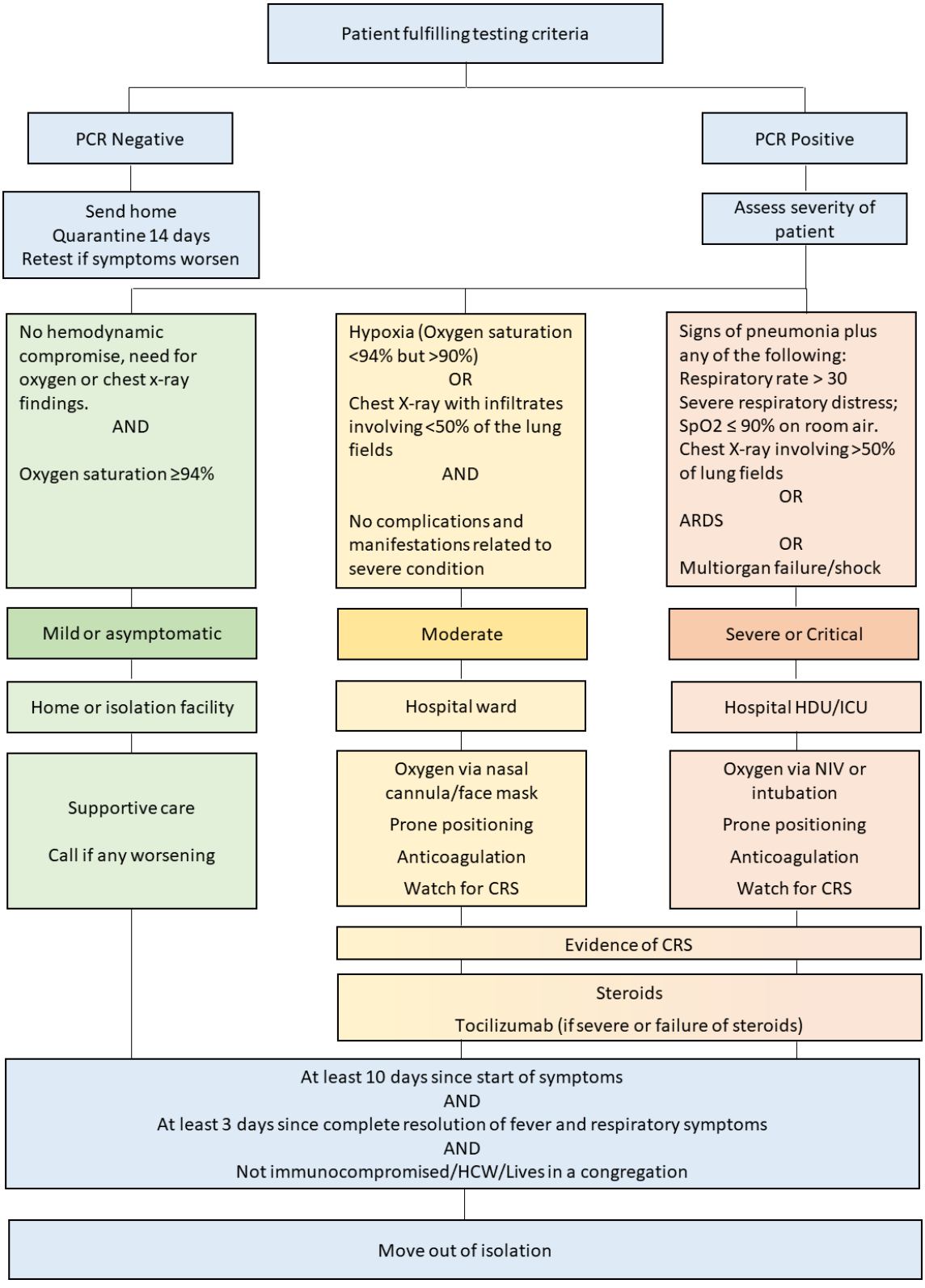
http://covid.gov.pk/

http://nhsrc.gov.pk/http://www.hsa.edu.pk/https://www.nih.org.pk/ https://www.facebook.com/NHSRCOfficialhttps://twitter.com/nhsrcofficialhttps://www.youtube.com/channel/UCdYuzeSP4Ug1fZZKLDiY

Annexure

Summary algorithm of COVID management



Clinical Management Guidelines for COVID-19

Disease Severity	Criteria	Where to manage?	Management		
Asymptomatic	SARS COV 2 infection with no symptoms	Home	Follow home management guidelines		
Mild disease	Presence of symptoms[1] consistent with COVID without any hemodynamic compromise, need for oxygen and no chest X-ray findings	Home For those who don't have home arrangements for isolation can be shifted to isolation facility	• Follow home management guidelines. • All supportive care with paracetamol for fever, ORS for diarrhoea and antihistamines for rhinorrhoea, • NO specific treatment • For any warning signs call 1700/1122 for assistance and guidance or consult health care facility.	**1: Symptoms:** • Cough • Shortness of breath • Fever • Asthenia/lethargy • Chills • Muscles pain • Headache • Sore throat • New loss of taste or smell	**Warning Signs** • Fever > 7 days or new fever after initial defervesce • SOB exertion or RR>20 • SpO2 of <94% on room air • Persistent palpitations • Pleuritic /Chest pain • Haemoptysis • New confusion/lethargy • Severe diarrhoea and dehydration • Excessive vomiting
Moderate disease	Hypoxia (SpO2 <94% but >90% or Chest X-ray Infiltrates involving <50% of the lung fields	Isolation unit inside hospital. Isolation unit need to be equipped with all the routine items in a general medical unit plus a proper Oxygen supply mechanism that can deliver up to 10 lit/min, Pulse oximeter	• Supportive care, Investigations • Oxygen through a face mask, nasal cannula • Voluntary prone positioning • If already on anticoagulation continue the same if not start on standard DVT prophylaxis (enoxaparin 40mg OD) • Remedesivir[4] Moderate and severe COVID requiring oxygen therapy regardless of if CRS is present. Use in critical patients as per available data is unlikely to be of benefit. • In case of Cytokine release storm[5]: a) Steroids 0.5-1 mg/kg/d of methylprednisolone for 3 days. Avoid if no evidence of CRS. b) Tocilizumab[6] Is reserved for patients in whom worsening occurs despite steroids or those who present as severe/critical disease in CRS	**Investigations required.** All patient with moderate or above category need to be assessed for cytokine storm • CBC • Ferritin • C-Reactive Protein • Lactate Dehydrogenase • D-Dimer • Chest X-ray (PA view) **Additional investigations** • Liver Function tests • BUN creatinine and electrolytes • Blood cultures • Blood glucose levels • EKG • ABG (for severe and critical) • Serum lactate (for severe and critical) • Respiratory cultures(for severe and critical)	**Optional investigations include** • Procalcitonin • Troponin • Echo • Pro-BNP • IL-6 • CT scan Chest

<table>
<tr>
<td>Severe disease</td>
<td>In Adults, clinical signs of pneumonia (fever/cough) plus any of the following
• Respiratory Rate >30
• Severe respiratory distress
• SpO2≤90 on room air
• Chest X-ray involving >50% of lung fields</td>
<td>High Dependency Unit

HDU need to be well ventilated(negative pressure) and equipped as an ICU where the Oxygen is supplied from a central source and the delivery systems are;
High flow nasal cannula, CPAP, BiPAP, (NIV),
The monitor and bed, along with other supplies are similar to ICU</td>
<td>• Supportive care
• Oxygen through High flow Nasal Cannula, CPAP (NIV)
• Prone positioning for 12-15 hours
• Anticoagulation: Switch to parenteral anticoagulation as aggressive prophylaxis dose as enoxaparin 40 mg q12h , if D-Dimers >3 times normal give therapeutic dose enoxaparin 1mg/kg/q12h
• Antibiotics only on specific indication, send cultures
• Remedesivir[4]
Moderate and severe COVID requiring oxygen therapy regardless of if CRS is present. Use in critical patients as per available data is unlikely to be of benefit.
• In case of Cytokine release storm[2]:
c) Steroids
0.5-1 mg/kg/d of methylprednisolone for 5 days.
Avoid if no evidence of CRS.
d) Tocilizumab
Is reserved for patients in whom worsening occurs despite steroids or those who present as severe/critical disease in CRS</td>
<td colspan="3">2: Cytokine Release Storm (CRS)
Any of the following in the presence of moderate, severe or critical disease
1. Ferritin>1000 mcg/L and rising in last 24 hours
2. Ferritin>2000 mcg/L in patient requiring high flow oxygen or ventilation
3. Lymphopenia <800 cell/ml, or lymphocyte % <20%, or Neutrophil to Lymphocyte ratio of >3 and TWO of the following
• Ferritin >700 mcg/mL and rising in the last 24 hours
• LDH >300 IU and rising in the last 24 hours
• D-Dimer>1000ng/ml(or>1mcg/ml) and rising in the last 24 hours
• CRP>70 mg/L(or >10 hs CRP) and rising in the last 24 hours, in absence of bacterial infection
• If any 3 present on admission no need to document rise
3: Tocilizumab dose
• 4-8 mg/kg IV. Not over 800mg (max), can repeat after 12 hours once only
Contraindications
Active TB, Zoster, Sepsis and positive blood culture, suspected GI perforation, Multiple sclerosis, allergy to Toci, ALT>5 Times or Bilirubin>2, ANC<2000 or Thrombocytopenia <50k, Pregnancy(relative contraindication)
4: Remdesivir
• 200mg IV on day 1 followed by 100mg IV daily on day 2-5</td>
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<tr>
<td>Critical disease</td>
<td>Any of the three manifestations
• ARDS[5]
• Multiorgan dysfunction[6]
• Septic shock[7]</td>
<td>Intensive Care Unit

An ICU need to be well ventilated and equipped with an ICU bed, a ventilator, a cardiac monitor, infusion pumps, and other items as per basic needs.</td>
<td>• Supportive care
• Oxygen through mechanical ventilation
• Prone positioning for 12-15 hours
• Anticoagulation: Switch to parenteral anticoagulation as aggressive prophylaxis dose as enoxaparin 40 mg q12h , if D-Dimers >3 times normal give therapeutic dose enoxaparin 1mg/kg/q12h
• Antibiotics only on specific indication, send cultures
• Remedesivir[4]
Use in critical patients as per available data is unlikely to be of any benefit.
• In case of Cytokine release storm[2]:
e) Steroids
0.5-1 mg/kg/d of methylprednisolone for 5 days.
Avoid if no evidence of CRS.
f) Tocilizumab
Is reserved for patients in whom worsening occurs despite steroids or those who present as severe/critical disease in CRS</td>
<td>5: ARDS
Onset: within one week of a known clinical insult (pneumonia) or new or worsening respiratory symptoms.
Chest imaging: (X-ray or CT-Scan): Bilateral opacities, not fully explained by volume overload, lobar or lung collapse or nodules.
Origin of pulmonary infiltrates: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography to exclude hydrostatic cause of infiltrates /edema if no risk factor present.
<u>Oxygen impairment in adults</u>
Mild ARDS : PaO2/FiO2:>200 mmHg and ≤ 300 mmHg (with PEEP or CPAP≥5cm H20
Moderate ARDS: PaO2/FiO2:≤200 mmHg and > 100 mmHg (with PEEP or CPAP≥5cm H20
Severe ARDS: PaO2/FiO2 ≤100 mmHg (with PEEP ≥cmH20)</td>
<td>6: Multiorgan failure
Acute life threatening organ dysfunction caused by a dysregulated host response to suspected or proven viral or bacterial infection. Signs of organs dysfunction include: Altered mental status, difficult or fast breathing, low oxygen saturation , reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia</td>
<td>7: Septic shock
Persistent hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level > 2 mmol/l.</td>
</tr>
</table>

- **Investigational therapies**: Treatment modalities including (but not limited to) convalescent plasma, Ivermectin or famotidine should be used only in the setting of an approved research protocol by NBC and includes consent and safety oversight
- Routine use of Hydroxychloroquine/ chloroquine and Azithromycin is discouraged and not supported by evidence
- De-isolation: The detection of RNA during convalescence does not indicate the presence of viable infectious virus. NOTE: A test to document Cure is not required in the below mentioned patients with the exception of immunocompromised patients
  In those who are <u>symptomatic</u>, <u>symptom-based strategy</u> is recommended: At least 10 days from the start of symptoms AND at least 3 days after resolution of symptoms (fever and respiratory symptoms).
  In those who are <u>asymptomatic</u> the <u>time based strategy</u> is recommended i-e Ten days from the date of the test.

Note: The above recommendations are being regularly reviewed by the Ministry of National Health Services, Regulations & Coordination and will be updated based on the international & national recommendations and best practices.