Saudi MoH Protocol for Patients Suspected of/Confirmed with COVID-19

Supportive care and antiviral treatment of suspected or confirmed COVID-19 infection

(Version 3.3) November 24th, 2021

Disclaimer: This is a living guidance that is subject to change as more evidence accumulates. It will be updated regularly and whenever needed. The guidance should be used to assist healthcare practitioners select the best available pharmacotherapy for COVID-19 infection according the best available and current evidence and is not intended to replace clinical judgement but rather to complement it. The evidence is inconclusive regarding the efficacy of most medications for covid-19. It is important to explain this to patient and family and obtain informed consent for use of these medications for unapproved indications. Convalescent plasma transfusion should only be used according to an approved study protocol.

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<th>COVID-19 Testing*</th>
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<th>Precautions</th>
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</thead>
</table>
| Suspicious Cases (follow case definition published in Saudi CDC guidelines) | Mild to Moderate: Symptoms with no shortness of breath | – Treat symptoms  
– If no hospital admission required, need to follow instructions and recommendations published by Saudi CDC [https://covid19.cdc.gov.sa/professionals-health-workers/] | – Not required  
– Do not stop ACEI/ARBs in patients with hypertension, post-MI, or heart failure | – Paracetamol (acetaminophen) is the preferred agent for pain/fever see below table “Medication Related Information”  
– Labs and work-up: CBC, Urea/Electrolytes, Creatinine, CRP, LFTs, Chest X-ray, COVID-19 PCR tests |
| Mild to Moderate: Symptoms with no shortness of breath in high-risk patients⁷ | – Treat symptoms  
– If hospital admission is not required, follow instructions and recommendations published by Saudi CDC [https://covid19.cdc.gov.sa/professionals-health-workers/]  
– Consult Infectious Disease Specialist | | |
### Saudi MoH Protocol for Patients Suspected of/Confirmed with COVID-19

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*(Version 3.3) November 24th, 2021*

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| **PCR Confirmed Cases** | Mild to Moderate: Symptoms (no O₂ requirements/no evidence of pneumonia but with other symptoms of covid-19 e.g., fever) | - Treat symptoms  
- Follow instructions and recommendations published by Saudi CDC [https://covid19.cdc.gov.sa/professionals-health-workers/](https://covid19.cdc.gov.sa/professionals-health-workers/) | In case of new onset cough and fever or anosmia, or both) within 7 days  
- Consider inhaled budesonide (Pulmicort®)  
  - Adult Dosing: 800 μg per actuation (two inhalations) twice a day until symptom resolution  
- Consider starting any of the following according to clinical evaluation and treating consultant’s discretion:  
  - Consider Favipiravir  
    - Adult Dosing: 1800 mg/dose twice a day on the first day; followed by 800 mg/dose twice a day for 7-10 days  
    - Pediatric Dosing:  
      - 10-15 kg: Loading Dose: One tablet PO BID for One day (maximum 400 mg/day). Maintenance from Day 2: Half tablet (100 mg) PO BID (maximum 200 mg/day)  
      - 16-21 kg: Loading Dose: Two tablets PO BID One day (maximum 800 mg/day). Maintenance from Day 2: One tablet PO BID for One day (maximum 1200 mg/day)  
      - 36-45 kg: Loading Dose: Four tablets PO BID for One day (maximum 1600 mg/day). Maintenance from Day 2: Two tablets PO BID (maximum 800 mg/day)  
      - 46-55 kg: Loading Dose: Five tablets PO BID for One day (maximum 2000 mg/day). Maintenance from Day 2: Two Tablets qAM, Three Tablets qPM (maximum 1000 mg/day)  
      - For >55 kg: Can use adult dosing if age ≥16 years, if age <16 years use dosing of 46-55 kg range  

For non-hospitalized ≥ 12 years of age patients at high risk of clinical progression treatment should start after positive PCR and within 10 days of symptom onset. (when available):  
- Consider Casirivimab 600 mg plus imdevimab 600 mg IV infusion once for patient weigh ≥40 kg. If IV infusions are not feasible or would cause a delay in treatment, casirivimab 600 mg plus imdevimab 600 mg administered by four subcutaneous injections (2.5 mL per injection) can be used as an alternative.  
OR  
- Consider sotrovimab for patient weigh ≥40 kg: 500 mg intravenous IV infusion once. | Inhaled budesonide (Pulmicort®) see below table “Medication Related Information”  
- Bronchospasm, oral candidiasis, and vasculitis  
- Favipiravir (non-formulary and non-SFDA registered) see below table “Medication Related Information”  
- Contraindicated in pregnancy  
- Anticoagulation see below “Thromboprophylaxis”  
- Casirivimab plus imdevimab non-formulary and non-SFDA registered see below table “Medication Related Information”  
- May cause infusion-related reactions, hypersensitivity/anaphylaxis during infusion and for ≥1 hour following infusion completion  
- Sotrovimab non-formulary and non-SFDA registered see below table “Medication Related Information”  
- May cause infusion-related reactions, hypersensitivity/anaphylaxis during infusion and for ≥1 hour following infusion completion |

- Criteria for using Anti-SARS-CoV-2 Monoclonal Antibodies should only be used in patients with high risk for progression to severe COVID-19 and/or hospitalization. These include:  
  1. Aged ≥65 years  
  2. Obesity (BMI >30)  
  4. Cardiovascular disease (including congenital heart disease)  
  5. Moderate-to-severe Chronic lung diseases (e.g., chronic obstructive pulmonary disease, asthma, interstitial lung disease, cystic fibrosis, pulmonary hypertension)  
  6. Any immunocompromising condition or chronic immunosuppressive treatment |  

*PCR Testing: Mild to Moderate: Symptoms (no O₂ requirements/no evidence of pneumonia but with other symptoms of covid-19 e.g., fever)  
Moderate-to-severe: Chronic lung diseases (e.g., chronic obstructive pulmonary disease, asthma, interstitial lung disease, cystic fibrosis, pulmonary hypertension)  
Any immunocompromising condition or chronic immunosuppressive treatment*
**COVID-19 Testing**

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<td>Severe: Clinical signs of pneumonia (fever, cough, dyspnea, fast breathing) and one of the following:</td>
<td>- Respiratory rate &gt;30/min (adults); ≥40/min (children &lt; 5 years)</td>
<td>Systemic Corticosteroids use:</td>
<td>Systemic Dexamethasone see below table “Medication Related Information”</td>
</tr>
</tbody>
</table>
- Blood oxygen saturation <90% on room air  
- ICU admission, decision by ICU treating team  
- Antibiotics and antifungals according to local antibiogram and institutional pneumonia management guidelines/ pathways. | - For all patients who require supplemental oxygen including (but not limited to) those requiring non-invasive and invasive ventilation.  
- To be used up to 10 days, until discharged, or if patient becomes asymptomatic.  
- Dexamethasone (Preferable Systemic Corticosteroids):  
  - Adult Dosing: 6 – 12 mg once daily oral (liquid or tablet) or intravenous preparation. Patients on chronic steroids, follow the usual recommendation of doubling steroids dose or start stress dose steroids based on clinical case basis on patients’ condition  
  - Pediatric Dosing: Prednisolone/ Prednisone: 1 mg/kg once daily (max: 40 mg) | - Cardiovascular disease: Use with caution in patients with heart failure and/or hypertension; use has been associated with fluid retention, electrolyte disturbances, and hypertension. Use with caution following acute myocardial infarction; corticosteroids have been associated with myocardial rupture.  
- Diabetes: Use corticosteroids with caution in patients with diabetes mellitus; may alter glucose production/ regulation leading to hyperglycemia.  
- Gastrointestinal disease: Use with caution in patients with GI diseases (diverticulitis, fresh intestinal anastomoses, active or latent peptic ulcer, ulcerative colitis, abscess or other pyogenic infection) due to perforation risk.  
- Myasthenia gravis: Use with caution in patients with myasthenia gravis; exacerbation of symptoms has occurred especially during initial treatment with corticosteroids.  
- Seizure disorders: Use corticosteroids with caution in patients with a history of seizure disorder; seizures have been reported with adrenal crisis. Labs and workup: Hemoglobin, occult blood loss, blood pressure, serum potassium, glucose, weight, and height in children; HPA axis suppression |  |
| OR | - Predictisolone/ Prednisone |  |  |
- Hydrocortisone | - Adult Dosing: In pregnant or breastfeeding women, prednisolone/ Prednisone 40 mg PO twice daily should be used instead of dexamethasone.  
- Pediatric Dosing: Prednisolone/ Prednisone (Oral/NG): 1 mg/kg once daily (max: 40 mg) |  |  |
- Methylprednisolone sodium succinate (IV): 0.8 mg/kg once daily (max: 32 mg) |
| OR | - Hydrocortisone |  |  |
- Methylprednisolone sodium succinate (IV): 0.8 mg/kg once daily (max: 32 mg) |  |  |
| Consider starting any of the following according to clinical evaluation and treating consultant’s discretion: |  |  |  |
- Consider Remdesivir (Start as early as possible) |  |  |  |
- Adult Dosing: 200 mg loading dose (IV, within 30 min), followed by 100 mg once daily for 5 to 10 days |  |  |  |
- Pediatric dosing  
  - <40 kg: 5 mg/kg IV load, then 2.5 mg/kg q24h for 5 to 10 days  
  - ≥40 kg: 200 mg IV load, then 100 mg IV q24h for 5 to 10 days |  |  |  |
| In case of corticosteroids contra indication: |  |  |  |
- Consider Remdesivir and Baricitinib (once available): |  |  |  |
- Adult Dosing: Remdesivir 200 mg loading dose (IV, within 30 min), followed by 100 mg once plus Baricitinib 4 mg (oral) once daily for 5 days. |  |  |  |
- Pediatric dosing for Remdesivir  
  - <40 kg: 5 mg/kg IV load, then 2.5 mg/kg q24h  
  - ≥40 kg: 200 mg IV load, then 100 mg IV q24h Plus |  |  |  |

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| PCR Confirmed Cases | Critical: | - Symptoms of the following:  
  o ARDS  
  o Respiratory failure requiring ventilation  
  o Sepsis  
  o Septic Shock  
  - Criteria for using tocilizumab:  
    1. Within 24 hours of ICU admission for MV, NIV, or HFNC oxygen  
    2. Patients who are exhibiting rapidly increasing oxygen needs while on dexamethasone and have a C-reactive protein level ≥75 mg/L (715 nmol/L). | o Pediatric dosing for Baricitinib  
  - ≥ 9 years: 4 mg (oral) once daily for 5 days.  
  - 2 - 9 years: 2 mg (oral) once daily for 5 days. | - Patients treated with baricitinib are at risk for developing serious infections, malignancies, and thrombosis  
   **Anticoagulation** see below “Thromboprophylaxis” |
| PCR Confirmed Cases | Systemic Corticosteroids use: | - For all patients who require supplemental oxygen including (but not limited to) those requiring non-invasive and invasive ventilation.  
  - To be used up to 10 days, until discharged, or if patient becomes asymptomatic.  
  - Dexamethasone (Preferable Systemic Corticosteroids):  
    o Adult Dosing: 6 – 12 mg once daily oral (liquid or tablet) or intravenous preparation. Patients on chronic steroids, follow the usual recommendation of doubling steroids dose or start stress dose steroids based on clinical case basis on patients’ condition  
    o Pediatric Dosing: Prednisolone/ Prednisone (Oral/NG): 1 mg/kg once daily (max: 40 mg)  
  - Hydrocortisone  
    o Adult Dosing: In pregnant or breastfeeding women that cannot take oral, IV hydrocortisone 80 mg twice daily should be used instead of dexamethasone.  
    o Preterm infants with a corrected gestation age of <40 weeks: 0.5 mg/kg every 12 hours  
  - Methylprednisolone sodium succinate (IV): 0.8 mg/kg once daily (max: 32 mg) | - Systemic Dexamethasone: (see precautions above)  
   Remdesivir (non-formulary and non-SFDA registered) (see precautions above)  
   Baricitinib (see precautions above)  
   **Anticoagulation** see below “Thromboprophylaxis” |
| PCR Confirmed Cases | Systemic Dexamethasone: | - Should perform IL6 and other inflammatory markers testing prior to start (CRP, Ferritin, D-dimer)  
  - Watch for infusion reaction  
  - Do not initiate if ANC is <2,000/mm³, platelets are <100,000/mm³, or if ALT or AST are >1.5 times ULN.  
  - Interrupt therapy if a patient develops a serious infection until the infection is controlled.  
  - **Anticoagulation** see below “Thromboprophylaxis” |

**Remdesivir**

- Start as early as possible  
  o Adult Dosing: 200 mg loading dose (IV, within 30 min), followed by 100 mg once daily for 5 to 10 days  
  o Pediatric dosing  
    - <40 kg: 5 mg/kg IV load, then 2.5 mg/kg q24h for 5 to 10 days  
    - ≥40 kg: 200 mg IV load, then 100 mg IV q24h for 5 to 10 days
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| PCR Confirmed Cases |          | For patients with severe ARDS on MV with high settings or ECMO or corticosteroids contraindication. | - Consider Remdesivir and Baricitinib (once available)  
  o Adult Dosing: Remdesivir 200 mg loading dose (IV, within 30 min), followed by 100 mg once plus Baricitinib 4 mg (oral) once daily for 5 days.  
  o Pediatric dosing for Remdesivir  
    - <40 kg: 5 mg/kg IV load, then 2.5 mg/kg q24h  
    - ≥40 kg: 200 mg IV load, then 100 mg IV q24h  
  Plus  
  o Pediatric dosing for Baricitinib  
    - ≥ 9 years: 4 mg (oral) once daily for 5 days.  
    - 2 - 9 years: 2 mg (oral) once daily for 5 days.  
| NOTES: Criteria for patients at high-risk for developing cytokine storm (1 or more of the following):  
  o Serum IL-6 ≥3x upper normal limit  
  o Ferritin >300 ug/L (or surrogate) with doubling within 24 hours  
| If rapid respiratory decompensation due to COVID-19, consider tocilizumab with dexamethasone  
  o Adult Dosing:  
    - Single dose of tocilizumab 8 mg/kg of actual body weight (maximum 800 mg) by IV infusion in combination with dexamethasone 6 – 12 mg daily for up to 10 days  
  - If Tocilizumab IV is not available, use subcutaneous 162 mg (a dose of 324 mg as two simultaneous 162 mg injections (< 100 kg bodyweight) or 486 mg (as three simultaneous 162 mg injections) ≥100 kg bodyweight.  
  o Pediatric Dosing (<18 years):  
    - <30 kg: 12 mg/kg repeated within 12 hours for maximum of 2 doses  
    - ≥30 kg: 8 mg/kg (max: 800 mg/dose) repeated within 12 hours for maximum of 2 dose  
  Tocilizumab is registered medications in Saudi Arabia and available in MoH formulary for other indications but have not shown proven efficacy in many randomized clinical trials as of yet and their use in this setting is considered off-label. Remdesivir favipiravir, casirivimab plus imdevimab, and sotrovimab are not currently registered by SFDA.  
  Pregnancy and Lactation: Management of infection with SARS-COV2 in pregnancy is mainly based on supportive care. Consideration of antiviral therapy should be based on patient condition, safety profile and preference of the patient and treating team. Refer to the MoH COVID-19 guidance in pregnancy  
  Thromboprophylaxis: Recommendations  
  - All admitted patients should be evaluated upon admission, and daily thereafter for both thrombotic and bleeding risk.  
  - A laboratory evaluation and monitoring: Baseline CBC, fibrinogen, PT, aPTT, D-dimer on admission, and serially.  
  - Baseline or surveillance imaging are not recommended in the absence of clinical symptoms of VTE  
  - Patients on chronic VTE prophylaxis should continue as planned before.  
  - Warfarin, DOAC and antiplatelet medications are not recommended to be used as prophylaxis  

NOTES:

Criteria for patients at high-risk for developing cytokine storm (1 or more of the following):  
- Elevated D-dimer (>1 mcg/mL)  
- Ferritin >600 ug/L at presentation and LDH >250  
- CRP > 75 mg/L

Thromboprophylaxis:

Recommendations
- All admitted patients should be evaluated upon admission, and daily thereafter for both thrombotic and bleeding risk.
- Laboratory evaluation and monitoring: Baseline CBC, fibrinogen, PT, aPTT, D-dimer on admission, and serially.
- Baseline or surveillance imaging are not recommended in the absence of clinical symptoms of VTE
- Patients on chronic VTE prophylaxis should continue as planned before.
- Warfarin, DOAC and antiplatelet medications are not recommended to be used as prophylaxis
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<td>- For patients whom anticoagulant therapy is contraindicated, mechanical thromboprophylaxis, preferably with intermittent pneumatic compression devices, should be utilized, although there is limited evidence of efficacy in hospitalized medically ill patients.</td>
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<td>- Thromboprophylaxis should continue until the time of discharge at least. Continuation of anticoagulation is subject to assessment of VTE risk by the treating medical team.</td>
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<td>- Heparin induced thrombocytopenia (HIT)</td>
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<td>- Platelets below 50 x 10^9/L</td>
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<tr>
<td>- Unexplained bleeding</td>
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<tr>
<td>- Inherited bleeding disorder (Hemophilia, thrombasthenia)</td>
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<tr>
<td>- Inherited red blood disorder (sickle cell disease)</td>
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<tr>
<td>- Previously on anticoagulation therapy</td>
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<tr>
<td>- Radiological evidence of thrombosis</td>
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</table>

**Adults:**
- Therapeutic doses should not be offered because of the risk of bleeding
- Thromboprophylaxis with low molecular weight heparin (LMWH) should be considered in ALL patients (including non-critically ill) within 24 hours of hospital admission for COVID-19 infection, in the absence of any contraindications (active bleeding and platelet count less than 25 x 10^9/L; monitoring is advised in severe renal impairment; abnormal PT or APTT is not a contraindication)
- Enoxaparin prophylaxis doses:
  - 40 mg subcutaneously once daily
  - Obesity BMI > 40 kg/m²: 40 mg subcutaneously every 12 hours
  - Pregnancy: 40 mg subcutaneously once daily
  - Renal impairment:
    - CrCl ≥ 30 mL/minute: no adjustments required
    - CrCl < 30 mL/minute: 30 mg subcutaneously once daily
  - Hemodialysis and CRRT: Avoid use if possible but if used, anti-Xa levels should be frequently monitored, as accumulation may occur with repeated doses.
- Patients with Heparin-induced thrombocytopenia (HIT), please follow MoH HIT protocol for alternative anticoagulation.

**Pediatrics:**
- Enoxaparin prophylaxis doses:
  - Infants 1 - < 2 months: 0.75 mg/kg/dose subcutaneously every 12 hours
  - Infants ≥ 2 months, children, and adolescents: 0.5 mg/kg/dose subcutaneously every 12 hours
  - Renal impairment: No pediatric specific recommendations (use with caution and monitor patient closely.
  - Dialysis: not approved but if used, dosages should be reduced and anti-Xa levels frequently monitored, as accumulation may occur with repeated doses.
  - Hemodialysis: Not dialyzable and supplemental dose is not necessary.
- Enoxaparin monitoring
  - Routine anti-Xa levels are not recommended.
  - If an anti-Xa level is deemed necessary, it should be drawn 4-6 hours after enoxaparin administration with an anti-Xa goal of 0.2 - 0.4 units/mL for prophylaxis and 0.5-1 Units/ml for therapeutic dose.
  - Consider re-checking anti-Xa if the patient experiences active bleeding or has evidence of renal dysfunction while on enoxaparin therapy

**Contraindications to Anticoagulation (Bleeding Risk Factors):**
- Intracranial hemorrhage, Brain ischemia/acute stroke, ongoing and uncontrolled bleeding /hematoma, congenital bleeding disorder
- Uncorrected coagulopathy: INR >1.5, APTT >44 seconds, fibrinogen <100 gr/dL, or platelet <50,000/microliter
- Consider Avoiding Anticoagulation
- Intracranial mass, Recent lumbar puncture / Epidural (<24 hours ago). The patient is likely to require an invasive procedure within 24 hours of starting enoxaparin, Neurosurgical procedure, Pelvic fracture within past 48 hours, Recent aspirin, or antiplatelet use (<5-7 days ago), Uncontrolled hypertension
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**Multisystem Inflammatory Syndrome in Children (MIS-C)**

**Criteria for Management:**
- Patient aged < 21 years presenting with fever (>38.0°C for ≥24 hours, or report of subjective fever lasting ≥24 hours), laboratory evidence of inflammation (including, but not limited to, one or more of the following: an elevated CRP, ESR, fibrinogen, procalcitonin, D-dimer, ferritin, LDH, or IL-6; elevated neutrophils; reduced lymphocytes; and low albumin), and evidence of clinically severe illness requiring hospitalization, with multisystem (≥2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurologic)
- No alternative plausible diagnoses
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or COVID-19 exposure within the 4 weeks prior to the onset of symptoms

**Management:**

- There are no established therapies for COVID-19-associated CSS or MIS-C. These medications are to be used only with guidance from Rheumatology, Cardiology and Infectious Diseases. Patients who are being evaluated for immunomodulatory therapy should also be considered for antiviral therapy if they are not already receiving it
- Supportive Care: Children with moderate to severe illness symptoms should be admitted to the hospital. Admission to a pediatric intensive care unit is appropriate for children with hemodynamic instability (shock, arrhythmia), significant respiratory compromise, or other potentially life-threatening complications
- Antiviral therapy (see above section)
- Immunomodulator Dosing and Monitoring

**Immunomodulator**

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<tr>
<td>IVIG with methylprednisolone see below table</td>
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</tr>
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**Medication Related Information**

**MIS-C** with or without features of Kawasaki disease or signs of myocardial dysfunction
OR
Severe or critical COVID-19 with evidence of CSS

- IVIG 2 g/kg + methylprednisolone at 0.8 to 1 mg/kg every 12 hours (maximum of 30 mg for 12 hours) for 5 days
- IVIG 2 g/kg + methylprednisolone bolus of 15 to 30 mg/kg/d for 3 days

- Assess cardiac function and fluid status prior to giving to avoid fluid overload
- Baseline renal function tests, urine output, IgG level, CBC
- Monitor clinically for signs of hemolysis after first dose
- Potential adverse reactions: anaphylaxis, infusion reaction, hemolysis, transaminitis, aseptic meningitis
- Pulmonary adverse reactions; blood pressure (prior to, during, and following infusion); clinical response
- For patients at high risk of hemolysis (dose ≥2 g/kg, given as a single dose or divided over several days, and non-O blood type): Hemoglobin or hematocrit prior to and 36 to 96 hours post-infusion and again at 7 to 10 days post-infusion

**Glucocorticoids**

**MIS-C** with features of shock or coronary artery dilation/aneurysm
OR
Severe or critical COVID-19 with evidence of CSS

- 1-2 mg/kg/day divided BID (prednisone, prednisolone, methylprednisolone)
- 5 mg/m2 daily (dexamethasone)

(see precautions above)

**Abbreviations:**


**Footnotes:**

*Testing for SARS-CoV2 virus shall be performed in accordance with published case definition by Saudi CDC guidelines.

High risk patients have one or more: 1. Elderly (age > 65 years), 2. With underlying end organ dysfunction, 3. Diabetes, 4. History of cardiovascular disease, 5. History of pulmonary disease, 6. Immunocompromised, and/or 7. Pregnancy
### Medication Related Information

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<th>Major Drug Interactions</th>
<th>Required dose adjustment</th>
<th>Pregnancy and Lactation</th>
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| Paracetamol (acetaminophen) | - Hypersensitivity to acetaminophen or any component of the formulation  
- Severe hepatic impairment or active liver disease | - Acetaminophen may increase the levels/effects of: Busulfan; Dasatinib; Imatinib; Local Anesthetics; Mipomersen; Phenylephrine (Systemic); Prilocaine; Sodium Nitrite; SORAFenib; Vitamin K Antagonists  
- The levels/effects of Acetaminophen may be increased by: Alcohol (Ethyl); Dapsone (Topical); Dasatinib; Fluoxacillin; Isoniazid; MepyraPONE; Nitric Oxide; Probenecid; SORAFenib | Requires dose adjustment with patient with hepatic impairment  
See MoH online formulary | Oral paracetamol is considered safe in normal therapeutic doses for short-term use as a minor analgesic/antipyretic in pregnancy.  
Consider Administering IV paracetamol to a pregnant woman only if clearly needed. Carefully assess maternal benefit and fetal risk before administering IV paracetamol during labor and delivery. |
| Remdesivir          | - Safety and efficacy not established | - Avoid Concomitant Use: There are no known interactions where it is recommended to avoid concomitant use.  
- Increased Effect/Toxicity: There are no known significant interactions involving an increase in effect.  
- Decreased Effect: There are no known significant interactions involving a decrease in effect. | No dose adjustment studied | Not studied |
| Favipiravir          | - Hematopoietic tissue suppression and increased in liver function parameters  
- Tests toxicity was also noted  
| Tocilizumab          | - Known hypersensitivity to tocilizumab or any component of the formulation  
- Active infections | - Avoid Concomitant Use: Anti-TNF Agents; BCG (Intravesical); Belinumab; Biologic Disease-Modifying Antirheumatic Drugs (DMARDs); Cladribine; Natalizumab; Pimeculom; Tacrolimus (Topical); Vaccines (Live)  
- Increased Effect/Toxicity: Anti-TNF Agents; Biologic Disease-Modifying Antirheumatic Drugs (DMARDs); Fingerimod; Leflunomid; Natalizumab; Sipronomid; Vaccines (Live)  
- The levels/effects of Tocilizumab may be increased by: Belinumab; Cladribine; Denosumab; Ocrelizumab; Pimeculom; Robumilast; Tacrolimus (Topical); Trastuzumab  
- Tocilizumab may decrease the levels/effects of: BCG (Intravesical); Coccidioides immitis Skin Test; CYP3A4 Substrates (High risk with Inducers); Nivolumub; Pidomilod, Sipuleucel-T, Small and Monkeypox Vaccine (Live); Tertomolitode; Vaccines (Inactivated); Vaccines (Live) | Requires dose adjustment with patient with hepatic impairment  
See MoH online formulary | Fetal risk cannot be ruled out |
| Baricitinib          | - Hypersensitivity to Baricitinib or any component of formulation | - Need therapy modification and monitoring:5-Aminosalicylic Acid Derivatives, Chloramphenicol (Ophthalmic), Clozapine Diferprone, Denosumab, Echinenac, Fingerimod, Leflunomid, Nitresine, Nivolumub, Pidomilod, Pretomanid, Probenecid, Promazine, Rufumilast, Sipuleucel-T, and Tertomolitode | Requires dose adjustment with patient with renal and liver impairment | Not recommended in breastfeeding  
Information related to pregnancy is limited |
| Systemic Dexamethasone | - Concomitant use of more than a single dose of dexamethasone with rilpivirine  
- Hypersensitivity to dexamethasone or any component of the product  
- Systemic fungal infection | - Avoid concomitant use of DexamETHasone (Systemic) with any of the following: Aldelesleukin; BCG (Intravesical); Cladribine; Conivaptan; Desmopresen; Fusidic Acid (Systemic); Idealislib; Indium 111 Capromab Pendetide; Lapatinib; Lasmiditlan; Macimorelin; Mifamurtide; MIFEPRiStone; Natalizumab; Pimeculom; Rilpivirine; Simprevir; Tacrolimus (Topical); Upadacitinib | Use cautiously in the elderly at the lowest possible dose  
See MoH online formulary | Pregnant or breastfeeding women, use prednisolone (Oral) or intravenous hydrocorticosterone instead of dexamethasone. |
## Saudi MoH Protocol for Patients Suspected of/Confirmed with COVID-19

**Supportive care and antiviral treatment of suspected or confirmed COVID-19 infection**

*(Version 3.3) November 24th, 2021*

### Medication Related Information

<table>
<thead>
<tr>
<th>Medication</th>
<th>Contraindication</th>
<th>Major Drug Interactions</th>
<th>Required dose adjustment</th>
<th>Pregnancy and Lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhaled budesonide (Pulmicort®)</td>
<td>– Hypersensitivity to budesonide&lt;br&gt;– Allergic cross-reactivity for corticosteroids is limited&lt;br&gt;– Patients with cirrhosis</td>
<td>– Diminish the effect of: Aidesleukin and Cosyntrorop&lt;br&gt;– Enhance the effect/toxicity of: Desmopresin and Loxapine&lt;br&gt;– Increase the serum concentration of Budesonide: CYP3A4 Inhibitors&lt;br&gt;– Diminish the effect of Budesonide: Tobacco</td>
<td>– Use cautiously in hepatic impairment&lt;br&gt;See MoH online formulary</td>
<td>– Present in breast milk.</td>
</tr>
<tr>
<td>IVIG</td>
<td>– Hypersensitivity to IVIG or any component of the formula&lt;br&gt;– Documentation of allergic cross-reactivity</td>
<td>– MMR, varicella vaccines</td>
<td>– Use cautiously with Renal impairment due to risk of immune globulin-induced renal dysfunction; the rate of infusion and concentration of solution should be minimized. Discontinue if renal function deteriorates.&lt;br&gt;See MoH online formulary</td>
<td></td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>– Active major bleeding&lt;br&gt;– History of immune-mediated heparin-induced thrombocytopenia within the past 100 days or in presence of circulating antibodies&lt;br&gt;– Hypersensitivity to benzyl alcohol (present in multi-dose formulation)&lt;br&gt;– Hypersensitivity to enoxaparin.</td>
<td>Avoid combination:&lt;br&gt;– Vorapaxar: May enhance the adverse/toxic effect of Anticoagulants. More specifically, this combination is expected to increase the risk of bleeding.&lt;br&gt;– Urokinase: May enhance the anticoagulant effect of Anticoagulants.&lt;br&gt;– Rivaroxaban: Anticoagulants may enhance the anticoagulant effect of Rivaroxaban&lt;br&gt;– Omacetaxine: Anticoagulants may enhance the adverse/toxic effect of Omacetaxine&lt;br&gt;– MIFEPRIStone: May enhance the adverse/toxic effect of Anticoagulants. Specifically, the risk of bleeding may be increased&lt;br&gt;– Hemin: May enhance the anticoagulant effect of Anticoagulants.&lt;br&gt;– Edoxaban: May enhance the anticoagulant effect of Anticoagulants.&lt;br&gt;– Dabigatran Etexilate: May enhance the anticoagulant effect of Anticoagulants.&lt;br&gt;– Apixaban: May enhance the anticoagulant effect of Anticoagulants.</td>
<td>– Renal impairment (CrCl 30 to 80 mL/min): No adjustment necessary&lt;br&gt;– Renal impairment (CrCl less than 30 mL/min): reduce usual recommended dose by 50%.&lt;br&gt;See MoH online formulary</td>
<td>– Low molecular weight heparin (LMWH) does not cross the placenta; increased risks of fetal bleeding or teratogenic effects have not been reported (Bates 2012).</td>
</tr>
<tr>
<td>Casirivimab plus imdevimab</td>
<td>– Hypersensitivity to Casirivimab or imdevimab</td>
<td>– COVID-19 Vaccine: effect may be diminished</td>
<td>– No dose adjustment studied</td>
<td>– Not known</td>
</tr>
<tr>
<td>Sotrovimab</td>
<td>– Hypersensitivity to Sotrovimab</td>
<td>– COVID-19 Vaccine: effect may be diminished</td>
<td>– No dose adjustment studied</td>
<td>– Not studied</td>
</tr>
</tbody>
</table>

### Drug Administration in patients with Swallowing Difficulties

<table>
<thead>
<tr>
<th>Drug</th>
<th>Formulation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favipiravir</td>
<td>Tablets</td>
<td>– Tablets can be crushed and mixed with liquid.</td>
</tr>
<tr>
<td>Baricitinib</td>
<td>Tablet</td>
<td>– Tablets can be mixed with room temperature water.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Administration via</th>
<th>Dispersion Volume</th>
<th>Container Rinse Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral dispersion</td>
<td>10 mL</td>
<td>10 mL</td>
</tr>
<tr>
<td>Gastrostomy tube</td>
<td>15 mL</td>
<td>15 mL</td>
</tr>
<tr>
<td>Nasogastric tube</td>
<td>30 mL</td>
<td>15 mL</td>
</tr>
</tbody>
</table>
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References:

8. NHS thromboprophylaxis and anticoagulation in COVID-19 infection. Imperial College Healthcare V 0.1 08.04.2020 Covid Treatment Group
18. Micromedex last access May 20, 2020
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30. Available at https://www.covid19treatmentguidelines.nih.gov/about/
34. National Institute of Allergy and Infectious Diseases. Adaptive COVID-19 Treatment Trial 2 (ACTT-2). ClinicalTrials.gov Identifier: NCT04104179
Summary of Protocol changes

- Addition of dexamethasone dose range 6-12 mg under severe and critical confirmed PCR cases