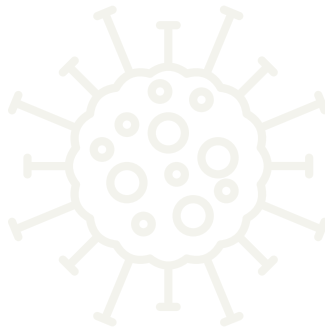


Africa Centres for Disease Control and Prevention (Africa CDC)

Home Management, Critical Care and Discharge Criteria for COVID-19 Patients



Africa Centres for Disease Control and Prevention (Africa CDC)
Roosevelt Street, Old Airport Area, W21 K19
P. O. Box 3243, Addis Ababa
Ethiopia

Tel: +251 11 551 7700

Email: africacdc@africa-union.org

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Overview

The continued increase in reported cases of COVID-19 on the African continent threatens to overwhelm our already weak health infrastructure. Therefore, it is important for Member States to take serious and urgent measures towards case management to significantly reduce COVID-19 deaths.

In view of the infrastructural and resource gaps, technology should be considered for remote management of patients during this period within the healthcare delivery system. As it is abundantly clear, even countries with more advanced healthcare infrastructure and resources have struggled to treat COVID-19 and nonCOVID-19 patients during this pandemic. The mild to moderate COVID-19 cases and selected nonCOVID-19 cases will benefit from telemedicine consultations.

The current evidence on the clinical characteristics of COVID-19 indicates that the majority of patients (80%) will develop mild to moderate symptoms and will not require hospital admission. They can recover from the virus at home following risk assessments by health and social services to exclude factors that may render home care inappropriate or refer to national policy on management of mild cases. A significant number of patients with Covid-19 can be asymptomatic despite positive testing. This group of patients must take major protection steps to prevent the spread of the virus within their households and the community.

With 20 % of the patients expected to develop severe symptoms, quality critical care of these patients becomes imperative. Member States need to ensure that the intensive care units (ICUs) are prepared to handle the increased cases of severe COVID-19. Member States are encouraged to use whatever resources they may have to provide basic oxygen support to patients.





Home management of mild cases of COVID-19

Mild cases defined as uncomplicated upper respiratory tract viral infections with any of the following: fever (ruling out any other cause of fever), fatigue, cough with or without sputum, anorexia, malaise, muscle pain, sore throat, and loss of smell or taste.

Suggested action points for home care

- Deploying a risk assessment and management tool tailored to the needs of the country such that the most vulnerable citizens are most protected.
- Prioritize identification and treatment of high-risk individuals, especially those with pre-existing medical conditions, through COVID-19 surveillance and a self-isolation support programme.
 - ✓ Telemedicine consultation services for patients in self-isolation, using video and telephone calls. Community Health Workers (CHWs) can ensure regular monitoring of confirmed cases and contacts in isolation. Daily reports will be made available to the relevant ministries of health and other stakeholders.
 - ✓ CHWs should be trained for remote triaging of patients with symptoms and to help differentiate patients requiring escalation and hospitalization from patients likely to recuperate at home.
 - ✓ Training of CHWs on the proper use of PPEs (personal protective equipment) and provision of adequate PPEs to CHWs in the field.

Inclusion criteria for home care

1. Asymptomatic and mild to moderate COVID-19 cases without underlying chronic conditions (Diabetes, Hypertension, Chronic lung disease, Asthma, Tuberculosis, and immunosuppression).
2. Oxygen saturation below 93%.
3. Favourable clinical, social, and environmental assessment.
4. A communication link is well established with health care providers, public health personnel, and CHWs.

Exclusion criteria for home care

1. COVID-19 patients with severe presentation.
2. COVID-19 patients with underlying chronic medical conditions such as diabetes, hypertension, pre-existing lung disease, asthma, tuberculosis, or immunosuppression.
3. Oxygen saturation below 93%.

4. Patients above the age of 65 years old.
5. Home care is not feasible due to residential setting, family dynamics, or safety concerns.
6. Difficulty in establishing communication links with health care providers, public health personnel, and CHWs.

Role of health care providers in home care

- Complete an initial risk assessment on the health status of the individual and family members.
- Assess social (type of home, number of family members, ability to social distance, accessibility, etc.) and environmental factors (hygiene, waste handling, ventilation, etc.).
- Advice should be provided to household contacts concerning appropriate infectious waste disposal as per local authority advice.
- Patients and their families should receive education on Infection Prevention and Control and supportive management of symptoms and ongoing psychosocial support during home care/isolation duration.
- Identify deteriorating COVID-19 patients at home (oxygen saturation falling below 95%, increasing dyspnoea, reducing renal function, etc.) to facilitate early admission to appropriate health institutions.
- The health care providers should perform ongoing assessment of household contacts and advise appropriately if any of them develop symptoms requiring additional self-isolation or testing.

What COVID-19 patients needs to do during home isolation

- Restrict patient to a well-ventilated single room. Open windows as much as possible.
- Limit movement in the household and in particular the shared spaces (kitchen and bathroom).
- Maintain a distance of one metre at least from household contacts and time duration of < 15 minutes.
- Use dedicated linen and eating utensils.
- Assign one person in good health with no underlying chronic illnesses as caregiver.
- No visitors should be allowed until full recovery or the full 14 days of home isolation has been achieved.
- Maintain good hand and respiratory hygiene i.e. wash hands with soap and water and wearing of surgical masks.
- Waste disposal in a separate area to be handled with care preferably in a coloured bin.

- Daily cleaning of patient's room using household antiseptics.
- Report any symptoms of breathing difficulties or deterioration as early as possible to household contact and to the health care provider. Patient should report any concerns in relation to mental health e.g. anxiety or sleep disturbance or domestic violence.
- Avoid public transport for travel to health care facilities, either request an ambulance or ride in a private vehicle with all windows open using a facial mask. Inform medical transport personnel (i.e., ambulance team) or the private vehicle driver of patient's diagnosis.
- Maintain good fluid intake at least 2litres/day, reasonable physical exercise inside patient's personal space and maintain connection with family and friends via phone and social media if possible.

Role of caregivers during home care

- Complete risk assessment with a health care provider to confirm the most suitable household contact who can look after COVID-19 patient at home.
- Limit the number of caregivers and assign one household member for this task.
- The caregiver should stay in a different room, if possible or if not possible, maintain a distance of at least one metre from the patient.
- Caregiver should wear a medical mask that covers the mouth and nose when in the same room with the patient. Remove mask using appropriate technique.
- Perform good hand hygiene after any type of contact with the ill person or their immediate environment or body fluids.
- Use dedicated linen and eating utensils for the patient. Clean them with soap and water daily as well as patient's clothes, bed linens, and hand towels.
- Clean and disinfect bathroom, toilet surfaces, and frequently touched surfaces on a daily bases, using household soap or detergent then regular household disinfectant containing 0.1% sodium hypochlorite. Gloves and protective clothing, e.g., plastic aprons, should be used during cleaning.
- Waste generated during home care of patients with COVID-19 should be placed into a waste bin with a lid and kept in the patient's room, then disposed of as infectious waste as advised by local authorities.
- Persons and caregivers who have been exposed to COVID-19 cases should monitor their health for 14 days from the last day of possible contact. This will include face-to-face contact within 1 meter for more than 15 minutes from 2 days before and up to 14 days after the onset of symptoms of their relatives.
- Notify the health care providers or public health personnel if the patient is deteriorating or if caregiver starts to develop symptoms suggestive of COVID-19.



Management of Severe Cases

Management of hypoxia

- Target oxygen saturation (SpO_2) greater than 93% (88–92% in chronic obstructive pulmonary disease [COPD]) during resuscitation. This target can be relaxed to SpO_2 greater than 90% once the patient is stable in nonpregnant adults and greater than or equal to 92–95% in pregnant women.

Respiratory support

- Simple O_2 support in hypoxia.
- Nasal or Facemask O_2 targeting SpO_2 greater than or equal to 93% (88-92% in COPD).

Augmented management of hypoxia with non-invasive modalities

- Mitigate the aerosolization risk to other **patients** and health care professionals. This is considered to be an Aerosolizing Generating Procedure (AGP).
- Monitor for exaggerated respiratory drive. Very high respiratory drive may lead to very large tidal volumes, large transpulmonary pressure swings, and patient-self-induced lung injury (p-SILI).
- Monitor closely for deterioration. Failure to improve within 1 hour should trigger assessment for tracheal intubation.

Consider awake prone ventilation (<https://africacdc.org/download/guidance-for-awake-prone-ventilation-in-the-non-intubated-conscious-patient/>).

Modalities of augmentation in order of effectiveness:

- ✓ High Flow nasal O_2 —be aware of high consumption of O_2 resources,
- ✓ Continuous Positive Airway Pressure (CPAP),
- ✓ Non-invasive ventilation (NIV) such as bilevel positive airway pressure (BPAP),
- ✓ Bubble CPAP in neonates and young children, and
- ✓ Prone positioning in awake and non-intubated patients at least 2 hours per day.

Invasive ventilation

- Risk mitigation around intubation—apnoeic rapid sequence intubation and avoid bag-valve-mask delivered breaths as this is an AGP. Use face mask with reservoir for pre-oxygenation.

- Most experienced operator should intubate.
- Video laryngoscopy, if available.
- In-line suction catheter preferable, if not available, regular suction catheter should be used.
- Use of HEPA (high efficiency particulate air) filters where possible.

Lung protective ventilation

- Keep patient's head elevated 30–45 degrees.
- Ventilation (CO_2):
 - ✓ Plateau pressure less than or equal to 30 cm H_2O ,
 - ✓ Driving pressure (plateau pressure minus PEEP) less than or equal to 15 cm H_2O ,
 - ✓ Respiratory rate less than 35/min,
 - ✓ Tidal volume aiming for 6 ml/kg to 8 ml/kg (especially where lung compliance is still good); may be used if there are special indications such as severe acidosis, and considering ultrprotective 4–5 ml/kg ideal weight if possible (calculate from gender and height),
 - ✓ Consider inspiratory-to-expiratory time (I:E) ratio 1:1 or even inverse ratios, where lung compliance is very low but not where lung compliance is good (greater than 40 ml/cm H_2O), and
 - ✓ Allow permissive Hypercapnia (allow CO_2 to rise while ensuring that pH does not decrease below 7.25–7.30) if needed to avoid injurious ventilation.

Oxygenation

- Titrate fraction of inspired oxygen (FiO_2) to target SpO_2 greater than or equal to 93%.
- PEEP—Individualize for each patient. Lower PEEP (aim 5–10 cm H_2O) when lung compliance is good.
- Higher PEEP when lung compliance is poor. Usually greater than or equal to 10 cm H_2O and consider greater than 15 in severe acute respiratory distress syndrome (ARDS). Monitor for complications during high PEEP.
- To reduce O_2 demand and avoid patient-ventilator dyssynchrony, use titrated sedation. Consider muscle relaxation. Start with bolus regime rather than infusion where possible.

- Prone positioning 14–16 hours per day, use proning teams to facilitate this.¹
- Nebulised pulmonary vasodilators such as Epoprostenol (Flolan) or titrated nitric oxide may be considered.
- Consider APRV (Airway pressure release ventilation).
- Early ECMO (Extra corporeal membrane oxygenation) referral, if available.

Secretion management

- Anticipate thick secretions which may be copious or difficult to clear. This may block filters, especially if positioned close to the patients, and can be a significant issue during prone ventilation where heat-humidity exchangers are used.
- Use in-line suction.
- Most centres have changed to humidified circuits due to thick secretions which may block off major airways.
- Consider mucolytics and nebulised hypertonic saline or N-acetyl cysteine.
- Therapeutic bronchoscopy may be needed. Treat this as an AGP.
- Tracheostomy is considered to be an AGP and is commonly delayed to 14–21 days.

Fluid management

- Ensure adequate fluid balance and be aware that many patients are quite dehydrated at admission.
- Avoid over hydration which can worsen respiratory failure.
- Use crystalloids, preferably balanced fluid solutions, such as Ringers Lactate and Plasmalyte solution. If aforementioned are not available, normal saline may be used.
- Resuscitation should be goal directed, with 250–500 mls boluses of fluid (consider smaller boluses if there are concerns of worsening respiratory failure).
- Maintenance fluid and ongoing losses + 20–30 ml/hour. Expect high insensible losses during high grade fever.
- Carefully track renal function, as renal failure is associated with a significant increase in mortality.
- Avoid nephrotoxic drugs in patients with acute kidney injury or chronic renal disease.
- Be aware of the clotting tendency in dialysis filter sets. Consider doubling the circuit heparinisation, using epoprostenol for filter anticoagulation, or systemic anticoagulation.

¹<https://africaadc.org/download/guidance-for-awake-prone-ventilation-in-the-non-intubated-conscious-patient/>

Cardiovascular

- Many patients do not need cardiovascular support.
- Expect that some will need vasopressor support, which may commonly be seen in the context of deep sedation.
- Use noradrenaline (norepinephrine) as the first line agent; consider epinephrine, vasopressin, and dopamine (where other agents are not available):
 - ✓ Aim for a mean arterial pressure (MAP) of 60–65 mmHg, and
 - ✓ Consider stress dose of corticosteroids if high vasopressor requirements persist (hydrocortisone 200 mg/day in divided doses of infusion).
- If inadequate perfusion due to decreased cardiac output is clinically suspected, consider adding dobutamine.
- Other cardiovascular pathology may include myocarditis, pericarditis, pericardial effusions, and arrhythmias, type 2 myocardial injury, myocardial infarction, acute cor pulmonale, acute systolic ventricular dysfunction, and Takotsubu syndrome. The prevalence of acute severe myocardial failure has been described in China as a significant cause of death, this however, seems to be reported less frequently in other regions.
- Monitor ecocardiographs daily and track troponin and NT-Pro BNP at admission and thereafter at intervals, if available.

Increased micro and macro thrombosis

- Likely that macro thrombotic events may be more prevalent.
- Likely that the prevalence of deep venous thrombosis (DVT) and pulmonary embolism (PE) may be at least 25–30%, probably higher in some settings.
- CT pulmonary angiogram (CTPA) is preferable to ventilation-perfusion (VQ) scan to exclude pulmonary embolism (PE). Echocardiography may be helpful in critical care setting when patient cannot be transported for CTPA.
- The evidence for enhanced anticoagulation is not confirmed.
- Use weight adjusted prophylactic low molecular weight heparin (LMWH, such as enoxaparin), preferred option, or unfractionated heparin (UFH). Many institutions pragmatically doubled the dose (i.e. the usual weight adjusted dose given twice per day).
- Continue prophylactic anticoagulation for 2–4 weeks post hospital discharge, after assessing bleeding risk. This may be with LMWH or direct oral anticoagulant at prophylactic dose.
- Full dose anticoagulation, preferably with LMWH (such as enoxaparin or unfractionated heparin [UFH]), in those with confirmed venous thromboembolism (VTE, DVT, and PE) or in patients with highly likely VTE but imaging is not feasible to confirm the diagnosis.

- Diffuse microangiopathy with thrombosis, especially in the lungs, likely plays a significant role in lung injury and reduced gas exchange. This may be signaled by raised D-dimer.
- Fibrinogen levels can often be very high. Prothrombin Time (PT) and activated partial thromboplastin time (APTT) are usually minimally abnormal. Mild thrombocytopenia is common.
- Disseminated Intravascular Coagulopathy is less common but may be seen in advanced decompensation.

Neuropsychiatry

- Neurological complications include loss of smell and taste, acute cerebrovascular disease, impaired consciousness, ataxia, seizures, neuralgia, skeletal muscle injury, corticospinal tract signs, meningitis, encephalitis, encephalopathy, Guillain-Barré syndrome, anxiety, and psychosis. Each of these conditions is to be managed on its own merit as per national guidance.
- Patients needing invasive ventilation will need sedation, often deep sedation, which may carry risk to the patient.
- Monitor the level of sedation using a validated sedation score such as the Richmond Agitation and Sedation Score (RASS).
- Titrate the sedation to patient needs and only sedate as deeply as required. Full mandatory ventilation where patient interaction is not desired or where muscle relaxation is used, may need deep sedation (e.g. RASS-4).
- In patients who trigger their own ventilation, use awake sedation (e.g. RASS 0 to -2).
- Expect delirium after prolonged sedation and ventilation. This may be quite severe in some patients.
- Consider targeted management rather than re-instituting deeper sedation again. This may include using nonpharmacological means, alpha-2 agonist, resetting the circadian rhythm with melatonin, and titrated typical or atypical antipsychotics. Avoid benzodiazepines where possible.

Other organ injuries

- Liver function tests are often mildly deranged. This can be managed conservatively.
- Fulminant liver failure is very rare.
- Pancreatitis has been observed. This mostly needs supportive care only.
- Muscle injury may occur with raised creatin kinase (CK).

Infection

- Co-infection with other organisms is possible but not common. However, consider every case on its own merit.
- During the influenza season, empirically start with oseltamivir while awaiting test results.
- If there is uncertainty concerning the presence of community acquired pneumonia, then start antibiotics, as per local guidelines. Stop as soon as diagnostic clarity is reached.
- Procalcitonin is usually low in COVID-19 and is useful to decide whether additional bacterial infection is present.
- Lymphopenia is very common, generally, and Neutrophilia is common in severe cases. Monitor the Neutrophil-Lymphocyte-Ratio (NLR), identified as an independent risk factor for critical illness in patients with COVID-19.
- Secondary infections occurring later during ventilation are common. Actively monitor for this and treat promptly and aim to stop antibiotics as soon as the infection has been adequately cleared.

Inflammation

- A cytokine storm is common. This mainly needs supportive treatment.²
- Expect high serum levels of CRP, IL6, ferritin, and neutrophils.
- Dexamethasone, 6 mg/day for 10 days, for patients requiring oxygen therapy or on a mechanical ventilation is currently recommended.
- Septic shock needs to be managed as per national guidance and the Surviving Sepsis Campaign guidelines.³
- In children and young adults, be vigilant for multisystem inflammatory syndrome.⁴
- Convalescent plasma and monoclonal antibodies are recommended as investigational drug only until more data is available on their use.

Communication

- Communicating with critically ill patients who have COVID-19 can be challenging, especially when they have delirium or other neuropsychiatric sequelae. There may be challenges in understanding what is said to them. The caregiver may also have difficulties in understanding what they are saying.

²<https://www.covid19treatmentguidelines.nih.gov/whats-new/>

³https://emcrit.org/wp-content/uploads/2017/01/Surviving_Sepsis_Campaign_International.96723.pdf

⁴<https://africacdc.org/download/multisystem-inflammatory-syndrome-in-children-and-adolescents-temporally-related-to-covid-19/>

These communication techniques can be useful:

- Gain the patient's attention before giving verbal instructions. Be at the same level physically with the patient and maintain appropriate eye contact.
- Speak directly to the patient in a calm manner, even when they are confused and agitated.
- Speak calmly and distinctly; not in a raised voice or tone.
- Tell the patient who you are and what will be done to them.
- Use simple, conversational words and give one instruction or statement at a time.
- Give cues and model desired behavior.
- Check for understanding and repeat instructions if the patient does not understand.
- Support and reassure the patient. Acknowledge when responses are received and understood.
- Provide written instructions and information for those who can read.

Nutrition

Nutrition is an important part of management of every patient, including patients with COVID-19. It is highly recommended that feeding is initiated as early as practicable in all patients, except for those with mechanical bowel obstruction, ileus, or who are under bowel rest.

- Assess patient's nutritional status using weight, height, body mass index, etc.
- Initiate feeding as soon as patient's condition permits.
- Preferred route of administration is enteral—oral, orogastric, nasogastric, or nasojejunal.
- Determine nutritional requirement using the following:
 - ✓ Calories—minimum 25–30 kcal/kg/day
 - ✓ Carbohydrate—60%–70%
 - ✓ Fats and lipids—30%–40%
 - ✓ Adequate protein—1.5 g/kg/day
 - ✓ Multivitamins and mineral mix
- The above may be constituted into a fluid diet using locally available food products which may be blended together and given via feeding tube.

The use of a reminder mnemonic to ensure that the routine elements of ICU care for each patient has been considered.

Examples include:

- **Fast hugs in bed please:** Fluid therapy and feeding; analgesia and antiemetics; sedation and spontaneous breathing trial; thromboprophylaxis; head up position (30 degrees) if intubated; ulcer prophylaxis; glucose control; skin/eye care and suctioning; indwelling catheter; nasogastric tube; bowel care; environment (e.g. temperature control, adequate ventilation); de-escalation (e.g. end of life issues, treatments no longer needed); and psychosocial support (for patient, family, and staff).

Discharge from Isolation for COVID-19 Patients

A. Criteria for discharging patients from isolation (i.e. discontinuing transmission-based precautions) without requiring retesting:

- ✓ For symptomatic patients—10 days after symptom onset, plus at least 3 additional days without symptoms (including without fever and without respiratory symptoms)
- ✓ For asymptomatic cases—10 days after positive test for SARS-CoV-2

For example, if a patient had symptoms for two days, then the patient could be released from isolation after 10 days + 3 = 13 days from date of symptom onset; for a patient with symptoms for 14 days, the patient can be discharged (14 days + 3 days) 17 days after date of symptom onset; and for a patient with symptoms for 30 days, the patient can be discharged (30 +3) 33 days after symptom onset.

B. For countries choosing to continue to use testing as part of the release criteria, the initial recommendation of two negative PCR tests at least 24 hours apart can be used—the repeat test should be done 10–14 days after the first positive test.



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Roosevelt Street W21 K19, Addis Ababa, Ethiopia

+251 11 551 7700 africcdc@africa-union.org www.africcdc.org [africcdc](https://www.facebook.com/africcdc) [@AfricaCDC](https://twitter.com/AfricaCDC)