# Adults with severe or critical COVID-19

***Executive summary***

**Introduction**

This guideline assumes that an adult patient has been diagnosed with COVID-19 or that the clinical picture is highly suspicious for COVID-19. A small group of patients who contract COVID-19 will become very unwell with it.

**Target User**

* Nurses
* Doctors

**Target area of use**

* Ward

## Key areas of focus / New additions / Changes

* Identification of those who may become unwell.
* Management of complications
* The importance of PPE in all circumstances

**Limitations**

* Low molecular weight heparin is not widely available and diagnostic facilities for venous thromboembolic disease are limited.
* We lack access to HDU/ITU level care and cannot ventilate patients.
* We have two negative pressure rooms.

## Presenting symptoms and signs

There are two groups of patients to think about as high risk in the COVID-19 outbreak:

1. **Those who have become very unwell with COVID-19 as their only problem.** This group seems to present to hospital 5-12 days after the start of symptoms. They can develop Acute Respiratory Distress Syndrome (ARDS) and become very unwell. Risk factors for developing severe disease include older age, diabetes, chronic respiratory conditions (including severe asthma and COPD), chronic heart conditions (including uncontrolled hypertension) and immunosuppression (which in our setting is HIV/AIDS, steroids and methotrexate use) and underlying malignancy. Also, lymphopenia, especially when progressively worsening seems to be a marker of likely poorer prognosis.
2. **Those patients who have another medical condition that has been complicated by contracting COVID-19**.

### Clinical presentation of COVID-19 Pneumonia (severe & critical COVID-19)

Clinically apparent COVID-19 primarily presents as a febrile, flu-like illness with recovery in approximately 80 % of cases without the need for hospitalisation. Anosmia (loss of sense of smell) is a relatively common finding.

In around 20% of cases this flu-like illness progresses to a pneumonia over a period of 5-12 days from symptom onset and in a small number of cases (approximately 5% of symptomatic cases) this progresses further to ARDS, multi-organ failure, circulatory collapse & death.

Severe disease is categorised as fever/cough/dyspnoea with one of the following: respiratory rate >30 breaths/minute, severe respiratory distress, oxygen saturation <90% on room air.

Critical disease includes patients with multi-organ failure (eg coagulopathy, acute kidney injury, altered mental status) in addition to signs of COVID-19.

Fever can be prolonged, lasting up to 14 days even in relatively uncomplicated cases, though persistence of fever after 7 days suggests that a more severe course may be developing.

As disease become more common, more atypical presentations may present including acute abdominal pain, diarrhoea, delirium etc.

### Differentiating COVID-19 from bacterial pneumonia (CAP)

The following are suggestive of COVID-19 rather than CAP:

* Travel from outside the Gambia
* A history of close contact with confirmed / suspected case(s) of COVID-19
* Household contacts with acute cough, fever, breathlessness
* High rapidly spiking fever (peaks > 37.80C)
* Several days history before respiratory deterioration
* History of loss of sense of smell / taste is highly suggestive and should be sought in all patients
* History of myalgia and /or headache
* Bilateral respiratory signs
* Bilateral infiltrates on the chest X ray, with a non-lobar, lower zone and peripheral predominance
* Normal WCC with relative lymphopenia and absence of neutrophilia.
* Significant pleural effusion is uncommon in COVID-19

Other laboratory features commonly seen:

* Slightly elevated liver enzymes (ALT/AST)
* Low platelets
* Raised LDH
* Raised troponin

Currently COVID-19 can only be confirmed by a viral PCR, usually of a throat or nasopharyngeal swab sample. Estimates of the sensitivity of the vary from 80-90%, probably worse later in disease when the virus is predominantly in the lungs. Specificity is good. Therefore remember two things:

* Imaging changes (CXR or US in our context) with symptoms and lab tests suggestive of COVID-19 with a negative test can still be COVID-19. This is particularly true at the time when pneumonia becomes a predominant feature, and also becomes more of a problem as the disease spreads (pre-test probability rises and the test performs worse).
* If someone has COVID-19, they can still have another infection or health problem complicating their presentation.

## Management

All patients must be assessed for severity and a decision made about plans for treatment escalation at the time of admission. This is covered in another guideline.

Currently, the management of COVD-19 is **supportive**.

All patients presenting with fever or history of fever should be tested for malaria. Malaria and COVID-19 may co-exist.

There have been several treatments suggested that may be of benefit.

* Remdesivir, a nucleoside analogue, has been shown to shorten the time to recovery in patients hospitalised with COVID-19. Remdesivir is not available in The Gambia.
* Dexamethasone has been shown to improve mortality in adult patients hospitalised in the UK with COVID-19 requiring oxygen. There are substantial differences between the UK and Gambian settings, and concerns about administering steroids too early in the disease and a trial is being proposed to establish if routine administration of dexamethasone to patients hospitalised with COVID-19 will improve mortality in The Gambia. At this moment, steroid therapy for patients with COVID or suspected COVID should be considered on a case by case basis after discussion with the duty consultant.
* Hydroxychloroquine & chloroquine have been shown to be ineffective for the treatment of patients hospitalised with COVID-19, and should not be prescribed.

**In all circumstances**, appropriate PPE must be worn. If a patient becomes critically unwell, then staff should still take the time to don the PPE in a safe and proper manner.

Decisions on whether patients with COVID-19 need admission are likely to vary depending on the state of the epidemic at the time and the public health strategy. Where containment is the objective public health authorities may request the admission of all patients. If resources and beds become scarce, this may change to those meeting specific criteria (eg at risk of deterioration, needing oxygen or palliation).

Respiratory support: Give oxygen to patients with SARI and respiratory distress, hypoxaemia, seizures or shock and target SpO2 > or equal to 94%. Once stable, target saturation is > 90% in non-pregnant and 92 – 95% in pregnant patients. (This is not a guide on how many litres of oxygen to give them but a target for the optimum saturations once the oxygen is started. Oxygen should be turned down if saturations are consistently 99-100%).

Positioning of patients may help their oxygenation. Patients should be encouraged to alternate between lying on their sides (both left and right), front and back. Sitting up and leaning over a table may also help. Patients should move between positions every 2-4 hours.

BiPAP or CPAP are indicated when patients are classed as critically ill. If BiPAP or CPAP are available, they are likely to be the ceiling of care for many patients in The Gambia. CPAP and BiPAP are aerosol generating so should ideally be deployed in a neutral or negative pressure room. It may become necessary to cohort (place together) patients with proven or suspected COVID-19 and COVID-19 patients on CPAP or BiPAP.

Intubation and ventilation may be available in a few cases offsite, but the feasibility of this is currently unknown. With mortality in well-resourced settings of 66% for selected patients put on a ventilator with COVID-19, it will be necessary to select specific patients that may benefit from this resource intensive procedure. Intubation should be done by the most skilled operative using strict PPE.

Anticoagulation:It is recognised that COVID-19 infection is associated with thrombo-embolic disease in other settings. Prophylactic anticoagulation is recommended for all patients requiring hospitalisation, though the optimal dose and nature of prophylactic anticoagulation is not known. Low molecular weight heparin (LMWH) is not widely available and diagnostic facilities for venous thromboembolic disease are limited in The Gambia. All patients who are immobile or who are in the severe or critical categories should receive unfractionated heparin 5000 iu subcutaneously every 12 hours unless a contra-indication is present. LMWH should be reserved for the treatment of clinically or ultrasonographically diagnosed thrombotic disease.

Fever: Give due consideration as to why the fever is being treated. Generally, bringing down a patient's fever will likely make them feel better but not necessarily change how long they are unwell for. The exception to this is in patients with haemodynamic instability where reducing fever may reduce the risk of hypoxic tissue damage.

There is currently no evidence that NSAIDs are associated with extra morbidity and mortality in COVID-19. There is some evidence from other respiratory infections that NSAIDS will increase stroke and heart disease risk in susceptible patients. We recommend the use paracetamol first and then ibuprofen at as little a quantity as possible, for as short a time as possible.

**Pain**: Please, see above under fever above. If unresponsive to paracetamol, then use the WHO pain ladder.

Underlying medical conditions: Individual decisions should be made about each patient as they come, to manage their underlying condition alongside their acute COVID-19 as needed. There are a few areas of controversy to address:

* **ACEi/ARB:** There is no current evidence to support that patients will either gain protection or come to harm from these medications. Continuing the medication where it is needed while the patient is unwell is reasonable. However, given that these patients are likely to be acutely unwell, they are likely to be at risk of hypotension and renal injury. In such a situation, consideration should be given to stopping them during the infection and re-starting these medications after recovery.
* **Asthma/COPD/Post TB lung**: These patients may benefit from steroids. Endeavour to use the lowest effective dose and where possible reduce the dose to less than 20mg for adults. However, given our limited therapy for bronchoconstriction, higher doses of steroids may still be needed.

Secondary bacterial infection: Patients who worsen unexpectedly, whose cough becomes productive, who have neutrophil leucocytosis or who have new lateralising signs and symptoms should be considered for treatment with antibiotics aimed at bacterial pneumonia (chloramphenicol and benzyl penicillin). It may be necessary for some patients (eg. critical cases, those with unclear aetiology or an atypical picture for COVID-19) to start antibiotics when they are unwell and then stop them if the test for COVID-19 comes back and explains their presentation.

Pressure area care: Ensure that patients who become bed bound are turned regularly (2-3 hourly) by nursing staff to stop pressure area damage.

Fluid and nutrition: Patients should be encouraged to eat but anorexia and anosmia are a common feature. Food intake is not vital and people will recover an appetite and their lost weight after recovery.

Fluid should be encouraged orally and then given NG first and ultimately intravenously if that does not work. If iv fluids are given, the aim is to maintain euvolaemia, taking into account insensible losses. Boluses should only be used if a patient is obviously shocked.

Monitoring: Hospitalised patients should be monitored regularly to identify deterioration. Saturations are particularly important. Early warning scores or specific severity scores should be used according to current practice.

Laboratory tests: Hospitalised patients should all have blood taken for FBC, Na, K, Urea, Creatinine, LDH. VCT should be considered in all patients admitted with severe respiratory distress. Malaria RDT can be performed on the ward. Blood cultures should be considered in patients with critical COVID-19 or where antibiotics are being considered for other signs of infection. Other tests may be indicated where there is clinical concern. Liaison with the laboratories and correct labelling and packaging of samples is imperative (see separate guidance).

### Communication with patients and families: visitors will be restricted. Communication with patients and their families is vital to minimise anxiety, and optimise recovery. Strategies for communication with relatives are listed elsewhere. For communication with patients all staff in PPE should ensure that their name, and ideally a picture of their face, is displayed outside of their PPE.

## Key Issues for Nursing care

* Regular monitoring of a potential unstable group of patients
* Adhering to PPE to ensure staff and wider public safety
* Communication with patients and families

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