

COVID 19 (SARS-COV 2)

- IPC

- TRIAGE



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MINISTRY OF HEALTH-ETHIOPIA



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ETHIOPIAN PUBLIC HEALTH INSTITUTE

OCCUPATIONAL SAFETY  
ETHICAL ISSUES  
DEATH CARE  
IPC  
CAASE MANAGEMENT  
LAB INVESTIGATION  
COVID 19 (SARS-Cov 2)



# COVID 19

Clinical management

# POCKET BOOK



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# COVID 19

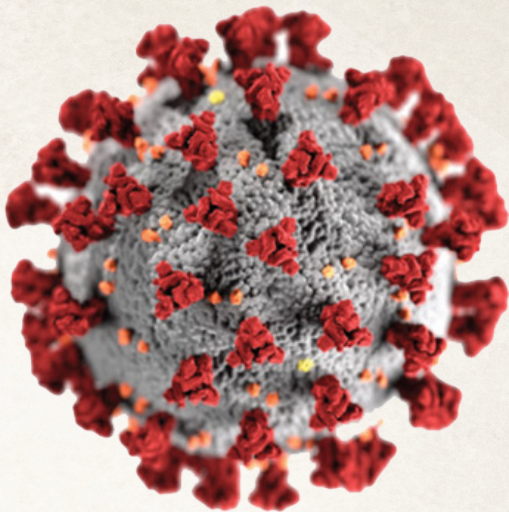
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# COVID-19



Coronavirus disease 2019 is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS Corona 2 Virus )

## Case Definitions

- **Suspected case**

A person presenting with fever ( $>38^{\circ}\text{c}$ ) or history of fever and symptoms of respiratory tract illness e.g. cough, difficulty in breathing AND a history of travel to or residence in a country/

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area or territory reporting local transmission of COVID-19 disease during the 14 days prior to symptom onset.

OR

A person with fever (>38°C) or history of fever and symptoms of respiratory tract illness e.g. cough, difficulty in breathing AND in the last 14 days before symptom onset, close contact with a person who is under investigation or confirmed for COVID-19

OR

A person with fever (>38°C) or history of fever and symptoms of respiratory tract illness e.g. cough, difficulty in breathing; And requiring hospitalization And in the absence of alternative diagnoses that fully explains the clinical situation

- **Probable case:**

A suspect case for which testing for COVID-19 is inconclusive

OR

A suspect case for whom testing could not be performed for any reason

- **Confirmed case:**

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

## Contact identification and Definition

### Close Contact

Any individual who has one of the following, consider as a close contact;

- Any individual who has had greater than 15 minutes face-to-face (<2 meters distance) contact with a suspected, confirmed case, in

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any setting.

- Household contacts defined as living or sleeping in the same home, individuals in shared accommodation sharing kitchen or bathroom facilities and sexual partners.
- Healthcare workers, including laboratory workers, who have not worn appropriate PPE or had a breach in PPE during the following exposures to the case:
  - Direct contact with the case (as defined above), their body fluids or their laboratory specimen
  - Present in the same room when an aerosol generating procedure undertaken on the case.
  - Passengers on an aircraft sitting within two seats (in any direction) of the COVID-19 case, travel companions or persons providing care, and crew members serving in the section of the aircraft where the case was seated.

## Casual Contact

Any individual who has one of the following, considered as a casual contact;

- Healthcare workers, not including laboratory workers, who have taken recommended infection control precautions, including the use of appropriate PPE, during the following exposures to the case:
  - Direct contact with the case (as defined above) or their body fluids
  - Present in the same room when an aerosol generating procedure undertaken on the case.
- Any individual who has shared a closed space with a case for less than two hours.
- Passengers on an aircraft sitting beyond two seats (in any direction) of a confirmed case.

- 
- Any individual who has shared a closed space with a confirmed case for longer than two hours, but following risk assessment, does not meet the definition of a close contact.

## Contact management of a confirmed case

### *Close contacts of a confirmed case;*

- They should undergo active follow-up for 14 days after the last possible exposure to a confirmed COVID-19 case
- They should be advised their risk and the symptoms of COVID-19 and provided with a PPE, including facemasks.
- They should be reminded about adhering to adequate respiratory precautions and hand hygiene practice throughout the period of active monitoring
- Contact should be made with them on a daily basis to ask about relevant symptoms for 14 days after the last possible exposure to a confirmed COVID-19 case
- Close contacts of a confirmed case should limit their movements and interactions with others and advised to avoid contact with immune compromised, elderly, pregnant or other vulnerable individuals.

### *Causal contacts of a confirmed case;*

- They should undergo passive follow-up for 14 days after the last possible exposure to a confirmed COVID-19 case.
- Advised about their risk and the symptoms of COVID-19 and provided all necessary information.
- Advised to self-isolate if they develop any relevant symptoms and call their local health institution/EPHI (8335).
- No isolation and restriction of movement is requiring unless they develop symptoms



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## COVID-19 personal protective equipment (PPE)

### Health care providers expected to:

1. Change their regular cloths and wear scrubs and shoes suitable for health care facility, example doctors shoes ( OR dedicated personal cloth and shoes dedicated only for COVID treatment center) in their office before they go to donning.
2. Then they go to donning and they put on PPE at donning on top of their scrub and shoe(or dedicated cloth and shoe) and directly go to area of assignment in the center.
3. After completing their session, they leave the center with the scrub and shoes(or dedicated cloth and shoe) after removing the apron, gowns, shoe cover, face mask, face shield or eye cover and hand washed at doffing.
4. It is advised to supervise and/or to self mirroring the donning and doffing procedures in the centers.

Single session means the period of time health care provider stays in the facility after donning until doffing. Most PPE are used for single session while disposable glove and disposable apron should be changed after each patient in a single session depending on the extent of contamination. Hand hygiene should be routine if there is a need to change any of the PPE during a session.

#### A. Aerosol generating procedures(AGP)

1. A long-sleeved disposable fluid repellent gown (covering the arms and body) or disposable fluid repellent coveralls,
2. Apron if long sleeved gown is non fluid repellent

- 
3. N95 face mask,
  4. A full-face shield
  5. Gloves
  6. Shoe cover

After AGP procedures, It is advised to remove N95,goggle,face, goggle, face shield and gloves after each patient contact.

## **B. Higher risk acute inpatient care areas for confirmed or suspected COVID 19**

1. Long-sleeved disposable fluid repellent gowns or disposable fluid repellent coveralls
2. If non-fluid-resistant gowns are used, a disposable plastic apron should be worn underneath.
3. N95 face mask,
4. Full face shield or eye Goggles,
5. Gloves.
6. Shoe cover

NB: A higher risk acute inpatient care area is defined as a clinical environment where AGPs are regularly performed. Ex. ICU, emergency room resuscitation areas, wards with NIV, operating theater, Ambulance staff conveying a patient into a high risk area are not required to change or upgrade their PPE for the purposes of patient handover.

## **C. Inpatient areas with suspected or confirmed COVID 19**

1. A fluid resistant surgical facemask or N95 if available

- 
2. Disposable gloves,
  3. Aprons and
  4. Eye protection
  5. Shoe cover

Use of aprons, surgical masks, eye protection and gloves is recommended for health and social care workers working in Emergency department and acute admission areas, those transferring patients and involved in other duties requiring close contact.

For operating theatres and operative procedures, labor ward and ambulance and ambulance staffs:

- Where AGPs are performed use PPE guidance set out for AGPs
- when there is no AGP, use recommendation for non AGP setting.

For primary care, ambulatory care and other non-emergency outpatient clinical settings: plastic aprons, surgical mask, eye protection and gloves should be used for any direct care of possible and confirmed cases.

For health and social care workers working in reception and communal areas but not involved in direct patient care, social distancing of 2 meters, if not possible surgical face mask.

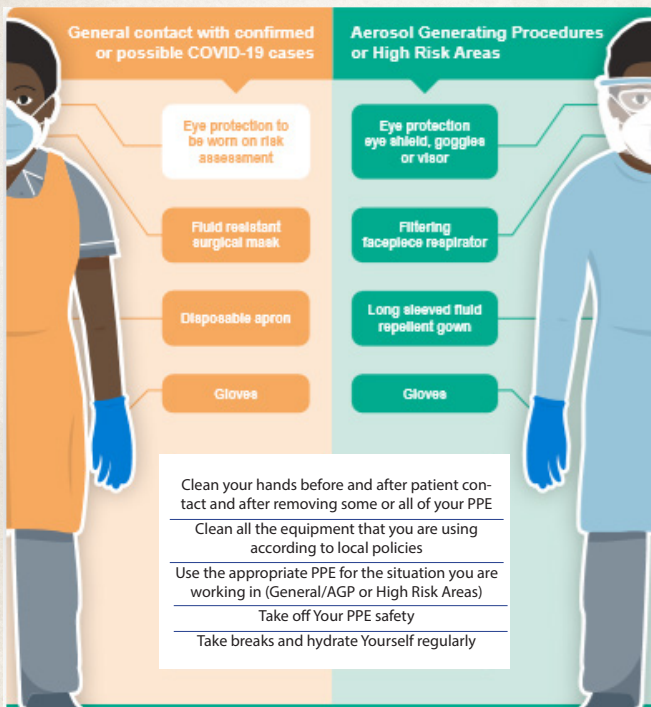
For health care workers in individual's home or quarantine sites for individuals coming from abroad: plastic aprons, surgical face mask, eye protection and gloves are recommended.

Pharmacy: if social distancing of 2 meters is maintained there is no indication for PPE in a pharmacy setting, if not surgical face mask.

For collection of nasopharyngeal swab for COVID 19: plastic aprons,

surgical face mask, eye protection and gloves should be used. Patient use of PPE: in clinical areas, communal waiting areas and during transportation, it is recommended that possible or confirmed COVID-19 cases wear a surgical face mask if tolerated, for example, not using oxygen.

## RAPID VISUAL GUIDE FOR PPE IN ETHIOPIA



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## Infection prevention and control

To prevent infection caused by aerosol route, respiratory droplet or direct contact with bodily

fluids, the following materials will be required to prevent spread of infection or disease.

### IPC Materials Required


- N95 mask
- Long sleeved gown
- Examination glove
- > 60% Alcohol Based Hand Rub (ABHR)/ Sanitizer
- 70% Alcohol
- Leak proof biohazard bag
- 0.5% Chlorine Solution
- Apron

All team members should perform consistent and appropriate hand hygiene procedures:

- Hand hygiene: is the process of removing soil, debris, and microbes by cleansing hands using soap and water, Alcohol Based Hand Rub (ABHR) antiseptic agents, or antimicrobial soap.
- Hand washing: is the process of mechanically removing soil, debris, and transient flora from hands using soap and clean water.
- Alcohol-Based Hand Rub (ABHR): is a fast-acting, antiseptic hand rub that does not require water to reduce resident flora, kills transient flora on the hands, and has the potential to protect skin.

# Hand Washing

## Hand Hygiene Technique with Soap and Water

 **Duration of the entire procedure: 40-60 seconds**



**0** Wet hands with water;



**1** Apply enough soap to cover all hand surfaces;



**2** Rub hands palm to palm;



**3** Right palm over left dorsum with interlaced fingers and vice versa;



**4** Palm to palm with fingers interlaced;



**5** Backs of fingers to opposing palms with fingers interlocked;



**6** Rotational rubbing of left thumb clasped in right palm and vice versa;



**7** Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



**8** Rinse hands with water;



**9** Dry hands thoroughly with a single use towel;



**10** Use towel to turn off faucet;



**11** Your hands are now safe.

# Hand Hygiene Technique with Alcohol Based Formulation

1a



Apply a palmful of the product in a cupped hand, covering all surfaces;

1b



2



Rub hands palm to palm;

3



Right palm over left dorsum with interlaced fingers and vice versa;

4



Palm to palm with fingers interlaced;

5



Backs of fingers to opposing palms with fingers interlocked;

6



Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



Once dry, your hands are safe.

## *Proper donning sequence includes:*

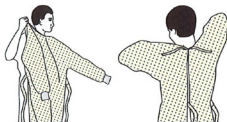
Wash your hands if visibly soiled, if visibly clean use ABHR. Wear single use disposable gowns, Wear N95 masks (Check for fitness), Wear Goggles, Wear gloves, Refrain from touching other surfaces with contaminated gloves

### SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

#### 1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



#### 2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



#### 3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



#### 4. GLOVES

- Extend to cover wrist of isolation gown



**USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION**



# How to take off Personal Protective Equipment

## HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

### 1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



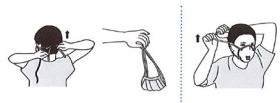
### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

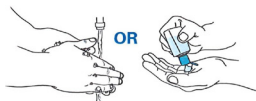


### 3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



### 4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



## Diagnostic testing For COVID-19

Based on clinical and epidemiological factors and linked to an assessment of the likelihood of infection.

- 
- PCR testing should be done for all suspect cases.
  - Rapid collection and testing of appropriate specimens from patients meeting the suspected case definition for COVID-19 is a priority for clinical management and outbreak control
  - Safety procedures during specimen collection: Ensure that adequate standard operating procedures (SOPs) are in use and that staff are trained for appropriate specimen collection, storage, packaging, and transport under appropriate IPC caution.
  - Specimens that can be delivered promptly to the laboratory can be stored and transported at 2-8°C.
  - All specimens collected for laboratory investigations should be regarded as potentially infectious.

## Collection of Instructions Respiratory Specimens

*Upper respiratory tract specimens:*

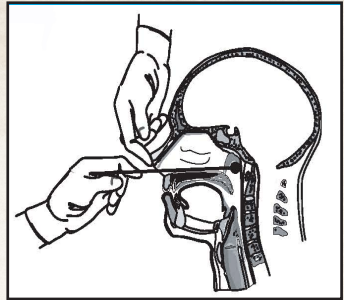
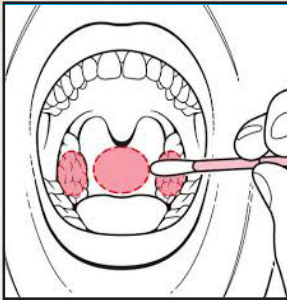
*Use the flexible shaft nasopharyngeal swab:*

Tilt the patient's head back 70 degrees & insert the swab into nostril parallel to the palate until resistance is encountered

Leave swab in place for several seconds to absorb secretions, slowly remove the swab while rotating it then insert the swab in to the tube and cover the tip by liquid in the tube.

Broncho alveolar lavage, tracheal aspirate. Collect 2-3 mL into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container.

- Sputum specimens should be correctly labeled and accompanied by a diagnostic request form



## Laboratory testing for COVID-19 virus

Laboratories undertaking testing for COVID-19 virus should adhere strictly to appropriate bio-safety practices.

- Routine confirmation of cases of COVID-19 is based on detection of the virus RNA by real-time reverse-transcription polymerase chain reaction (RRT-PCR)
- A number of factors could lead to a negative result in an infected individual, including:
  - Poor quality of the specimen, containing little patient material
  - The specimen was collected late or very early in the infection.
  - The specimen was not handled and transported appropriately
  - Technical reasons inherent in the test, e.g. virus mutation or PCR inhibition.
- If a negative result is obtained from a patient with a high index of suspicion for COVID 19 virus infection, the lower respiratory tract if possible, should be collected and tested.

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## General imaging services

- All referring physicians should use the national or WHO surveillance criteria to screen patients before they send patients to the imaging department.
- Imaging facilities recommended to have enough screening space and waiting area which adequate to maintain the recommended social distance from patients
- Personal protective devices for the screening staff like surgical masks and gloves should be provided.
- It is highly recommended to implement capabilities for remote interpretation diagnostic imaging and working from home;
- It is also recommended to decrease the patient load of the department by prioritizing urgent cases and subsequent cancelling non emergent examination.
- Imaging facilities should prepare a checklist for screening of all patients coming to the department for any symptoms/signs suggestive of COVID19 infection (as per the national guideline, see the checklist below).
- All chest CT examinations should be communicated to the reporting radiologist as soon as possible
- Imaging services specific to probable/suspected/confirmed COVID-19 patients

### Recommendations:

CT is not, currently, recommended for initial diagnosis of COVID-19. Viral testing remains the only specific method of diagnosis even if radiologic findings on CXR or CT are suggestive of COVID-19.

# COVID 19 TRIAGE PROTOCOL

Name of the patient					
Date	Time	Age	Sex	Male	Female
<b>COVID 19 SPECIFIC</b>					
Does the client has COVID 19 defining illness ?				Yes	No
				A Fever, B Cough C SOB	
Does the patient have travel history to COVID 19 affected country?				Yes	No
Close contact with a confirmed or individual with o cough, o SOB, o Fever with in the 14 days prior to illness onset				Yes	No
Close contact with a confirmed or individual with cough,SOB, fever in the 14 days prior to illness onset				Yes	No
Worked or attended a health care facility in the 14 days prior to onset of symptoms where patients with hospital associated COVID 19 infections has been reported				Yes	No
<b>Pre-triage result</b>					
An individual having with any acute respiratory illness (runny nose sore throats) AND at least one of the above (fever ,cough, SOB ),that individual should be consider as pre-triage COVID 19 suspect and should be direct to facility isolation area .				Suspect	Non-suspect
Suspect corona virus with any acute respiratory illness (runny nose sore thought) AND at least one of the above (fever ,cough, SOB ),that individual should be consider as pre-triage COVID 19 suspect and should be direct to facility isolation area .					

**Check for RED criteria**

Airway & Breathing	Other
Unresponsive	Any infant <8 days old
Stridor	Age <2 months and temp <36 or >39°C
Respiratory distress or central cyanosis	High-risk trauma
SpO <sub>2</sub> <90%	Threatened limb
<b>Circulation</b>	Acute testicular/scrotal pain or priapism
Capillary refill >3 sec	Snake bite
Weak and fast pulse	Poisoning/ingestion or dangerous chemical exposure
Heavy bleeding	
<b>Disability</b>	
Active convulsions	Any 2 of: - Lethargy - Sunken eyes - Very slow skin pinch - Drinks poorly
Hypoglycaemia	

Yes

**Move to High Acuity Area immediately**

**Check for YELLOW criteria**

Any infant 8 days to 2 months old	Severe pallor
Unable to feed or drink	Restless, continuously irritable or lethargy
Vomits everything	Severe pain
On-going diarrhoea	Trauma/burn (no red criteria)
Dehydration	Known diagnosis requiring urgent surgical intervention
Wheezing (no red criteria)	New rash worsening over hours or peeling (no red criteria)
Malnutrition: Visible severe wasting OR oedema of both feet	Exposure requiring time-sensitive prophylaxis (eg animal bite)

Yes

**Move to Clinical Area**

**Check for high risk vital signs**

Temp <36° or >39°

SpO<sub>2</sub> <92%

A/P/U other than A

RR	under 1 year	>1 and <5 years	>5 and <12 years
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High	50	40	30
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Low	20	15	10
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RR	under 1 year	>1 and <5 years	>5 and <12 years
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High	50	40	30
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Low	20	15	10
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No

**Move to Low Acuity or Waiting**

**Check for RED criteria**

**Airway & Breathing**

Unresponsive

Stridor

Respiratory distress or central cyanosis

**Circulation**

Weak pulse or capillary refill >3 sec

HR <50 or >150

Heavy bleeding

**Disability**

Active convulsions

Any two of:

Altered mental status

Stiff neck

Hypothermia or fever

Headache

Hypoglycaemia

**Other**

High-risk trauma

Poisoning/ingestion or dangerous chemical exposure

Threatened limb

Snake bite

Acute chest or abdominal pain (>50 years old)

ECG with acute ischaemia

Violent or aggressive

**Pregnant with any of:**

Heavy bleeding

Severe abdominal pain

Seizures

Severe headache

Visual changes

SBP  $\geq$  160 or

DBP  $\geq$  110

Active labour

Trauma

Yes

**Move to High Acuity Area immediately**

**Check for YELLOW criteria**

Vomits everything or ongoing diarrhoea

Unable to feed or drink

Sever pallor

On-going bleeding (no red criteria)

Recent fainting

Altered mental status or agitation (no red criteria)

Acute general weakness

Acute focal neurology

Acute visual disturbance

New rash worsening over hours or peeling (no red criteria)

Severe pain (no red criteria)

Visible acute limb deformity

Open fracture

Suspected dislocation

Other trauma/burns (no red criteria)

Sexual assault

Acute testicular/scrotal pain or priapism

Unable to pass urine

Wheezing (no red criteria)

Exposure requiring time-sensitive prophylaxis (eg. animal bite, needlestick)

Yes

**Move to Clinical Area**

**Check for high risk vital signs**

HR <60 or >130

RR <12 or >30

Temp <36° or >39°

SpO<sub>2</sub> <92%

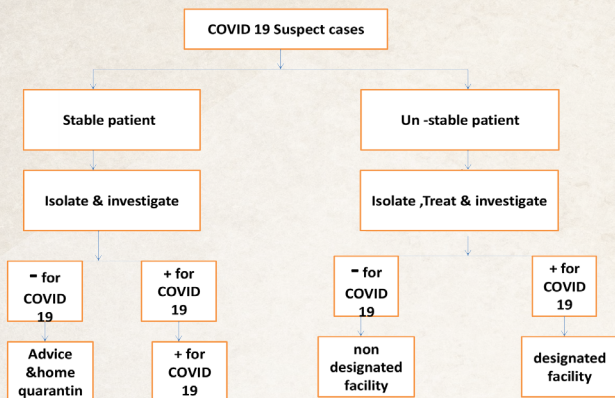
AV/PU other than A

Yes

No

**Move to Low Acuity or Waiting**

## COVID-19 patient flow



## General principle of clinical management for COVID

Case description	Clinical syndrome	Treatment Site
Patients uncomplicated upper respiratory tract viral infection may have non-specific symptoms such as fever, fatigue, cough (with or without sputum production), anorexia, malaise, muscle pain, sore throat, dyspnea, nasal congestion, or headache.	Mild	Treatment centers , inpatient ward



<p>Adult: pneumonia but no signs of severe pneumonia and no need supplemental oxygen.</p> <p>Child: non-severe pneumonia who has cough or difficulty breathing + fast breathing: fast breathing (in breaths/min): &lt; 2 months: <math>\geq 60</math>; 2-11 months: <math>\geq 50</math>; 1-5 years: <math>\geq 40</math>, and no signs of severe pneumonia.</p>	Moderate	Inpatient ward
<p>Patient having severe pneumonia, acute respiratory, distress Syndrome (ARDS) or sepsis and patients responding to non-invasive management.</p> <p>These patients manifest with dyspnea, RR <math>\geq 30</math>/min, blood oxygen saturation (SpO<sub>2</sub>) <math>\leq 93\%</math>, or when there is ABG PaO<sub>2</sub>/FiO<sub>2</sub> ratio &lt; 300 OR</p> <p>in Kigali definition SpO<sub>2</sub>/FIO &lt;350, and/or lung infiltrates in CT imaging <math>\geq 50\%</math> within 24 to 48 hours; this occur in 14% of cases.</p>	Severe	Inpatient ward
<p>Respiratory failure requiring mechanical ventilation , septic shock, and/or multiple organ dysfunctions (MOD) or failure (MOF) and it need invasive or special monitoring ICU management;</p>	Critical	ICU

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## Clinical Management

### A. Mild Illness

- Maintain standard infection prevention and control procedures
- Close monitoring for signs of clinical deterioration such as respiratory failure, sepsis/ septic shock has to be done for early management of such complications.
- Advise patients to keep hydrated, but not to take too much fluid as this can worsen oxygenation
- Provide symptomatic therapies with antipyretic/ analgesic
- Antipyretics / analgesics in adults:  
Paracetamol 1gm paracetamol PO every 6–8 hours, maximum 4g/ 24hr Tramadol 50–100 mg PO/IV every 4–6 hours for analgesics purpose as needed, daily maximum 400 mg/day can be given alternatively or combined with paracetamol
- Pediatrics: Paracetamol 15 mg /kg PO, Suppository every 6-8 hours: avoid aspirin use in pediatrics cases to avoid Reye Syndrome

### B. Moderate COVID-19 illness

- Continue support as the mild cases
- Add empiric oral antibiotics :
- In adult: Amoxicillin 500mg po TID or Amoxicillin-clavulanate 1gm PO BID or 625 mg po TID for 5-7days
- In Pediatrics: Azithromycin 10mg /kg/day for day 1 and 5mg/kg/day for the rest of 4 days OR Amoxicillin-clavu-

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lanic acid TID dosing: 20–40 mg/kg/24 hr ÷ Q8 hr PO, BID dosing: 25–45 mg/kg/24 hr ' Q12 hr PO, extended release 600: ≥3 mo and <40 kg: 90 mg/kg/24 hr ÷ Q12 hr PO × 10 days.

### *C. Severe COVID 19 illness*

Adult: Assess severity using CURB-65 criteria.

The CURB-65 criteria (Confusion, Urea >7mmol/L or abnormal Creatinine value, Respiratory rate >30, Blood pressure <90/60, Age >65) For all patients, the CURB-65 score should be interpreted in conjunction with clinical judgment. Patients with a CURB-65 or CURB-65 score of >2 patient should be admitted to ICU.

Pediatrics: Pneumonia + general danger signs: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions

- Provide oxygen supplementation for an SpO<sub>2</sub> target ≥ 90% (for pregnant mother and children SpO<sub>2</sub> target >92-94%)
- Conservative IV fluid management should be instituted
- In COVID 19 superimposed bacterial infection is common and to treat all likely pathogens antibiotics administration is common depending on the treating physician judgment.
- Empiric antimicrobials should be started after taking specimen for culture and sensitivity (preferably broader spectrum antibiotics)

#### *Adults:*

- In patients with who are with severe ill and critical, hospitalized, immunocompromized or with previous structural lung disorder :Give Ceftazidime/Cefepime 2g iv Tid +or +/-Vancomycin 1 gm IV BID \*Ceftriaxone 1gm IV bid is alternative to ceftazidime/Cefepime but nowadays it is not routinely used in severe pneumonia or sepsis because of high rate of resistance.

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-If there is no response with the above antibiotics or culture and sensitivity result suggests it Meropenem(or other available carbapenemes) 1g IV q8hours +/- vancomycin 1g IV q12 hours can be used.  
- When patients improve and are able to take PO switch to Amoxicillin-clavulanate (look dose at mild/moderate pneumonia section above).

### *Pediatrics:*

- Ceftriaxone 75-100mg /kg 12 hourly + Azithromycin 10mg /kg/day for day 1 and 5mg/kg/day for the rest of 4 days.  
Add Vancomycin 40-60 mg /kg every 6 hourly for hospital acquired infection, previous intake of antibiotics and underlying lung structural problem

## *D. Critical Illness in COVID 19*

A. Management of patients with hypoxemic respiratory failure and/or ARDS

### **1. Oxygen Therapy**

Indications of oxygen in SARI:

- SpO<sub>2</sub> < 90% (if patient is hemodynamically normal)
- SpO<sub>2</sub> < 94% (if patient with any emergency signs of airway, breathing or circulation)
- SpO<sub>2</sub> < 92-95% (if pregnant woman).
- Severe respiratory distress
- Sepsis with hypo perfusion or shock
- Alteration of mental status
- Short of pulse oximeter clinical signs severity signs can be used

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## Oxygen administration

Initiate high flow oxygen therapy in severe cases

In adults and older children:

- A. • Start with 10–15 l/min via face mask with reservoir bag.
1. In less ill patients start with 5 L/min by nasal cannula  
Pediatric:
  2. Standard flow rates for oxygen through nasal prongs or nasal catheters are 0.5–1 L/min for neonates, 1–2 L/min for infants, 1–4 L/min for older children
  3. Face mask can also be used as an alternative method in emergency setting when high flow (5-10L/min)

If no improvement proceeds with Non Invasive Positive Pressure trial.

## ***2 .Use of Non Invasive Positive Pressure:***

With the huge burden of cases needing respiratory support, critical care units are obliged to use non-invasive positive pressure ventilations (NIPPV) despite their limitations. Experts recommend the use of NIPPV with precautions as it may delay time to intubations and increase risk of transmission of SARS CoV2 virus.

Recommendations for respiratory failure treatment in COVID 19 patients.

- Bi-level positive airway pressure ventilation (BiPAP), and continuous positive airway pressure ventilation(CPAP) with high PEEP 10-15 cm H<sub>2</sub>O as tolerated can be used for respiratory support until intubation
- Short of mechanical ventilators, NIPPV can be tried to support patients as it can especially be useful in patients with chronic

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respiratory diseases.

- Airborne precautions are advised while in use.

Contraindications for use of NIPPV:

- Change in mental status
- Shock
- Pneumothorax
- Absence of spontaneous breathing
- Unable to handle its secretions

## Monitoring

- Closely monitor the vital signs, and respiratory distress signs
- As patients may be anxious, you can use low dose sedation while in use
- If after 30 minutes of trial, the patients has no improvement, immediately intubate

## ***3. Invasive Mechanical Ventilator use***

### 3.1 Intubation

- Endotracheal intubation should be performed by a trained and experienced provider using airborne precautions.

### Preparation

- Apply monitoring: Spo<sub>2</sub>, ECG and BP on 3-minute cycle at the very least
- Prepare for difficult air way, resuscitation equipment including bag valve mask with reservoir bag and drugs
- Prepare suction with appropriate size suction tips
- Prepare different endotracheal tube (ETT) size cuffed prefer

- 
- Prepare paralytic drug (preferably rocuronium, suxametonium) and sedative drugs (preferably Fentanyl, ketamine, midazolam)
  - Prepare oxygen source
  - Check IV access (ideally x2)
  - Prepare Glidescope if possible or Video laryngoscopy or different size laryngoscope
  - Prepare plaster and bandages for securing the ETT
  - Institute airborne precautions while intubation
  - Put patient in sniffing position or sit them up slightly to minimize further reduction in FRC

### Pre-oxygenation:

- Pre-oxygenation with 100% oxygen for 5min or 5 vital capacity breaths.
- Avoid manual ventilation as it aerosolizes infectious droplets to the atmosphere.

### Sedate and paralyze

- Give opioid or IV lidocaine to blunt airway reflex if appropriate
- Paralyze and sedate (Be prepared for difficult air way).
- Rapid sequence induction with larger doses of ketamine 1-2mg/kg and suxamethonium 2mg/kg to avoid coughing during intubation and to rapidly intubate patient with the first attempt.
- Ketamine should ideally be first line drug due to its bronchodilator effects as well as haemodynamic stability

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## Place the tube

- Use Glidescope if available to reduce the risk of transmission by keeping distance from patient's airway
- Assure correct placement of tube by observing chest rise and /or by capnography if possible
- Monitor vital signs and pulse oximeters reading subsequently

## 4.2 Use of Mechanical Ventilator

Recommendation regarding management of patients with COVID19 ARDS

Use lung protective ventilation (LPV) strategy in Mechanical ventilator setting adjustment

- Low tidal volume(TV), (4-8 ml /KG)
- Low inspiratory pressure, and
- High PEEP (Max PEEP suggested in pediatrics:15mmHg with hemodynamic monitoring)
- If no improvement, consider prone ventilation except in pediatrics patient.

### 3.2.1 Setting for Acute Respiratory Distress Syndrome (ARDS)

- Set TV 6–8/kg based on adult and children predicted body weight.
- Reduce TV to reach target of 6 mL/kg over couple of hours
- If TV is at 6 mL/kg and Pplat remains > 30 cm H<sub>2</sub>O, then reduce TV by 1 mL/kg each hour, to a minimum 4 mL/kg.  
NB: At the same time, increase respiratory rate(RR) to maintain minute ventilation (MV){Remember  $MV = TV \times RR$ }.
- Set RR to approximate minute ventilation (MV):



- Do not set > 35/min
- Set I: E ratio so 1:3- 1:4
- May require higher flow rates
- Set inspiratory flow rate above patient demand(Commonly > 60 L/min)
- Set FiO<sub>2</sub> at 1.00, titrate down. You can titrate the FiO<sub>2</sub> to the lowest value that maintains target SpO<sub>2</sub> 88–93%
- Set PEEP 5–10 cm H<sub>2</sub>O or higher for severe ARDS.
- Set PEEP corresponding to severity of oxygen impairment
- Monitor for intrinsic PEEP

### 3.2.2 Adjustment of MV parameters

#### A. PEEP titration for oxygenation

We can adjust either the concentration of oxygen(FiO<sub>2</sub>) provided or the positive end expiratory pressure (PEEP) to achieve target oxygenation PaO<sub>2</sub>=55-80mmhg, or Oxygen saturation 88-93%.

FiO <sub>2</sub>	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7
PEEP	5	5	8	8	10	10	10	12	14

FiO <sub>2</sub>	0.8	0.9	0.9	0.9	1.0
PEEP	14	14	16	18	18-24

#### Lower PEEP, Higher FIO<sub>2</sub> strategy

FiO <sub>2</sub>	0.3	0.3	0.3	0.3	0.3	0.4	0.4
PEEP	5	8	10	12	14	14	16

FiO <sub>2</sub>	0.5	0.5-0.8	0.8	0.9	1.0	1.0
PEEP	18	20	22	22	22	24

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Higher PEEP, lower FiO<sub>2</sub> strategy

## B. Lung protective ventilation strategy

- If P<sub>plat</sub>>30 cmH<sub>2</sub>O; decrease TV by 1ml/kg steps (minimum=4ml/kg)
  - If P<sub>plat</sub><25 cmH<sub>2</sub>O and TV< 6ml/kg, increase TV by 1ml/kg until P<sub>plat</sub>> 25 cmH<sub>2</sub>O or TV=6ml/kg
  - If P<sub>plat</sub>< 30 and breath stacking or dys-synchrony occurs; may increase TV in 1ml/kg increments to 7 or 8 ml/kg if P<sub>plat</sub> remains ≥30ml/kg
- Reduce high levels of PEEP should be done gradually: 2 cm H<sub>2</sub>O, once or twice a day

## 4. Fluid management

- Conservative fluid strategy is recommended, as appropriate to the overall clinical status.
- Diuresis or fluid removal in patients with favorable hemodynamics is recommended.

## 5. Sedation and paralysis

- It may be used to reduce patients dys-synchrony
- Consider neuromuscular blockage in the presence of refractory hypoxemia despite high PEEP

## 6. Prone Positioning

Prone Positioning is beneficial in improving ventilation-perfusion mismatch, promoting homogenous aeration and decreasing lung injury among others. Recent data also indicate mortality benefit.

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## 6.1 Indication for Prone Positioning

- It is recommended to use Prone Positioning as we observe poor oxygenation despite maximal ventilator support
  - The advantage of prone positioning is to improve the ventilation-perfusion mismatch, improve the homogeneous aeration and reduce lung injury as well as infection by facilitating airway secretions drainage.
  - Mortality benefit of prone positioning has also been described in literature when used early in moderate to severe ARDS.
  - Trials also indicate that non intubated patients may benefit with prone positioning in patients with refractory hypoxemia with high flow oxygen.
  - Taking into consideration the availability of resources, especially optimal nursing care ,we advise to pronate the patients for at least 12hours ,preferably 16 hours per day in the absence of contraindications.
- 
- Significant hemodynamic instability
  - Severe acidemia
  - Cerebral perfusion pressure < 60 mmHg
  - Increased ICP > 30 mmHg
  - Pregnancy
  - DVT treated for <2 days
  - Facial surgery or severe facial trauma
  - Massive hemoptysis
  - Pelvic fractures
  - Life-threatening cardiac arrhythmias within 24 hours
  - Bronchopleural fistula
  - Unstable fracture

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- Serious burns (> 20% body surface area)
  - Spinal instability
  - History of difficult or nasotracheal intubation
  - Inability to tolerate face-down position
  - Recent sternotomy or major abdominal surgery
  - Recent tracheostomy
  - Active intraabdominal process

### B. Management of septic shock

Apply the six sepsis management bundles within 1hr: appropriate fluid management, Oxygen delivery, antibiotics, sending specimen for culture and sensitivity, and monitoring of lactate and hourly urine output.

- Immediate aggressive volume expansion with isotonic solution, preferably R/L or R/L alternative with N/S is the mainstay of management in septic shock.

### In adults:

- o Start with at least 30ml/kg in the first 3hrs, then additional fluid boluses depending on hemodynamic response .
- o For pediatrics 40-60ml /kg (20ml /kg hourly bolus) can be given.  
NB: Precautious administration of fluids is needed for malnourished pediatric (Refer the Ethiopian Guideline on Malnutrition)
- o Further fluid administration depends on the response to fluid resuscitation
- o Closely monitor for signs of fluid overload (jugular venous distension, crackles on lung auscultation, pulmonary edema)

- 
- on imaging, or hepatomegaly in children)
- o Stop or decrease fluid administration if signs of fluid overload.
  - o Watch for signs of target perfusion achievement (Mean Arterial Pressure (MAP) > 65 mmHg or age appropriate target for children, urine output (> 0.5 ml/kg/hr in adults, 1 ml/kg/hr in children), and improvement of skin mottling, capillary refill, level of consciousness)
  - o If target perfusion is not achieved or hemodynamic response is poor with standard fluid administration within one-hour start vasopressor administration.
    - The vasopressor of choice in adults is norepinephrine (NE) (2-30 µg/min/ (0.1-1 µg/kg/min) but epinephrine (2-30 µg/min, (0.1-1 µg/kg/min) and dopamine (2-20 µg/kg/min) can be used respectively. Titrate dose based on response.
    - For children, epinephrine (0.1–0.3 µg /kg/min) is the first-line vasopressor, but dopamine can also be used.
    - Closely monitor the veins for any extravasations of vasopressors as it may cause tissue swelling and necrosis.
  - o Broad spectrum antibiotics should be administered for possible superimposed infection

### Adults:

- In patients with who are critical, hospitalized, immunocompromized or previous structural lung disorder: Cefazidime/Cefepime 2g iv TID +/- Vancomycin 1 gm IV BID
- Meropenem 1g IV q8hours +/- vancomycin 1g IV q12 hours in critical patients if there is no response with the above alternative or culture and sensitivity result is suggestive •

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- When patients improve and are able to take PO Amoxicillin-clavulanate (Augmentin) 2 gm PO BID for 7-10 days

### Pediatrics:

- Ceftriaxone 75-100mg /kg 12 hourly + Azithromycin 10mg /kg/day for day 1 and 5mg/kg/day for the rest of 4 days
- Vancomycin 40-60 mg /kg every 6 hourly can be added for hospital acquired pneumonia, underlying lung structural problem, previous antibiotic use .

Other antibiotics can be administered based on the clinical judgment of the clinician

- o Surgical drainage or debridement of an abscess or dead / necrotized tissue.
- o Blood transfusion if Hgb is  $\leq 7$ mg/dl in adults, Hgb is  $< 10$  mg/dl in pediatrics to keep adequate O2 saturation.
- o Collect culture and sensitivity , organ function tests, electrolytes, and imaging results and manage if there is any complications.
- o Stress dose steroid (Hydrocortisone 2 mg/kg IV hydrocortisone (maximum 100 mg), followed by 1 mg/kg (maximum 50 mg) of hydrocortisone dosed every six hours for a maximum of seven days or until all vasoactive infusions have been discontinued for at least 12 hours, whichever comes first: can be given for refractory septic shock in children.

### C. Antiviral treatment:

Some studies in different countries showed Favipiravir is potential treatments effective against COVID-19.

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If these drugs is available, it is recommended to use:

- Mild and moderate cases:

Favipiravir/ Avigan (adult dose): Favipiravir 1600mg PO BID the first day then 600mg PO BID 7-10days.

#### D. Anticoagulant for COVID-19 patients

- a. Mild cases: No need for anticoagulation unless there is a non-COVID-19 indication for anticoagulation
- b. Moderate/Severe cases: Start prophylaxis  
LMWH 40mg subcutaneous daily or UFH 5000 S/C b.i.d until discharge
- c. Critical cases:

- Start on therapeutic anticoagulation if there is established VTE or ARDS with unexplained deterioration of respiratory failure and or elevated D dimer level greater than 6x than normal with no contraindication for anticoagulate
- Give :LMWH 40mg Subcutaneous bid orUFH 5000 U S/C bolus and then 17500 U S/C b.i.d then shift to oral anticoagulants- Rivaroxaban 15 mg PO b.i.d for 21 days, THEN 20 mg PO daily, or Warfarin (three days overlap) dose adjusted to INR 2-3 after improvement for a total of three months.

NB: Avoid anticoagulation if there is:

INR>1.4

Low platelet (<25,000)

Uncontrolled Blood pressure

Active bleeding from any site

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Any other potential risk factor for fatal bleeding

If difficult to assess coagulation profile

- d. Those on prior anticoagulant treatment:  
Continue anticoagulants
- e. With new diagnosis of VTE requiring anticoagulant  
Start with therapeutic anticoagulation as step “c”.

### E. Convalescent plasma treatment

- Convalescent plasma (CP) transfusion: 400 ml CP should be administered intravenously for moderate to severe COVID19 cases admitted to hospitals.
- CP is collected from recovered COVID 19 cases three weeks after last negative RT-PCR.
- It is available at Ethiopian Blood bank and all COVID treating centers can get CP by contacting the blood Bank.
- The transfusion procedure follows standard blood and blood product transfusion protocol. It is advised for every COVID 19 treatment centers to counsel recovered cases for CP donation.

Obstetrics considerations:

- Air born precautions and contact precaution should be instituted (N95 mask, eye shield and protective clothes including gloves, with appropriate disposal sites) in delivery rooms.
- Isolation room with CTG, Oxygen and ventilator for mother coming pregnant or in labor
- Emergency/Elective CS to be done on the OR table and anesthesia machine dedicated for COVID -19 patients



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- Spontaneous or induced labor to be monitored continuously. I.e. we need to dedicate CTG machine to the isolation room
  - Oxygen saturation must be measured hourly and respiratory compromise need be diagnoses When the SaO<sub>2</sub> <94mmHg
  - o Note: pulse oximeter must be available at the isolation rooms
  - Temperature to be measured with thermometer not by hand for early identification of sepsis on the background of COVID-19 for management purposes.
  - o Avail thermometer 24/7 at the labor and delivery unit and wards.
  - Lab tests should include CBC, CRP, Organ function tests and Imaging including x-ray and CT with abdominal shields.
  - o NB: Investigation including imaging should not be delayed for the sake of fetal reasons.
  - For those laboring mother with ARDS or impending respiratory compromise; second stage needs to be shortened if the prerequisites for instrumental delivery are met.
  - Regional anesthesia is appropriate for most but when GA is the option additional PPE has to be considered.
  - Neonatal care can continue with the existing protocol of care
  - Breast feeding should be encouraged as there is no evidence not to.
  - Postpartum care can continue either at the isolation room or patient can be transferred to the designated center of care for COVID-19

### Antenatal care: pregnancy with COVID -19

- Antenatal evaluations for pregnant women with

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- COVID-19 can safely be postponed for 2-4 weeks.
  - Elective CS are recommended to be postponed by 2wks if the obstetric conditions allow

## Breast feeding in COVID 19

- Infants born to mothers with suspected, probable, or confirmed COVID-19 should be fed according to standard infant feeding guidelines, while applying necessary precautions for Infection Prevention Control .
- Mother should always wear mask and practice hand and breast washing before every breast feeding session
- In situations when severe illness in a mother with COVID-19 or other complications mothers should be encouraged and supported to express milk, and safely provide breast milk to the infant, while applying appropriate IPC measures.

## Pediatrics Considerations:

### Newborn Risk

- It remains unclear if SARS-CoV-2 is vertically transmitted from mother to fetus antenatal via maternal viremia and trans placental transfer. Prior published experience with respiratory viruses would suggest this is unlikely.
- Perinatal exposure maybe possible at the time of vaginal delivery based on the detection of virus in stool and urine.
- Newborns are at risk of infection from a symptomatic mother's respiratory secretions after birth, regardless of delivery mode

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## All infants

- Mother and infant will best be based as rooming in with all IPC standards applied
- A designated, limited set of caregivers will be assigned to the infant
- Infant should be bathed as soon as is reasonably possible after birth
- Newborns will be tested for perinatal viral acquisition as follows:
  - molecular assay testing will be done on 2 consecutive sets of nasopharyngeal, throat and stool swabs collected at least 24 hours apart
  - testing will begin at ~24 hours of age, to avoid detection of transient viral colonization and to facilitate detection of viral replication
  - newborn will be designated as uninfected if all 6 tests are negative

## Delivery Room Management

- Initial stabilization/resuscitation of the newborn will take place as per center usual care
- Newborn resuscitation should not be compromised to facilitate maternal/infant separation
- If the center has a newborn resuscitation room separate from the mother's delivery room, this should be utilized
- Because of the uncertain nature of newborn resuscitation (that is, suctioning and/or tracheal intubation may be required), Airborne Precautions should be used. Signs and symptoms of coronavirus infection is more of non-specific:-
  - High index of suspicion suffice

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- Premature labor, Fetal distress in utero as a risk and to be suspected highly with COVID-19 mother
  - Neonatal respiratory distress syndrome (RDS)
  - Pneumonia
  - Lethargy
  - Thrombocytopenia, low WBC and lymphocytes
  - Abnormal liver function
  - Death in severe cases

## Admission

- Infants who are well appearing at birth and who would otherwise be admitted to the center's well newborn area should be cared for in a designated area separate from other newborns. Centers should assess their local structures to determine where such infants should receive care.  
Staff will use Enhanced Droplet Precautions for these infants
- Infants who require NICU care due to illness or gestational age at birth should be admitted to a single patient isolation room within the NICU. Mostly noninvasive ventilation  
If the infant requires technical CPAP, HFNC as CPAP, or any form of mechanical ventilation, Airborne Precautions must be used, until infection status is determined as outlined above.
- Antibiotics as per the neonatal guideline

## Breastfeeding

- Early initiation of breast feeding is should be encouraged

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with strict IPC

- Mother may express breast milk (after appropriate hand hygiene) and this milk may be fed to the infant by designated caregivers or by mother herself with all the IPC precautions if need be Breast pumps and components should be thoroughly cleaned in between pumping sessions using standard policies (clean pump with antiseptic wipes; clean pump attachments with hot soapy water)

## Nutritional guidance for Covid -19 patients

### A. NUTRITION MANAGEMENT FOR NON-CRITICAL ILLNESS,

#### FOR PEOPLE WITH GOOD APPETITE

1. Assess their nutritional status, Weight/ height/ Appetite history, Weight loss history,
2. Ensure adequate amount of water to replace insensible loss related with fever (at least two liters per day which they can drink as tea/ besso/ milk/Kineto/ etc. )
3. Ensure adequate calories, by ensuring they have, at least 3 main meals a day- all including additional vegetables 2 x/day and if possible 2 fruits per day.
4. Encourage tolerated activity/ walking/ sitting in the sun in the morning

#### FOR PEOPLE WITH POOR APPETITE

1. Consider supplementation with Vitamin C, zinc, Vitamin A,

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B6, D, E, iron, Folate and fiber if not getting enough from the diet (or if only eating less than half of their given meal at each mealtime).

2. Offer small frequent meals (smaller portions of regular meals, biscuits, bread with peanut butter, Avocado and bread) and high energy drinks (Atmit/ milk/ Besso with milk/ Juice with yoghurt) a total of 6 – 7 small meals and high energy drinks with meals and before bed.
3. Ensure enough sleep, reduced stress, exercise, completely avoid intake of alcohol and tobacco products.
4. All pregnant women with COVID-19 should be provided with information and counselling on safe infant feeding, appropriate infection prevention, and control (IPC) measures to prevent COVID-19 virus transmission.

NB:

- If the child have malnutrition on admission to Covid ward, the nutritional management should follow the national severe acute malnutrition management protocol.
- Infants born to mothers with suspected, probable, or confirmed COVID-19 should be fed according to standard infant feeding guidelines, while applying necessary precautions for IPC;

## B. NUTRITION MANAGEMENT IN CRITICALLY ILL PATIENTS

- Early Enteral Nutrition initiate within 48 hours is recommended if haemodynamically stable.
- Enteral Nutrition should be delayed if there is uncontrolled shock, hypoxemia, hypercapnia or acidosis upper GI bleeding, high-output intestinal fistula or gastric residual volume

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is above 500 ml.

- Calculate amount of feed that would be required for 24 hours, aim to start on lowest volume if tolerance is an issue.. but aim for 50ml – 80 ml of feed, given as a bolus over 5-10min, every 2 – 3 hours. The first few days patient may not get the full calculated 24 hour feed, aim to reach full calculated volume per day at most within 5 days of starting feeds.
- Critically ill adult patients should receive feedings at rates of 25 to 30 kcal/kg. 35ml/kg/d if no other fluid is being given.
- Fluid monitoring to facilitate feeding: last 24 hr fluid output + 500ml if no edema or 300mls if there is edema.
- For the unstressed adult patient with adequate organ function requiring nutrition support, a daily protein intake of 1.3 g/kg/day-1.5g/kg/day may be adequate.

### Parenteral Nutrition (if available)

- If available, Parenteral Nutrition is recommended for patient whom we are not achieving targeted enteral feeding within seven days.
- The amount of glucose (PN) or carbohydrates (EN) administered to ICU patients should not exceed 5 mg/kg/min.
- For intravenous lipids the upper recommendation is 1 g/kg body weight/day with a tolerance up to 1.5 g/kg/day.

## Emergency surgical Procedure

### Preparation before bringing patient to OR:

Personal protection of health care providers is important. Planning ahead of time is important to allow sufficient time for staff to apply personal protective equipment (PPE) and barrier precautions.

- 
- Use check list to make sure all PPE are in place before bringing patient to OR and start anesthesia
  - Remove all jewelry and watches, leave your cell phone behind
  - Prepare all the necessary Anesthesia equipment and Drugs using the designated checklist
  - PPE for aerosol precaution is necessary including long sleeve gown, Face shield , N95 mask, Double glove, Foot wear, Locally prepared plastic coat.

## Priority setting for Surgery

Priority level 1a Emergency - operation needed within 24 hours

Priority level 1b Urgent - operation needed with 72 hours

Priority level 2 Surgery- that can be deferred for up to 4 weeks

Priority level 3 Surgery- that can be delayed for up to 3 months

Priority level 4 Surgery- that can be delayed for more than 3 months

## Infrastructure and human resource

The operation theatre will be easy access able and close to ICU.

Five rooms are required:

1. Changing room
2. Ante room/ preparation room/ supply room
3. Induction room/ main Operation room
4. Recovery room
5. Utility room



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## Human resource

Minimize number of people in the OR

Senior surgeon

Resident/ Assistant

Scrub nurse

Circulating nurse

Runner (should not enter the induction/main OR)

## Surgical Transport of COVID 19 Suspected or confirmed cases

- The transfer of the patient to and from the OR should be organized and planned in advance.
- Hospital security is responsible for clearing the route from the ward or intensive care unit (ICU) to the OR, including the elevators.
- Stretcher-bearers and welcoming personal should wear an individual protection equipment (IPE),
- The transfer from the isolation ward to the OR will be done by the ward nurses in full personal protective equipment (PPE) including a well-fitting N95 mask, goggles or face shield, splash-resistant gown, and boot covers.
- When moving, the patient should always hold a correctly adjusted surgical mask, and should ideally be placed in an impermeable cover. The sides of the bed should be cleaned before transfer.
- For patients coming from the ICU, a dedicated transport ventilator is used. To avoid aerosolization, the gas flow is turned

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off and the endotracheal tube clamped with forceps during switching of ventilators.

## Anesthetic management

Ideally, the management of COVID-19 patients should occur in a specifically dedicated OR.

- The number of people involved in the procedure should be limited to a minimum. Entering or exiting the OR, as well as exchange of persons should be avoided during the entire procedure.
- Reference staff members should be appointed to take care of those procedures, or at least to guide them.
- Hydrophobic filters, with a high filtration capacity, should be used between the facial mask or the tube and the Y piece of the ventilation circuit tubes, as well as between the expiratory tube and the expiratory valve. All filters should be replaced after the procedure.
- The gas sampling line should be connected upstream of the filter connected to the Y piece.
- Soda lime should be changed before the procedure to avoid unnecessary disconnections.
- Closed-circuit aspiration systems should be used, equipped with disposable filters, to avoid contaminating the usual aspiration system.

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## Check list I the OR

### Sign In

Staff

Anaesthetist, Surgeon, Circulating Nurse

- Site marking, Consent and appropriately informing family members should be completed as usual.
- Sign in at reception should be modified to ensure minimal unnecessary staff exposure.
- Hospitals departments should agree this locally and advise staff.
- Suspending this process allows for retention of PPE equipment and less staff risk.

Managing COVID-19 IN Surgical systems-

<https://journals/.www.com/annalsofsurgery/Documents>

### Intubation

Staff

Anaesthetic medical & nursing staff only

- This is considered an Aerosol Generating Procedure (AGP) [www.hspc.ie](http://www.hspc.ie).
- Requires standard contact and Airborne Procedure protocols.
- Surgeons should not be in the operating theatre for intubation unless concurrent management of bleeding etc. requires their presence.
- Under no circumstances should staff enter the operating room without properly applied PPE

Consensus statement: safe Airway Society principles airway Management and tracheal

Intubation specific to the COVID-19 adult patient group. Medical journal of Australia. Published online March 16th 2020.

### Scrubbing

Staff

Most Senior Surgical Staff Available

Work in teams of two (buddy) to ensure correct application of equipment.

Equipment advice:

Masks: FFP3 or Higher. (FFP3 Mask should fit face securely and if not surgeon should be fitted for an N95 or PAPR).

Eye Wear: Full Coverage Eye protection.

Footwear Though not part of COVID-19 PPE, Consider the use of shoe covers as with any operation. Gloves: Double Glove. Alcohol-based hand prep of PPE gloves may be appropriate.

Gown: Waterproof Gown. If not available Waterproof apron underneath standard gown.

Michigan surgery Recommendations updated March 20th 2020

## Intra Op

Staff

Anaesthetic, Surgical and Nursing Staff

All surgery should be Performed in a quick and efficient manner, the following principles apply to all Surgeries but particularly Laparoscopic:

- Strict Haemostasis
- Electrocautery low settings
- Liberal use of suction
- Reduce Trendelenburg
- Low Pneumoperitoneum pressure levels: consider open Surgery as an alternative
- Avoid long dissection in one area
- Avoid Harmonic or Ultrasound Dissection if possible

Minimally invasive surgery and the novel coronavirus outbreak: lessons learned in China and Italy

<https://journals./www.com/argalsafsurgery/Documents>

## Post OP

All Staff

- All PPE should be removed inside the operating room.
- Exposed skin, outside of gown, mask, goggles, gloves are presumed to be infected and should not be touched directly.
- Follow PPE removal and disposal guidelines on CDC website.
- Order is important: first gloves then gown, then wash or alcohol rub hands, then eyewear and mask, then wash or alcohol
- <https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf>

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## Discharge criteria for Hospitalized Confirmed case

1. A normal temperature lasting longer than three days AND
2. Resolved respiratory symptoms AND
3. Two consecutive negative PCR test result that were at least one day apart AND /OR
4. Substantially improved acute exudative lesion on chest CT,

### DEATH CARE AND BURIAL

While deceased is in bed,

1. Adhere to standard precautions and use appropriate personal protective equipment (PPE) at all times.
2. Notifying the family and grief counselling according to the ethical standard
3. After the physician declares death, perform the following tasks to prevent exposure to blood and body fluid during transportation to protecting morgue personnel:
  - a. Remove all disposable tubes and lines appropriately.
  - b. Dress all wounds with impervious material to prevent oozing of body fluids or bleeding from wounds or previous catheter sites.
  - c. Request an appropriately sized body bag and place the body in the bag.
4. Follow the proper identification of the body, transportation, and documentation in the morgue.
5. Patients with COVID 19 should have body tags labeled with the appropriate category.
6. The nurse in charge or dedicated personnel will inform the morgue supervisor if the deceased was known to harbor COVID 19(This information will also be confirmed in writing on the identification tag.)

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## In The Morgue

1. All morgue staff and especially body washers must be oriented and provided training on COVID 19 regarding the proper infection control practices (i.e., hand hygiene, modes of disease transmission, and the importance of PPE) and how to apply these practices.
2. Always use standard precautions and use appropriate personal protective equipment (PPE) at all times. Avoid direct contact with blood and body fluids.
3. Use PPE (mask, goggles, latex/vinyl gloves, boots, water proof full-length apron) to prevent splashing and contamination with body fluids. Remove disposable PPE and discard immediately after the task is completed.
4. Better to avoid Autopsy examination unless required by court. If it is done it has to be carried out under strict IP procedure.
5. Close families should be allowed to see the body after tubes removed and wound sites dressed under strict IP precautions and standard PPE used. But no family member should be allowed to touch, kiss or hug the body even under PPE.
6. Do standard body preparation and put the body in plastic bag, zipped or tied water tight so that there is no leakage of body fluids
7. Put the body in coffin, seal the coffin and disinfect the coffin with disinfectant. Body should be directly transported to burial site(mortuary) the same day and should not be allowed

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to be transported to home or religious places.

8. Those carrying the coffin from the morgue to the mortuary until burial are the same individuals until the body is buried. The individuals observe standard IP procedures and use standard PPE Staff handling dead bodies of unknown category at the time of COVID-19 outbreak Staff may need to handle dead bodies of unknown categories. For example, dead bodies found on the street or abandoned in a house with unclear history or suspected COVID-19 should strictly observe all the recommendation put in this guideline for confirmed COVID-19 cases.

## BURIAL

Burial is the preferred disposal method.

Burial site

Regular burial sites can be used to bury bodies of patients died from COVID-19

Burial process

1. It is recommended that bodies of suspected or probable COVID 19 infection (after postmortem examination) shall be disposed off (burial or cremation) as soon as practicable.
2. Religious rituals are to be conducted at the mortuary but coffin should not be opened
3. Embalming (preserving body by drying) must be avoided.
4. Relatives are prohibited from opening the sealed coffin.

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5. Vehicle used to transport the body should be disinfected

## ETHICAL ISSUES IN COVID 19 MANAGEMENT

### ETHICAL ISSUES DURING COVID 19 PANDEMIC

Relevant ethical principles are justice (fairness), beneficence (acts that are done for the benefit of others), utility (actions are right insofar as they promote the well-being of individuals or communities), respect for persons (treating individuals with humanity, dignity and inherent rights), liberty (social, religious and political freedom), reciprocity (making a fitting and proportional return).

During the care of patients with COVID-19 at facilities many ethical issues are expected to arise in the clinical care process, equitable distribution of scarce resources (such as access to life support equipment, staff time, and termination or withdrawal of care).

#### Frontline response workers' rights and obligations

As the risks of occupational exposure, physical and mental health stress on HCWs run high during public health emergencies like COVID-19 many ethical issues arise. Clients at the care in health facilities during these emergencies are also at increased risk of stigma and may suffer in accessing safe, timely and equitable care. The below section provides guidance to common ethical issues in this setting.

- HCWs should not be expected to take on risky work assignments during an infectious disease outbreak unless they are provided with the training, tools, and resources necessary to minimize the risks to the extent reasonably possible.
- HCWs are also ethically and legally entitled to health insurance coverage especially for occupational related adverse events.



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- As professionals with high civil societal capital HCWs should be availed priority access to highest health care even for family members who become ill through contact, as the nation's capacity allows.
  - In case of adverse events incurred by HCWs in an occupational setting appropriate compensation should be provided to them. This can be devised and implemented by Ministry of Health and relevant sectors according to need.
  - HCWs should be availed appropriate support for reintegration into the community including advocacy to reduce impact of stigma as well as providing job placement and relocation by government as situations dictate.
  - HCWs are obliged to follow the standard IP precautions on their return to community and family.
  - HCWs are also ethically obliged to uphold the ethos of their profession, abide by their oath and professional code of conduct in caring for patients at all times. Facility Ethical issues Facilities are obliged to prepare contingency plans to provide screening, isolation and emergency care for patients with COVID 19.
    - Facilities are also expected to develop and implement a COVID-19 facility preparedness and readiness plan including setting up a pre-triage screening for COVID-19, isolation areas with access to essential and emergency care. N.B. Resource allocation of a particular facility will be governed by facility COVID-19 protocol.
    - Facilities should put in place processes and structures to ensure care provided for patients with COVID19 is as safe, effective, proven, equitable and dignified as possible. Patients should also be allowed to access family members and significant others through phone.
    - Facility should provide adequate and of good quality food/drink/cloth to patients.
    - Information on patient's condition should be com-
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municated to their family regularly and upon request by the treating physician.

- Facilities should establish a clinical Ethical Committee (CEC) and put in place protocol that address difficult clinical decision making in caring for patients with COVID-19 as well as to ensure safety, equity and quality of care and use of scarce resources.
- Facilities should put in place necessary resources to ensure safety of patients and staff alike in dead body handling, disinfection of equipment for reuse and other ethical issues at the hospital.
- Any COVID-19 patient who requires emergency surgical or other interventions should not be denied these emergency services at any health facility, denying the service amounts to stigmatization.



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