

SOP - Non Health facility based Quarantine

The quarantine of persons is the restriction of activities of or the separation of persons who are not ill but who may be exposed to an infectious agent or disease, with the objective of monitoring their symptoms and ensuring the early detection of cases. Quarantine is different from isolation, which is the separation of ill or infected persons from others to prevent the spread of infection or contamination.

WHO recommends that contacts of patients with laboratory-confirmed COVID-19 be quarantined for 14 days, from the last time they were exposed to the patient.

Definition of contact: a person who is involved in any of the following from 2 days before and up to 14 days after the onset of symptoms in the patient:

- Having face-to-face contact with a COVID-19 patient within 1 meter and for >15 minutes;
- Providing direct care for patients with COVID-19 disease without using proper personal protective equipment;
- Staying in the same close environment as a COVID-19 patient (including sharing a workplace, classroom or household or being at the same gathering) for any amount of time;
- Travelling in close proximity with (that is, within 1 m separation from) a COVID-19 patient in any kind of conveyance;
- and other situations, as indicated by local risk assessments.⁵

COVID-19 Screening and Management Protocol

Clinical condition	Risk of infection	Investigation	Management
Asymptomatic	Recent International Travellers in the immediate past 14 days	NO	HOME QUARANTINE, Daily reporting
	Attended a large gathering for any family, political or religious purposes in past 14 days	Serology** IF HOTSPOT declared, otherwise NO	HOME QUARANTINE, Daily reporting
	Direct contact* with a Lab Confirmed/Swab report pending Patient (Household OR Health Care Professional without adequate PPE)	swab (between Day 5 and 14 only)	HOME QUARANTINE, Daily reporting
ALL Symptomatic (Fever AND Cough AND/OR Breathlessness)	Recent International Travellers in the immediate past 14 days	Swab	HOSPITAL ISOLATION/ ICU
	Direct contact* with a Lab Confirmed/Swab report pending Patient (Household OR Health Care Professional without adequate PPE)	Swab	HOSPITAL ISOLATION/ ICU
	Attended a large gathering for any family, political or religious purposes in past 14 days	Swab	HOSPITAL ISOLATION/ ICU
	Health Care Provider	Swab	HOSPITAL ISOLATION/ ICU
	ALL Severe Acute Respiratory Illness SARI hospitalised irrespective of Travel/Close Contact	Swab	HOSPITAL ISOLATION/ ICU

Standard Operating Procedure For Quarantine & Isolation
Department of Pediatrics, KGMU, LKO

Last updated: 07/04/2020

Quarantine measures

Those who are in quarantine must be placed in adequately ventilated, spacious single rooms with ensuite facilities (that is, hand hygiene and toilet facilities). If single rooms are not available, beds should be placed

at least 1 metre apart.

- Suitable environmental infection controls must be used, such as ensuring adequate air ventilation, air filtration systems, and waste-management protocols.
- Social distance must be maintained (that is, distance of at least 1 metre) between all persons who are quarantined.
- Accommodation must provide an appropriate level of comfort, including:
 - provision of food, water, and hygiene facilities;
 - protection for baggage and other possessions;
 - appropriate medical treatment for existing conditions;
 - communication in a language that those who are quarantined can understand, with an explanation of their rights, services that will be made available, how long they will need to stay and what will happen if they get sick; additionally, contact information for their local embassy or consular support should be provided.
- Medical assistance must be provided for quarantined travellers who are isolated or subject to medical examinations or other procedures for public health purposes.
- Those who are in quarantine must be able to communicate with family members who are outside the quarantine facility.
- If possible, access to the internet, news, and entertainment should be provided.
- Psychosocial support must be available.
- Older persons and those with comorbid conditions require special attention because of their increased risk for severe COVID-19.

Possible settings for quarantine include hotels, dormitories, other facilities catering to groups, or the contact's home. Regardless of the setting, an assessment must ensure that the appropriate conditions for safe and effective quarantine are being met.

Protective Measures for Infection control in home Quarantine settings

S. No.	Setting	Activity	Risk	Recommended PPE	Remarks
1	Persons being quarantined		Low Risk	Triple layer mask	
2	Designated family member	Taking care of person being quarantined	Low Risk	Gloves	While cleaning commonly touched surfaces or handling soiled linen
3	Other family	No Risk	No PPE required	Maintain a distance of at least 1 meter from person under home quarantine. Senior citizens in the household should stay away from such persons under home quarantine.	3

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- WHO Guidelines: Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19) Interim guidance 19 March 2020
- WHO Guidelines: Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings

SOP for Hospital Quarantine:

For whom :

- Any symptomatic Infant, Child, adolescent in contact with COVID positive patients whether its direct face to face contact of < 1 meter, taking care of such patient without PPE, living or travelling with < 1 meter distance.

General care & spread prevention measures in Quarantine:

- Minimum 1 meter distance between beds.
- All children kept in quarantine wear surgical 3 layer mask (Change 6-8 hrly)
- Only one care taker will be allowed to stay with child till COVID 19 report is available.
- Nasopharyngeal and oropharyngeal swab testing on D1, those positive will be shifted to isolation.
- If negative repeat on D 13 (D7 if new symptoms appears/worsening of previous symptoms).
- If positive shift to isolation. Negative on D13 goes home after completion of 14 days.
- Monitor Spo2 and temperature – 8 hrly

Protective Measures for Infection control in hospital Quarantine settings

S. No.	Setting	Activity	Risk	Recommended PPE
1	Persons being quarantined		Low Risk	Triple layer mask
2	Healthcare staff working at quarantine facility	Health monitoring and temperature recording	Low Risk	Triple layer mask Gloves
		Clinical examination of symptomatic persons	Moderate Risk	N-95 masks Gloves
3	Support staff		Low Risk	Triple layer mask Gloves

Treatment protocol at quarantine

Symptom	Treatment	Investigations
Fever	PCM if >100 F	
Dry Cough	<ul style="list-style-type: none">• Cough suppressant like dextromethorphan ± antihistaminics• Add oral bronchodilators in asthma/ recurrent wheezes' (no nebulization but MDI may be used)	
Hydration	<ul style="list-style-type: none">• Ensure fluid intake according to weight of child oral/ iv fluid	
Respiratory difficulty	<ul style="list-style-type: none">• SPO2 > 94 % - monitor 2 hrly• 85- 93%- high flow oxygen/ non rebreathing mask , watch for 1 hr,• <90% - despite above measures. shift for ventilation• Broad spectrum Antibiotics. If needed	CBC + CXR

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SOP for ISOLATION WARD

- COVID 19 positive cases will be kept in isolation ward (Infectious Disease Hospital)
- Every patient wears a mask if no respiratory difficulty
- If child is young and can't stay alone in isolation then only one care taker will be allowed to stay with child throughout the hospital stay. He/ she will be provided full/ partial PPE according to availability. At the time of discharge of child caretaker will be tested and will be sent to quarantine/ isolation according to need.

Setting up of isolation rooms:

- Negative pressure ventilation in isolation rooms is the standard recommendation for management of a suspected or proven COVID-19 patient. However, in case of non-

availability of these rooms, use single rooms with separate air outlet/exhaust, preferably on the higher floor of the building.

- These rooms should be equipped with resuscitation trolley, essential drugs, multipara monitor and ventilator. Positive pressure rooms like operation theatres are not suitable for airway management as aerosol generation is higher.

Entering and exiting isolation wards

- Before entering isolation wards, the medical staff needs to ensure that they have collected all required equipment, have performed hand-hygiene and have put on the PPE. Preferably, this should be done in the following order, performing hand hygiene, donning the gown, mask or respirator, eye protection and gloves.
- Clearly identified separate donning and doffing areas along with proper waste disposal should be demarcated.
- On the other hand, before exiting from an isolation ward, PPEs should be removed in a manner that prevents self-contamination. Ideally, this can be done by removing the most contaminated PPE items first, performing hand hygiene immediately after removing gloves, removing the mask or particulate respirator, discarding disposable items in a closed rubbish bin, putting reusable items in a dry closed bin. In case the gown is disposable, the ministry advises removing the gloves together with the gown upon removal, followed by hand hygiene, removing eye protection, mask or respirator, followed by hand hygiene again.

Care of Pediatric patients in isolation ward:

- Admission: All children with COVID-19 require admission.
- Antipyretics: Treat fever with paracetamol. Avoid ibuprofen.
- Fluids: In case of respiratory compromise consider fluid restriction to reduce the risk of ARDS. Children with mild disease should receive normal maintenance fluid. Monitor for fluid balance. Consider diuretics in case of pulmonary edema. Monitor renal functions in sick patients.
- Respiratory support: Most of children are unlikely to develop respiratory failure. Use low flow nasal cannula (LFNC) oxygen if they are hypoxic. High flow nasal cannulae should not be used without full PPE. Blood gases should be done in those children requiring further respiratory support.
- Radiology: chest x-rays and CT scans should not be conducted routinely. It should be done by a portable X ray machine in those patients requiring CPAP, prolong oxygen therapy or clinical deterioration.
- Antibiotics if child is:
 - Unusually sick at admission/day
 - No improvement by day 3 (particularly fever and/or still in oxygen)
 - CRP or WBC are raised.
 - CXR shows obvious bilateral changes a macrolide might be a better first choice antibiotic as this may be associated with mycoplasma or atypical infection; if there are unilateral signs consider amoxicillin or co-amoxiclav.

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- Productive cough
- Suspected sepsis
- Antivirals: lopinavir-ritonavir may be given in severe cases but no trials of antiviral medications have been conducted in children with COVID-19.
- Bronchodilators: Bronchodilators should be used only on strong suspicion of bronchoconstriction (wheeze, and prolonged expiratory phase). MDI/spacer is preferred rather than nebulisation to minimize droplet spread.
- Steroids: Systemic steroids should not be used as a treatment for COVID-19 except in ARDS cases.
- Liver dysfunction: Liver functions should be checked in children having pneumonia.
- Hydroxychloroquine: Chloroquine and hydroxychloroquine may have antiviral activity. This should be given in event of PICU admission.

Discharge Criteria:

- Patient afebrile for minimum 48 hours
- At least 7 days child became unwell
- Completely well for 24 hours
- Two consecutive PCR tests which are negative, taken 24 hours apart, after recovery

Treatment Protocol in Isolation

Treatment is based on severity category of the Patient which is as follows:

Asymptomatic infection	No clinical or radiological features but tested positive
Mild	Upper respiratory or gastrointestinal symptoms and signs
Moderate	Clinical/radiological features of lower respiratory involvement
Severe	Presence of dyspnoea or hypoxemia requiring oxygen, refusal to feed, altered sensorium
Critical	Organ dysfunction including Acute respiratory distress syndrome (ARDS), shock, encephalopathy, myocardial dysfunction, coagulation dysfunction and acute kidney injury

Treatment Based on Severity of Disease in Proven Corona Virus Disease-19 (COVID-19)

<i>Symptomatic proven case</i>	<i>Admit in</i>	<i>Treatment</i>	<i>Discharge</i>
Mild	Designated COVID isolation room	Symptomatic treatment	Discharge if 72 h afebrile or 7d after symptom onset and two samples negative 24 h apart followed by home quarantine for total 14 d
Moderate	Designated COVID isolation room	supportive care oxygen oseltamivir	Clinical improvement and two negative nCoV PCR tests 24 h apart
Severe	COVID ICU	Provide nasal prong oxygen Escalate to invasive ventilation if worsening Avoid HFNC/NIV Oseltamivir Ritonavir/Lopinavir OR Hydroxychloroquine Supportive care	Clinical improvement and two negative nCoV PCR tests 24 h apart
Critical	COVID ICU	In addition to the above: Intubate based on clinical/blood gas/radiological features Use all airborne precautions Ventilation ARDS protocol Other organ support Once improving, wean from ventilator and extubate as per protocol	Clinical improvement and two negative nCoV PCR tests 24 h apart

HFNC: High-flow nasal cannula, NIV: Non-invasive ventilation, ICU: intensive care unit, ARDS: Acute respiratory distress syndrome.

Medication and doses in COVID-19 children

S No.	Drug	Dose
1.	HCQ – Hydroxychloroquin or Chloroquin	Adult: 400mg PO Q12h x 1 day, 200mg PO Q12h x 4 days Pediatric: 7-8mg/kg/dose PO q12h x 1 day, then 7-8 mg/kg/dose PO q12h x 4 days (max. upto adult dose)
2.	Lopinavir /ritonavir x 14 days	Adult: 400/100mg PO Q12h Pediatric: <ul style="list-style-type: none"> • < 15kg: 12mg/kg/doseq12h • 15-40kg: 10mg/kg/doseq12h • >40kg: 400mg q12h • Oral tablet • ≥15-25kg: 200mg q12h • ≥25-35kg: 300mg q12h • >35kg: 400mg q12h
3.	Redesavir x 10 days	Adult: 200mg IV on day 1(loading dose) followed by 100mg IV OD x 9 days Pediatric: < 40 kg: 5 mg/kg IV on day 1, then 2.5 mg/kg IV q24h

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4.	Oseltamivir	Adult: 75/150mg BD x 5 days Pediatric <1 yr old: 3 mg/kg/dose twice daily >1 yr or older: 15 kg - 30 mg twice a day >15 to 23 kg - 45 mg twice a day >23 to 40 kg - 60 mg twice a day >40 kg - 75 mg twice a day X 5 days
5.	Azithromycin	10 mg / kg once a day on Day 1, 5 mg/kg 2-5 th day

DRUG INTERACTIONS

Category X

1. Midazolam – _Atazanavir/Lopinavir-Ritonavir: May increase serum concentration of midazolam

Category D

2. Chloroquine – _Atazanavir/Lopinavir-Ritonavir: May increase serum concentration of chloroquine

3. Fentanyl – _Atazanavir/Lopinavir-Ritonavir: May increase serum concentration of fentanyl

4. Ketamine – _Atazanavir/Lopinavir-Ritonavir: May increase serum concentration of ketamine

Category C

5. Chloroquine – _Azithromycin/Levofloxacin: QT prolongation/hypoglycemia

6. Chloroquine – _Levofloxacin/Aspirin/Linezolid: QT prolongation/hypoglycemia

Severe and critical cases management:

Severe and critical cases need ICU care for monitoring, ventilation and organ support therapy, so they need to be shifted to a dedicated COVID - ICU care setting other than Paediatric Intensive Care Unit. Criteria for ICU admission:

- Requiring mechanical ventilation
- Shock requiring vasopressor support
- Deteriorating mental status
- Multi-organ dysfunction syndrome

When to intubate:

- Impending respiratory arrest
- Child not maintaining saturation >90% on non-invasive oxygen supplementation
Hypotension requiring vasopressor support
- GCS < 8 with threatened airway

Intubating a child with COVID 19

Dos

- Upgrade to N 95 , Wear fluid resistant gown, standard gloves and face shields
- Use negative pressure isolation room
- Use rapid sequence intubation (full dose paralytic)
- Use video laryngoscope if available

Avoid:

- High flow oxygen (Bipap, nebulizer, high flow nasal , >6L/m)
- Dont allow unnecessary staff in room
- Avoid bagging

- Avoid prolonged intubation attempt
- Avoid open circuits (viral filter or clamp on ET if disconnected)
- Don't bring used PPE outside the room/ ward

Non-invasive ventilation: NIV is currently discouraged because of risk of aerosol generation. Bubble CPAP may be offered for new-born and children with severe hypoxemia if invasive ventilation is not available.

How to intubate:

- Pre-oxygenation with 100% FiO₂
 - Avoid bag and mask ventilation (due to aerosol generation)
 - The most skilled member of the team should perform intubations
- Rapid sequence intubation to be done
 - During induction, monitor for hemodynamic instability and use fluids and vasopressors if required
 - After intubation, appropriate cleaning/disinfection of equipment and environment should be done

Management strategies for ARDS

The general principles of management of child with ARDS apply to a child with COVID-19 associated ARDS. The principles include lung protective ventilation: appropriate PEEP; low tidal volume ventilation. Use low Tidal volume ventilation, 3 – 6ml/kg predicted body weight (PBW) for poor compliance and 5 - 8ml/kg PBW with better preserved compliance and maintain target plateau pressure less than 28. Titrate PEEP for persistent hypoxia. Max PEEP 15 cm of H₂O for children (WHO recommendations)

Care of ventilated patient:

- Fresh, preferably disposable ventilator circuit to be used for every new patient; use an expiratory filter
- Use cuffed endotracheal tubes.
- HME to be changed every 48 hours or when visibly soiled; use a viral filter in the expiratory circuit.
- Do not disconnect the circuit. If disconnection is required then clamp the endotracheal tube and once reconnected unclamp the tube.
- Use closed suctioning technique and avoid routine suctioning
- Sedation and muscle relaxants may be used in difficult to ventilation patients
- Opt for restrictive fluid than liberal fluid therapy.
- Do not use steroids for patient with pneumonia with no ARDS.
- In patients with severe ARDS low dose methyl prednisolone 1- 2mg /kg/day for 5- 7 days

Resuscitation of COVID 19 Child:

- Minimize the number of people inside the room during high aerosol generating events like cardiopulmonary resuscitation.
- One airway specialist, one nurse/doctor for chest compression and one nurse for administering medications are essential.
- Other assistants may remain outside the room and may enter only if necessary, after donning full PPE.

- Hand bagging needs to be avoided. Connect HME or bacterial filter to it to limit aerosol generation. Use 2 person 2 handed technique for bagging, one person to hold the face mask tight while the other ventilates to minimise aerosol generation by decreasing leak.
- management should be SAS (safe, accurate, swift). Safe for patient and staff, Accurate, avoiding unfamiliar, unreliable and repeated techniques and Swift i.e timely without rush or delay.
- There is no emergency intubation in pandemic .Unplanned intubation will harm both patient and health care worker increasing risk of spread of infection and worse outcome.
- Perform intubation only after putting on complete PPE .
- If facility available intubate in a negative pressure room
- Treatment algorithm and cognitive aids needed like ET tube size, fixing length etc should be displayed in the room.
- Ensure full neuromuscular blockade before attempting intubation to limit aerosol generation.
- All drugs needed should be preloaded preferably outside the room include adrenaline 0.1ml per kg 1 in 10,000 solution, atropine 0.02 mg/kg (not needed as routine, use in case of bradycardia or as antisialogogue before ketamine), Ketamine 1- 2mg/kg or Vecuronium 0.1mg/kg or Rocuronium 1.2mg/kg or suxamethonium 1mg/kg

Septic shock:

- Recognize septic shock in children with any hypotension (systolic blood pressure [SBP] < 5th centile or > 2 SD below normal for age) or two or more of the following: altered mental state; bradycardia or tachycardia (Heart rate < 90/min or > 160/min in infants and < 70/min or >150/min in children); prolonged capillary refill (> 2 sec) or feeble pulses; tachypnea; mottled or cold skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.
- Management should be as per Surviving Sepsis Campaign Guidelines

General Infection Prevention Measures in Isolation

- In the intensive care setting, disinfection of high–touch surfaces like monitors, ventilator screen, other equipment, resuscitation trolleys etc are essential and need to be carried out every 4 hours.
- Surface decontamination- Alcohol (e.g. isopropyl 70% or ethyl alcohol 70%) can be used to wipe down surfaces where the use of bleach is not suitable for e.g. Mobiles, laptops, keys, pens etc.
- Disinfection – Freshly prepared 1% sodium hypochlorite should be used as a disinfectant for cleaning and disinfection with at least 10 minute contact period.
- Aerosol – Ensure room disinfection within 20 minutes of any procedure generating aerosol.
- Social distancing – Maintain at least 1 meter distance unless required for examination or procedure.
- Contact and droplet precautions – minimize direct contact, ensure hand hygiene, and cough etiquette.

Reference:

- Ravikumar N, Nallasamy K, Bansal A, et al. Novel Coronavirus 2019 (2019-nCoV) Infection: Part I - Preparedness and Management in the Pediatric Intensive Care Unit in Resource-limited Settings [published online ahead of print, 2020 Mar 29]. *Indian Pediatr.* 2020;S097475591600151.
- WHO Guidelines: Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19) Interim guidance 19 March 2020
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