Ministry of National Health Services,
Regulation and Coordination,
Government of Pakistan

GUIDELINES FOR THE MANAGEMENT OF COVID-19 IN CHILDREN

A CONSENSUS DOCUMENT

unicef for every child
آغا خان یونیورسٹی ہسپتال
The Aga Khan University Hospital
PAKISTAN PEDIATRIC ASSOCIATION
IDG
World Health Organization

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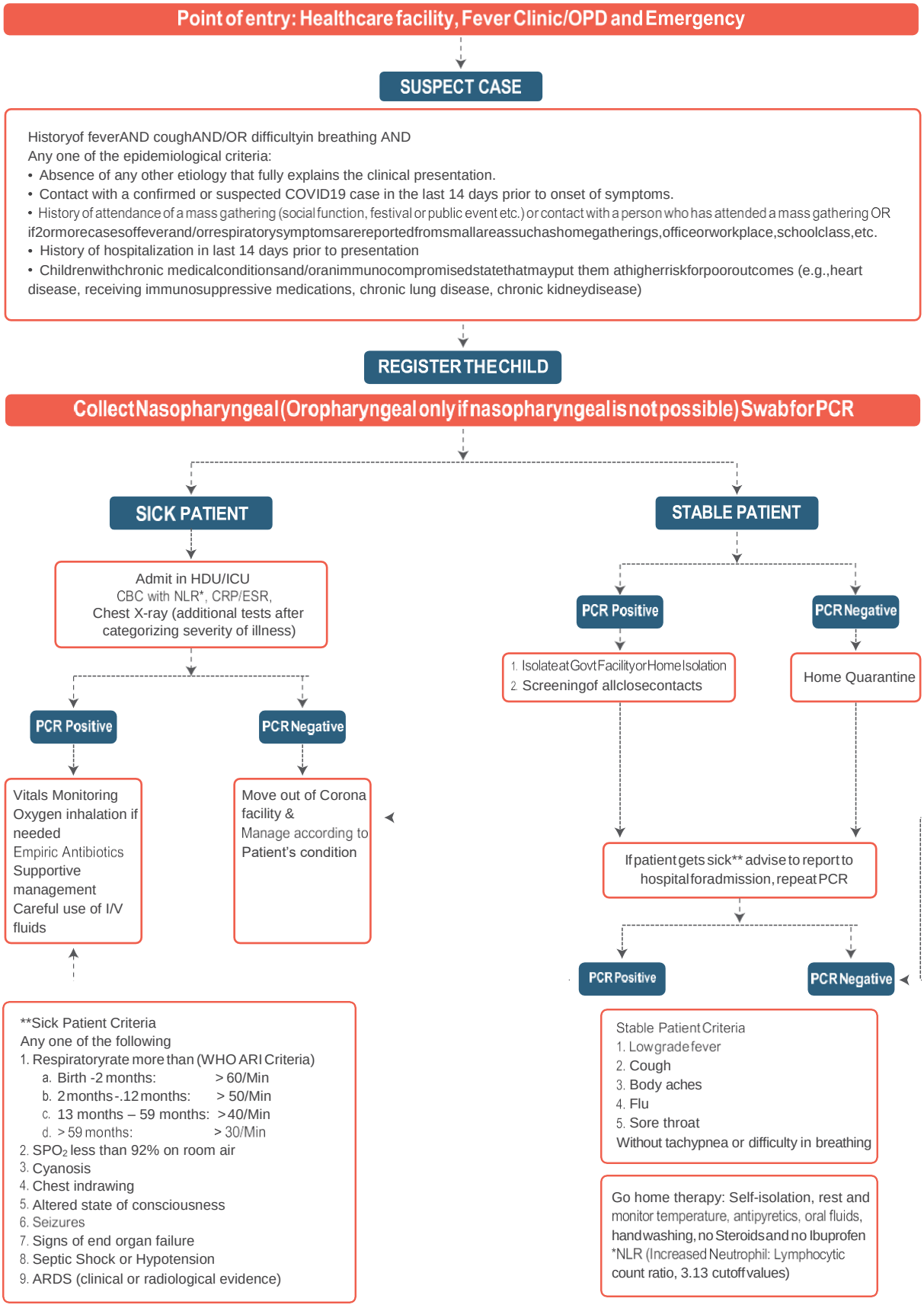
1. Background

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus SARS-CoV-2 (Severe Acute RespiratorySyndrome Coronavirus 2).The outbreak started inDecember 2019 from Wuhan, China, and declared a global health emergency by World Health Organization (WHO) on 30th January 2020 (1). Coronaviruses are enveloped, positive single-stranded large RNA viruses that infect humans, but also a wide range of animals. Due to the presence of projections on their surface, which resembles solar corona, the virus was named as Coronavirus (Latin coro- na=crown). COVID-19 spreads through droplets or contact with an infected person and indirectly by touching contaminated surfaces (fomites). At the time of formulation of this document, there is no evidence of intrauterine transmission (2). Reported symptoms in children include cold-like symptoms, such as fever, runny nose, and cough. Vomiting and diarrhea have been reported in 10% of cases (3). The understanding of the spectrum of disease is limited in children due to less number of cases and milder nature of the disease as compared to adults (4). Adults with age of ≥ 60 years having an underlying co-morbid (heart disease, chronic obstructive pulmonary disease, diabetes etc.) are at risk of acquiring the severe disease (5, 6). According to current estimates, the mean incubation period is 5 days, ranging from 0-24 days with potential of asymptomatic transmission (7). At this time, there are no specific vaccines or evidence based treatment for COVID-19, partic- ularly in children. Data has been extrapolated from adults, for use in children in need of treatment. The guidelines have been developed based on what is known about COVID-19 and are subject to change as additional information becomes available.

2. TriageAlgorithmforscreeningchildrenfor COVID-19:



3. Screening Criteria for COVID 19:

Clinical Criteria	Epidemiological Criteria (presence of any one is necessary)
#Fever AND Cough AND/ OR difficulty in breathing	Absence of any other etiology that fully explains the clinical presentation OR
	*Contact with a confirmed or suspected COVID19 case in the last 14 days prior to onset of symptoms OR
	History of attendance of a mass gathering (social function, festival or public event etc.) or contact* with a person who has attended a mass gathering OR if 2 or more cases of fever and/or respiratory symptoms are reported from small areas such as home gatherings, office or workplace, school class, etc. OR
	History of hospitalization in last 14 days prior to presentation OR
	Children with chronic medical conditions and/or an immunocompromised state that may put them at higher risk for poor outcomes (e.g., heart disease, receiving immunosuppressive medications, chronic lung disease, chronic kidney disease)

#documented or undocumented

*Contact: A person living in the same household as a suspected or confirmed COVID-19 case OR had direct physical contact with a suspected or confirmed COVID-19 case (e.g. shaking hands) OR having unprotected direct contact with infectious secretions of a suspected or confirmed COVID-19 case (e.g. being coughed on, touching used paper tissues with a bare hand) OR had face-to-face contact with a suspected or confirmed COVID-19 case within 2 meters for 15 minutes OR who was in a closed environment (e.g. classroom, meeting room, hospital waiting room, etc.) with a suspected or confirmed COVID-19 case for 15 minutes or more and at a distance of less than 2 meters.

4. Case Definitions:

Suspect Case	Epidemiological Criteria (presence of any one is necessary)
Confirmed case	Laboratory confirmation of COVID-19 infection by RT-PCR, irrespective of clinical signs and symptoms

5. Laboratory Investigations

(Follow strict isolation precautions while taking samples)

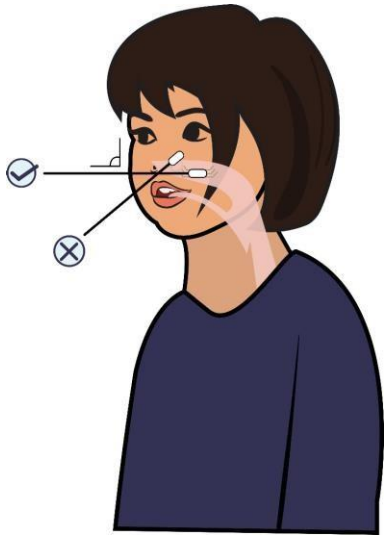
- ③ RT-PCR for COVID-19 on a nasopharyngeal specimen (oropharyngeal only if nasopharyngeal is not possible) specimen. In ventilated patients, bronchoalveolar lavage or tracheal aspirates are preferred.
- ③ CBC
- ③ ESR/CRP
- ③ Chest X-ray (CT-chest may be considered in ventilated patients depending on clinical condition and availability)
- ③ Electrolytes, BUN, serum creatinine, Liver function tests
- ③ LDH, d-Dimers, Procalcitonin, Ferritin in severe illness
- ③ ECG, Cardiac enzymes if clinically indicated
- ③ Blood cultures and any other relevant cultures to rule out secondary bacterial infection

5.1 Prognostic Markers:

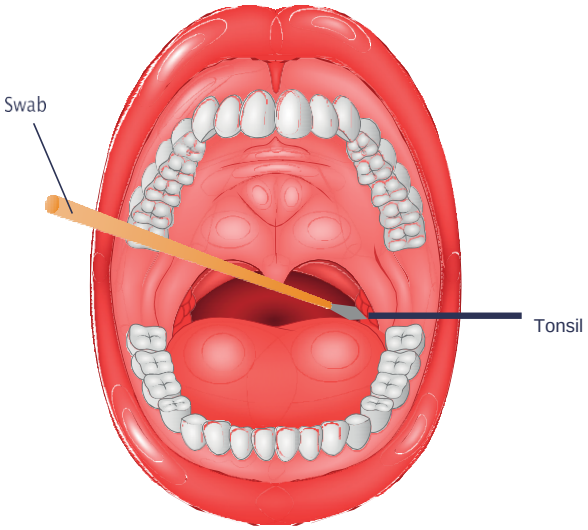
Test	Result	Comments
Lymphocytes	Low	Low in 80% of cases
Platelets	Mildly Low	<100 poor prognosis
CRP	High	>125 poor prognosis
Urea/Creatinine	Mildly High	AKI usually mild
AST/ALT	High	5 times normal, transient, no fulminant hepatitis, rise day 14
Ferritin	High	Not always

5.1.1 Procedure for collection of nasopharyngeal swab:

- ③ Can be collected through one or both nares
- ③ A swab is inserted into the nostril and back to the nasopharynx and left in place for a few seconds. It is then slowly withdrawn with a rotating motion. A second swab should be used (where available) for the second nostril. The tip of the swab is put into a vial containing 2–3ml of virus transport medium and the shaft cut.
- ③ All airborne isolation precautions should be followed while collecting the sample.



Nasopharyngeal Swab Collection



Throat is Swabbed in the area of the Tonsil

5.1.2 Procedurefor collection of oropharyngeal swab:

- Only done if unable to perform nasopharyngeal swabbing
- Collect from back of throat and both tonsillar pillars
- Both tonsils and the posterior pharynx are swabbed vigorously, and the swab is placed in transport medium as described above
- All airborne isolation precautions should be followed while collecting the sample

5.1.3 Transport and storage of Specimen:

- Collected specimen should be transported to the dedicated laboratory as soon as possible.
- Until sample processing, the sample should be refrigerated at -20^{0}C.
- In case a sample needs to be stored for more than 3 days before processing then archive it at less than -70^{0}C.

6. Admission Criteria for COVID-19:

COVID-19 is suspected or confirmed AND any of the following criteria present?	
Symptoms and signs of pneumonia (fast breathing and/or chest-indrawing)	YES /NO
Any general danger signs (grunting, persistent vomiting, and convulsions/CNS signs)	YES /NO
Need of supplementary oxygen or oxygen saturation <95% on room air?	YES /NO
Radiological confirmed pneumonia	YES /NO
If YES to any of the above, admission is advised	
On chemotherapy	YES /NO
Known secondary immunodeficiency (HIV, grade 3 malnutrition)	YES /NO
Diagnosed primary immunodeficiency	YES /NO
Underlying co-morbid condition (Cystic fibrosis, Congenital Heart Disease, Diabetes, CKD)	YES /NO
IfYEStoanyoftheaboveinasuspectedorconfirmedcaseofCOVID-19,decisiontoadmitisbased on severity of the underlying disorder	
InNOtoALLoftheaboveinasuspectedorconfirmedcaseofCOVID-19admissionisNOTadvised*	

**In all suspected cases where testing is not possible and above criteria are absent we do NOT recommend admission, given that isolation procedures at home or isolation facility are available*

7. Categorization and Management of Confirmed COVID-19 Cases

Case	Definition
Asymptomatic	Aconfirmedcase(NasopharyngealRT-PCRispositiveforSARSCoV2)havingno clinical signs and symptoms.
Mild	A confirmed case with non-specific upper respiratory tract infections (low-grade fever, runnynose,cough)withnoradiologicalsignsofpneumonia.
Moderate	A confirmed case with fever and cough/difficulty in breathing without any danger signs; having the radiological evidence of pneumonia requiring hospitalization with or without the need of oxygen support.
Severe	Aconfirmedcasewithfeverandcough/difficultyinbreathinghavingatleastone *danger sign together with radiological evidence of pneumonia AND/OR sepsis/ septicshock, respiratoryfailure/ARDS, multipleorgandysfunction(MOD)

**Danger signs: (severe dehydration , lethargy/dullness, decrease in conscious level/unconsciousness, irritability/ excessive/inconsolable cry, central cyanosis, grunting or nasal flaring , chest in drawing , fast breathing according toage, convulsions,SpO2<92%onroomair,signsofheartfailure/myocarditisorsignsofshock).*

Asymptomatic COVID-19 Case (Annexure -1A):

Home isolation for at least 10 days after test positive or after onset of illness AND at least 3 days after beingsymptomfreewhicheveris longerOR isolationin dedicated governmentcentersasappropriate.

Educate the caregiver/patient about symptoms and encourage reporting if any new symptoms develop or worsening of symptoms is noticed (report on national health helpline 1166 or respective provincial helplines).

Difference between isolation and quarantine:

Isolation *is used to separate ill persons who have a communicable disease from those who are healthy.*

Quarantine *is used to separate and restrict the movement of well person, who may have beenexposed toaconfirmedorsuspectedcaseofCOVID19,toseeifthey becomeill.*

Mild-Moderate COVID-19 case (Annexure 1B):

Description	Mildcase(suspectedorconfirmed)	Moderate Case
Placement	Preferhome isolation after assessing home situation (separate room + attached bathroom) Admitinhospitalorrefertoadedicated government isolation center (depending uponthebedavailability)onlywhen homeisolationisnotpossible. Ifadmitting,followisolationprocedures as for moderate cases.	Refer/admit in single room isolation or confirmed cases of COVID 19 can be cohorted together, keep a distance of 2 meter between beds. Contact and Droplet precautions
*Investigation	CBC, Blood culture and Chest X-ray Testing for mild COVID-19 is optional and to be done as per availability.	CBC,Bloodculture,CRP,ChestX-Ray,SGPT are recommended Where available, BUN, Cr, electrolytes should also be done Other investigations based on requirement (Repeattestsifclinicallyindicated or any worsening of symptoms. Rule out co-infections, if fever persists) Rule out H1N1 if available
*Additional tests as per physician's discretion in immunocompromised and children with chronic co- morbidities		

Description	Mildcase(suspectedorconfirmed)	Moderate Case
Treatment	③ Hydration (preferably orally) ③ Paracetamol for fever (avoid NSAIDS)	③ Intravenous hydration until stable to tolerate orally ③ Paracetamol for fever (avoid NSAIDS) ③ Normal saline nasal drops ± nebulization (if needed under strict airborne precautions) ③ Antibiotics (ampicillin or ceftriaxone) for secondary bacterial infections (escalate on clinical worsening if needed).
Points to remember 1. Can consider broader spectrum antibiotics in immunocompromised and children with chronic co-morbidities at physician's discretion 2. Caregiver/Health care provider should wear PPE as suggested by the institution while taking care of COVID-19 patients or performing aerosol generating procedures like nebulization, steam inhalation, suctioning etc.		
Discharge criteria	Patient is clinically well and suitable for discharge from hospital as follows: ③ Appropriate clinical assessment shows resolution of symptoms and ③ Risk assessment of home environment indicates ability to isolate and there is acceptance of advice about staying at home for 2 weeks of illness or resolution of symptoms whichever comes later If no arrangements at home then keep the child for 14 days in isolation in hospital or refer to a dedicated government isolation center. (Discharge for immunocompromised children and with chronic co-morbidities depend upon the severity of underlying illness and at the physician's discretion.	

Severe COVID-19 cases or with Acute Respiratory Distress Syndrome (Annexure 1C):

Placement	Investigations	Treatment	Discharge Criteria
Admit the patient to airborne isolation with strict PPE in high dependency unit/intensive care units.	CBC, blood culture & othe relevant cultures, CRP, lactate, renal function, liver functions, electrolytes, ABGs, coagulation profile, ECG and Chest X-ray and CT–chest. Rule out H1N1	Airway management and *oxygen therapy (HIGH FLOW BY FACE MASK) ± mechanical ventilation (CONSIDER EARLY) during resuscitation to target SpO2 ≥ 92% Strict Vitals and I/O monitoring Use IV hydration conservatively until no evidence of shock. Paracetamol for fever (avoid NSAIDS) Give empiric antimicrobials to treat suspected bacterial infections (based on local epidemiology and susceptibility patterns) Oseltamivir (when there is ongoing local circulation of seasonal influenza or H1N1 is positive) * For complicated cases (children with septic shock, renal failure , liver failure , cardiac failure or Multi-organ failure etc. follow the standard WHO guidelines available at: http://www.ptpol.pl/images/koronawirus/WHO-2019-nCoV-clinical-2020-eng.pdf)	1. Retesting after resolution of symptoms or after 7 days of hospitalization whichever comes later (2 samples should be negative 24 hours apart) 2. If the patient is clinically well and suitable for discharge from hospital, they can be discharged after: ③ Appropriate clinical assessment for resolution of symptoms. ③ Risk assessment of their home environment and provision of advice about staying at home. (Discharge for immunocompromised children and with chronic co-morbidities depend upon the severity of underlying illness and at the physician's discretion)

* There is limited evidence on use of Lopinavir/ritonavir (LPV/r), chloroquine phosphate, hydroxychloroquine, interferon therapy, remdisivir and other investigational drug for the treatment of COVID-19. They are under consideration and their use varies from region to region.

Avoid the use of systemic corticosteroids for treatment of COVID-19 pneumonia outside of clinical trials unless they are indicated for another reason like septic shock (not responding to fluid therapy and vasopressors) or asthma. It may delay the viral shedding or may result in complications (9).

Due to uncertainty around the potential for aerosolization, nebulization, HFO, NIV, including bubble CPAP, can be used with strict airborne precautions.

Avoid the use of azithromycin for the treatment of COVID-19.

Multisystem Inflammatory Syndrome in Children (MIS-C):

Multisystem inflammatory syndrome in children (MIS-C) is a condition where different body parts can become inflamed, including the heart, lungs, kidneys, brain, skin, eyes, or gastrointestinal organs. From April 2020, numbers of cases have been reported from various countries in previously healthy children presenting with a severe inflammatory syndrome with Kawasaki disease-like features[1, 2]. This syndrome is observed either in laboratory-confirmed COVID-19 cases or in cases having an epidemiological link to a COVID-19.

Preliminary Cases Definition of MIS*:

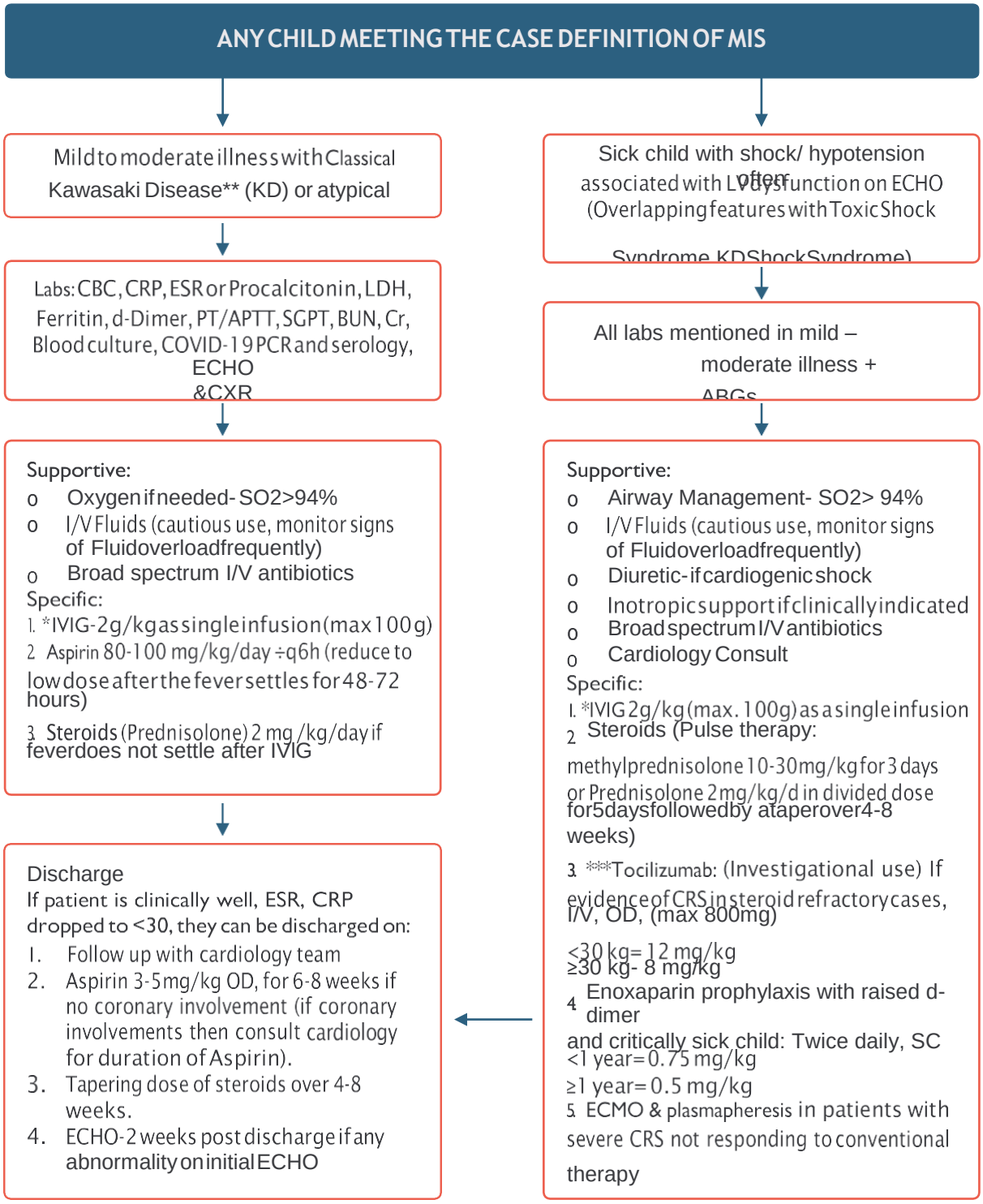
World Health Organization (WHO) has developed a preliminary case definition of MIS based on the available data from different parts of the world [3].

The case definition will be revised as more data become available.

Once diagnosed, it is better to refer the child to the facility where ECHO and ICU are available.

Children and adolescents 0–19 years of age with fever ≥ 3 days	
AND two of the following	a) Rash or bilateral non-purulent conjunctivitis or muco-cutaneous inflammation signs (oral, hands or feet). b) Hypotension or shock. c) Features of myocardial dysfunction, pericarditis, valvulitis, or coronary abnormalities (including ECHO findings or elevated Troponin/NT-proBNP), d) Evidence of coagulopathy (by PT, PTT, elevated d-Dimers). e) Acute gastrointestinal problems (diarrhea, vomiting, or abdominal pain).
AND	Elevated markers of inflammation such as ESR, C-reactive protein, or procalcitonin
AND	No other obvious microbial cause of inflammation, including bacterial sepsis, staphylococcal or streptococcal shock syndromes.
AND	Evidence of COVID-19 (RT-PCR, antigen test or serology positive), or likely contact with patients with COVID-19.

*Consider this syndrome in children with features of typical or atypical Kawasaki disease or toxic shock syndrome



Management of Multisystem Inflammatory Syndrome in Children (MIS-C):

***Classic KD:** Fever for ≥ 5 days with **at least 4 of the 5 following:** 1. Erythema of oral and pharyngeal mucosa/cracking of lips/strawberry tongue, 2. Bilateral bulbar conjunctivitis (without exudate) 3. Rash: Maculopapular, diffuse erythroderma, or erythema multiforme-like 4. Erythema and edema of the hands and feet and/or periungual desquamation 5. Cervical lymphadenopathy (≥1.5 cm diameter), usually unilateral.

Atypical KD: Presence fever ≥ 5days **AND** 2-3 KD criteria **OR** positive echocardiogram **OR** ≥3 abnormal laboratory findings (Anemia for age, increased platelets, albumin <3.0 g/dl., raised AST, ALT, WBC > 15000, Pyuria).

**Consider 2nd dose of IVIG in refractory cases of KD: (1. if fever persists. 2. CRP or ESR not improving. 3. Coronary dilatation)

*** (Ferritin > 300ug/L and doubling in 24 hours or >600ug/L at presentation and LDH >250, d-dimers raised)

Cytokine Release Syndrome (CRS):

CRS is an acute systemic inflammatory syndrome characterized by fever and multi-organ dysfunction. It is caused by certain infections (Ebola, influenza, COVID-19 etc.), drugs (rituximab) and after CAR (chimeric antigen receptors) T-Cell Therapy for Lymphoma[4-6]. CRS is associated with increased levels of inflammatory cytokines and activation of T lymphocytes, macrophages, and endothelial cells which leads to capillary leakage, vascular compromise, and coagulopathy.

CRS is a life-threatening emergency associated with high mortality; thus, an early identification is essential.

In the presence of moderate to severe COVID-19 disease, follow the trend of following CRS markers:

- Serum Ferritin
- LDH
- CRP
- IL-6
- D-Dimer
- ALC or Lymphocyte % or N/L ratio

Management of CRS[7]:

Follow management of moderate–severe COVID-19 disease. In addition, following treatment options can be considered if any evidence of CRS;

Steroids

Role in early CRS
Dose: 0.5-1 mg/kg/day (max. 100mg) Route:
Intravenous
Duration: 5 days

1. *IL-6 inhibitor (Tociluzamab, ACTEMRA)

Role in severe CRS not responding to steroid therapy
Dose: <30 kg= 12 mg/kg, ≥30 kg- 8 mg/kg (max. 800mg)
Route: Intravenous
Duration: One dose, may repeat after 12 hours if no clinical improvement

**Under Investigation in multiple clinical trials*
Contraindicated in sepsis or positive blood culture, deranged liver function, allergy to tociluzamab, active TB, intestinal perforation and pregnant ladies)

References:

1. Verdoni, L., et al., *An outbreak of severe Kawasaki-like disease at the Italian epicentre of the SARS-CoV-2epidemic: anobservationalcohortstudy.* TheLancet,2020.**395**(10239):p.1771-1778.
2. Prevention, C.f.D.C.a. *Kawasaki Disease*. 2020; Available from: https://www.cdc.gov/kawasaki/about. html.
3. Brief, W.H.O.S. *Multisystem inflammatory syndrome in children and adolescents with COVID-19*. 2020; Available from: https://www.who.int/publications/i/item/multisystem-inflammatory-syndrome-in- children-and-adolescents-with-covid-19.

1. Shimabukuro-Vornhagen, A., et al., *Cytokine release syndrome.* Journal for ImmunoTherapy of Cancer, 2018. **6**(1): p. 56.

1. deJong, M.D., etal.,*Fatal outcome of humaninfluenza A (H5N1)is associatedwith high viral load and hypercytokinemia.* Nat Med, 2006. **12**(10): p. 1203-7.
2. Waltuch, T., et al., *Features of COVID-19 post-infectious cytokine release syndrome in children presenting to the emergency department.* The American journal of emergency medicine, 2020: p. S0735-6757(20)30403-4.
3. Cancio, M., et al., *Emerging trends in COVID-19 treatment: learning from inflammatory conditions associated with cellular therapies.* Cytotherapy.

Annexure 1A: Alogrithm for Management of Asymptomatic Case

Homecare

Household members should stay in another room or be seperated from the patient as much as possible.

Prohibit visitors at home

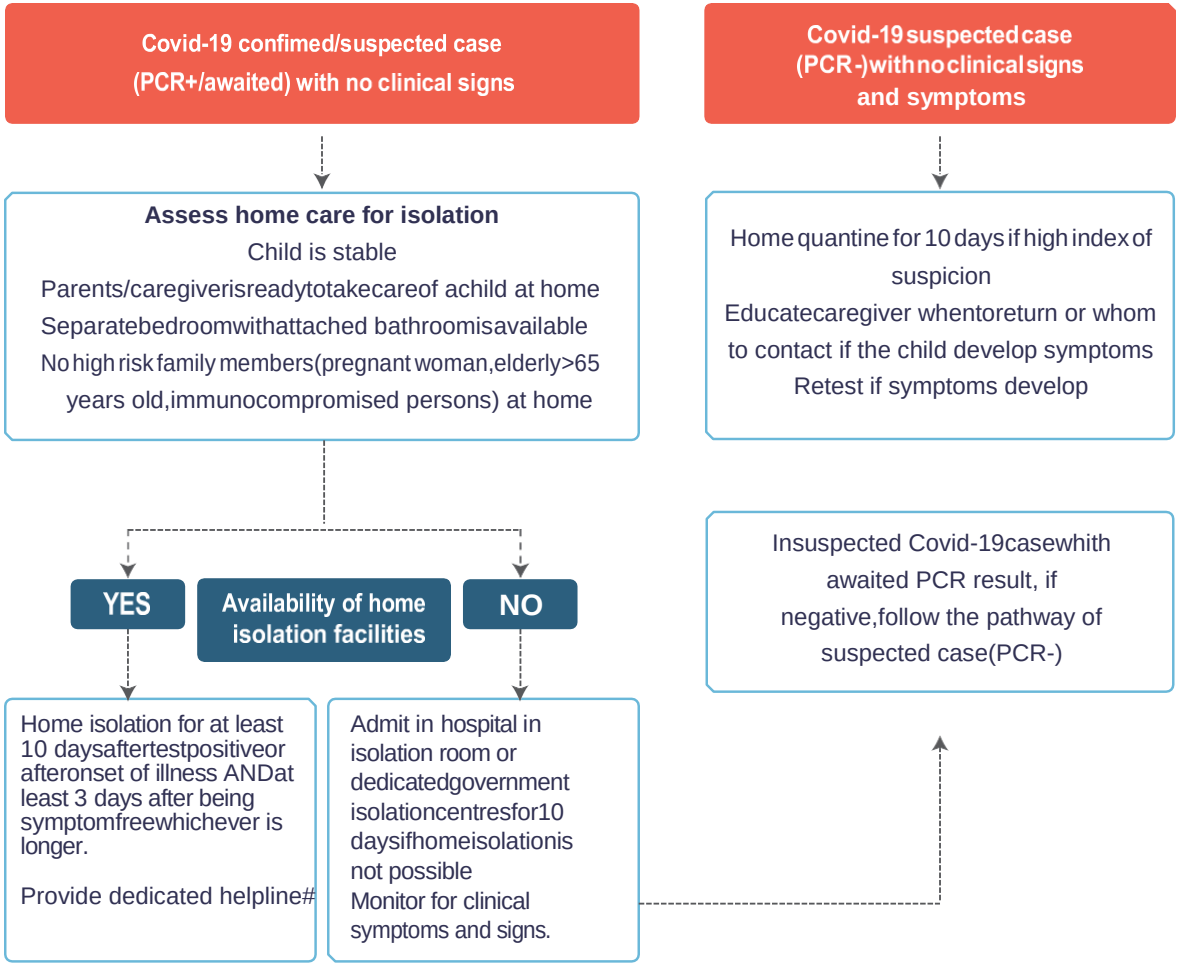
Minimize exposure with pets

Make sure that shared spaces in the home have good airflow

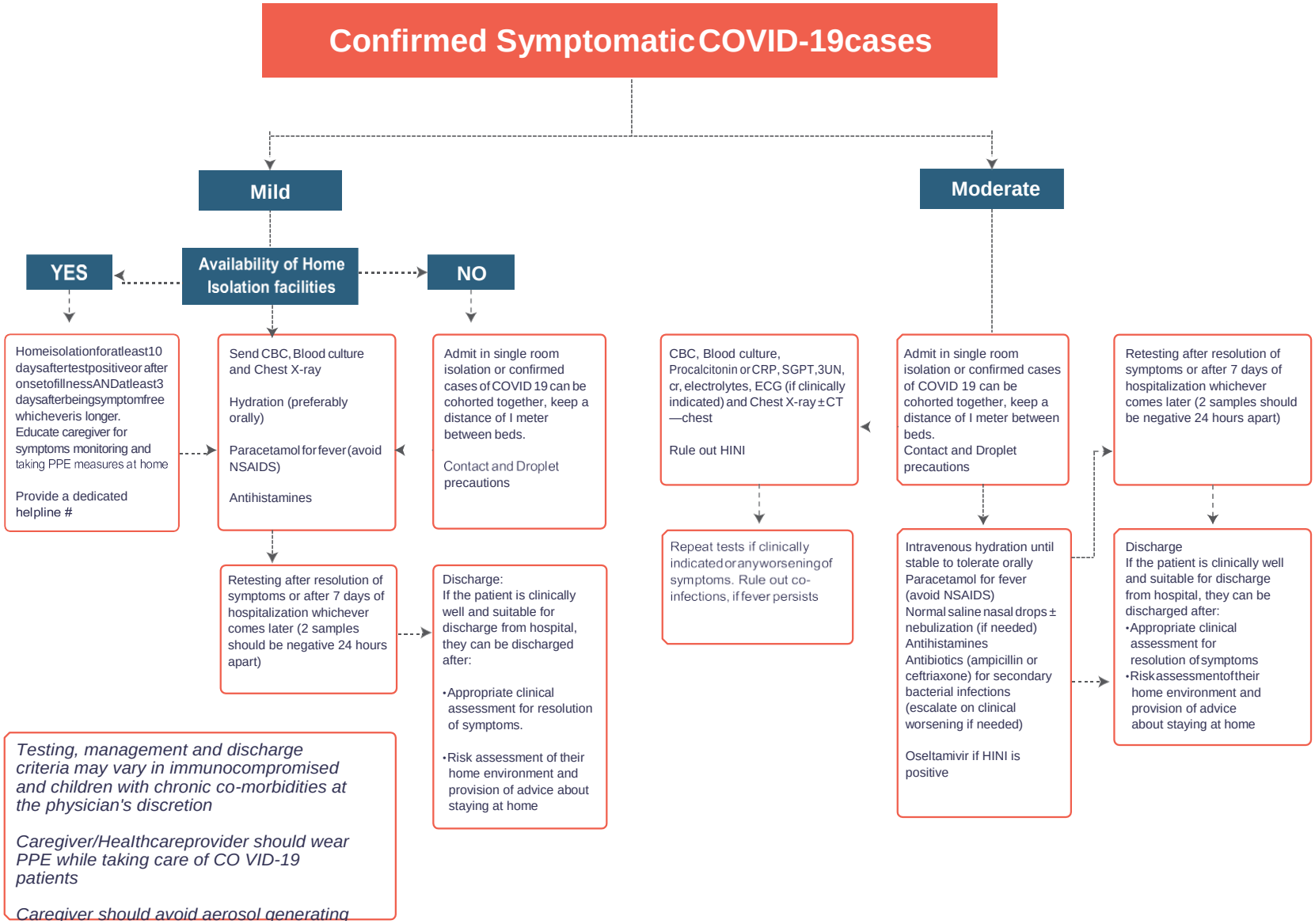
Perform hand hygiene frequently

Adolescent patient should weara facemask if around people (caregiver should wear a facemask while taking care of young patient)

https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html



Annexure 1B: Alogrithm for Management of Symptomatic Mild-Moderate COVID-19Cases



Points to Remember

There is limited evidence on use of Lopinavir/ritonavir (LPV/r), chloroquine phosphate, hydroxychloroquine, interferon therapy, remdisivir and other investigational drug for the treatment of COV/D-19s. They are under consideration and their usevaries fromregion to region.

Avoidtheuseof systemiccorticosteroidsfor treatment of COVID-19 pneumoniaoutside of clinical trials unless they are indicated for another reason like septic shock (not responding to fluid therapy and vasopressors) or asthma. It maydelaythe viral shedding or may result in complications.

Due to uncertainty around the potential for aerosolization, nebulization, HFO, NIV, including bubble CPAP, can be used with strict airborne precautions.

Avoid the use of azithromycin for the treatment of COVID-19.

Confirmed Symptomatic Severe COVID-19 case

Admit the patient to airborne isolation with strict PPE in high dependency unit/intensive care units

CBC, Blood culture & other relevant cultures, Procalcitonin or CRP, lactate, renal function, liverfunctions, electrolytes, ABGs, Coagulation profile, ECG and Chest X-ray and CT —chest.

Rule out HINI

Airway management and oxygen therapy (HIGH FLOW BY FACEMASK) ± mechanical ventilation (consider early) during resuscitation to target sp02>92%

Strict Vitals and 1/0 monitoring

Use I/V hydration conservatively until no evidence of shock.

Paracetamol for fever (avoid NSAIDS)

Give empiric antimicrobials to treat suspected bacterial infections (based on local epidemiology and

In additiontothe above supportivemeasures, consider the following if no contra- indications (preferably early in thecourse ofillness s12th day) after COVID confirmation.

Oseltamivir (when there is ongoing local circulation of seasonal influenza or HINI is positive)

Forcomplicatedcases, (childrenwith septic shock, renal failure, liver failure, cardiacfailure or Multi-organ failure etc. follow the standard WHO guidelines availableat

http://www.ptpol.pl/images/koronawirus/W Ho-2019-ncov-finical-2020-eng.pdf

Discharge criteria:

1. Retesting after resolution of symptoms or after7 days of hospitalization whichever comes later (2 samples should be negative 24 hours apart)
2. If the patient is clinically well and suitable for discharge from hospital, they can be discharged after:
   - Appropriate clinical assessmentforresolution of symptoms.
   - Riskassessmentoftheir home environment and provision of advice about stayingat home

8. Newborn withCOVID-19

The consequences of a COVID-19 infection during pregnancy are uncertain; to date there is no concrete evidence of vertical transmission (2). There is no information to date to suggest COVID-19 isteratogenicorhaslong-termimplicationforfetal/neonatalhealth.

Feeding Infants born to Mother with Confirmed or Suspected COVID-19 Infection:

Breast milk is the best source of nutrition for infants. There remain however many unknowns about COVID-19. For that reason, families should participate in the decision to use breast milk for infant feeding with the support of the healthcare providers. Whenever infants must be separated from their mother due to infection control restrictions, hospitals should make every effort to provide expressed breast milk to newborns.

If well infants are rooming with a COVID-19 confirmed or suspected mother, take all possible precautions to avoid transmission of virus from mother to the infant, like washing of hands before touching theinfant and before each feeding. Ensure the motherwears aface mask while breast feeding. Similar precautions need to be taken for skin-to-skin contact and kangaroo mother care.

During temporary separation, mothers who intend to breastfeed should be encouraged to express their breast milk to establish and maintain milk supply. Prior to expressing breast milk, mothers should practice hand hygiene. After each pumping session, the entire pump should be appropriately disinfected (14).

Definition of suspected 2019-SARS-CoV2 infection

The newborns suspected of 2019-SARS-CoV2 infection are those born to the mothers with a history of COVID 2019 infection between 14 days before delivery and 28 days after delivery, or the newborns directly exposed to those infected with 2019-SARS-CoV2 (including family members, caregivers, medical staff, and visitors). Suspected infants are under consideration regardless of whether they are symptomatic or asymptomatic.

Neonatal clinical manifestations associated with COVID 19 infection

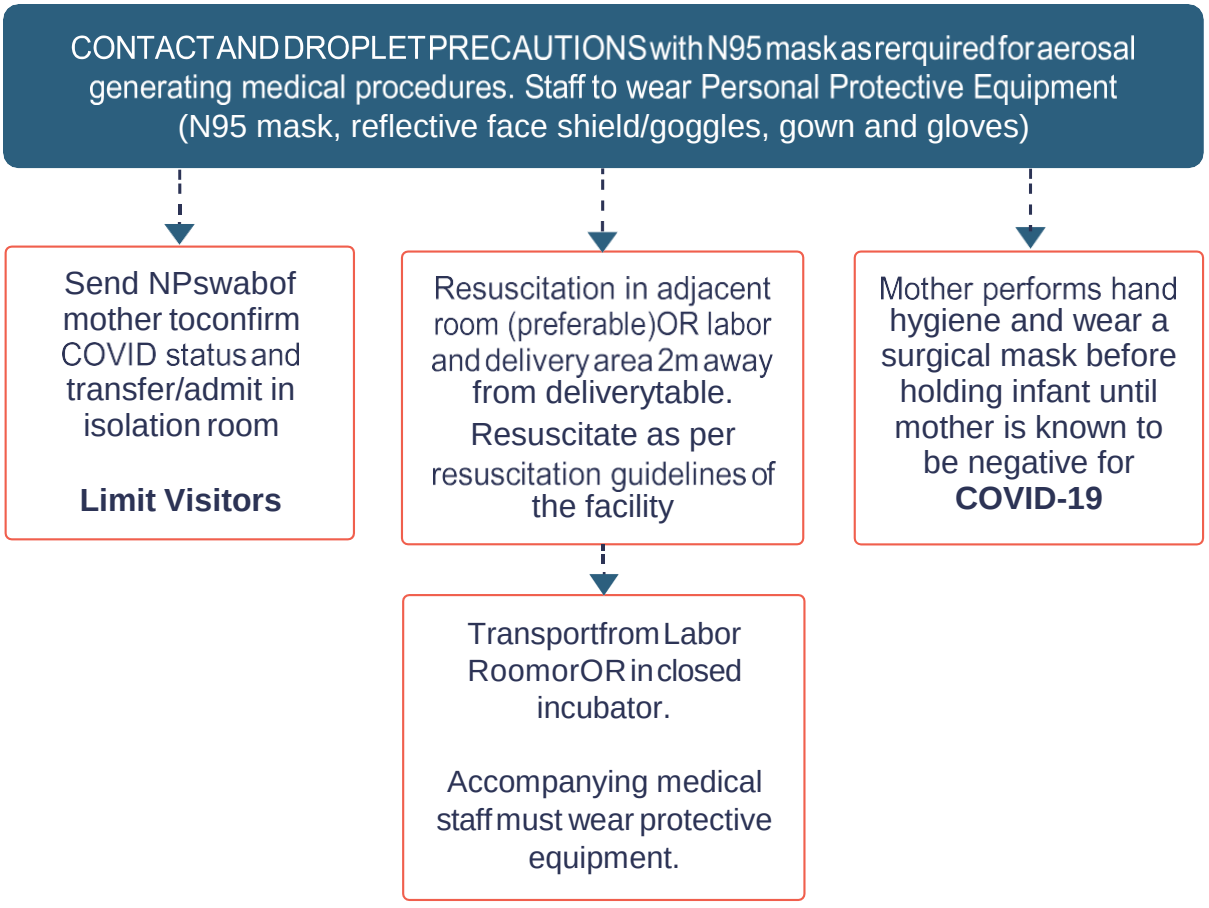
Clinical findings especially for premature infants are not specific therefore, it is necessary to closely monitor vital signs, respiratory symptoms and gastrointestinal symptoms. Temperature instability, respiratory and cardiovascular symptoms including tachypnea, grunting, nasal flaring, apnea, cough, or tachycardia may be present. Other findings may include poor feeding, lethargy, vomiting, diarrhea, and abdominal distension.

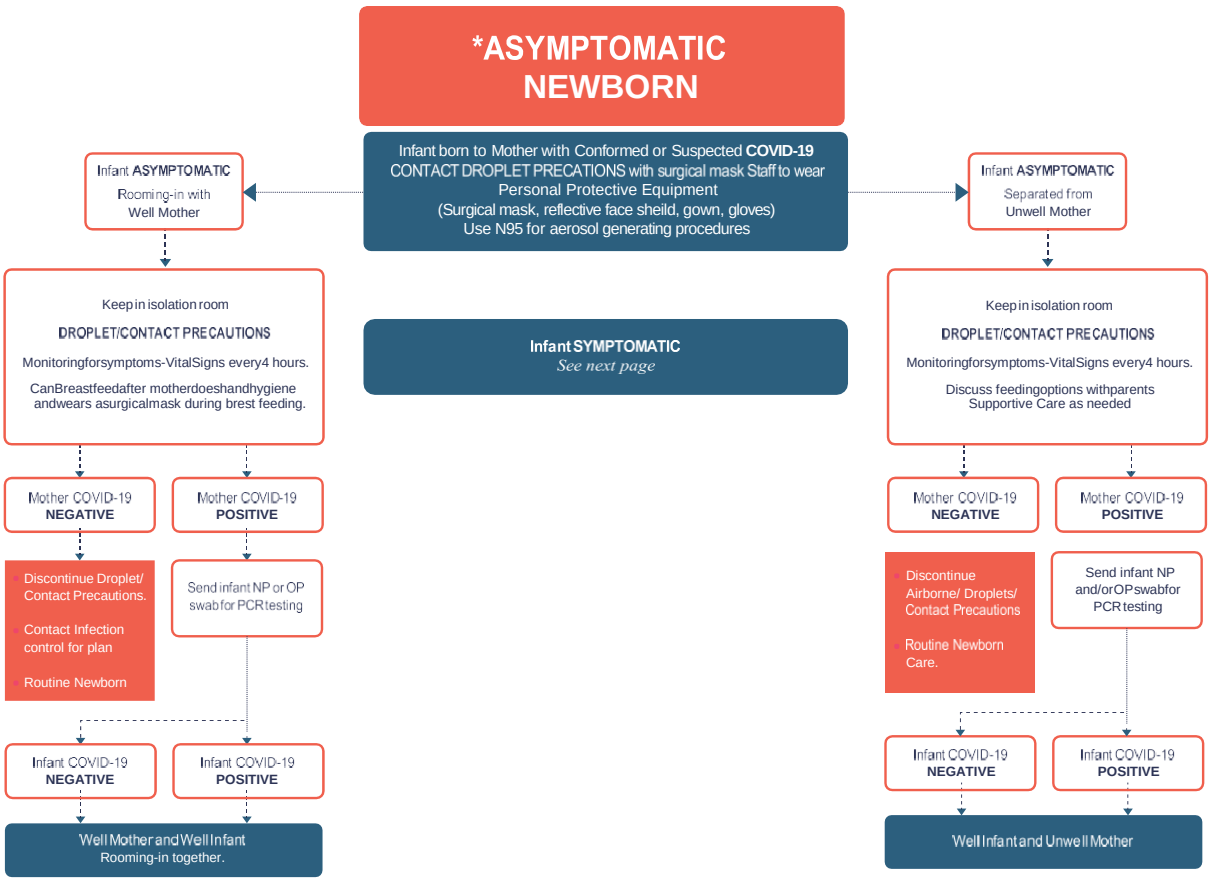
Laboratory examinations may be non-specific.

Complete blood count (CBC): An early exam may show normal or decreased leukocyte counts, or decreased lymphocyte counts.

Other findings: May include mild thrombocytopenia, and elevated levels of creatinine kinase, alkaline phosphatase, alanine aminotransferase, aspartate and aminotransferase. Chest X-ray is likely to show signs of pneumonia.

Facility management of infant born to Mother with Confirmed or Suspected COVID-19





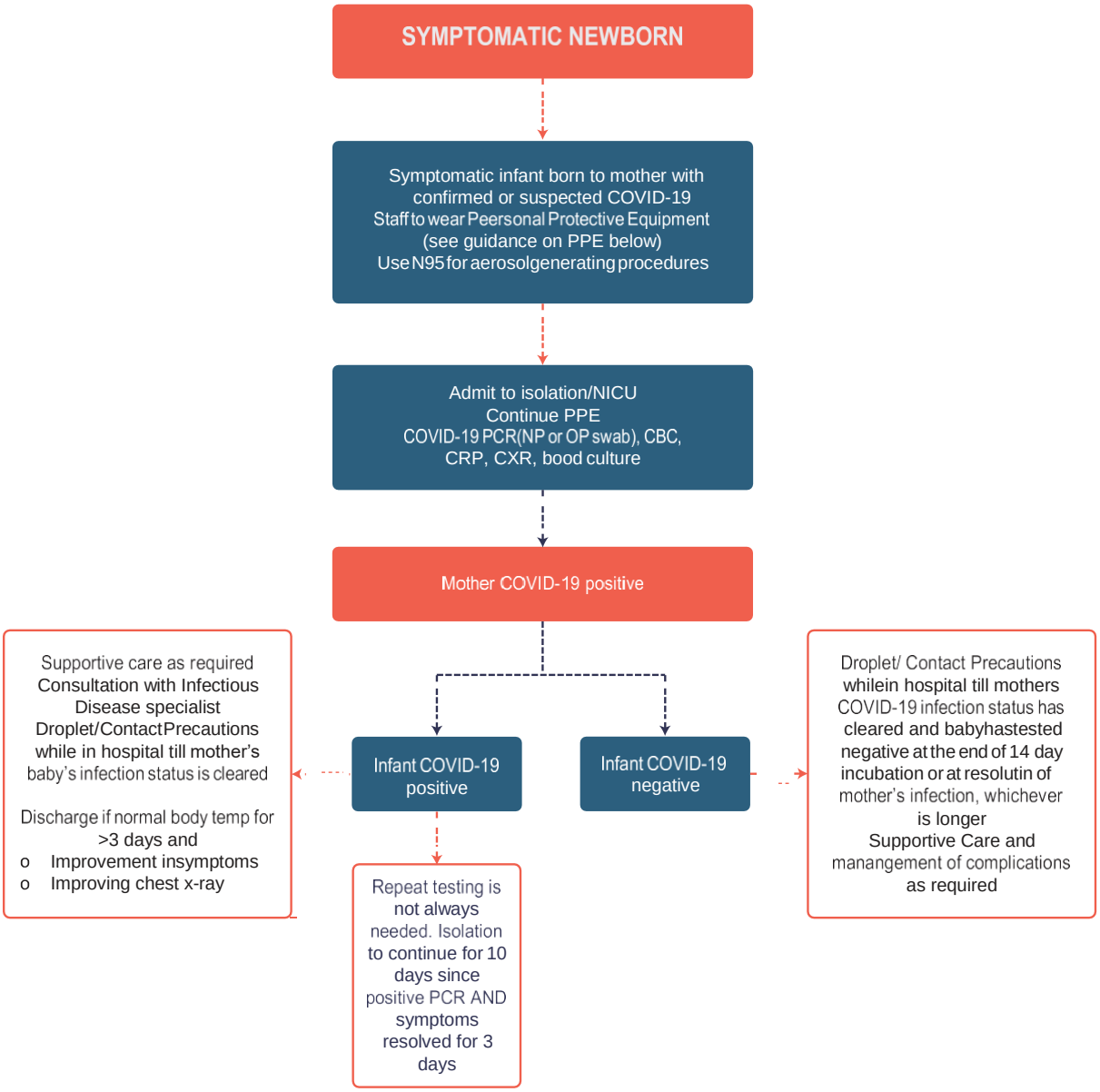
***Infant of a COVID-19 positive mother may not be routinely tested if there is no clinical indication.**

Well Mother and Well Infant Rooming-in together.

- If baby tested Positive for **COVID-19**, maintain Droplet/Contact Precautions while in hospital until mother's and baby's COVID-19 infection status has cleared.
- If baby tested Negative for **COVID-19**, maintain Droplet/Contact Precautions while inhospital until mother's **COVID-19** infection status has cleared and baby has tested negative at the end of 14-day incubation or at resolution of mother's infection, whichever is longer.
- Can bedischargedhome ifwell-suggestself-isolation till mother's **COVID-19** infection has cleared and baby status is clear.
- ContactPaeds IDas appropriate (ifavailable)
- Emotional support for Family.

Well Infant and Unwell Mother

- Droplet/ Contact Precautions while in hospital until mother's and baby's **COVID-19** infection status has cleared.
- Can be discharged home as per routine is well.
- Contact infection control for advice regarding need for self-isolation post discharge.
- Contact Paeds ID as appropriate (if available)
- Emotional support for Family.


SYMPTOMATIC NEWBORN
Symptomatic infant born to mother with confirmed or suspected COVID-19
Staff to wear Peersonal Protective Equipment (see guidance on PPE below)
Use N95 for aerosolgenerating procedures
Admit to isolation/NICU
Continue PPE
COVID-19 PCR(NP or OP swab), CBC, CRP, CXR, bood culture
Mother COVID-19 positive
Supportive care as required
Consultation with Infectious Disease specialist
Droplet/ContactPrecautions while in hospital till mother's baby's infection status is cleared
Discharge if normal body temp for >3 days and
o Improvement insymptoms
o Improving chest x-ray
Infant COVID-19 positive
Infant COVID-19 negative
Repeat testing is not always needed. Isolation to continue for 10 days since positive PCR AND symptoms resolved for 3 days
Droplet/ Contact Precautions whilein hospital till mothers COVID-19 infection status has cleared and babyhastested negative at the end of 14 day incubation or at resolutin of mother's infection, whichever is longer
Supportive Care and manangement of complications as required

9. Prevention of COVID 19

Currently there is no vaccineavailable toprevent COVID-19. Thebest waytoprevent COVID-19 is to avoid being exposed to this virus (11, 12). We can limit the transmission of virus by taking everyday preventive measures such as:

1	Staying at home when sick. Do not send the sick child to school.
2	Caregiverand a child should weara facemask, particularlywhen you/yourchild are around other people (e.g., sharing a room or vehicle) and before you/your child enter a healthcare provider's office or health facility
3	Covering mouth and nose with flexed elbow or tissue when coughing or sneezing. Dispose of used tissue instantly.
4	Washing hands often with soap and water or use a sanitizer with 60-80% alcohol, whichever is available
5	Avoid touching your eyes, nose, and mouth with unwashed hands.
6	Cleaning frequently high-touched surfaces (tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks etc.) by detergents and disinfectants formulations such as sodium hypochlorite with concentrationof5000-6150ppmto500-615ppmfreechlorineareusedfor environmental surface cleaning.
7	Avoid goingtocrowded placeslikeshopping malls, restaurants, publicparksetc.

**Little is known about the COVID-19 being the novel disease. As we learn, more about COVID-19 public health officials may recommend additional actions*

Steps of hand washing

③ Ifyouareusingsoapandwaterfollowfollowingsteps:

1. Wethands with safe running water
2. Apply enough soap to cover wet hands
3. Scrub all surfaces of the hands – including backs of hands, between fingers and under nails – for at least 20 seconds. This is similar to singing the ABC song at a normal tempo or the happy birthday song twice.
4. Rinse thoroughly with running water
5. Dryhandswithaclean,drycloth,single-usetowelorhanddrierasavailable

③ Ifyou are using a hand sanitizer, ensure that it contains at least 60-80% alcohol, use enough to cover all surfaces of your hands and rub them together until they feel dry

RUB HANDS FOR HAND HYGIENE!
WASH HANDS WHEN VISIBLY SOILED

Duration of entire procedure: 20-30 seconds

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

Rub hands palm to palm.

Right palm over left dorsum with interlaced fingers and vice versa

Palm to palm with fingers interlaced.

Backs of fingers to opposing palms with fingers interlaced.

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

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

Rinse hands with clean water.

Once dry, your hands are safe.

It is better to clean hands more often. Additional key time points to clean hands include

- ③ After blowing one's nose, coughing, or sneezing
- ③ After using the restroom/toilet
- ③ Before eating or preparing food
- ③ After contact with animals or pets
- ③ Before and after providing routine care for another person who needs assistance (e.g. a child)

Clean and Disinfect household high-touched surfaces

Suggestion for a home based preparation for cleaning and disinfection

Prepareableachsolutionbymixing:5tablespoons(1/3rdcup)bleachpergallonofwateror4teaspoons bleach per quart of water

Daily Preventive measures

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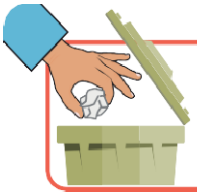

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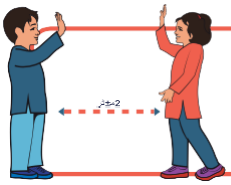

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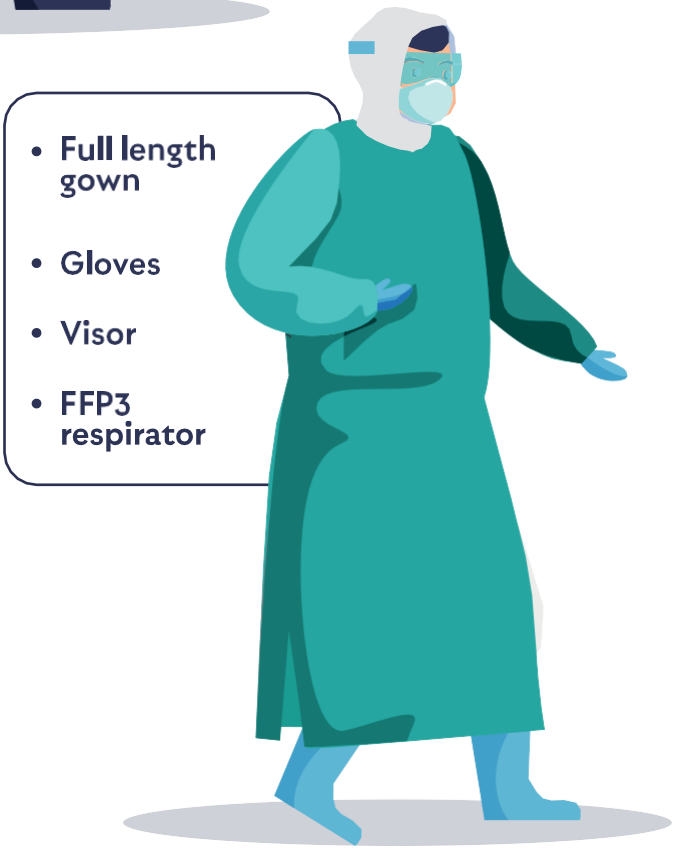
Levels of protection for health care workers

- This is a generic guidance
- Where available please adhere to your institution's rules

Protection Level	Protective Equipment	Scope of Application
Level I protection	• Disposable surgical cap • Disposable surgical mask • Work uniform • Disposable latex gloves or/ and disposable isolation clothing if necessary	• Pre-examination triage, general outpatient department
Level II protection	• Disposable surgical cap • Medical protective mask (N95) • Work uniform • Disposable medical protective uniform • Disposable latex gloves • Goggles	• Fever outpatient department • Isolation ward area (including isolated intenseive ICU) • Non-respiratory speciman examination of suspected/ confirmed patients • Imaging examination of suspected/ confirmed patients • Cleaning of surgical instruments used with suspected/ confirmed patients
Level III protection	• Disposable surgical cap • Medical protective mask (N95) • Work uniform • Disposable medical protective uniform • Disposable latex gloves • Full-face respiratory protective devices or powered air-purifying respirator	• When the staff performs operations such as tracheal intubation tracheotomy, bronchofibroscope, gastroenterological endoscope, etc,, during which, the suspected confirmed patients may spray or splash respiratory secretions or body fluids/ blood • When the staff performs surgery and autopsy for confirmed/ suspected patients • When the staff carries out NAT for COVID-19

Guidance on Personal Protective Equipment (PPE)

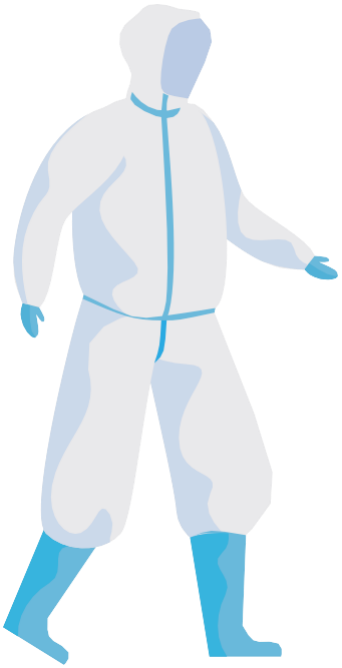
STANDARD PPE
All contact with suspected or confirmed COVID-19 patients



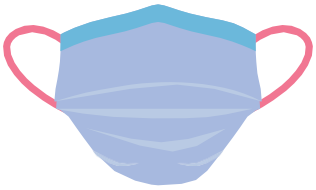
FULL PPE
Aerosol Generating Procedures ONLY
Oropharyngeal/nasopharyngeal swabbing, nebulization, intubation, resuscitation

Types of Personal Protective Equipment

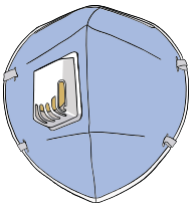
Gown



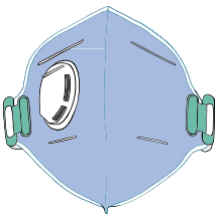
Full Body Suit/ Tyvek Suit



3 Layered Medical/ Surgical mask



N95 Mask



N95 Respirator

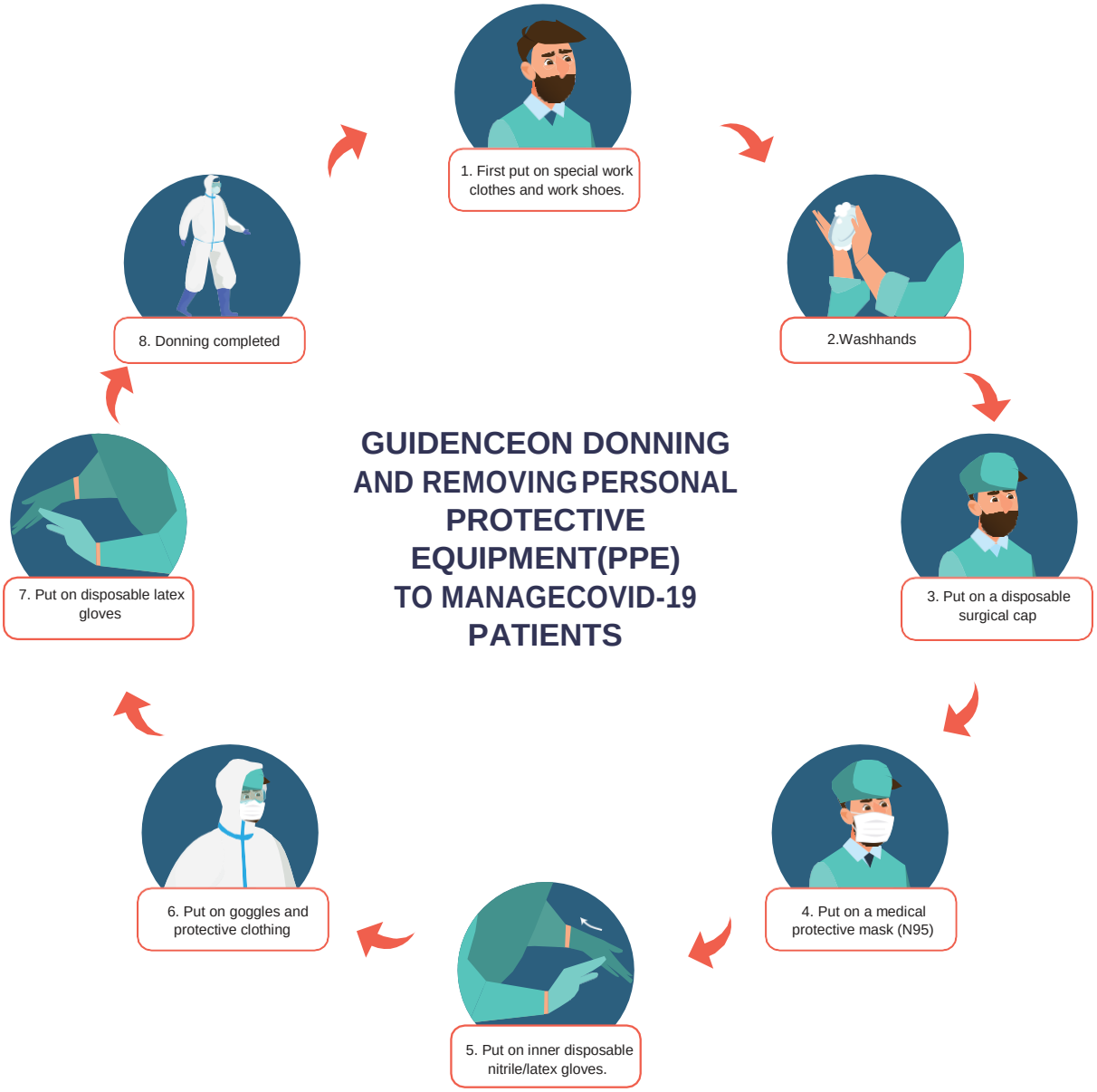
Goggles

Gloves

Shoe Gloves

Guidance on Donning and Doffing

Method of Donning



Protocol for Donning PPE:

Put on special work clothes and work shoes - Wash hands - Put on disposable surgical cap - Put on medical protective mask(N95) - Put on inner disposable nitrite/latex gloves - Put on goggles and protective clothing (note: if wearing protective clothing without foot covers, please also put on seprate waterproof boot covers), put on a disposable isolation gown (if required in the specific work zone) and face shield/powered air purifying respirator (if required in the specific work zone) - Put on outer disposable latex gloves.

Method of Doffing

Protocol for Removing PPE:

Wash hand and remove visible bodiyfluids/blood contaminants on the out ersur faces of both hand → Wash hands replace outer gloves with new gloves → Remove powered air-purfying respirator or self-priming filter-type full-face mask/mask (if used) → Wash hands → Remove disposable gowns along with outer gloves(ifused)→Wash hands and put on outer gloves→Enter Removal Area.

OR

① → Wash hands and remove protective clothing along with outer gloves (for gloves and protective clothing, turn inside out while rolling them down) (note: if used, remove the waterproof boots covers with clothing) → Wash hands→ Enter Removal Area. →Wash hands

② remove goggles → Wash hands and remove mask → Wash hands and remove cap

③ →Wash hands and remove inner disposable latex gloves. Wash hands and take shower. Leave Removal Area. put on clean clothes and enter the clean area.

Essential Precautions for Frontline Healthcare Staff

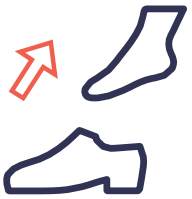
- Do not wear watches, rings, or bracelets.
- Do not bring personal computers, handbags and wallet to hospital. Just a credit card and some notes should be enough.
- Leave the driving license in the car.
- After arriving home, leave mobile phone case in car and just take naked phone inside your house.
- Do not take phones, remotes, iPads to the duty rooms in hospital
- Cleaning spectacles, business card, pen, mobile phones and car keys with antiseptic solution on arriving at hospital and just before leaving.
- Disinfect/clean the frequently used surfaces such as steering wheel, door handle of car and bike etc.
- If possible, use the spare rooms in the hospital to change into scrubs after arriving at work and replace it with your clothes before leaving.
- If work clothes are not available from the hospital, bring the work clothes with you in a clean bag.
- Wash your hands to the elbows before leaving the hospital.
- Leave work shoes in the car or outside the home.
- Wash your work clothes (with hot water if possible) and do not mix it with the other clothes
- Take shower as soon as you arrive home.
- Nutrition: Take high protein diet, citreous fruits, dry fruits, and multivitamins to increase immunity

Protocols for entering your home

Actions against COVID-19.

1. When you come home, try not to touch anything.

2. Take off your shoes.



3. Disinfect your pet's paws if youwere walking it

4. Take off yourouter clothing and put in a laundry bag.

5. Leave bag, purse, keys etc. in a box at the enterance.

6. Shower or, if you were not able, wash all exposed areas well.

7. Clean your phone and glasses with soap and water, or alcohol.

8. Clean the surfaces of what you have brought outside with bleach before storing

9. Remove your gloves carfully, throw them away and wash your hands

10. remember that it is not possible to do a total disinfection, the objective is to reduce the risk.

Additional information:

Radiological findings in COVID-19 disease

Chest X-ray:

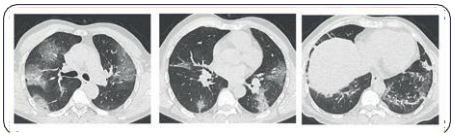
- Typically, patchy ground glass opacities peripheral and basal (may be unilateral)
- Number of lung segments increases with more severe disease
- Over time, patches coalesce into more dense consolidation
- May be subtle/appear normal
- Uncommon: effusions, cavitation, mass, lymphadenopathy (think of alternate/ other concomitant diagnosis)

CT-Chest fidnings:

- Unlike adults no data in children to support use
- Needshouldbebalancedwithriskofionizingradiationcontaminationofradiologyroom
- Does not change management
- Considered ONLY in sick children or where suspected alternate diagnosis
- May be normal in early stages
- Possible findings: peripheral ground-glass opacities, 'crazy paving', diffuse alveolar damage, organizing pneumonia.
- Uncommon: Non-peripheral, effusions, lymph nodes, lobar pneumonia and cavitation (think of alternate/ other concomitant diagnosis)

CXR

CT Chest



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