DIRECTORATE OF HEALTH SERVICES
GOVERNMENT OF MANIPUR

**Guidelines
on
Operationalization of Covid Care Services
for
Children and Adolescents**

No.2/COVID-19/DHS-2020, 23rdJuly, 2021.

This Guidelines is developed in alignment with **"Guidelines on Operationalization of Covid Care Services for Children and Adolescents"** of the Ministry of Health & FW, Govt. of India, 16 June, 2021 and decision of **State Technical Expert Committee Meeting** held on 20th July, 2021.

Guidelines on Operationalization of COVID Care Services for Children & Adolescents

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List of Abbreviations:

AED	:	Automated External Defibrillator
AGP	:	Aerosol Generating Procedure
ALS	:	Advanced Life Support
ANM	:	Auxiliary nurse midwife
ASHA	:	Accredited Social Health Activist
AYUSH	:	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy
BiPAP	:	Bilevel Positive Airway Pressure
BLS	:	Basic Life Support
BP	:	Blood Pressure
BVM	:	Bag Valve Mask
CBNAAT	:	Cartridge based NucleicAcid Amplification Test
CBWTF	:	Common Biomedical Waste Treatment and Disposal Facility
CCC	:	COVID-19 Care Centre
CCTV	:	Close Circuit Television
CHC	:	Community Health Centre
CHO	:	Community Health Officer
CMHO	:	Chief Medical Health Officer
COVID-19	:	Coronavirus Disease 2019
CPAP	:	Continuous Positive Airway Pressure
CPCB	:	Central Pollution Control Board
CPR	:	Cardiopulmonary Resuscitation
CRP	:	C-reactive protein
CRRT	:	Continuous Renal Replacement Therapy
CSSD	:	Central Sterile Services Department
CT	:	Computed Tomography
DCH	:	Dedicated COVID-19 Hospital
DCHC	:	Dedicated COVID-19 Health Centre
DH	:	District Hospital
DNS	:	Deputy Nursing Superintendent
ECG	:	Electrocardiogram
ER	:	Emergency Room
ETCO2	:	End-tidal Carbon Dioxide
ETT	:	Endotracheal Tube
FRU	:	First Referral Unit
GDMO	:	General Duty Medical Office
HCW	:	Health Care Worker
HD	:	Hemodialysis
HDU	:	High Dependency Unit

HFNC	:	High Flow Nasal Cannula
HR	:	Human Resources
HWC	:	Health and Wellness Center
ICMR	:	Indian Council of MedicalResearch
ICU	:	Intensive Care Unit
IEC	:	Information Education and Communication
iGOT	:	Integrated Government Online Training
IMA	:	Indian Medical Association
IMNCI	:	Integrated Management of Neonatal and Childhood Illness
IPC	:	Infection Prevention and Control
IPHS	:	Indian Public Health Standards
IV	:	Intravenous
LMA	:	Laryngeal Mask Airway
LMO	:	Liquid Medical Oxygen
LMWH	:	Low Molecular Weight Heparin
MDI	:	Multi-dose inhaler
MIS-C	:	Multisystem InflammatorySyndrome in Children
MO	:	Medical Officer
MoHFW	:	Ministry of Health and FamilyWelfare
MPW	:	Multi-purpose Worker
MS	:	Medical Superintendent National
NCDC	:	Centre for Disease Control
NGO	:	Non-governmental organization
NIBP	:	Non-invasive blood pressure
NICU	:	Neonatal intensive care Unit
OPD	:	Out Patient Department
PCR	:	Polymerase Chain Reaction
PD	:	Peritoneal Dialysis
PHC	:	Primary Health Centre
PPE	:	Personal Protective Equipment
PSA	:	Pressure Swing Adsorption
QoC	:	Quality of Care
RKS	:	Rogi Kalyan Samiti
RT PCR	:	Reverse Transcriptase Polymerase Chain Reaction Severe Acute
SARS-CoV-2	:	RespiratorySyndrome Coronavirus 2 Special Newborn Care Unit
SNCU	:	
SOP	:	Standard Operating Procedure
UHF	:	Unfractionated Heparin
USG	:	Ultrasonography
UT	:	Union Territory

Guidelines on Operationalization of COVID Care Services for Children & Adolescents

Executive Summary

1. Based on sero-surveillence reports, COVID 19 infection in children above 10 years of age occurs in similar frequency to that of adults, even though, among the confirmed cases <12% are individuals < 20 yr age.

2. Children have less severe disease than adults. In the majority, infection is asymptomatic or mildly symptomatic. It is uncommon to have moderate to severe covid in healthy children. Children with co-morbid conditions have more severe manifestations and poorer outcomes; they should be a priority group for vaccination, once vaccines are approved for children.

3. It is anticipated that there may be intermittent surges in the number of cases. A combined effort from private & public sector is needed to handle any surge in future after the withdrawal of the lockdown, school re-opening or as third wave over next 3-4 months.

4. The basic principles of equity and dignity of care should be followed.

5. The estimates for additional bed capacity for pediatric care may be calculated based on the peak daily cases in different districts during the second wave. From this number, projections for pediatric cases and number of admissions required can be derived.

6. It is desirable to augment the existing covid care facilities to provide care to children with acute covid. This will need additional pediatric specific equipment, infrastructure, and pediatric formulations. Also, adequate number of trained manpower- both doctors and nurses should be provided. The health authorities should initiate capacity building programs for appropriate pediatric care. In hospitals providing paediatric care, separate arrangements for example - separate bed for paediatric COVID care need to be established.

7. It is desirable to designate specific areas in the COVID facilities for pediatric care. These facilities should allow parents to accompany the child.

8. For children with MIS-C, who test negative for acute COVID, care has to be provided by the existing pediatric facilities. These facilities also need augmentation esp. HDU and ICU services.

9. The document provides guidance about additional requirements for infrastructure, equipment and manpower.

10. The management protocols for children with acute COVID and MIS-C have been developed by the MoHFW[*]. Most drugs used in adults such as Ivermectin/ HCQ/ Favipiravir/ Antibiotics such as Doxycycline or Azithromycin have not been tested in

children for prevention or treatment of COVID infection in children. Therefore, these are not recommended in children.

11. Majority of children have asymptomatic or mild illness and can be managed at home by parents. Treatment is symptomatic including paracetamol for fever, good monitoring for worsening by measuring respiratory rates, difficulty in respiration, oral intake and oxygen saturation. In a community setting, ASHA / MPW should be involved for management of children at home and also monitor to assess the need for referral/ admission.

12. National programs like IMNCI are in place in the country; COVID care should be embraced in the same with follow up for children. At the community level, it is important to train community health workers to pick red flag signs. Additionally, all stake holders including the community should be educated by IEC.

13. Medical officers should provide leadership to ensure service delivery locally by involvement of community health workers.

14. For improving the quality of care and for capacity building, hand-holding of district hospitals and other facilities should be taken up by the medical colleges. These centers can provide leadership in clinical management and training. Telemedicine could be harnessed for reaching out to large number of facilities.

15. Data drives science, the importance cannot be over emphasised. Therefore, it is important to ensure data collection at all levels and transmission from community to higher centers.

16. Appropriate IEC campaign should be launched for communication of correct information and dealing with the mis-information campaigns on media and social media.

*Medical/clinical protocols are dynamic & continuously evolving and may change time to time.

Introduction

In the ongoing COVID-19 pandemic, morbidity and mortality has mainly been seen in adults. In India, < 12% of all confirmed cases are in individuals < 20 yr (1), while this population constitutes approx. 41% of the population (2). Similarly, of all deaths due to COVID-19, only <2% are contributed by < 20 yr age group (3). MIS-C has been reported to occur in children; typically, the surge in cases of MIS-C follows that of the surge in total COVID-19 cases after approx. 2-6 weeks.

In the second wave, there was a sharp increase in the numbers of cases of COVID-19, the peak crossing 4 lakh new cases a day. The proportion of individuals < 20 yr of all COVID-19 confirmed cases has remained unchanged (1). However, with increase in the number of cases, the numbers of children and adolescents with confirmed COVID-19 have also increased. Similar trend is also observed in our state.

Among adults with confirmed COVID-19 infection, it is well documented that 80% experience mild illness, approximately 14-15% experience moderate- severe disease and 5% are critically ill. Earlier reports had suggested that illness severity was associated with age (>60 years old) and co-morbid disease. During the second wave, large numbers of younger individuals had moderate-severe disease.

Till date, children have relatively been spared of serious disease and poor outcomes. As per the available sero-survey data prior to launch of vaccination drive, children 10-17 years had seropositivity similar to that in adults, i.e., 25.3% (4). However, the proportion of <20 yr olds among confirmed COVID-19 cases is lower than expected. It means that children are as susceptible as adults to infection, but a large majority remains asymptomatic. Even among the symptomatics, vast majority have mild disease only. The clinical features of COVID in India are similar to that described elsewhere [5-7].

As has been seen in countries where a significant proportion of adults have received COVID-19 vaccines, the proportion of children among new cases increases gradually [in the US, the proportion has increase from 14% to 24% as in May 2nd week and changed to 19.8% in the third week (8)].

Various experts are predicting a third wave with a disproportionately high burden among the pediatric population. Re-opening of schools and colleges may contribute an increase in the infections in children. Therefore, there is a need to prepare for any future sudden surge of COVID cases in the pediatric age group. It is important to augment existing health facilities for children, particularly ICU and HDU facilities, while also strengthening community level care i.e., PHCs/ HWCs.

Estimated burden of COVID-19 in children

National and international data indicated a maximum of 2-3% of such children requiring hospitalisation in wave 1/ 2. However, to meet the surge in India, we need to be ready for a little higher number and for an indicative projection, a figure of 5% of children with COVID have been estimated to be requiring hospitalisation. Box 1A and Box 1B provide estimates for requirement for beds for pediatric COVID care of Manipur and all the districts of our state respectively. It will be desirable to have estimates for the additional capacity at hospital level/ at level of administrative units to ensure adequate projections and preparedness; this is important because the incidence of COVID is likely to be variable in different areas and also the peak in number of cases will also be at different time points. The same framework could be used for estimating the bed requirements for different percentages of children needing hospitalization. Also, the focus has to be augmentation at all levels and not just of ICU beds. Investment in ICU beds alone or disproportionately will not be cost-effective.

Box 1A: Projections for beds for pediatric COVID care in Manipur

	Peak cases per day →	Whole state
A		**1327**
B	Estimated number of confirmed cases in < 20 yr* at peak of the wave (@12% of A) [ref 1]	159
C	Percentage of children needing admission	5%
D	Numbers of children needing admission daily at peak of wave (5% of B)	8 (7.9)
	1. Numbers needing ward admission	5 (4.7)
	2. Numbers needingHDU/ICU admission (2% of B)	3 (3.2)
E	Average length of stay of admitted child	10days
F	Total Beds required for pediatric care for managing at the peak of the surge (D X E)	80
G	Total Ward Beds required for pediatric care for managing at the peak of the surge (D1 X E)	50
H	ICU/ HDU beds required for pediatric care for managing severe disease at the peak of thesurge (D2 X E)	30

*Peak case is calculated from peak cases per day found between 1April and July 21, 2021
**Patients above 12 years can be managed under adult Physician

Box 1B: Projections for beds for pediatric COVID care in different districts of Manipur

A	Peakcases per day→	#IW	IE	TBL	BPR	CCP	KCG	Others*
		400	352	124	107	120	119	50
B	Estimatednumberofconfirmed casesin<20yr*atpeakofthewave(@12%ofA) [ref1]	48	42	15	13	14	14	6
C	Percentageofchildrenneedingadmission	5%	5%	5%	5%	5%	5%	5%
D	Numbersofchildrenneeding admission daily at peak of wave(5%ofB)	2.4	2.1	0.8	0.7	0.7	0.7	0.3
	1. Numbers needing wardadmission	1.5	1.3	0.5	0.4	0.4	0.4	0.2
	2. Numbers needingHDU/ICUadmission(2%ofB)	0.9	0.8	0.3	0.3	0.3	0.3	0.1
E	Average length of stay of admittedchild	10 days	10 days	10 days	10 days	10 days	10 Days	10 days
F	Total Beds required for pediatriccareformanagingat thepeakofthesurge (DXE)	24	21	8	7	7	7	3
G	TotalWardBedsrequiredfor pediatriccareformanagingat thepeakofthesurge (D1XE)	15	13	5	4	4	4	2
H	ICU/HDUbedsrequiredfor pediatriccareformanagingsevere disease at the peak of thesurge(D2XE)	9	8	3	3	3	3	1

Others* Remaining districts with peak cases around 50 and less than 50.
**Peak case is calculated from peak cases per day found between 1April to July 21, 2021
***Patients above 12 years can be managed under adult Physician

Considering 40% of this will be managed by the private sector, 60% may remain dependent on public health facilities. With the COVID infections now being reported more in rural areas, the above-mentioned proportions for private and public sector may vary in different regions of the state.

For providing care to children with MIS-C, the existing pediatric facilities have to be strengthened. As per the IPHS norms, approx. 10% of beds in a district hospital should be earmarked for sick children. These facilities should be upgraded to have adequate emergency facility, and enough HDU beds. The guideline developed by the Child Health Division, MoHFW- "Strengthening Facility Based Paediatric Care: Operational Guidelines." Provides detailed requirements [https://nhm.gov.in/images/pdf/programmes/childhealth/guidelines/Strenghtening_Facility_Based_Paediatric_Care-Operational_Guidelines.pdf].

This document provides guidance for augmenting health facilities to be prepared for another surge, which may affect the children.

Proposed operationalization

The document will provide the necessary guidance for augmentation of health facilities in Manipur. The following framework may be considered for the implementation:
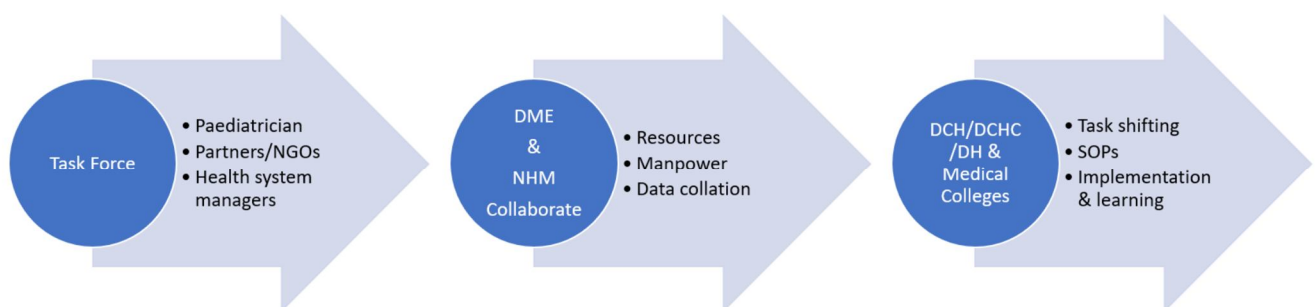
The document presents an overall guidance. The implementation will require assessment of available facilities at the level of administrative units- a detailed mapping of beds (ward/HDU/ICU) for children at various facilities, equipment, trained staff has to be carried out. To prepare for a possible surge, it will be good to have a database of all medical and paramedical staff who could contribute in the roll-out of pediatric care during the surge. Realtime "war rooms" (IT enabled) should be commissioned for managing the surge at local administrative unit level; these will also help in linking the community to DCHC/ DCH /district hospitals to Medical Colleges.

Requirements for Pediatric COVID Care

Among the symptomatic children with COVID, fever and respiratory symptoms are the commonest symptoms. The children may have other symptoms also such as gastrointestinal symptoms (diarrhea, vomiting, etc.). The severity of symptomatic pediatric COVID illness ranges

from mild to severe; additionally, MIS-C cases have to be considered (https://www.mohfw.gov.in/pdf/ProtocolforManagementofCovid19inthePaediatricAgeGroup.pdf) . (*Medical/clinical protocols are dynamic & continuously evolving and may change time to time).

The following figure provides the classification of disease severity based on clinical criteria (Fig 1).

Figure 1: Spectrum of Pediatric COVID Cases and scope of management
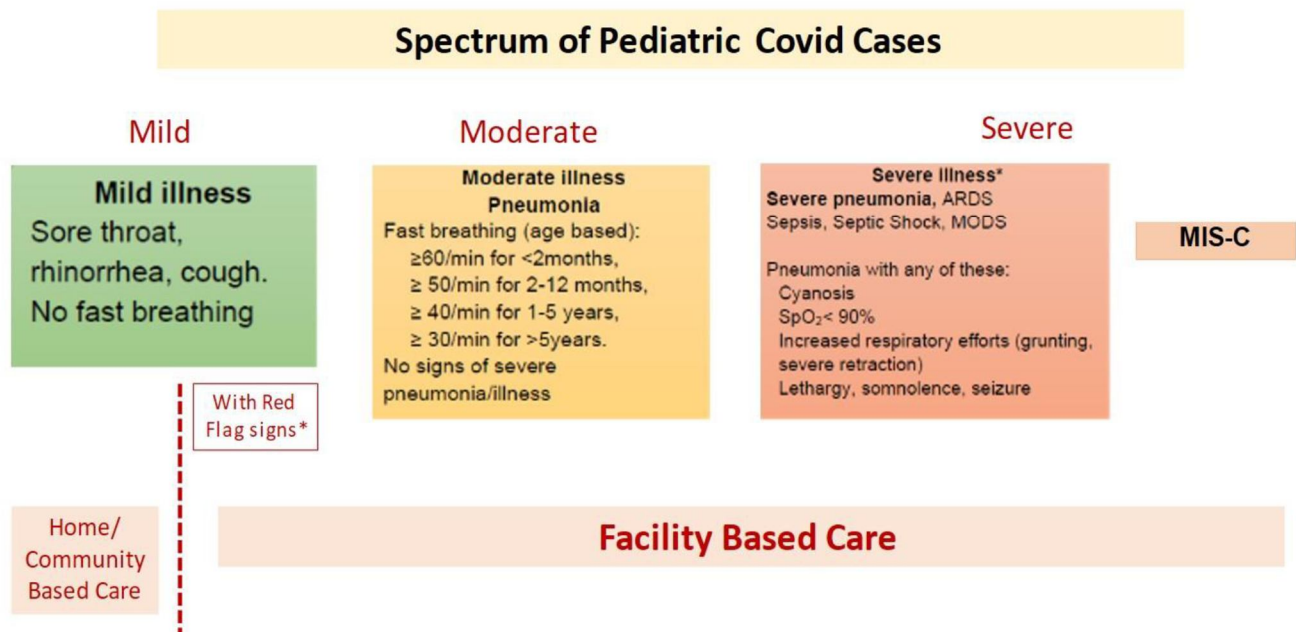
Upper panel depicts the spectrum of pediatric COVID cases classified as mild, moderate and severe depending on clinical presentation of cases and lower panel depicts the type of care (Hospital/ Community or Home) that needs to be provided

Given the spectrum of severity of illness in children and also the unique aspect of MIS-C (without active SARS CoV2 infection), the following framework is proposed (Box 2):

Box 2: Framework for sites for screening/ testing and management of children with COVID-19/ MIS-C

Screening	Confirmed COVID cases (PCR/ CBNAAT/ RAT positive)	MIS-C (PCR/ CBNAAT negative)
Existing screening facilities	Existing COVID facilities (CCC, DCHC, DCH, HDU, ICU)	In addition, also in existing Pediatric facilities- HDU/ ICU services.
Pediatrics ER		

Suspecting COVID-19 and testing in children

The guidelines developed by the MoHFW for management of pediatric COVID-19 outlines the symptoms of COVID-19 (Fig 1). The indications for testing children for COVID-19 are the same as that proposed by the Ministry/ ICMR. Presence of a recent/ current confirmed case of COVID-19 in a family member or a close contact raises the index of suspicion.

At a community level, use of the IMNCI framework to manage children may suffice. The framework will be able to identify sick children needing referral. However, all children with fast breathing and confirmed COVID-19 will need referral for admission. Providing pulse oximeter to the MPW/ ASHA will improve the monitoring and care of children. Children with malnutrition, children with disability, and conditions such as HIV infection, underlying cardiac, liver, kidney ailments, children on cancer chemotherapy and immunodeficiencies would need special attention.

The following figure shows the IMNCI approach to COVID-19 in children (Figure 2).

Figure 2: IMNCI type approach for COVID-19 in children

CHECKING FOR POSSIBLE COVID 19 INFECTION IN THE COMMUNITY BY ASHA

ASK

- Has the infant/child had fever, runny nose. loose stools, poor feeding?

LOOK, LISTEN, FEEL (to be done 12 hourly)

☐ Count the breaths in one minute.

☐ Repeat the count of elevated

☐ Look for nasal flaring

☐ Look for severe chest indrawing

☐ Look and listen for grunting

☐ Measure axillary temperature

☐ Measure oxygen level

LOOK FOR DANGER SIGNS:

☐ See if infant/child is lethargic or unconscious?

☐ Look at the young infant's/child's movements- Are they less than normal

☐ Is the young infant/ child unable to drink or vomits

☐ Dry oral mucosae/ sunken eyes

☐ Pinch the skin of the abdomen. Does it go back:
  - Very slowly (longer than 2 seconds)?
  - Slowly?

☐ Skin rash, stomach pain, red eyes, pale/grey/blue skin/lips/nail beds, extremely tired/lethargic/unconscious (MIS-C)

} YOUNG INFANT /CHILD MUST BE CALM

*AGE BASED RESPIRATORY RATE CUT-OFFS FOR FAST BREATHING:
< 2 mon: ≥ 60/min
2-12 mon: ≥ 50/min
>12 mon- 5 yr: ≥ 40/min
>5 yr: ≥ 30/min

Fever +, stuffy nose+/-, normal respiration, no grunt, no chest indrawing, alert, active, oxygen > 95%

If progresses to moderate disease i.e,
Fast breathing (based on provided age based cut-offs*) and
No intercostal/suprasternal/subcostal retractions and
Unremitting fever for >5 days (If axillary temperature 37.5°C or above (or feels hot to touch) or
Temperature less than 35.5°C (or feels cold to touch
Develops danger signs at any time or
Co-morbidities (underlying chronic lung/kidney/liver disease, malignancy, genetic syndromes)

If progresses to severe disease:
- Fast breathing (based on age appropriate cut offs)
- Grunt, nasal flaring
- Severe chest recessions
- SpO2 < 94%
- Cold extremities
- Poor oral intake, especially in infants and young children
- Lethargic, especially in infants and young children
- Seizures/ encephalopathy

Report to CCC by telemedicine every evening
Reassess daily
Paracetamol drops @10-15 mg per kg 4-6 hourly
Continue breast feeding

Refer to near by CCC using ambulance equipped with oxygen and pediatric specific monitoring equipment
Should ensure the bed availability in CCC prior to shifting
HCW should accompany the child till CCC

Inform designated CCC and arrange for transfer to nearby tertiary care centre using ambulance equipped with oxygen and pediatric specific monitoring equipment
Inform Medical Officer / paediatrician
Transfer on oxygen, IVF

Children seeking care at various facilities should be screened for COVID if they have the clinical features of COVID (Fig 1). Children with indications for testing for COVID should be tested at the designated facilities; children seeking care in ER should be tested in the facility itself. It will be desirable to have RAT kits in ER for quicker confirmation of the diagnosis. RAT may help in early diagnosis in symptomatic children, however negative test should be followed by RTPCR. Children who need admission and need to undergo a RTPCR/ CBNAAT, should be transferred to a holding area while awaiting the reports. The holding area should have requisite facilities for oxygen therapy, HDU/ ICU support.

Management of COVID-19 cases at community level

Children with mild COVID-19 can be managed in the community setting with home isolation under direct care of the parents and family. Parents should be explained about the danger signs for progression of disease (fast breathing, increased work of breathing, bluish discoloration, SpO2 < 94%, not accepting feeds, lethargy, fever persisting beyond 5 days, or high grade fever for more than 3 days). Community health workers (MPW and ASHA) should visit the home at least once daily for providing basic medications as necessary, and monitoring for vitals and danger signs. Checklists for surveillance and monitoring by the MPW/ASHA have been developed **(Appendix 1).** If any worsening is suspected, community health workers should

contact the designated physician (MO/CHO) for a teleconsultation (phone call, video call). Community health workers should inform the patient transfer ambulance/team for transfer of the patients to DCHC/DCH in case there are indications for admission. Overall services should be monitored in a COVID Control Room under supervision of MO. Appropriate infographics should be developed to support the care of child at home.

Community level preparations

A comprehensive IEC campaign which includes messages about pediatric COVID. There has to a specific emphasis on vulnerable children. The orphanages, boarding schools, hostels would need special attention as these could be potential hotspots. Suggested components of the IEC campaign should include

- Reassurance about disease in children
- Symptoms and signs of COVID-19
- Need for early testing for COVID-19 in case of symptoms
- Principles of home isolation
- Avoidance of self-medication for COVID-19
- Whom to contact in case of emergency
- Awareness about MIS-C
- Not to neglect routine immunization of the child
- Following COVID-19 appropriate behaviour including use of mask, social distancing and hand hygiene. (Masks recommended in children aged 5 years or above)
- Those eligible to take COVID-19 vaccination
- Continue other medications for chronic illnesses

This community level intervention will include pamphlets in vernacular languages, posters and home isolation kit. We may bring in tools like number mothers made aware vs. number of mothers registered in RCH portal each district-wise for ensuring a wide reach-out.

Pulse oximeters can be loaned to a family and then can be used later for another family once the previous family recovers. There are concerns about the reliability and ability to record accurate saturation with the finger pulse oximeters in the youngest children. So, adequate importance should be given to the symptoms and clinical findings to assess a child for seeking further medical advice.

Once COVID vaccines are approved for children, community level programs should focus on appropriate communication to facilitate a wide coverage.

Categorization of COVID Health Facilities

On 7th April, 2020, the Ministry of Health and Family Welfare issued a guidance document on appropriate management of suspect/confirmed cases of COVID-19. Based on this guidance,

our state has augmented or created infrastructure for managing COVID cases which are largely catering to adult cases due to the small proportion of pediatric cases. This infrastructure developed for COVID care needs to be augmented for managing pediatric COVID-19 cases for future. This infrastructure will need additional resources to care for the increased number of child patients who often would need accompanying one family member. Children's area/wards should preferably be separate from adult wards for their mental comfort and to ensure parent is allowed to accompany the child, in contrast to the policies in adult area. In addition, to cope up with a **COVID-19 related condition unique to children- MIS-C**, there is also a need to strengthen the existing health facilities for providing assured quality critical care.

The emergency services need strengthening. There has to be appropriate triage systems in place. To keep patients suspected to have COVID-19, while awaiting reports, a holding area is required. The available holding area mainly for adult patients may be augmented to provide appropriate space for children. Such a facility should have facilities for oxygen therapy, HDU and preferably ICU support.

Currently, the COVID-19 hospitals are categorized into three types. As per the management algorithm for COVID-19 cases, infrastructure and other health system requirements varies by symptoms (see Figure 1), wherein the severe cases are admitted in **dedicated COVID-19 hospitals (DCHs)**, cases with moderate symptoms, particularly those requiring oxygen support are admitted in **dedicated COVID-19 health centres (DCHCs)** and mild or asymptomatic cases are either home isolated or admitted in **COVID-19 care centres (CCCs)**. Figure 3 provides the framework for facility-based treatment.

Figure 3: Types of Facility based care
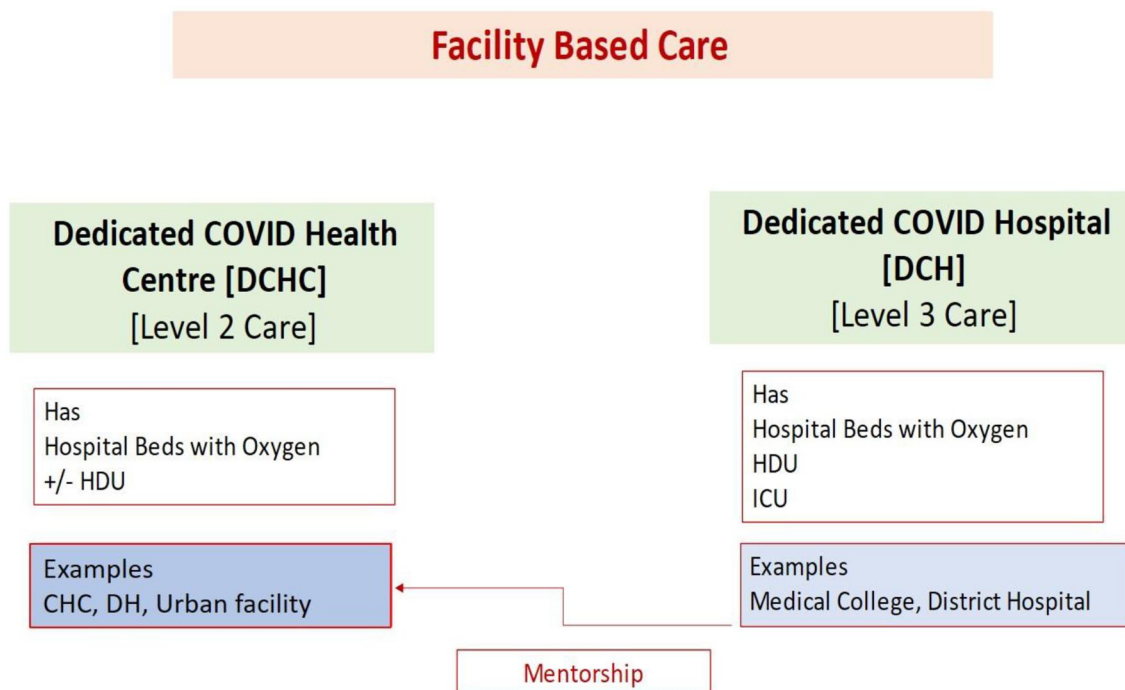
Overview of types of facility based care for management of COVID Cases: Two types of facility based care models are available: DCHC and DCH. While the former has hospital beds with facilities to cater for Oxygen delivery with/ without High Dependency Units (HDU); the latter typically has all components of hospital care including Intensive Care Unit (ICU). DCHC are also referred to as Level 2 Care and DCH as Level 3 Care.

Triaging/ deciding the level of care of children with COVID-19

Children seeking care at a facility should be triaged appropriately with assessment of severity of illness.

Triaging involves two stages - One at the entrance/ screening facility/ ER, and the other at the holding area before entering into the isolation ward/rooms. It consists of both screening plus detailed evaluation wherein patients can be monitored before being wheeled into specific hospital isolation wards.

Depending upon the type and severity of cases the three types of health facilities presently functional for care of patients with active COVID-19 are:

COVID-19 Care Centre (CCC)

The COVID Care Centres are for cases that have been clinically assigned as mild cases or mild COVID suspect cases, in the scenario where there is no facility to isolate at home.

All these COVID care centres have to be mapped to one or more DCHC in case the patient requires referral. One BLS enabled ambulance is to be attached with each of these facilities with sufficient oxygen support on a 24x7 basis.

Dedicated COVID-19 Health Centre (DCHC)

The Dedicated COVID Health Centres are the hospitals that offer care for all cases whose severity has been clinically assigned as moderate. These hospitals are to have assured Oxygen support and have an appropriate referral mechanism for referring to higher centre i.e., DCH, if the symptoms worsen. 10% of total beds at DCHC can be earmarked for paediatric cases; these should be equipped well to handle pediatric cases. There should be provision for augmentation by another 10%, if need arises.

Dedicated COVID-19 Hospital (DCH)

Dedicated COVID Hospitals offer comprehensive care primarily for those who have been clinically assigned as severe. Ten percent of total beds at DCH can be earmarked for paediatric cases and 10% more can be further augmented. All DCH with more than 300 beds should have a separate area designated for children.

Augmentation of additional beds/ ICUs will be done in the existing identified DCH facilities. These hospitals should be equipped with fully functional ICUs and Ventilatory beds with assured Oxygen Support. The Dedicated COVID Hospitals would also be referral centres for the Dedicated COVID Health Centres and the COVID Care Centres.

There should be ambulance facilities for smooth inter-facility transfers (Appendix 2).

Augmentation of the above facilities for pediatric care

Appropriate tools for monitoring should be available (e.g., pulse oximeters with pediatric and newborn size probes). Appropriate formulations of medications required for supportive care should be available. Adequately trained manpower (doctors and nurses) should be available for care of sick children (details below).

Common examples of anticipated care at different levels of care for Pediatric COVID patients are depicted in Table 1. These depend on the availability of specialist providers and the oxygen needs of the patient.

Table 1: Examples of type of Care vis-à-vis type of facility

Type of Care	Examples
Level 2 Care	- Oxygen requirement up to 5 L/min to maintain oxygen saturation ≥95% with stable vital parameters - Oxygen by face mask or nasal prongs or oxy-hood - Monitoring by Medical doctor with a remote on-call Pediatrician / Internal medicine specialist
Level 3 Care	- Oxygen requirement >5 L/min and/or unstable vitals - Requisite backup (Lab, Radiology, Blood bank services etc) to maintain 24X7 ICU Care - High flow oxygen: Non rebreathing masks, High flow nasal cannula - Non invasive ventilation: Bubble CPAP, BiPAP - Mechanical Ventilation, - Monitoring under supervision of Pediatrician/ Intensivists

Table 2 provides the summary of requirements for various levels of care

Table 2: Summary of recommendations for type of facility-based care for pediatric COVID cases

Type of Care	Recommended number of beds	Examples of Care	Recommended Oxygen source	Pediatric Ventilators	HR needs	Locations for set-up (examples)
Level 3 [at DCH]	PICU and HDU beds HDU beds: 3:1 PICU beds	Mechanical / Non-invasive ventilation Continuous monitoring of vital parameters Delivery of COVID positive mothers and care of neonates	LMO, PSA Units	At least 1/3rd of all HDU/ PICU beds. There should be provision to convert HDU to PICU beds with minimal inputs	Pediatrician/ Intensivist/ Obstetrician/ Anesthetist and corresponding required numbers of SR/JR in Med Colleges	Medical Colleges, Large District hospitals, Private health facilities
Level 2 [at DCH and DCHC]	Beds depending on regional needs capable of providing oxygen therapy	Oxygen therapy needing a flow of 5L/minute	PSA Units/ Oxygen cylinders	Nil Can have equipment for NIV if expertise available	General Medical Doctor with on-call pediatrician	Smaller District Hospitals and Community Health Centres
Level 1 [at CCC]	Depends on local needs, part of COVID Care Centres for adults	Children of adults who are admitted at COVID Care centres; children with co-morbidities not needing oxygen therapy and home isolation care is not feasible	Oxygen concentrators Oxygen Cylinders	Nil	Pediatrician / Medical Officer with teleconsultation from paediatrician (Public/ Private)	At Covid Care Centres

1. *All levels of care should be equipped with optimal transport facilities*
2. *The actual needs will vary depending on regional requirement*
3. *The above models can be either a hybrid model (with re-purposed beds meant for adult care under a given setting) or a standalone model specific for pediatric care. For immediate scale-up, it is recommended that hybrid model with re-purposing of existing adult beds for pediatric care be made available. Simultaneously, efforts should be undertaken to develop specific pediatric beds.*
4. *Each pediatric bed should also cater for beds for corresponding care givers, alongside.*

DCH: Dedicated COVID Hospitals; DCHC: Dedicated COVID Health Centre; CCC: Covid Care Centre; LMO: Liquid Medical Oxygen; PSA: Pressure Swing Adsorption; NIV: Non-invasive ventilation

Provisions to allow parent/ family member to stay with the child

These facilities should have provision for the stay of a parent/ care-giver with the child. This could be an adult family member who also has mild COVID/ asymptomatic infection, or one who has previously recovered from COVID. In case the caregiver is COVID negative, he/she still may be allowed to be with the child, after due counselling, appropriate consent, and providing them with appropriate PPE (esp. a good fitting N95/ FFP2 mask).

Augmentation of existing pediatric care facilities to provide care to children with MIS-C

MIS-C is a severe post-COVID-19 inflammatory disorder in children which is frequently associated with complications such as cardiac dysfunction, coronary aneurysms, thrombosis, and multi-organ dysfunction etc. MIS-C cases tend to peak 2-6 weeks following the peak of COVID-19 cases in the community. MIS-C should be suspected in children with persistent fever beyond 3 days with clinical manifestations (Rash, bilateral non-purulent conjunctivitis, diarrhoea, vomiting, or abdominal pain, bleeding, respiratory distress, shock), especially if child had contact with COVID-19 patient in past 1-2 months or had acute covid infection. These features should be included in IMNCI fever algorithms for early suspicion of MIS-C in community and first referral. If MIS-C is clinically suspected, children should be referred to centres capable of providing intensive care support (mechanical ventilation, shock management, facilities for echocardiography, as needed). Management involves supportive care, organ support and immunomodulation (steroids-first line).

Clinical definition of MIS-C, evaluation and treatment protocols have been published (https://www.mohfw.gov.in/pdf/ProtocolforManagementofCovid19inthePaediatricAgeGroup.pdf). **(*Medical/clinical protocols are dynamic & continuously evolving and may change time to time).**

Most children with MIS-C will be presenting to the emergency rooms. As the numbers are likely to increase after a surge in infections, there has to be adequate facilities for their management. The main aspects of care are adequate monitoring esp. of the cardiovascular status. Many of these children, who are PCR/ CBNAAT negative, will be cared for in the pediatric facilities. The HDU/ ICU facilities will need augmentation for the same. The mainstay of management of children with MIS-C are steroids (iv methylprednisolone) and IVIG.

For providing care to children with MIS-C, the existing pediatric facilities have to be strengthened. As per the IPHS norms, approx. 10% of beds in a district hospital should be earmarked for sick children. These facilities should be upgraded to have adequate emergency facility, and enough HDU beds. The guideline developed by the Child Health Division, MoHFW- "Strengthening Facility Based Paediatric Care: Operational Guidelines." Provides detailed requirements[https://nhm.gov.in/images/pdf/programmes/childhealth/guidelines/Strenghtening_Facility_Based_Paediatric_Care-Operational_Guidelines.pdf].

At a 300 bedded DH, the following can be recommended:

- 4 beds in Emergency
- 20 bedded Pediatric ward
- 8 bedded HDU
- 4 bedded ICU

The numbers will proportionately be higher in DH with higher bed strength. These beds do not include the beds for newborn care and SNCUs.

The administration should ensure that at least these minimum numbers of beds are assigned for Pediatrics and these are well equipped as well as well staffed. At the same time efforts should be made to increase the overall numbers of beds as well as beds for pediatric care in the public health system. Additional details of staffing and equipment requirements are discussed later in the document.

Augmenting bed capacity for pediatric care in urban, peri urban and rural area

1. The existing covid facilities should be augmented; the numbers of beds available should be enhanced by at least 10%. These facilities should have provisions to allow the parents to be with the child; separate areas could be earmarked within the covid facilities for children and their parents.

2. These augmented facilities should have adequate provision for oxygen supplies, pediatric specific respiratory support devices, monitoring equipment for children, pediatric formulations. Adequate number of trained manpower for managing pediatric cases should be made available.

3. Standalone pediatric hospitals should create areas dedicated for pediatric covid care.

4. For managing MIS-C, the existing pediatric facilities within various hospitals need strengthening for HDU/ ICU care.

5. If the surge is excessive and the capacity of covid facilities is overwhelmed, then use of general beds/ wards/ ICUs in hospitals may be considered.

6. Pandemics like COVID-19 may affect us at any point of time. Thus, parallely we also need to strengthen our existing health facilities particularly DH and secondary care facilities for provision of assured non-COVID-19 critical care.

7. This is also to flag here that any strengthening in the facility will only be able to respond adequately if it is properly linked with community-based home care. Lesson from the present pandemic has clearly indicated reactions by the public, rushing to the facilities, seeking care for the cases which could have been well managed at home and this may have resulted in denial of certain services for those who actually needed the admission. It is therefore also proposed that every district should have a COVID control room under the guidance of paediatrician and physician so that focus on adequate IEC, reassurance for

community and home-based management particularly for mild cases is properly disseminated and assured to the people.

Admission criteria in different types of health facilities

Suspected cases of paediatric COVID-19 need to be screened based on the symptoms using a standard flow chart (Figure 1) by a trained health worker at community level with proper PPE.

Based on these criteria, patients can be categorized as mild, moderate or severe. The mild cases are then referred to COVID Care Centre or home isolation. Pediatric cases screened with moderate and severe symptoms should be referred to higher facilities (DCHC or DCH). On the basis of above screening, once the patient reaches designated facility, following steps are undertaken:

Initial Screening and Triage 1 at the health facility

1) Just at the entry gate, trained personnel with the recommended PPE to screen the patient by recording temperature, recording SpO_2, take the history of the patient if they have come in contact with COVID-19 patient or if they have any symptom. Patients with low SpO2 (<94%) should be immediately started on oxygen support in the triage area.

2) Attendants and patients beyond 5 years of age group, should wear mask and also follow hand hygiene. A distance of at least 1- meter to be maintained.

Triage 2

1) The cohorting of patients may further be done by the attending doctor based on the clinical observations and will be placed accordingly for appropriate management.

2) The moderate cases are shifted to the yellow/ orange area where COVID-19 testing is done (if not tested earlier). If COVID-19 positive, whether moderate or severe symptoms, they will be admitted to DCH/ DCHC for advance care. If the child tests negative for COVID-19, they are provided with non- COVID-19 essential services. Children in whom there is a strong suspicion of COVID, particularly with family member having COVID, but the child tests negative for COVID, the child should be managed in the holding area and the RTPCR should be repeated.

3) For patients showing severe symptoms and requiring immediate lifesaving measures, emergency should be equipped with ventilator support, access to oxygen support and multipara monitors.

4) After stabilization in Emergency, they can be shifted to pediatric ICU.

Figure 4 : Flow of services at DCHC/DCH
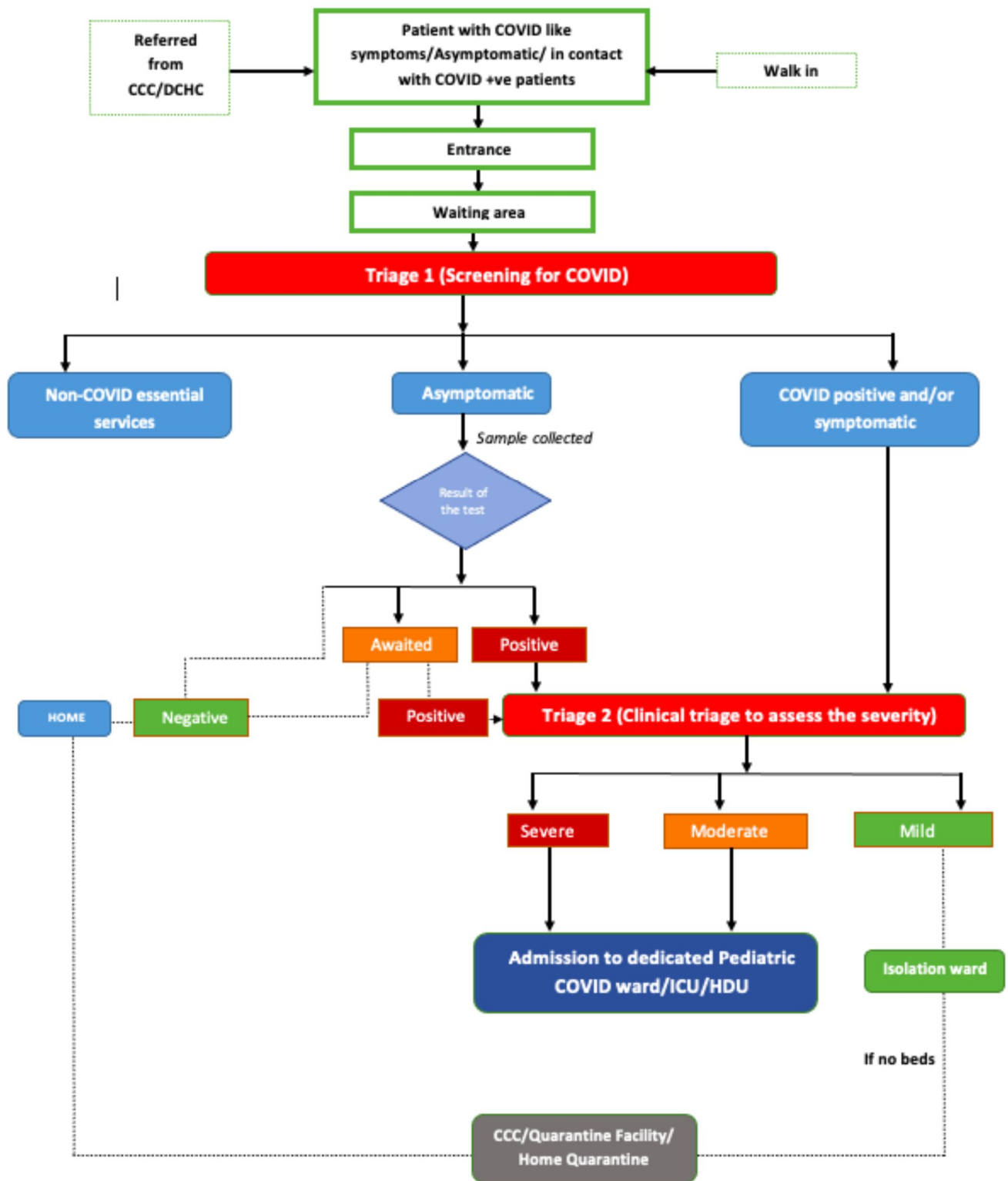
Hospital Infrastructure (DCHC/DCH)

Area for Screening/ Triage / Emergency

1) The emergency area of a COVID facility should be comprehensively created keeping in mind easy accessibility and quick response.

2) The Emergency area should have a dedicated dual triage system with clinical management zones.

3) The triage area should have dedicated space with wall mounted multipara monitors and medical gas outlets. The multipara monitors should have probes/ accessories suitable for children.

4) Necessary accessories for providing oxygen therapy/ respiratory support to children of all age groups should be available; please see section below

5) Pediatric formulations of the commonly used medications should be available; please see section below.

6) Service provision as per the process flow explained above should be available through adequately trained human resource round-the-clock.

7) There should be easy approach and access for ambulances with adequate space for the free passage of vehicles and a covered area for alighting patients.

8) Space to ensure distancing, stretchers, wheelchairs and trolleys should be available at the entrance of the emergency at a designated area.

Oxygen supported beds

1) **Oxygen supported beds**- All beds in DCHC will be oxygen supported whereas DCH will have both ICU and HDU beds. The distance between the beds should be at least 1 metre/ 3 feet.

2) A separate room/Anteroom at the entry of the ward to be made- where all the precautionary steps of PPE, hand sanitizing and hand wash facility can be practiced before entering the room (Donning area).

3) Pediatric wards, similar to other wards, need to have adequate cross ventilation.

4) An attendant / guardian can be allowed with every pediatric patient. They should be trained and oriented on infection prevention, hand hygiene, and providing supportive care to the patients.

5) A designated area should be earmarked in all such hospitals for keeping personal belongings of pediatric patients/ attendants, washroom, etc.

6) The beds in the Pediatric ward should be placed either on one side or both sides of the nursing station ensuring good visibility. It should also be ensured that COVID patients

are not left unattended in the wards as this may have an impact on their mental health leading to isolation and depression.

7) Male and Female toilets should be conveniently located.

Critical care beds: HDU and ICU

1) Critically ill patients requiring highly skilled lifesaving medical aid and nursing care will be admitted here.

2) Generally, Pediatric HDU beds are for patients with single organ failure where a specialist can monitor and manage. Pediatric ICU beds are for patients with multiple organ failure and life is eminently at threat requiring ventilator support with backup for super and multispecialty care. So, a hybrid critical care area (HDU + ICU) with both ventilatory and non-ventilatory beds can be established.

3) **Intensive Care Unit with ventilatory beds** with access to oxygen and multipara monitors (with 3 meter distance from centre of each bed)

4) The unit will also need specialized services such as suction (central supply or through standalone machines), medical gas supply, oxygen (through central supply or cylinders with humidifiers and flowmeters), uninterrupted electric supply, heating, ventilation and air handling unit. Pediatric and newborn specific equipment and consumables should be made available.

5) Ceilings, flooring and walls should be constructed of materials with high sound adsorption capabilities.

6) There should be $\geq$12 air exchanges per hour and preferable, a negative air pressure maintained.

> ## Linkages with tertiary care hospital
>
> *All secondary care hospitals should be linked with District hospital where assured critical care for COVID and related complications (such as MIS-C etc) can be managed.*
>
> *The state must ensure linkages with Tertiary care centres. The medical colleges should be linked with district hospitals. For the same and nodal person shall be appointed who would coordinate regarding bed availability and preparedness.*
>
> *The medical college should regularly update the number of beds available in the public domain.*
>
> ## Augmenting the capacity of medical college
>
> *All paediatric beds at Medical college must be supported by regular oxygen supply and basic equipments.*
>
> *All medical college should have paediatric hybrid HDU consisting of both ventilatory and non-ventilatory beds. The number for the same shall be decided by the medical college depending upon the case load.*
>
> *The paediatric unit catering or being created to serve COVID cases should have preferably separate entry and exit. It should also have a facility to allow one attendant within a critical care ward to support the admitted cases. During non-COVID time, it can serve as a critical care unit.*
>
> *Additional beds may also be added as paediatric COVID positive case increases.*

Telemedicine could be harnessed for supporting various pediatric COVID care facilities and also facilities managing MIS-C. The concept of e-ICU should be deployed for improving care of sick children in the periphery.

Please refer to Appendix 3 for the details of **common services for all types of health facilities**

For the **human resource requirements**, please refer to Appendix 4.

Training

Capacity building of HR on surveillance, infection prevention and control, clinical management and risk communication should be ensured. Training modules available on the website of MoHFW (https://www.mohfw.gov.in/) or iGOT Diksha portal (https://diksha.gov.in/igot/) for these activities shall be used. A combination of online training with virtual interactions, and supplemented by in-person training (Hybrid) may be developed for optimal capacity building. The medical colleges could support/ mentor district hospitals; appropriate linkages for the same should be developed.

Both the doctors and nurses posted in emergency, HDU/ICU, pediatric wards should be trained in routine and critical pediatric care. Customised packages for training hospital attendants, security staff & parents will be needed.

Equipment

Medical equipment plays a significant role in patient care in COVID Hospitals. All the necessary equipment to provide clinical, support and other services should be ensured. Additional equipment, if required, can be procured to provide the full range of services being offered at the facility. Before initiating procurement of any equipment, facility wise gap analysis is a must. A systematic and robust programme for bio-medical equipment maintenance and monitoring should be in place with dedicated responsible people. For equipment requirements, please refer to **Appendix 5**.

For specification of equipment, please refer to the link http://nhsrcindia.org/category-detail/technical-specifications/ODgz

Infection Prevention & Control

Since COVID-19 infection is highly infectious, every hospital handling such patients is expected to put robust infection prevention control protocol in place. Such protocols would be based on latest guidelines, issued by the MoHFW, ICMR, NCDC and CPCB. Safe-guarding health of service providers, attendants and community is of paramount importance. The protocols for pediatric care areas are the same as those for the covid areas.

Following steps need to be undertaken immediately –

Constitution of Hospital Infection Control Committee, if not constituted earlier and weekly meetings

1) Reorientation training of all categories of hospital staff on infection control and prevention.
2) Adherence to infection prevention protocols including cleaning, segregation and transport.

3) Ensuring uninterrupted supply of Sodium Hypochlorite, Isopropyl Alcohol, Ethyl Alcohol, Hydrogen Peroxide, Alcohol based hand rub, Glutaraldehyde, Bins, Linens, etc.

4) Ensuring supply of water and availability of liquid soap, and paper to dry hands and dispenser at all patient care points

5) Facilitate access to full complement of PPE by all category of staff and ensuring its usage on 24x7 basis

6) Availability of Alcohol based hand rub at every possible point of use by the staff and attendants

7) Collection of segregated waste from COVID patients and its labelling throughout the chain of its movement till disposal.

8) Re-ensuring that Common Biomedical Waste Treatment and Disposal Facility (CBWTF) operator collects the waste at least once in a day

9) Reinforced IEC activities on hand hygiene, PPE, cough etiquette, etc.

10) Ventilation and air-exchanges in patient care and visitors' area.

11) Appropriate Bio-safety measures in the laboratories, as per guidelines

Inventory of consumables need to be maintained ensuring an uninterrupted supply chain of consumables. Nodal person should be assigned to oversee

Disposal of the deceased

While the outcomes in pediatric covid are good, deaths may occur occasionally. Dead body disposal for children dying due to COVID-19 should be streamlined; the principles are same as that for adults. Availability of pediatric size body bags should be ensured. Cremation services should be equipped and sensitized to handle bodies of the children. For details please refer to MoHFW guidelines (https://www.mohfw.gov.in/pdf/1584423700568_COVID19GuidelinesonDeadbodymanagement.pdf).

Discharge criteria

For children admitted in a facility, the criteria for discharge are same as that for adults [https://www.mohfw.gov.in/pdf/ReviseddischargePolicyforCOVID19.pdf]

Post COVID-19 care

Children who have suffered from severe COVID-19 infection especially those who have needed invasive ventilation will need enhanced care on follow up. Likely post discharge complications include infections (pneumonia, invasive fungal infections including mucormycosis), thromboembolism, progressive fibrosis and hypoxemia among others. Since children have good regenerative capacity the likelihood of persistent pulmonary dysfunction and

need for home oxygen therapy is likely to be less. The following are recommended for discharge and post discharge care of children who have suffered severe COVID-19

1. A pulse oximeter should be given to the patient at discharge with advice about how the saturation should be monitored

2. Advice about warning signs which include development of fever, persistent drop in oxygen saturation, increased cough or breathlessness, chest pain, headache/ jaw pain/ tooth pain/ nasal blockage.

3. Provision for home oxygen therapy in those that need it and emergency contact number in case of exhaustion of oxygen supply or malfunction of concentrator

4. Emergency contact number in case of warning signs

5. Influenza and pneumococcal vaccination may be considered

Care of neonates born to COVID-19 positive mothers

Up to 10% of neonates born to COVID-19 positive mothers may be RT-PCR positive for SARS-CoV-2 during birth hospitalization (9). Majority of these neonates remain asymptomatic. Occasionally, moderate to severe infections with oxygen requirement can occur. A significant proportion of neonates may however require special or intensive care due to prematurity and perinatal complications. Breastfeeding, rooming-in, kangaroo mother care (when required) should be encouraged in all cases. Therefore, the pediatric facility should have equipment and surgical consumables suitable for neonates including preterms. Routine immunization should be done for stable neonates. Management guidelines for perinatal-neonatal COVID-19 have been published (6).

Neonates with Late-onset Covid-19 disease

During the second wave, an increasing number of neonates with moderate to severe Covid-19 pneumonia and gastrointestinal symptoms have been seen. These neonates typically acquire the infection at home from other family members. Occasional cases of MIS related to COVID antibodies transmitted from the mother have also been seen. The pediatric HDU/ ICU should have suitable equipment and surgical items for care of these neonates e.g.,servo-controlled open care systems, air-oxygen blending systems, CPAP, ventilators capable of supporting preterms and appropriate sized nasal interfaces and endotracheal tubes.

The following types of clinical areas are required for the care of neonates (Table 3):

Table 3: Requirements for various scenarios for new born care

S .No.	Type of facility	Type of care	Location	Remarks
1.	Newborn Care Corners	Resuscitatio nfacilities	Next to or within each delivery area for suspect and confirmed Covid-19 pregnantwomen	Special attentionrequired for ensuring thermoregulation and availability ofblended air-oxygen
2.	Special Care Newborn Unit/Neonatal intensive care Unit for care of 'suspect' neonates	Special or intensive Care for Prematurity or Other perinatal illnesses.	Ideally should be located close to the delivery area. Can be part of pediatric suspect ward, or as a standalone unit, or carved out of existing SNCU/NICU with separate entry/exit and donning/doffing facilities.	Special attention required for ensuring thermoregulation and appropriate equipment. As majority of neonates born to Covid-19 mothers will turn out to be negative and will need to stay in the area for 5-6 days before they can be confidently declared negative for SARS-Cov-2, this area will need the largest proportion of neonatal beds, staff and equipment
3.	Special Care Newborn unit /Neonatal intensive care unit for care of 'confirmed' neonates	Special or intensive Care for prematurity or other perinatal illnesses or early onset Covid-19 disease	Part of pediatric COVID confirmed area	As the number of such cases is going to be small, it will be more efficient to locate them within the pediatric COVID facility.
4.	Postnatal COVID ward /rooms for mother-baby dyads	Rooming-in of stable babies with suspect or confirmed Covid-19 mothers	Part of obstetric Postnatal wards /rooms for 'suspect' or 'confirmed' Covid- 19 mothers.	Equipment and staff for monitoring and essential neonatal care will be required. (thermoregulation, lactation and KMC support, monitoring for blood glucose, jaundice and phototherapy
5.	Well-baby COVID area	Rooming-in of stable neonates with family caregivers in case of non-availability of mother.	An area under pediatrics will have to be marked for this. If such a facility cannot be created, these babies may be accommodated in the SNCU for 'suspect' cases (item no.2) until fit for discharge	Family members may also be positive or not available for baby care. In such cases, the babies can be accommodated in the SNCU for 'suspect' cases.

It will be more efficient and beneficial for patients as well as care providers, if the obstetric and delivery areas for suspect and Covid-19 pregnant women are located along with neonatal and pediatric areas.

For the **Governance structure for Pediatric COVID Care**, please refer to Appendix 6

Equity and dignity of care is critical in all health care services, including the covid facilities. Please refer to Appendix 7 for the framework to provide and monitor appropriate services, roles and responsibilities of the nodal officers to ensure high-quality care.

Research and Registry

To understand disease burden, profile, pattern and outcomes, including any changes over time, a registry should be established to collect data from pediatric cases, including severe COVID & MIS-C. It will also be important to include data for the more vulnerable children; e.g., malnourished children, children with disabilities, children with chronic medical conditions, and children living with HIV. At the same time, important research areas should be identified and projects undertaken to address various aspects of management of COVID in children. Operational research is also a need of the hour.

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Appendix 1: Checklists for surveillance and monitoring by ANM/ASHA

Physical Triage Checklist – Surveillance in Children
(To be used by ASHA/MPW-M or F/Community Health Worker/Community Volunteer)

1. **Demographics**
    a. Name: ....
    b. Age: ....0-2 months □ 2- 12 months □ 1-5 years □ >5-9 years
        □ 10-14 years □ 15-18 years □
    c. Sex: ....

    RT-PCR/RAT status with date _____

2. **Symptoms (Please consult CHO/MO if any one of the following symptoms is present):**

Symptom		No. of Days since onset of symptom	Symptom		No. of Days since onset of symptom
Fever	□		Fatigue	□	
Cough	□		Body ache	□	
Shortness of breath	□		Loss of smell	□	
Loss of taste	□		Headache	□	
Runny/blocked nose	□		Vomiting	□	
Sore throat	□		Rash	□	
Blood in sputum	□		Confused status	□	
Redness of eye, lips	□		Loose stools	□	
Abdominal pain	□		Chest pain	□	

3. **Co-morbidities (if already known):**

Diabetes Mellitus Type 1	□	Chronic Liver disease	□
Hypertension	□	Congenital Heart Disease	□
Cardiac disease	□	Cancer	□
Respiratory illness	□	On steroid/chemotherapy	□
Chronic kidney disease	□	Regular dialysis?	□
Psychiatric illness	□	Obesity	□
Chronic arthritis	□	Severe malnutrition	□
Neurological disorders	□		

4. List of current medications:

    a. _____

    b. _____

    c. _____

5. Examination (Please consult CHO/MO if any one of the following signs is present):

S. No.	Parameter	Response	Action required- Consult CHO/MO in case of the following finding
1	Mental status	Conscious, oriented ☐ Altered sensorium ☐	Altered sensorium

2	Respiratory rate (RR) (count/min)	...................../min	If more than
			  ≥60/min for 0-2 months
			  ≥ 50/min for 2-12 months,
			  ≥ 40/min for 1-5 years
			  ≥ 30/min for >5years

3	Oxygen saturation	.............%	below 94%

	1. Eligibility criteria for home isolation (Please tick the response)		
A.	Is respiratory rate < age specific cutoff	Yes	No
B.	Is room air SpO_2 >= 94%	Yes	No

C.	Absence of **ALL** of the following high-risk features
	  ● Cardiovascular disease including hypertension
	  ● Diabetes
	  ● Immunocompromised states
	  ● Chronic lung disease
	  ● Chronic kidney disease
	  ● Chronic liver disease
	  ● Cancer
	  ● Transfusion dependent thalassemia/hemophilia
	  ● Cerebrovascular disease
	  ● Obesity (BMI> 2SD)
	  ● Severe malnutrition
		Yes	No

	2. Social eligibility criteria for home isolation (Please tick the response)		
A	The patient has a requisite facility for isolation at his/her residence and also for quarantining the family contacts	Yes	No
B	Caregiver is available to provide care on a 24X7 basis	Yes	No

C	The parents/caregiver has agreed to monitor health of the child and regularly inform his/her health status to the Surveillance Officer/ doctor	Yes	No
D	The parents/ caregiver have filled an undertaking on self-isolation and shall follow home isolation/quarantine guidelines	Yes	No

Red flag signs:

S. No.	Parameters	When to refer (Danger Signs)
1	Fever	>100.4 F for more than 3days
2	SpO2	below 94 %
3	Bluish discolouration of body	Refer if Yes

4	Respiratory rate	If more than
		    ≥60/min for 0-2 months
		    ≥ 50/min for 2-12 months,
		    ≥ 40/min for 1-5 years
		    ≥ 30/min for >5years

5	Chest indrawing	Refer if Yes
6	Skin rashes	Refer if Yes
7	Redness or swelling of lips and tongue	Refer if Yes
8	Redness and swelling of hands and feet	Refer if Yes
9	Oral Intake	Refer if reduced
10	Lethargic	Refer if Yes
11	Urine output (at least 6 times/day for newborn)	Refer if Reduced
12	Cold extremities (check in newborn)	Refer if Yes

**Physical Triage Checklist- Home Isolation Daily checklist
(To be filled for 14 days)
Date: ....**

Number of Days of home isolation: ....

1. Demographics

    a. Name: ....

    b. Age: .... 0-2 months □   >2- 12 months □ 1-4 years □   5 to 9 years □
       10-14 years □   15-18 years □

    c. Sex: ....

General Examination

S. No.	Parameters	Observation	When to refer (Danger Signs)
1	Fever		>100.4 F for more than 4 days
2	SpO$_2$		below 94 %
3	Cold extremities	Yes No	Refer if Yes
4	Respiratory rate		If more than ≥60/min for 0-2 months ≥ 50/min for 2-12 months, ≥ 40/min for 1-5 years ≥ 30/min for >5years
5	Chest in-drawing	Yes No	Refer if Yes
6	Skin rashes	Yes No	Refer if Yes
7	Redness or swelling of lips and tongue	Yes No	Refer if Yes
8	Redness and swelling of hands and feet	Yes No	Refer if Yes
9	Oral Intake	Adequate Reduced	Refer if reduced
10	Lethargic	Yes No	Refer if Yes
11	Urine output (at least 6 times/day for newborn)	Adequate Reduced (less than 6 times a day)	Refer if Reduced
12	Cold extremities (check in newborn)	Yes No	Refer if Yes

Other observations:

S. No.	Parameters	Observation	Action required
1	Daily monitoring chart updated	Yes No	Ensure adherence to home isolation protocol
2	Drugs available and administered on a timely basis	Yes No	
3	Warm saline gargles (for children more than 5 years age and adolescents)	Yes No	
5	Oral fluids taken regularly	Adequate Reduced	
6	Timely Intake of nutritious diet	Yes No	
7	Child wearing mask (>5 years of age)	Yes No	

Appendix 2

Specific requirements for Inter- Facility transport – transfer to a higher facility

Background:

A referral pathway and emergency transport need to be in place for the transfer of patients with history of contact, suspected or positive for COVID-19 with severe illness, to the designated higher facility. The guidelines for this inter facility transport–transfer will ensure their safe clinical care as well as make sure that the clinical team as well as the transport team are sufficiently protected from SARS-COV-2. Given the highly contagious nature of SARS-COV-2, we need to pay special attention to infection control and monitoring during transport of critically ill children.

Transport of patients

AMBULANCES

Ideally, separate ambulances and personnel should be earmarked for transporting COVID-19 suspect / proven cases.

There are 2 types of ambulances: ALS i.e., those with ventilators & BLS those without ventilators. There are also ambulances for neonatal transfer that have equipment meant for management of sick newborn.

If dedicated ambulances for COVID are not feasible then other ambulances having basic facilities like that of BLS can be used but strict adherence to cleaning & decontamination protocols must be followed before it is used for non-COVID purposes.

Each facility should make a list of all the ambulances available in the locality and empanel them to be used whenever required.

The ambulance should have the following **basic equipment and drugs** in anticipation of any medical emergency en route:

1. Stretcher trolley (foldable) with IV stands
2. Vital sign monitor.
   NIBP, with cuffs of all sizes
   SPO_2
   ECG
3. Transport Ventilator with O2 source and inbuilt compressor
4. Syringe infusion pump
5. Ventimask with O2 flow meter
6. Ambu bag,250ml, 500ml ,1000ml with face masks 0,1,2 and reservoir
7. Laryngoscope with blades: 0,1,2 straight and curved
8. ETT No: 2.5, 3, 3.5, 4, 4.5, 5, 5.5
9. LMA 0, 1, 2
10. Oropharyngeal airway
11. Suction apparatus with suction and Catheter
12. Emergency drug tray: Adrenaline, Lorazepam ,Phenytoin, Phenobarbitone, Atropine, Dextrose (25% & 10%), Furosemide, Midazolam, Hydrocortisone, Salbutamol respiratory solution
13. IV fluids: Normal saline, Ringer lactate, 10% dextrose
14. Nebulizer
15. Glucometer
16. IV Cannulae

17. Hood Box
18. Tapes to fix the tubes
19. Triple layered masks
20. Hand sanitizers.

Ambulances should have only the essential equipment and material for immediate use to avoid contamination

Protection of Personnel
- For HCW providing clinical care during transport: Full PPE: Protective gown, N95 masks, double gloves, goggles, head cover, shoe covers.
- For drivers, technicians not directly involved in care of the patient: Gown, surgical masks, gloves
- For patients not requiring respiratory support: Surgical mask whenever feasible (older than 5 years)
- For accompanying care giver: surgical mask
- Public health measures e.g. hand hygiene, respiratory etiquettes need to be adhered to.

Procedure
The staff of the referring hospital has to first get in touch with the higher level referral hospital, ensure the availability of beds and inform about the condition of the child.
Prior to shifting of the patient, HCW from the ambulance will perform the following:
- Wear the appropriate PPE
- Assess the condition of the child
- Ensure that the child is stabilized
- Contact the identified facility for facility preparedness & readiness.

Only one caregiver, usually the mother, should be allowed to accompany the child.

Management on board
- Measure vitals of patient and ensure the patient is stable
- Measure SPO2
- If required, give supplemental O2 therapy with oxygen hood instead of low flow O2 via nasal cannula, to maintain SPO2 >90%.
- If a Bag Valve Mask (BVM) is required in the event of worsening hypoxia during transport, provide only gentle bagging to reduce aerosolisation.
- Avoid unnecessary breathing circuit disconnection during transport
- In general, all Aerosol Generating Procedures (AGP) should be avoided during transport unless absolutely necessary for patient care.
- If a child is being transported on a ventilator to the higher center follow ventilator management protocols provided the HCW is either trained or is assisted by a doctor well versed in ventilator management.
- In the event of cardiac arrest in an intubated and mechanically ventilated patient: Do not disconnect the ventilator when starting CPR, increase FiO2 to 100%, give chest compression, check the ventilator tubing to ensure that, that was not the cause for the cardiac arrest as, early detection and proper treatment of potentially reversible causes during CPR, is very important.

Handing over the patient

- On reaching the receiving hospital, the HCW will hand over the child and give details of any intervention done during transport.
- HCW will then doff as per protocol, followed by hand washing. Use alcohol rub/ soap and water for hand hygiene.
- Transport staff should put on new PPE prior to the return journey in the same ambulance and doff after reaching back
- The Biomedical waste (including the PPE) to be disposed off in a bio- hazard bag (yellow bag). Inside would be sprayed with sodium hypochlorite (1 %) and after tying the exterior should also be sprayed with the same. It will be disposed off at their destination hospital. This is again followed by hand washing.
- The equipment used during transport should be cleaned and sterilized as per facility protocol.

Disinfection of ambulance

- All surfaces that may have come in contact with patient, attendant or materials contaminated during patient care (e.g.: stretcher, rails, control panels, floor, walls, work surface) should be thoroughly cleaned & disinfected using 1% sodium hypochlorite solution.
- Clean and disinfect reusable patient care equipment before use on another patient with alcohol-based rub.
- Cleaning of all surfaces & equipment in the ambulance should be done morning, evening, & after every use with soap / detergent & water.
- Cleaning staff should be in PPE

Training of the ambulance staff

- All the staff of the ambulances e.g., the driver, the technicians should undergo training in:
  - Some basic knowledge of what COVID-19 infection is
  - General principles of infection control
  - Donning and doffing of PPE

Appendix 3

Common services for all type of health facilities

Waiting area
1. To be set up along with the triage area where an attendant of the child can wait and can be sent back from a separate exit. A physical distance of at least one metre between two people should be maintained.
2. Only one attendant will be allowed with each patient. Mask and hand washing facility will be made available for all attendants.

Diagnostic Services
In addition to Diagnostics tests required for confirmation of COVID 19 (details given in following section), tests for management of critical patients in ICUs, including Complete Blood Count, Serum Electrolytes, Kidney and liver function tests, CRP, Arterial Blood gas, Troponin are required. For ICUs, Point-of-care testing devices can also be used.

Support services
Provision for medical gas pipeline system/ oxygen supply (details placed at Annexure 2), laundry (on or off site), Sanitation, housekeeping services, Kitchen service, CSSD services (can be linked with main services). Services like Bio Medical Equipment Management, CSSD, Mechanized Laundry, Dietary Services should be linked with the existing health facility. Personnel to manage these services should also be ensured.

Disaster Preparedness and Management
Compliance as per state and centre government guidelines for disaster management should be ensured.

Fire Safety
Access of fire tender and rescue teams, availability of open spaces on each floor, clearly visible fire exits with proper illumination and lighting (even during interruption in electric supply) are some of the important considerations for creating fire safe infrastructure. As a principle, none of the fire exit doors should be kept locked. These doors should be fire resistant and can be opened towards the outside with a push bar system on the doors. Fire detectors, extinguishers, sprinklers, and water connections should be functional and easily accessible.

Electrical Load
1. Distribution of electric load along with load balancing to various equipment and installations in a facility is very important since overloading at any point can result in mis happening like electric fire hazard or can damage the equipment.
2. Similarly, fluctuation in voltage also adversely affects the equipment and hence automatic voltage regulators which regulate fluctuating input power voltage and maintain constant output voltage should be provided. So, electrical installation is a specialized job and must be given due importance to ensure proper care with reduced risks to the patient.

Oxygen Support

1. Provision of continuous supply of oxygen for oxygen therapy will be critical in Emergency Department, Intensive Care Units (ICUs), oxygen supported beds, isolation wards/rooms, etc. Oxygen generator based system to generate oxygen in-house is recommended as a preferred source of supply of oxygen, as this will ensure an uninterrupted supply.
2. This is to flag here, if the Oxygen Generation Plant is being installed, then it should cater to the needs of the entire hospital in both COVID and non-COVID cases.

Administration area, **storage room with adequate supplies.**

Staff room/Rest room

For health care workers to be made available separately. It should have provision for a changing room and a pantry for staff. A small locker for the staff to keep extra uniforms can also be provisioned for.

Security arrangements

Should be adequate and appropriate, for example, female security guards for female wards. CCTV cameras can be installed to ensure monitoring and surveillance. Security services should be properly planned and staff should be trained accordingly. Restricting unnecessary movements and visits to ensure patient safety and breaking possible chain of transmission is also the responsibility of security staff.

Appendix 4

Human Resource

1) HR at various facilities should be as per IPHS, however if any additional beds are added to fulfil additional service requirement for COVID cases, additional Human Resource will be required while addressing the following principles:

2) Ideally, staff to operationalize and manage the facility, should be utilized from the existing pool of staff/from the nearest non-functional or partially functional health facilities.

3) Services of Specialist such as Medicine, Anesthesiologists, Pediatrics, Microbiologist (for diagnostic support and IPC), Psychiatrists, Psychologists, Psychiatric Social Worker and General Duty Medical Officers (GDMO), are required for care of the patients admitted in the facility.

4) For HR other than specialists, following ratio of staff can be adhered to:

Service Area	Type of Staff	Ratio (per shift)
Emergency	Nurses	Red + Yellow + Green + Triage + Isolation Beds (At least 2 nurses in each shift)
	Medical Officer	1:10
Oxygen Supported Bed	Nurses	1:6
	Medical Officer	1:10
ICU	Nurses	1:1
	Medical Officer	1:10
SNCU	Nurses	1:3
	Medical Officer	1:10
HDU	Nurses	1:2
	Medical Officer	1:10
Wards	Nurses	1:6
	Medical Officer	1:15

5) Arranging HR shall be the responsibility of the CMO/CMHO/Head of the district health department, etc.

6) They can also be hired on an hourly/temporary basis. Trusts, NGOs, mission hospitals, Professional organizations like IMA can also be contacted.

7) For specialists, doctors and nurses particularly working in DCH, there should be a defined roster. Administration should provide accommodation for them so that, if they wish, they may prefer to stay in the accommodation provided during quarantine and to keep their families safe.

Appendix 5

Equipment/ Medications required at various levels of health care

Level 1: COVID Care Centres

The list of key equipment and consumables for CCC are depicted in Table 1.

Table 1: Proposed standard of Pediatric COVID Care at CCC (Level 1) facility/CHC

Essential Equipment (per 25 beds)	Consumables	Drugs / Medications
- Resuscitation Couch/ Bed (1-2) - Self-inflating bags newborn (250 ml), infant (500ml) & pediatric (750 ml) (1-2 of each size) - Masks newborn, Infant, child (00,0,1,2) - O2 cylinders / Oxygen concentrators (2 Jumbo) - Laryngoscope handle and blades (curved & straight) of all sizes (1-2) - Pulse oximeter (1-2) - Electrical / foot-operated suction machine (1-2) - Glucometer & strips (1-2) - Thermometer (1 per bed) - ECG machine -1 - Radiant warmer (1) - Emergency trolley (1) - Measuring tape (1-2) - Weighing scales for infants and children (1 each) - NIBP with all cuff sizes (1-2) - Torch (1-2) - Stethoscope (1-2) - Algorithms/flow charts - Printed drug dosages for children - AED (desirable) - X-ray view box (1) - Table and chairs for staff (2) - Almirah (2)	- Oxygen delivery devices: Nasal prongs, simple face masks, non-rebreathing masks, oxygen hood - Pediatric NRBM masks, Simple face masks and nasal cannula of all sizes - Oral / nasopharyngeal airways (different Ped. sizes) - Endotracheal tubes (2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0 cuffed and uncuffed) - Intra-osseous needle - IV infusion sets/dosiflow - IV cannulae (size 20,22 or 24,26G), three way - Adhesive tape, 2 sizes - Syringes 1 ml, 2 ml, 5 ml, 10 ml - Disposable needles 22,23,26 G - Nasogastric tubes (sizes 6,8,10,16 fr) - Suction catheters: size 6, 8,10,12 Fr - RL / NS 0.45% Saline with 5% Dextrose - Dextrose 10% ,25%, 50% - Povidone-iodine for local application, Spirit swabs - Spacers and Masks - Hand Rub - Gloves - Medical Waste Segregation Buckets	- Oral Rehydration Solution - Paracetamol (oral Syp. And Tabs, per rectal, IV) - Inj. Atropine - Inj. Adrenaline - Inj. Sodium bicarbonate - Inj. Calcium gluconate - Inj. Magnesium Sulphate (50%) - Inj. Phenobarbitone, Inj. Phenytoin - Inj. Diazepam, - Nasal/ buccal/ rectal diazepam or midazolam (desirable) - Salbutamol (MDI) - Inj. Hydrocortisone, dexamethasone), Tab. Prednisolone - Inj. Furosemide - Inj. oral Ampicillin, Amoxicillin, cloxacillin 3rd generation cephalosporin - Inj. gentamicin/amikacin - Inj. Ranitidine/pantoprazole - Inj/Oral Anti-histaminics (Avil) - Inj. Potassium chloride - Inj. LMWH/UFH - Syp Zinc - Syp. Multivitamin

● IV stands (2) ● Needle cutters (1) ● Patient Stretcher and Wheelchair (1-2) ● Water Cooler – 1 for each facility ● Refrigerator – 1 for each facility ● BLS Ambulance with 24X7 oxygen support – mandatory 24X 7	● Bandages, adhesives ● Pediatric drip set	

Level 2: Dedicated COVID Health Centres

Table 2: Proposed standard of Pediatric COVID Care at DCHC (Level 2) facility

Essential Equipment	Consumables	Drugs/Medications
In addition to Level 1, ● High flow nasal cannula (HFNC) ● Bubble CPAP ● BiPAP machine with appropriate pediatric NIV mask ● Venturi masks ● Syringe pumps ● Otoscope ● Ophthalmoscope ● Defibrillator ● Patient Transport trolley/ ventilator ● Multi para monitors ● 12 lead ECG machine ● Ventilators (invasive & non-invasive) if skilled manpower is available ● Indigenous CPAP/ Bubble	**In addition to Level 1,** ● Blood transfusion sets ● LP needles, ICD tubes (8,10,12 Fr), bags ● Tracheostomy Kits ● Ventilator tubing's ● NIV masks(pediatric size) ● Central venous lines (optional) ● Umbilical catheters ● Closed Suction Catheters(6,8,10,12Fr) ● Urine Catheters and bags ● Foley's catheters 6, 8, 10, 12, 14Fr ● Urometers	**In addition to Level 1,** ● Inj. Ketamine ● Injections Dopamine, dobutamine, adrenaline, nor epinephrine, ● Inj. Adenosine, Amiodarone, lidocaine ● Inj. Fentanyl, Inj. morphine ● Inj. Trenaxemic acid ● Inj. Valproate, Inj. Leviteracetam ● Inj Methylprednisolone ● Inj IVIG

Level 3: Dedicated COVID Hospital (Medical colleges, teaching hospitals)

Table 3: Proposed standard of Pediatric COVID Care at Level 3 (DCH)

Essential Equipment	Consumables	Drugs/Medications
In addition to Level 2, • ICU ventilators capable of ventilating all pediatric age group including preterm neonates • Pediatric and neonatal reusable ventilator circuits with appropriate heating wire, humidification chamber, temperature sensor probes for humidification • Endotracheal cuff manometer • Portable USG with pediatric appropriate probes • Renal replacement therapy (in referral centers) • Transport Ventilator • Air Mattresses • Blood storage services	In addition to Level 2, Central venous access (3, 3.5, 4, 4.5, 5Fr catheters) Arterial line transducers Peritoneal dialysis catheters PD Dialysis Fluid Closed suction catheters Suction catheters sizes: 6,8,10,12,14,16Fr with gradation over (not plain) Pediatric and Neonatal HMEs • Neonatal and pediatric disposable ventilator circuits • Endotracheal tubes both cuffed and uncuffed (3,3.5,4,4.5,5,5.5,6,6.5) • Tracheostomy tubes (3, 3.5, 4, 4.5)	In addition to Level 2, Inj. Milrinone, Inj. Vasopressin Inj. Albumin Antibiotics: Piperacillin-Tazobactam, Meropenam, Colistin, Septran, Levofloxacin Inj. AMB, fluconazole

1. Beds: Includes standard electrical fittings per type of bed as per standard hospital parameters.

2. Oxygen source could be from central pipeline, cylinders or concentrators. But all ICU beds must have central pipeline oxygen source.

3. Compressed air source: Are mandatory for ICU Ventilators. If the ventilators are turbine driven, then air compressors not needed.

4. Suction source could be central suction or stand-alone suction machine.

Appendix 6

Governance

A. Effective governance of the public health system includes the establishment of institutional arrangements (existing facility and stand-alone COVID hospital) and policies along with their continuous monitoring to ensure proper implementation. Apart from ensuring good leadership, it also includes specific interventions such as:

B. Existing hospitals have RKS in place, in-case a new hospital or temporary building is converted into COVID hospital, then, the RKS of the nearest hospital or as decided by the District Health Administration will work as the RKS/Hospital Management Committee.

C. During pandemic, epidemic, disasters, or such crises, state and district administration support in procurement/supplies/hiring of HR and in establishing various need-based services for the hospital.

D. Every district taskforce/RKS should include pediatrician as a member.

E. Daily/ Weekly meeting on case reviews, follow up details of home isolated COVID positive cases, surge in active cases, home-based rehabilitation and death reviews should be ensured, as needed.

In addition to above, the RKS is empowered for taking decisions on:

1) Procurement of equipment and consumables to fulfil operational requirement

2) Flexibility to hire human resource based on demand and needs

3) Capability to enhance functional capacity in terms of a greater number of beds

4) Building accountability into the system (monitoring) and ensuring patient safety and infection control mechanisms.

5) Patient centric services being delivered round the clock and assuring emergency services;

6) Addressing grievances through a robust and efficient system

7) Compliance with statutory norms (Acts and regulations) and ensuring robust clinical governance (adherence with SOPs and standard treatment guidelines, adverse incident reporting, near miss reporting, clinical audits)

8) Proactively seek out participation from charitable and religious organizations, community groups and corporates for providing volunteers for clinical and allied health services

9) Confirm that all patients do not incur any cost for their treatment, transport, diet and stay.

10) Ensure stress free environment for service providers.

11) Provision of non-clinical services (e.g. safe drinking water, diet, litter free premises, clean toilets and linen, security)

12) Ensuring adherence to Infection Prevention and Security Protocols.

13) Any other support required to hospital for its smooth functioning.

Monitoring

Monitoring, continuous support and encouragement by supervisors and administration will strengthen quality of service delivery. RKS should regular review the reporting on adverse events, infection control measures, safe clinical practices etc. Mechanisms for monitoring will include proper record keeping and maintenance, supportive supervision and a regular system of audits (clinical audit, death audit, disaster preparedness audit) as part of clinical governance.

Roles and Responsibilities (SNO/DNO)

1. The prime responsibility of a nodal officer would be to do a quick situational analysis with the help of public health team, identify priority action points to close the gaps.
2. Activate/ utilise the war rooms in terms of its ability to respond to dynamic emergent scenarios at field level.
3. Take a stock of the supply chain management (with a focus on oxygen and pediatric consumables) and ensure availability of essential medicines and consumables in the identified institutions.
4. State should ensure that capacity building of the staff at these SHC &PHC Health and wellness Centres and CHCs are completed at the earliest.
5. Officer in charge of CCCs/ PHCs / CHCs should provide a real time data on patient inflow and resources available with the institutions, district nodal officer/war room, immediate replenishments/ provide other support.
6. States may ensure the tele-consultation facility with a dedicated doctors for these facilities.

Roles of MPW/ ASHA

1. MPW/ ASHA should be able to identify children with symptoms suggestive of COVID using IMNCI based algorithm.

2. MPW/ ASHA workers should be trained for monitoring a child in home isolation and early recognition of indications for referral and facilitate the transport.
3. Calling BLS/ALS ambulance as soon the respiratory rate in a child is observed at the levels indicated
4. Follow the national protocols for home management of a child with COVID
5. To assist in the vaccination drive for children once COVID vaccines are approved for children.

Appendix 7

Equity and Dignity of Care

1. Well maintained Infrastructure, adequate & skilled human resource, functional equipment & instruments and sufficient drugs & consumables ensure the fulfilment of the 'Structural' requirements for a well-functional COVID care facility. However, for attaining enhanced satisfaction with improved clinical outcomes, it becomes equally pertinent to ensure 'Quality' in the 'Processes' of the care.

2. *As a healthcare provider, while it is important to ensure provision of safe and evidence based clinical care, it is equally fundamental to provide the care that makes patients' and visitors' experiences rewarding. Ensuring 'Quality of Care' as a key component would require undertaking conscious and concerted efforts to identify the 'Gaps' by measuring the Quality of Care (QoC) as per the National Quality Assurance Standards.*

3. A well-built institutional framework under the guidance of SNO will oversee the functions of COVID care facilities for seamless implementation of the quality standards.

4. Key functional areas like laboratories, diagnostics, supply chain etc., should be monitored through an internal and external quality assurance systems.

5. Quality in services needs not only to be delivered but also to be perceived by the patient and the attendants coming to health facility. So, besides ensuring technical protocols, it is pertinent that care is delivered with respect and dignity in an environment which is client friendly.

6. Implementing a robust feedback system like *"Mera Aspataal"* and even exist interviews after OPD and indoor services are some of the important processes for understanding the patient perspective towards the care being provided by the health facilities.

7. Measures should be taken to decrease out of pocket expense of the patient.

Daily Rounds (MS/Deputy MS/HM/DNS/Matron/Nurse In-charge/SI)

A. Daily round by the health officers/ managers would have the advantage of picking up gaps in delivery of quality services, cleanliness, adherence to infection prevention protocols, provision of respectful care to all patients particularly to patient without attendants.

B. They should ensure technical protocols are adhered in all service delivery areas, unnecessary stores and junk are removed, room-wise protocols are displayed in each department, cleaning schedule, adequate medicines, equipment, consumables for that particular day. They should also monitor whether equipment is in a functional state or not.

C. Monitoring and recording the critical indicators of hospital like – bed occupancy, death rate, mid-night head count etc., handing-over and taking-over protocols, sharp management protocols, biomedical waste disposal practices are being followed as per protocols are also essential activities to be done during the daily rounds. Removal of unnecessary items, non-functional equipment etc. undertaking of pest control measures inside hospital building & all over the campus should also be done.

Records, Registers & Death Audits

Health intelligence in terms of standard formats to capture data on key performance indicators will facilitate a system for robust internal monitoring. This should be regularly reviewed by senior administrative and clinical personnel to enable gap analysis. An action plan with corrective measures, the person/department responsible and time lines should be prepared and reviewed at the next meeting. Every week death audits, not for blame, but to understand fixable root causes should be done in a non-threatening environment. Computer with Internet connections to be provided for entering facility MIS information.