

The 2021 Toolkit for Emergency Preparedness and Mitigation to Combat Surge of Pediatric COVID-19 Patients in India: The World Health Organization Collaborating Center for Emergency and Trauma in South East Asia Recommendations

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Abstract

The authors of this toolkit focus on children under the age of 18 comprising approximately 41% of the total population in India. This toolkit has been created with an objective to prepare, mitigate the effects of any surge of COVID-19 in our communities, and help to optimally utilize the scarce resources. The toolkit design suggests the manpower, equipment, laboratory support, training, consumables, and drugs for a 10-bedded pediatric emergency room, 25-bedded COVID pediatric intensive care unit, and 75-bedded COVID pediatric high dependency unit/ward as defined for a 100-bedded facility. A dedicated and detailed chapter is included to address the psychological needs of the children. These data can be modified for other department sizes based on the facilities, needs, local environment, and resources available.

Keywords: COVID-19, disaster, pediatric toolkit, preparedness

INTRODUCTION

Welcome to this unique document that focuses on the youngest, most vulnerable members of our society. The authors of this toolkit recognize that children under the age of 18 comprise 41% of the total population of 1.39 billion in India, amounting to nearly 570 million.^[1] At the same time, there are scarce resources and an urgent need to plan for an influx of children who will need medical care in combating COVID-19. Extrapolating the infectivity rates from previous waves, we assume that 10% of the total population might get infected with COVID-19 during the 3rd wave, which will amount to 57 million pediatric cases. Assuming that 10% of these will need hospital admission and 5% will need intensive care unit (ICU) care, there shall be an anticipated need to be ready with resources to cater to 5.7 million hospital admission

and 2.8 million ICU patients. Indian Academy of Pediatrics and Ministry of Health and Family Welfare have provided management guidelines for children with COVID-19.^[2,3] Our focus is to provide a broad toolkit for pediatric COVID-19 preparedness in India. The toolkit can be used by health facilities for preparing for COVID care facilities and may be

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modified as per their requirements. The inspiration for this document comes from the New York City Department of Health and Mental Hygiene's 2006 pediatric disaster tool kit. We wish to thank and acknowledge those authors (Pediatric Disaster Toolkit).^[4]

How to Use Tool Kit

The tool kit is designed for 100 beds in the facility devoted to pediatrics in the facility to which should have 25% beds reserved for COVID pediatric ICU (PICU) and 75% as COVID high dependency unit (HDU)/wards. The tool kit design suggests the manpower, equipment, consumables, and drugs for a 10-bedded pediatric emergency room, 25-bedded COVID PICU, and 75-bedded COVID pediatric HDU/ward as defined for a 100-bedded facility. These data can be modified for other department sizes based on the facilities planning objectives. We recommend that the facility have a 10-bedded pediatric emergency area. Each chapter in this tool kit is meant to stand alone to be used as a checklist and helpful reference for facilities that either have a limited pediatric inpatient service and or no critical care capabilities. We urge you to take each chapter and discuss it with your administrations and other clinical services and adjust it as your environment dictates. The details of infrastructure, personnel, equipment, drugs, laboratory, radiology support, and training needed for such a facility are included in the subsequent chapters.

Process of Development of Tool Kit

In anticipation, the World Health Organization Collaborating Center for Emergency and Trauma (WHO-CCET) of South East Asia and the World Academic Council of Emergency Medicine recognized a need for a comprehensive guide for planning and mitigation for pediatric patients during the COVID-19 pandemic. The WHO-CCET appointed a team of subject matter experts from the field of Pediatrics, Pediatric Emergency Medicine, Disaster Medicine, Emergency Medicine, and Hospital Administration. This team met regularly through virtual conferences and identified specific topics to be addressed based on the previous experience with COVID patients. A literature search was then conducted and recommendations were developed which are reflected in this tool kit. This tool kit reflects the opinions drafted by content experts for which consensus was sought to identify areas of agreement and disagreement. In contrast to clinical practice guidelines, which are based primarily on high-level evidence, consensus statements are more applicable to situations where evidence is limited or lacking, yet there are still opportunities to reduce uncertainty and improve the quality of care. This manual describes the planning measures needed by every health care facility. The authors have identified categories of institutions these tool kit recommendations are designed to assist in planning for a surge of pediatric COVID patients.

Preparation, mitigation, and assignment of in-patient bed space for hospitals without pediatric intensive care unit

1. Ideally sick patients should be promptly transferred to a hospital that can provide pediatric critical care. Until the transfer is completed, patients should be managed by Pediatric Staff in areas where beds with multiparameters are available (example; postoperative recovery room, beds in the pediatric ward, adult medical, or surgical ICU)
2. Moderately ill children requiring admission should be admitted to the pediatric ward until all beds are utilized. Anticipating a surge, the hospital should increase pediatric ward beds and assign the older pediatric patients (we suggest all aged more than 14 years) to the adult wards. Whenever possible, all children should be admitted to the same adult ward for ease of nursing care and to improve the children's psychological well-being.

Assignment of in-patient bed space for hospitals without a pediatric service

The following is a suggested plan for the distribution of pediatric cases upon arrival at a hospital without both PICU capability or pediatric inpatient wards. Hospitals must consider their resources and personnel when creating a specific pediatric disaster surge plan. All pediatric patients requiring admission should be stabilized ideally in the emergency department. Capacity should be expanded for initial stabilization. Arrangements for the safe transport of sick patients to a higher level of care should be made as soon as it is medically and technically possible.

Space Considerations

When planning for COVID-19 pediatric management the facility should have well-defined areas before a surge in patient volume in the form of the triage area, PICUs, pediatric HDUs, and pediatric step-down wards. Ideally, all the beds should have the capability to deliver oxygen. Details of the ideal infrastructure recommended are in Table 1. The use of adult beds may be considered if the following actions are taken:

- Children who have to be boarded in adult beds that have side rails
- The bed should be set at the lowest possible height from the floor
- In the case of electronic controls on the beds, the beds should be unplugged so the buttons do not function.

Personnel

The details of the personnel to be deployed in each area with their specialty areas of experience are depicted in Appendix I. However, these are suggestions and the individual job responsibilities may be modified depending upon the facility's need and availability of personnel [Table 2].

Table 1: Recommended infrastructure

	Triage/Screening area	COVID HDU and ward	COVID-PICU
Purpose	The patient receiving area, where quick assessment followed by categorization in red, yellow or green is done and management initiated accordingly See the triage section*	The area where patients needing oxygen support, CPAP, BiPAP will be managed	The area managing critically sick children with multi-system involvement, and/or needing mechanical ventilation/support
Infrastructure	An open area at the entrance of the facility Should have restricted entry to pediatric patients	An open ward with adult-sized beds (should have 75% beds of total capacity, with oxygen capabilities on all beds; central oxygen supply or 50%, oxygen cylinders and oxygen concentrators on 25% of total bed strength)	
Patient care attendants	One relative, preferably a parent with at least a triple-layered mask ideally (but a single layer is acceptable)	One relative (preferably a parent) an N-95 mask must be worn at all times to be allowed into the unit (clearly stated and posted in multiple places)	One relative (preferably a parent) an N-95 mask must be worn at all times to be allowed into the unit (clearly stated and posted in multiple places)
Donning doffing area	Donning doffing area for staff	Donning doffing area for staff	Donning area at entry of the PICU Doffing area at the exit of the unit if possible (PICU should have separate entry and exit whenever possible)
Resuscitation bay	Should be used for children requiring resuscitation as they reach ED, should not be used as a holding place for patients Beds labeled as red/immediate (at least 2), yellow/delayed, ^[5] and green/minimal (at least 5)*		
RT-PCR/RAT testing area	Optional, strongly recommend at a kiosk but outside the emergency department		
Other support areas	E.g., doctor's duty room, restrooms for patients and staff these should be separate, nursing counters, storage room with the ability to be locked	E.g., doctor's duty room, restrooms for patients and staff these should be separate, nursing counters, storage room with the ability to be locked	E.g., doctor's duty room, restrooms for patients and staff these should be separate, nursing counters, storage room with the ability to be locked

*Please see "triage" section. HDU: High dependency unit, PICU: Pediatric intensive care unit, RT-PCR: Reverse transcription polymerase chain reaction, ED: Emergency department, CPAP: Continuous positive airway pressure, BiPAP: Bilevel positive airway pressure, RAT: Rapid antigen test

Table 2: Summary showing provider level and training program/course

Provider level	Training program/course					
	BLS	ACLS	PALS	ATLS/ATCN/ITLS	Basic disaster training/CDLS/BDLS	ADLS/disaster drills
Emergency department doctors and nurses	Yes	Yes	Yes	Yes	Yes	Yes
Emergency medicine technician (EMT/paramedic)	Yes	Yes	Yes (EPC)	Yes (PHTLS)	Yes	Yes
Pediatric department inpatient doctors and nurses	Yes	Yes	Yes		Yes	
Pediatric ICU doctors and nurses	Yes	Yes	Yes		Yes	Yes
Surge capacity doctors and nurses (nonpediatric)	Yes	Yes	Yes		Yes	

■ Mandatory/definite training, ■ Not mandatory. BLS: Basic life support, ACLS: Advanced cardiovascular life support, PALS: Pediatric advanced life support, ATLS: Advanced trauma life support, ATCN: Advanced trauma care for nurses, ITLS: International trauma life support, CDLS: Core disaster life support, BDLS: Basic disaster life support, ADLS: Advanced disaster life support, EPC: Emergency pediatric care, PHTLS: Prehospital trauma life support

EQUIPMENT TOOL KIT

The number after each item is the recommended number for a 10 bedded pediatric emergency room, 25 bedded COVID PICU, and 75 bedded COVID pediatric HDU/ward as defined for a 100 bedded facility. Table 3 shows a list of the ideal items the facility should assure are available for use whenever possible. The authors understand that this may not always be possible but urge facilities to make efforts to achieve these goals. Consumables are calculated for a duration of 1 month for a 100-bedded facility with 100% occupancy. The equipment have been categorized

as essential (E) and desirable (D) as per the priority and feasibility [Appendix II].

DRUG TOOL KIT

The authors want to stress to tool kit users who may not be familiar with pediatric patient care that all drug dosing is weight-based. In addition, we want to stress that failing to estimate the correct dosing may result in either underdosing the child and then not getting the results desired or overdosing which could lead to drug toxicities. We also acknowledge that during an influx of patients during a surge of any pandemic,

Table 3: Important training courses and link to the website

Training course	Website
Resuscitation courses	
BLS course	https://international.heart.org/en/our-courses/basic-life-support IAP ALS-BLS (iapalsbls.org)
ACLS course	https://international.heart.org/en/our-courses/acls-provider-course IAP ALS-BLS (iapalsbls.org)
PALS course	https://international.heart.org/en/our-courses/pediatric-advanced-life-support
EPC course	https://www.naemt.org/education/epc
Trauma training courses	
ATLS course	https://www.atls.in/
ATCN course	https://www.atls.in/atcn-calendar.htm
ITLS course	https://www.itrauma.org/students/initial-certification/
PHTLS course	https://www.naemt.org/education/phtls/phtls-courses
Disaster medicine training courses	
CDLS course	https://www.ndlsf.org/cdls
BDLS course	https://www.ndlsf.org/bdls
ADLS course	https://www.ndlsf.org/adls
Disaster risk management, India	http://www.onlinenidm.gov.in/
Additional training courses	
WHO courses	https://openwho.org/courses/UNCT-COVID19-preparedness-and-response-EN https://www.who.int/emergencies/diseases/novel-coronavirus-2019/training

BLS: Basic life support, ACLS: Advanced cardiovascular life support, PALS: Pediatric advanced life support, EPC: Emergency pediatric care, ATLS: Advanced trauma life support, ATCN: Advanced trauma care for nurses, ITLS: International trauma life support, PHTLS: Prehospital trauma life support, WHO: World health organization, IAP: Indian Academy of Pediatrics, ALS: Advanced life support

each patient's weight may be difficult to estimate. We strongly recommend the length to a weight-based system. There are many of these on the commercial market. We do not recommend one over the other but have included links to explore. The hospital's pharmacy should be encouraged to be ready with drugs needed for a surge of Pediatric patients. A drug tool kit can be used as a reference for the preparation of a 100-bedded facility [Appendix III].

LABORATORY AND TESTING CHECKLIST

It is anticipated that each facility has an investigation policy including a list of investigations [Appendix IV] and a communication plan to educate laboratory and other investigational facility personnel (including radiology) on the testing and reporting process along with specific to laboratory personnel protective equipment (PPE) training. A facility-wide communications plan for public/patients data sharing also needs to be in place; who will be tested for accessing/collecting laboratory results in concordance with the hospital policies. In case an alternative facility is needed for laboratory/radiology support, we recommend that the alternative facility be identified in advance and modalities for transport of samples and collection of reports can be defined and communicated with all involved personnel. Interim review reports can be communicated to hospital administration and at the regulatory level.

TRAINING

The authors have identified the ideal course in the table 3 below but want to also note that equivalent courses approved

by the Government of India may be substituted based on the facilities preferences. It is important to remember that children are not young adults. They have anatomic and physiologic peculiarities and thus all the doctors, nurses, and support staff should be trained in the assessment of pediatric patients, skills required in pediatric care, equipment use, and attitude required for handling pediatric patients, especially during pandemics. This section compiles training recommendations for healthcare workers and provides links to the courses recommended. The recommendations are based on the settings and scope of practice. In the Indian context, broadly they are divided into three sections below. Please note that the authors discuss just in time training modules. These are meant to educate and empower all staff in reaching out of their comfort zone to provide care to the pediatric patient. Every hospital should provide the following recommended training regardless of its current scope of service.

Please refer to chapters on the following topics which are delegated to training:

- Plan for expanding existing space through surge (including the use of adult-in-patient space if/when available). Identification of the potential space where a temporary PICU could be established and service provided
- Formulating just-in-time training modules relevant to the hospital. Just-in-time training for COVID-19 management provides staff with competencies and encourages the attitude required to safely work in the facility during the COVID-19 pandemic, as well as understanding the basic principles of public health emergency care and their role in the facility
- Escalation plan for disaster duty roster with existing staff

- d. Identification of personnel who can be placed in surged spaces after just-in-time training and reinforcement of basic disaster training protocols
- e. Pediatric-focused disaster drills at regular intervals. A drill is a coordinated and supervised activity testing a specific operation in a facility.

INFECTION CONTROL CONSIDERATIONS OF COVID-19 IN THE PEDIATRIC SETTING

This section reviews the infection control measures in the pediatric setting specific to COVID-19 disaster. Links to resources that provide information to facilities treating COVID-19 patients are included. We recommend using them in conjunction with the institutional guidelines for reinforcing best practices for infection control during the COVID-19 in the pediatric setting.

GENERAL GUIDELINES

The infection control measures in the pediatric setting do not differ from the measures in other clinical care areas designated in the facility. Appropriate PPE should be worn during cleaning as well as all procedures. Careful attention should be given to maintain complete records of all persons who were present during these activities (refer “cleaning and sanitation” section^[5]).

ENVIRONMENT

Environmental hygiene includes flooring, walls, spacing (distancing), and ventilation. Cleaning and disinfection measures of surfaces should follow institutional protocols based on the national guidelines. The authors of this tool kit recommend a mandatory institutional policy for cleaning, sanitation, and disinfection.

Adequate ventilation can reduce the risk of the spread of the virus and subsequent infection. Different ventilation systems exist and there is a need for healthcare facilities to adopt an optimal approach based on their climate and geography (Refer to “air and ventilation” section^[5]).

Ensure optimal treatment space and adequate spacing between beds in different settings (Ward/ICU) to prevent the transmission of infection. In the PICU there should be 100–150 sqft spacing between beds refer to the section on PICU^[9]).

HAND HYGIENE

The importance of hand hygiene has been emphasized for years and reinforced since the beginning of this pandemic. Following the guidelines-based hand washing, and hand rub strategies are strongly recommended. The WHO’s 5 moments of hand hygiene provides a summary of hand hygiene in healthcare settings.^[10] The details of hand-washing procedure have been described by experts in the link provided.^[11]

EQUIPMENT

Routine surface disinfection, targeted strategies based on the equipment/device used need to be practiced.^[12]

BIOMEDICAL WASTE MANAGEMENT

Ensure the implementation of guidelines for handling, treatment, and disposal of waste generated during the management of COVID-19 patients.^[13] This is particularly important for the safety of health care workers (HCWs) and the prevention of the iatrogenic spread of infection. Training HCWs and ancillary staff in biomedical waste management are mandatory the facilities guidelines should be updated based on the governmental guidance and communicated with all stakeholders.^[3] The video for the safe management of biomedical waste in COVID-19 describes the details of the procedure.^[14] Proper sanitation, hygiene, and waste management guidelines should be followed in all healthcare settings.^[15]

ADDITIONAL LINKS

- Infection prevention and control guidelines for 2019-nCoV (COVID-19) by the All India Institute of Medical Sciences, India^[12]
- COVID-19 IPC Sameeksha is a compilation of scientific reviews and guidelines from WHO and the Government of India intended for clinical and public health professionals in India^[16]
- Operational guidelines for strengthening facility-based pediatric care by National Health Mission, Child Health Division, Ministry of Health and Family Welfare, India^[17]
- Preparedness for the management of surge of COVID-19 in children, Number 33/31/F2/2020/H and FW dated June 2, 2021 by COVID-19 outbreak control and prevention state cell, Health and Family Welfare Department, Government of Kerala^[18]
- Online courses on COVID-19 Infection prevention and control measures
 - Infection prevention and control for COVID-19^[19]
 - Standard precautions - Environmental cleaning and disinfection^[20]
 - Infection prevention and control core components and multimodal strategies.^[21]

EMERGENCY TRIAGE AND SURGE CONSIDERATIONS

This section reviews the recommended approach to pediatric triage. The users will find substantial detail in the section since it has been evident during this COVID-19 pandemic that the identification through the triage of the very sick patients who need intervention and those who can have delayed treatment is essential to the best outcomes for our patients and the functioning of facilities.

TRIAGE AND SCREENING BEFORE TREATMENT

The clinical presentation in children with COVID-19 is

nonspecific such as fever, cough, runny nose, diarrhea, abdominal pain, and irritability, and mimics many other illnesses. Thus, local epidemiology is important for deciding the level of the index of suspicion of COVID-19 in children with these manifestations.

TRIAGE AND CLASSIFICATION OF SEVERITY FOR MANAGEMENT

As children present with nonspecific symptoms, general guidelines for assessing the severity of illness in neonates and children at the community level such as those outlined in Integrated Management of Childhood Illnesses, should be valid criteria for triage at the community and primary healthcare level. As respiratory manifestations and diarrhea are the most common manifestations in children, integration of disease severity classification of these two conditions into the COVID triage algorithm should suffice. Moreover, with the easy availability of pulse oximetry, it can be integrated into the triage algorithm for the early detection of hypoxia. Children with Multisystem Inflammatory Syndrome in Children (MIS-C) require expert care for the proper diagnosis and management; and it being a rare complication of COVID-19 in children, we recommend putting it under “severe disease” criteria so that such children are managed in hospitals with the availability of pediatricians. Children who are unresponsive and floppy, unconscious, convulsing, cyanosed, or grunting should be immediately put in the “very severe category” by the triage team for immediate management of airway, breathing, and circulation. Table 4 describes triage and classification of severity of COVID-19 disease in children.

INITIAL SCREENING CRITERIA DURING A COVID-19 SURGE

Any fever with

- Clinical features suggestive of shock (poor peripheral pulses, drowsiness, cold hands, and feet, not passing urine)
- Respiratory symptoms such as cough/runny nose/sore throat/difficulty in breathing
- Diarrhea ± abdominal pain or discomfort ± vomiting
- Myalgia/irritability
- Skin rash/conjunctival congestion
- Neonate born to mother with suspected/confirmed COVID-19
- The presence of a recently confirmed COVID-19 case in the household or among close contacts.

Children presenting with the above features in an epidemiological background suggestive of high risk of COVID-19 infection should be tested for COVID-19 by reverse transcription-polymerase chain reaction (RT-PCR) or a rapid antigen test (please note that the rapid antigen test cannot be used to rule out disease; therefore, all infection control measures must be maintained until a negative RT-PCR report is available in symptomatic children).

ADDITIONAL CONSIDERATIONS - UPGRADATION OF RISK CATEGORY

It may be considered for children with [22-25]

- Cancers
- Chronic kidney diseases
- Type 1 diabetes
- Chronic hematological diseases
- Known immunodeficiencies
- Immunosuppressive therapy
- Chronic liver disease
- Obesity/Type 2 diabetes
- Severe malnutrition (weight for height Z-score <-3 or mid-upper-arm circumference <11.5 cm).

CRITERIA FOR PEDIATRIC INTENSIVE CARE UNIT ADMISSION FOR COVID-19

- All respiratory or cardiac arrest
- Unstable airway
- Inability to oxygenate (O_2 saturation <90% on >50% oxygen requirement)
- Inability to ventilate with rising PCO_2 levels with respiratory insufficiency
- Septic or other severe forms of shock
- Glasgow coma scale score <8 or sudden fall in score by >2 points
- Status epilepticus
- Acute renal failure
- Multiple organ dysfunction syndrome.

MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN

During the initial outbreak of the COVID-19, it was noted that most patients impacted were adults. In some instances, pediatric hospital volume was so low that some units and their staff were incorporated into the adult surge plan. However, 4–8 weeks after the pandemic struck, children began to present with a mysterious systemic inflammatory illness. This illness would come to be known as Multisystem Inflammatory Syndrome in Children or MIS-C. MIS-C has a variety of phenotypes, ranging from a Kawasaki-like illness to hypotension/shock with some patients requiring outpatient follow-up and others vasopressor support in the PICU. Despite the various ways in which it can present, MIS-C almost always occurs in the setting of exposure to SARS CovV-2 within the past 2–8 weeks. To date, there is no singular case definition, workup, or proven treatment regimen for MIS-C. This is largely due to the relatively small number of cases and lack of randomized controlled trials. A quick reference guide is in the appendix of this toolkit that provides the clinician with suggestions on identifying, evaluating, and managing children with suspected or proven MIS-C [Appendix V].

Table 4: Space/surge capacity considerations

Classification	Findings	Management	Remarks
Severe disease	General danger signs Lethargic or unconscious Not able to drink or breastfeed Vomiting everything Convulsions* Features of severe pneumonia* (oxygen saturation <90%, central cyanosis, stridor in a calm child, severe chest indrawing, grunting) Features of severe dehydration (in patients with diarrhea/vomiting) (Any two out of following: lethargic or unconscious, sunken eyes, skin pinch going back very slowly, unable to drink or breastfeed) Features suggestive of MIS-C* (High fever >3 days, rash, conjunctivitis, cold peripheries)	Referral for hospitalization (COVID hospital) Put in most acute areas/beds of pediatric emergency services If pediatric critical areas get saturated, send to adult emergency services Refer for intensive care in PICU (If PICU is full, manage in adult intensive care units with Pediatrics support)	Red: tagged/identified patients, or critical patients, should be placed in the most acute care area of the emergency department Red tag overflow: critical patients should go to a monitored observation area in the emergency department. Responsibility for the management of these cases should be with the emergency department consultants and senior resident on duty
Moderate disease	Features of pneumonia Fast breathing (WHO age-specific cut-offs) Lower chest indrawing Oxygen saturation 90-94% Features of some dehydration (in patients with diarrhea/vomiting) (Any two out of following: restless or irritable, sunken eyes, skin pinch going back slowly, drinking eagerly or thirsty) No features of severe disease	Referral for hospitalization (nearby covid care center or district hospital) If brought to a Level 3 hospital, manage in nonacute areas/beds of pediatric emergency services Overflow goes to adult nonacute areas or back referred to Level 2 with transport services	Yellow: tagged patients, moderately ill, should be placed in the nonacute care area of the emergency department. Yellow tag overflow: should be designated in an area where patients can be re-evaluated frequently to ensure their condition does not deteriorate and thus warrant immediate medical intervention. Patients requiring admission should be transferred up to preidentified in-patient wards which have been converted to accommodate pediatric patients based on toolkit recommendations as soon as possible. Responsibility for the management of these cases should be with the emergency department consultants and senior resident on duty
Mild disease	Other features not fitting into severe or moderate disease criteria	Home care from level 1, level 2 or level 3 Symptomatic treatment Monitoring and supervision Keep in a large waiting area till disposed Facility for frequent evaluation till discharged Danger signs to report back should be explained	Green: tagged patients, minimally ill, should be triaged to the waiting room, lobby, or the predesignated adult/pediatric clinic Green tagged patients must be re-evaluated frequently to ensure their condition does not deteriorate and thus warrant immediate medical intervention. When medically reasonable, green-tagged patients should be discharged home as soon as possible to an appropriately identified adult caregiver as per hospital policy

MIS-C: Multisystem Inflammatory Syndrome in Children, PICU: Pediatric intensive care unit, WHO: World Health Organization

INTER AND INTRA-FACILITY TRANSPORT

Children with COVID-19 disease may need inter and interfacility transport. The interfacility transfer might be needed for the purpose of investigations, if not available at the treating center, or for treatment to a higher level of care facility than is available at the diagnosing institution. In addition, the transfer of patients within the facility will be needed for investigations such as the radiology department for computed tomography scan or to cardiology for echocardiography. Safe transport with the patient in a stable condition should be the aim when such a requirement exists. It is suggested that all COVID-19 treating hospitals develop a transport team, with orientation and training in the safe transport of patients. See Box 1 for the personnel and equipment requirements for the transport of patients within and outside of the facility.

TRANSPORT OF PEDIATRIC PATIENTS WITHIN THE HOSPITAL

General guidelines for transporting pediatric patients between hospital units or diagnostic testing areas.

Transport personnel

All transport personnel should be oriented to the special needs of pediatric transport and patients should never be left alone/unattended at any time. Additional staff skilled in pediatric airway management and familiar with pediatric resuscitation ideally should accompany the patient on the transport.

Unstable patients

Unstable patients require continuous 1:1 observation during transport. In addition, parents or adult caregivers should be encouraged to stay with children.

Transport equipment

Airway management and resuscitation supplies are available which are appropriate for all age groups (see equipment recommendations). For long distance, intrahospital transport ambulance should be available. For small distance or short time in transport expected the use of adult stretchers may be appropriate for children >8–10-year-old, smaller children may require a crib, additional transport personnel, and/or converting an adult stretcher by adding padding to inside rails to assure safety during transport.

THE PSYCHOSOCIAL NEEDS OF CHILDREN DURING A DISASTER

To properly care for children in hospitals it is necessary to consider both their physical and mental health needs and treating them in the context of the family unit. Children's responses to disaster and hospitalization may share some aspects of adult responses but are distinguished by the developmental contexts in which children of varying ages experience, mediate, and communicate the impact of associated events and procedures. An unfamiliar environment such as a medical setting can be made to feel safer for pediatric visitors and patients by including familiar people, familiar things, and routines. Hospitals need also note the cultural differences that may cause a group of children exposed to the same trauma to react differently and must ensure that mental health staff is sympathetic to each of these variances. Lastly, there are legal concerns regarding the treatment and release of children which each hospital should consider when creating the pediatric response portion of its disaster plan.

General guidelines

1. When describing the hospital experience to children of any age, it is important, to be honest in your description and in answering any questions they may have. However, it is important not to give preconceived notions about what a child may feel. Caregivers should avoid the use of the words "pain" and "scary" in describing experiences the child may have since everyone feels pain and emotions differently
2. Since young children (preschool through school-age) learn best by experience, provide as much information as you can to help the child learn about their upcoming experience. Describe what the child may smell, hear, touch, and feel using as many tangible items as possible, such as dolls and books
3. Children's reactions and symptoms can be expressed through behavior, thoughts, emotions, and physical reactions. Children's fears about their own safety can contribute to symptoms of anxiety and depression and may also lead to oppositional and aggressive behavior. This may be an attempt to reassert some sense of control and should be recognized as such
4. Do not leave children unaccompanied in front of a television, for example, with the news on, but allow them to talk about what is going on if they choose. Clarify misconceptions with simple, truthful explanations

5. Refrain from having conversations about the disaster in front of the children or within hearing distance. This can lead to misunderstandings and misconceptions
6. Gather unit staff and develop language for describing events of disaster. Ensure that all staff is educated accordingly and then communicate this information consistently to avoid adding to the children's confusion
7. Opportunities for play are important for learning, expression of feelings, normalcy, escape, and mastery. Age-appropriate toys and diversionary activities are helpful to have on hand. This may include puzzles, books, simple art supplies, and video and audiotapes. If possible, allow children to interact in groups and monitor for misconceptions
8. Try not to separate them from their primary caregivers for extended periods of time. Allow a parent/caregiver to accompany the child to procedures as much as possible. To encourage feelings of safety and familiarity try to limit the number of staff caregivers (i.e. assign the same nurse to care)
9. Parents will be most helpful when they are/feel informed-if they are upset from not knowing what is going on that tension is going to affect the child
10. Assess for any underlying mental health disorder that may require immediate psychiatric consultations such as trouble sleeping, lack of appetite, and physical complaints with no medical basis
11. Gather information about varying cultural responses to trauma and death
12. Gather a list of community resources (counseling services, etc.) for distribution to parents/caregivers upon discharge
13. Identify staff within the hospital who can assist with addressing the emotional and psychological issues i.e. social workers, psychologists, psychiatrists, chaplains, psychiatric nurses, and have an on-call list available for unit staff
14. Identify resources for staff support to cope with the impact of seeing injured and/or dying children
15. Identify community resources that may be able to donate services, supplies, and specifically for the children.

DEVELOPMENT SPECIFIC GUIDELINES FOR TREATING CHILDREN IN THE HOSPITAL

Infants

- Try to let a parent/caregiver stay with the baby during medical procedures
- Use familiar objects from home such as a stuffed animal, blanket, music box, or toy to help comfort the baby before, during or after a procedure.

Toddler and preschool

- Try not to have conversations about your child's care in their presence unless you are including them in the conversation. Children overhear much more than adults

think and without any explanation, the information may seem frightening

- Let a parent/caregiver stay overnight with the child if possible. If appropriate, let other family members, including brothers and sisters, come and visit. With the understanding that these family members must follow all COVID-19 guidelines of the institution
- Reassure the child that the hospitalization is not a punishment. Try to avoid using good/bad labels particularly during a procedure. For example, instead of saying “See, you were so good, the doctor only had to do this once,” you can say, “You did such a good job of sitting still, I know that was hard”
- Children learn best through play and “medical play” can be particularly useful. Allow them to handle some medical equipments such as a stethoscope, and blood pressure cuff. Allow them to practice the procedure on a doll
- Allow the child to make choices whenever possible but do not offer a choice when none exist. For example, do not say, “Would you like to come into the treatment room now so the doctor can look at you?” It would be better to say, “Do you want to bring your bear or blanket with you to the treatment room?”

School-age

- School-age children can be given more specific information about what is going to happen to them. Many medical terms can be confusing for children. For example, the term “I.V.” could be confused with the word “ivy” or “dye” with “die.” Give simple, specific explanations for procedures
- This is a great age for medical play (communicating understanding, and fear through play with medical equipment). Allow the child the opportunity to reenact events through play with different kinds of toys or art materials. This is an important way for school-age children to express their feelings and gain a sense of control over what is happening to them
- Respect the child’s privacy and encourage others to do the same by knocking before entering the room and being sensitive to who is around when examinations are being conducted
- Sometimes children at this age regress, or start up with behaviors that they had grown out of (thumb sucking and bed wetting), when in a stressful situation like being in the hospital. Do not berate (come on, you’re a big girl now...) or punish for this behavior. Encourage the child to express his feelings and discharge emotions through play.

Adolescents

- Try not to have conversations about the teen’s care in his/her presence unless you are including him/her in the conversation. Adolescents can understand much more about their bodies and what is happening to them and may resent not being included in discussions about their condition or treatment

- Do not assume that teens manage their emotions the same way as adults do. Give them opportunities to discuss what is happening with staff both with and without the parent/caregiver being present so they can ask questions
- Respect a teen’s privacy and encourage others to do the same by knocking before entering the room and being sensitive to who is around when examinations are being conducted.

How CHILDREN CAN REACT TO A DISASTER

Children react differently to stressful events than adults. Their response can often be delayed and may be hard to detect. They may find it hard to talk about how they have been affected.

- Staff needs to be aware of changes in children’s behaviors such as extra clinging or a change in appetite. Parents, teachers, and other caring adults who know the child are in the best position to notice these changes
- Don’t wait for them to come to you, ask questions such as: Are they having trouble sleeping? Are they feeling less safe than before?
- Some children are more likely to have emotional reactions to the events:
 - Children who witnessed the event first hand or whose parent, a relative, or friend was killed or injured
 - Children who are displaced from their home or schools
 - Children who have a past history of emotional problems
 - Children who have a past history of trauma, either as a victim or a witness to violence or abuse
 - Children with an adult in their life who is having difficulty with their emotions, a witness to violence, or victim of domestic violence.

Emotional responses also vary by development stages and may include the following.

Children aged 5 and younger may

- Have fears of being separated from a parent
- Be unusually fearful, “fussy,” clingy, and have crying bouts
- Return to outgrown behavior, such as bed-wetting or baby talk
- Have nightmares or problems sleeping
- Have stomach aches, headaches, or other physical complaints that do not have a medical base
- Startle easily
- Have a loss or increase in appetite.

Children aged 6–11 may

- Have appetite changes
- Headaches, gastrointestinal problems
- Loss of interest in social activities
- Sadness or depression
- Feelings of inadequacy and helplessness

- Feelings of anger and aggression
- Isolation from others, fewer interests in friendships
- Repetitive behaviors such as hand-washing.

Children aged 12–18 may

- Have appetite changes
- Headaches, gastrointestinal problems
- Loss of interest in social activities
- Sadness or depression
- Feelings of inadequacy and helplessness
- Feelings of anger and aggression
- Isolation from others, fewer interests in friendships
- Repetitive behaviors such as hand-washing.

Not all children exhibit all symptoms and their reactions may change over the 1st days or weeks following a crisis.

HELPFUL HINTS TO ASSIST CHILDREN DURING AND AFTER A DISASTER

For children under age 5

- Try to keep to normal routines and favorite rituals as much as possible
- Limit exposure to TV programs and adult conversations about the events
- Ask what makes them feel better
- Give plenty of hugs and physical reassurance
- Provide opportunities for them to be creative and find other ways to express themselves.

For children older than age 5

- Do not be afraid to ask them directly what is on their mind and answer their questions honestly
- Talk to them about the news and any adult conversations they have heard
- Make sure they have opportunities to talk with peers if possible
- Set gentle but firm limits for acting out behavior
- Encourage verbal and play expression of thoughts and feelings
- Listen to the child's repeated retelling of the event.

WHEN TO CONSULT A MENTAL HEALTH PROFESSIONAL

Consultation with a mental health professional may be useful at any of these times. However, psychiatric consultation should be sought if any of the following is exhibited:

- Excessive fear of something terrible happening to their parents or loved ones
- Excessive and uncontrollable worry about things, such as unfamiliar people, places, or activities
- Fear of not being able to escape if something goes wrong
- Suicidal thoughts or the desire to hurt others
- If the child has hallucinations
- Expressing feelings of being helpless, hopeless, and worthless.

LEGAL CONSIDERATIONS

The following are legal questions and issues that may arise during a disaster. Having policies and procedures in place before an event should be considered:

- For unaccompanied children during a disaster, consent is not needed to treat for a life or limb-threatening situation. Is parental consent needed to treat a child victim with minor injuries? With psychological injuries?
- Is parental consent required to decontaminate an unaccompanied child? What if the child is asymptomatic? What if the child is refusing?
- What medical or social information can be released and to whom during a disaster?
- Check Health data privacy and security rules and your legal counsel concerning the unidentified patient locator protocols such as posting Polaroid photographs of unidentified children
- Who can children be released to and if not the parent or caregiver, what permission or information is needed? What is your protocol for releasing children if no legal guardian or parent can be found or if no permission document is provided?

CULTURAL DIFFERENCES ABOUT DEATH AND DYING

Every culture has its own rituals and manner of mourning. Given that India is such a diverse society, mourning patterns of ethnic groups are going to be equally different. Clinicians should be careful about definitions of “normality” in assessing families' responses to death. The patient's response may be very different from the physicians' cultural beliefs and expected response. In addition, health care providers should remember not to assume people within any particular cultural group fit a pattern when mourning. Each family unit, as each individual, needs to be treated and assessed on an individual case-by-case basis.

- It is important for staff to appreciate an ethnic group's particular attitudes about mourning and to find out from a family what its members believe about the nature of death, the rituals that should surround it, and the expectations of the afterlife
- Often a failure to carry out death rituals contributes to a family's experience of unresolved loss
- Helping family members deal with a loss often means showing respect for their particular cultural heritage and encouraging them actively to determine how they will commemorate the death of a loved relative
- While it is generally better to encourage families toward openness about death, it is also crucial to respect their cultural values and timing for dealing with the emotional aftermath of a loss
- Staff may inquire about:
 - What are the prescribed rituals for handling dying, disposition of the body, rituals to commemorate the loss

- What are the group's beliefs about what happens after death
- What do they believe about appropriate emotional expressions
- What are the gender rules for handling the death
- Staff should identify personnel in their setting who may be able to provide more details regarding specific cultural groups such as pastoral care, social work, or even particular staff members from various cultural groups.

OBTAINING MENTAL HEALTH SERVICES IN THE COMMUNITY

Every child experience emotional difficulty from time to time, but at some point, a child's problems may warrant professional attention.

FACT SHEET AFTER A DISASTER: A GUIDE FOR PARENTS AND CAREGIVERS

From the National Institute of Mental Health.^[28]

Natural disasters such as tornados, or man-made tragedies such as bombings, can leave children feeling frightened, confused, and insecure.

Whether a child has personally experienced trauma or has merely seen the event on television or heard it discussed by adults, it is important for parents, caregivers, and teachers to be informed and ready to help if reactions to stress begin to occur.

Children respond to trauma in many different ways. Some may have reactions very soon after the event; others may seem to be doing fine for weeks or months, then begin to show worrisome behavior. Knowing the signs that are common at different ages can help parents and teachers to recognize problems and respond appropriately.

Preschool age

Children from 1 to 5 years in age find it particularly hard to adjust to change and loss. In addition, these youngsters have not yet developed their own coping skills, so they must depend on parents, family members, and teachers to help them through difficult times.

Very young children may regress to an earlier behavioral stage after a traumatic event. For example, preschoolers may resume thumb sucking or bedwetting or may become afraid of strangers, animals, darkness, or "monsters." They may cling to a parent or teacher or become very attached to a place where they feel safe.

Changes in eating and sleeping habits are common, as are unexplainable aches and pains. Other symptoms to watch for are disobedience, hyperactivity, speech difficulties, and aggressive or withdrawn behavior. Preschoolers may tell exaggerated stories about the traumatic event or may speak of it over and over.

Early childhood

Children aged five to eleven may have some of the same

reactions as younger boys and girls. In addition, they may withdraw from playgroups and friends, compete more for the attention of parents, fear going to school, allow school performance to drop, become aggressive, or find it hard to concentrate. These children may also return to "more childish" behaviors; for example, they may ask to be fed or dressed. Do boys and girls act differently?

Adolescence

Children 12 to 14 are likely to have vague physical complaints when under stress and may abandon chores, school work, and other responsibilities they previously handled. While on the one hand, they may compete vigorously for attention from parents and teachers, they may also withdraw, resist authority, become disruptive at home or in the classroom, or even begin to experiment with high-risk behaviors such as drinking or drug abuse. These young people are at a developmental stage in which the opinions of others are very important. They need to be thought of as "normal" by their friends and are less concerned about relating well with adults or participating in recreation or family activities they once enjoyed.

In later adolescence, teens may experience feelings of helplessness and guilt because they are unable to assume full adult responsibilities as the community responds to the disaster. Older teens may also deny the extent of their emotional reactions to the traumatic event.

HOW TO HELP

Reassurance is the key to helping children through a traumatic time. Very young children need a lot of cuddling, as well as verbal support. Answer questions about the disaster honestly, but do not dwell on frightening details or allow the subject to dominate family or classroom time indefinitely. Encourage children of all ages to express emotions through conversation, drawing, or playing and to find a way to help others who were affected by the disaster.

Try to maintain normal routines and encourage children to participate in enjoyable activities. Reduce expectations temporarily about performance in school or at home, perhaps by substituting fewer demanding responsibilities for normal chores.

Finally, acknowledge that you, too, may have reactions associated with the traumatic event, and take steps to promote your own physical and emotional healing.

WHEN TO SEEK MORE HELP

Consultation with a mental health professional may be useful at any of these times. A list of online resources is provided in Table 5. However, psychiatric consultation should be sought if any of the following is exhibited:

- Excessive fear of something terrible happening to their parents or loved ones
- Excessive and uncontrollable worry about things such as unfamiliar people, places, or activities

Table 5: Important training courses and link to the website

Training course	Website
Childline information may also be obtained at the website	https://www.childlineindia.org https://www.childlineindia.org/a/COVID-19
Phone number	1098
Manual of psychosocial support for Children during COVID-19. Joint effort of childline and UNICEF	https://www.unicef.org/india/media/3401/file/PSS-COVID-19-manual-childline.pdf
Contacting the child's pediatrician for a referral to a mental health professional or clinic may also be helpful. UNICEF: United Nations Children's Emergency Fund	

Box 1: Personnel and equipment's requirement for transport

Personnel
Transport of stable patient
Person oriented to the pediatric management-junior resident, nursing officer, multitask health worker
One parent should accompany the child
Transport of unstable patient
At least one person-oriented to pediatric airway management-postgraduate 3rd year, senior resident, trained nursing officer
One parent should accompany the child
Equipment
Transport incubator for infants
Stretchers for children >8-10 years of age
Appropriate resuscitation equipment supplies
Portable vital sign monitor
Equipped ambulance for interfacility transport [©]
Transport ventilator for intubated/critical patients
Information
Properly written document with a detailed medical condition of the patient including all test and study results as well as a current list of medications and prior interventions
Prior telephonic handover to the receiving doctor and nurse and the name of the accepting physician
[©] Equipment on board in BLS ambulance are oxygen cylinder, blood pressure apparatus, and a stethoscope and for ALS ambulance in addition to BLS equipment are defibrillator-monitor, ECG, syringe pump, pulse oximeter, resuscitation kit, suction machine, and nebulizer. BLS: Basic life support, ALS: Advanced life support, ECG: Electrocardiogram

- Fear of not being able to escape if something goes wrong
- Suicidal thoughts or the desire to hurt others
- If the child has hallucinations
- Expressing feelings of being helpless, hopeless, and worthless.

CHILDLINE INDIA FOUNDATION

Supported by the Ministry of Women and Child Development. Contact for any child-related emergency, 24 h a day. Counseling professionals provide free, confidential information, and referral services, 24 h a day. They have the latest information and where to go for help. Anyone can call. Help is available in several languages. Dedicated resources are also available for the ongoing COVID-19 pandemic [See Box 1 and Appendix VI].

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Appendix I: Details of the personnel deployed in each area with their areas of experience

Designation	Number	Description
Triage/screening area		
Physician coordinator/nodal officer [#]	1/shift	Holding postgraduate degree in one of the suggested clinical departments e.g., medicine, dermatology, ophthalmology, ENT, surgery, community medicine
Resident doctor	3/shift	Postgraduate 1 st /2 nd /3 rd year; with experience in one of the clinical department's dermatology, ophthalmology, ENT, surgery, community medicine, other area depending on the facilities resources etc.
Trainee intern	1/shift	Post MBBS
Senior nursing officers [#]	2/shift	With experience in managing one of the clinical departments e.g., medicine, dermatology, ophthalmology, ENT, surgery, community medicine, or other area depending on the facilities resources etc.
Nursing officers	4/shift	With experience of OPD/ward of any clinical departments/community medicine
Trainee nurse	1/shift	Should work under supervision
Nursing orderlies [#]	3/shift	Multi-purpose workers
Housekeeping workforce [#]	2/shift	For sanitation and cleaning
Security personnel [#]	1/shift	Can also be utilized for temperature scanning of visitors where needed and for supervising proper mask use by visitors
COVID HDU and ward		
Physician coordinator/nodal officer [#]	1/shift	For covid ward holding postgraduate degree in one of the clinical departments e.g., medicine, dermatology, ophthalmology, ENT, surgery, community medicine
Senior resident	2/shift	With experience in one of the clinical departments e.g., dermatology, ophthalmology, ENT, surgery, community medicine etc.
Resident doctor	3/shift	1 st and 2 nd -year postgraduate trainee
Trainee intern	2/shift	Post MBBS
Senior nursing officer [#]	2/shift	With experience in managing one of the clinical departments e.g., medicine, dermatology, ophthalmology, ENT, surgery, community Medicine, other area depending on the facilities resources etc.
Nursing officers	6/shift	With experience on the ward, of any
Trainee nurse	2/shift	Should work under supervision
Nursing orderlies [#]	4/shift	Multipurpose workers
Housekeeping workforce [#]	4/shift	For sanitation and cleaning
Security personnel [#]	2/shift	Can also be utilized for temperature scanning of visitors where needed and for supervising proper mask use by visitors
COVID PICU		
Physician nodal officers [#]	01/shift	From departments having experience in managing HDU/ICU e.g., pediatrics, medicine, anesthesia, critical care medicine, surgery, neurosurgery, pediatric surgery, cardiothoracic surgery
Senior resident	2/shift	With experience in managing ICUs/HDUs/OTs namely, e.g., pediatrics, medicine, anesthesia, critical care medicine, surgery, neurosurgery, pediatric surgery, cardiothoracic surgery
Resident doctor	2/shift	2 nd /3 rd -year postgraduate trainee
Trainee intern	1/shift	Post MBBS
Senior nursing officers [#]	2/shift	With experience in managing HDU/ICU/OT e.g., pediatrics, medicine, anesthesia, critical care medicine, surgery, neurosurgery, pediatric surgery, cardiothoracic surgery other area depending on the facilities resources
Nursing officers	5/shift	With experience in managing ICUs/HDUs/OTs namely, e.g., pediatrics, medicine, anesthesia, critical care medicine, surgery, neurosurgery, pediatric surgery, cardiothoracic surgery
Technician	1/shift	For taking care of the maintenance of equipment, oxygen supply devices
Trainee nurse	1/shift	Should work under supervision
Nursing orderlies [#]	3/shift	Multipurpose workers
Housekeeping workforce [#]	2/shift	For sanitation and cleaning
Security personnel [#]	1/shift	

[#]Job responsibilities as per hospital policy document, however these may be expanded based on the extent of the disaster. HDU: High dependency unit, ICU: Intensive care unit, PICU: Pediatric ICU, OPD: Outpatient department, ENT: Ear nose throat, OTs: operation theatres

Appendix II: Equipment tool kit**Home care**

Digital thermometer for axillary use or other devices that ensures that the body temperature can be monitored

Pulse oximeter compatible for infants and children (Refer to government policies for procurement)

Nonconsumables	Screening room/triage area	COVID HDU and ward	COVID PICU
Vital sign monitors showing at least three parameters: Heart rate, SPO ₂ , and blood pressure; with a compatible neonatal, infant, and pediatric size blood pressure cuffs and SPO ₂ probes for infant and children (E)	10	75	25
Defibrillator with infant and pediatric AED pads (E)	01	02	01
Transport ventilator (pediatric compatible) (E)	01	01	01
Ventilators for mechanical and noninvasive ventilation (compatible for with neonatal and pediatric use) with compatible circuits and humidifiers (E)			25
High flow oxygen delivery devices with pediatric circuits with humidifiers and heating wires (E)		30	05
ABG analyzer (E)		01	01
BiPAP machine with pediatric circuits (E)		30	05
Oxygen concentrators (E)		20	
Oxygen cylinders (E)		30	
Syringe infusion pumps (E)	30	100	75
Nebulizers (E)	05	50	10
Portable vital sign monitors with at least SPO ₂ and heart rate recordings (E)	5		
Self-inflating bags (250-750 mL) bag with different sized masks (neonatal, infant, and pediatric sized) (E)	10	100	20
Laryngoscope with a straight blade and curved blades (0, 1, 2 sized) (E)	5	20	10
Aneroid sphygmomanometer with pediatric cuffs (E)	10	30	5
Pulse oximeters for infants and children (E)	10	75	25
Portable vitals sign monitors with at least SPO ₂ and heart rate (E)	10	10	5
Video laryngoscopes (for neonatal and pediatric use) (E)	1 each	2 each	1 each
Weighing scale (E)	2	1	1
Digital thermometers for axillary use (E)	10	75	25
Portable ultrasound machine with appropriate probes (D)		1	1
Echocardiography (D) (in-hospital or available to the hospital)			1
CT scan (D) (in-hospital or available to the hospital)			1
Portable X-ray machine (D)		1	1
Central monitoring system (D)		4	2-3
Length-based weight tape (D)	2	2	2
Consumables	Screening room/triage area	COVID HDU and ward	COVID PICU
Intravenous cannula: 24G	500	3000	500
Intravenous cannula: 22G	500	4000	500
Intravenous cannula: 20G	500	3000	1000
Oxygen headboxes for neonates and young infants	10	30	10
Simple face masks: Infant size	500	3000	250
Simple face masks: Pediatric size	500	3000	250
Nonbreathing masks: Infant size	500	2000	250
Nonbreathing masks: Pediatric size	500	2000	250
Face masks with nebulization chamber	300	2000	500
Oxygen nasal prongs: Neonatal size	500		
Oxygen nasal prongs: Infant size	500		
Oxygen nasal prongs: Pediatric size	500		
Nasal prongs/canula: Neonatal size		2000	250
Nasal prongs/canula: Infant size		2000	250
Nasal prongs/canula: Pediatric size		3000	500
Syringes (1, 2, 5, 10, 20, 50 mL)	500 each	3000	1500
Syringes (2 mL)	500 each	8000	5000
Syringes (5 mL)	500 each	8000	5000

Contd...

Appendix II: Contd...**Home care**

Digital thermometer for axillary use or other devices that ensures that the body temperature can be monitored

Pulse oximeter compatible for infants and children (Refer to government policies for procurement)

Nonconsumables	Screening room/triage area	COVID HDU and ward	COVID PICU
Syringes (10 mL)	500 each	8000	5000
Syringes (20 mL)	500 each	5000	1000
Syringes (50 mL)	500 each	5000	1000
Nasogastric tubes (6F, 8F, 10F, 12F, 14F)	200 each	2000 each	500 each
Ryle's tubes (14F, 16F, 18F)		1000 each	500 each
Oropharyngeal airway: Infant size			50
Oropharyngeal airway: Pediatric sizes			50
Seldinger technique vascular access kits 3F, 4F, 5F, 6F, 7F			100 each
Peritoneal dialysis fluid (2 liters)			1000
Tenckhoff peritoneal dialysis catheters (neonatal and pediatric size)			05 each
Chest tubes (neonatal, infant, and pediatric size)			25 each
Endotracheal tubes, uncuffed (ID 2.5, 3, 3.5, 4); cuffed (ID 4.5, 5, 5.5, 6 mm)			400 each
Diapers: Neonatal sizes		20,000	5000
Diapers: Infants' sizes		20,000	5000
Diapers: Pediatric sizes		20,000	10,000
Urinary catheters 6F, 8F, 10F, 12F		500 each	500 each
Urobags		500	2000
PPE kits	1000 [#]	20,000 [#]	20,000 [#]
N-95 masks	1000 [#]	20,000 [#]	20,000 [#]
Triple-layered masks	2000 [#] (Triple or double-layered masks (surgical) or ear loop masks)	30,000 [#]	30,000 [#]
Face shields	1000 [#]	20,000 [#]	20,000 [#]
Pediatric mortuary bags (in case of mortality in COVID patients)			300

[#]Refer to CDC/WHO guidelines for PPE use.^[6-8] E: Essential, D: Desired, PICU: Pediatric intensive care unit, HDU: High dependency unit, SPO₂: Oxygen saturation, PPE: Personnel protective equipment WHO: World Health Organization, CT: Computed tomography, ABG: Arterial blood gas, BiPAP: Bilevel positive airway pressure, CDC: Center for Disease Control, AED: Automated external defibrillator

Appendix III: Drug tool kit

Medication	Strength	Approximate quantity (each)
Home care		
Syrup paracetamol	125 mg/5 mL; 250 mg/5 mL	2000
Tablet paracetamol	500, 650 mg	5000
WHO oral rehydration solution		2000
Syrup zinc	20 mg/5 mL	10,000
Tablet zinc	50 mg	30,000
Nasal saline drops		2000
Susp amoxycillin	125 mg/5 mL	6000
Tablet amoxycillin	250, 500 mg	10,000
Screening room/triage area		
Syrup paracetamol	125 mg/5 mL, 250 mg/5 mL	500
Tablet paracetamol	500, 650 mg	1000
WHO oral rehydration solution		1000
Syrup zinc	20 mg/5 mL	2000
Tablet zinc	50 mg	10,000
Nasal saline drops		500
Intravenous fluids (normal saline, half normal saline, DNS, 10% dextrose)		5000
Nebulization solution salbutamol		500
Nebulization solution budesonide		500
Injection methylprednisolone	20 mg/mL 40 mg/mL	100
Injection dexamethasone	4 mg/mL	100
Injection amoxycillin clavulanic	625 mg	500
Injection amoxycillin	125, 250, 500 mg	500
Injection ceftriaxone	250 mg, 500 mg, 1 g	500
Injection intravenous immunoglobulin	5%	200
Tablet methylprednisolone	2, 4, 8, 16, 32 mg	500
Tablet dexamethasone	1, 2, 4 mg	500
Syp dexamethasone	0.5, 1 mg/mL	500
COVID HDU/ward		
Syrup paracetamol	125 mg/5 mL, 250 mg/5 mL	1000
Tablet paracetamol	500, 650 mg	2500
WHO oral rehydration solution		1500
Syrup zinc	20 mg/5 mL	2000
Tablet zinc	50 mg	5000
Nasal saline drops		200
Intravenous fluids (normal saline, half normal saline, DNS, 10% dextrose)		1000
Nebulization solution salbutamol		200
Nebulization solution budesonide		400
Injection methylprednisolone	20 mg/mL 40 mg/mL	500
Injection dexamethasone	4 mg/mL	500
Injection amoxycillin clavulanic	625 mg	1000
Injection ceftriaxone	250 mg, 500 mg, 1 g	1000
Injection IVIG	5%	300
Injection dopamine		1000
Injection dobutamine		1000
Injection adrenaline		2000
Injection noradrenaline		2000
Tablet methylprednisolone	2, 4, 8, 16, 32 mg	500
Tablet dexamethasone	1, 2, 4 mg	500
Syp dexamethasone	0.5 mg/mL, 1mg/mL	500
Tablet aspirin	75 mg	1000
Injection clexane		500
COVID PICU		
Intravenous fluids (normal saline, half normal saline, DNS, 10% dextrose)		500
Nebulization solution salbutamol		100

Contd...

Appendix III: Contd...

Medication	Strength	Approximate quantity (each)
Nebulization solution budesonide		300
Injection methylprednisolone	20 mg/mL 40 mg/mL	200
Injection dexamethasone	4 mg/mL	200
Injection amoxycillin clavulanic	625 mg	500
Injection ceftriaxone	250 mg, 500 mg, 1 g	500
Injection IVIG	5%	200
Injection dopamine		500
Injection dobutamine		500
Injection adrenaline		1000
Injection noradrenaline		1000
Tablet methylprednisolone	2, 4, 8, 16, 32 mg	250
Tablet dexamethasone	1, 2, 4 mg	250
Syp dexamethasone	0.5 mg/mL, 1 mg/mL	250
Tablet aspirin	75 mg	500
Injection clexane		500

WHO: World Health Organization, HDU: High dependency unit, PICU: Pediatric intensive care unit, IVIG: Intravenous immunoglobulin

Appendix IV: List of investigations needed at pediatric COVID care facility

Laboratory	Investigation
Hematological	Complete blood count with peripheral smear ANC NLR PLR
Biochemical	Liver function tests Kidney function tests Ferritin D
Microbiology	RT-PCR Rapid antigen test KOH mount Cultures CRP IL-6 PCT
Special	2D ECHO with Doppler (to performed by a cardiologist with experience in pediatrics ECHO) ECG ABG
Radiological	Chest X-ray Ultrasonography CT scan MRI

ANC: Absolute neutrophil count, NLR: Neutrophil to leucocyte ratio, PLR: Platelet to leucocyte ratio, D: Dimer, RT-PCR: Reverse transcription polymerase chain reaction, IL: Interlukien, CRP: C-reactive protein, CT: Computed tomography, MRI: Magnetic resonance imaging, ECHO: Echocardiography, 2D: Two-dimensional, ECG: Electrocardiogram, PCT: procalcitonin, ABG: Arterial blood gas

Appendix V: Multisystem inflammatory syndrome in children (Multisystem Inflammatory Syndrome in Children)

Case Definition	Description
Either of the following sets of symptoms ≥1 of the following	Age <21
	Fever ≥38
	Hypotension or shock
≥2 of the following	Severe cardiac illness
	Severe end-organ involvement (excluding respiratory disease)
	Maculopapular rash
The absence of a more likely diagnosis	Bilateral nonpurulent conjunctivitis
	Mucocutaneous inflammatory
	(i.e., viral illness or bacterial sepsis)
Epidemiologic criteria (≥1)	Close contact with an individual with laboratory confirmed SARS-CoV-2 infection
	Close contact with an individual with COVID-19 like illness who had close contact with an individual with laboratory confirmed SARS-CoV-2 infection
	Travel to or residence in an area with sustained, ongoing transmission of SARS-CoV-2
Virologic laboratory criteria (≥1)	Detection of SARS-CoV-2 RNA or antigen within 4 weeks
General laboratory criteria (≥2)	Detection of SARS-CoV2 antibody
	Neutrophilia
	Lymphopenia
	Thrombocytopenia
	Hypoalbuminemia
	Elevated CRP
	Elevated ESR
	Elevated D-dimer
	Elevated ferritin
	Elevated LDH
	Elevated procalcitonin
MIS-C categories and management	
Mild	No O ₂ or vasoactive support
Moderate	IVIG + aspirin
	Consider regular dose IV corticosteroids with taper if refractory
	O ₂ requirement and/or low dose vasopressors
Severe	IVIG + aspirin + IV corticosteroids with taper
	NIPPV/invasive ventilation and/or high dose/multiple vasopressors
	IVIG + aspirin + IV pulse steroids with taper
Therapeutic anticoagulation indications ^[26,27]	Current or prior VTE
	Severe LV dysfunction
	Large/giant coronary aneurysms

MIS-C: Multisystem Inflammatory Syndrome in Children, IV: Intravenous, LDH: Lactate dehydrogenase, LV: Left ventricular, IVIG: Intravenous immunoglobulin, ESR: Erythrocyte sedimentation rate, CRP: C-reactive protein, VTE: Venous thromboembolism

Appendix VI: On-line resources for pediatric psychosocial issues

Resource	Details	Website
India		
NIMHANS	The website offers multiple resources for psychological care and mental health and well-being of children NIMHANS telehelpline is available to exclusively guide doctors to provide effective psychiatric care in COVID-19 treatment settings Phone number: 080-471 16414	https://nimhans.ac.in/child-adolescent-psychiatry/
National Disaster Management Authority	A Government of India initiative for disaster management. It includes various resources to assist children in a disaster situation	https://www.ndma.gov.in https://ndma.gov.in/kids/index.html
Vikaspedia	An initiative by the Government of India ministry of electronics and information technology (MeiTY). Has various online resources on health, education and social welfare	https://vikaspedia.in Disaster management resources (https://vikaspedia.in/social-welfare/disaster-management-1) Mental health RESOURCES (https://vikaspedia.in/health/mental-health)
Adolescent health resources i.e., RKSK	Initiative by ministry of health and family welfare to support and improve the health of children from 10-19 years of age. The website has various educational resources as to how to attend to the physical health, mental health and well-being of this age group	https://vikaspedia.in/health/nrhm/national-health-programmes-1/rashtriya-kishor-swasthya-karyakram-rksk Resource book (http://nhm.gov.in/images/pdf/programmes/RKSK/ANM_Training_Manual/Resource_Book_%20ANM_LHVs.pdf)
PM-CARES for Children' Scheme	Financial resource scheme by the Government of India to assist children affected by the COVID-19 pandemic	https://vikaspedia.in/schemesall/schemes-for-child
Global		
WHO India	A united nations agency for health that works with the ministry of health to provide resources for global health matters including disaster management	https://www.who.int/india/
UNICEF India	The website provides various resources to support children affected by disaster in India	https://www.unicef.org/india/what-we-do/disaster-risk-reduction
Save the children	The website provides various resources for Global Child Health, education, pandemic threats and child advocacy	https://www.savethechildren.org/us/where-we-work/india
American Red Cross	Various country specific resources available under their international disaster and crisis relief initiatives	https://www.redcross.org/about-us/our-work/international-services/international-disasters-and-crises.html
United States FEMA for kids	Site with multiple games, coloring books, and materials aimed at younger, computer savvy children	https://www.ready.gov/kids/be-ready-kids
Centers for Disease Control and Prevention	Resources on caring for children in the disaster	https://www.cdc.gov/childrenindisasters/index.html
AAP	AAP children and disaster. Web site created by AAP. Useful with multiple documents related to children's needs during disasters	https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Pages/default.aspx

RKSK: Rashtriya Kishor Swasthya Karyakram, UNICEF: United Nations International Children's Emergency Fund, WHO: World Health Organization, FEMA: Federal Emergency Management Agency, AAP: American Academy of pediatrics, NIMHANS: National Institute of Mental Health and Neurosciences