

King George's Medical University, Lucknow, India



Paediatric Orthopaedic Guidelines
during
COVID-19 Pandemic

Prepared by

Department of Paediatric Orthopaedics

King George's Medical University, Lucknow

Email- ajaipaedortho62@gmail.com

Academic Collaboration by

- **Indian Society of Paediatric Traumatology (ISPT)**
- **INDUSEM Health & Medicine Collaborative**
- **Emergency Crisis Management Solution (ECMS)**
- **Indian Academy of Paediatricians (IAP)**
- **Indian Orthopaedic Association (IOA)**
- **Uttar Pradesh Orthopaedic Association (UPOA)**

Contributors

(In Alphabetic Order)

- ❖ **Ajai Singh**, Professor & Head, Department of Paediatric Orthopaedics, King George's Medical University, Lucknow, India
- ❖ **Anup Agrawal**, Vice President Asia Pacific Trauma Society & Secretary Uttar Pradesh Orthopaedic Association (UPOA)
- ❖ **Atul Srivastava**, Secretary Indian Orthopaedic Association (IOA) & ex-President Uttar Pradesh Orthopaedic Association (UPOA)
- ❖ **Bakul Parekh**, President, Indian Academy of Paediatrics (IAP)
- ❖ **Dhirendra Singh**, Sr Orthopaedic Consultant & ex-President Uttar Pradesh Orthopaedic Association (UPOA)
- ❖ **G V Basavaraj**, Secretary, Indian Academy of Paediatrics (IAP)
- ❖ **Kayur Mehta**, Research Fellow, Paediatric Infectious disease, McGill University, Canada
- ❖ **Nitin Chawla**, Paediatric Acute and Critical care Specialist, Medical Director ECMS
- ❖ **Prashant Mahajan**, Professor of Emergency Medicine and Pediatrics, Vice-Chair, Department of Emergency Medicine, Section Chief, Pediatric Emergency Medicine, CS Mott Children's Hospital of Michigan, USA
- ❖ **Sagar Galwankar**, Executive Director of The American College of Academic International Medicine, CEO, INDUSEM, Associate Professor, Florida State University, United States

Sources

WHO interim guidance 13.3.2020,

Guidelines Resuscitation Council UK,

COVID document British Orthopaedic Association 30.3.2020,

Clinical Radiology: The Royal College of Radiologists,

COVID 19: Guidelines for Surgical Care American College of Surgeons,

The Lancet-Infectious disease 2020,

Guidelines Indian Orthopaedic Association 2020.

POSI Advisory Commentary Document 2020

Coronavirus Disease 2019 in Children-United States, Feb 12 – April 2, 2020. MMWR Morb Mortal Wkly Rep2020; 69:422-26

British J Oral and Maxillofacial Surgery 2020

Introduction

As health providers, it is our prime duty to conduct and follow the national / international guidelines to fight against COVID-19 pandemic caused by SARS CoV-2 virus. We also have responsibility to ensure the safe protocols for our trauma patients with special reference to paediatric population. As per Census 2011, India, with a population of 121.1 Cr, has 16.45 Cr children in age group 0-6 years and 37.24 Cr in age group 0-14 years which constitute 13.59% and 30.76% of total population respectively. Although rural population constitute about 69% of India's population, the proportion of young children (0-6 years old) living in rural areas is substantially higher (estimated at 74%). Low velocity trauma sustained at home and / or school is more common in children less than 10 years, while high velocity trauma is common in children more than 10 years. High velocity trauma is typically due to road traffic accidents mainly four-wheel vehicles closely followed by two-wheelers. Amongst falls, fall while playing at home is most common. As per Indian study, about 26.48% of paediatric trauma were poly trauma, followed by head/face trauma (19.86%).

The wellbeing and safety of the patient are paramount and this is never more so than when dealing with a diseased / injured child. The intended purpose of these paediatric guidelines is to recognise a scientific step by step protocol to provide high standard of appropriate and timely care at paediatric orthopaedic units at trauma / emergency centres. These relates to clinical management and radiological imaging. As management of paediatric orthopaedic emergency / trauma cases is preferred over cold cases, so these guidelines mainly targeted to paediatric orthopaedic trauma and emergency cases.

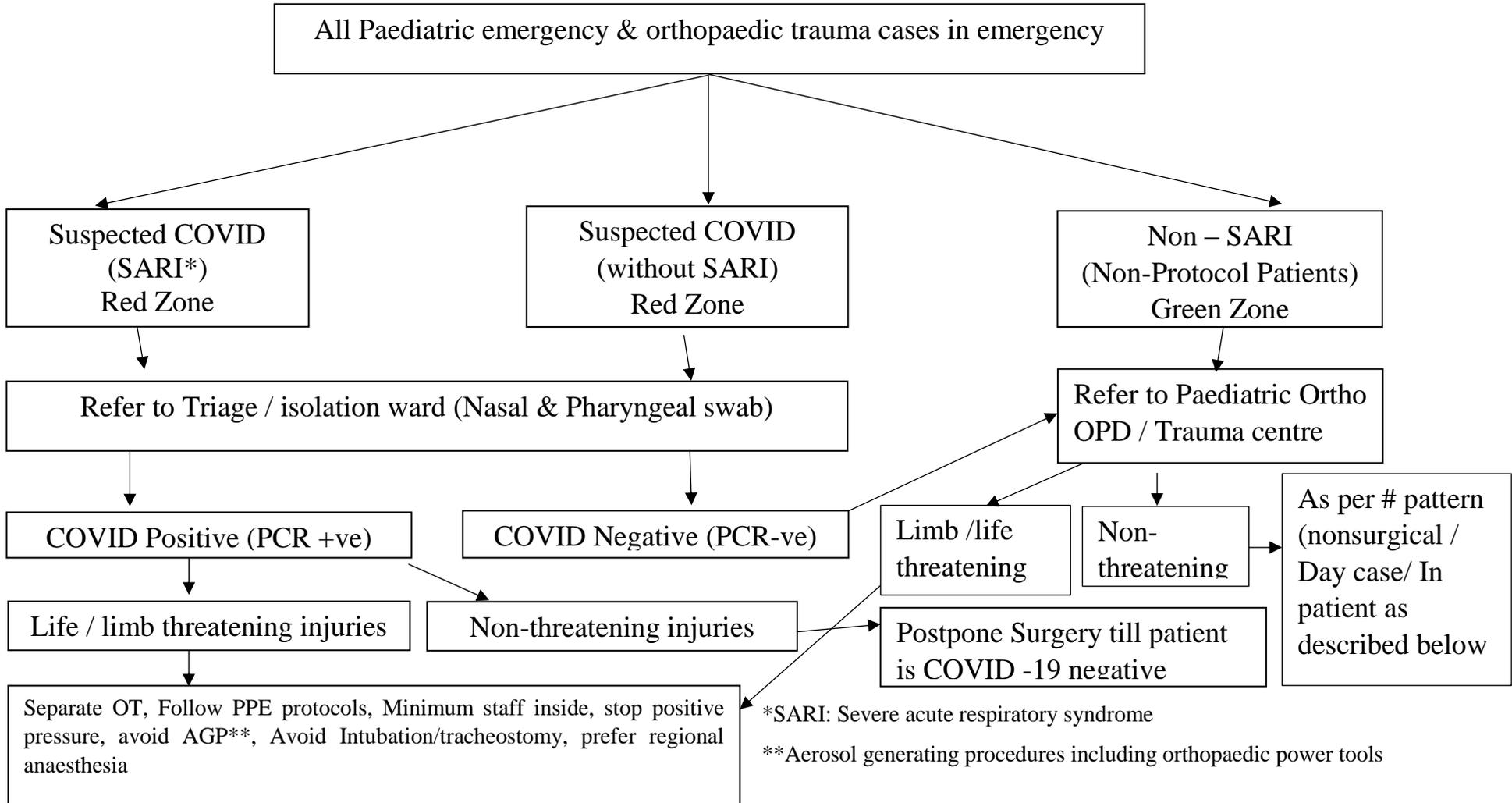
Disclaimer

Knowledge and best practices about COVID-19 are in a state of flux and rapidly evolving. Every day we are getting newer research and experiences, so every day our understanding and practices are evolving and changing. The guidelines here are being suggested as per recommendations of various national and global associations. However, every paediatric orthopaedic surgeon must adopt these as per their experience, understanding, experience and resources. These guidelines offer suggestions to support and enhance care while reducing variation and improving patient and provider safety /exposure. Department of Paediatric Orthopaedics, King George's Medical University, Lucknow, India will not be responsible for any damage to person or property due to negligence or ill understanding of these guidelines. All practicing paediatric orthopaedic surgeons are advised to read these guidelines carefully and must exercise their own judgement and discretion.

COVID-19 in Children: The link in Transmission Chain

- ✓ Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), causing corona virus disease (COVID-19) is a pandemic.
- ✓ Infants and children appear to be at lesser risk: in China about 1% of COVID 19 cases belong to age less than 10 years. As per recent study, 1.7% of the cases were below 18 years of age.
- ✓ Infants and children are typically high risk for admission to hospital after respiratory tract infection with viruses
- ✓ Due to immature respiratory tract and immune system: severe respiratory disease may develop in this age group
- ✓ Case definitions and management strategies for children are absent because of limited number of paediatric cases with COVID-19
- ✓ Kelvin AA et al (Lancet Infectious 2020) reported that about 50% of these children remain asymptomatic or mildly infected with pneumonia. The most important finding of present analysis is the clear evidence that children are susceptible to SARS-CoV-2 infection, but frequently do not have notable disease, raising the possibility that children could be the facilitators of viral transmission.

Flowchart for Paediatric Emergency and Orthopaedic Trauma cases in reference to COVID-19



Paediatric Orthopaedic Patients without COVID suspicion @ Outpatient Department

- Even without symptoms, consider every injured as potential COVID carrier: utmost precautions with regards to PPE.
- Minimize OPD patients: no unnecessary bags / files / papers / X Rays: screen all patients and attendants at entry
- Use Telemedicine and schedule appointments accordingly
- Daily sanitization of OPD complex
- Clearly mentioned Dos and Don'ts
- One patient with one attendant only with compulsory face masks
- Social distancing in OPD waiting area and examination chamber
- Availability of hand sanitizer at waiting area and examination area with regular sensitization.
- Minimum health and support staff with face mask, gloves and hospital shoes
- Paediatric trauma patients must get preference over cold paediatric orthopaedic cases.
- Cold cases must be given spot consultations with follow up after 3-4 weeks
- Separate examination and procedure area
- Plan minimum follow ups, whenever required only video calling
- Minimal inter- / intradepartmental references
- Minimal investigations
- Minimum admissions for Inpatient management
- Video / online rehabilitation protocols

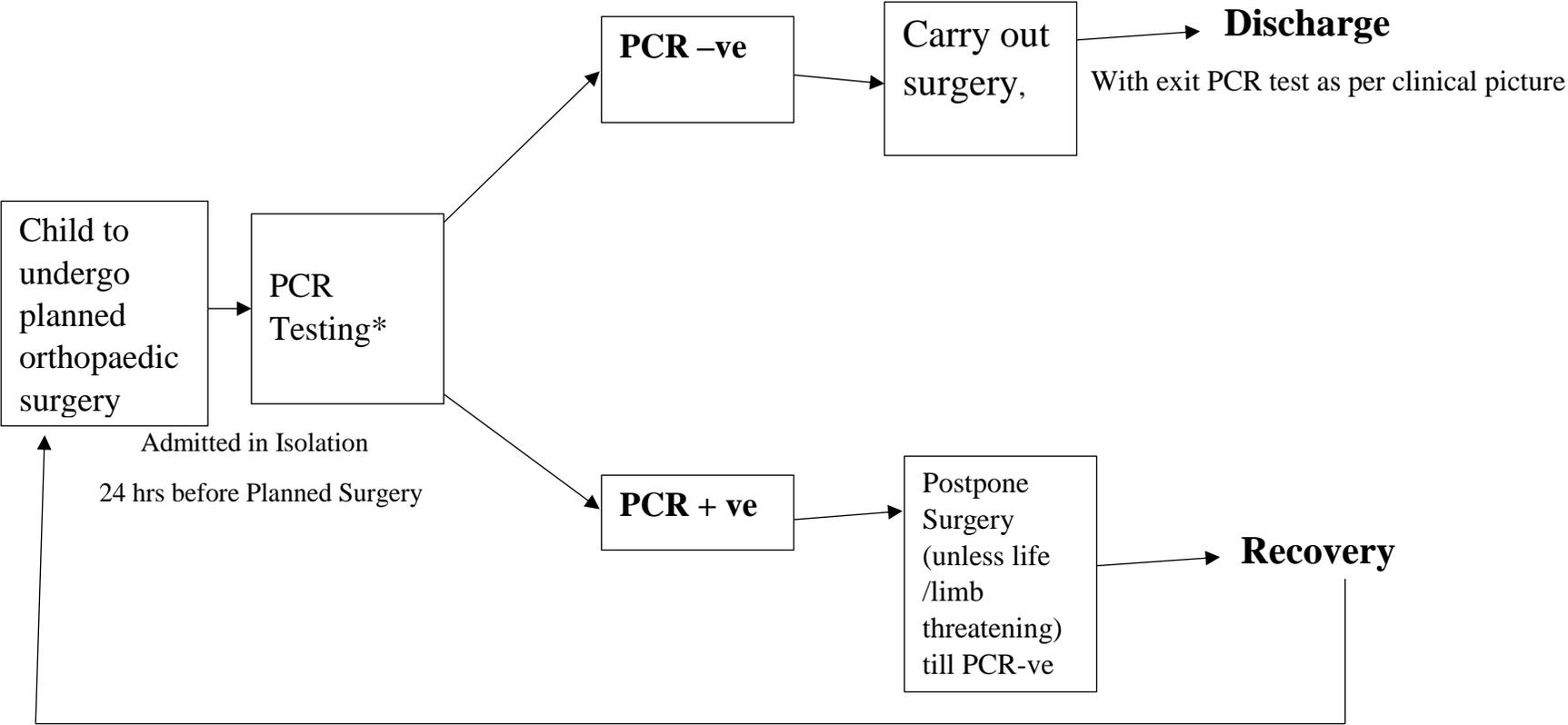
Basic Principles of Paediatric Orthopaedic Trauma Management: COVID 19 Pandemic

1. Always consider the possibility of non-accidental injury. The principles of management will remain unchanged.
2. If necessary, children with following suspected diagnosis without radiology at presentation:
 - a) Soft tissue injuries
 - b) Wrist, forearm (incomplete / complete in less than 10 years children), clavicle and proximal humeral #s
 - c) Long bone fractures with obvious clinical deformity
 - d) Foot #s without significant clinical deformity and swelling
3. These injuries can be managed without cast at presentation
 - a) Knee ligament, meniscal and patella injuries may be managed with bracing
 - b) Stable ankle #s may be managed by fixed ankle boots or softcast
 - c) stable Hind-, mid- and forefoot injuries may be managed by fixed ankle boots or plaster shoe.
4. A single follow-up appointment at 4 to 12 weeks, depending on limb or bone fractured, is acceptable for the majorities of injuries. Patient-initiated follow-ups is appropriate for following conditions:
 - a) Patellar subluxations and dislocations, knee ligament and meniscal injuries, excluding locked knees
 - b) Lateral malleolar #s and suspected ankle avulsion #s
 - c) Foot injuries except suspected mid- and hind foot injuries
 - d) Wrist, forearm, clavicle and humeral #s, including proximal humerus
 - e) Gartland 1& 2 supracondylar humerus #s

Non-Operative Management of Paediatric Orthopaedic: COVID 19 Pandemic

1. # Clavicle
2. # Humerus
3. #around elbow including # Supracondylar humerus, single condylar #s
4. # single bone forearm without dislocation and # both bones of forearm if child below 10 years
5. # around wrist without dislocations
6. Monteggia # dislocation and Galeazzi's # dislocation in children below 10 years
7. # Hand with or without dislocations
8. # spine without signs of neurological involvement
9. Uncomplicated # Pelvis
- 10.# shaft femur below age 10 years (plaster spica if child below 5 years and traction if child between 5-10 years)
- 11.# patella with or without acute patellar subluxations / dislocations
- 12.Knee ligament and meniscal injuries
- 13.Stable diaphyseal tibial #s
- 14.Extra articular tibial #s without neurovascular or soft tissue compromise
- 15.Undisplaced injuries around ankle
- 16.Extra articular calcaneal #s
- 17.Foot injuries without dislocations
- 18.Non- / delayed unions
- 19.Chronic osteomyelitis
- 20.Tendinitis
- 21.Joint pains and back pains
22. Benign tumours
- 23.Soft tissue injuries: sprain / strains / contusions/ cellulitis

Flowchart Suggesting COVID-19 testing protocol for Paediatric Orthopaedic Surgical Cases



***Role of antibodies testing is still not supported by ICMR recommendations**

Paediatric Orthopaedic Trauma Day Case Surgeries: COVID 19 Pandemic

1. Close reduction of subluxations / dislocation
2. # with neurological involvement, resolving after management
3. Undisplaced or displaced Periarticular # requiring percutaneous pinning
4. Single condyle # around elbow
5. Gartland 2 requiring percutaneous pinning
6. Extra articular femoral # in children below 06 years: spica / traction
7. Incision – drainage of local abscess
8. Primary suturing of lacerations

Inpatient Paediatric Orthopaedic Surgeries: COVID 19 Pandemic

1. Displaced Diaphyseal #s not fit for conservative management
2. Open #s
3. Septic arthritis
4. Acute osteomyelitis with sub periosteal abscess
5. Acute on chronic osteomyelitis with hot abscess
6. Prosthetic joint infection
7. Orthopaedic lesions associated with shock (hypovolemic or septic)
8. Femoral # in children more than 6 years requiring operative stabilisation
9. Displaced periarticular # requiring open reduction with fixation
10. Intra-articular #s
11. Acute SUFE: close reduction with or without pinning with plaster
12. Iatrogenic peripheral nerve injury
13. Trauma with uncontrolled haemorrhage or penetration
14. Cauda equina
15. Acute onset paraplegia
16. Life and limb threatening injuries
17. High velocity and complex trauma
18. Poly Trauma
19. Malignant bone tumours

Principles for Inpatient Facility: COVID 19 Pandemic

- ❖ Patient should be admitted if there is no other alternative
- ❖ Separate and exclusive Isolation ward for COVID positive and COVID suspect inpatients: they should be under droplet and contact precautions
- ❖ Social distancing and restriction of number of attendants should be followed in ward for Non COVID cases
- ❖ Day case facilities for ambulatory trauma, in-patient facility may require under special situations
- ❖ Severe, complex and non-ambulatory cases with or without some of complication or comorbidity must be admitted
- ❖ Proper planning is must so that total hospital stay may be minimised
- ❖ Special Informed consent is must with reference to COVID 19
- ❖ Minimum inter departmental references
- ❖ Minimum diagnostic test: even if required then minimum movement
- ❖ Follow preoperative protocol given by ICMR / Institutions / Government
- ❖ Use of PPE (N95 masks, double gloves, gown and face shield) is must if any Aerosol Generating Procedure is required, which should be under negative pressure
- ❖ Consider leaving cut ends of K-wires unburied
- ❖ For complex or poly trauma, staged approach may be required i.e. discharge to readmit
- ❖ Use absorbable skin suture (explain its possible side effects)
- ❖ Plan discharge to minimise frequency of follow ups

- ❖ Provide some discharge packs with basic dressing materials, if needed
- ❖ While transferring patients, clear passage is required to avoid contamination. Separate trolley is required. Use full precautions.
- ❖ Rehab program using video and telemedicine

Pre-operative Workup: COVID 19 Pandemic

- Routine preoperative work up
- Rule out history of symptoms (fever, dry cough, shortness of breath, fatigue, rhinorrhoea and diarrhoea) / contact / travel history to hot spots
- Ideally all patients must be tested for COVID 19: PT-PCR is the only confirmatory test available. Reliability of rapid test kits is still not established.
- If routine COVID 19 tests not available then one get CT chest (as per recommendations of Am College of Radiology)
- If even CT not available then treat all children as COVID 19 positive with full precautions
- Check resources such as PPE kits, staff and ventilator / isolation ward bed
- Avoid surgery in nights
- Avoid non- life saving blood transfusions: Check donors complete history in reference to COVID 19
- Surgical masks not fit for aerosol generating procedures: N 95 masks should be used
- Patient should be transferred directly to OT without going to preoperative room.
- Patients and other health workers must wear masks all the time.
- Postoperative care should be in isolation ward only if patient is COVID 19 positive. Patients must remain under supervision of COVID physician. Operative surgeons must give their opinions after undergoing all precautions.

Anaesthesia / OT Considerations: COVID 19 Pandemic

- ✓ Prefer regional anaesthesia whenever possible
- ✓ If General Anaesthesia: preferably in separate intubation / extubation room ideally equipped with negative pressure
- ✓ Anaesthetist and technician must use full PPE when intubating
- ✓ Dedicated OT: COVID 19 OT for COVID positive and COVID suspects
- ✓ NO laminar flow
- ✓ Negative pressure OT
- ✓ Doors closed during procedures
- ✓ Minimum essential OT staff
- ✓ O2 mask must be avoided or should be used with precautions to avoid contamination of central line.
- ✓ Avoid orthopaedic power tools if possible
- ✓ No entry / exit in between procedure
- ✓ All PPE should be removed inside OT, except masks
- ✓ Discard them properly
- ✓ Normal sterilizing methods enough
- ✓ Anaesthesia trolley, OT table, instrument trolley and surfaces sanitization by 70% ethyl alcohol or 1% sodium hypochlorite
- ✓ Soiled linen, if present should be segregated in labelled container.

- ✓ Follow biomedical waste protocols
- ✓ Regular COVID screening for doctors and OT staff between 5 to 14 days