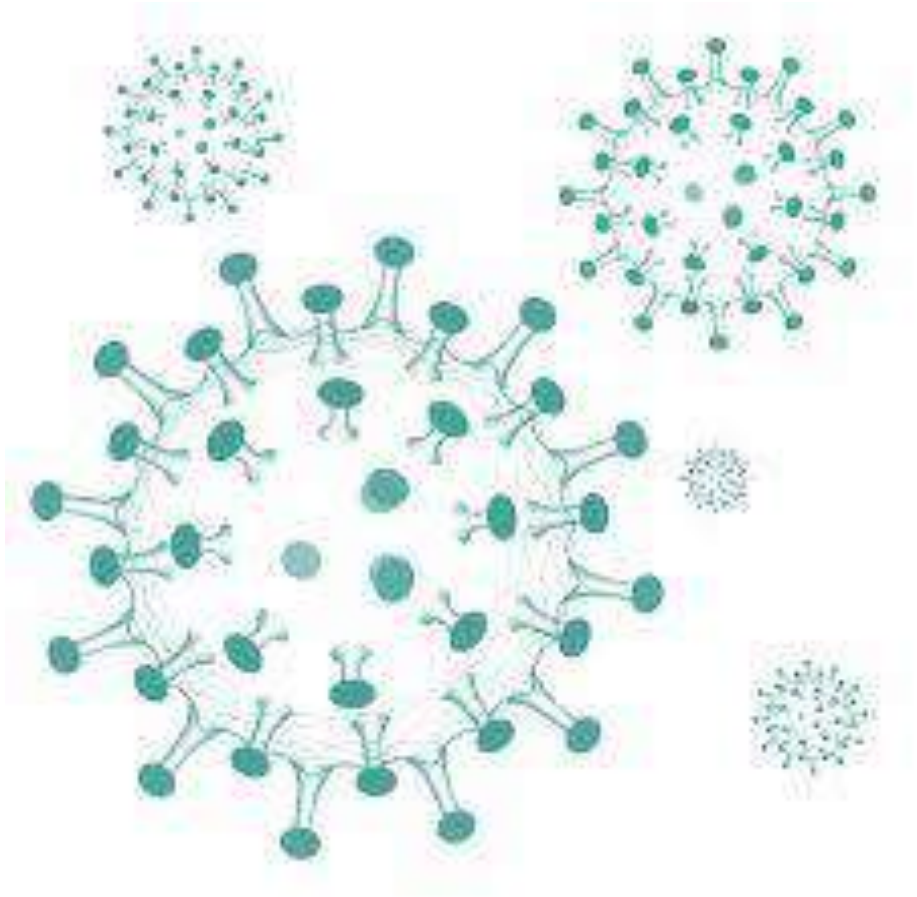
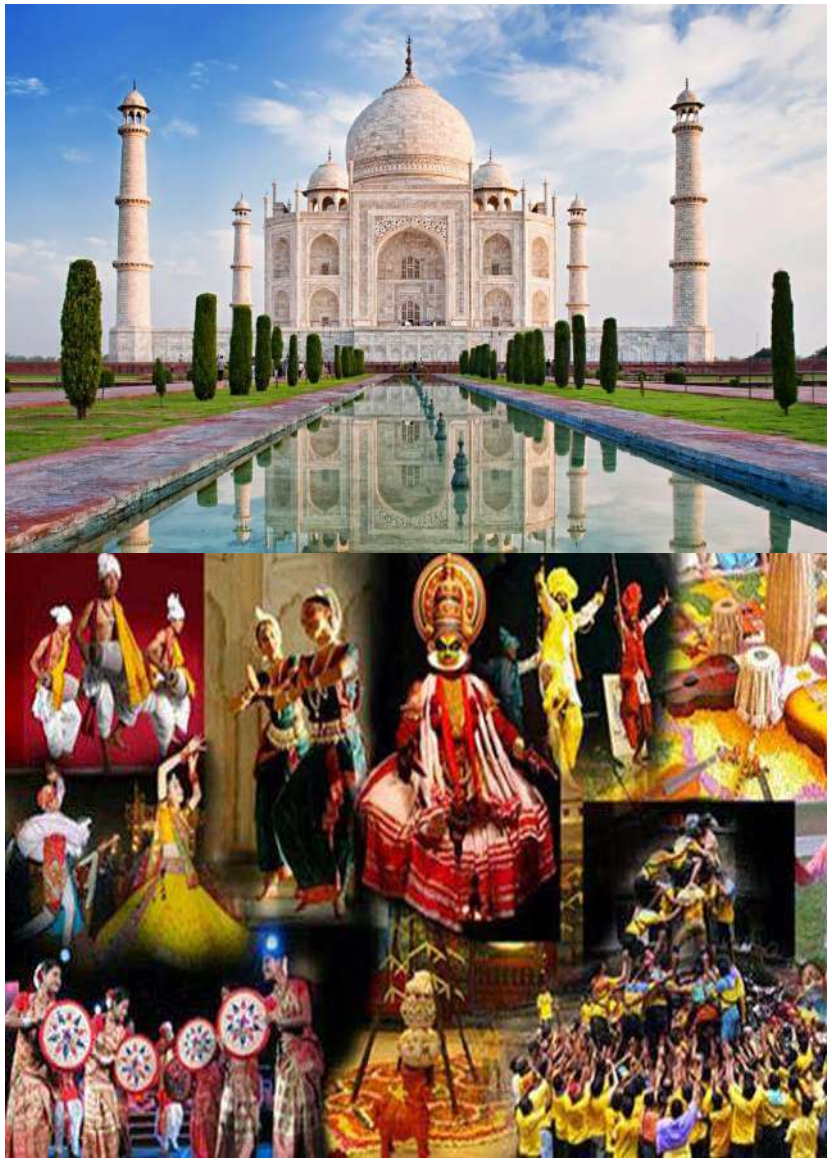


Operational Preparedness and Planning of Hospitals in India towards COVID - 19 Pandemic

Dr. Lallu Joseph
Quality Manager, Associate GS, CMC Vellore
Secretary General, CAHO

India

- One of the oldest civilizations with rich cultural heritage.
- Himalayas in the North, Bay of Bengal in the East, Arabian Sea in the West, Indian Ocean to the South
- Area- 3.3 million sq. km
- 7th largest country in the world
- Lying entirely in the northern hemisphere
- Land frontier of about 15,200 km.
- Coastline- 7,516.6 km.
- Border- 7 countries



Government of India

- Largest democracy in the world, with around 900 million eligible voters, as of 2019.
- Federal form of government, called “Central" Government, with elected officials at the Union, State and local levels.
- 28 States and 8 Union Territories

Health Indices - Infrastructure and manpower in India

Total hospital beds in India	**19 lakhs**
Public Sector **Private Sector**	**7 lakhs** **12 lakhs**
Total ICU beds in India	**95000**
Public Sector **Private Sector**	**36000** **59000**
Total Ventilators in India	**48000**
Public Sector **Private Sector**	**18000** **29000**
Total population (2016) **Life expectancy at birth (m/f) (2016)**	**1.3 Billion** **67/70**
Ratio of Doctors to population **Ratio of Nurse to population** **Isolation beds**	**1:1456 (0.69:1000)** **1.7 per 1000 (1:475 approx.)** **1:84000**

Lockdown in India

- First case of COVID 19 - January 30th
- Voluntary public curfew - March 22nd
- Number of confirmed cases - More than 500
- Phase 1 - March 25th - 14th April
- Phase 2 - April 15th - 3rd May
- Phase 3 - May 4th - 17th May
- May 3rd - Three zones - Red, orange and green- with relaxations
- Phase 4 - May 18th - 31st May (with some relaxation)

Pandemic Management in India

- Health is a state subject - pandemic allows centre to take charge
- Centre used provisions of disaster management act, 2005 and Epidemic Diseases Act, 1897 to take control of public health
- Centre listed restrictions- States allowed to enhance restrictions but not relax without consent from centre

Management by Indian States

Pockets of excellence

- **Kerala model** – Public health geared to managing pandemic, Experiences from Nipah, Contact tracing and isolation, managed by public health facilities
- **Odisha model** - Increased testing, effective resource allocation, swift private sector partnerships, infrastructure set-up, capacity building of human resources in health care, and incentives for citizens to test, PPP Model.

Golden Words…..

It’s time to set aside the “business as usual” mindset. Even if large numbers of severe cases don’t start appearing for weeks, every moment spent on preparations now will pay off…..

Vineet Chopra, M.D., M.Sc., the chief of hospital medicine at Michigan Medicine, the University of Michigan’s academic medical center.

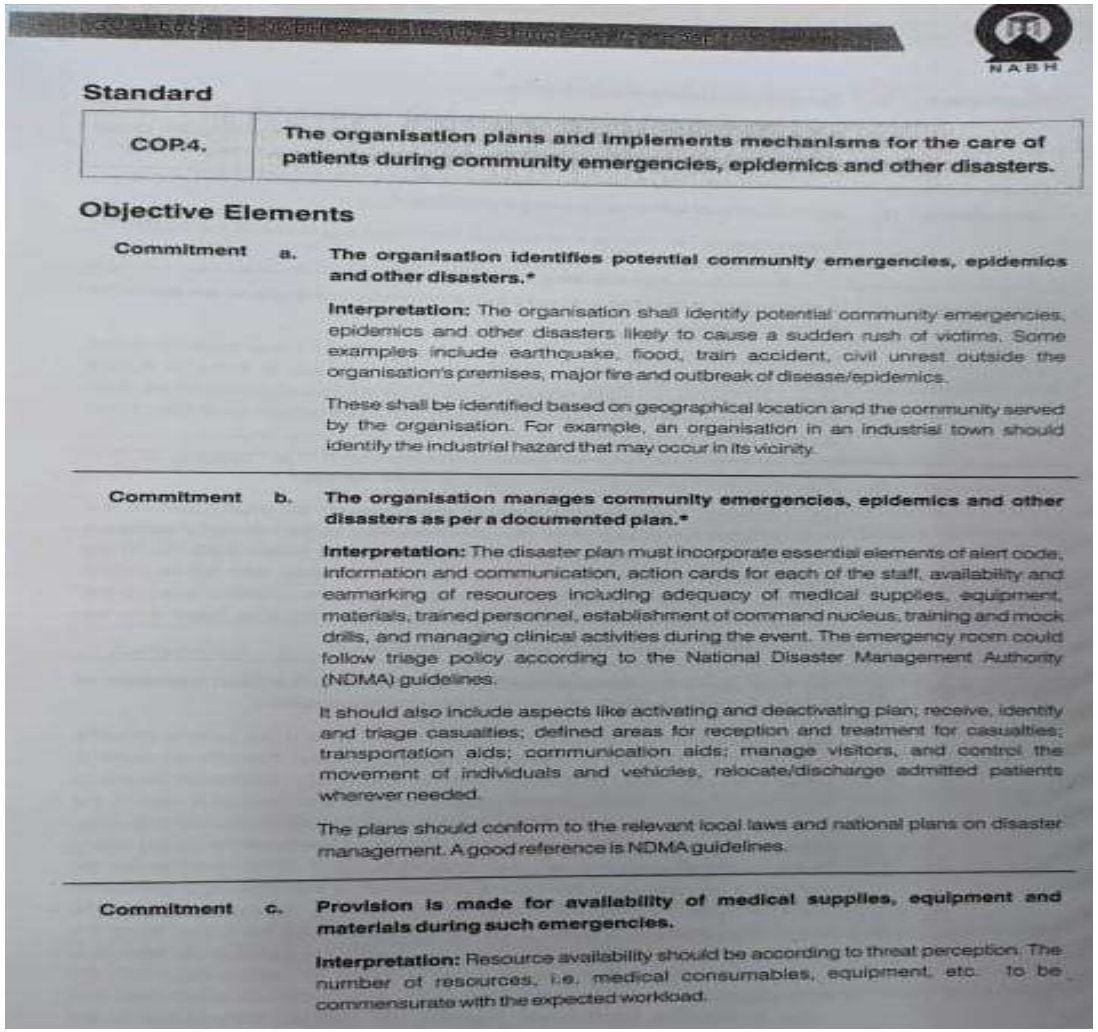
What is Hospital Preparedness?

Every hospital, in collaboration with other hospitals and public health agencies, will be able to provide appropriate care to COVID-19 patients requiring hospitalization while maintaining other essential medical services in the community, both during and after a pandemic.

This definition recognizes that what constitutes "appropriate care" and the criteria for hospital admission may well change during a pandemic.


Prevention & preparedness phase
No infectious diseases emergency
Conduct annual Mock drill
Standby phase
Global Outbreak potential to reach your country
Review released Advisory & Propose an action plan
Initial action phase
Pandemic declared by WHO
HICS activated Screening /Triaging
Cohorting
IPCs measures strengthened
Targeted action phase
Pandemic declared by WHO
Wide spread community outbreak
HICS activated
Develop communication to empower & engage with the stakeholders including community
Strengthen & implement surge management strategy
Stand down phase
Infectious disease emergency has abated.
Health services return to normal activities
Discontinue heighted surveillance activities that are no longer required
Monitor for second wave and / or resistance to antibiotics/ antiviral
Transition to routine infectious disease control or interim arrangements

Accreditation (NABH requirements)



Standard

COP.4.	**The organisation plans and implements mechanisms for the care of patients during community emergencies, epidemics and other disasters.**

Objective Elements

Commitment a. **The organisation identifies potential community emergencies, epidemics and other disasters.***

Interpretation: The organisation shall identify potential community emergencies, epidemics and other disasters likely to cause a sudden rush of victims. Some examples include earthquake, flood, train accident, civil unrest outside the organisation's premises, major fire and outbreak of disease/epidemics.

These shall be identified based on geographical location and the community served by the organisation. For example, an organisation in an industrial town should identify the industrial hazard that may occur in its vicinity.

Commitment b. **The organisation manages community emergencies, epidemics and other disasters as per a documented plan.***

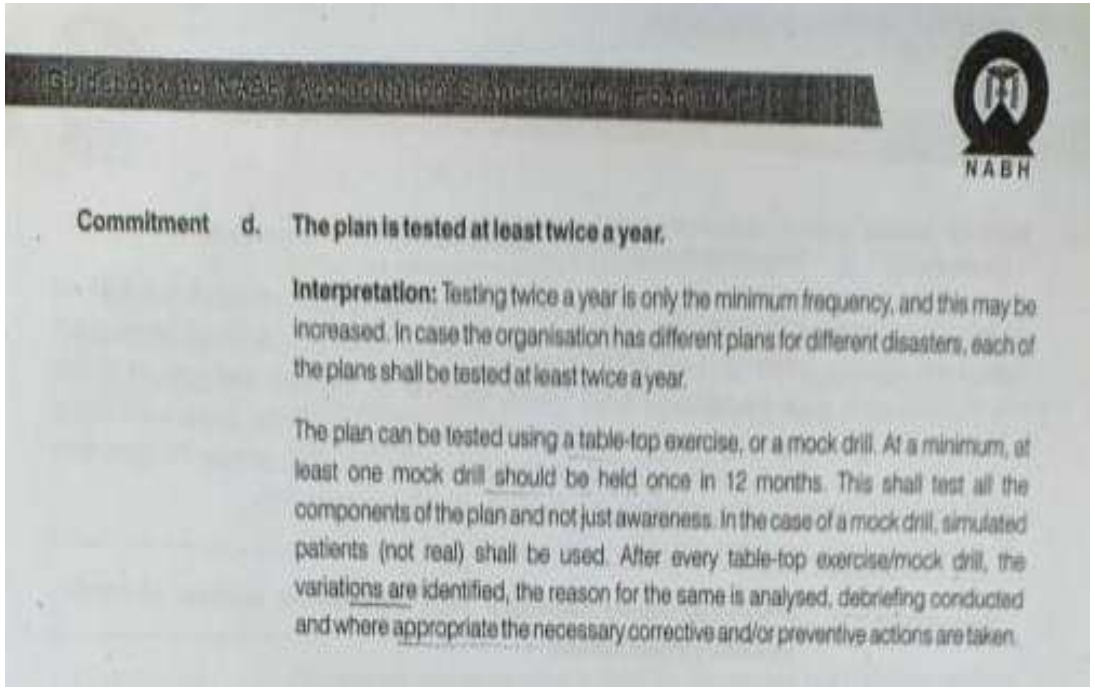
Interpretation: The disaster plan must incorporate essential elements of alert code, information and communication, action cards for each of the staff, availability and earmarking of resources including adequacy of medical supplies, equipment, materials, trained personnel, establishment of command nucleus, training and mock drills, and managing clinical activities during the event. The emergency room could follow triage policy according to the National Disaster Management Authority (NDMA) guidelines.

It should also include aspects like activating and deactivating plan; receive, identify and triage casualties; defined areas for reception and treatment for casualties; transportation aids; communication aids; manage visitors, and control the movement of individuals and vehicles, relocate/discharge admitted patients wherever needed.

The plans should conform to the relevant local laws and national plans on disaster management. A good reference is NDMA guidelines.

Commitment c. **Provision is made for availability of medical supplies, equipment and materials during such emergencies.**

Interpretation: Resource availability should be according to threat perception. The number of resources, i.e. medical consumables, equipment, etc. to be commensurate with the expected workload.

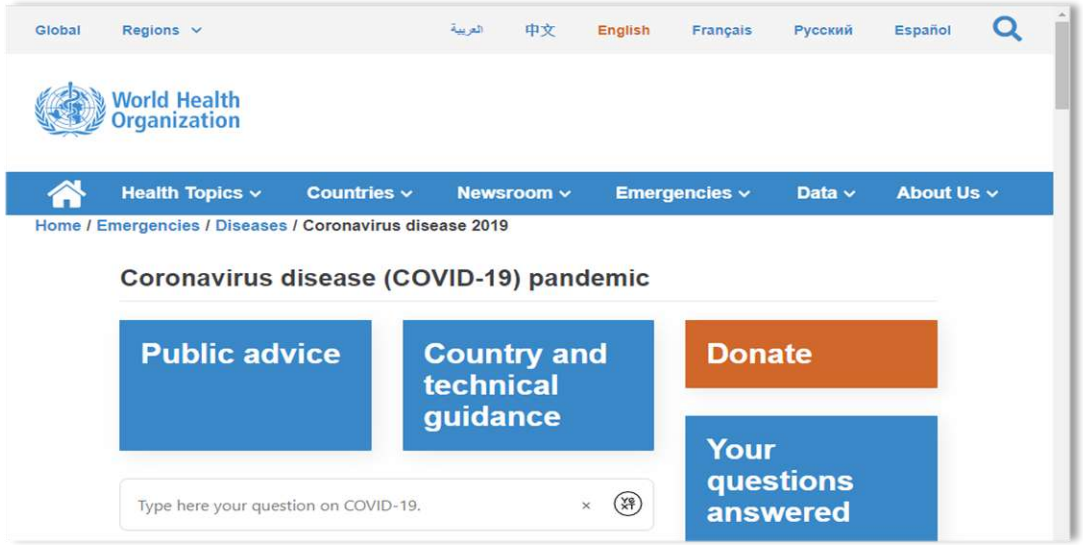


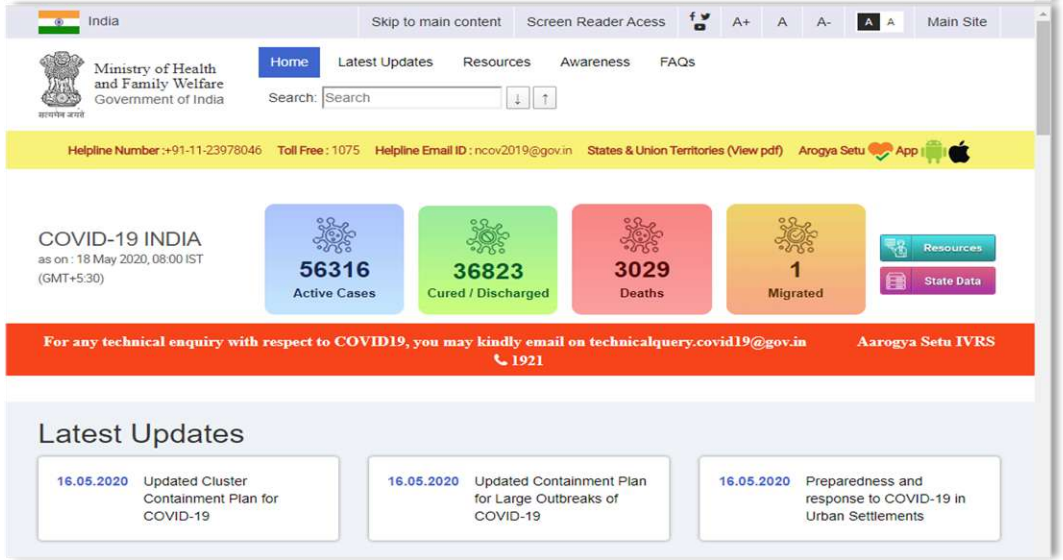
Commitment d. **The plan is tested at least twice a year.**

Interpretation: Testing twice a year is only the minimum frequency, and this may be increased. In case the organisation has different plans for different disasters, each of the plans shall be tested at least twice a year.

The plan can be tested using a table-top exercise, or a mock drill. At a minimum, at least one mock drill should be held once in 12 months. This shall test all the components of the plan and not just awareness. In the case of a mock drill, simulated patients (not real) shall be used. After every table-top exercise/mock drill, the variations are identified, the reason for the same is analysed, debriefing conducted and where appropriate the necessary corrective and/or preventive actions are taken.

Guidelines followed - COVID Preparedness





Leading from the Front - Establish HICS (Hospital Incident Command System)

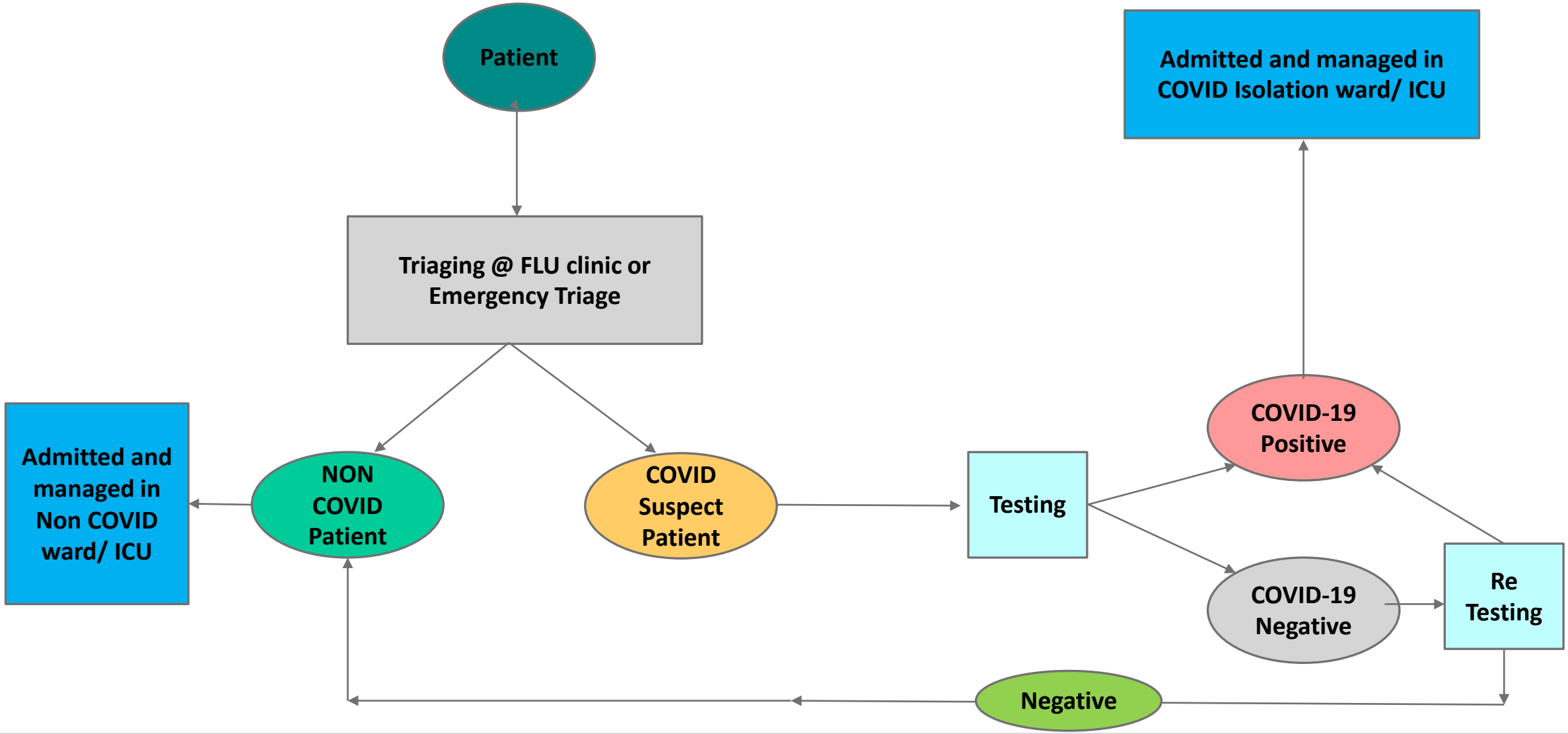
HICS	Priorities
Head of the Hospital	Overall responsibility
Clinical Experts (Infectious Diseases, Infection control, Pulmonologist & Intensivist)	Patient care and staff safety
Operation representatives – Inpatient, Outpatients and other clinical services , Nursing Admin, General Admin	Operation management –day to day functioning & Surge planning
Medical Admin	Coordination with health authorities
Logistics –SCM	Rapid & evidence based decision making
Finance	Flow of materials and funds
Infection Control Officer/ Safety Officer / Quality Manager/ Risk Manager	Communications and coordination with the sub teams

Elements of Planning/ Sub Committees

1. Patient Flow
2. Administrative Controls
3. Infection Control Practices
4. Manpower including staff health
5. Training & Development
6. Logistics -SCM
7. Clinical Management
8. Financial Management

1. Patient Flow

Triage and Patient Flow



Different Strategies Adopted for Triage and Patient Flow

- Make it mandatory for all patients and visitors to wear masks
- Flu clinic at the entrance
- All patients screened with thermal scanners
- Patient interviews with checklists
- Full protection and PPE in ED, Flu clinics
- COVID wards in isolated buildings
- Patient Cohort
- Separate route and lifts
- Staff movement

Flu Clinic at the Entrance

Patients Screened with Thermal Scanners

Full Protection and PPE in ED, Flu Clinics

COVID Wards in Isolated Buildings

Patient Cohort

- Cohort 1- Positive test for COVID- 19----Level 1, 2, 3 (Mild symptoms, Require medical attention, Sick and ventilated)
- Cohort 2- Clinically suggestive, but pending test results
- Cohort 3- Clinically inconsistent & Negative Test

Staff Movement

Staff enter the floor in their street wear and collect scrub suit from issue counter

Move to change room and change to scrubs. Keep the street wear and valuables in locker

Go to the donning room of the wards and Don appropriately

On completion of shift, move to doffing room of the respective wards and remove the hazmat suit, N95 mask and other PPE. Leave the donning room (to locker) in scrubs

Pick up the streetwear from locker, take shower and move out

2. Administrative Controls

Administrative Controls

- Essential services
- Creating additional beds
- Support services - Transport
- Entry restriction
- Visitor management
- Donning and Doffing supervision
- Food and refreshments
- Social distancing
- Tele-consult and Telemedicine

Entry Restriction

Visitor Restriction

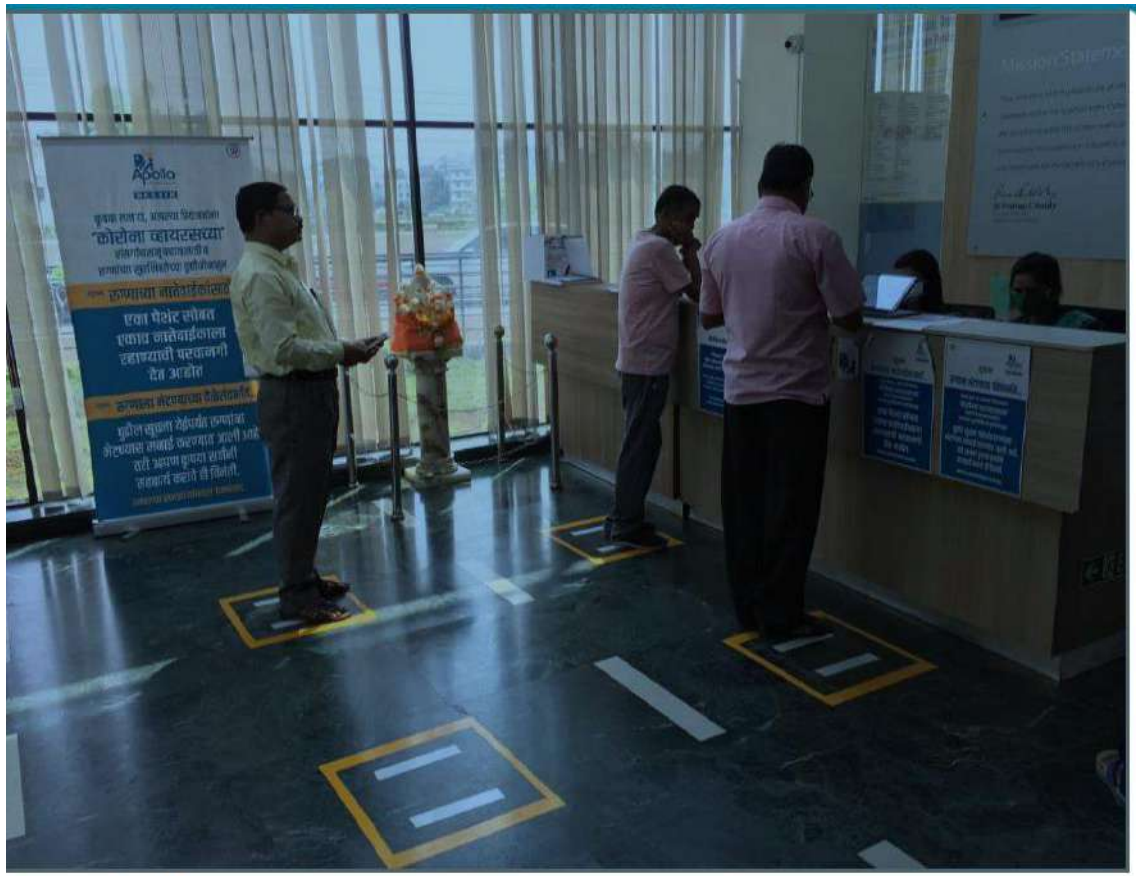
Donning and Doffing Supervision

- Each ward to have one room for donning and one doffing room
- Donning room- appropriate PPE kept ready for the staff
- Doffing room- Bins and other accessories for storage of PPE for reuse, if required (N95)
- Supervision/double check of the donning before the staff enters the COVID area

Food and Refreshments

- For patients
- For Healthcare workers

Social Distancing



Social distancing at Registration Counter

Tele consult, Tele medicine

- Increasing number of patients prefer to consult doctors over video and audio calls
- Remote health consultation used effectively for triaging potential cases

3. Infection Control and Engineering Controls

Infection Control and Engineering Controls

- Protocols- Cleaning of all areas, instruments, equipment, linen
- Spraying and disinfecting
- Negative pressure areas- ICU, Isolation
- Positive pressure OT to Negative pressure OT
- Waste Management

“High frequency” touch surfaces

- Telephone
- Mobile phone/ pager
- Door knobs / handles
- Lift/ elevator buttons
- Keypad & Mouse
- Chair arms (including wheel chairs)
- Hand rails
- Side rails of stretchers








Cleaning Protocol

- Cleaning solution to be used
- PPE to be used – Glove, Mask and Apron

Sweeping and mopping - **three times daily**
Wall cleaning - **atleast once a day**
Toilet cleaning - **every hour** along with all flush knobs and high touch areas.
Entrances to all patient rooms, door handles, knobs - **every 4 hours**.
Patient waiting area chairs - **every 2 hours** (including those outside wards).
OPD cubicles and knobs - **every 2 hours**
High touch areas including fridge handles - **every shift**.
Patient cots and furniture - **once a day**.
After BMW removal from outside, cleaning that area should be done by the ward.
Phones to be wiped with Isopropyl alcohol **every shift**.
Wiping of wheel chairs and trolleys – **after every use**
Lifts (entrance, doors, lift buttons, full cabin - top to bottom and side to side), mopping the floor - **every 4 hours**









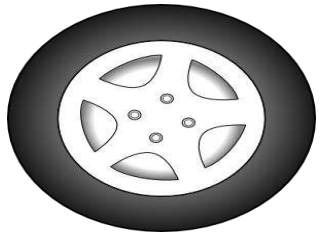


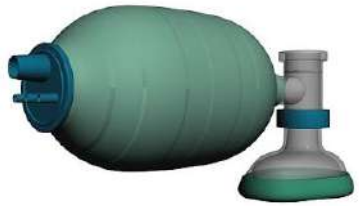

Canteens/ food services

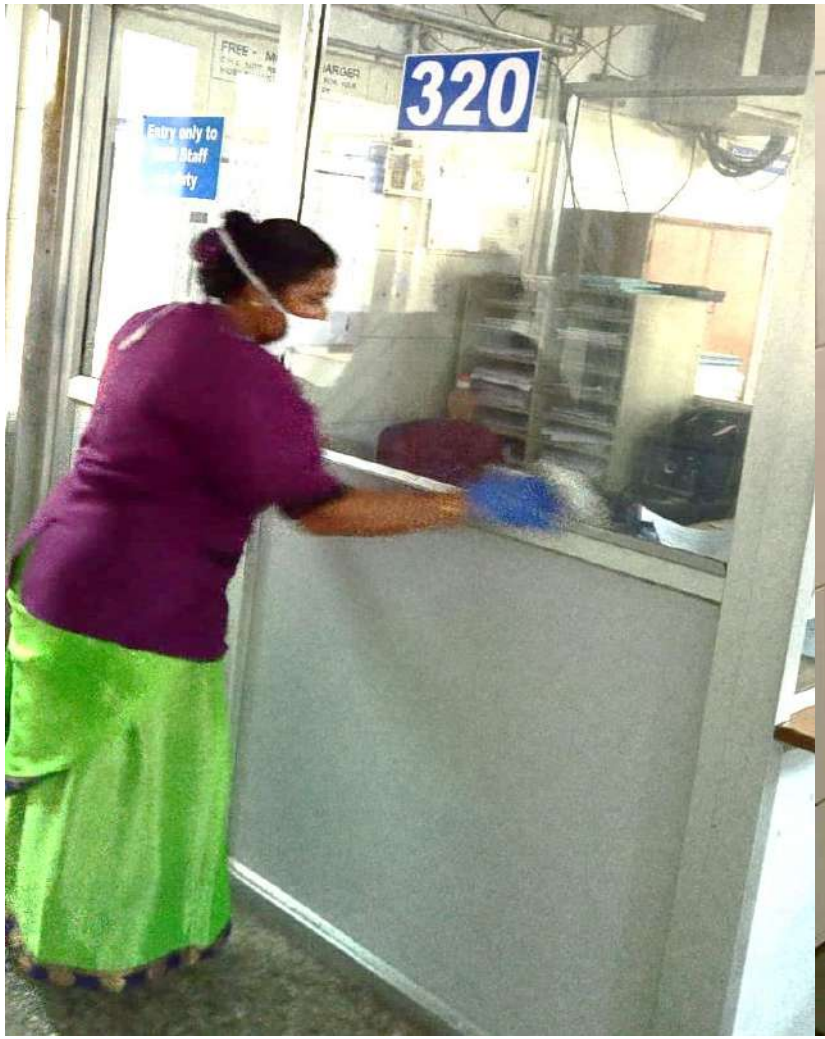
- Permit take away
- Wipe counter every hour
- Social distancing
- Avoid common drinking glass, cups.

Vehicles/ Ambulance

All seats, seat handles, handrails, steering wheels, window rails, windows, doors to be cleaned after every trip. **Ventilate for 30 minutes**.
Floor of the bus, tyres to be cleaned **twice a day**.
Body of the vehicle to be **wiped everyday morning**. One round of disinfectant spray in the evening.
The patient cabin to be cleaned **after every trip**
Ambulance, after the transfer of the body to cremation/ burial will be decontaminated with 1% Sodium Hypochlorite
Hand wash and sanitizer must be present in all ambulances
Ambubag and Suction Machine must be cleaned properly after **every use.**
Patients must be provided with **fresh oxygen masks** if needed (Do not use O2 Mask more than once)



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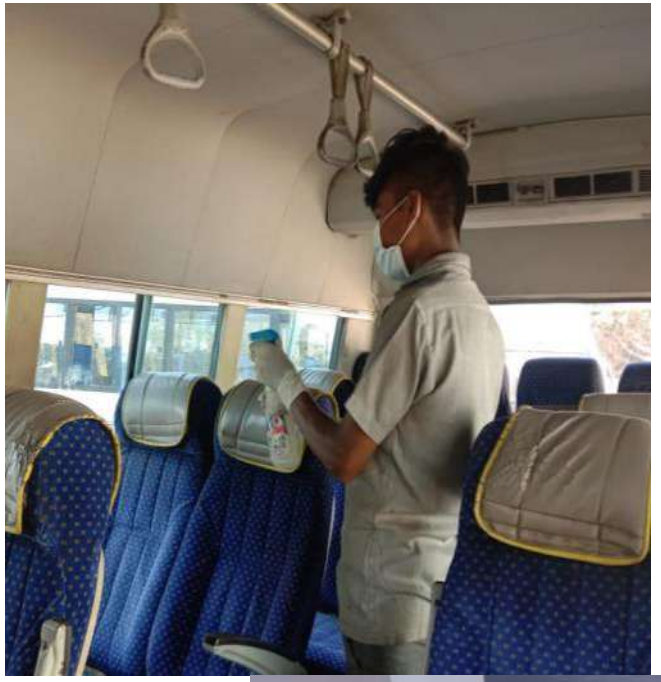
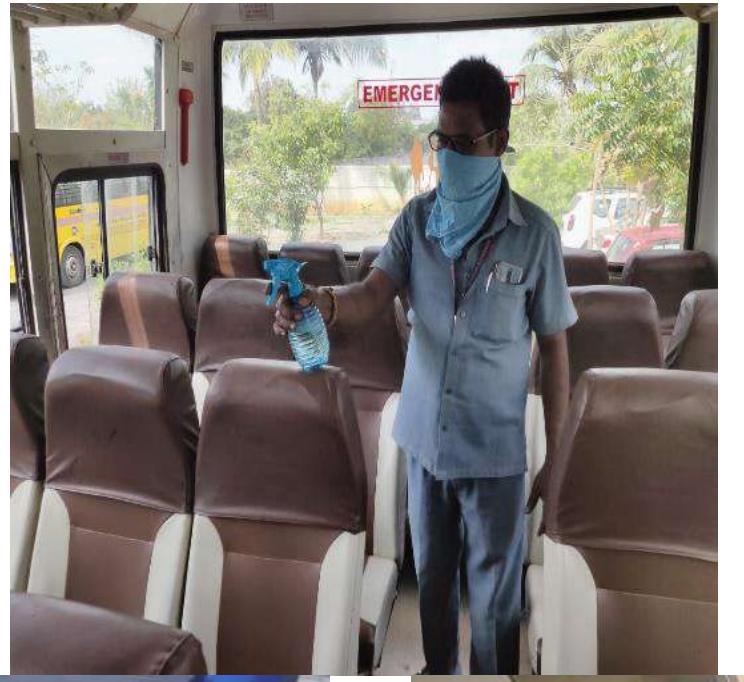
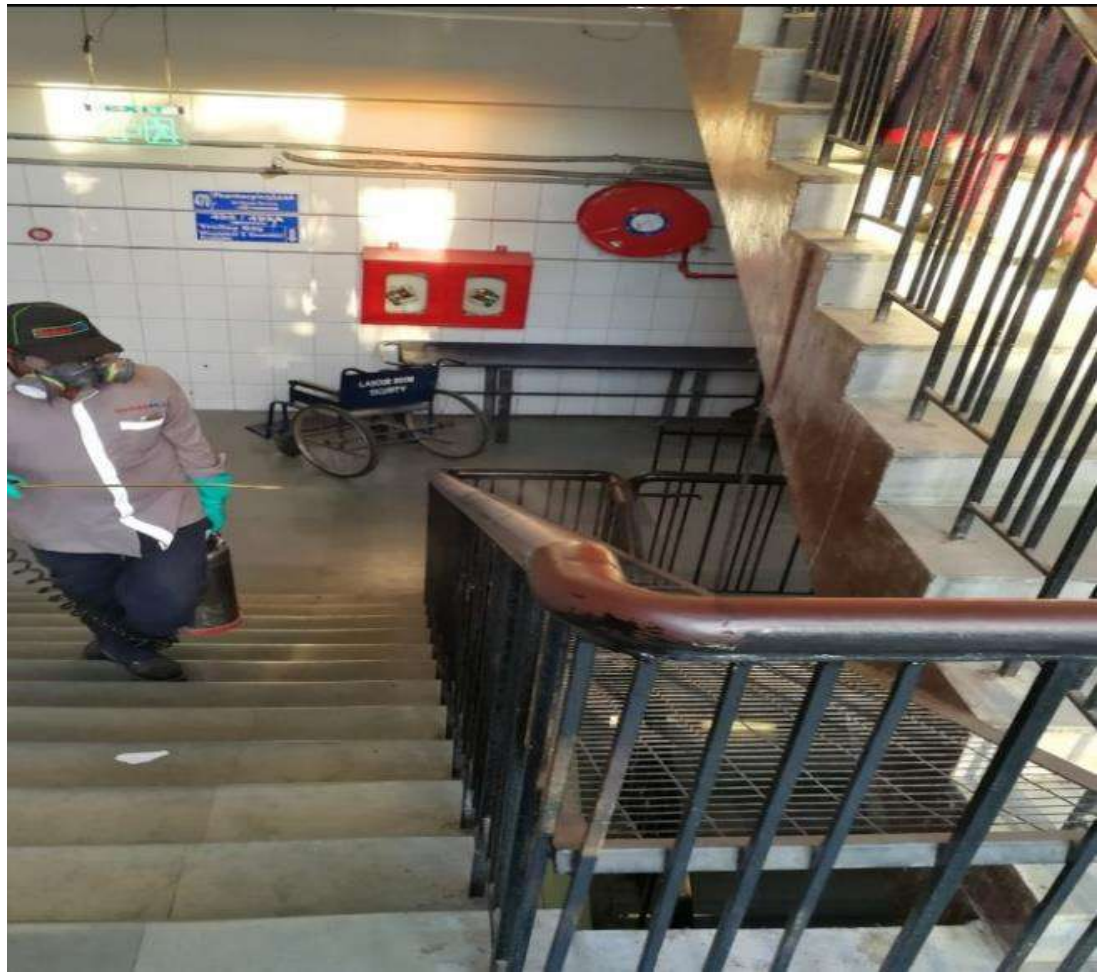





Please Use AHD before and after
1 Punch In
2 Punch Out

Spraying and Disinfecting



Spraying and Disinfecting

Hand Wash Stations

HVAC modifications

- Isolating rooms from central air conditioning with individual ductless units
- Providing exhaust airflows so that the room is in slightly higher negative pressure condition compared to adjacent corridor
- Positive pressure theatre converted to negative pressure theatre.

Those rooms do nothing to aid the patient nor do they protect the staff who are in the room with the patient. The rooms do allow staff to work outside the room without personal protective equipment and rely on proper PPE to protect staff inside the room

Waste Management

TAMILNADU POLLUTION CONTROL BOARD

From
Thiru.A.V. Venkatachalam, I.F.S.,
Chairman,
Tamilnadu Pollution Control Board,
76, Mount Salai, Guindy,
Chennai – 600032.

To
All the CBMWTFs
(List enclosed)

Lr.No.T4/TNPCB/F.007641/BMWM/2020-5 Dated: 13.04.2020

Sir,

Sub: TNPCB-BMWM – Revised CPCB Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/ Diagnosis/ Quarantine of COVID-19 Patients – Duties of Common Biomedical Waste Treatment Facility – To ensure strict compliance of the Guidelines - Regarding.

Ref:
1. CPCB Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/ Diagnosis/ Quarantine of COVID-19 Patients
2. TNPCB Lr.No.T4/TNPCB/F.007641/BMWM/2020 Dated 20.03.2020 & mail dated 26.03.2020
3. Lr. No. B-31011/BMW(94)/2020/WM-1 dated 25.03.2020 received from the Member Secretary, Central Pollution Control Board
4. Revision 1 of CPCB Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/ Diagnosis/ Quarantine of COVID-19 Patients (copy enclosed)
5. JCEE's Lr.No.F.LDP/BMW/JCEE(M)/TNPCB/CHN.ZONE/2020, Dt:12.04.2020

******

Your attention is invited to the reference second cited, wherein it was instructed to strictly comply with the duties of the CBMWTFs as prescribed in the CPCB guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/ Diagnosis/ Quarantine of COVID-19 Patients.

However, it has been brought to the notice of the Board that, the household (domestic) biomedical wastes such as Masks, Gloves, etc., collected by the local bodies have not been disposed through the Common Biomedical Waste Treatment Facilities.

Hence, it is instructed that, the domestic biomedical wastes such as the Masks, Gloves, etc., collected and stored by the local bodies shall be collected by the CBMWTF operators, as and when informed by the local bodies and shall dispose the same immediately upon receipt at facility. The local bodies have already been informed in this matter.

The receipt of this letter shall be acknowledged.

Sd/-
CHAIRMAN
TNPCB

Copy to:

1. All the JCEEs (M), TNPCB
2. The DEE, TNPCB, Manaimaki Nagar, Thanjavur, Vellore, Ooty, Coimbatore South, Ramanathapuram, Virudhunagar, Tirunelveli, Kumarapalayam

4. Manpower including Staff Health

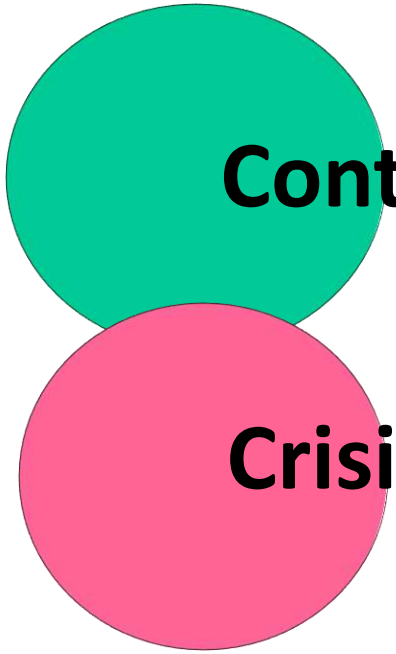
Manpower Issues

COVID-19 outbreak in community

Staff absenteeism/ shortages due to illness

Mitigate Healthcare Personnel Staffing Shortages by effective Planning

Mitigate Healthcare Personnel Staffing Shortages

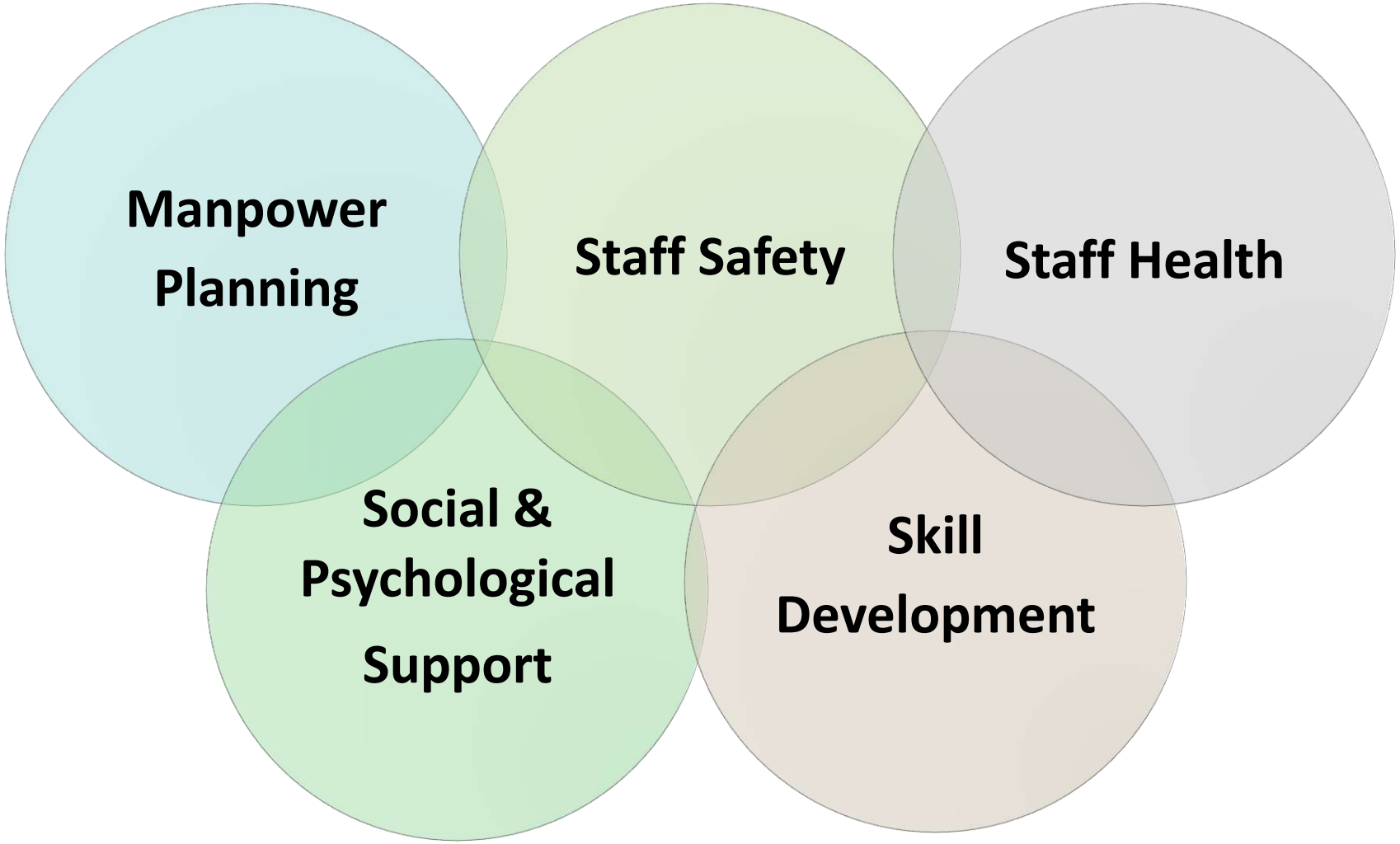


Contingency Capacity Strategies

Crisis Capacity Strategies

(When there are no longer enough staff to provide safe patient care)

Elements to Strategize Manpower Planning



Mitigating - Manpower Challenges

First line of defense	Second line	Third line
Junior doctors/ residents/ DNB residents	SRs/ Associates/ Attending Consultants	Senior Consultants/ HODs

- Formulating a separate **COVID team** (Pulmonologist, Anesthetist, Nurse & Technician)
- **During crisis -** planning for other specialty clinicians to be inducted in the COVID team
- **Separate Roster** for COVID area & Non COVID area
- **Shift scheduling**
  - 2 shift / 3shift / 4shift per day each for nurses and doctors
  - 12 hr vs 6 hr shifts with minimum shift breaks
- **Staff containment** such as restricted or no movement from the COVID area to avoid transmission
- **Lean management** concept – FOA, billing, OPD staff, Marketing, Finance– work from home

5. Training and Development

Training & Development

For Whom? - Nurses, Doctors, Paramedics, etc.,

What?

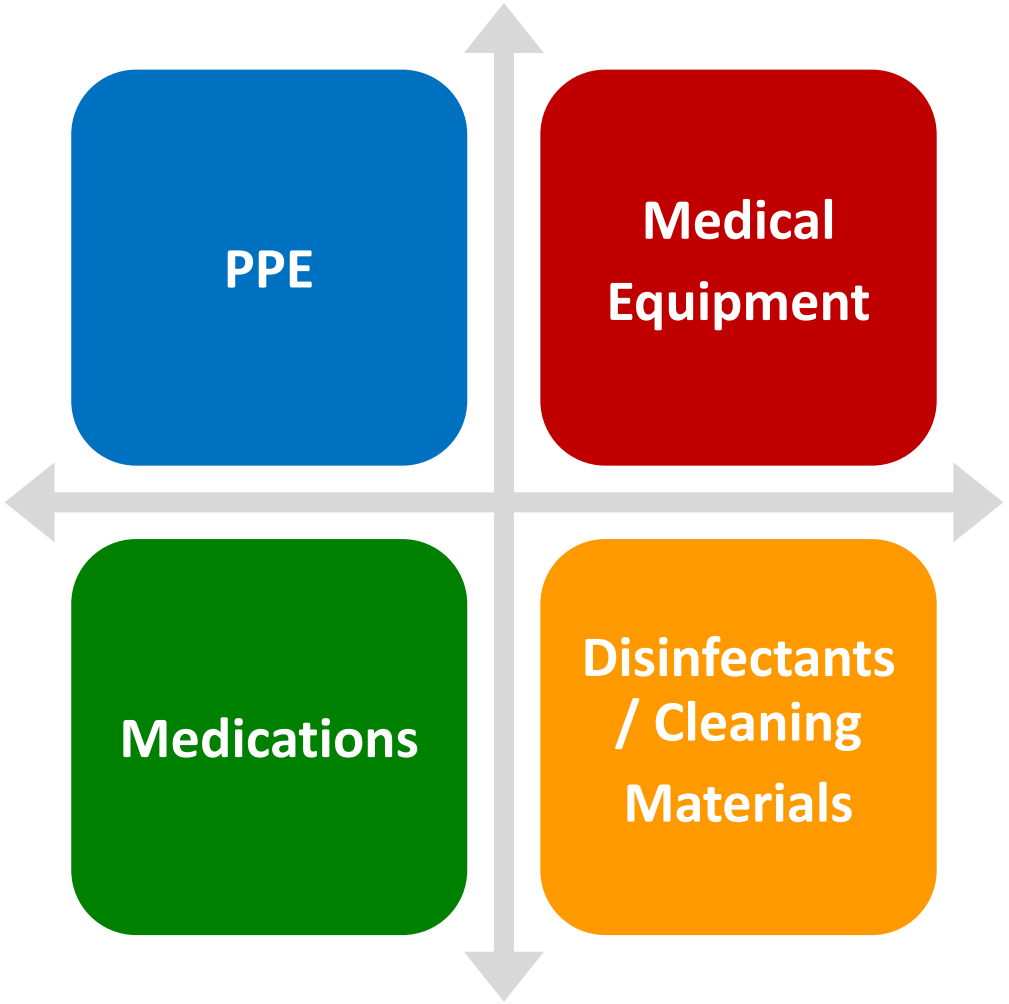
- PPE donning and doffing for all the staff posted in HOT zone
- Screening tools by paramedics
- Intubations by non anesthetists clinicians
- Specialty specific protocols eg. Radiology investigations, ambulance transfers, etc.,
- Sample collection techniques

When?

- Scale up during the preparedness phase
- Sustain during impact phase

6. Logistics Management - SCM

SCM -Key Considerations



- Right Quality
- Right Quantity
- Right Time
- Justified use /appropriate use
- Inventory /adequate stock maintenance

COVID-19: Guidelines on rational use of Personal Protective Equipment

Source - Ministry of Health and Family Welfare, Directorate General of Health Services [Emergency Medical Relief]

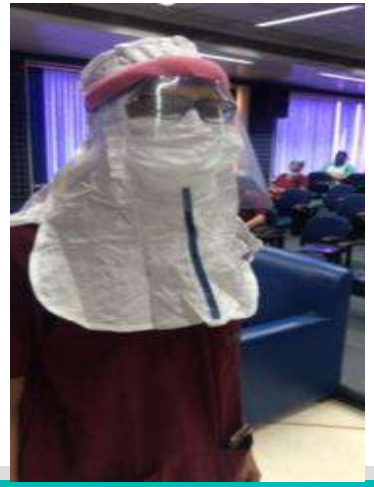
Patient Care Activities /Area	Risk of Exposure	Triple Layered Mask	N-95 Mask	Gloves	Gown/Coverall	Goggles	Head Cover	Shoe cover
Triage Area in OPD	Moderate risk	✗	✓	✓	✗	✗	✗	✗
Help desk/ Registration counter	Moderate risk	✗	✓	✓	✗	✗	✗	✗
Temperature recording station	Moderate risk	✗	✓	✓	✗	✗	✗	✗
Holding area/ waiting area	Moderate risk	✗	✓	✓	✗	✗	✗	✗
Doctors chamber in OPD	Moderate risk	✗	✓	✓	✗	✗	✗	✗
Clinical Management in Isolation rooms	Moderate risk	✗	✓	✓	✗	✗	✗	✗
ICU facility / Critical Care Ward where aerosol generating procedures are done	High Risk	✗	✓	✓	✓	✓	✓	✓
SARI ward - attending to severely ill patients of SARI	High Risk	✗	✓	✓	✓	✓	✓	✓
Sample Collection/Sample testing for COVID-19	High Risk	✗	✓	✓	✓	✓	✓	✓
Dead Body Packing	High Risk	✗	✓	✓	✓	✓	✓	✓
Dead Body Transport	Moderate Risk	✗	✓	✓	✗	✗	✗	✗
Mortuary - Dead Body Handling	Moderate Risk	✗	✓	✓	✗	✗	✗	✗
Mortuary- While performing autopsy	High Risk	✗	✓	✓	✓	✓	✓	✓
Sanitary staff	Moderate risk	✗	✓	✓	✗	✗	✗	✗
CSSD/Laundry- Handling linen of COVID-19 patients	Moderate risk	✗	✓	✓	✗	✗	✗	✗
Visitors attending OPD	Low Risk	✓	✗	✗	✗	✗	✗	✗
Visitors accompanying Patients in IP facility	Low Risk	✓	✗	✗	✗	✗	✗	✗
Supportive services-Administrative Financial Engineering Security, etc	NO risk	✗	✗	✗	✗	✗	✗	✗

Refer to ICMR/ MOHFW latest guidelines on PPE use.

Defining appropriate PPE for various level of associated risk for the given activity eg High, Medium and low.

PPE Appropriate Use

- Issue of Kits instead of loose PPE
- PPE Selection through an expert committee (ICO, Clinician and Quality personal).
- Samples selected to be tried for fit test before order.
- Ordering PPE should be based on current level of consumption as well as assumptions in times of surge –Plan keeping various types of models applicable to the HCO



PPE Appropriate Use

- Use **PPE calculators** – designed by CDC or conventional method of recording in the areas.
- **PPE reuse**– Discuss and have a standard one. eg N95 respirators Reuse.
- **PPE Quality control** ensured every time the consignment is received so as to ensure staff safety is never compromised.
- *Quality Manager can take the additional responsibility of QC*

Need for decontamination and re-use

- Global shortages of N95 respirator masks, due to Covid-19
- Supplies limited to few sources
- Cost escalation

Options for new technology

- Microwave-generated Steam (MSG)
- Warm Moist Heat (WMH)
- Vapour-Phase Hydrogen peroxide (VPHP)
- Ultra- Violet Germicidal Irradiation (UVGI)

AIIMS –SOP for extended use of N95 Mask SOP

Five N95 mask per person

4 small brown covers numbers 1,2,3,4 & large brown covers

Place each N95 mask in separate small paper

Mark both mask and the bag as 1,2,3 & 4

5th mask is being issued as a reserve

On day 1 , wear the mask no.1 when you step out for duty

After return home, place the used N95 in paper bag no.1 & left it dry out for 4 days(Do not throw away the mask)

On day 2 ,use mask number 2 when you go for duty

After return home, place the used mask N95 in paper bag no.2 & let it dry out for the next 4 days

N95 SOP

Do the same for day 3 & day 4

Use the N95 mask no.1 on day 5 again

Repeat the exercise until all 4 masks have been used 5 times as recommended by CDC, Atlanta, USA

All four will be used up in 20 days (N95 masks will not be treated and reused)

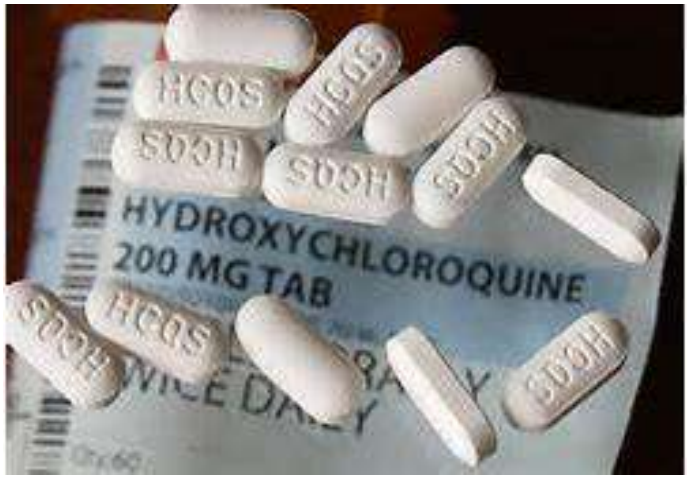
Bring all 4 masks in the bag, throw them in the yellow waste bin ward/area

You will be issued 5 new N95 masks after 20 days

Measures to conserve PPE

- Shifts without break
- Sample kiosks to minimize PPE use
- Extended use and reuse of masks
- Decontamination of masks

Medications



- List of essential medications specific to COVID patient treatment eg Sedatives/ Neuromuscular blockers, antiviral
- Pharmacy – ensure adequate stock availability in buffer.
- Medications return policy – No returns accepted from COVID areas.
- Medication storage policy/ Single strip policy

Medical Equipment

- Daily check of all the vital equipment
- Equipment with transparent covers or lamination to minimize contamination of surfaces.
- Regular cleaning of equipment after use.
- MOU with hospitals providing advanced critical care support in case of facility run out of vital equipment eg Ventilators , Bipap machine.
- Room for innovations

Disinfectants and Cleaning Solutions

- Selection & Procurement of bulk supply .
- Making a list of local vendors and contacting them for bulk supply
- Disinfectants readily available all across the hospital
- In case of short supply -In house preparation
- Additional responsibility of Non clinical staff - cleaning their own desk and work stations

Logistics -F&B ; Transport Facility

F&B – Dry & Fresh ration

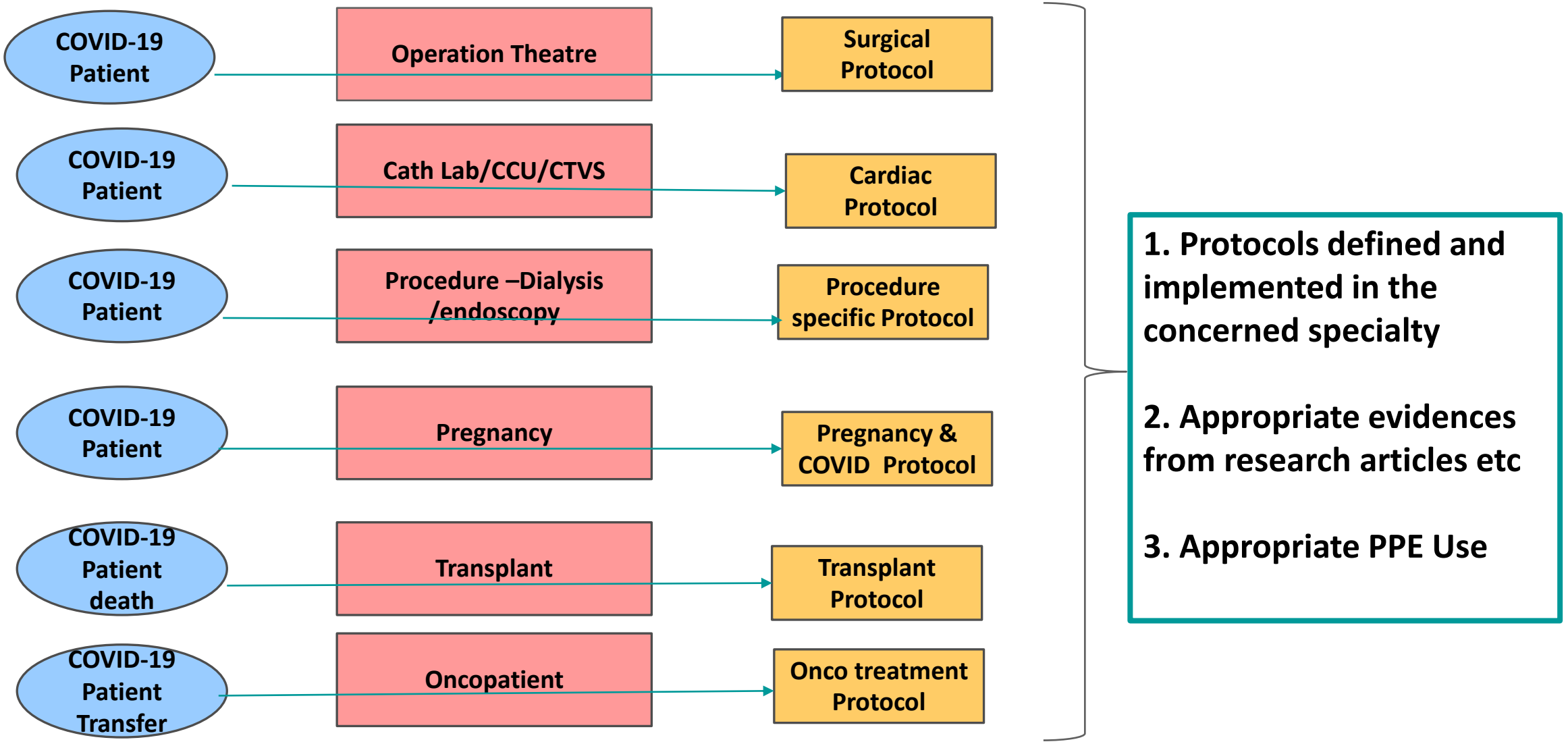
- Storing dry rations in bulk in lieu of country wide lockdown to have uninterrupted supply
- Contacting local vendors for fresh supply of items

Transport facilities

Provide transport facility for Hospital Staff – Hiring private cab or bus services .

7. Clinical Management

COVID-19 & other Specialty: Operational Aspects



8. Financial Management

Financial constraint

- Appropriate use of resources
- Financial planning and management
- Reducing unnecessary expenses

COVID 19 – Low Cost Solutions in Resource Limited Settings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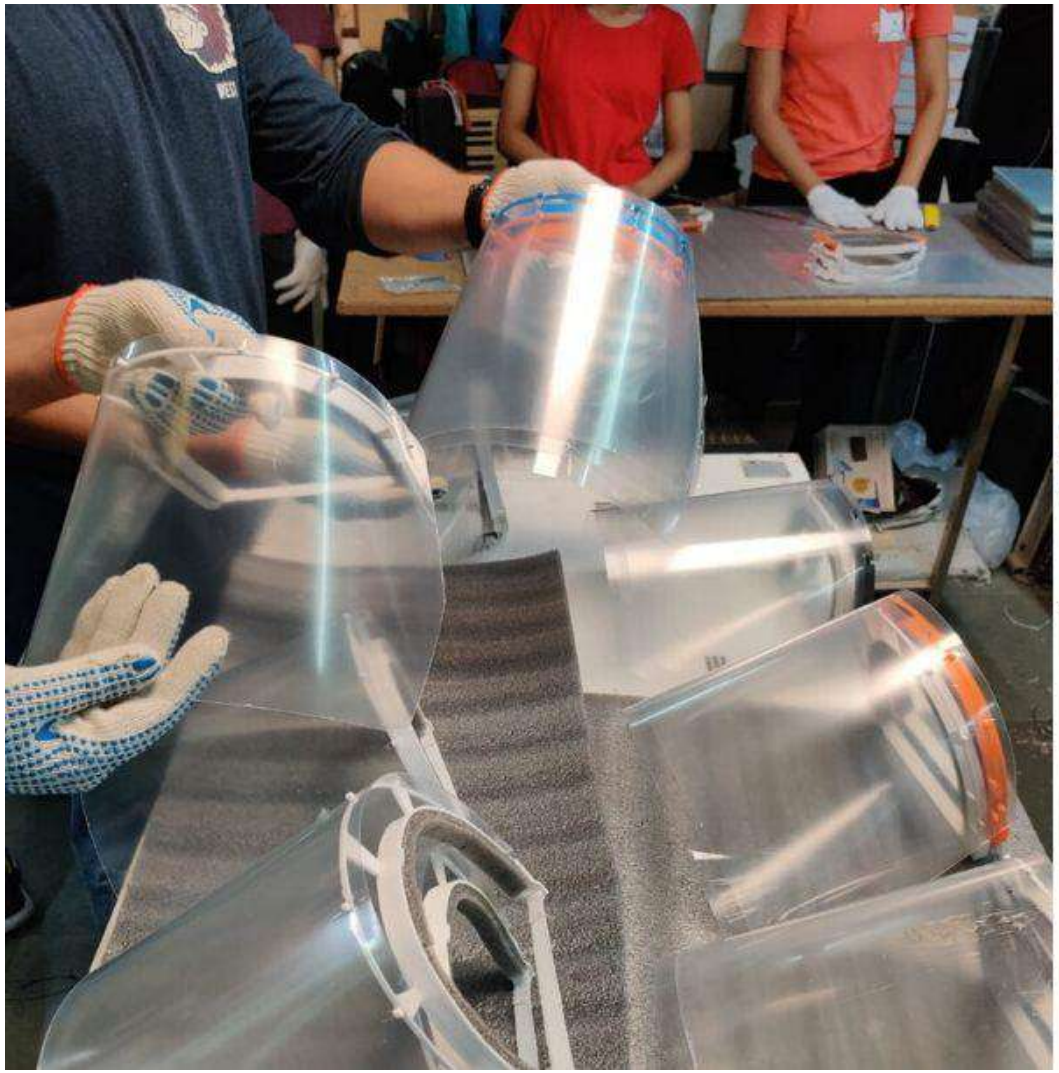
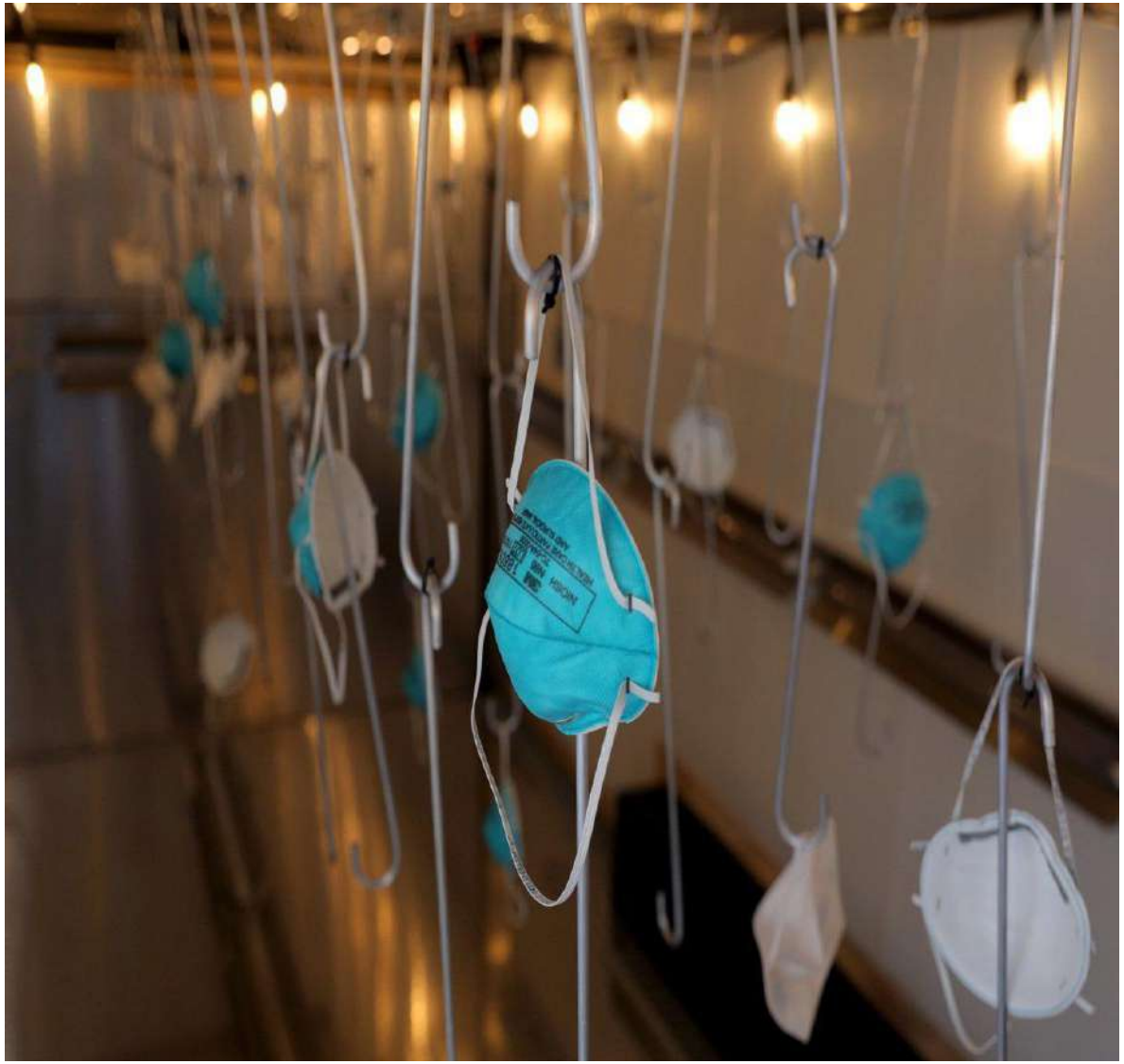



WAITING AREA


CC WD



"Thank you so much for everything you do, both in facing this pandemic and before it. You've taken care of families at every step, from birth to death. You are now walking right into the fire to help humanity get through these tough times."

This presentation is dedicated to your strength, resilience and care.

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