



## **Reference Guide for Converting Hospitals into dedicated COVID Hospitals.**

**COVID-19 (nCorona) Virus Outbreak Control and Prevention State  
Cell**

**Health & Family Welfare Department  
Government of Kerala**



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## CHAPTERS

List of abbreviations	4
Introduction	5
Objective of the document	6
Facilities for COVID-19 Patient care	7
General Plan of conversion of hospitals into COVID hospitals	8
COVID cell & District COVID cell	12
Planning and managing Infrastructure	13
Requirements to convert a hospital into COVID Hospital	15
Planning and managing Human resources	17
Planning and managing Hospital Infection Control for COVID	19
Planning and managing equipment and consumables	20
Planning and managing COVID patient flow	21
Surge capacity and cohorting of patients	23
Planning and managing Hospital Pharmacy	24
Planning and managing House Keeping	25
Planning and managing Hospital Laboratory service	26
Planning and managing of Logistics	27
Planning and managing of Security services	28
Planning and managing Laundry services	29
Planning and managing Bio-Medical waste	30
Planning and managing Dietary services	31
Planning and managing and Bio-Medical engineering services	32
Planning and managing Communications	33

Planning and managing Mortuary services	34
Planning and managing Monitoring and Daily Review	35
Planning and managing Non-COVID patients currently admitted	36
Planning and managing Concurrent Emergencies	37
References	
Annexures	
Acknowledgement	

## LIST OF ABBREVIATIONS

AYUSH- Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy

CCC- COVID Care Centres

CFLTC- COVID First Line Treatment Centre

CH- COVID Hospital

COVID- Corona Virus Infectious Disease

HDU- High Dependency Unit

HR- Human Resources

ICU- Intensive Care Unit

PPE- Personal Protective Equipment

SARI- Severe Acute Respiratory Infection

SOP- Standard Operating Procedure

## 1. INTRODUCTION

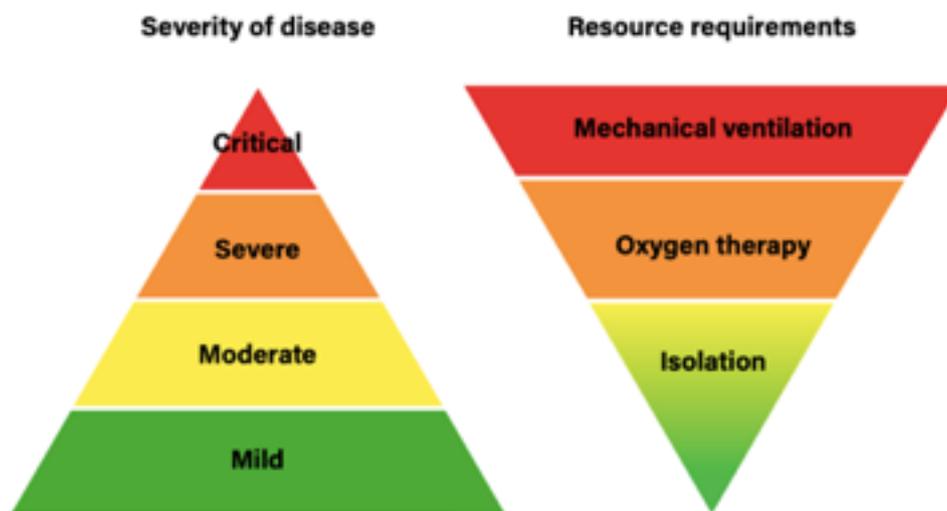
WHO has declared the COVID-19 epidemic affecting more than 201 countries as a Pandemic. Due to the inflow of persons from affected countries, Kerala state has strengthened the surveillance and control measures against the disease.

The Kerala Health has set the following broad objectives –

- Least morbidity
- No mortality
- No community spread

As the epidemic is progressing, there is an urgent need to be fully prepared to provide the best health care to the patients.

The diagram below shall help in understanding the concept of the spectrum of the disease and corresponding preparedness and allocation of precious resources. Though the critical and severe area (red and orange colour) of the pyramid on the left is less, the corresponding resource requirements are huge as shown on the pyramid on the right<sup>1</sup>.



**Fig1. Severity of disease and corresponding resource requirements**

Reference: SARI treatment centre. Practical manual to set up and manage a SARI treatment centre and a SARI screening facility in health care facilities, WHO March 2020.

## **2. OBJECTIVE OF THE DOCUMENT**

1. To build capacities of all to have clarity regarding the hierarchical structures for COVID treatment - COVID Care Centre, COVID First Line Treatment Centre and COVID Hospitals.
2. To build capacities of the Private Sector Hospitals to convert the Hospitals into COVID Hospitals
3. To build capacities of all regarding treating the other patients (Non-COVID)

### 3. FACILITIES FOR COVID-19 PATIENT CARE:

**COVID CARE CENTRES (CCC):** A COVID care centre is a facility meant for quarantining persons who have recently arrived in Kerala from other countries and other states of India. The objective of a COVID care centre is to enable successful isolation and management of asymptomatic cases. This will help to contain the spread and manage the people during the period of incubation. The COVID care centres should have the following:

1. Independent single rooms with attached toilets
2. Proper electricity, water and internet connectivity
3. Proper food and drinking water facility
4. Security to ensure safety of isolated people

These centres should be coded BLUE colour

The standard operating procedure on CCC is given as annexure-1.

Due to the ban on inbound flights to Kerala and the heightened level of surveillance the need for CCC has been deescalated at present.

Therefore these centres can be used for those people who do not have home isolation facilities, homeless, destitute etc. If a need arises due to the surge in people being exposed and having difficulty in home isolation these centres may be activated further and expanded.

**COVID FIRST LINE TREATMENT CENTRES (CFLTC):** The CFLTCs are facilities exclusively for treatment of all mild and moderate symptomatic persons under surveillance and should be utilised for treating positive cases when need arises. They are the primary level health care centres for providing care to less serious cases. If such patients become serious they need to be referred to COVID hospitals immediately. This will help in appropriate use of resources at the COVID Hospital and prevent patient surge. These centres should be coded GREEN colour. The standard operating procedure on CFLTC is given as annexure-2.

**COVID HOSPITAL(CH):** COVID Hospitals are those dedicated hospitals that cater to severe or critical COVID patients. These hospitals are generally tertiary care centres or where critical care facilities are available. All measures need to be taken to postpone elective surgeries and reduce general OP. Super speciality and emergency wings of concerned departments should function and ensure that there is no contact or mixing of COVID and Non-COVID (general) patients in these hospitals. COVID suspects or COVID confirmed patients with other emergencies like trauma, acute abdomen, obstetric emergencies should be managed with full transmission based precautions and infection control practices in consultation with the COVID cell in the hospital. These centres should be coded RED colour. The reference guide for conversion of hospitals into COVID hospitals is described in this document.

## 4. GENERAL PLAN OF CONVERSION OF HOSPITALS INTO DEDICATED COVID HOSPITALS

### Planning in three phases:

The planning should be done for three phases:

- A. In this phase the patients predominantly coming to the hospitals are likely to be symptomatic returnees from COVID affected areas, positive cases, symptomatic contacts of confirmed cases etc and no evidence of local transmission or cluster. In this phase regular admissions are to be reduced and plan for discharge and shifting of patients to identified facilities. Set up COVID isolation facilities (COVID Help desks, COVID OP, earmark or identify isolation beds/ rooms, ICUs, ventilators etc). Elective surgeries may be postponed. OP timings to be reduced. Plan for further expansion of the hospital to dedicated COVID Hospitals anticipating further influx of COVID suspected patients.
- B. In this phase the threshold is reached when there are a large number of symptomatic or positives among the contacts or when there is evidence of local community spread or clusters<sup>2</sup> or the bed occupancy reaches 50% of identified. At this time regular patients coming as in case of emergencies and specialists OPDs should stop, in anticipation of more influx and surge of less serious patients not requiring respiratory support. (More beds in wards and less ICU beds needed). The area identified further in phase A, as mentioned above, should be used for the scaling up. (expansion). Process of converting other hospitals including private hospitals and hospitals attached with the Private Medical Colleges should be initiated at this phase. This should be coordinated with the District COVID cell chaired by the District Collector.
- C. In this phase there is evidence of multiple clusters or large community spread. Here more seriously ill patients are anticipated. (more ICU beds are required and plans for converting wards into ICU with amenities like Oxygen, Infusion pump, Ventilators, monitors etc.) Other hospitals including private hospitals should be converted and functioning at this stage. This should be coordinated with the District COVID cell.

Stages of admission threshold and expansion according to various phases:

Phase	Admission Threshold	Expansion Facilities
A	CFLTC, CHs as per the criteria applicable to them	-
B	When 50% of the beds in the above phase are filled.	Readiness is to be ensured as per the plan, so that at this point of time preparedness of other

		facilities in AYUSH Hospitals and Private Hospitals must be completed.
C	When 50% of beds in the above phase also are filled.	Readiness in the places identified for phase 3 is to be ensured. The facilities include Schools, Colleges, Hotels, Marriage Halls, Community Halls etc.

At all these above facilities special care should be taken to put the specific category of Patients i.e, Positive cases with mild symptom in COVID FIRST LINE TREATMENT CENTERS and Server symptoms Breathlessness, fever and pneumonia in MCH COVID Hospitals / Private COVID Hospitals

SI No	Facility	Category of patient
1	COVID First Line Treatment Center. Independent rooms and Halls	Symptomatic people not yet diagnosed positive.  ( To be in independent rooms having attached bathroom)  and Symptomatic positive with mild symptoms.  ( To be in the halls which is well lit and having cross ventilation)
2	COVID Hospital Isolation beds and wards ICUs	All Positive patients with moderate to serious symptoms – fever , breathlessness, cough etc.

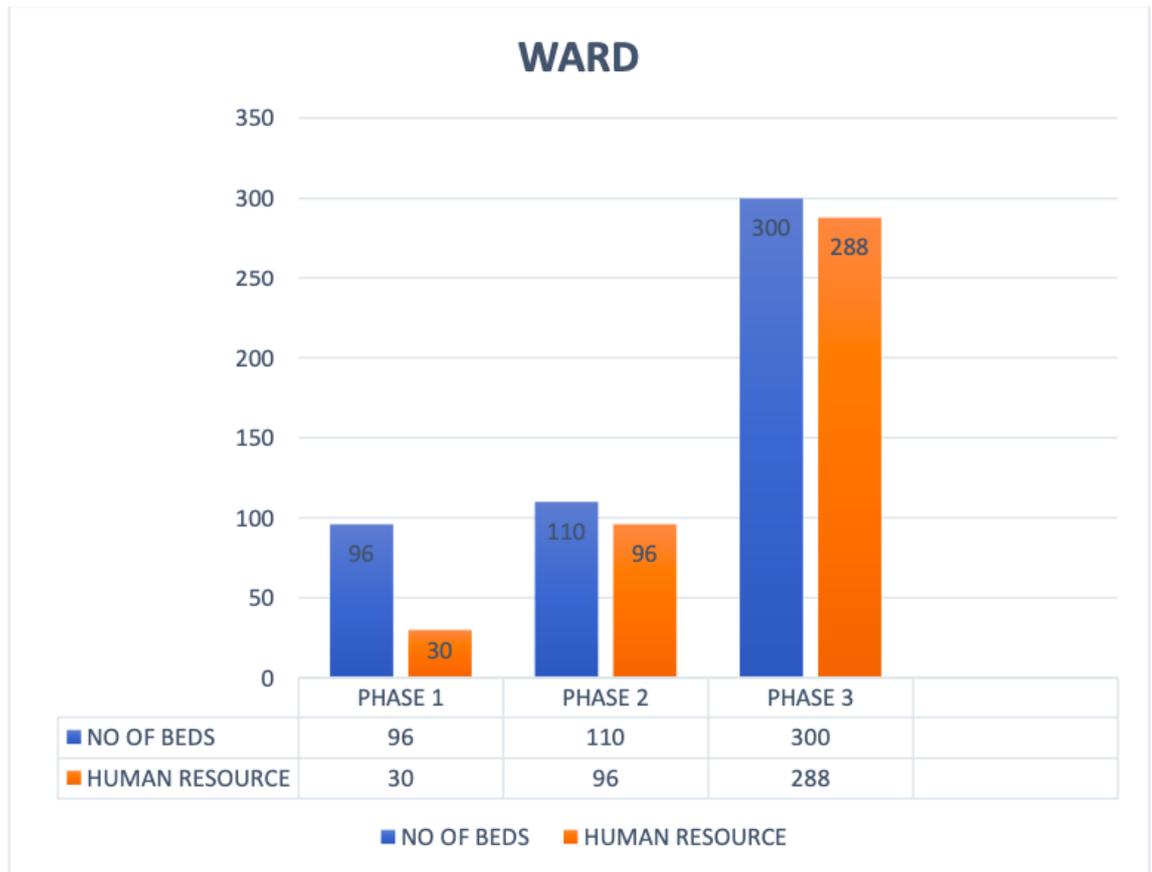


Fig-2: Graphical representation of scaling up of isolation wards (expansion) depending on phases.

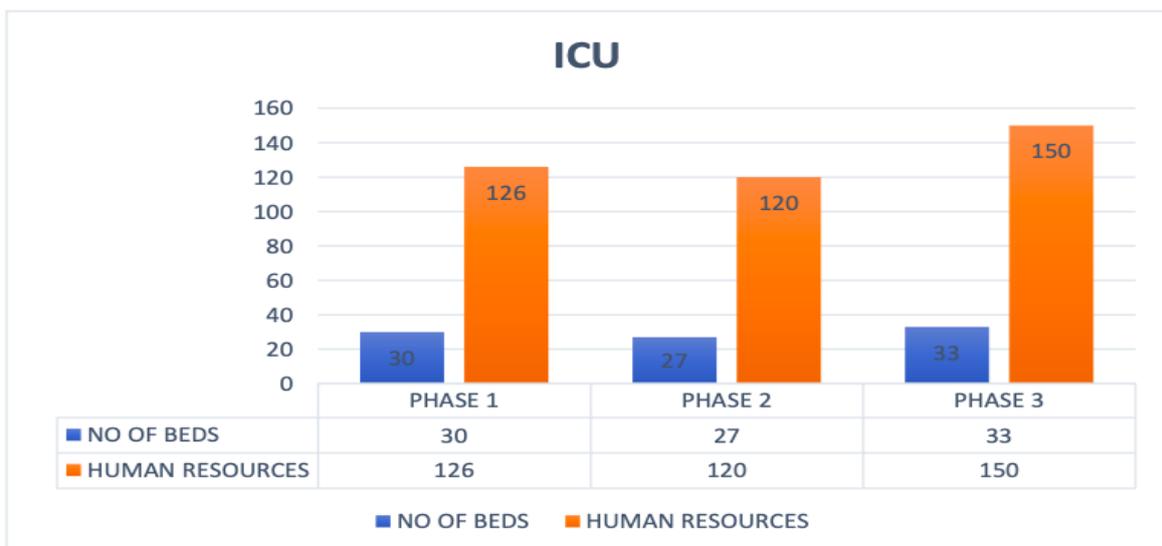


Fig-3: Graphical representation of scaling up of (expansion) ICUs depending on phases.

Figures are courtesy of Govt. Medical College and Hospital Kottayam, Kerala.

## 5. COVID Cell:

The success of any large endeavour is planning and the constitution of a core and cohesive team. The institution should constitute a dedicated COVID cell to plan, implement and deliver outcomes. The COVID cell should be the hub of all the activities in the institution and should be led by persons with decision making and implementing capacities (Superintendents, Directors etc). The COVID cell members should have similar capacity and should be selected from all relevant departments in the institution like (Medicine, Paediatrics, Emergency & Critical care, Anaesthesia, Infectious diseases, Prevention of Epidemic and Infectious Diseases Cell (PEID cell), Forensic Medicine, Infection control officer and nurse, Nursing Officer/superintendent, PRO, store Superintendent, heads of Laboratory, Engineering, Electrical, Housekeeping, Security and Transportation etc). Identify and entrust a nodal officer for each domain like Infrastructure, Processes, Inventory Management, Human Resources Management, Communication plans (including messages to public, Signages, etc.), Training and sensitisation to hospital staff, etc. The structure of COVID cell is given in annexures that are provided along with this document.

Identify a Core team in your Hospital with staff from different Categories (limiting to 4-5 members) for plan preparation. Consider brainstorming sessions with people and experts around you. The COVID cell of the institution should be empowered to constitute the core team for the planning and implementation of the process of converting the hospital into a COVID-19 treatment centre. Get inputs from peers, colleagues from other hospitals and experts from Medical Colleges. The planning done by other institutions in the state are given as annexures. Continuously take efforts to improvise the plans. These guidelines / frame work may be used by Hospitals in the Government sector, quasi Government and Private Sector.

Identify your requirements to set up a COVID-19 treatment center considering all the latest advisories and guidelines issued till date by Department of Health and Family Welfare Govt. of Kerala available on [www.dhs.kerala.gov.in](http://www.dhs.kerala.gov.in)

**DISTRICT COVID CONTROL CELL-** This is the hub of all COVID control activities for the concerned district chaired by the District Collector. All intersectoral co-ordination and communication activities for the district happen in the District.

## 6.PLANNING AND MANAGEMENT OF INFRASTRUCTURE:

### RESOURCE MAPPING:

Resource Mapping is the process of identification and listing of all available resources in the institution like infrastructure, human resources, facilities, drugs, supplies etc. This will help in efficient planning and execution

Identify all buildings, Number it serially and draw a schematic diagram with or without a scale. ( A scale of 1:200 meters may be adopted)

The hospital can be divided into zones as shown below for efficient patient management and infection control.

Try to have a Floor plan by identifying all utility areas, corridors, stairs, etc and mark the same in the floor plan.

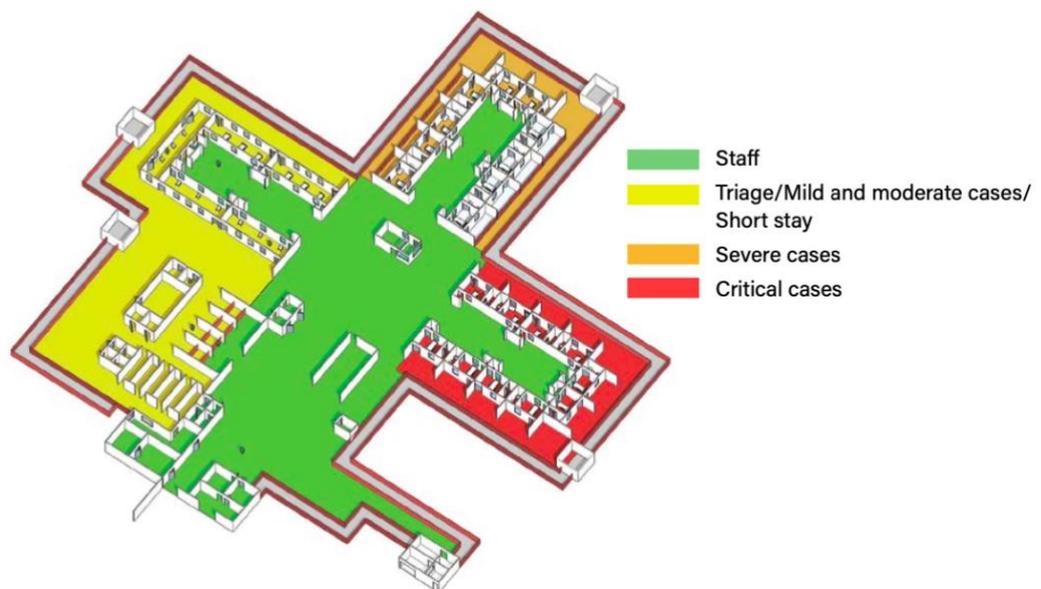


Fig.4 The diagram below shows the different zones categorizations for a COVID Hospital.

Reference: SARI treatment centre. Practical manual to set up and manage a SARI treatment centre and a SARI screening facility in health care facilities, WHO March 2020.

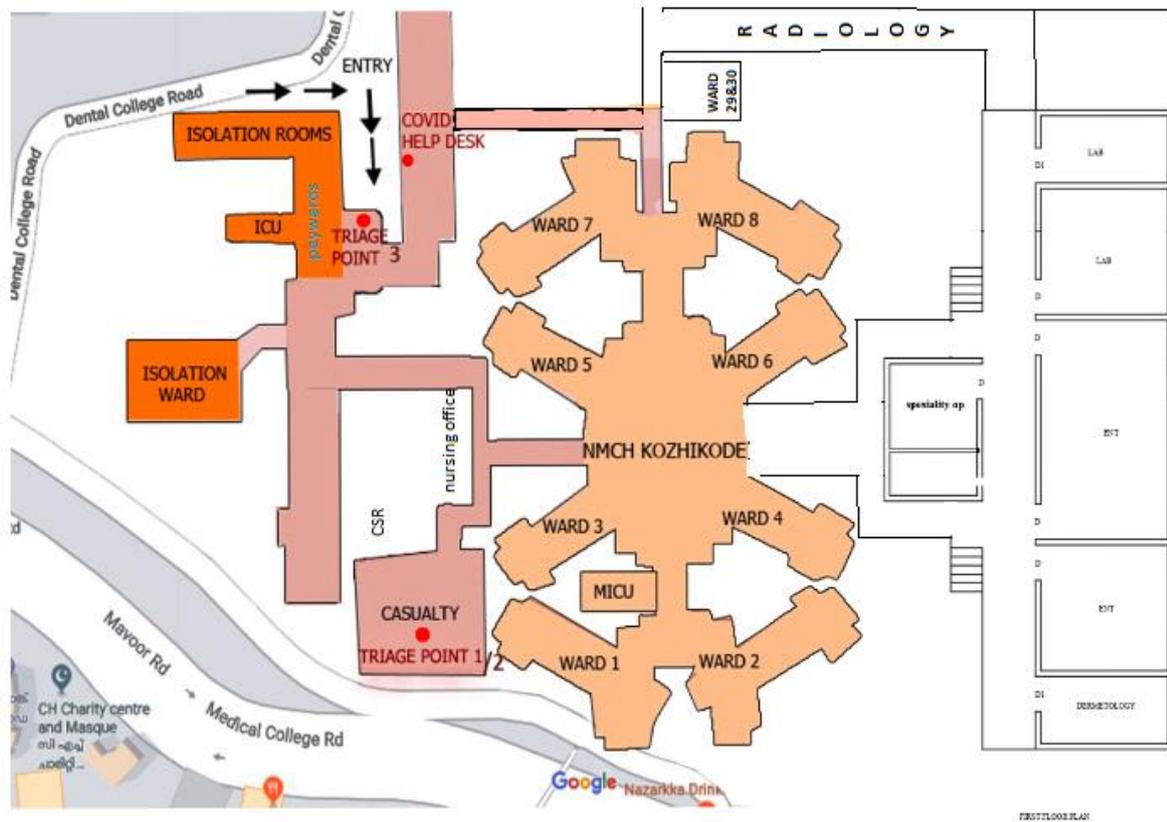


Fig.5. Floor map for COVID Hospital Courtesy: Govt. Medical College Kozhikode, Kerala

## 7. REQUIREMENTS TO CONVERT A HOSPITAL INTO COVID HOSPITAL.

Designate/Propose for each area in your Hospital into Entry/Exit, Reception, Triage area, OPDs, Wards, Emergency areas, special care zones, etc. A plan for patient flow in case of regular OPD, Triage and Emergency, etc. to be drawn. This may be planned for the three phases as mentioned above may be planned. A floor plan and flow of patients in different scenarios may be displayed in the patient entry zone (reception, Triage, etc.)

1. Identify all possible areas in the Hospital which can be converted into ICU. Existing ICU, HDUs, OT (except emergency OT and obstetric OT, if available). Identify wards which can be converted into ICU.

Example: Currently Government Medical college Thiruvananthapuram has got 271 ICU beds and 181 ventilators. Potential areas convertible to ICU beds are

a. 6 Wards- with Oxygen outlet (180 beds),

b. OT (50 beds),

c. Karunya dialysis (10 beds) Maintenance HD to be taken up in District Hospital, Taluk Headquarters Hospital.

(provided medical gas supply can be ensured). Manifold for Oxygen for multispeciality,(150 beds)

Total 665 ICU beds.(Ventilator deficit – 530, and see that for all beds Ventilators may not be needed)

2. Establish medical gas lines ( Oxygen ports- 2 nos, suction port and 1 compressed air minimum in each patient care area for those in need of ventilators). Keep stock of Oxygen three times the requirement for the contingency.

3. Establish uninterrupted power supply

4. Establish uninterrupted O<sub>2</sub> supply.

5. Monitor per bed with ECG, SpO<sub>2</sub>, NIBP( mobilized from OT, Private hospitals)

6. Syringe pumps- 3 per bed
7. Blood gas with point of care facility
8. Portable X-Ray and ECG machine
9. Ambu bags at each bed
10. Glucometer 2 per patient care area
11. Pulse oximeter ( Finger Probe) 2 per patient care area
12. Infrared Digital thermometers- 1 per patient care area
13. Beds that can be adjusted from the fowler's position & air bed.
14. Bedside locker
15. Bins for waste segregation.
16. 100- 125 sq feet per patient care area.
17. Smart phones with whatsapp video calling facility in all ICUs and patient care areas.
18. Suction apparatus one for 2 beds where central suction is not available

## 8.PLANNING AND MANAGEMENT OF HUMAN RESOURCES (HR):

List out the HR available in the Hospital with their Name and Designation under different cadres. Keep their contact details ready.

1. Categorize required human resources into various categories.( Doctors, Pharmacists, Security, Nurses, Laundry, Housekeeping, Biomedical engineering, Pharmacist, Lab, ICU technicians, X ray technicians .....). Physician patient ratio 1:12 ( ICU) , Nurse patient ratio 1: 3 for ventilated patients , for HDU nurse to patient ratio 1:6, and for ward patients nurse ratio 1: 10 Mobilize human resource and equipment from all private institutions in the third phase or earlier based on the requirement. (only emergency cases in private institutions).
2. List out all possible human resources in each district or zone.(From other private medical colleges, from various nursing colleges, nursing schools, voluntary workers, NGOs, specialty organizations (ISCCM, ISA, Physician associations, Pediatric organizations).
3. Group each category of workforce into three groups; group in action(duty group), one group quarantined(Standby), and one in reserve depending upon the surge capacity of the institution. These groups can be rotated every 14 days. Similarly nonclinical and para clinical staff can be engaged in activities like training, triage, communications, data management, logistics etc. (For practical purpose it is proposed to have two groups one on duty/shift as planned and the second group as reserve so that in case of sickness or absenteeism, we will be able to fill the gap). Please refer to the advisory issued in this regard.

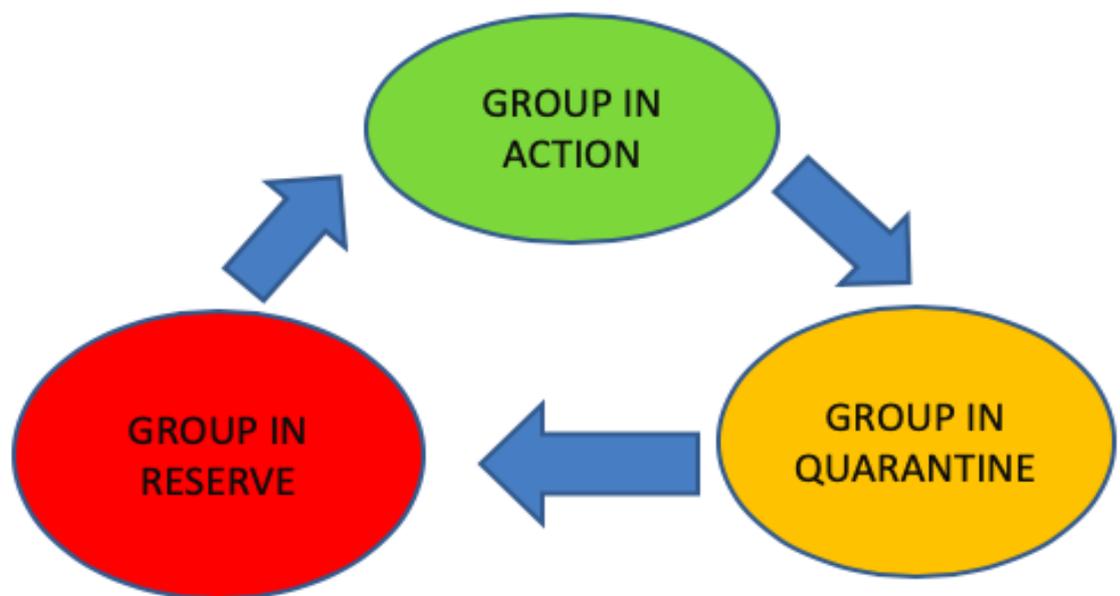


Fig.6 Workforce rotation  
Courtesy: Govt. Medical College Thiruvananthapuram

4. Plan to monitor staff absenteeism and sickness every shift and pull from the reserve group.
5. Plan minimum needs of the staff to ensure operational sufficiency and to keep staff stability. (food, stay, transport, psychological support, medical care if he/she becomes sick, family support, child care). The designated staff (documented appropriately) looking after Human Resource in each clinical area should coordinate this.
6. Plan shift rotation for self care
7. Prepare a job card for everyone ( to whom to report and what to do)
8. Training as per job card.

## 9. PLANNING AND MANAGEMENT OF HOSPITAL INFECTION CONTROL:

The Hospital Infection Control Committee has an active role in the planning, implementation and execution of the COVID Hospital plan. Infection control should be given the utmost priority in the whole planning and implementation. Transmission based precautions are to be applied in the settings. Training for all medical and non-medical staff should be provided on COVID as well as on infection control.

Training with demonstration on the use of PPE should be given.

**HOW TO PUT ON AND TAKE OFF**

## Personal Protective Equipment (PPE)

 World Health Organization

**How to put on PPE (when all PPE items are needed)**



**Step 1**

- Identify hazards & manage risk. Gather the necessary PPE.
- Plan where to put on & take off PPE.
- Do you have a buddy? Mirror?
- Do you know how you will deal with waste?



**Step 2**

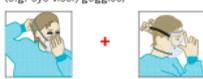
- Put on a gown.



**Step 3a**

- Put on face shield.

OR



**Step 3b**

- Put on medical mask and eye protection (e.g. eye visor/goggles)

**Note:** If performing an aerosol-generating procedure (e.g. aspiration of respiratory tract, intubation, resuscitation, bronchoscopy, autopsy), a particulate respirator (e.g. US NIOSH-certified N95, EU FFP2, or equivalent respirator) should be used in combination with a face shield or an eye protection. Do user seal check if using a particulate respirator.



**Step 4**

- Put on gloves (over cuff).

**How to take off PPE**



**Step 1**

- Avoid contamination of self, others & the environment
- Remove the most heavily contaminated items first

**Remove gloves & gown**

- Peel off gown & gloves and roll inside, out
- Dispose gloves and gown safely



**Step 2**

- Perform hand hygiene



**Step 3a**

**If wearing face shield:**

- Remove face shield from behind
- Dispose of face shield safely



**Step 3b**

**If wearing eye protection and mask:**

- Remove goggles from behind
- Put goggles in a separate container for reprocessing
- Remove mask from behind and dispose of safely



**Step 4**

- Perform hand hygiene

Fig.7. How to put on and take off PPE; Courtesy- WHO

## 10. PLANNING AND MANAGEMENT OF EQUIPMENTS AND CONSUMABLES:

Inventory of all the equipment and consumables related with COVID treatment is to be prepared by the COVID cell. A daily update of the inventory should be done. Utilization rates by various isolation wards / ICU should be assessed.

A model recommended inventory recommended by WHO is given below.

WHO Code	WHO Description	Qty
YMEQGLASWS1--A1	GOGGLES PROTECTIVE, wraparound, soft frame, indirect vent.	300
PEXTALCO1G--A1	ALCOHOL-BASED HAND RUB, gel, 100mL, bottle	60
EWASBAGBR007-A1	BAG BIOHAZARD, REFUSE, AUTOCLAVABLE, 30x50cm, yellow	100
EWASYCHN5G1--A1	CHLORINE NaDCC, 45-55%, gran., 1kg, pot	8
CPPEGOWI3L--A1	GOWN, AAMI level 3, non sterile, disp., size L	540
CPPEGOWI3M---A1	GOWN, AAMI level 3, non sterile, disp., size M	630
CPPEGOWI3XL--A1	GOWN, AAMI level 3, non sterile, disp., size XL	450
CPPEGOWI3XXL-A1	GOWN, AAMI level 3, non sterile, disp., size XXL	180
CMSUGLEN1L1--A1	GLOVE EXAMINATION, nitrile, pf, size L	2200
CMSUGLEN1M1--A1	GLOVE EXAMINATION, nitrile, pf, size M	4200
CMSUGLEN1S1--A1	GLOVE EXAMINATION, nitrile, pf, size S	4200
CMSUGLEN1XL--A1	GLOVE EXAMINATION, nitrile, pf, size XL	1600
CPPEMASS2RL--A1	MASK SURGICAL, type IIR, level 2, s.u, non sterile, earloop, size L	1100
CPPEMASS2RM--A1	MASK SURGICAL, type IIR, level 2, s.u, non sterile, earloop, size M	1100
CPPEMASS2RS--A1	MASK SURGICAL, type IIR, level 2, s.u, non sterile, earloop, size S	1100
CPPEMASPF205-A1	RESPIRATOR, mask, FFP2/N95, type IIR, s.u., unvalved, noseclip	6000
CPPEFSHIED02-A1	FACE SHIELD, clear plastic, disp.	2700
CMSUTHERIO1--A1	THERMOMETER, INFRARED, no contact, handheld	30
CINSCONTC51--A1	SAFETY BOX, needles/syringes, 5l, cardboard for incineration	40
OPACUN62BS1--A1	BOX, triple packaging, biological substance UN3373 +pouch	100
OPACUN62IS1--A1	BOX, triple packaging, infectious substance UN2814	20
CMSUBAGB4A04-A1	BAG BODY, 8 handles, U-shaped zip, white, 400 microns, adult, 230x100cm	20

Fig.8. WHO's list of personal protective equipment module for SARI treatment centre based on 100 patients

## 11. PATIENT MANAGEMENT PLAN

1. Categorize patients based on severity (category A- mild symptoms, B- Fever and breathlessness, C- fever, breathless and pneumonia).

Positive Category A patients will be in COVID First Line Treatment Centers, Positive Category B patients will be in District COVID Hospital or Private COVID Hospitals and Positive Category C patients will be in the MCH COVID Hospital / DH COVID Hospitals and Private COVID Hospitals.

2. Proper signage shall be displayed in all patient areas to reduce confusion among the patient and staff as well prevention of transmission of infection.
3. There should be an exclusive good transporting system and bed management system for inter hospital transport.
4. DISTRICT CONTROL UNIT where all updated census of bed availability can be obtained. This is connected to all COVID hospitals of the district. This unit can advise the availability of the bed in each centre and up to date patient census will be available there and the same centre can arrange transportation and retrieval of patients from centre to centre. Current 108 ambulances and paramedics can be utilized. Need to train the paramedic and SOP for disinfection has to be there.
5. Those private institutions willing for exclusive COVID case management also may be taken up if possible logistically.
6. Institutional SOP for the following activities should be developed:
  - a. Plan how to triage all patients with epidemic symptoms without coming in contact with the general pool of patients. Establish a triage criteria of all patients with respiratory symptoms can be utilized. Find triage places in each centre, train staff, make sure 24x 7 days availability, and practice safe infection control protocols. Those with Cat A & B go to Taluk Hospitals and Category C will go to Medical college. Bed management system itself will do the safe transportation.
  - b. Those who need a resuscitation need to be transported to a resuscitation area, intubated with minimal droplet expulsion and then shift or admit. For this we need an Anesthesiologist / Intensivist/ACLS trained person. We need a dedicated resuscitation area.
  - c. Plan how to resuscitate safely. Need to develop SOP for safe intubation. (Video laryngoscopy, covering Ambu with plastic cover with suction, clamping while putting ET tube, Intubation after full muscle relaxation, Viral Bacterial filter with HME .....)
  - d. Plan how to reduce infection contracting to the workforce (HME HEPA filter at exhalation limb, centralized monitoring system ( stasis system on bulk),keeping the breathing circuit as intact, avoiding unnecessary movement, strict disinfecting policy, closed suction ....)
  - e. Plan how to transport safely outside the ICU in case of need. (Red channel: overall avoid all types of transport/avoid CT like investigation, more point of care tests).
  - f. Infection control practice /PPE usage training for all relevant workforces. ( this has to be done under urgent basis).

- g. Plan for shifting out and discharge as per national/state guidelines. Rapid shift out of patients to their own home once they are stable enough, respective PHC medical officers should monitor further and feedback with treating centers should be taken if necessary.
- h. Plan for treatment as per advisories issued. (Latest guidelines should be made available as more evidence gets).
- i. If district hospitals are taking for class C patients, MCH may be taken for escalating treatments like ECMO provided situation allows and experts are available.
- j. Estimate daily consumption of consumables, preparation of the inventory and coordinate with the procurement/indenting/supply and Logistics system in the hospital should be done in each treatment unit.
- k. Plan staff surveillance based on respiratory symptoms before every shift and quarantine if needed.

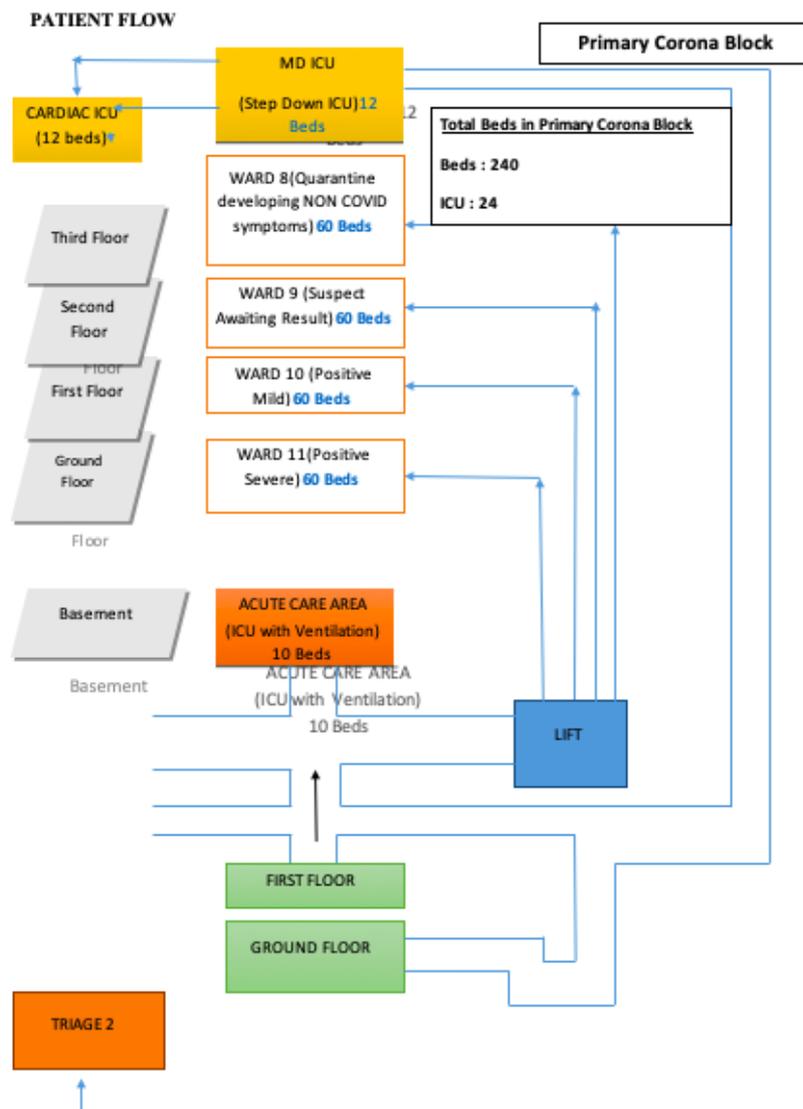


Fig.9. Patient flow. Courtesy Govt. Medical College Thrissur.

## 12.SURGE CAPACITY AND COHORTING APPROACH

Surge capacity:

Surge capacity is the ability of a health system to meet an increased demand for health services. Planning for surge capacity should allow for progressive scale-up of activities over several stages, with clearly defined activation thresholds for each stage.

Cohorting approach:

Patient cohorting means placing patients infected with the same laboratory- confirmed cases in a designated ward or area. Cohorting may be done as per their test positivity and gender status. The diagram adopted from WHO shows the cohorting approach.



Fig.10. Cohorting of patients

Reference: SARI treatment centre. Practical manual to set up and manage a SARI treatment centre and a SARI screening facility in health care facilities, WHO March 2020.

After doing the overall planning as stated above the COVID Care Centers, COVID FIRST LINE TREATMENT CENTER and COVID HOSPITALS will be ready.

### **13. PLANNING AND MANAGEMENT OF HOSPITAL PHARMACY**

1. Identify the nodal person for the pharmacy. Ensure training for all staff in the pharmacy are provided.
2. Find volunteers from Pharmacist associations of Kerala if needed.
3. Prepare essential medication lists for each centre.
4. Procurement, acquisition, storage, stock and stockpile monitoring. Identify multiple vendors in advance.
5. Plan to estimate periodic consumption (daily /weekly) of medicines.
6. Plan for estimating future requirements as per past consumption.
7. Update inventory daily.
8. Plan for inventory feedback with the procurement system.
9. Decide each role by job card.
10. Staff screening for sickness.
11. Staff training on infection control practices /PPE usage.

## 14. PLANNING AND MANAGEMENT OF HOUSEKEEPING.

1. Calculate and identify manpower required for all shifts x 24 hour x 7 days in each centre.
2. Disinfection SOP.
3. Training to the staff on SOP.
4. PPE use and hospital infection control practice training.
5. Daily screening of staff for sickness.
6. Plan for procurement, acquisition, storage, stock and stockpile monitoring of disinfectants. Identify multiple vendors in advance.
7. Estimating the daily consumption of disinfectants.
8. Plan for updating daily inventory.
9. Plan for estimating future requirements based on consumption and inventory check.
10. Decide each role by Job card .

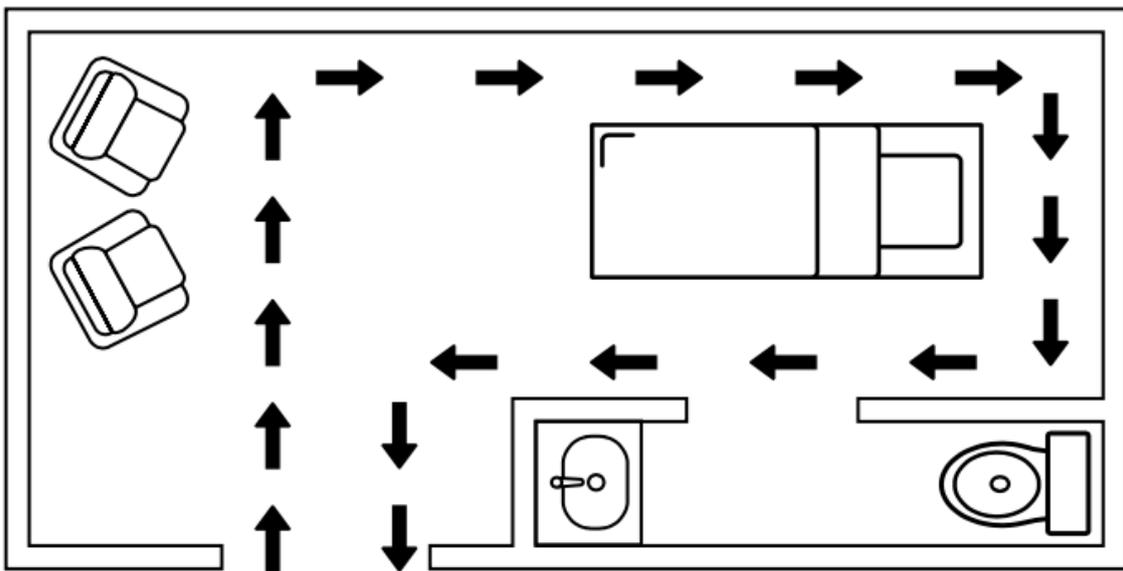


Fig.11 cleaning strategy for environmental surfaces, moving in a systematic manner around the patient care area. Courtesy: WHO.

## 15. PLANNING AND MANAGEMENT OF HOSPITAL LABORATORY SERVICES

1. Manpower estimation 24 x 7 days.
2. Identify additional qualified volunteers of lab personnel.
3. Plan only the essential test to be done minimum for COVID patients, calculate surge capacity of the lab in each hospital based on the daily essential tests and decide the turnaround time. Additional information can be obtained from the following [link](http://dhs.kerala.gov.in/wp-content/uploads/2020/03/interim_24032020.pdf). [http://dhs.kerala.gov.in/wp-content/uploads/2020/03/interim\\_24032020.pdf](http://dhs.kerala.gov.in/wp-content/uploads/2020/03/interim_24032020.pdf)
4. Develop an SOP for safe handling of the biological fluid and provide training for safe disposal of biological fluids.
5. Infection control practice /PPE usage training of the staff.
6. Housekeeping /cleaning activities of the unit, develop an SOP.
7. Plan for procurement, acquisition, storage, stock and stockpile monitoring of reagents. Identify multiple vendors in advance.
8. Plan for estimating the daily consumption of reagents.
9. Plan for updating daily inventory.
10. Plan for estimating future requirements based on consumption and inventory check.
11. Coordinating with the procurement system to make sure of constant supply of reagents.
12. Job card for each staff.
13. Staff screening for sickness.
14. Plan for the surge capacity of the lab, where we can outsource it. Identify all private labs (NABL accredited) in the district.
15. Plan MOU with outsourcing lab.
16. Plan for safe transportation of specimen.
17. Train the staff on Hospital Infection control and PPE.
18. Check how early and how to receive test results from outsourced lab
19. Develop an internal quality check mechanism without interrupting the lab work.

## **16. PLANNING AND MANAGEMENT OF LOGISTICS**

1. Arrange a centralized procurement system for each institution for procurement, transport, warehousing, stock monitoring, tracking and reporting of essential equipment.
2. Prepare list of essential equipment, consumables and medications in consultation with end users for each district( Includes ventilator with inbuilt compressors, NIV with hood (NOT mask), monitors, syringe pumps, infusion pumps, blood gas machines) and list out consumables.
3. The list of essential medicines a list of pre-defined essential medications required for each district.
4. Plan how to get feedback from the end user's consumption and inventory and plan procurement so that there won't be any interruption in the supply chain.

## **17. PLANNING AND MANAGEMENT OF SECURITY SERVICES**

1. Make a list of security staff available in the hospital.
2. Identifying possible major security issues that may come up when dedicated COVID areas are identified.
3. Identify potential people from Ex-military services if more personnel are required.
4. Provide training on Infection control practices and PPE.
5. Provide training on how to restrict and manage traffic to restricted areas.
6. Provide training on how to ensure that there is no overcrowding.
7. Plan how to connect with Governmental organizations like police, ambulance services, fire etc. whenever needed. The list of contact persons and phone numbers may be provided at designated places.

## 18. PLANNING AND MANAGEMENT OF LAUNDRY

1. Estimate linen required to run a given bed.
2. Plan and make an SOP for the laundry department. (methods of sorting, disinfection, washing, extraction, drying, ironing, folding, mending and delivery). Use power laundry if available
3. Maintain stock and transfer register.
4. Train with the SOP.
5. Plan additional infrastructure to keep an uninterrupted supply of linen in case of surge of patients.
6. Issue Job cards with job description to the workers in the laundry department.

## 19. PLANNING AND MANAGEMENT OF BIO-MEDICAL WASTE MANAGEMENT

The advisory for management of Bio-Medical waste from patients/suspects of COVID-19 are given in the link below. [http://dhs.kerala.gov.in/wp-content/uploads/2020/03/bwm\\_08022020.pdf](http://dhs.kerala.gov.in/wp-content/uploads/2020/03/bwm_08022020.pdf)

1. Plan segregation of contaminated sharps, syringes, blood contaminated materials safely as per existing biomedical rules.
2. Plan for safe transport of Bio-Medical waste.
3. Develop an SOP for the institution and provide training.

## **20. PLANNING AND MANAGEMENT OF DIETARY SERVICES**

1. Find human resources for dietary preparation and supply for the institution.
2. Preparing a list of raw materials of food for the workforce and patient as per various phases.
3. Develop a system to monitor procurement, storage, stock and issue of dietary items.
4. Estimating the daily consumption of food.
5. Plan for updating daily inventory.
6. Plan for estimating future requirements based on consumption and inventory check.
7. Ensure food safety and hygiene.
8. Plan for seeking resources or contribution from community and corporate sector.
7. Job card with job description.

## **21. PLANNING AND MANAGEMENT OF BIOMEDICAL ENGINEERING SERVICES.**

1. Identify the biomedical human resource available.
2. Estimate the need for equipment.( Ventilators, Syringe pumps, NIV, Crash carts, airway requirements, ventilator accessories) for each phase.
3. Plan how to ensure continuous power source and alternate power sources.
4. Ensure continuous O2 supply.(Medical gas supply)
5. Ensure working status of equipment daily.
6. Identify serious maintenance problems and rank them in order of maintenance.
7. Plan for corrective and preventive maintenance.
8. Describe how to provide external technical service if necessary in case of in vivo maintenance service not competent.
9. Infection prevention practice/PPE training .
10. Plan for staff screening.
11. Job card with job description.

## **22. PLANNING AND MANAGEMENT OF COMMUNICATION.**

1. Make a system in each centre to communicate with the workforce, patients, family, other healthcare institutions and Govt. as per the need and situation.
2. Make a system on how to collect this information from the treating group and patient care areas.
3. Dedicated communications may be established especially with the institutional COVID cell.
4. Assign roles and responsibilities and prepare a Job card.

## 23. PLANNING AND MANAGEMENT OF MORTUARY SERVICES

It is recommended to use a combination of standard, contact and droplet precautions to protect health-care workers managing the body of a person with suspected or confirmed COVID-19.

Ensure dignity to the dead body at all times.

1. Decide manpower for 24x7 coverage of services.
2. Infection control and PPE training for the staff while receiving, storing and transfer of bodies
3. Plan and train how bodies are to be packed and disposed as per national guidelines.
4. Plan for the transportation of bodies.
5. Plan how family members are catered
6. Plan disinfection practice of the vehicle after the body transportation, advisory regarding this matter has been published on [www.dhs.kerala.gov.in](http://www.dhs.kerala.gov.in)
7. Plan what infection control practices to be followed by the driver
8. Plan how to do a daily surveillance of mortuary staff
9. Plan housekeeping practice of mortuary

## 24. MONITORING OF ACTIVITIES AND DAILY REVIEW

All the activities should be monitored. A few of the indicators for monitoring are given below:

- No. of patients attending COVID OP
- No. of samples taken
- No. of Hospitalizations
- No. sent on home isolation
- No. of COVID19 positives at present
- No. of discharges
- No. of HRs on each shift
- Infection control practices
- Stock position of PPE kits and other consumables
- Onset of symptoms among health care workers etc
- Issues faced by each department
- Patient complaints/suggestions

A daily review of the day's activities should be reviewed by the COVID cell in the institution. A fixed time may be used so that all the members can come prepared for the daily review

## **25. MANAGEMENT OF NON-COVID PATIENTS CURRENTLY ADMITTED IN THE HOSPITAL.**

All the emergencies shall be handled as it is being done now, if the patients are coming to the existing facilities because people know the address and for convenience they should be attended to, if we refer them to some other Hospitals, the time lost to travel to other hospital will be detrimental to the life of the patient.

All super specialty Hospitals will continue to function as they have been functioning during the normal time. They should also provide services to the emergency cases.

All COVID positive patients such as delivery etc to be done as per the protocol. We have been conducting HIV positives deliveries. Similar kind of precautions may be taken.

Other than emergencies the other general OP and IP will get shifted to one level down Hospitals i.e. General Hospitals under Directorate of Health Services. If the human resource in MCH is not involved in COVID care such Human Resource should be deployed to the General Hospitals so as to ensure that proper health care is provided to other general patients. The General Hospitals are linked to Taluka Hospitals, CHCs and FHC and PHC at the grass root level. These health institutions shall cater to the general population with other ailments than COVID infection.

If Super Specialties like Neurology, Cardiology, Nephrology, etc. cases can be relocated to newly identified Tertiary care hospitals like GH in the district/major private hospitals, that should be planned and action initiated at the earliest with proper intimation to existing patients.

Surgery, Medicine, Orthopaedics, ENT, OMFS, Psychiatry, Respiratory Medicine, Cardiology can be relocated to the government general hospitals in the district with relocation of essential specialists on a turn basis, if required.

Nephrology and patients on dialysis, can be relocated to major hospitals under government and private sector where facilities for dialysis is available. (Temporary shifting of equipment also may be considered if there are no technical issues)

A pool of doctors for all specialities and super-specialities to be formed which includes doctors from govt and private hospitals and allowed to perform emergency surgical procedures (only) and interventions in all the above mentioned alternate centers irrespective of their place of working. The specialists Doctors not directly involved in the COVID care may get shifted to the General Hospitals to continue tertiary care to the emergency patients.

## **26. PLANNING AND MANAGEMENT OF CONCURRENT EMERGENCIES**

1. Decide what emergencies can be catered in the hospital during the pandemic and list them.
  2. Decide what workforce is needed to cover the concurrent emergencies and plan manpower to handle concurrent emergencies.
  3. Plan how to cater to all these emergencies
  4. Plan how to avoid mixing up of pandemic management with concurrent emergencies.
  5. Medicolegal, trauma cases, road traffic accident cases and post-mortem examinations can be conducted at levels where such facilities are available.
  6. Staff surveillance mechanism needs to be planned.
  8. Credentialing, privileging and training of extra manpower
  9. Job sheet for each category of workforce.
- .....

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## ANNEXURES

1. ADVISORY ON CCC
2. ADVISORY ON CFLTC
3. COVID PLAN GOVT. MEDICAL COLLEGE KOZHIKODE, KERALA

## ANNEXURE-1



**COVID 19 (nCorona) Virus Outbreak Control and Prevention State Cell  
Health & Family Welfare Department  
Government of Kerala**

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**COVID-19 – Advisory for Patient admissions to COVID Care Center – Reg**

**No.31/F2/2020/Health - 28<sup>th</sup> March 2020**

The World Health Organization (WHO) has declared COVID 19 epidemic affecting more than 199 countries as a pandemic. Due to inflow of persons from affected countries, Kerala has strengthened the surveillance and control measures against the disease. A COVID care centre (CCC) is a facility meant for quarantining persons who have recently arrived in Kerala from other countries and other states of India. The objective of a COVID care centre is to enable successful isolation and management of asymptomatic cases.

**COVID Care Centres**

These are centres where the persons reaching Kerala can be quarantined to contain the spread and manage the people during the period of incubation.

The COVID care centres shall have the following:

1. Independent single rooms with attached toilets
2. Proper electricity, water and internet connectivity
3. Proper food and drinking water facility
4. Security to ensure safety of isolated people
5. These centres should be coded BLUE colour

**Standard Operating Procedure**

**Purpose**

- Provide proper quarantine and prevent the spread of disease transmission

A CCC shall operate under the following standard operating procedure.

1. The district administration shall identify and manage the infrastructure with the assistance of the LSG. Number of rooms can be flexible as district administration decides. More rooms can be attached if the number of cases increases.
2. Identification should be in the order of priority starting with hostels rooms and with single rooms with bathrooms, then the hotel rooms and then dormitories can be identified if case arises
3. The LSG should ensure basic needs such as food, water, sanitation, internet connectivity and waste management. The local ward member should be involved in the working of the centre, as the LSG is expected to provide vital services such as water, food and cleaning services.
4. It should be under the direct control and observation of the Health Inspector (HI) of the area. If there is no HI, the DMO shall identify a person in charge.
5. There should be at least two Health Care Volunteers (HCV) on duty at any time per shift.
6. There should be a register on the front desk to record all details of the persons admitted in the CCC.
7. At the time of admission, there should be a symptom checklist duly filled by HCV. Daily symptom checks of inmates should be done by HCVs.
8. If a person becomes symptomatic, he/she shall immediately be referred to the nearest designated isolation facility hospital in designated ambulance.
9. Persons with fever, cough, sore throat, dyspnoea, diarrhoea should not be admitted in the CCC. All inmates should be sensitized about personal hygiene, environmental hygiene and physical distancing.
10. There should be signage on personal hygiene (cough, sneeze and hand hygiene), environmental hygiene physical distancing and clinical features of the disease displayed near the front desk.
11. The HCVs should maintain a list of medicines that persons with other co-morbidities admitted in CCC are routinely taking. The HCVs must ensure supply of these medicines in concurrence with the nearby Health Care Institution and LSG. The demand list must be provided to the LSG every 3 days and it should be procured and supplied by the LSG if the nearest Health Care Institution does not have adequate stock.
12. A doctor of the nearby public health care institution (PHC/CHC/FHC) should attend the call, if an inmate becomes symptomatic.
13. The Junior Health Inspector (JHI) of the area must visit and report on the CCC to the concerned Health Care Institution on a daily basis.

14. All the staff members and visitors of a CCC shall practice standard and transmission based precautions. If a staff member develops a symptom, they should self-isolate and report to the medical officer in charge.
15. If a CCC can be converted into a Healthcare Institution later, standard operating procedures of COVID first line treatment centre will apply.
16. Discharge protocols already issued as part of the revised guidelines march2020 31/2020/Health will apply for these cases.

#### Human Resource needed for CCC

- Less than 50
  - Health care volunteer-2
  - Doctor on call -1
  - JHI( male/female)-1
  
- CCC with 50-100 beds
  - Health care Volunteer -4
  - Doctor on call -2
  - JHI( Male/female)-2
- CCC with 100-200 beds
  - Health care volunteer -4
  - Doctor on call 4
  - JHI-4
- CCC more than 200
  - Health care volunteer-6
  - Doctor on call-6
  - JHI-6

  
Principal Secretary



**COVID 19 (nCorona) Virus Outbreak Control and Prevention State Cell  
Health & Family Welfare Department  
Government of Kerala**

**COVID-19 – Advisory for Patient admissions to COVID First-Line Treatment Centre (CFLTC)– Reg**

**No.31/F2/2020/Health - 28<sup>th</sup> March 2020**

The World Health Organization (WHO) has declared COVID 19 pandemic affecting more than 199 countries. Due to the inflow of persons from affected countries, Kerala has strengthened the surveillance and control measures against the disease. Since more number of primary contacts are turning positive, and more number of patients are being admitted, some centres need be identified as COVID First Line Treatment Centres. The district administration should decide if the centres can be designated as COVID first-line treatment centre based on the following specifications.

**COVID First-Line treatment centre**

**Definition**

The centre identified as COVID Health care centre should treat all mild and moderate symptomatic persons under surveillance and should be utilised for treating positive cases, when need arises.

They are the primary level health care centres for providing care to less serious cases and referral of serious cases to the COVID Hospitals to avoid crowding directly in the COVID Hospital and wastage of resources.

The COVID first-line treatment centres should be coded green colour

The following service delivery should be ensured in COVID first Line treatment centre

- The district administration can identify as many centres for this purpose in line with protocols for isolation.

- The district administration should prepare the list of health care professionals and post them to the health care centre.
- Logistics, necessary drugs and consumables should be made available.
- As per the prescribed guidelines, the mild symptoms and category A can be treated at these centres, as per revised interim treatment guidelines issued by GOK Health and family welfare department on 24 march2020 31/2020/Health.
- The staff should be trained in the treatment guidelines.
- All the treatment guidelines and the reference protocols should be printed and made visible in the treatment area
- The identified centres should have an observation area, treatment area, at least 10-25 beds for observation.
- Any centre with 10-25 beds should have the following staff pattern. If there are more than 25beds, sufficient staff may be made available accordingly.
  - Doctors- 8 in rotation
  - Staff nurse -12
  - Pharmacist-3
  - Cleaning staff- 10
  - Health care volunteer- 6
  - Security-3
- There should be an OP register, admission register, inpatient register with symptom checklist register for OP and IP cases.
- Adequate signage should be displayed in the waiting area, treatment areas and patient area
- A daily report should be sent to district control room
- The centre should conduct OP from 8 AM till 6 PM in rotation. Ensure ward duty and night duty also.
- There should be a triage area, in front of the OPD, to conduct screening based on a symptom check list
- Emergency reporting should be done if any person admitted is found missing from the hospital
- Should have provision for biomedical waste management & general waste management.

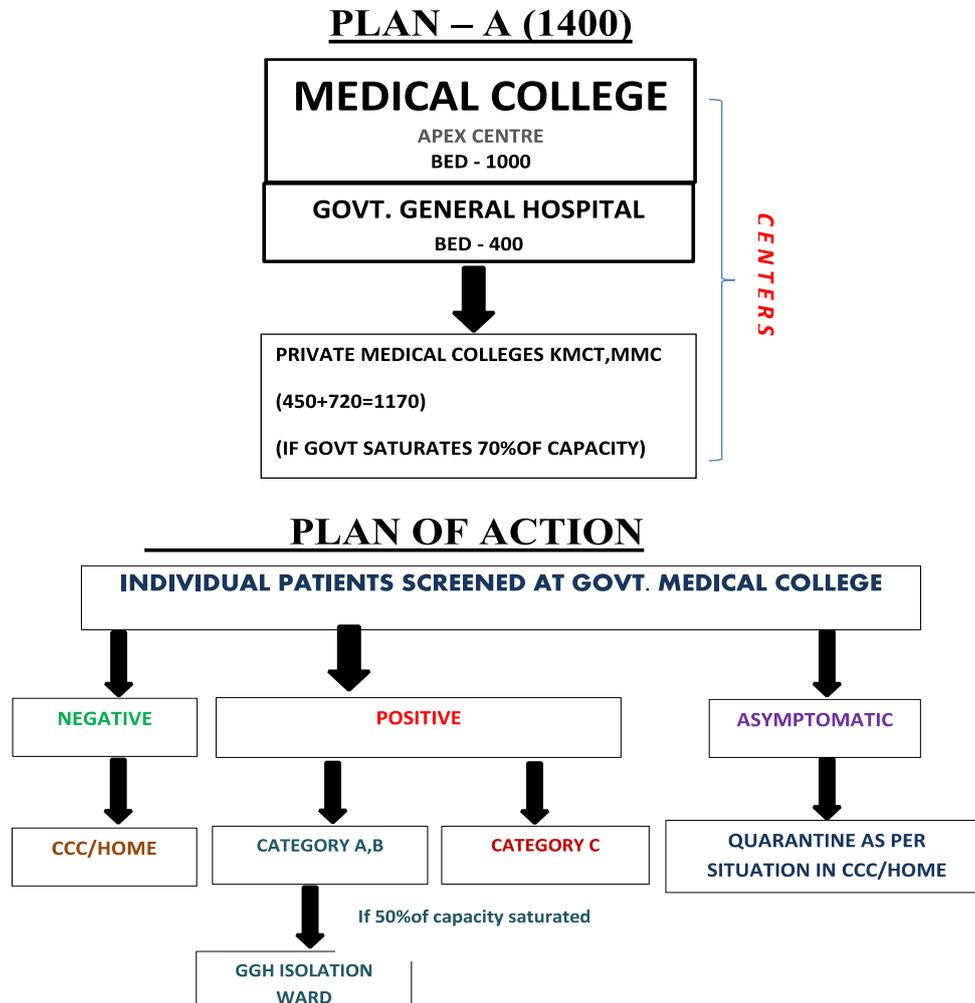
**DRUG LIST FOR FIRST LINE TREATMENT CENTERS**

Serial Number	Name of the Drug/consumable	Quantity
01	Tab Paracetamol 500 mg	10000
02	Tab Cetrizine 10mg	3000
03	Tab Salbutamol 4mg	2000
04	Tab Chlorpheniramine maleate 4mg	2000
05	Tab Metformin 500mg	1000
06	Tab Amlodipine 5mg	1000
07	Tab Atorvastatin 10mg	1000
08	Tab Losartan Pottassium 50 mg	1000
09	Tab Eteophylline theophylline	1000
10	Tab Glimipride 1mg	1000
11	Cap Amoxycillin 250 mg	1000
12	Cap Amoxycillin 500 mg	1000
13	Tab Ciprofloxacin 500mg	1000
14	Tab Metronidazole 400mg	1000
15	Tab Pantoprazole 40mg	2000
16	Tab Domperidone 10mg	1000
17	Tab Ondansetron 4mg	1000
18	Calamine lotion	200
19	Salbutamol expectorant	1000
20	Mixture expectorant	300
21	Tab Prednisolone 10mg	1000
22	Tab Doxycycline 100mg	1000
23	Tab Amoxicillin and Clavulanic acid 625 mg	1000
24	Inj Paracetamol	500
25	Injection Ranitidine	1000
26	Inj Hydrocortisone	300
27	Inj Avil	300
28	Inj ondansetron	300
29	Inj Pantoprazole	500
30	IV Fluids RL,NS,DNS,5%Dextrose	500 each
31	Insulin 30/70	500
32	ORS	5000
	Specific Drugs	
33	Tab Hydroxychloroquine	500
34	Tab Azithromycin	1000
35	Tab Oseltamivir	500
	Other items	
36	Surgical spirit	30

37	Adhesive tape	10
38	Non adhesive bandage	10
39	IV set	1000
40	Needle (18,20,22,24 G)	300 each
41	IV canula(16,18,20G)	300 each
42	Syringe (2cc,5cc)	500 each

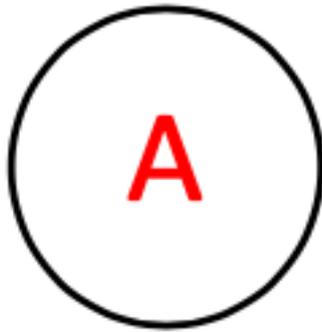
  
Principal Secretary

## ANNEXURE-3: COVID PLAN GOVT. MEDICAL COLLEGE KOZHIKODE, KERALA



1. THREE LAYER ARRANGEMENT OF HR
2. CORONA CARE CENTRE(CCC)IN EACH TALUKS
3. IF 50% OF PLAN A SATURATES, GO TO PLAN B
4. GGH will continue OP and Casuality services for non corona patients
5. Sub apex centres -KMCT ,MMC Private medical colleges

## **PLAN – B (765)**



### **UPGRADATION OF GOVT MAJOR HOSPITALS**

- 1. THQH KOYILANDY - 150**
- 2. TH NADAPURAM - 110**
- 3. TH PERAMBRA – 40**
- 4. DH VADAKARA - 210**
- 5. TH KUTTIYADI - 100**
- 6. TH BALUSSERY - 75**
- 7. TH THAMARASSERY - 60**
- 8. TH FEROKE - 20**

### **ACKNOWLEDGMENT**

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