

**CONTINGENCY MANAGEMENT FOR FUTURE PANDEMICS AND LESSONS
FROM THE COVID-19 PANDEMIC AT RUKMANI BIRLA HOSPITAL, JAIPUR.**

Dissertation submitted to

The IIHMR University, Jaipur

For the partial fulfillment of the award of the degree of
Master of Business Administration (MBA)



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DECLARATION BY THE STUDENT

I hereby declare that this dissertation titled contingency management for future pandemics and lessons from the covid-19 pandemic at Rukmani Birla hospital, Jaipur, is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Dr. Tripti Bhaskar

Date:

Abstract

Title: Contingency Management for future pandemics and lessons from the COVID-19 Pandemic at Rukmani Birla Hospital, Jaipur.

Author: Dr. Tripti Bhaskar

Background: The wretched event of coronavirus first wave humbled many rich and developed countries where even lavish health care systems were swamped by this virus. Just as past pandemics taught the world grim truths about how to deal with outbreaks, lessons from this virus thrive in the West.

COVID-19 has triggered a variety of challenges for hospitals and health care organizations. Pandemics are unusual health care crisis. The consequences of COVID-19 will unfold over many years. Contingency planning will assist hospitals and health care organizations to adapt and sustain patient services

Objectives:

- To identify the lessons learned from COVID-19 pandemic.
- To understand the importance of contingency planning.
- To formulate a contingency plan for second wave and future waves.

Method:

A core committee was formulated in order to develop an appropriate plan for COVID-19 situation and was named “COVID Prevention and control committee”. The records of the meeting were analyzed, and actions taken by the hospital were studied. The compliance to guidelines from state Government were also evaluated by comparing the guidelines of Government of Rajasthan with that of CPC committee. In this study, the importance of Contingency planning and new contingency plan for future third wave have been formulated for the hospital taking into consideration the latest guidelines by the Government and WHO.

Conclusion:

The novel coronavirus has spread a tremor through hospitals and healthcare organizations all over the globe. An outbreak of this huge scale with such swift progression has definitely outshined the inadequacy in healthcare systems. Just when Indians thought that the virus has gone away after almost a year of gloom and doom, a new second wave roared back and we were caught unaware. To avoid such circumstances in future and to keep the normal day to day functioning of the hospitals, we should keep a contingency plan ready for the future pandemics which can be activated at the time of need.

Abbreviations:

CPC- COVID prevention and control committee

WHO- World Health organization

MOM-Minutes of meeting

HFNC-High flow nasal cannula

NIV- Non-invasive ventilation

CBC- Complete blood count

KFT- Kidney function test

LFT- Liver function test

COPD- Chronic obstructive pulmonary disease

ER- Emergency

PICU- Pediatric intensive care unit

SICU- Surgical intensive care unit

JR-Junior resident

SR-senior resident

BME-Bio-medical engineering

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Table of contents

S.No.	CONTENTS	PAGE NO.
1	Chapter-1 Introduction	10-11
2	Chapter-2 Review of literature	12-18
3	Chapter-3 Methodology 3.1 Research Question 3.2 Research Objective 3.3 Materials and methods	19-21
4	Chapter-4 Results and discussion 4.1 Steps in Contingency plan 4.2 Contingency Plan at Rukmani Birla Hospital, Jaipur. 4.2.1 As per the 1 st CPC meeting, the committee decided upon few points. 4.2.2 After the start of second wave of coronavirus, 16 th CPC meeting was held on 7 th April 2021. 4.2.3 As per the 17 th CPC meeting held on 22 nd May 2021, following criteria had been decided to tackle the second wave. 4.2.4 Facilities made for patients and attendants coming for RT-PCR. 4.2.5 Preparation for third wave of COVID-19. 4.2.6 Management of other anti-viral and essential drugs for the treatment of COVID-19	22-44
5	Chapter-5 Conclusion	45-50
6	Annexures	51-55

List of figures

S.No.	CONTENTS	PAGE NO.
2	Figure 4.1 Admission criteria for elective cases	31
3	Figure 4.2 Admission criteria for surgery cases	32
4	Figure 4.3 Admission criteria for COVID positive cases to General Ward	32
5	Figure 4.4 Current non-COVID admissions protocol	34
6	Figure 4.5 Post COVID patients	34
7	Figure 4.6 Non-COVID emergency	35
8	Figure 4.7 Current criteria for admission in general ward	36
9	Figure 4.8 Admission criteria for ICU	37
10	Figure 4.9 Shift out Criteria from COVID-ICU	37
11	Figure 4.10 Facilities made for patients and attendants coming for RT-PCR	38
12	Figure 4.11 Segregation of COVID OPD Consultation Chambers and Sample Collection Room	38
13	Figure 4.12 Additional OPD Billing Counter for COVID Patients	39
14	Figure 4.13 Patient segregation through color coded bands.	39

CHAPTER-I

INTRODUCTION

COVID-19 has hit the world hard. Undoubtedly it has changed our lives forever. It has left the world's healthcare system overwhelmed by the rise in cases and deaths. The world has seen how India is being ravaged by a second wave of the Covid-19 pandemic, which has accelerated beyond anywhere else in the world. From this time, we need to focus on the plans for such waves to come in future also. For these reasons it's important to have a contingency plan.

The cycle of identification and monitoring of risks and vulnerabilities is called Contingency planning. It consists of analyzing the risks and implementations to mitigate the risks.

The key factors to keep in mind while making a contingency plan are:

- Practical
- Easy
- Realistic
- Feasible
- Needs based
- Efficient
- Should be effectively operational
- Regularly tested for its effectiveness
- Monitored regularly
- Updated if required

Objectives of the study:

- To identify the lessons learned from COVID-19 pandemic.
- To understand the importance of contingency planning.
- To formulate a contingency plan for second wave and future waves.

Research Question: What is the importance of contingency planning, methods to achieve it and its implementation for future preparedness?

CHAPTER-II

REVIEW OF LITERATURE

Table 2.1: Review of Literature

<u>S.No.</u>	<u>Title</u>	<u>Author/ Year</u>	<u>Findings</u>
<u>1</u>	First and second waves of coronavirus disease-19: A comparative study in hospitalized patients in Reus, Spain	Simona Iftimie (March 31, 2021)	The most frequent signs and symptoms in both waves were fever, dyspnea, pneumonia, and cough, and the most relevant comorbidities were cardiovascular diseases, type 2 diabetes mellitus, and chronic neurological diseases. Patients from the second wave more frequently presented renal and gastrointestinal symptoms, were more often treated with non-invasive mechanical ventilation and corticoids, and less often with invasive mechanical ventilation, conventional oxygen therapy and anticoagulants. hospitalized patients in the second wave were younger, required fewer days of hospitalization, had lower mortality rates and treatments were more

			effective and less intensive.
<u>2</u>	Are Hospitals Ready For Covid's Second Wave?	Lionel Laurent (October 07 2020)	Covid-19 patients fill more than a third of intensive-care beds in the Asia region. It's a similar story in Madrid. Blunt, lockdown-style measures — the closure of bars, gyms and other businesses — are being rolled out to slow case growth and hospital admissions.
<u>3</u>	Characterization of the Second Wave of COVID-19 in India.	Rajesh Ranjan, Aryan Sharma (17/04/2021)	The spread of the second wave is much faster than the first wave. Hence, quick and effective administrative intervention is needed to arrest the rapid growth of the epidemic
<u>4</u>	India's COVID emergency	The Lancet (May 08,2021)	India must now pursue a two-pronged strategy. First, the botched vaccination campaign must be rationalized and implemented with all due speed. Second, India must reduce SARS-CoV-2 transmission as much as possible while the

			vaccine is rolled out.
<u>5</u>	India's COVID-19 crisis: a call for international action	The Lancet	The 8 steps were laid down by the Lancet committee that the international community must take to help address the crisis in India.
<u>6</u>	COVID-19: Pandemic Contingency Planning for the Allergy and Immunology Clinic	Science direct (May 2020)	In the event of a global infectious pandemic, drastic measures may be needed that limit or require adjustment of ambulatory allergy services. These suggestions are intended to help provide a logical approach to quickly adjust service to mitigate risk to both medical staff and patients. Importantly, individual community circumstances may be unique and require contextual consideration. The decision to enact any of these measures rests with the judgment of each clinician and individual health care system.
<u>7</u>	Mobilizing effective contingency plans for future health	Tony Cambridge (April 2020)	COVID-19 has sent a shockwave through healthcare systems all over the world. In a direct

	system threats: COVID-19 NHS case study.		response to the progress of the transmission of SARS-CoV-2, contingency plans have been mobilized to protect the NHS workforce, providing essential services within pathology laboratories and the point of care (POC) teams associated with blood sciences laboratories.
<u>8</u>	Contingency Planning in Healthcare	Bartleby research	Contingency planning considers unwanted or unintended events that could have the ability to impact an organization's functioning. Contingency plans help to mitigate certain risks. The contingency center is the backup plan in the event of a disaster.
<u>9</u>	How India's second wave became the worst COVID-19 surge in the world	Nilanjana Bhowmick	The surge took us by surprise and the system is now totally overwhelmed. Indians are being turned away from vaccination centers because supplies have run out. The picture changed drastically when India began recording a dramatic increase in new

			cases from April 15 onward, with more than 200,000 cases daily and hospitals ran out of oxygen.
<u>10</u>	Second wave of COVID-19 pandemic in India: Barriers to effective Governmental response.	Sujita Kumar Kar	As of April 10, 2021, India is the 3rd leading country based on the USA and Brazil's identified cases. Immediate national and international attention is needed to identify the appropriate containment strategy of the pandemic. Otherwise, the world may lose many lives that could be saved by political wills considering the general people's safety than winning in the immediate election.
<u>11</u>	Contingency plan for the intensive care services for the COVID-19 pandemic.	P. Rascado Sedes (Sep 2020)	The objectives of this article are to estimate the magnitude of the problem and identify the necessary human and material resources.
<u>12</u>	Coronavirus (COVID-19) Medical Contingency Plan Version 2.0	Smartmeetings.com	This plan is designed to provide information on identifying and minimizing potential risk, not to treat or evaluate potential patients. This

			article discusses the preparation and response action list during COVID.
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CHAPTER-III

METHODOLOGY

3.1 Research Question: What is the importance of contingency planning, methods to achieve it and its implementation for future preparedness?

3.2 Materials and methods:

- Study design: Secondary research- It is a process in which the researcher collects data from already existing data or studies and evaluates them.
- Study Setting: Rukmani Birla Hospital, Jaipur.
- Duration of study: 1st February 2021 till 19th June 2021.
- Study method: The MOM's of CPC committee were studied. The current plan to tackle the second wave was evaluated and the plan for predicted third wave was formulated accordingly. This study is based on secondary research taking the guidelines of Government of Rajasthan and World Health Organization into consideration.
- Study population: All the IPD patients at Rukmani Birla Hospital, Jaipur, coming with or without any COVID related symptoms.
- Study approach: Qualitative assessment- It is a type of research in which data is obtained from open-ended conversations, interviews and focus-groups.
- To evaluate the current process for admission of COVID and Non-COVID patients, the following steps were used:
 - i. The data and points decided upon in CPC meetings were analyzed.
 - ii. Any short-comings in this were identified for further improvement.
 - iii. Primary data was collected by going on rounds and seeing if the staff is adhering to these protocols.
 - iv. In every CPC meeting, the gaps were discussed and a process was made to overcome them.

- v. Regular meetings were held with operations team and supply chain team to discuss the shortages of medicines and how to procure.
- Medical Admin team meetings were organized on a weekly basis to discuss the process of supply chain for distribution of Remdesivir and other COVID related drugs.
- A weekly meeting was also held with the BME staff to discuss any issues in supply of oxygen.

CHAPTER-IV

RESULTS AND DISCUSSION

Due to the second wave of COVID-19, our healthcare system was unable to admit any Non-Covid patients. The operation theaters were non-operational at

many hospitals due to inability to maintain the much needed oxygen to operate any OT.

Many patients turning up to the hospitals to seek clinical care for any other disease (Other than COVID), were ultimately tested positive for the virus.

To avoid such circumstances in future and to keep the normal day to day functioning of the hospitals, we should keep a contingency plan ready for the future pandemics which can be activated at the time of need.

Lessons learned from COVID-19 pandemic:

The World Health Organization warned that ‘The world is ill-prepared to respond to a severe influenza pandemic or to any similarly global, sustained and threatening public-health emergency. This pandemic has exposed all the loopholes in our healthcare system. In the countries with strong operational health care systems, it was inadequate to handle the grim situation due to this pandemic. This has also exposed the fundamental lack of a contingency plan.

The bottlenecks seen were:

- 1) Limited authorized testing facilities- The most developed cities in India and the national capital has seen at least 4 to 5 days of waiting to get a COVID test done. India needs to not only scale-up the testing systems but also provide abundant instrumentation and expertise required to perform COVID test.
Getting diagnostics facilities running to a scale that they can handle large number of samples are the major requirements.
- 2) Formulation and identification of available resources and strategies to promptly harness them.
- 3) Contingency planning to identify the facilities which can be effectively used as healthcare facilities in the time of emergency.

- 4) It is necessary to increase the ICU beds in the country in order to avoid the situations where patients are dying due to unavailability of beds and to prevent hospitals and health care facilities from being overwhelmed if any future waves come.
- 5) Planning for shelter hospitals for the cases with mild systems.
- 6) Safety and protection of health-care and all front-line workers.
- 7) Effective and decisive bio-medical engineering which is a very crucial part of any pandemic.
- 8) Better availability of medical grade oxygen.
- 9) Increasing the number of ambulances and capping the prices for service.
- 10) Government should also engage the general population in management of crisis by voluntarily engagement in crisis management at least of the youth.
- 11) Health insurance programs to help people seek medical care without caring about the cost of treatment.
- 12) Improving 24*7 teleconsultation to reduce the workload of doctors.
- 13) Governments globally should work together to form a contingency plan which can be activated at the time of need.
- 14) More budget should be allocated to research activities involving vaccine producers, medical workers.

Importance of contingency planning:

Pandemics, in any form, whether mild, moderate or severe, usually affect a large number of the population and require a multi-sectoral response over time.

Preparing and planning for a pandemic is a continuous process. In order to avoid the grim losses seen during the second wave, it is important to have a contingency plan at place.

➤ Steps in contingency planning: -

1. Risk mitigation:

It includes steps to lessen the probability and gravity of occurrence, of a given risk and hence reduce its effect.

2. Risk analysis:

- It includes, identification and monitoring of life threatening hazards.

3. Risk Preparedness:

- Identify steps to ensure readiness to respond to a pandemic.
- Propose implementation according to level of wants.
- Preparedness refers to all steps to increase understanding and capacity to foresee, respond to and recover from the impact of events.
- Readiness is the result of preparedness actions.

4. Contingency plan:

- Establish a contingency plan based on situation.
- Set preliminary response.

The specific health hazards of the virus should be considered. In this document, covid-19 is used as an example hazard. This hazard carries specific health risks, such as, fever, dry cough, tiredness, difficulty breathing or shortness of breath, chest pain or pressure, loss of speech or movement.

An example of COVID-19:

○ RISK ANALYSIS:

Table 4.1 (Risk analysis)

Hazard	COVID-19
Early warning mechanisms	Public awareness via different modes, contact tracing. Curbs to restrict social gatherings
Scenario	Proportion of people affected Proportion of people died Proportion of people recovered Proportion of people Vaccinated Proportion of inaccessible hospitals and healthcare institutions. Lack of or access to basic health facilities Lack of Oxygen at hospitals Lack of medications Lack of ambulance services
Health needs	Lack of access to essential services Need of oxygen and remdesivir
Assumptions	Medications and oxygen supplies reach the patients without hamper Pre-positioned stocks to meet the demand Speed up the vaccination manufacturing and administration process

○ RISK MITIGATION:

Table 4.2 (Risk mitigation)

Identified health risks	COVID-19
Trauma	Public risk interaction to promote personal safe behavior. Training in mass casualty management.
Lack of access to essential services	Identify red zones and containment zones and evaluate the health infrastructures Strengthen first aid response Identify referral systems
Risk for developing symptoms	Improve health care infrastructure in high risk areas Assess opportunities and speed up the process for COVID vaccination campaign in high risk areas Develop and implement risk communication campaign

○ RISK PREPAREDNESS:

Table 4.3 (Risk preparedness)

Identified health risks	COVID-19
Trauma	Public awareness to promote personal safe behavior.

	Training in mass casualty management
Lack of access to essential services	Identify red zones and containment zones and evaluate the health infrastructures Strengthen community based first aid Identify back-up for referral systems
Risk for developing symptoms	Improve health care infrastructure in high risk areas Assess opportunities and speed up the process for COVID vaccination campaign in high risk areas Develop and implement risk communication campaign

○ CONTINGENCY PLAN:

Table 4.4 (Contingency plan)

Responsibility	Response needs	Preparedness action
Coordination	A mutual and synergic health sector response which protects the needs of all affected people. Uniform decision-making with ministry of health and other decision-makers.	Verify procedures are in place for requesting and synchronizing global assistance.
Information and planning	Joint risks and needs assessments	Verify availability and understanding of triggers of enabling of response.
Health operations and expertise	Technical guidance on mass casualty management. Early warning, alert and response systems. Shipment of basic package of health services in areas with	Form all needed guidelines. Formulate risk communication messages. Identify possible communications channels.

	lack of access.	
Operations support	Undisturbed supply chain	Ensure catalogues and lists of prepositioned supplies available. Pre-identify accommodation for surge teams.
Finance	Availability or rapid access to contingency funds. Availability of budget lines that can be repurposed. Development of donor appeals. Plan for Human resources management (Doctors, nurses and other front line workers).	Ensure emergency standard operating procedures (E SOPs) are in place. Identify and contact potential donors for vaccines and oxygen cylinders.

○ ACTION PLAN:

Table 4.5 (Action plan)

Objectives	Activity	Priority
Risk mitigation		
	Map the high risk areas and red zones	1
	Evaluate health-care facilities and bed availability in hospitals	2
Preparedness actions		
	Train health care staff to handle the COVID wave	1
	Plan for newer drugs and vaccination for all	3

4.1 Contingency plan at Rukmani Birla Hospital, Jaipur-

4.1.1 As per the 1st CPC meeting, the committee decided upon few points:

Agenda of 1st CPC meeting:

- 1) Discussion on novel coronavirus.
- 2) Strategic preparedness and response plan
- 3) Revision of COVID SOP's

Our COVID team will consist of 3 consultant doctors: -

- Dr. Sushil Kalra
- Dr. Puneet Gupta
- Dr. Rakesh Godara

COVID suspected and positive patients to be admitted under COVID team and not under any specific consultant.

➤ What do we do if previously negative IPD patient turns positive during their stay in the hospital: -?

- CT scan of chest for any negative patient in whom symptoms are suspicious
- Patient will be shifted to second floor isolation ICU/ward as per requirement if positive findings present.

➤ Location to which any COVID positive patient will be shifted: -?

- Primary consultants treating COVID patients to decide on the logistics.

➤ How is bed allotment to COVID positive patients going to be carried out: -?

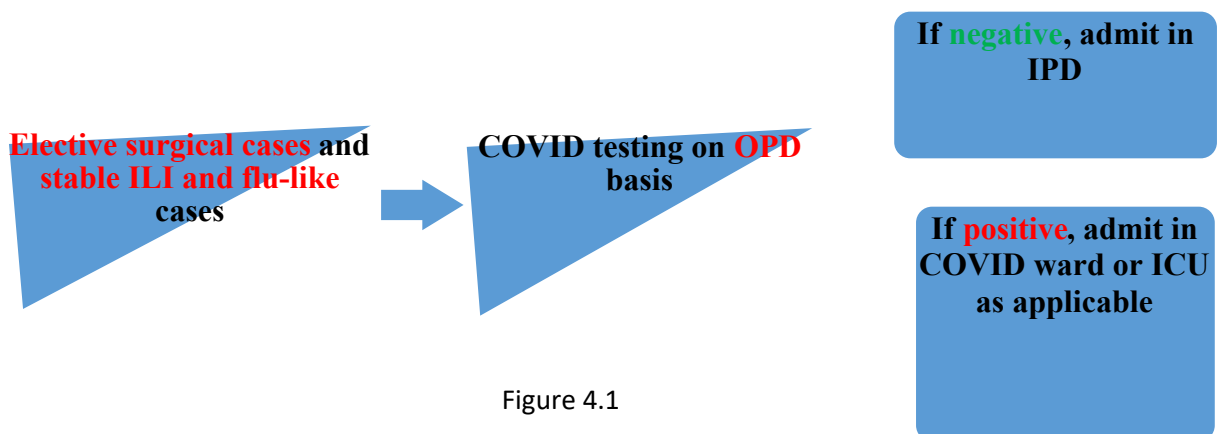
General ward:

- All stable patients who are maintaining SpO2 levels can be admitted here and can be shifted out if needed.

Isolation ICU:

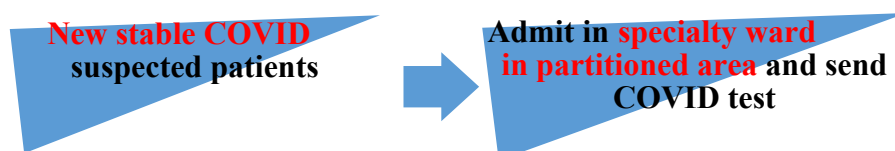
- Total 13 beds are there in Isolation ICU.
 - Out of these 13 beds, two divisions were made- 7 beds in left and 6 beds in right.
 - Left 7 beds- Patients who have low probability to come positive and who's RT PCR reported is awaited will be kept here.
 - Right 6 beds- Patients who have higher probability to come positive will be kept here.
- **What to do if we run short on COVID beds?**
- In such cases, SICU will be opened and all COVID suspected patients will be kept here.

Admission criteria for elective cases:



Admission criteria for

surgery cases:



If **negative**, admit in IPD

If **positive**, admit in COVID ward or ICU as applicable

Figure 4.2

Admission criteria for
Ward:

COVID positive cases to General

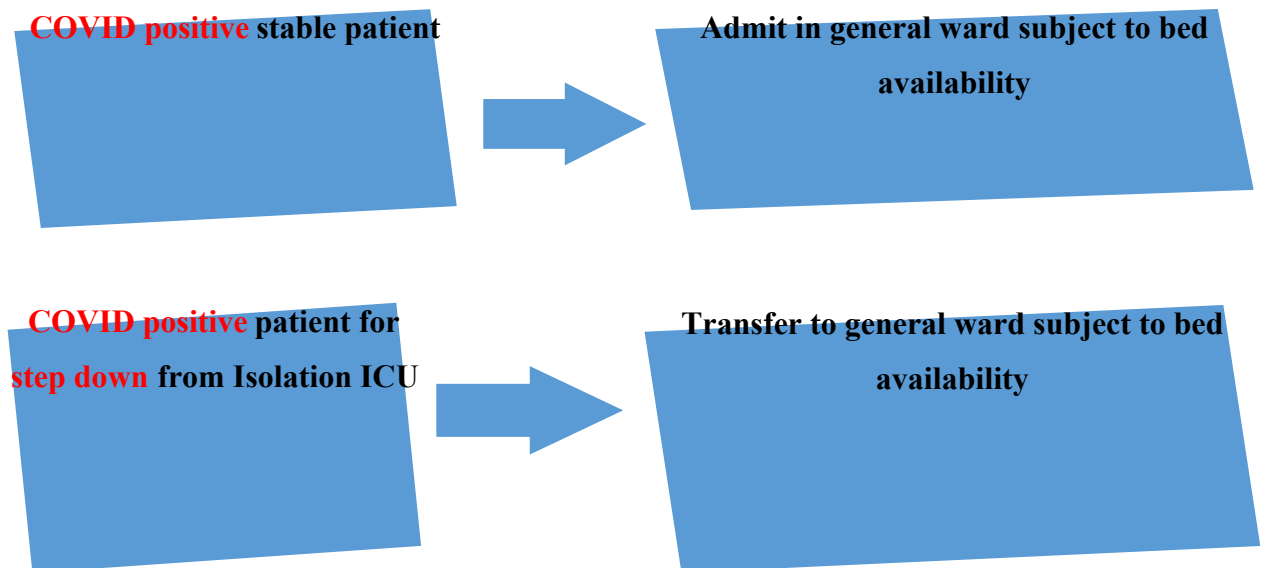


Figure 4.3

4.1.2 After the start of second wave of coronavirus, 16th CPC meeting was held on 7th April 2021. The points discussed in this meeting are as follows:

- 1 Bed should be kept vacant in ER for any cardiac or neuro case.
- Red color band will be used on COVID suspected/positive patients and green for COVID negative patients.
- TAT for the RT PCR reports to be reduced by looking up for more out-sourced labs.
- Emergency OT can be used as for any emergency surgery without awaiting COVID report.
- There is no need for weekly or monthly COVID testing for dialysis or cath lab patients.

4.1.3 As per the 17th CPC meeting held on 22nd May 2021, following criteria had been decided to tackle the second wave:

- Rukmani Birla Hospital is having 5 floors amongst which we have dedicated our SICU (1st floor), General Ward (2nd floor), HDU (2nd floor), Holding area (2nd floor), and entire 5th floor for COVID-19 patients.
- ICCU (1st floor) and MICU (1st floor) have been kept for treating post-COVID patients.

CURRENT NON-COVID ADMISSIONS PROTOCOL:

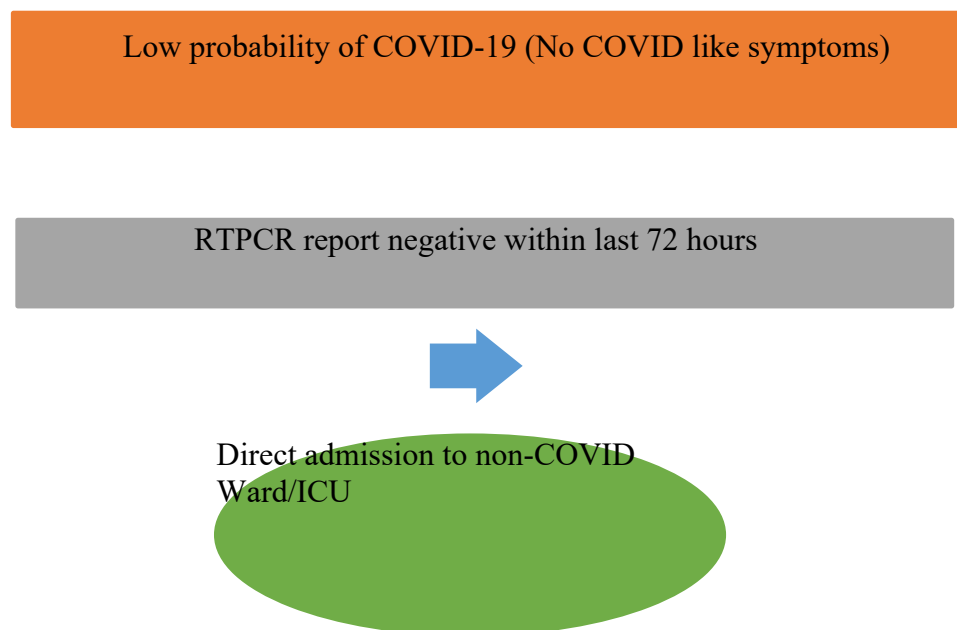


Figure 4.4

POST COVID PATIENTS:

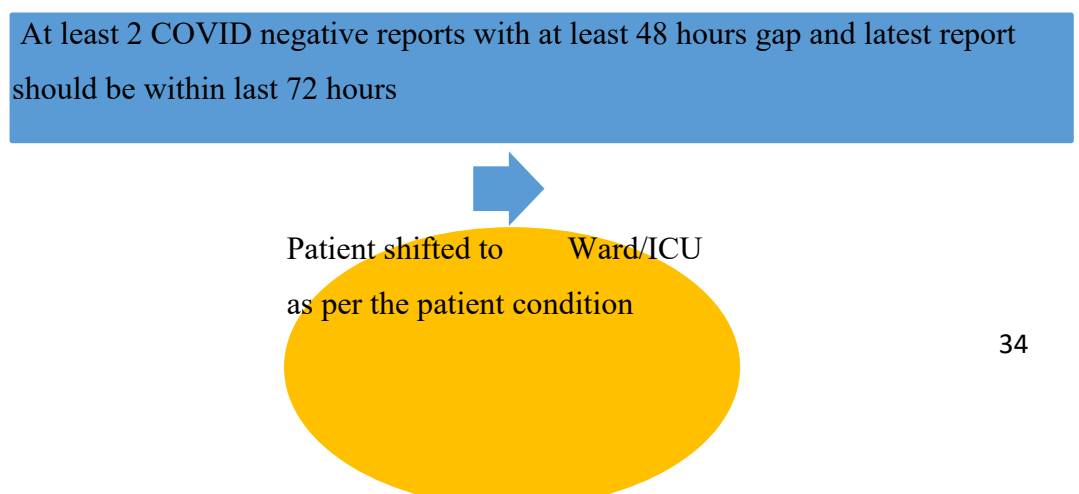


Figure 4.5

NON-COVID EMERGENCY:

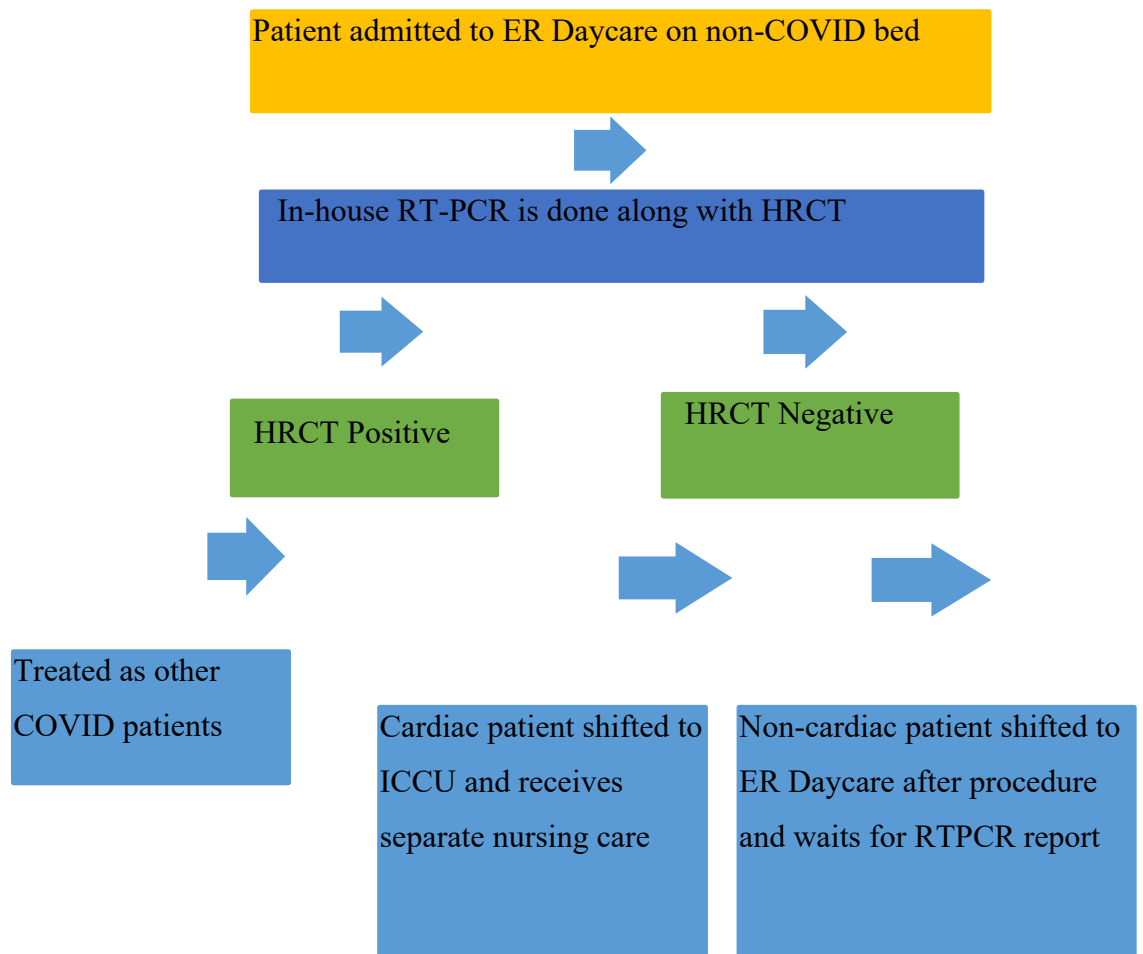


Figure 4.6

CURRENT CRITERIA FOR ADMISSION IN GENERAL WARD:

Patient presenting with fever and dry cough

Presence of high risk factors:

- Uncontrolled hyperglycemia
- Post-transplant
- CABG/PTCA within last 3 months
- Cancer
- Chronic lung disease
- ARF/CRF
- HIV positive

Yes

Advice admission

No

Signs of instability:

- Need for O2 to maintain >94% SPO2
- Fever $\geq 101^{\circ}\text{F}$ for ≥ 3 days
- Breathing difficulty
- Inability to take orally
- Nausea and vomiting

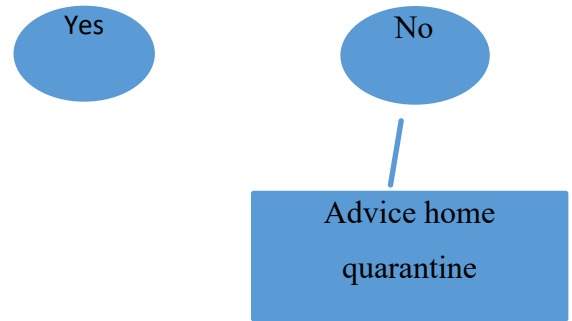


Figure 4.7

Admission criteria for ICU:

Admission Criteria for COVID-ICU

- Evidence of impending cytokine storm
- Signs of respiratory failure, abnormal ABG
- >5L of O₂ required to maintain >94% SPO₂
- Hemodynamically unstable
- Any patient who needs HFNC, BiPAP or Mechanical Ventilation

Figure 4.8

Shift out Criteria from

COVID-ICU:

Shift Out Criteria from COVID-ICU

- Evidence of diminishing cytokine storm
- Two negative RT-PCR tests at least 48 hours apart
- <5L O₂ requirement to maintain >94% saturation
- Prolonged stability even if on higher flow oxygen
- Low possibility of return to ICU
- Obvious clinical improvement as documented by the Treating Doctor

4.1.4 Facilities made for patients and attendants coming for RT-PCR:

- **Shaded waiting area for COVID-19 patients-**

To provide relief to COVID suspected patients waiting for consultation/ billing and thereby reduce crowding at the ER billing counter.



Figure 4.10

- **Segregation of COVID OPD and Sample Collection**

To segregate suspected and from non COVID patients. We COVID OPD & sample collection area.

Consultation Chambers Room-

COVID positive patients have created separate



Figure 4.11

- **Additional OPD Billing Patients-**

Counter for COVID



Figure 4.12

- **Providing Bands at Entrance checking for patient segregation-**

While checking vitals at entrance, our nursing put a band on wrist of every visitor, whether it is patient or his/ her attendant. If vitals are Ok, then green band is put on and they are allowed to enter and visit to their consultant. In case if their temperature is high or if they have any symptoms than red band is put on their wrist and they are asked to consult our physician.

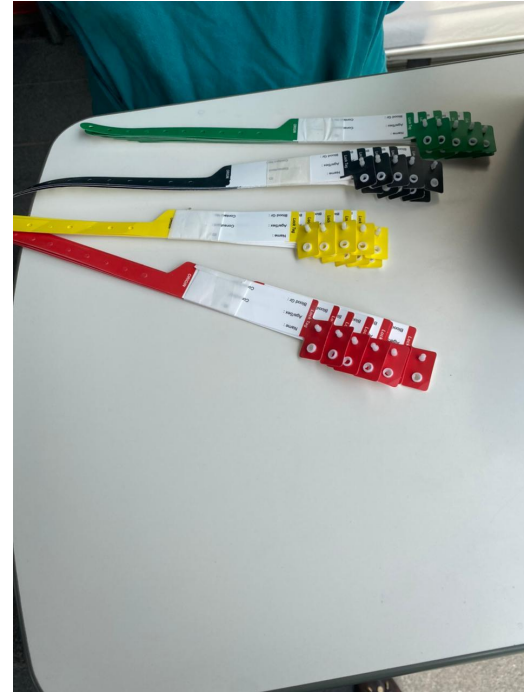


Figure 4.13

4.2 Supply chain management:

4.2.1 Here is how we managed the O₂ supply-

Oxygen is a very crucial part in the treatment of patients with moderate to severe COVID infection. In the second wave of COVID-19, we have seen a drastic shortage of oxygen in the whole country. With more and more number of patients requiring oxygen support of their survival it was becoming very difficult to manage the supply of oxygen.

The oxygen for industrial use was also diverted towards only medical use. Many tones of oxygen were imported from different countries to meet the increasing demand.

Rukmani Birla Hospital is having its own oxygen generator plant purchased from AIROX, Pune.

It has a capacity to fill 88 D- type cylinders per day with an oxygen purity of 93% to 95% whereas purity required by a patient is 90%-100%. During COVID-19 second wave, the average requirement of oxygen from the ICU's was increased up to 180 cylinders per day. We managed to fill 88 cylinders via our oxygen generator and rest were filled by some out-sourced agencies like Ankur gas agency to meet the requirement.

4.2.2 The management of Remdesivir-

- A handover register was maintained and 4 nursing supervisors were made responsible to get it filled and signed by the patient attendant during handover of remdesivir.
- In cases where patient attendant was anxious about his/her patient receiving the dose without any failure and miscommunication, the attendant was allowed inside the ICU's with following proper COVID protocol and the dose was administered in front of them.
- On the other hand, in cases where the relative didn't go inside the ward, the empty vial of remdesivir was shown.
- All the empty vials were collected and kept in a separate disposable bag and were shown to the nodal officer (assigned by the Government) for verification before final disposal.

4.2.3 Management of other anti-viral and essential drugs for the treatment of COVID-19:

- A huge shortage of fabiflu, mederol, Fentanyl, Dolo and other drugs used for the treatment of positive patients, was seen during the second wave. Alternative drugs were used in their places as the increasing demand couldn't be met.

4.2.4 Management of plasma and other blood-coagulants:

RBH has its own blood bank and is permitted for whole human blood IP and blood components and plateletpheresis and is well equipped.

An application was sent to the Government of Rajasthan for granting the permission of plasmapheresis in its license in order to collect convalescent plasma from the donors who have recovered from COVID-19 for further management of COVID patients.

The permission was approved on 5th May 2021 and RBH has its own plasma bank now.

4.3 Preparation for third wave of COVID-19:

We, at Rukmani Birla Hospitals, Jaipur, intend to prepare for third wave of COVID-19 which is predicted to hit the kids the most by evaluating the current readiness and analyzing the gaps and filling them within a period of 6 weeks.

We plan to convert our SICU on 1st floor to PICU. It is having 9 beds out of which 5 beds will be utilized as ventilator beds and rest 4 as non-ventilator beds with oxygen support. A

draft plan has been made in which we have identified the current gaps and we plan to work on this within a time frame of 6 weeks.

MANPOWER REQUIRED	PURPOSE	GAPS	CURRENT READINESS	C U R R E N T R E A D I N E S S
Pediatric intensivist	He/she will serve as an overall coordinator for PICU.	Currently we don't have a pediatric intensivist.	Team HR is in talk with some of the renowned pediatric intensivists in Jaipur and will hire soon.	
	Will perform procedures like intubation, placement of vascular catheters.			
Pediatrician	They will manage the children in PICU. Guide the nursing staff.	No gaps	We have 2 pediatricians.	
Residents	Will be responsible for 24 hours' coverage of PICU. Will work under the guidance of Pediatricians and Pediatric intensivist.	No gaps	Currently we have 4 residents in the department of Pediatrics.	
Pediatric Cardiologist, Pediatric Neurologist and Pediatric Urologist	Currently there are no indicative studies and evidences of effects of COVID on heart, nervous system and kidneys in children	We don't have.	We will be hiring them on VC basis if needed.	
Nursing Staff	Nurses in PICU will help in pediatric resuscitation procedures, respiratory care, electronic patient monitoring, equipment	Training of nursing staff to handle children. Nursing staff with expertise	We have already identified 1 nurse who can be the nursing in-charge of PICU. Team HR have already started searching for at	

RESOURCES REQUIRED	
Ventilators	We have 1 dedicated pediatric ventilator. Also, all our 26 ventilators have pediatric mode.
BiPAP machines	BiPAP machines needs to be procured.
Oxygen support at all beds	We have oxygen support at all the beds in ICU.
Pediatric accessories and consumables	We need to procure.
Medicines as per the doses required for pediatric care.	We need to procure.

CHAPTER-V

Conclusion:

The novel coronavirus has spread a shockwave through hospitals and healthcare systems all over the globe. A pandemic of this huge scale with such rapid progression has definitely outshined the insufficiencies in healthcare systems. Just when Indians thought that the virus has gone away after almost a year of gloom and doom, a new second wave roared back and we were caught unaware.

When the pandemic hit for the first time, Governments all over the world implemented rigorous measures to tackle its spread. In India, the first wave began in March, 2020 and peaked around September 2020. This time India has experienced a 4 times rise in the COVID infections as well as mortalities. Thinking that the monstrous virus has left, many of us rushed to reclaim our pre-COVID lifestyles. The guards were lowered and social- distancing norms were violated while the virus was still furious and was mutating.

The outcomes of this are playing out in front of our eyes. The crematoria and hospitals are over-burdened. This time the virus has affected rural population as well as children.

According to data, during the second wave 54.5% of hospital admissions have required oxygen support. This marked a 13.4-percentage-point increase from the peak during September and November of first wave.

Since we were not prepared for the second wave we have seen devastation all over India. Here comes the role of contingency planning.

A contingency plan helps an organization to plan for any upcoming unforeseen event in a way that the organization can return to its normal functioning as soon as possible without much disruption. The contingency plan should protect resources while minimizing inconveniences for patients, customers and the organization. The variation in supply and demand that occurs as part of the any event often creates problems that contingency plans can deal. The practice knows these events happen with some frequency.

Recommendations:

Rukmani Birla hospital, Jaipur is one of the leading healthcare institutions in Rajasthan. We were able to manage the second wave somehow. But, a proper plan should be at place for further such waves.

- 1 We only have 1 oxygen generator plant, which was unable to meet the oxygen demand during the second wave. I would recommend that we should start planning to purchase one more generator or we can have MOU with any leading gas agency.
- 2 The process for remdesivir was not uniform and had many confusions. A proper flow should be planned in which we can decide that how will we procure remdesivir and who will be responsible for its distribution to the patient. A system should be made to ensure the family of the patient that his/her loved one is under proper care and in good hands.
- 3 A dedicated person should be given responsibility to monitor the admission process of all COVID patients.
- 4 A team should be made responsible for bed allotment during third wave.
- 5 Our HMIS should be able to give real time and accurate information regarding the COVID positive IPD patients.
- 6 The billing team should do audits of the bills of COVID patients in order to keep a check that we adhere to the treatment guidelines set by Government of Rajasthan.
- 7 Dedicated ICU in-charges should be there along with a team of JR's and SR's to meet the extra care required by the ICU patients.

Implementation of these recommendations:

1. We are already in discussion with AIROX for procurement of 1 PSA plant to tackle further waves.
2. Procurement of Remdesivir is under the control of Drug controller, Rajasthan. According to the GOR policy, admission and remdesivir requirement form of every patient is filled and sent to Drug control office, Jaipur. The required quantity is then supplied by them to the hospital.
3. A senior manager from Medical Admin Department has been assigned the responsibility to lead the bed allotment and admission process in coordination with nursing supervisors.
4. We are also planning to launch a new HMIS software in coming month. After its launch, the planning for a dedicated COVID dashboard will be done in co-ordination with our IT team.
5. JR's and SR's will be pulled out from their respective departments according to the frequency and load of third wave.

Limitations and strengths of the study:

The exponential increase in India's COVID infections over the past 2 months has swamped the health care system, we have seen patients dying in ambulances gasping for oxygen outside hospitals. The crematoriums were overwhelmed like never seen before.

The basic medicines and supplies were drained. The dire shortage of oxygen has been a major challenge in many big states as well. Many hospitals were seen tweeting and making appeals on social media that they have stopped taking any further admissions due to the shortage of oxygen.

All this happened because we were not prepared and there was no coordination among the states.

The intensity to which the coronavirus second wave peaked was unpredictable and similarly nobody knows when and how will the further waves come and how much preparation will be enough. This is probably one of the limitations of this study.

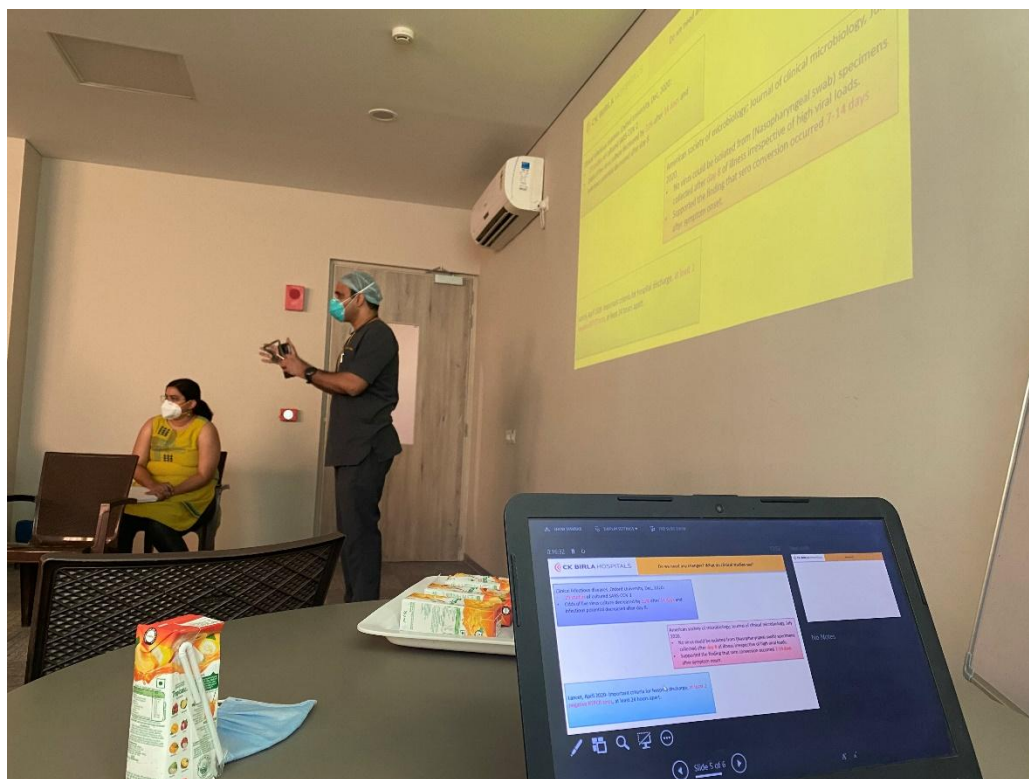
The strengths of the study are the second wave has given us an idea about the loopholes in our healthcare system and it has also in some way made the general population more aware that further waves may come and we should keep following the COVID appropriate behavior till the vaccination of all is covered. The gaps which were seen during the second wave should be filled and a proper contingency plan should be kept in place by the Government of India which could be activated anytime when required.

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Annexures:

1) A glimpse of CPC meeting:





2) Approval for plasmapheresis:

E-Mail

GOVERNMENT OF RAJASTHAN
DRUGS CONTROL ORGANISATION, SWASTHYA BHAWAN,
TILAK MARG, JAIPUR

Blood Centre, M/s Rukmani Birla Hospital (A Unit of CMRI), Second Floor, Gopalpura Bypass Road, Gopalpura, Jaipur (Raj.) holds licence on Form 28-C for Whole Human Blood I.P. and preparation of Blood Components bearing No. Raj-2629 Date 06.08.2018 valid upto 05.08.2023.

Further permission is hereby granted under the said licence for Apheresis per following details:-

1. Plasmapheresis (LEADING TO SINGLE DONOR PLASMA)

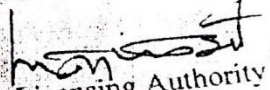
Name of Technical Supervisor :

Mr. Naval Kishor Sharma.

Dated: 05-08-2021




Central License Approving Authority
&
Drug Controller General (I)
FDA Bhawan, New Delhi


Licensing Authority
&
Drugs Controller
Rajasthan, Jaipur

3) AIIMS guidelines for COVID treatment:

COVID-19 patient with mild disease

Upper respiratory tract symptoms(&/or fever) WITHOUT shortness of breath or hypoxia

Home Isolation

- ❖ Contact & droplet precautions, strict hand hygiene
- ❖ Symptomatic management (hydration, anti-pyretic, anti-tussive)
- ❖ Stay in contact with treating physician

- ❖ Seek immediate medical attention if:
 - ❖ Difficulty in breathing
 - ❖ High grade fever/severe cough, particularly if lasting for >5 days
 - ❖ A low threshold to be kept for those with any of the high-risk features
 - ❖ Peripheral oxygen saturation (by applying an SpO₂ probe to fingers) should be monitored at home
 - ❖ Tab Ivermectin (200 mcg/kg once a day for 3 to 5 days) to be considered
 - ❖ Inhalational Budesonide (given via MDI/DPI at a dose of 800 mcg BD for 5 to 7 days) to be given if symptoms (fever and/or cough) are persistent beyond 5 days of disease onset.
 - ❖ Systemic Steroids NOT indicated

COVID-19 patient with moderate disease

Any one of:

Respiratory rate > 30 /min

SpO₂ < 90% on room air

ADMIT IN ICU Respiratory support

- Consider use of NIV (Helmet or face mask interface depending on availability)/HFNC in patients with increasing oxygen requirement, if work of breathing is LOW
- Intubation should be prioritized in patients with high work of breathing /if NIV is not tolerated
- Use conventional ARDSnet protocol for ventilator management Anti-inflammatory or immunomodulatory therapy.
- Maintain euvolemia (if available, use dynamic measures for assessing fluid responsiveness)
- Serial CXR; HRCT chest to be done ONLY if deteriorating
- Lab monitoring: CRP and D-dimer 24-48 hourly; CBC, KFT, LFT daily; IL-6 to be done if deteriorating (subject to availability)

COVID-19 patient with severe disease

Any one of:

19. Respiratory rate ≥ 24 /min
20. SpO₂ $\leq 93\%$ on room air

ADMIT IN WARD Oxygen Support:

- Target SpO₂: 92-96% (88-92% in patients with COPD)
- Preferred devices for oxygenation: non-rebreathing face mask
- Awake proning should be encouraged in all patients who are requiring supplemental oxygen therapy (sequential position changes every 1-2 hours)
- Anti-inflammatory or immunomodulatory therapy
- Patients may be initiated or switched to oral route if stable and/or improving
- Clinical Monitoring: Work of breathing, Hemodynamic instability Change in oxygen requirement
- Serial CXR; HRCT chest to be done ONLY If there is worsening
- Lab monitoring: CRP and D-dimer every 48 to 72 hourly; CBC KFT, LFT every 24 to 48 hourly; IL-6 levels to be done if deteriorating.