

## **" HOSPITAL CRISIS PREPERDNESS PLAN FOR COVID-19 pandemic "**

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### **ABSTRACT**

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**Background:** Healthcare facilities like ( Hospital , clinics , Pharmacies ... etc. ) have a vital role in response to emergencies on an international and local scales , as in infectious disease epidemics , The readiness of hospitals facing pandemic threats like pandemic like ( SARS-COV2 ) in appropriate way is dictated to huge extent by health infrastructures of countries and local regions.

During this pandemic many facilities have a chance, even with all risks and challenges that is the facility facing, to provide a special service and have a chance to make a remarkable contribution to healthcare infrastructure in their countries by making their organizations a value-based model.

The main goal of this plan is to ensure that Hospital management has held effective policies and procedures for implementing a program for Emergency Risk management plan capable to facing effectively risks like pandemics, providing perfect services in flied where mistakes costs a lot.

## **Results**

- Application of such steps make an approach to save healthcare team.
- Avoid nosocomial infection.
- Save available resources and life.
- Increase hospital income to face financial in-situ challenges.
- Better coordination, collaboration and leveraging will result into a more effective response. Preparedness if there is more waves of same virus or bioterrorism.

## **Conclusion & Recommendation**

Pandemic will have a vast temporary or even permanent change to few services. Market condition could trend as mixture of suffered practices, low income. Hospitals and healthcare system leaders have a chance to make a remarkable contribution to healthcare infrastructure in their countries by making their organizations a value-based model.

by using business strategies of cost effectiveness.

On micro level all services should be permanently redesigned. On macro level, stimulus funding, government aids and charities help in expenses specially in outpatient facilities and give a push to these business models.

**We recommend** Hospital also to have a good communication channels with other hospitals in the area, with Vaccine Center in country as in case of vaccine availability to be enrolled in list of eligible. Also, if there is a possibility to held clinical trials that will not conflict with the current event, it should be ran out with taking all ethical, medical, academic criteria on consideration, as it'll be.

**Key words:** Medication, Safety, Pharmacy, Health, Project, Hospital preparedness plan, Crisis management.

## **Introduction**

**C**orona virus's family is an important and famous pathogen all over the world to human and animal. At November 2019 a Novel family member has been identified as the causative pathogen of a cluster of pneumonia cases in Wuhan City located in Province of Hubei, China. Spreading rapidly resulting in outbreak in China then invading all foot step on earth.

The source of SARS-CoV-2 remains unknown.

Although, available scientific community suppose that it is zoonotic origin possibly came along from undomesticated animal species or an intermediate vector (animal or one of its waste). transmission between humans confirmed in Wuhan, China.

many healthcare providers there has caught this infection in their healthcare facilities where they work with nearly the similar clinical symptoms. Most popular symptoms are Fever, Coughing and chest tightness that differentiate its severity according to each case.

After its outbreak in China a cluster of cases appeared in other countries.

In the first of 2020 specifically February 2020, The World Health Organization Called the new spreading pandemic caused by the SARS-CoV-2 (Covid19) Which is an abbreviation to Corona Virus disease 2019.

**Reference:**

- US National Library of Medicine National Institutes of Health
- WHO Timeline - COVID-19
- Egypt MOH Protocol for COVID19

**Aim of the work**

- Provide a guide to follow when facing Covid19 Surveillance in Hospitals or any healthcare facility having the same setting.
- Putting a standard to follow in the management of Covid19 Patients.
- Provide a guide to make maximum benefit and the minimum waste of resources available Like (Laboratory testing / PPE / Beds etc.).
- Applied as a tool for quality control/audit helping for COVID-19 surveillance and infection control / Supply management / Human resources and prevention program.

**Vision:** Hospital Free from Covid19

**Mission:** Provide patient tracks that prevent infection to Health care team

**Goal:** Establishing effective system that manage all requirement of COVID-19 suspected/confirmed patient treatment.

By the End of march 2020 The Hospital will be ready to receive Covid19 patients.

**Scope:** COVID-19 suspected/confirmed patient

# Methodology

## **General Principal:**

Readiness to face any emergency or hazard. Risk management program should be on standby mood to be able to have Emergency response when it's needed rapidly.

## **Hospital Emergency Committee**

A multi-sectoral coordination planning committee has been created to overseeing cross multi-level preparedness and response activities of the COVID-19 outbreak, chaired by the Chief medical director.

Also there will be a Project manager chaired by A Hospital vice president

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- The Hospital Emergency Management Committee should must be consist of representatives of Hospital mail activities ( Medical affairs, Nursing care, pharmacy services, emergency department services, infection control, Laboratory & screening services, administration, engineering and maintenance sector, administration, human resources management, food & beverage services, laundry, waste management and cleaning).
- It's responsible for developing strategic and action plans, ensuring operational readiness for any COVID-19 outbreak, also reviews and endorses the decisions provided by MOH.
- They meet weekly to coordinate preparedness and response; meeting can be virtual if there is another consideration.
- Each meeting should be recorded and documented to be edited for any updates or new decisions.
  - Responsibilities & tasks of the Hospital Emergency Committee:
- Hold Emergency Risk management plan to maintain coordination between different sectors of hospital maintaining risk assessment, prevention, preparedness, response and recovery.
- Provide Hospital with Emergency plan respond to all-hazards, build policies and specify plans that deals with internal and external types of emergencies.

Responsible for:

- Evaluation of risks that hospital is exposed to.
- Put measuring criteria that reduce emergency risk.
- Define activities and resources needed to the hospital to be prepared facing an emergency.
- Define methods of evaluation for example: (SWOT Analysis) of hospital services and emergency preparedness (i.e., staff training)
- Forming algorithm for the facility incident management and a general response plan.
- Pass readiness activities in cooperation with other entities on the health system theatre, including other healthcare facilities working in the area and neighboring private and public-sector healthcare centers.
- Setting up communication channels with non-government health or non-health authorities, volunteer organizations and other businessmen, leaders or influencers.

N	Department	NAME	Title
1	Hospital administration		
2	Infection control/hospital epidemiology		
3	Public relations adviser/public information coordinator		
4	Medical staff (e.g., physician, surgeon, physical therapist, etc.)		
5	Nursing management administration		
6	Human resources management (employee recruitment, training and development, performance appraisal)		
7	Facility personnel representative (e.g., union representative)		
8	Occupational safety and health administration		
9	Critical care unit		
10	Accident & emergency department		
11	Engineering and maintenance		
12	Environmental (housekeeping) services		
13	Security		
14	Diagnostic imaging (radiology)		
15	Staff development/education		
16	Pharmacy administration		
17	Data storage & Information technology		
18	Purchasing agent / Supply chain		
19	Laboratory & Screening services		

- Assign a hospital epidemiologist / Microbiologist / clinical Pharmacist or infectious disease specialist with the authority declaring for early warning and surveillance in the facility

analyzing data and evaluating Level of threatening.

- Assign responsible staff for coordinating preparedness planning, including a COVID-19 response coordinator (with back-up).

They are responsible for a colossal scope of actions needed to comply to a specific emergent situation.

These actions, which are the base of the facility’s incident management system, can be divided according to 5 main functions:

1. Response, recovery management and coordination tasks (Take command and making decisions).
2. Response and recovery planning function (Develop awareness of current situation, specify objectives and response and recovery strategies covering the timeframe of the epidemic or other emergency)
3. Logistical function (calling and expanding the necessary resources and maintaining of the infrastructures or setting it up if needed)
4. Operational management function (Grantee the availability and re-distribution of skilled staff and other resources to react directly to complication arising from the emergency).
5. Administrative function (Paying bills, tallying costs, tabulate debts, holding up contracts).

	Department	Name	Title	Contact Nu

**Back-up team**

	Department	Name	Title	Contact Nu

**The Incident Action Plan**

It is a document adopted by the Incident Command Group in hospital. Mainly it is a development of the facility emergency Response Plan to the demands & the needs and current situation of emergency and is revised as the emergent so its parameters improve. It declares how could the hospital respond to such nascent situation. It assigns a person who will be responsible for providing estimates of the available resources and the additional needs to complete these tasks.

It also presents a standard measure against which progress in achieving the hospital’s response objectives can be done.

- List of all hospital services in priority order.

List of hospital services that must provide at any time with any circumstances.

- update the effective admission and discharge criteria According to priorities decided.

Criteria and Protocols for patients discharge from isolation (i.e., becoming noninfectious) without needing for retesting:

- For cases with symptoms: 10-14 days after onset of symptom, + at least three additional days with no symptoms at all (including no fever, no pyretic intake and without any respiratory symptoms)
- For cases without symptoms: 10 days after testing positive for SARS-CoV-2
- Ensure Two ways communication between the Hospital incident management group & the concerned stakeholders inside & outside the hospital.
- Appoint a team of social workers and psychiatrist to provide physical support for both (healthcare workers, patients and their families)
- Assign responsible staff for applying Healthcare Quality criteria during pandemic to assure health service did not affected with stress and overload.
- Economic and financial expert is applied as a consultant during the pandemic to set a strategic plan for fund raising and expenses cost.

### **Respiratory Triage & Isolation**

- Set a protocol for triage for seek of ensuring that patients with acute respiratory infection are recognized.
  - a. utilizing from screening surveys \ questionnaires following the updates of case definition” Respiratory Triage checklist”.
  - b. Recommended suitable PPE during the pandemic, according to the workplace, personnel, and type of activity.
- Create an equipped triage station at the gates or entrance of the hospital, supported by trained healthcare provider.
- Allocate an exclusive waiting and examination area for patients complaining of fever and/or respiratory symptoms. The area should be well ventilated, away from other cases and secure.
- Appoint a triage supervisor responsible for daily revision of all triage operations.
- Ensure at least a distance of one-meter between beds regardless of whether patients are suspected of having COVID-19.

## **Admission**

- Establish Diagnosis and Treatment Protocol for COVID-19.
- Ensure General measure Avoid mixing of suspected and confirmed cases.
- Cases should be admitted in different rooms under Negative pressure or HEPA filter unit each with separate toilet, in case of large rooms similar cases of same severities put together with plastic non transparent curtains between beds that is cleaned regularly also if a public toilet should be ensured that is cleaned before and after each use.
- Check the availability of oxygen supplies and means of respiratory support, in addition to sufficient sedation for intubated patients.
- Narrow visitors to those essential for patient support.
- Ensure visitors apply all precaution and wearing suitable PPE.
- Having a record of all persons entering the patient's room- including facility staff and visitors.
- is necessary.

## **Patient Transport**

- Avoid transporting patients from their rooms or area unless medically necessary.
- If transportation is needed, the patient uses a medical mask, use safe transport tracks to limit exposure for all surrounding people in the facility (Staff, patients, visitors).
- Ensure healthcare providers who are transporting patients applying hand hygiene and wearing suitable PPE.
- Alert the area which will receive the patient to create any precautions needed as early as possible before the patient's arrival.
- There should be a safe track for patient and healthcare providers away from infected patients with good ventilation.
- Each property (bed – tray – ambulance ... etc.) used Must Be disinfected with proper technic to avoid transmission of pathogens.

## **Infection Prevention & Control**

- Ensure that healthcare providers are following standard precautions for all patients.
- Verbal instructions, informational posters, cards, etc. should be provided all around the facility to ensure that healthcare providers, patients, and visitors are aware of precautions of hand hygiene, respiratory precautions, appropriate PPE to wear and prevention of healthcare-associated infections.



- Hand hygiene (water, soap, paper towel, alcohol-hand rub) situations, and waste trashes are distributed across the hospital at strategic locations.
- Ensure all healthcare providers wear Rubber gloves, masks and closed shoes before starting cleaning and disinfection process.

Before starting the disinfecting and cleaning process, skin areas must be protected and the exposed areas of the body, such as arms, must be protected by wearing a waterproof apron or wearing a thick clothing.

Protection of eye may be needed if there is a risk of using chemicals aerosols, vapors or sprays.

These tools should be disposed after the completion of the process.

- Contact precautions Must be followed for both suspected or confirmed COVID-19 cases.
- All researches and protocols recommend against spraying people with disinfectants (such as using sterilization rooms and gates) as this practice can be harmful and will not reduce the ability of the infected person to be infectious.
- Avoid misuse or mixing disinfectants and other cleaning chemical during the disinfection process to avoid the release of toxic gases that may lead to health problems.
- Ensure healthcare providers having airborne precautions while aerosol-generating procedures (invasive and noninvasive), such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, collection of nasopharyngeal swap/aspirate and autopsy.
- Clean and disinfect surfaces routinely which the patient is in contact.
- Provide equipment that is either single-use and disposable or if equipment needs to be shared (e.g., stethoscopes, blood pressure cuffs, thermometers, food trays) among patients, clean and disinfect between use for each patient (e.g., by using Diluted Chlorine Solution 0.5 % or ethyl alcohol 70%).
- Nasal canulae and oxygen masks and should be disposable (single-use).
- Laundry, food service utensils and medical waste must be disinfected or discharged in accordance with safe routine procedures.

### **Healthcare workers (HCWs)**

- An exclusive team of HCWs should be designated to give care for suspected or confirmed cases to reduce the risk of transmission.
- Choosing them should follow a restricted criterion and avoid staff of high-risk group.

- Ensure that all staff members receive training on precautions of contact, droplets, and airborne when dealing with patients (including donning and doffing, hand hygiene, respiratory hygiene, correct use of PPE, masks tested for fitting, etc.).
- Trace and call all healthcare workers who had protected (proper use of PPE) or unprotected (without wearing PPE or PPE used improperly) exposed to suspected or confirmed patients with COVID-19.
- Ensure that adequate personal protective equipment (PPE) (i.e., medical/surgical masks, N95/FFP2 respirators, gloves, gowns, eye protection) is accessible to staff.
- If the supply of PPE is limited, prioritize staff caring for cases.
- Designated skilled ward staff to work in rate and demand areas (e.g. infectious disease wards, emergency and intensive care units) to support surge.
- Provide training and on situ exercises related to areas of need, including following infection prevention and control procedures and policies, clinical management, to ensure staff safety.
- Prioritize staffing needs by unit or service and distribute personnel accordingly.
- Estimate staff absenteeism in advance and monitor it continuously.
- Readiness and trained to meet an increased demand for health services (Surge capacity) is a cornerstone of the overall approach to managing health emergencies. It has implications for the functioning of the entire hospital.

### **Laboratory**

- Ensure the availability of basic laboratory testing (e.g., complete blood count, electrolytes, blood gas analysis, blood culture, biochemistry profile, and sputum examination).
- Train staff on packaging and transportation procedures for specimen according to national and international transport regulations and requirements.
- Laboratory Must follow biosafety measures and comply with national guidelines or these provided in the WHO Laboratory Biosafety Manual.
- The hospital laboratory provides critical services for several essential hospital activities, such as surveillance, infection prevention and control, and patient management.
- WHO guidelines for collecting, preserving, and shipping specimens must be followed.
- Adoption of standardized laboratory procedures, checklists, forms and log sheets.

- Laboratory waste discharge and management, cleaning must be given high priority among the hospital's activities.
- Prioritizing laboratory activities should strike a balance between the need to identify causative agents of an epidemic and the need to ensure continuity of routine testing activities.
- contributes to the safety and efficiency of operations and facilitates exchange of information and cooperation on laboratory management not only in the hospital but also between hospitals and throughout national, regional and international laboratory networks.

### **Radiology Services**

- Ensure sustainable radiology operations and restricted pathways for COVID-19 PLAN.
- Central coordination for COVID-19 preparedness for messaging between hospital infection control and the radiology department.
- Standard, droplet and contact precautions.

### **Operating Room (confirmed or suspected COVID-19 Patients)**

- will not be brought to Post-Anesthesia Care Unit (PACU) or holding areas.
- will be managed in a designated Operation Room-Other than major one-to minimize staff & patient exposure.
- Will be recovered in the designated Operation Room or transferred to ICU into a room with negative pressure or well-ventilated single room with portable HEPA filter.
- Ensure a high-quality Heat and Moisture Exchanging Filter (HMEF) can remove at least 99.97% of airborne particles of 0.3 microns or greater is placed between the endotracheal tube (ETT) and reservoir bag during procedure to avoid contaminating the atmosphere.
- Plan forward to provide space of time to allow all staff to wear PPE and barrier precautions.
- Limit the number of staff in the room to the absolute minimum required for the care and support of the patient without exposing patient or healthcare staff any hazard.

#### **Recommendation:**

- Consider early intubation to avoid the risk of a crash intubation when it's a matter of life and no time to apply PPE safely.
- Apply Disposable mask, goggles, footwear, gown and gloves. Look for the double glove technique if it's available.

- N95 masks at a minimum shall be utilized. Powered air purifying respirators (PAPR) devices may offer superior protection when dealing with an airway of an infected patient.
- Application of Standard American Society of Anesthesiologists monitoring must be applied before induction of anesthesia.
- Atomized local anesthetic can aerosolize the virus, so Avoid awake fiberoptic intubation, unless specifically indicated.
- Assign the most experienced anesthesia professionals available to perform intubation.
- Seal all used airway equipment in a double zip-locked plastic bag. It must then be removed for decontamination and disinfection.

### **Logistics**

- Logistics contain under it meaning many activities as transport, warehousing, procurement, stock monitoring, tracking and reporting.
- Logistics calls for a proactive and anticipatory management approach.
- Stockpiles and chain supply management of special Medicine, tools and equipment (such as antimicrobial and antiviral medicines and personal protective equipment) are needed in readiness for a possible increased demand during an emergency.
- The core function of the hospital's Incident Command Group is to provide coordination of logistics between the various hospital departments.
- Giving support for transport of the patient is an essential logistic function include transfer of patients between hospitals, especially referral hospitals.
- Major disasters (i.e.: epidemics) can put severe burden on functions of logistics: To overcome these complications we require the coordination of other partners and stakeholders (including other, possibly private-sector, hospitals) and opening the communication channels with charities or public fund.
- Ensuring the readiness & availability of back-up of resources and support for the maintenance of essential equipment are very important logistic functions.

### **Hospital pharmacy**

- During an epidemic, having essential medicines available at any time for patients and feed different departments of the facility is critical to efficient management of patient overload and to the continuity of hospital services to non-epidemic patients.
- In many hospitals, maintains stocks of medicines and other healthcare necessities (such as blood, oxygen, solutions, vaccines, laboratory reagents and disinfectants) in readiness for an emergency is on the burden of the pharmacy, so this must be managed in professional way.

- The need for medicines and protective equipment will depend on the rate of consumption, nature of the emergency and the risks it poses.
- The pharmacy may participate in the management and redistribute of donation include the medicines received from local, national or even international sources.
- Adoption of Policies and standard procedures of pharmacy, checklists and log sheets to ensure safety and efficiency of operations, managing routine (non-emergency) pharmaceutical services, facilitates exchange of information and cooperation between neighboring hospitals, regional health facilities and health authorities.
- Updating the stock of medicines and supplies, including oxygen, antibiotics, antipyretics and antiviral drugs.

### **Financial Management**

- As part of preparedness to Covid19, financial resources management for maintenance of existing disaster response structures and to ensure effective emergency response is important, Securing PPE, Salaries, Food should Be priorities.
- Preservation and survival of hospital during COVID-19 will be dependent on their ability to maintain cash and liquidity, developed cash flow projections to assess and guide needed immediate actions.
- Cautiously follow COVID-19 expenses Understanding the impact of added COVID-19 expenses may be critical later in securing funding or other assistance. Expenses tell an important part of the story of COVID-19's impact on hospital.
- All expenses payment should be covered for at least 3 months ahead.
- The budget calculation used per-patient costing exercise performed by the health and financial Department employee, which was based on the existing financial, human resource, supplies, utilities, accommodation, transportation, information management and waste management related data. Costs are derived mainly taken from existing government financial and procurement data. Fixed cost like infrastructure and opportunity cost like continuation of existing services are not included.
- Funding will be from: Existing domestic resources as Emergency department, Donor mapping will be conducted for COVID response and channelized for filling
- the gap where necessary.

## **Surveillance**

- Call-center and text-based reporting systems will be established to enable effective event-based surveillance.
- Hospital Staff, surveillance officers, medical recorders, statisticians and laboratory personnel will be trained/oriented based on the guidelines.
- KPIs Should be held for each member of staff and each point of plan to avoid misleading or mistakes that may affect both patient and staff members.
- A control Phase Should be held before starting the project to ensure that is every aspect is covered.
- Survey should be held to each cured patient, helping project manager correcting missing objects or undetermined mistakes.

## **Summary**

In this project, we are dealing with a plan to set the Hospital (S) prepared to face the emerging Corona virus (Corvid 19), by preparing the hospital to receive, treat and isolate infected cases according to the severity of the case (suspicion - moderate infection - infection that needs intensive care), as well as with Providing an emergency reception service, with no conflict between receiving Corona infected cases and emergency situations, with special pathways for each of them, under the management of a multi-sectoral planning council, each of which is responsible for establishing and preparing its role in the plan and following it up, The council meets on a weekly basis to discuss new decisions and latest updates on treatment protocols and dealing with infected patients.

The presence of teams responsible for implementing the preparation plan and running it on a daily basis, with the presence of an alternate team in the event of the first being infected or forced to undergo isolation.

There is a protocol to differentiate between infected and uninfected cases by using a thermometer, and for this to help in how to deal with cases coming to the hospital and which path you will take.

Transportation of patients in the hospital and the Department of Infection Control and Prevention are discussed as they have a major role in the permanent work in the hospital.

Managing human resources from the workforce of health service providers, administrators, and hospital workers has a large factor to be discussed so that the hospital can provide an integrated health service in the event of infection of one of its members or go for quarantine.

Managing the pharmacy, medical supplies, and preventive equipment, controlling the stock and providing a reserve in a way that prevents its loss, misuse or waste.

Ensuring medical devices and their maintenance, laboratory tools, and the availability of prevention methods for health service providers when dealing with patients.

Providing logistical services including equipment, transportation, and communication methods with different institutions

Equip operating rooms with adequate tools, equipment and preventive measures needed to deal with cases infected with the virus in emergency situations.

Providing the necessary medicines in the hospital pharmacy and reviewing stores, methods of preservation, dealing with the possibility of drug shortages.

The economic and financial management of the plan and how to provide financial support during the crisis period.

The existence of methods for evaluating the manpower and the extent of its efficiency and psychological and professional readiness to deal with daily situations and add the necessary advantages and incentives to encourage them to do work in a professional and professional manner.

### **Conclusion & Recommendations**

The pandemic will likely lead to long-term permanent change to few services. Hazard and public directives (like waves of infection) may lead to a longer or multiphase crisis response. Market condition could trend as combination of stressed practices, low income. Hospitals and healthcare system leaders have a chance to make a remarkable contribution to healthcare infrastructure in their countries by making their organizations a value-based model. by using business strategies of cost effectiveness, with aid of planed cost transformation outlined. On micro level all services should be permanently redesigned. On macro level, stimulus funding, government aids and charities help in expenses will help some outpatient healthcare facilities avoid bankrupt. Practices that do not survive may more seriously consider true affiliation or merger agreement with large healthcare systems to sustain in industry. We recommend Hospital also to have a good communication channels with other hospitals in the area, with Vaccine Center in country as in case of vaccine availability to be enrolled in list of eligible.

Also, if there is a possibility to held clinical trials that will not conflict with the current event, it should be ran out with taking all ethical, medical, academic criteria on consideration, as it'll be.

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