

**Expert Guided Emergency Department- Planning, Designing and
Commissioning at Aster Medcity**

**Internship Training
at
DM Healthcare – Aster Medcity**

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**Under the guidance of
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**Post Graduate Diploma in Hospital & Health Management
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TO WHOMSOEVER MAY CONCERN

This is to certify that Dr. Sudha Pathak student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management Research, Jaipur has undergone dissertation at D M Healthcare –Aster Medcity Kochi, from 3rd Feb 2014 to 19th May 2014.

The candidate has successfully carried out the study designated to her during dissertation and her approach to the study has been sincere, scientific and analytical.

The internship is in fulfilment of the course requirements.

I wish her all success in all his future endeavours.



Dr. Ashok Kaushik

Dean, Academics and Student Affairs

IHMR, Jaipur

TO WHOMSOEVER IT MAY CONCERN

The certificate is awarded to **Dr. Sudha Pathak**, in recognition of having successfully completed her Internship in the department of Operations and has successfully completed her Project at Aster Medcity on **Expert Guided Emergency Department – Planning, Designing and commissioning**, for a period starting from 03/02 2014 to 19/05/2014

During her project period she was sincere and hard working. We wish her all success in her future endeavors.

For Aster Medcity


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ABSTRACT

Key words – Emergency department, designing and planning, Commissioning.

Introduction:

Designing Emergency Department is challenging. This is purely because emergency medicine is a young speciality and still in a state of flux. Increased growth in volume ,pressures for operational efficiency, new operational models for patient flow and new concepts in physical design make planning for emergency services space a complex problem

We are trying new things all the time to improve performance and efficiency. We add paediatric waiting rooms and short stay units and ‘fast track’ areas and streaming. When all is said and done, is there such a thing as the perfect emergency department? Probably not, but we can get very close.

I have had the privilege of planning, designing and commissioning of emergency department at ASTER. There are some essential aspects of emergency department design, that when done right, make a huge difference.

Does good design and planning contribute to well being of both patients and staff?

Definitely!

Does good design and planning affect efficiency? **Definitely!**

After planning and designing, commissioning comes i.e. brought into use.

Commissioning is bringing into use, on time, a facility that has been designed in consultation with those who will use it. It starts at the onset of the project, ie.before building onsite commences and finishes with evaluation after the project has been completed and the facilities brought into use.

Objective:

- To identify factors responsible for a well commissioned service in the integrated Emergency Department.
- To develop and support an integrated emergency care pathway.
- To ensure delivering prompt high quality, safe, cost –effective and accessible emergency care

Data and Methods:

An **Exploratory study** was carried out and data was collected. 40 doctors were taken as respondents. Purposive sampling technique is used to select the respondents.

An open-ended questionnaire with 24 questions was prepared. An analysis of various parameters was done and on the basis of which recommendations were given.

Out of all the responses top 5 responses were taken for the analysis.

Result: More than 50% of the respondents confirmed that, triage is the best way to prioritise the patients and streamlining the process in Emergency.

Conclusions:

This report has made important recommendations which I hope commissioners, clinicians, and policy makers involved in configuring emergency services will consider. The adoption of these recommendations should ensure the delivery of safe and high quality care within the Emergency Department

ACKNOWLEDGEMENT

This project report is the result of three months of training whereby I have been accompanied and supported by many people. It is a pleasant aspect that I now have the opportunity to express our gratitude to all of them.

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LIST OF ABBREVIATIONS

ACLS- Advanced Cardiac Life Support

ATLS- Advanced Trauma Life Support

BMW- Bio Medical Waste

CME- Continuing Medical Education

CoE- Centre of Excellence

CSSD- Central Sterile Supply Department.

ED- Emergency Department

EMR- Electronic Medical Record

EMT –Emergency Medical Technician

ER- Emergency Room

GPS-Global Positioning System

GR – Guest Relations

HIS- Hospital Information System

ICCA- IntelliSpace Critical Care and Anaesthesia

ICD- International Classification of Diseases

ICU- Intensive Care Unit

KPI- Key Performance Indicator

MRD- Medical Record Department

OT- Operation Theatre

P1, P2, P3, P4, P5- Priority areas 1, 2,3,4,5

PACS- Picture Archiving and Communication System

PALS- Paediatric Advanced Life Support

TAT- Turn Around Time

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CHAPTER 1

Project Title:

Expert Guided Emergency Department - Designing, Planning and Commissioning at Aster Medcity.

1.1. Introduction:

An emergency department (ED), also known as accident & emergency (A&E), emergency room (ER), or casualty department, is a medical treatment facility specializing in acute care of patients who present without prior appointment, either by their own means or by ambulance. The emergency department is usually found in a hospital or other primary care centre.

Due to the unplanned nature of patient attendance, the department must provide initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention. In some countries, emergency departments have become important entry points for those without other means of access to medical care.

The emergency departments of most hospitals operate 24 hours a day, although staffing levels may be varied in an attempt to mirror patient volume.

Emergency Departments (EDs) are under increasing pressure due to the high demand for ED access to available inpatient beds. This lack of available resources to meet emergency demand is leading to crowding and access block resulting in prolonged patients waits for an inpatient bed. While efforts are being made to address this, including improving available bed stock and the development of hospital avoidance programs, EDs must continue to improve their operational efficiency. One way to meet the demand for emergency care is to optimise ED and hospital bed capacity. The National Emergency Access Target (NEAT) aims to improve access to emergency care by reducing access block and its associated negative outcomes. This target requires ED patients to be admitted, referred for treatment in an inpatient unit, or discharged within four hours. ED overcrowding has been increasingly prevalent for over 20 years. Evidence from initiatives to address overcrowding suggests a

need to change current practices throughout the system to meet access targets, make better use of resources and maintain the quality of care delivery.

As emergency departments have high patient turnover, varied casemix and a large workforce, their **design is crucial** to their function. Emergency departments must be planned with due consideration for the potential for growth and expected changes in health care delivery. Current and potential models of care must be considered. Key considerations include safety and security, amenity, access, image and consumer expectations, and evolving work practices. In general, a combination of activity (number of attendances), acuity (types of attendances) and the desired performance level (waiting times and access block) determine the amount and type of space required. In addition, workforce is broadly proportional to activity. Therefore staff area sizes are also related to departmental activity. The emergency department is a core clinical unit of a hospital and the experience of patients attending the emergency department significantly influences **patient satisfaction and the public image** of the hospital. Its function is to receive, triage, stabilise and provide emergency management to patients who present with a wide variety of critical, urgent and semi urgent conditions whether self or otherwise referred. The emergency department also provides for the reception and management of disaster patients as part of its role within the disaster plan of each region. In addition to standard treatment areas, some departments may require additional specifically designed areas to fulfil special roles, such as:

- Management of paediatric patients
- Management of major trauma patients
- Management of psychiatric patients
- Management of patients following sexual assault
- Management of infectious patients
- Extended observation and management of patients
- Management of prisoners in custody
- Management of patients affected by chemical, biological or radiological incidents
- Undergraduate, postgraduate teaching
- Transport and retrieval services
- Telemedicine

Information which would assist in the planning of an emergency department includes:

- Annual census and trends
- Average daily census with peak patient volumes
- Triage categories of patient presentations
- Admission/transfer rate, including the number of cases requiring monitoring

- Average length of stay
- Turnaround times for radiology and pathology
- Patient mix, identifying those who are >65 years of age, and paediatric cases

1.1.2. AIM: To design, develop and commission comprehensive Emergency Department based on expert expectancy.

1.1.3. OBJECTIVES:

- To identify factors responsible for a well commissioned service in the integrated Emergency Department.
- To develop and support an integrated emergency care pathway.
- To identify key determinants for delivering high quality, safe, cost –effective and accessible emergency care.

2. Review of Literature:

Commissioning – what it is

- Commissioning is bringing into use, on time, a facility that has been designed in consultation with those who will use it.
- It starts at the onset of the project, ie.before building onsite commences.
- It finishes with evaluation after the project has been completed and the facilities brought into use.

The importance of commissioning:

Each and every new hospital building must be commissioned, ie brought into use.

Commissioning is required to turn the new facility into a dynamic, functioning organization that provides a planned and improved service to the community.

The ideal time to begin the commissioning process is during the planning stage. From this point onwards; equipment suppliers will bombard the commissioning team with information and offers. Design teams will request detailed specifications, makes and models for some medical equipment so that appropriate mechanical services (drains, data connection etc.) can be incorporated in the correct room and position. At this stage, Commissioning Teams should only provide typical layouts and generic specifications to avoid being forced into guessing which specific equipment will be the final choice.

Commissioning - who leads it

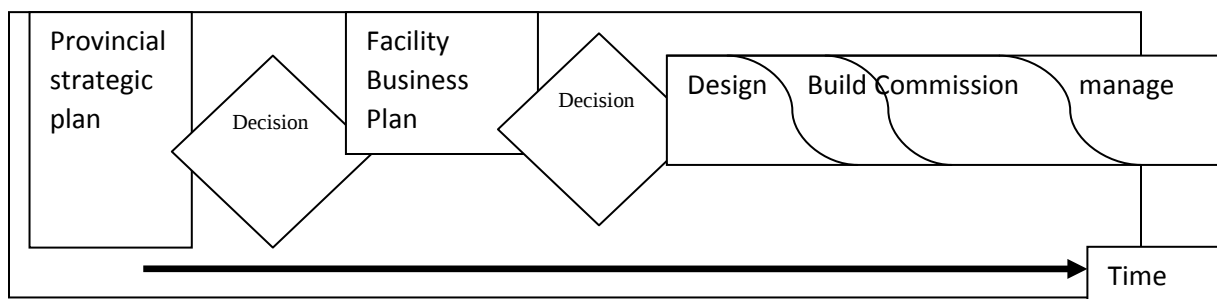
Good commissioning requires purposeful and constant management attention. It must be led by someone with sufficient seniority and authority.

- to ensure decisions are taken when required,
- to ensure the team members perform to the standard expected,
- to ensure those outside of the Commissioning Team required to make a contribution do so and

- to ensure that timescales are maintained.

The main stages of a building project are shown in Figure 1. The diagram illustrates the important point that operational commissioning starts as soon as the decision has been taken to proceed with the project.

Fig 1.2.1. Main stages of a building project.



Commissioning is not something to be left to the end of a project. The Commissioning Team can only do their jobs if the strategic and political problems that affect the process are anticipated and resolved without delay. Strong business orientated management at an institutional level remains a major factor in successful commissioning.

Opening sequence:

Unless the new facility is a single department, it is highly unlikely that the new facility will open in its entirety on one day. Certainly a whole new hospital will be brought into use gradually over a period of several weeks or even several months as new services are developed and specialist staff recruited. Those moving in first will generally be the Commissioning Team, security personnel, hospital management, facilities management, engineering and clinical workshops, stores and logistics, cleaning and IT.

To commission new laundry, CSSD and kitchens to serve the existing hospital before the new hospital opens to patients. It is only after the building is handed over that the huge task can begin of distributing the furniture, and of installing and testing the specialized equipment. Operating theatres have to be tested by the Microbiology Department, medical gas deliveries organized, gas outlets double-checked and stores filled. New and existing staff will have to be orientated with the new facility and procedures, and training carried out in the use of new medical equipment as it is commissioned.

It is only when these key tasks have been completed that it is possible to begin moving clinical services into the new building. There are no firm guidelines as to which comes first, although an early introduction of outpatient clinics would allow clinical support services to be tested and built-up incrementally.

The costs of commissioning:

It is very difficult to be specific about the costs of commissioning. Each project differs one from another and some are more complex than others. As a guideline, commissioning costs can be expected to total about 1% of the total building costs, ie fees, construction and equipping.

Ten Key Tasks and Challenges:

There are considerable challenges to be met in opening a hospital on time. The key tasks and

Challenges include:

1. Ensuring purposeful direction for the project.
2. Agreeing the clinical content of the hospital.
3. Agreeing the educational function of the hospital.
4. Establishing the on-going management of the hospital.
5. Approving the on-going finances of the hospital.
6. Developing the workforce plan for the hospital and recruiting staff.
7. Commissioning the whole hospital.
8. Assessing and counteracting the knock-on effect on other hospitals.
9. Deciding on the appropriate computer system for the hospital and installing it.
10. Handling the commissioning task alongside the already full agenda of key decision makers

Information which would assist in the planning of an emergency department includes:

- Annual census and trends
- Average daily census with peak patient volumes
- Triage categories of patient presentations

- Admission/transfer rate, including the number of cases requiring monitoring
- Average length of stay
- Turnaround times for radiology and pathology
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MAJOR SPACE DETERMINANTS

General

Space determinants revolve around the major functional areas of the department. These may be divided broadly into:

- (a) Ambulance and ambulatory entrances
- (b) Reception/Triage/Waiting area
- (c) Administrative area
- (d) Resuscitation area
- (e) Acute Treatment area (of non-ambulant patients)
- (f) Consultation area/fast track area (for ambulant patients)
- (g) Staff workstations
- (h) Specialty areas, e.g.
 - ☐ Paediatric areas
 - ☐ Distressed relatives/interview room
 - ☐ Procedure room(s)
 - ☐ Plaster room
 - ☐ Pharmacy/drug preparation
 - ☐ Ophthalmology/ENT
 - ☐ Mental Health Assessment
 - ☐ Isolation room(s)
 - ☐ Decontamination areas
 - ☐ Teaching areas
 - ☐ Tutorial room
 - ☐ Support services
 - ☐ Storage
 - ☐ Clean and dirty utility
 - ☐ Shower/bathroom/toilets
 - ☐ Staff rooms
 - ☐ Linen trolley bay
 - ☐ Mobile equipment bay
 - ☐ Mobile X-Ray equipment bay
 - ☐ Cleaner's room

- ☐ Lounge/beverage preparation area
- ☐ Emergency services officer/lounge
- ☐ Offices and administration area
- ☐ Diagnostic areas eg. Medical imaging unit/ laboratory area (optional)

Total Size

The total internal area of the emergency department, excluding observation ward and internal medical imaging area if present, should be at least 50m²/1000 yearly attendances. The minimum size of a functional emergency department that can incorporate all of the major areas is 700m². These figures are based upon access block being minimal.

Fire Safety

Emergency Departments should be constructed to comply with fire regulations.

Bed Spacing

In the Acute Treatment area there should be at least 2.4 metres of clear floor space between beds. The minimum length should be 3 metres.

Air Conditioning

The emergency department should have a separate air system capable of rapid change from recirculation to fresh air flow. Special purpose rooms (e.g. Infectious Disease Isolation Room) or areas (i.e. paediatric waiting area) may have special flow and filtering requirements.

Information/Communications Support

Emergency departments are high volume users of telecommunications and information technology. Telephones should be available in all offices, at all staff stations, in the clerical area and in all consultation and other clinical rooms. A central communications area for the disposition of all incoming calls is recommended. The use of multifunction, wireless communication devices should be considered. Additional phone jacks should be available for the use of facsimile machines and computer modems where required. A dedicated telephone to receive admitting requests from outside medical practitioners is desirable. Cordless phones or phone jacks should be available for access to patients' beds.

Emergency Power

Emergency power must be available to all lights and GPOs in the Resuscitation and Acute Treatment/Observation areas of the department. Emergency lighting should be available in all other areas. All computer terminals should have access to emergency power. In the event of a total power failure, sufficient space and power points should be available to enable a backup system of lighting to be stored and maintained.

Wall Finish

Hospital beds, ambulance trolleys, and wheelchairs may cause damage to walls. All wall surfaces in areas which may come into contact with mobile equipment should be reinforced and protected with buffer rails. Bed stops should be fitted to the floor to stop the bed head from coming into contact with and damaging fittings, monitors, etc.

Decontamination Room

A decontamination room should be available for patients who are contaminated with toxic substances. In addition to the requirements of an isolation room, this room must:

- Be directly accessible from the ambulance bay without entering any other part of the department
- Have a flexible water hose, floor drain and contaminated water trap
- Have storage space for personal protective and decontamination equipment
- Have storage space for personal protective and decontamination equipment

Functional Relationships

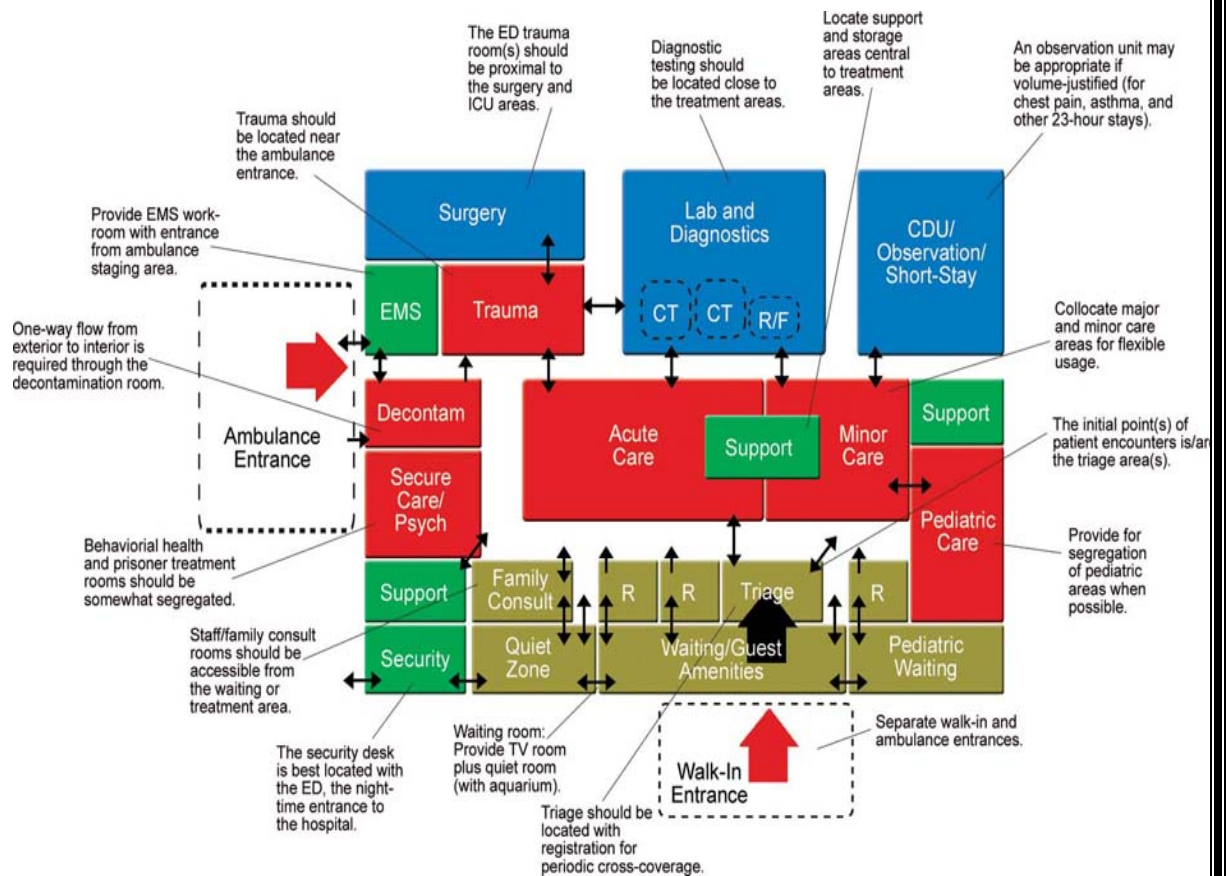
The functional relationships may be summarised by the following diagram:

Direct Access	<u>Ready Access</u>	<u>Access</u>

Ambulance	Car Parking	Inpatient wards
Medical Imaging	Helipad (if applicable)	Pharmacy
Short Stay Unit	Coronary Care Unit	Outpatients
	Intensive Care Unit	Mortuary
	Operating Rooms	
	Pathology/Transfusion Service	
	Medical Records	

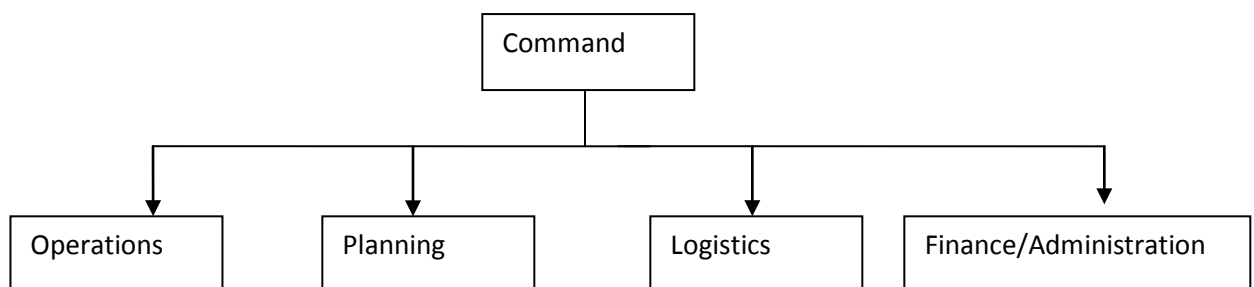
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- With **JCAHO** urging Emergency Departments to correct overcrowding, lengths of stays, and unsafe care giving conditions, hospitals all over the country are scurrying to upgrade their ED facilities. Here are a few tips



1.3. CONTROL AND COMMAND:

A well functioning command and control system is essential for effective hospital emergency-management operations.



1.4. HOSPITAL EMERGENCY CODES:

Hospital Emergency Codes are used in hospitals worldwide to alert staff to various emergencies. The use of codes is intended to convey essential information quickly and with minimal misunderstanding to staff, while preventing stress and panic among visitors to the hospital. These codes may be posted on placards throughout the hospital, or printed on employee identification badges for ready reference. Hospital emergency codes may denote different events at different hospitals, including nearby ones. Because many physicians work at more than one facility, this may lead to confusion in emergencies, so uniform systems have been proposed. You will hear alarms most of the time for code blue.

Code Blue: "Code Blue" is generally used to indicate a patient requiring resuscitation or otherwise in need of immediate medical attention, most often as the result of a respiratory arrest or cardiac arrest.

A hospital code used to indicate a patient requiring immediate resuscitation. Many physicians work at more than one facility, this may lead to confusion in emergencies, so uniform systems have been proposed. You will hear alarms most of the time for code blue

1.5. COMMUNICATION:

Clear, accurate and timely communication is necessary to ensure informed decision – making, effective collaboration and communication, and public awareness and trust, Consistent with applicable laws and regulations, the hospital and its medical staff must provide to the ED a list of appropriate “on call” specialists who are required to respond to assist in the care of emergency patients within reasonable established time limits

Transfer of responsibility should be accomplished in an effective, orderly, and predictable manner to promote optimal care of patients attending ER.

Internal and External Methods of Communication:

- Information within the emergency department flows in a dynamic pattern. Staff has considerable input into the functioning of their workplace.
- Patient handover between shifts occurs at the patient’s bedside.
- Bulletin/ Notice boards
- Externally the EMD communicates with ICU, wards and multiple other departments via phone, or written memos.
- Within the department and from the department to various intensive care areas of the hospital and also to conduct consultants or Sr. doctors on matter pertaining to better patient care there is requirement of efficient communication system. This can be in various forms viz: telephones, intercom or paging system. This is effective and efficient communication system is the backbone of accident and emergency services.

1.6. TRIAGE:

The process of categorizing and prioritizing patients with the aim of providing the best care to as many patients as possible with the available resources. Maintaining patient triage operations, on the basis of a well-functioning mass-casualty triage protocol, is essential for the appropriate organization of patient care. Triage is an essential function in Emergency Departments (EDs), where many patients may present simultaneously. It aims to ensure that patients are treated in the order of their clinical urgency which refers to the need for time-critical intervention. Triage also allows for the allocation of the patient to the most appropriate assessment and treatment area, and contributes information that helps to describe the departmental case-mix.

Triage is the first point of public contact with the ED. Our EMD follows the Australasian Triage System and patients are triaged into 5 categories P1,P2,P3,P4 and P5. Any patients identified as per Triage Category are taken immediately into an appropriate assessment and treatment area. A more complete nursing assessment should be done by the treatment nurse receiving the patient. Triage is carried out by staff members who are both specifically trained and experienced. (ACLS/ATLS/PALS Trained)

The Emergency Department has 2 different sections for managing Trauma and Non trauma patients. Other areas include Decontamination room, Negative pressure room for communicable disease cases, procedure room and trauma OT.

Triage is the first point of public contact with the ED. The triage assessment generally **should take no more than two to five minutes** with a balanced aim of speed and thoroughness being the essence. The triage assessment involves a **combination of the presenting problem and general appearance** of the patient, and may be **combined with pertinent physiological observations**. Vital signs should only be measured at triage if required to estimate urgency, or if time permits. Any patient identified as Triage Category 1 or 2 should be taken immediately into an appropriate assessment and treatment area. A more complete nursing assessment should be done by the treatment nurse receiving the patient. The triage assessment is not intended to make a diagnosis.

Triage is carried out by staff members who are both specifically trained and experienced. (ACLS/ATLS/PALS Trained)

SAFETY AT TRIAGE:

It is essential that all EDs plan for the potential risk of aggressive behaviour of patients or their relatives at triage. There must be a safe and non-threatening physical environment, which is as private as possible whilst not exposing staff to risk. Front line staff should have minimization-of-aggression training and protocols and procedures for dealing with challenging behaviour. Where the safety of staff and/or other patients is under threat, staff and patient safety should take priority and an appropriate security response should take place prior to clinical assessment and treatment.

Time to Treatment:

The time to treatment described for each Triage Category refers to the maximum time a patient in that category should wait for assessment and treatment. In the more urgent categories, assessment and treatment should occur simultaneously. Patients should be seen well within the recommended maximum times

1.7. RETRIAGE:

If a patient's condition changes while one is waiting for the treatment or if additional relevant information becomes available that impacts on the patient's urgency, the patient should be re-triaged. Both the initial triage and any subsequent categorizations should be recorded, and the reason for the re-triage documented in the EMR.

Documentation triage:

The documentation of the triage assessment should include at least the following essential details:

- ✓ Date and time of assessment
- ✓ Name of triage officer
- ✓ Chief presenting problem(s)
- ✓ Limited, relevant history
- ✓ Relevant assessment findings
- ✓ Initial triage category allocated
- ✓ Re-triage category with time and reason
- ✓ Assessment and treatment area allocated
- ✓ Any diagnostic, first aid or treatment measures initiated

SPECIFIC CONVENTIONS:

In order to maximize reproducibility of allocation between departments, the following conventions have been defined:

Pediatrics:

The same standards for triage categorization should apply to all ED settings where children are seen – whether purely Pediatric or mixed departments. All five triage categories should be used in all settings. Children should be triaged according to objective clinical urgency.

Trauma:

Triaging should be done according to ATLS protocols. (ABCDE approach)

Behavioural Disturbance:

Patients presenting with mental health or behavioural problems should be triaged according to their clinical and situational urgency. Where physical and behavioural problems co-exist, the highest appropriate triage category should be applied based on the combined presentation.

While some acutely-disturbed patients may require an immediate clinical response (perhaps combined with a security response) to ensure their safety, it is recognized that some individuals entering an ED and posing an immediate threat to staff (e.g. brandishing a dangerous weapon) should not receive a clinical response until the safety of staff can be ensured. In this situation, staff should act so as to protect themselves and other ED patients and obtain immediate intervention from security staff and/or the police service. Once the situation is stabilized, a clinical response can take place as (and if) required, and triage should reflect clinical and situational urgency.

1.8. Continuity of Essential Services

The disaster does not remove the day to day requirement for essential medical and surgical services that exists under normal circumstances. Rather, the availability of essential services needs to continue in parallel with the activation of a hospital emergency response plan

1.9. Human Resource:-

Effective human resource management is essential to ensure adequate staff capacity and the Continuity of operations during any incident that increases the demand for human resources.

Emergency department should be staffed by qualified personnel with knowledge and skills sufficient to evaluate and manage those who seek emergency care. EDs should be designed and equipped to facilitate this work.

Timely emergency care by an emergency physician and emergency nursing staff physically present in the ED must be continuously available 24 hours a day, seven days a week. Staffing of accident and emergency department will depend on its size, workload, type of hospital and the resources available. Emergency care is more or less a team work where the components of the team play an important role in providing efficient medical care.

STAFF REQUIREMENT IN EMERGENCY ROOM

- **DOCTORS :**
 - Head of Department/Senior Consultant – 1
 - Senior Specialist/ Specialist – 4
 - Junior Residents – 4
- **NURSES:**
 - Head Nurse -1 (only during day)
 - Nurse Manager- 1 (only during day)
 - Nursing staff
 - Total → 45 + 10**
 - 15 per shift
 - Triage Nurse → 1 staff
 - Priority 1 & 2 → 1:1 ratio → 5 staffs
 - Priority 3-5 → 1:2 ratio → 6 staffs
 - Trauma Bay/ Resuscitation → 2 staffs
 - Team Leader → 1 staff
 - ** 10 staffs who will be covering for post night duty nurses and leaves
- **ATTENDERS/ NURSING ASSISTANTS : Total → 5 per shift**
 - Triage Bay- 2/ shift
 - Patient movement and Nurse assistance – 3/shift
- **DEPARTMENT EXECUTIVES :**
 - Total – 2

- o One per shift
- **GUEST RELATION:**
 - o 2 per shift
- **MEDICAL SOCIAL WORKER:**
 - o 1 per shift
- **SECURITY:**
 - o 2 per shift

3. Methodology:

- a. Type of Study: - Exploratory Study.
- b. Location of Study: - D M Healthcare –Aster medcity, Kochi.
- c. Site of Study :- Emergency Department
- d. Sample size -40
- e. Sampling Method: - Purposive Sampling Technique.
- f. Source of Data :- in-depth review of literature
- g. Data collection tools :- Questionnaire, checklist , Observation and Face to face interview

An **EXPLORATORY STUDY** was carried out and data was collected. An analysis of various parameters was done and on the basis of which recommendations were given.

SAMPLING TECHNIQUE: Purposive sampling technique is used to select the respondents.

SAMPLING SIZE: 40 (Doctors from almost all the specialties)

DATA COLLECTION PROCEDURE:

A open-ended questionnaire was prepared including 24 questions. Out of all the responses 5 top responses were taken and analysis was done.

4. ANALYSIS AND INTERPRETATION

OBJECTIVE 1 : To identify factors responsible for a well commissioned service in the integrated Emergency Department.

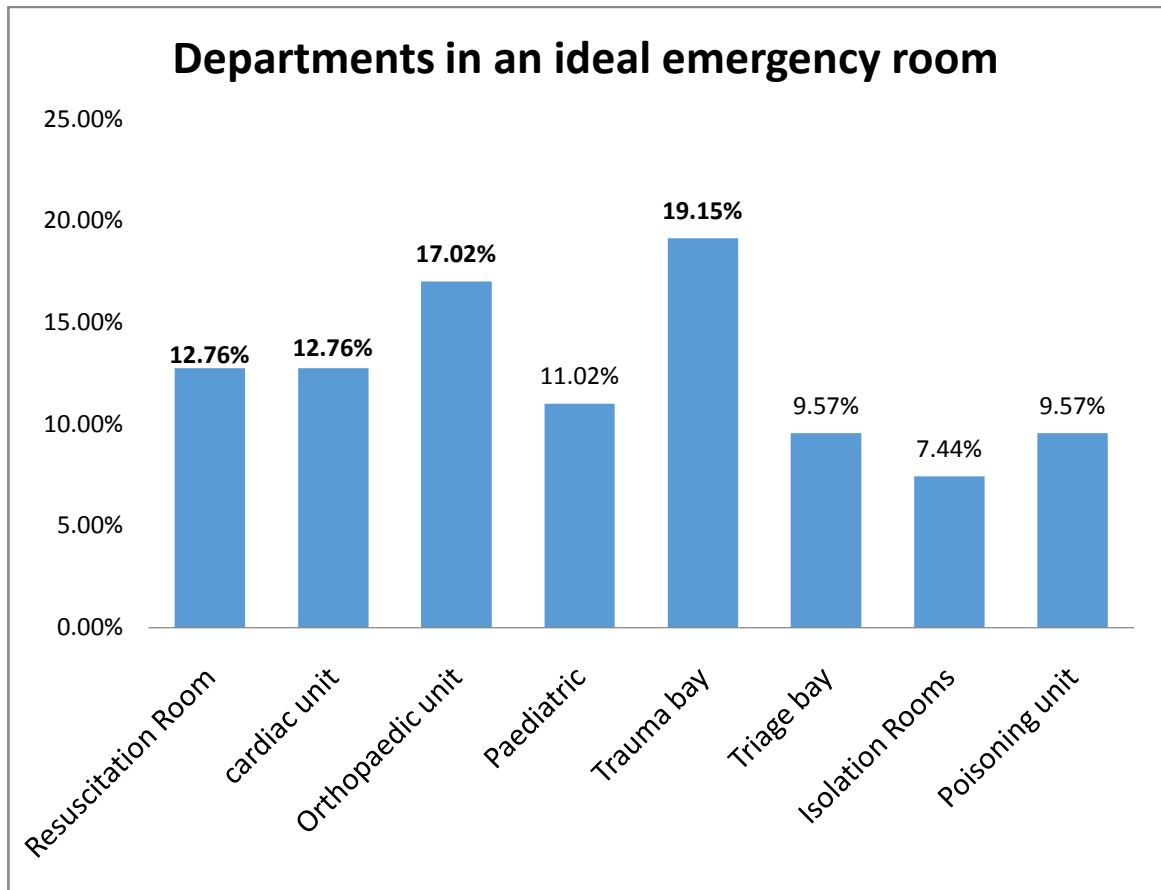


Fig: 4.1 shows the Departments in an ideal ER

On the basis of respondents it was found that in an Emergency Department these departments need to be incorporate trauma bay ,orthopedic unit, Resuscitation room, cardiac unit, pediatric unit, Triage bay, Isolation rooms, and Poisoning unit.

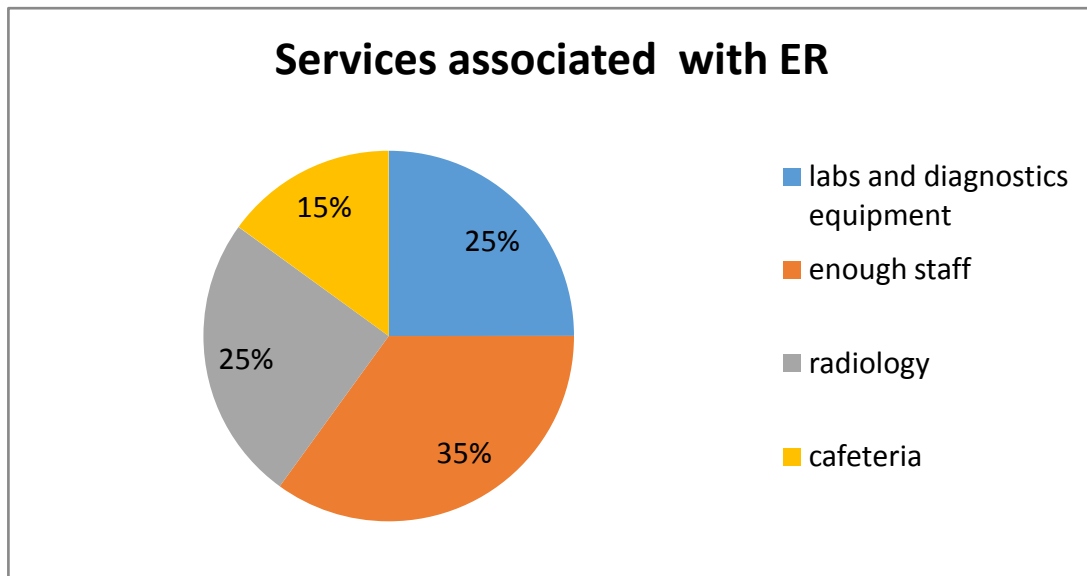


Fig 4.12 shows the services necessary all the time in association with ER

The following services are needed to be present all the time in Emergency Room- Labs and diagnostics equipment, Radiology, Adequate staff for smooth functioning in ER and cafeteria

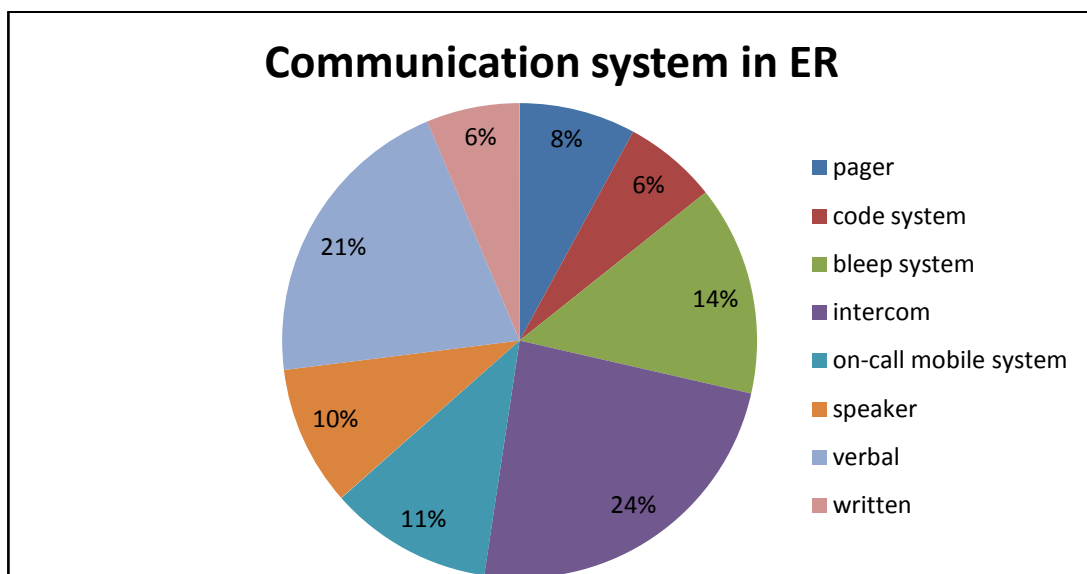


Fig: 4.4 shows Communication system in ER

According to almost 1/4th of the respondents, intercom is the best way to communicate with each other in ED followed by verbal communication i.e. 21%. Other communication system which we can follow is bleep system, CODE system for any disaster, speaker and written in case if there is no emergency.

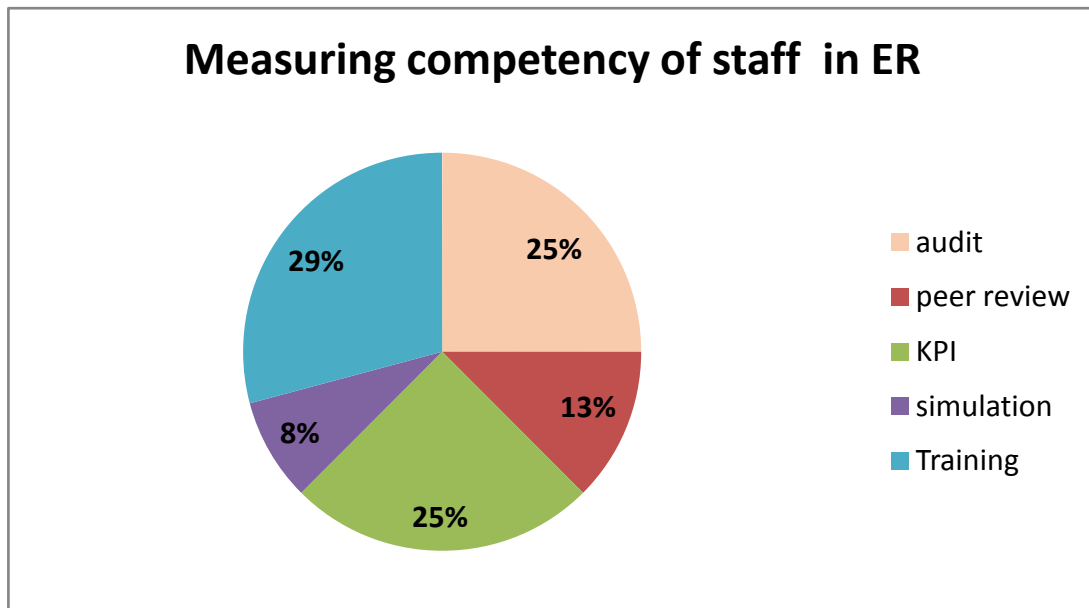


Fig: 4.3 shows methods to measure competency of staff in ER

As per the respondents, the best way to measure the competency of staff in Emergency Department is training on regularly basis. Other methods includes audit, peer review, simulation and KPI like TAT adherence, no. of incidents, or complications, patient satisfaction survey, no. of delayed admissions, yearly monitoring of CMEs,etc.

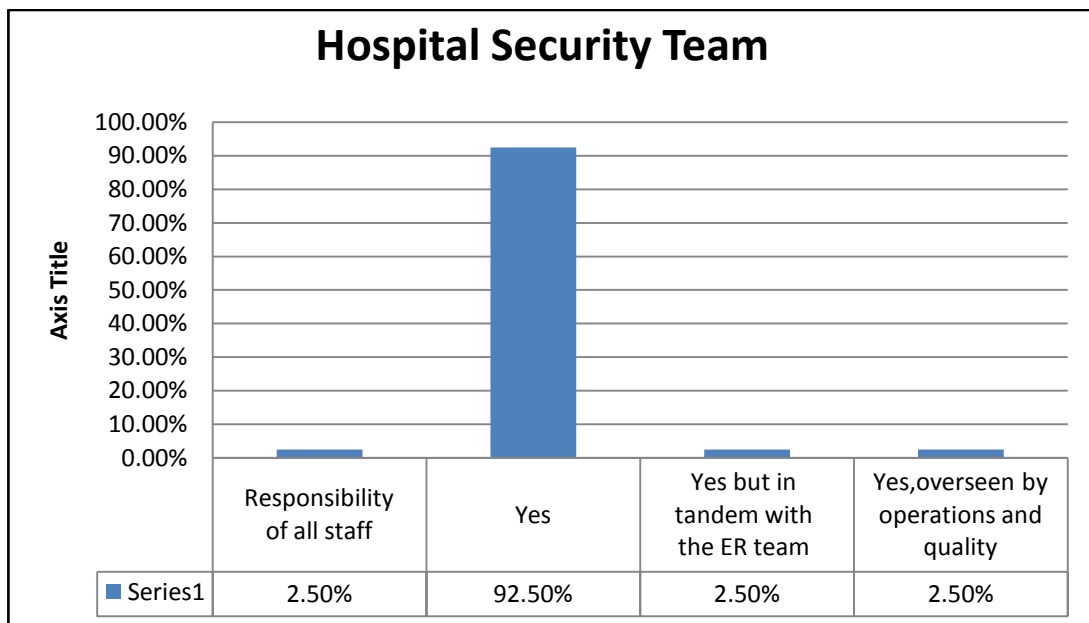


Fig: 4.5 shows Hospital Security Team

Almost 92.5% of the respondents suggested “Hospital Security Team” to be in ED, from safety point of view. Few of them around 2.50% suggested that its solely not the responsibility of ED, but in tandem with operations and quality department.

OBJECTIVE 2: To develop and support an integrated emergency care pathway.

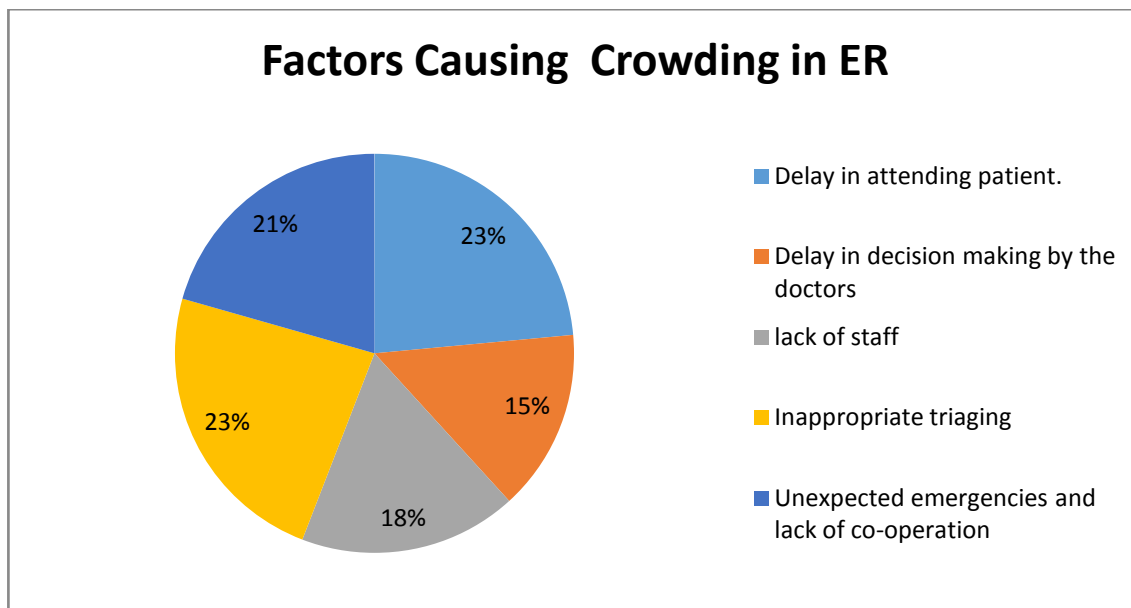


Fig: 4.14 shows the Factors Causing Crowding in ER

These are the factors which causes crowding in ER, delay in attending the patients, delay in decision making, in appropriate triaging, unexpected emergencies and lack of co-operation among staff in ER.

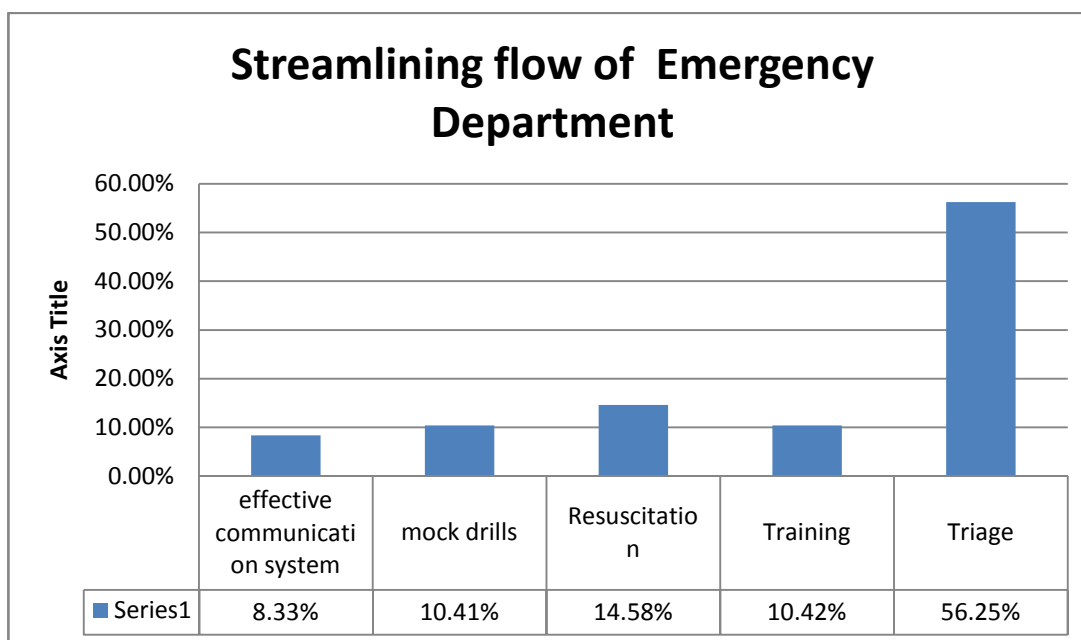


Fig: 4.2 shows the streamlining in Emergency Department

Triage, according to most of the respondents i.e. 56%, is the best way to streamline the flow in Emergency Department. Other ways include effective communication system, mock drills, Resuscitation and Training.

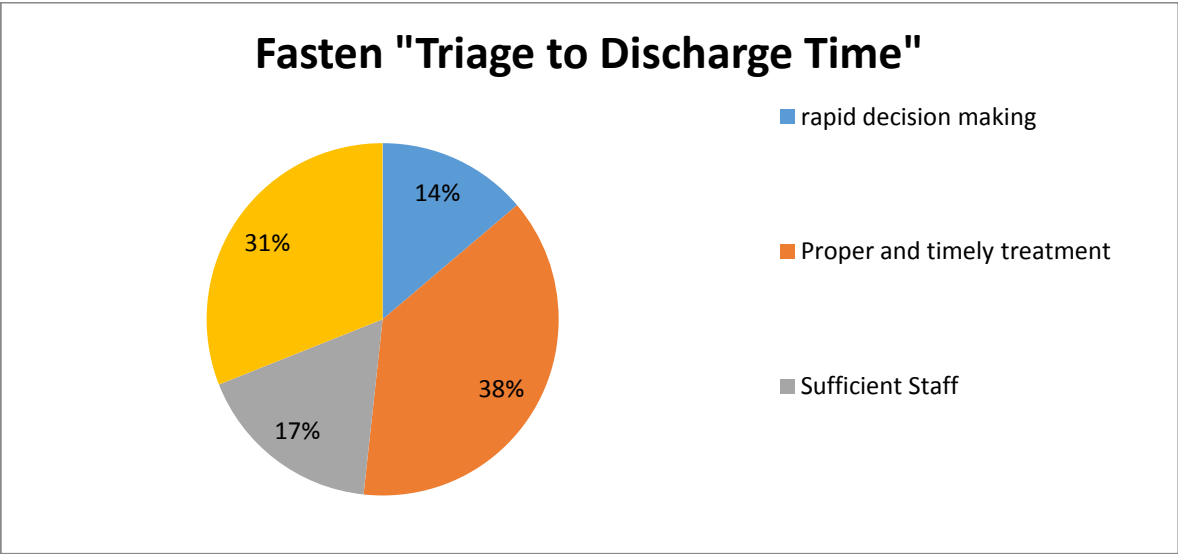


Fig: 4.15 shows the Fasten “Triage to Discharge Time”

In Emergency Department there is a need to fasten the process at each stage when the patient enters inside the ER. Some of the ways suggested by the respondents are rapid decision making, proper and timely treatment, sufficient staff to carry out the procedures and non-delay in dispensing medication, non-delay in discharge summary and efficient billing.

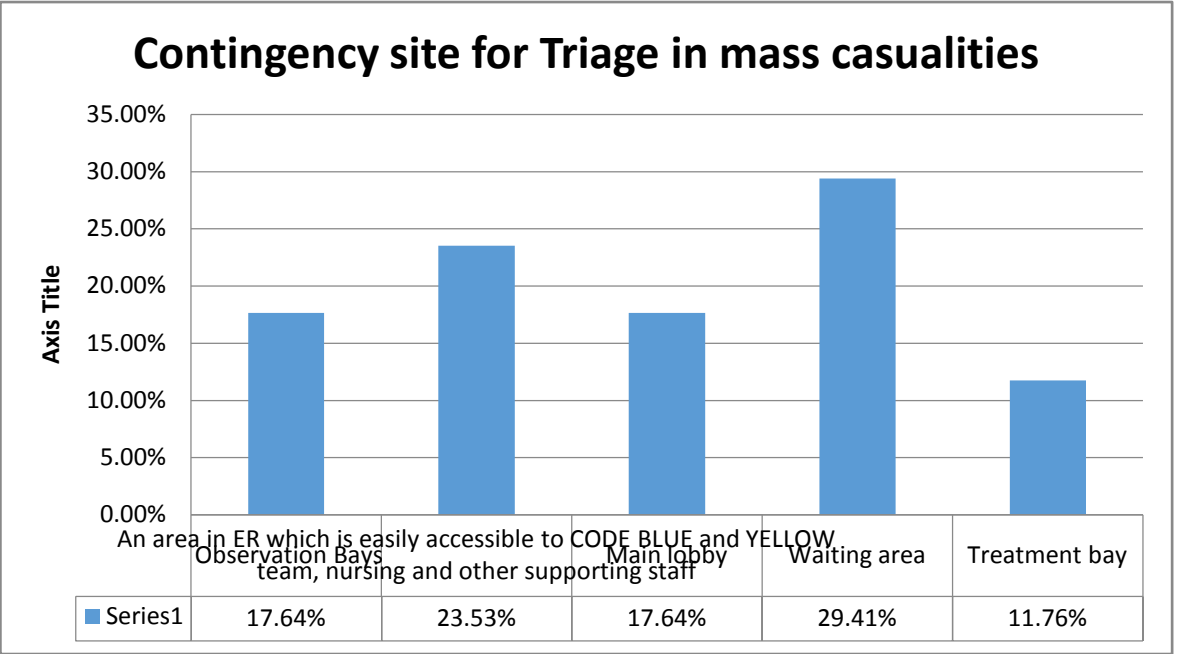


Fig: 4.7 shows the Contingency site for Triage in mass casualties

To attend any mass casualty in ER, 29% suggested that waiting area is the place where they can triage the patient. 23% suggested that any area can be chosen which is easily accessible to CODE BLUE and YELLOW, nursing and other supporting staff without any delay.

OBJECTIVE 3: To identify key determinants for delivering high quality, safe, cost – effective and accessible emergency care

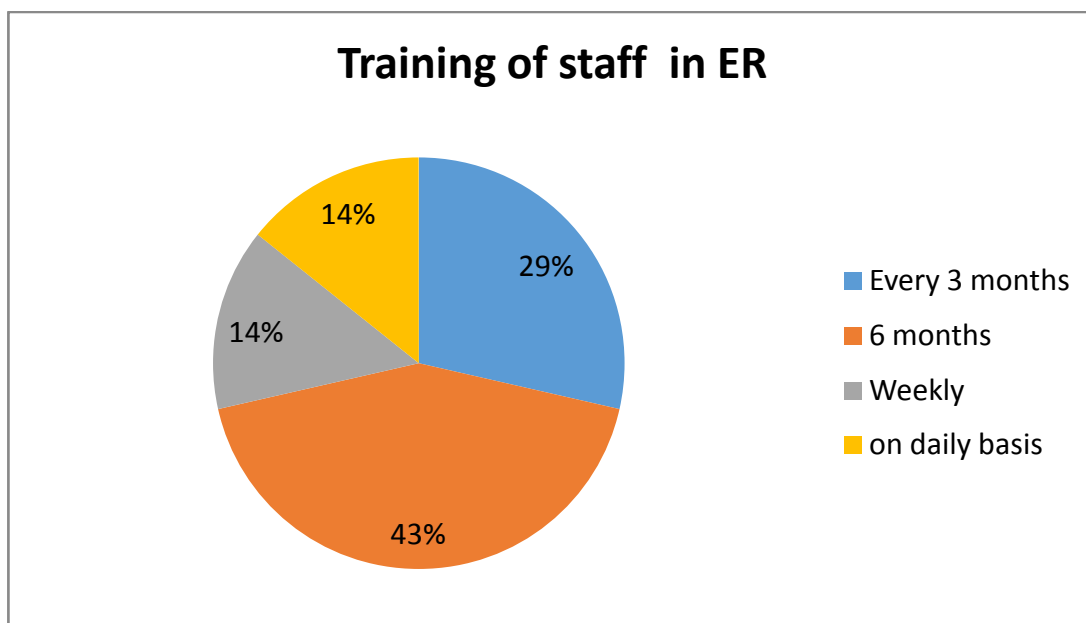


Fig: 4.11 shows the Training in ER

The training in ER is very essential to improve the efficiency of a staff. According to most of the respondents i.e. 43%, most of the training should be scheduled within 6 months of period. Other suggestions include training in every 3 months, weekly, or on daily basis.

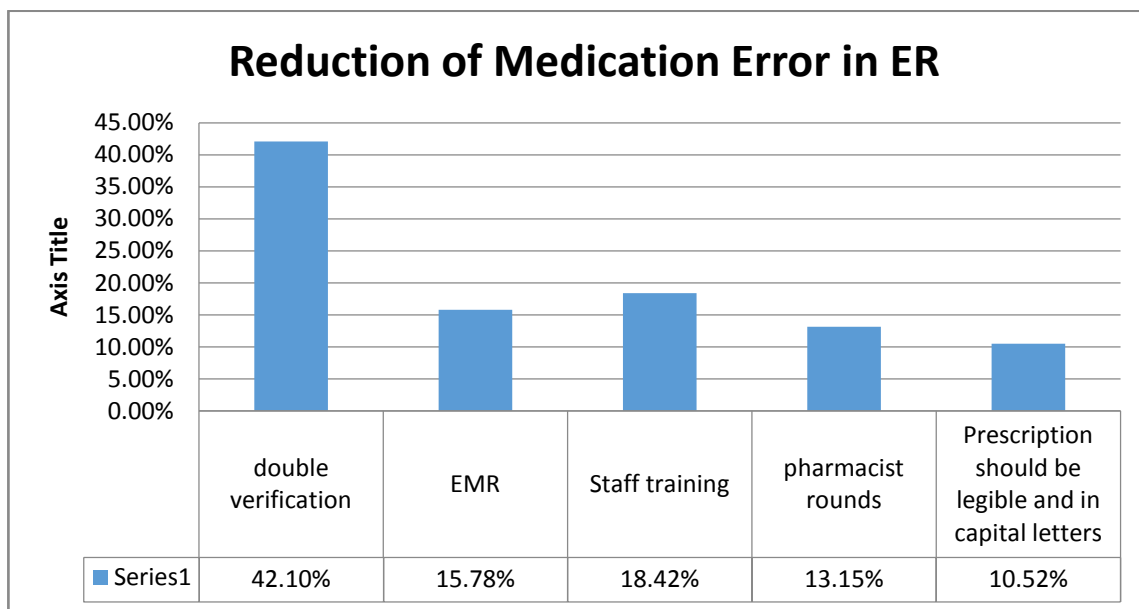


Fig: 4.10 shows the Reduction of Medication Error in ER

42% of the respondents suggested that double verification of the doctors prescription for name of medication and drug dosage, should be done by the nursing staff and/ or pharmacist before dispensing the medicine. 18% suggested that training is the another way to reduce medication error followed by EMR, and pharmacist round.

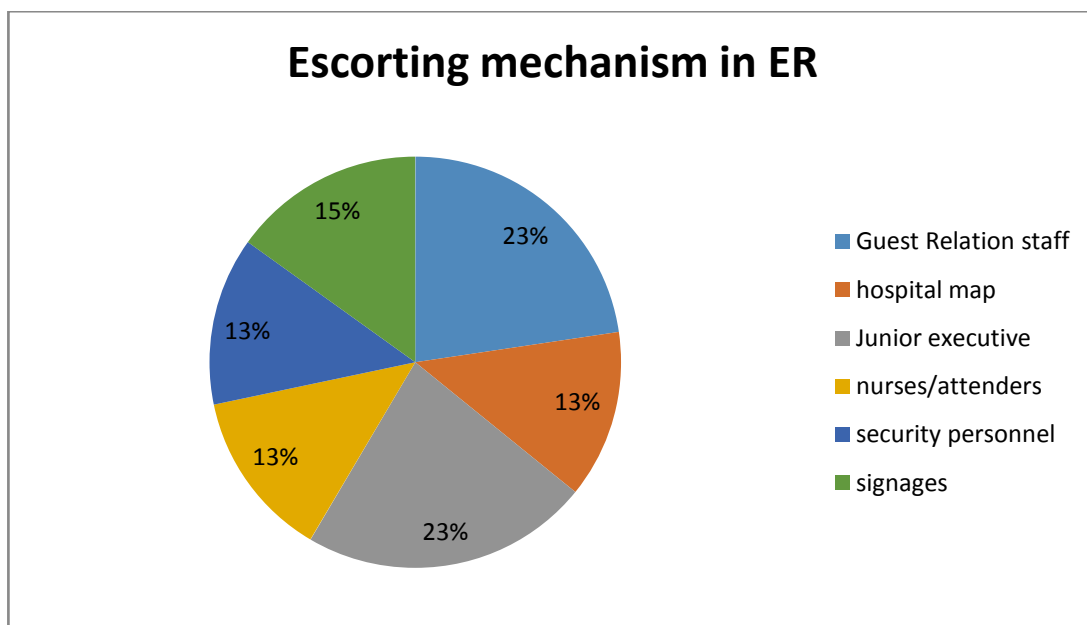


Fig: 4.6 shows the Escorting mechanism in ER

Escorting system in ER plays a very crucial role in directing the patient as well as visitors. About 1/4th of the respondents suggested that GR's escort the patient in ER followed by nurses/attenders, and security personnel. Hospital map and signage's are equally important to guide the patient, suggested by 13 & 15 % of the respondents respectively.

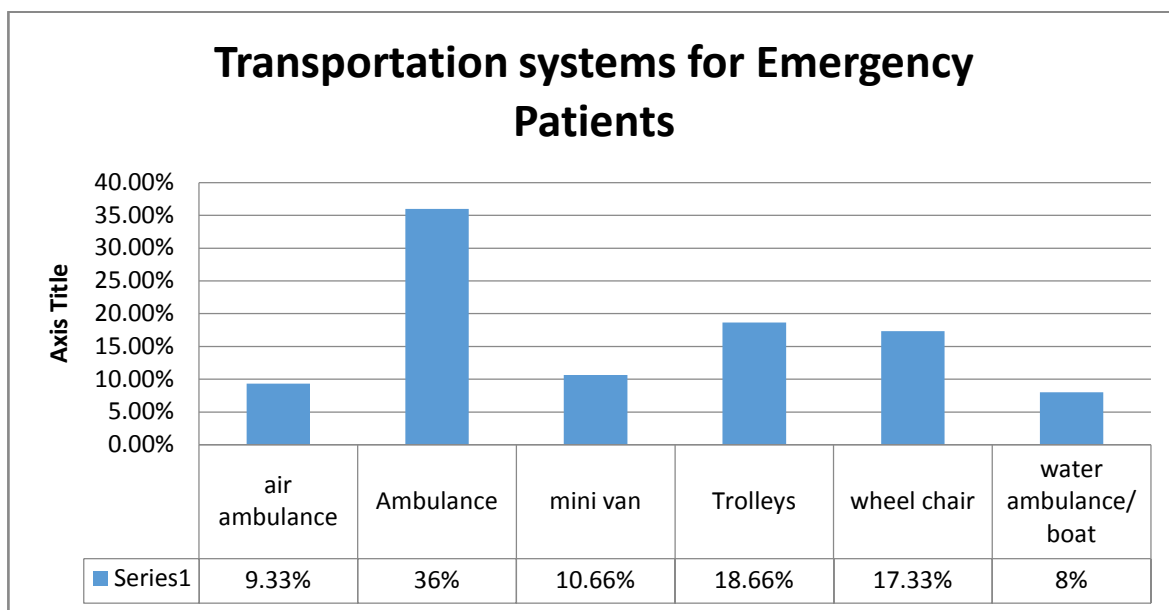


Fig: 4.9 shows the Transportation systems for Emergency Patients

Most of the respondents i.e. 36% are in a favour of ambulances, either basic for transportation purpose only or equipped to give patient the primary care till they reach the hospital. Other options include air ambulance, water ambulance or boat, minivan, trolleys and wheel chair.

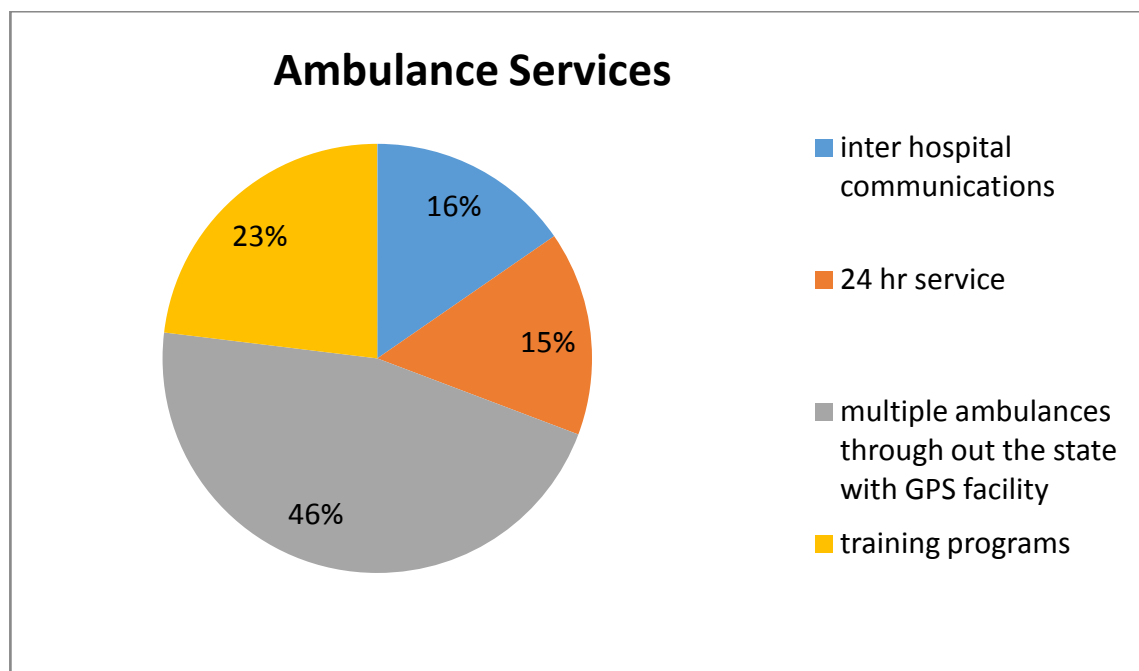


Fig: 4.13 shows the Ambulance Services

The ambulances services can be made effective by inter hospital communications, it should run 24 hours and multiple ambulances should be there throughout the state with GPS facility. The ambulance should be manned with trained EMTs so that enroute treatment can be given to the patient.

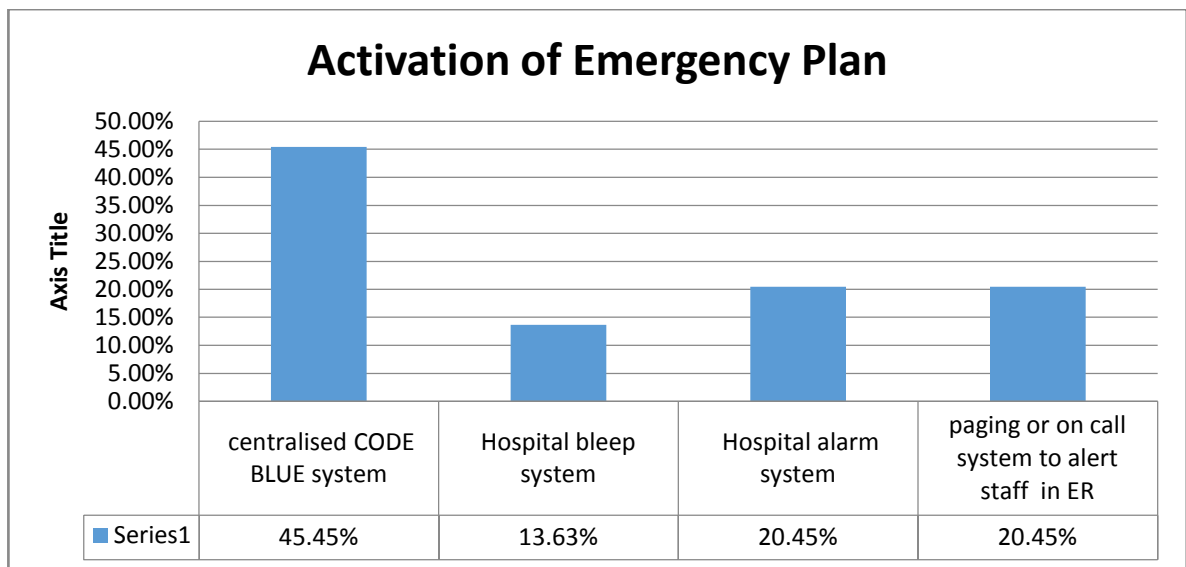


Fig: 4.8 shows the Activation of Emergency Plan

The best way to activate emergency plan is Code blue alert according to most of the respondent i.e. 45%. Other systems may include Hospital bleep system, Hospital alarm system, or paging system to alert staff in ER.

5. As per the plan, this is how Emergency Department has been designed and commissioned. Shown below are some of the images of the ED.



Image 1: Showing initial stage of treatment room without any priority area.



Image 2: Waiting Lounge



Image 3 : Waiting Area



Image 4: Just After the equipment installation.



Image 5: P1, P2 area with Nursing Station1.



Image6: Pharmacy Area near entrance.



Image 7: Showing P3, P4, P5 priorities area



Image 8: Reception Area



Image 9: Triage Room



Image 10: Paediatric Bay



Image 11: Paediatric Bay after equipment installation

RESULT:

In ED according to most of the respondents, trauma bay, Orthopaedic unit, resuscitation room, cardiac unit, isolation room, poisoning units are the departments which need to be incorporate in an ideal ED.

56% of the respondents suggested triage is the best way to streamline the process in ED.

KPI and regular audit according to most of the respondents ie 25% is the best way to check the competency of the staff in ED.

As communication plays a very important role in ED, 21% of the respondents suggested that intercom is the best way to communicate .Other means of communication includes pager, bleep system, on-call mobile, and alarm, verbal and written communication.

During mass casualties, the contingency site for triage according to most of the respondents with maximum percentage ie, 29% is waiting area, followed by an area which

is easily accessible to CODE blue and yellow with 23 %.

Centralised CODE BLUE system is the best way to activate Emergency plan in ED (45%)

The transportation system which we can explore in our hospital system are, ambulance, air ambulance, water ambulance and bike ambulance.

42% of the respondents suggested that double verification of the doctor's prescription by nurses/pharmacists is the best way to reduce medication error in ED.

Most of the respondents i.e. 43% suggested that training should be scheduled within 6 months to increase the competency of the staff in ED.

The main factors for crowding in Emergency are- delay in attending patient, inappropriate triaging, delay in decision making and unexpected emergencies and lack of co-operation among the staffs in ER.

TO fasten the “triage to discharge time” there should not be delay in dispensing medication, discharge summary, and billing according to 31% of the respondents.

Recommendations:

- In Emergency Room, there is a need to create paediatric bay.
- Emergency Department should have a designated, isolated area for psychiatric patients and also poisoning unit with observation capabilities that allow for better patient safety.
- To avoid crowding some of the recommendations are-
 1. Define response times for both initiation and completion of consultations.
 2. Assign a physician to triage.
 3. To study TAT associated with ancillary services like investigations and try to reduce it.
 4. Carefully evaluate staffing needs.

5. Monitor individual practitioners in the ED with regard to overall TAT, numbers and type of test ordered and percentage of patients admitted.

- Hospital maps should be there to guide the patient as well as the visitors.
- Timely communication of information with ambulance services, GPs and hospital in-services.
- Jidoka-(Autonomation) – To reduce medication error in ER .Errors cause machine to stop and root cause can be find quickly. For eg: in case of wrong medication, Drug-Drug interaction occurs and when we entered in HIS some indication we will get and we will correct it on time without compromising patient safety.
- CIMS data should be loaded in HIS system.
- Ensuring that A&E department adopt best practice for handling “majors” including senior review.

Discussion

Emergency departments across the nation are constantly faced with increasing and unpredictable patient volumes. At the same time, there's the constant need to improve quality and efficiency while enhancing the value of medical care provided to emergency patients

Getting patient better, quickly and safely requires the systematic implementation of good practice, consistent approach by all the clinicians, collaboration within and between the organization and great leadership along the pathway. Crowding in Emergency department is again a big issue and overcrowding hampers the delivery of high quality care. There should be protocol driven system, prioritization of patients (triaging) who will do the triage, adherence to the TAT, streamlining of all the process, so that there will be no crowding in the Emergency Room.

In case of mass casualty, in which area where we going to receive the patients, triage the patient and of course at this point of time prioritization plays a important role. Those patients who are in critical condition should be taken care first and those who are stable should be seen later or directly can be send to the treatment room without triage.

Designing of emergency room is also very important. Now- a -days ED is designed in such a manner that can manage children, adults, trauma patients and patient with less urgent conditions.

After considering all the components, the study had made an attempt to design and plan a fully integrated emergency department.

This study will prove useful to those moving into commissioning for the first time and those working in other parts of health care who need to know about commissioning in overall terms.

CONCLUSION

This report has made important recommendations which I hope commissioners, clinicians, and policy makers involved in configuring emergency services will consider. The adoption of these recommendations should ensure the delivery of safe and high quality care within the Emergency Department.

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ANNEXURES

Questionnaire for EMERGENCY department:-

Name of Respondent:

Department:

Date:

1. Which all speciality areas you expect in an ideal ER?
2. How will you streamline the patient flow in ER?
3. How are you going to measure/quantify the competency of the various staffs in ER?
4. What type of communication system you want in ER?
5. Do you want “Hospital Security Team” responsible for hospital safety and security activities?
6. Any mechanism for escorting emergency medical personnel, patients and visitors?
7. Identify a contingency site for (receipt and) triage of mass casualties during major incident?
8. What in your opinion is the best way to activate emergency response team in your hospital?
9. Suggest various mode of transportation of patients which can be explored in our hospital setting.
10. Mechanism to identify and reduce medication error in ER?
11. How will you identify and maintain the essential hospital services i.e. those that need to be available at all times in any circumstances?

12. How will you ensure the existence of a systematic and deployable evacuation plan that seeks to safeguard the continuity of critical care?
13. Is a team of hospital staff is required to carry out a post-action hospital inventory assessment?
14. For prompt response from emergency staff, how frequently you want Emergency staff to be trained?
15. How can we make ambulance service more effective/useful?
16. What volume of resuscitation/trauma patients can be managed by ER at a single point of time?
17. Should all EDs have a dedicated area for resuscitation of patients?
18. What clinical protocols are needed to enhance decision making in the management of severely ill or injured patients?
19. Suggest initiatives which could ensure patient satisfaction?
20. Policy for Maintenance and repair of equipment?
21. What are the factors causing crowding in ER?
22. What initiatives in your opinion could fasten the “triage to discharge “time in ER?
23. Among doctors, staff nurse, and EMTs who would be the ideal person to do the triaging for better decision making?
24. How does the ‘Fast Track Units” in ER help in easy functioning of ER?

Checklist for Emergency Department

1. COMMUNICATION:

Recommended Actions

Appoint a public information spokesperson to co-ordinate hospital communication with the public, the media and health authorities.

Designate a space for press conferences (outside the immediate proximity of the emergency department, triage/waiting areas and the command centre).

Draft brief key messages for target audiences (e.g. patients, staff, public) in preparation for the most likely disaster scenarios.

Ensure that all communications to the public, media, staff (in general) and health authorities are approved by the incident commander or ICG.

Establish streamlined mechanisms of information exchange between hospital administration, department/unit heads and facility staff

Brief hospital staff on their roles and responsibilities within the incident action plan.

Establish mechanisms for the appropriate and timely collection, processing and reporting of information to supervisory stakeholders (e.g. the government, health authorities), and through them to neighbouring hospitals, private practitioners and prehospital networks.

Ensure that all decisions related to patient prioritization (e.g. adapted admission and discharge criteria, triage methods, infection prevention and control measures) are communicated to all relevant staff and stakeholders.

Ensure the availability of reliable and sustainable primary and back-up communication systems (e.g. satellite phones, mobile devices, landlines, Internet connections, pagers, two-way radios, unlisted numbers), as well as access to an updated contact list.

2. Safety and Security

Appoint a hospital security team responsible for all hospital safety and security activities.

Prioritize security needs in collaboration with the hospital ICG. Identify areas where increased vulnerability is anticipated (e.g. entry/exits, food/water access points, pharmaceutical stockpiles).

Ensure the early control of facility access point(s), triage site(s) and other areas of patient flow, traffic and parking. Limit visitor access as appropriate

Establish a reliable mode of identifying authorized hospital personnel, patients and visitors.

Provide a mechanism for escorting emergency medical personnel and their families to patient care areas.

Ensure that security measures required for safe and efficient hospital evacuation are clearly defined.

Ensure that the rules for engagement in crowd control are clearly defined.

Solicit frequent input from the hospital Security team with a view to identifying potential safety and security challenges and constraints, including gaps in the management of hazardous materials and the prevention and Control of infection.

Identify information insecurity risks. Implement procedures to ensure the secure collection, storage and reporting of confidential information.

Define the threshold and procedures for integrating local law enforcement and military in-hospital security operations.

Establish an area for radioactive, biological and chemical decontamination and isolation.

3. TRIAGE:-

Designate an experienced triage officer to oversee all triage operations (e.g. a trauma or emergency physician or a well-trained emergency nurse in a supervisory position).
Ensure that areas for receiving patients, as well as waiting areas, are effectively covered, secure from potential environmental hazards and provided with adequate work space, lighting and access to auxiliary power.
Ensure that the triage area is in close proximity to essential personnel, medical supplies and key care services (e.g. the emergency department, operative suites, the intensive care unit).
Ensure that entrance and exit routes to/from the triage area are clearly identified.
Identify a contingency site for receipt and triage of mass-casualties.
Identify an alternative waiting area for wounded patients able to walk.
Establish a mass-casualty triage protocol based on severity of illness/injury, survivability and hospital capacity that follows internationally accepted principles and guidelines.
Establish a clear method of patient triage identification; ensure adequate supply of triage tags
Identify a mechanism whereby the hospital emergency response plan can be activated from the emergency department or triage site.
Ensure that adapted protocols on hospital admission, discharge, referral and operative suite access are operational when the disaster plan is activated to facilitate effective patient processing.

4. SURGE CAPACITY:-

Calculate maximal capacity required for patient admission and care based not only on total number of beds required but also on availability of human and essential resources and the adaptability of facility space for critical care.

Estimate the increase in demand for hospital services, using available planning assumptions and tools.

Identify methods of expanding hospital inpatient capacity (taking physical space, staff, supplies and processes into consideration).

Designate care areas for patient overflow (e.g. auditorium, lobby).

Increase hospital capacity by outsourcing the care of non-critical patients to appropriate alternative treatment sites (e.g. outpatient departments adapted for inpatient use, home care for low-severity illness, and chronic-care facilities for long-term patients)

Verify the availability of vehicles and resources required for patient transportation.

Establish a contingency plan for interfacility patient transfer should traditional methods of transportation become unavailable.

Identify potential gaps in the provision of medical care, with emphasis on critical and emergent surgical care. Address these gaps in coordination with the authorities and neighbouring and network hospitals.

In coordination with the local authorities, identify additional sites that may be converted to patient care units (e.g. convalescent homes, hotels, schools, community centres, gyms)

(Prioritize/cancel nonessential services (e.g. elective surgery) when necessary.

Adapt hospital admission and discharge criteria and prioritize clinical interventions according to available treatment capacity and demand.

Designate an area for use as a temporary morgue. Ensure the adequate supply of body bags.

Formulate a contingency plan for post mortem care with the appropriate partners (e.g. morticians, medical examiners and pathologists).

5 .Continuity of Essential Services :-

List all hospital services, ranking them in order of priority.
Identify and maintain the essential hospital services, i.e. those that need to be available at all times in any circumstances.
Identify the resources needed to ensure the continuity of essential hospital services, in particular those for the critically ill and other vulnerable groups (e.g. paediatric, elderly and disabled patients)
Ensure the existence of a systematic and deployable evacuation plan that seeks to safeguard the continuity of critical care (including, for example, access to mechanical ventilation and life-sustaining medications)
Coordinate with the health authorities, neighbouring hospitals and private practitioners on defining the roles and responsibilities of each member of the local health-care network to ensure the continuous provision of essential medical services throughout the community.
Ensure the availability of appropriate back-up arrangements for essential life lines, including water, power and oxygen.
Anticipate the impact of the most likely disaster events on hospital supplies of food and water. Take action to ensure the availability of adequate supplies.
Ensure contingency mechanisms for the collection and disposal of human, hazardous and other hospital waste

6. HUMAN RESOURCE:-

Update the hospital staff contact list.
Estimate and continuously monitor staff absenteeism.
Establish a clear staff sick-leave policy, including contingencies for ill or injured family members or dependents of staff.
Identify the minimum needs in terms of health-care workers and other hospital staff to ensure the operational sufficiency of a given hospital department
Establish a contingency plan for the provision of food, water and living space for hospital personnel.
Prioritize staffing requirements and distribute personnel accordingly.
Recruit and train additional staff (e.g. retired staff, reserve military personnel, university affiliates/students and volunteers) according to the anticipated need.
Address liability, insurance and temporary licensing issues relating to additional staff and volunteers who may be required to work in areas outside the scope of their training or for which they have no licence.
Establish a system of rapidly providing health-care workers (e.g. voluntary medical personnel) with necessary credentials in an emergency situation, in accordance with hospital and health authority policy.
Cross-train health-care providers in high-demand services (e.g. emergency, surgical, and intensive care units).
Provide training and exercises in areas of potential increased clinical demand, including emergency and intensive care, to ensure adequate staff capacity and competency.
Identify domestic support measures (e.g. travel, child care, care for ill or disabled family members) to enable staff flexibility for shift reassignment and longer working hours.
Ensure adequate shift rotation and self-care for clinical staff to support morale and reduce medical error.
Ensure the availability of multidisciplinary psychosocial support teams that include social workers, counsellors, interpreters and clergy for the families of staff and patients
Ensure that staff dealing with epidemic-prone respiratory illness are provided with the appropriate vaccinations, in accordance with national policy and guidelines of the health authority.

Functional Indicators of Safe Hospitals		
Instructions: In the second column corresponding to each item, put a ✓ if the condition was satisfied or an X if the condition was not satisfied is lacking. Use the last column for remarks or comments. Put N.A. (not applicable) in the last column if the condition does not exist in own country or local setting.	✓ or X	Remarks
A. Site and Accessibility of Hospital/Health Facility		
1. Site/ Location		
a. located along or near good roads and adequate means of transportation readily accessible to the community		
b. reasonably free from undue noise, smoke, dust, foul odors, floods and shall not be located adjacent to railroads, freight yards, children's playgrounds, airports, industrial plants, disposal plants		
c. complies with all local zoning ordinance		
2. Accessibility		
a. no obstructions on the roads leading to the hospital		
b. has access to more than one road (alternative routes) and has separate entrance and exit routes		
c. has well-paved access roads (cemented or asphalt) that are properly identified and labelled		
d. directional signage is available, properly fastened and readable even in darkness		
e. corridors, hallways and aisles must be 2.4-2.6 meters wide hospital		
f. use of ramps as access to second and higher floors		
g. stairways with safe and adequately secured railings must be at least 112- 120 cm wide each step must be less than 17 cm high and made of concrete		
h. any opening in walls protected by fire doors or fixed windows with wire glass		
i. any door to a stairway, ramp, elevator shaft, light and ventilation shaft or chute in a stairway enclosure shall be self-closing and normally shall be kept closed		
j. outdoor stairs must have enclosed and protected openings		
B. Internal Circulation and Interoperability		
3. Internal Circulation		
a. nurses at the stations can oversee the wards and are accessible to the patients		
b. gender-sensitive wards and sanitary toilets		
c. a. proper zoning of service areas:		
i. departments most closely linked to the community are located nearest to the entrance		

(OPD, ER, administration, primary health care		
ii. departments that receive their workloads from the wards or inner zones should be located closer to these zones (radiology, laboratory)		
iii. inpatient departments should be in the inner zone		
d. secured and controlled points of entry with available map of the area		
4. Interoperability		
a. general service areas such as power plant, boilers, water storage facilities, laundry area and pump house are located in separate structures		
b. areas to be converted to spaces for patients during disasters properly identified with adequate lighting, electrical outlets, water supply and lavatories or bathrooms		
c. morgue is located separately from the service areas, preferably with a fence or gate		
d. diagnostic areas with heavy equipment are preferably on the ground floor but are safe from flooding		
e. identified evacuation and holding area		
f. laboratory, radiology and radiotherapy-medicine facilities are restricted areas		
C. Equipment and Supplies		
1. Interoperability		
a. basic equipment should be available in each ward or treatment area		
b. basic diagnostic and therapeutic equipment are functional and properly labelled		
c. stockpile at least a week's supply of medical items		
2. Equipment and Supplies for Emergency		
a. emergency medicines in the emergency room and in the critical service areas (OR, RR, ICU, NICU)		
b. instruments for emergency procedures		
c. medical gases		
d. ventilators, life support equipment		
e. disposable personal protective equipment (PPE) for epidemics		
f. crash cart for cardiopulmonary arrest		
g. triage tags and other supplies for managing mass casualties		
D. Equipment and Supplies		
1. Standard Operating Procedures (SOP) and Protocols		
a. SOP on infection control, decontamination procedures		
b. SOP on internal and external referral of patients		
c. SOP admission to emergency department d. SOP for		

collecting and analyzing information		
2. Procedures		
a. special administrative procedures for disasters and emergency response		
b. procedures for resource mobilization (funds, logistics, human resources) to include shifting of duties during emergencies and disasters		
c. procedures to expand services, spaces and beds in the event of a surge of patients		
d. procedures to protect patients'		
e. procedures for regular safety inspection of equipment by the appropriate authority and preventive maintenance records		
f. procedures for hospital epidemiologic surveillance		
g. procedures for preparing sites for temporary placement of dead bodies for forensic medicine		
h. procedures for transport and logistic support		
i. procedures for response during evening, weekend and holiday shifts		
3. Guidelines		
a. guidelines for food and supplies of hospital staff during emergencies		
b. guidelines and measures to ensure well-being of additional personnel mobilized during an emergency		
c. treatment guidelines or protocols		
d. guidelines for mental health and psychosocial support		
e. guidelines such as a memorandum or hospital order for all hospital personnel to participate in drills and simulation exercises		
f. guidelines for handling volunteers, especially during emergencies and disasters		
g. guidelines regarding firearms when visiting or going to the hospital or for police visiting friends or relatives in the hospital or conducting official business such as guarding a convicted patient		
E. Logistic System and Utilities		
1. Logistic System		
a. system for estimating drug requirement, maintaining an inventory, storing and stocking and issuing and controlling the use of drugs		
b. stockpile of emergency medicines and supplies		
c. special arrangement with vendors and suppliers for emergency purchases in times of disaster		
d. allotting contingency fund for emergency purposes		
e. system for rotating items that will expire first while placing on hold those with later expiration dates		
f. process for allocating resources and recording their use		

g. emergency kits		
h. adequate blood bank facility with SOP and guidelines for correct storage and handling of blood and blood products and rapid procurement in emergencies		
2. Water Supply System		
a. safe and potable water in emergencies at five litres per outpatient a day and 60-100 litres per inpatient a day and additional litres for laundry, flushing toilets and other utilities		
b. alternate source of water if the main supply is cut off		
c. identified agencies responsible for timely restoration of water service, supplementary pumping system if the system fails or services disrupted or for alternative water supply		
3. Electrical System		
a. system for how electric power is supplied to the hospital, higher distribution voltage such as 400/230 v, use of 3-phase 4-wire system for lower cost and greater efficiency		
b. hospital's electric supply in terms of amperage or cyclage or kilowatts		
c. use of inflammable cooling system for transformers, i.e. dry type, epoxy resin or silicon oil or high temperature R-Temp oil		
d. location of control panels and power distribution lines should be marked in the floor plan		
e. presence of emergency power generator or alternative power for emergency lighting and operation of essential equipment		
f. generator set should be located on the premises but not adjacent to the OR or ward areas		
g. recommended circuits to which emergency power should be provided:		
i. Lighting:		
• all exits, including exit signs, stairways and corridors		
• surgical, obstetrical, recovery room, emergency room and operating room		
• nursery, laboratory, recovery room, intensive care units, nursing stations, labour room and pharmacy		
• generator set location, electrical switchgear location and boiler room		
• one or two elevators, if needed for emergency		
• telephone operator's room		
• computer room		
ii. Equipment:		
• nurses' call system		
• alarm system, including fire alarm		
• fire pump for central suction system		

• blood bank refrigerator		
• equipment in operating, recovery, intensive care and delivery rooms		
• one electrical sterilizer, if installed		
• sewage or pump lift system		
• equipment necessary for maintaining telephone service and two- way radio base system		
iii. Heating, cooling and ventilation system:		
• operating room, delivery room, labour room, recovery room, intensive care units, nurseries, neonatal intensive care units and patients' rooms		
• emergency lights with battery backup available for use during the period between the interruption of the power supply and connection to a generator set to light important areas inside the hospital such as stairs, hallways, the operating room, emergency room, intensive care units, recovery room, neonatal intensive care units, nurses' stations and cashier area		
4. Medical Gases Distribution System		
a. properly maintained medical gasoline		
b. gas tanks and medical gas pipes regularly inspected		
c. safety valves installed to prevent leakage in piped-in gases		
d. available leak alarm system and locator		
F. Safety and Security Systems		
1. Safety and Alarm Systems		
a. signs in the hospital indicate the location of escape routes and firefighting equipment		
b. building layout diagram provided for easy identification; designates evacuation site for each hospital ward		
c. smoke detectors at proper intervals covering the entire building		
d. regular checkups of the smoke detectors to ensure they function and have an adequate power supply		
e. visible and accessible equipment for local fire control, including fire hoses and fire extinguishers that should be placed strategically in corridors, at exit routes and at entrances to high-risk rooms such as laboratories		
f. regular maintenance of the fire extinguishers, the contents of which expire over time and must be replaced regularly		
g. compliance with guidelines for proper placement of fire detectors and firefighting equipment		
h. personnel training on use of fire extinguishers		
i. hospital alert in order for hospital to prepare and mobilize resources in response to early warning signs or signals		
j. system of recalling staff and positioning them for possible response to emergencies		
k. system of activating and deactivating the code alert		
2. Security Systems		

a. available security unit (private or organic)		
b. SOP on tightening security in certain high-risk areas such as the main entrance and exit points, storage areas for controlled substances and volatile chemicals and areas containing high-value medical equipment		
c. repository for firearms upon entering the hospital (no firearms allowed inside hospital)		
d. provision to recall or call to duty of off-duty guards during emergencies and disasters		
e. coordination with local officials to assist the hospital during emergencies and disasters		
G. Communications, Transportation and Information Systems		
1. Communications and Transportation Systems		
a. backup communications facilities (cellular phone, handheld radios, satellite communication facilities)		
b. equipped ambulances for transport of casualties from the field to the hospital, for moving patients to other facilities in cases of referral or overload or for evacuating and relocating a hospital service		
c. list of identified available and capable ambulances for use during emergencies		
d. list of equipment, medical supplies, emergency drugs and training of personnel for ambulances		
2. Public Information Systems		
a. public information centre where people can go to request information concerning family members		
b. public information centre is coordinated by a social worker and staffed by personnel or volunteers		
c. training of public information officer (PIO) in risk communications		
d. public awareness and public education campaign with warning messages or risk communications		
e. procedures for communicating with the public and media		
3. Information Management Systems		
a. preparation of a census of admitted patients and those referred to other hospitals		
b. proper recording and reporting using standard forms		
c. ways of sharing information with proper authorities		
d. information management system during monitoring of events in emergencies or disasters		
1. Hospital Emergency Incident Command System		
a. The chief of hospital as the incident commander and other staff to fill the positions of the Incident Command Group (ICG)		
b. system for activating and deactivating the ICG		
c. with uniform, identification and job description sheet (JDS)		

d. available operations centre and an alternate operations centre		
2. Contingency Plan		
a. accessible, tested, updated and disseminated hospital emergency preparedness, response and recovery plan that includes a hazard prevention and mitigation plan, vulnerability reduction plan and a capacity development plan. This plan includes the systems, guidelines, SOPs and protocols for emergency management		
b. includes an evacuation plan in emergencies		
c. plan for expansion of services in times of a sudden surge of patients		
d. procedures to activate and deactivate the plan		
e. cooperative arrangements with local emergency plans		
f. contingency plans for needed medical treatment during different types of disasters, including diseases with an epidemic potential		
3. Manuals for the Operation, Preventive Maintenance, and Restoration of Critical Services a.		
a. electrical supply and backup generators		
b. drinking water supply and alternate source of drinking water		
c. fuel reserves		
d. medical gases		
e. standard and backup communications systems		
f. wastewater treatment		
g. solid waste treatment		
h. fire suppression		
I. Human Resources		
1. Organization of Hospital Disaster Committees and Emergency Operation Centre		
a. crisis management committee with technical expertise that could advise an executive committee regarding crisis, emergency and disaster management		
b. an emergency response team composed of physicians, nurses, midwives, an emergency management technician-trained staff, paramedics and trained ambulance driver		
c. a health emergency planning group responsible for formulating a health emergency preparedness, response and recovery plan and other hospital response plans		
d. a safety committee headed by an officer in charge of promoting safety in the hospital against all hazards		
e. a hospital operations centre headed by a hospital emergency management coordinator in charge of monitoring emergencies or disasters, dispatching response teams, mobilizing other resources for emergencies, operational 24 hours a day, seven days a week. It has a		

designated office or unit with personnel equipped with communications facilities, a computer system, directories and an alternate communications system if the system fails.		
2. Capability Building of Personnel		
a. All of health workers trained in basic life support, cardiopulmonary resuscitation and standard first aid		
b. emergency room medical staff trained in Advanced Cardiac Life Support and Advanced Pediatric Cardiac Life Support		
c. hospital responders trained in an emergency medical technician course, the Incident Command System (ICS) and for a Mass Casualty Incident (MCI)		
d. hospital managers must be trained in the Hospital Emergency Incident Command System (HEICS)		
3. Drills and Exercises		
a. conduct fire drills at least twice a year		
b. conduct simulation drills or exercises at least annually		
J. Monitoring and Evaluation		
1. Post-incident evaluation of emergencies or disasters for which there has been a response		
2. Evaluations of fire drills at least twice a year		
3. Evaluation of emergency simulation exercise or drill at least once a year		