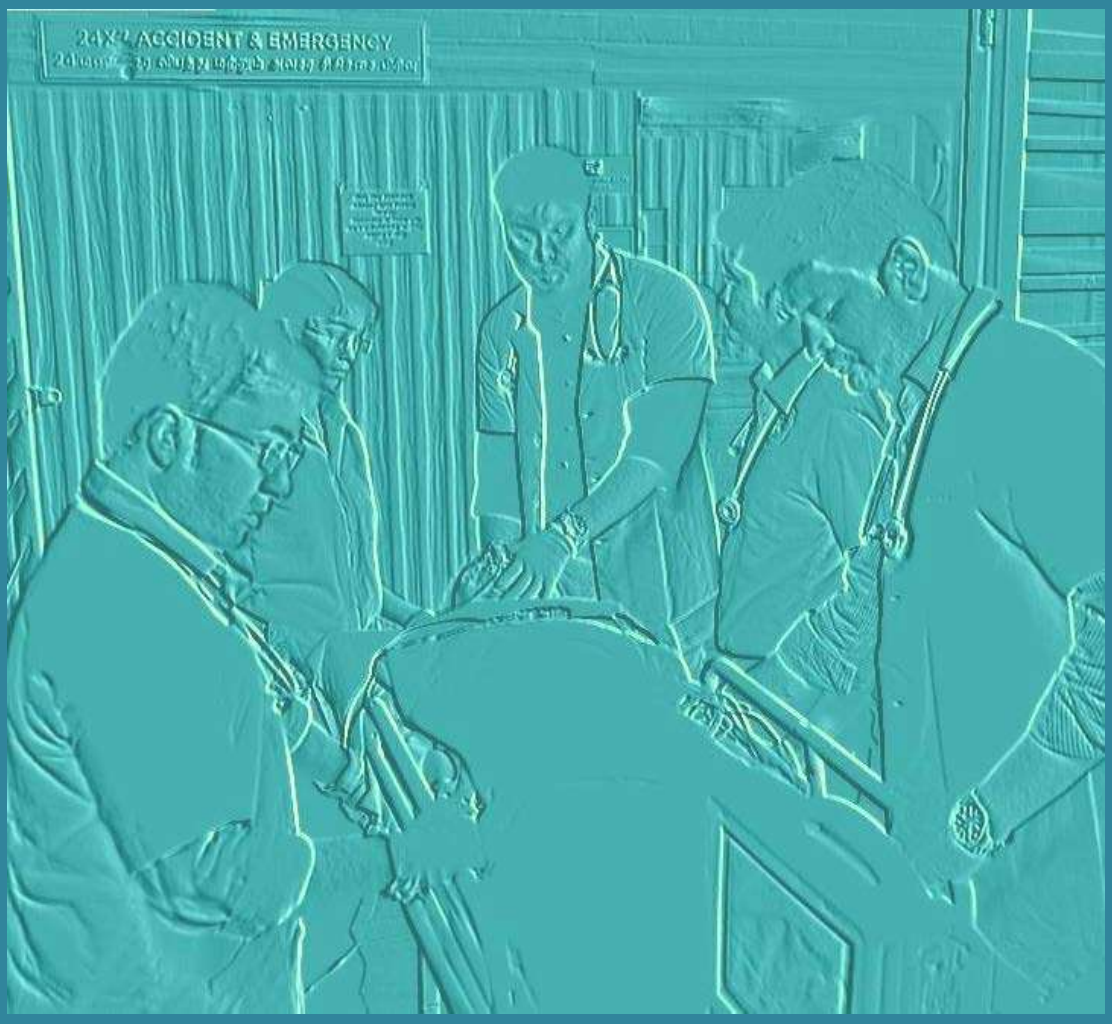
HEALTH QUEST

(Quality Upgradation Enabled by Space Technology)

In

INDIA

EMERGENCY



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Foreword

Indian Space Research Organization (ISRO), since its inception, has been striving to apply space related technologies to address the problems of common man and society at large keeping the national development as prime focus. With a humble beginning in early 60s, Indian space program has matured as a symbol of the country's sophisticated technological capabilities and its regional and global prestige. Over the last four decades, Indian Space program has made remarkable progress towards building the space infrastructure as the community resource to accelerate various developmental processes and harness the benefits of space applications for socio-economic development. The achievements of ISRO from time to time, prove that this organization completely stands by its vision to 'harness space technology for national development'.

For achieving this vision, ISRO develops critical technologies, and strives towards delivering Zero-Defect space systems. In the entire endeavors of ISRO, Quality takes the prime position. The Quality Assurance mechanism in-vogue at ISRO is entirely home grown, which works on a continual improvement basis, and also takes cognizance of the latest technologies available elsewhere in this field.

I am glad to note that, the Indian medical fraternity is very keen on adopting some of the best Quality practices of ISRO, into the areas of Emergency care and Critical care departments. It is very heartening to note that, this resourceful document "Health QUEST" is a result of the meticulous joint efforts of medical fraternity and ISRO.

I wish the medical fraternity all the very best for exploring efficient ways and means of incorporating ISRO's best practices in other disciplines of Medical Sciences as well, which will be highly beneficial for the needy.

आ सी किरण कुमार
(आ सी किरण कुमार)

Dated: July 24, 2017

A. S. Kiran Kumar

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The nerve centre of activity where human errors are most likely to happen is in the Emergency and Intensive care set up of any healthcare centre. As experts are racing against time to assess, decide and carry out measures to save the life in one setting [emergency department] and help the patient smoothly tide over the crisis as in other setting [Intensive care] where in keen observation and effective management is the key.

Statistics from across the world reveal that the human errors in these two settings are quite significant, and that it is, an obstacle in the way of ensuring the benefits of advances in Medicine to the fullest advantage of the patient.

ISRO has earned a unique place of pride in the arena of space technology through its world acclaimed best practices. Adopting these best practices into the Emergency and Intensive Care Unit set up through standardized protocols is certainly bound to reduce human errors and over a period time, the goal of achieving Near Zero status in emergency and intensive care unit set up is bound to become a reality.

Wishing this endeavour all success, let us not forget ever patient who comes into the emergency Department and is being managed by the team of experts is quite like the precision of a space launch.

Dr. Devi Shetty

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Foreword

Enormous strides have been made in the field of medicine in the preceding century especially so in the latter half. For these advancements to be translated into effective patient care, the element of human error and equipment error has to be at a near zero level, particularly at Emergency and Intensive Care Set ups. It is here, that care givers are subjected to intense stress and strain as they are racing against time to offer their best in their endeavour to help the patient recover.

This complex interplay of factors gives room for human errors, which as of now, even in the better developed Healthcare systems of the world is estimated to be equivalent of about of a few aeroplane crashes for every 100 flights.

Concerned about this, I happened to share this information with Dr. K Kasturirangan, former Chairman, ISRO who opined that the Emergency and Intensive care Unit set up being akin to a space vehicle launch site, where there can be no room for errors, be it a human or machine. This led to the idea of adopting some of the appropriate best practices of ISRO into healthcare set up.

Thus began the journey, under the stewardship of Shri. A.S Kiran Kumar, Chairman, ISRO who very ably and deftly created the environment along with his officials, for a meaningful interaction with the medical fraternity of Emergency medicine and Intensive care set up.

This novel idea was discussed by the Association of Health Care Providers India (AHPI) and the Consortium of Accredited Healthcare Organisations (CAHO) and was decided that the focus should be on two high-mortality areas of healthcare: emergency medicine and critical care medicine. As these areas cater to a high number of critical patients, it was thought that adapting best quality practices here would significantly bring down mortality and morbidity. Therefore, the well-recognised domain experts in these two areas were invited to join the venture, namely the Society for Emergency Medicine, India (SEMI) and the Indian Society for Critical Care Medicine (ISCCM), Planet Aerospace, Bangalore and the National Accreditation Board for Hospitals and Healthcare Providers (NABH), which drives the quality healthcare movement in India, are also partners in this collaboration.

The stakeholders met multiple times with the common objective of developing guidelines for our country, in these two areas of health care.

The core focus areas, as suggested and agreed by domain experts, were discussed at length, by all stakeholders at ISRO Headquarters, Bengaluru. The best quality practices of ISRO, were incorporated into these areas, and the resulting document underwent several reviews.

The current document is the first edition of this endeavour, is dedicated to the people of India. I believe that these guidelines can be easily adopted by any healthcare institution in India, both in the public and private sectors, without any significant cost implications, infrastructure or human resource requirements. It is my ardent hope that this will bring about a huge change in the way that emergency and critical care healthcare is delivered in our country.

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BACKGROUND OF EMERGENCY DEPARTMENT

The Emergency Department of any institution is an entry point for significant number of patients to any healthcare organization. It has to be conveniently located in the ground floor with direct access to the patients and ambulance. The entrance of the emergency department is always separate from OPD entrance.

The department caters to various trauma and medical emergencies in both adults and in children round the clock and is adequately staffed with emergency physicians, emergency paramedics and nursing staffs to handle such emergencies at all times and days.

The trauma emergencies may include head injury, facial and oromaxillary injuries, chest injury, abdominal injury, musculoskeletal injuries and fractures.

The Common medical emergencies handled in the emergency department includes neurological emergencies like seizures or Stroke, respiratory like Asthma or any breathing difficulty, cardiac emergencies like myocardial infarction or cardiac arrest or any acute arrhythmia and varied abdominal and gastrointestinal emergencies.

Apart from this, the department also caters to patients with poisoning, drowning, hanging, bites and stings, Acute allergy and anaphylaxis and also handles any mass or multiple casualty events and medico legal cases.

During non outpatient hours**,** The department also handles outpatient based complaints and non emergency cases who generally are triaged out to OPD during OPD hours.

Unlike wards or ICU, the beds in the emergency department are utilized on a continuous basis for different patients on a given day for initial stabilization and are eventually transferred to appropriate inpatient care areas of the Health care Organization for continuity of care under different specialities (or) discharged from ER after initial treatment with a followup advice. There are no recommendations or scope for providing continuity of care in the emergency department/beds .

The department also oversees operations of the prehospital emergency medical services (Ambulance) and coordinates their services.

QUALITY IN EMERGENCY CARE

Maintaining quality and developing error free systems have been the focus of engineering over the last few decades. The space system quality assurance program summarizes their quality assurance in two practical headings namely, paying attention to detail and handling uncertainties.

More recently, quality issues have received much attention in the medical field and there has been a some wisdom from airline industry, replicated to healthcare in error prevention by introduction of safety checklists.There are however some fundamental differences between the medical and engineering field (man and machine)

The first aspect is dealing with uncertainties. One of the primary differences between man and machine is the degree of variability. Unlike machines which can be “cloned”, every individual human being is different and each responds and reacts differently to illness and treatment. While there is a general pattern of presentation and response to illness, the uncertainties that one need to be prepared and deal with is more in the medical domain than in the engineering domain.

Especially In Emergency Medicine, The uncertainties is particularly enormous as mostly the presenting illness is not well defined by the patients and he/she is not fully coherent or concious to give his symptoms,signs not obviously evident,no support documents or prior medical history available, short therapeutic window , delayed or denied consent and affordability to emergency medical care.

The second aspect is paying attention to detail. Although on the surface this appears to be similar between the medial and engineering field, there is a fundamental difference. Domain experts in the engineering field have made a remarkable difference for machines.However the domain experts in medicine need to start understanding the key performance metrics and measure for ensuring better outcomes but still need to have a holistic approach and expertise in order to be successful and have a low margin for error. There is also a lack of adequate expertise in emergency medicine available all over India.

In the light of the above, how do we approach quality issues in the Emergency Departments?
Pre-requisites of a good quality assurance program is

a. It should be reasonably simple
b. It should be locally relevant
c. Easily implementable
d. Should not be resource intense and
e. Should have tangible outcomes which can be measured

OBJECTIVES OF EMERGENCY DEPARTMENT - HEALTH QUEST

- To recommend a ER design– patient flow for input-throughput-output
- Easily Adaptable measures in certain areas of ER process in any emergency department in India for improving outcomes (Without excessive logistics or manpower or cost implications)
- Monitor compliance and report deviances for corrective actions
- Future: Other areas / process which can be strengthened can be slowly incorporated once the basic areas are addressed.

METHODS OF REDUCING ERRORS

QUALITY DOMAINS (ADAPTED FROM ISRO)

Three quality domains used by the ISRO may be applied to the Emergency Departments.
They are

a. Quality in design
b. Quality in conformance
c. Quality of performance

AN OVERVIEW OF THE PROPOSAL

Domain	Parameter	Measurement/outcome
Quality in design	Staffing	Medical – Doctor and consultant cover, idealy Emergency Physician who had a Full time Emergency training and experience with an MDEM /MD A&E /DNB EM /FRCEM/MRCEM/AB EM/MEM/DEM/FEM in Emergency Medicine Nursing – BSc / Msc Nursing -ACLS trained, appropriate ratio (1:2) Paramedics– with BSc ETCT/BSc A&ECT/ MSc ECC / EMT – B/EMT – A/HSSC training in in Emergency and Trauma care for EMS services
	Infrastructure and equipment	Infrastructure - Adequate bed spacing, Flow design (input, throughput and output) Equipment - multi-parameter monitors, ventilators, Defibrillators, Emergency Crash Carts.
Quality in conformance (*Attention to detail*)	Check-lists	Triage & Initial Assessment – Nurses Initial Assessment – Doctor (Adult) Initial Assessment – Doctor (Pediatric) Stroke Checklist
	Protocols	General management of Poisoning ER to ICU transfer Criteria ER to OT criteria
Quality of performance	Quality indicators	Door to triage time (nurse) Door to Initial assesment time (Doctor) Door to needle time in Stroke thrombolysis Pain score Assessment Investigation report return time Nurse / Patient ratio Patient satisfaction level Time taken for discharge or Admit (Disposition) Mortality – ER mortality Process parameters - length of stay, Left without been seen by doctor, Pain assessment Safety - patient falls, medication error, failed-intubation rate Infections - hand hygiene compliance
	Practical training and certification	Milestone review
	Performance analysis	Quality assurance meetings Root cause analysis Mortality and morbidity audits Feedback and review

MANPOWER

Quality in design entails 2 major sub domains – resource personnel and infrastructure. Quality can be compromised and adverse events can occur if this domain is not appropriately addressed. For example at least three levels of skills are required for health care workers – Factual level (a good knowledge base of the subject), Cognitive level (ability to integrate information particularly in a complex case) and procedural skills (intubation, lines etc.). Competency based training and skill acquisition was recommended (see below).

Domain	Cover	Skill/equipment
Medical	Junior (24-h) cover level	Cosultant level : Emergency Physician with an MD/DNB/MRCEM/MEM/DEM/FEM in Emergency Medicine with airway and resuscitation skills (BLS, ACLS, ATLS, PALS certified) Other MD/DNB in relevant specialty with experience in EM as per MCI / NBE norms Medical officer level: Can be a resident of emergency medicine training program (MD/DNB/MEM/MRCEM) A medical doctor with MBBS qualification and adequate experience in Emergency Medicine
	Senior (consultant)	Qualified in emergency medicine with (MD EM/ MD A&E/DNB EM /MRCEM/FRCEM/MEM/AB EM Manage difficult airway and central venous access Have good communication skills Aware of legal formalities involved in emergency department
Nursing	24-h junior level cover Senior supervisory role	BLS/ACLS /ATLS / PALS trained Communication skills are crucial. Must interact with patient - family - police - EMT - visitors. Must have tact, patience, understanding, and discretion. Organizational skills - patient line-ups, inquiries, etc. (Constantly under patient scrutiny) Able to perform in hectic situations. Can recognize who is sick. (Depends on experience, skill and expert clinical judgment). Accurate assignment of triage levels is based on: Practical knowledge gained through experience and training. Correct identification of signs or symptoms. Use of guidelines and triage protocols.

Technical	Emergency and Trauma Care Technicians	BSc ETCT/BSc A&ECT/ MSc ECC / EMT – B/EMT – A/HSSC training in emergency and trauma care for EMS
Department Quality champion	One from each of the above groups	Certified Internal Auditor (AHPI) CAHO Certified profesional for Quality Implementation in Hospitals (Basic and/or Advanced)
Infrastructure	Spacing Equipment's	Adequate spacing between emergency trolley beds Multi-parameter monitors 1/bed (alerts on events) Provision for invasive mechanical ventilation for priority 1 beds Defibrillators x at least 1 Emergency Crash Cart x 1

EMERGENCY DEPARTMENT DESIGN

A full fledged emergency department has the following areas of care

1. Patient Waiting Area
   An area outside the emergency department for patients and relatives who await their turn into ER (priority 3,4) or relatives of patients who are undergoing emergency care

2. Triage area (or bed side triage)
   Every emergency department has a triage or triaging area (could be bedside) to sort incoming patients and is defined as the prioritization of patient care based on the severity of injury / illness, prognosis, and availability of resources.

3. Resuscitation Area / room / bay (priority 1 area)
   This area is dedicated to the immediate care of patients and victims in cardiac arrest, airway, breathing and circulation compromise. The 'Resus' area consists of two or more resuscitation beds with all resuscitation equipment (monitors, defibrillators, airway, intubation & surgical equipment) available at an arm's distance including pediatric resuscitation kits.

A patient maybe shifted to the Resus area from outside or from an area within the hospital or emergency department itself.

All priority 1 patients are managed here.

4. Urgent Care area (priority 2,3)
   All priority 2 and 3 patients are managed here. Majority of the ED admitted patients are assessed and managed here or observed here.

5. Consultation Rooms / Fast track area (high volume ER) for priority 4
   Many of the patients coming to an ED do not have an emergent problem, especially during non OPD hours. They are assessed and treated on outpatient basis in the consultation rooms or in fast track area.

6. Counseling room
   A counseling room with audio and video recording facility which will also be used for breaking bad news / grievance room.

7. Minor Procedure Rooms (desirable)
   Procedures like wound dressing , suturing of wounds, dislocation reduction & splinting of fractures & dislocations, fracture splints and casts, foreign body removal etc are done here. urgent care area can also be used for the same if no separate space is available for minor procedures.

8. Decontamination / body wash area (desirable)

A separate area with water faucet facility for complete body wash like in case of pesticide poisoning, contaminated wound washing, gastric lavage etc. The area should be ideally isolated from the treatment area and with a provision for an exhaust fan.

EMERGENCY DEPARTMENT SPACE REQUIREMENT

The factors which influence the Emergency Department size and design includes a general scope of clinical services provided in the HCO, average volume of ER visits, total number of beds in the HCO, availability of other support services like Radiology &Lab, total floor space, geographical location, demography of the patients who will be handled in the ER (pediatric vs geriatric) or (medical emergencies vs trauma),maximum number of possible users in a given time.

Entrance :

1. Direct access from the road for ambulance and vehicles –clearly marked and with temporary vehicle parking space for cars and other means of patient transport
2. Ramp for wheel chair / stretcher
3. Stretcher and wheelchair placing area
4. Well lit entrance with wide doors which can open both ways or one way opening into the ER
5. The doors should wide enough to move a patient in an emergency trolleys comfortably in and out. The ideal width would be minimum 6 feet when both the door are wide open.

Waiting Area :

1. The waiting area can be of a total size of at least200 square feet / 1000 yearly attendances that includes seating, telephones, display for literature, public toilets and circulation space.
2. The waiting room should include one seat per 1000 yearly attendances.

Triage area (if applicable)

1. Should be able to accommodate patients in wheel chair / emergency stretcher / walking in. The ideal space would depend on the volume of patients received in the department.
2. There is a close operational relationship between Triage and reception where registration counter is located.
3. The combined area of the reception/triage/clerical area can be at least 400 square feet /1000 yearly attendances

Resuscitation room / suite (priority 1) :

1. Ideally a individual closed space with provision for emergency stretcher bed, multipara monitor, defibrillator, crash cart, ventilator in each room.
2. The room should accommodate 4-5 staffs including doctors comfortably and to be able to move around the patient.
3. Good size for a single bed resuscitation room is 350 sq ft or 270 sq ft for each bed space if in a multi bedded room (not including storage area).
4. Ideally the number of resuscitation areas should be no less than 1/15,000 yearly attendances or 1/5,000 yearly IP admissions through ER.
5. There can be at least one dedicated single bedded resuscitation room in A&ED

Urgent care (priority 2,3):

1. Each treatment area can be at least 130 square feet in area.
2. Minimum recommended space between centers of two adjoining beds is 8 feet.
3. Each bed can be separated by a screen on all three sides for providing privacy.

Consultation room (priority 4):

For Examination and treatment of priority 4 patients

1. Minimum recommended space required is 215 square feet

Procedure room (If applicable):

1. Minimum recommended space required is 215 square feet

Emergency short stay unit (If applicable):

1. This facility may be provided either with in or adjacent to the Emergency Unit for the prolonged observation and ongoing treatment of patients who are planned for subsequent discharge (directly from the A&E),Mostly applicable to high volume emergency departments
2. The types of patients planned to be amitted to this Unit will determine the number and type of beds provided, and the design of associated monitoring and equipment however 8 beds is considered to be the minimum functional size.
3. The configuration of the short stay unit should be a minimum of 1 bed per 4000 attendances per year

Nursing Station:

1. Minimum recommended space required is 100 square feet
2. Staff room / utility storage room / security room / toilets / pharmacy substores are as per the requirements.

EMERGENCY DEPARTMENT PATIENT FLOW

The Emergency Department can have two types of patient input-throughput – and output flow based on the volume and space available in the healthcare institution.

For a large volume department, it is advisable that the entry and exit point of the emergency department are separate (Picture 1).The Triage room and registration can be done at the entry and there is also facility for registering the patient at the entry point. After triage, the patients are moved to the appropriate pre- identified bed space/area for further care.

All priority 1patients are moved to the resuscitation room. Priority 2 an d 3 are treated in the urgency care areas which can also be the observation area. Priority 4 patients are triaged out to OPD or can be handled in emergency room in a pre designated fast track room or doctor consultation room (especially in non OPD hours) in the emergency department and a emergency bed is not necessary for these category of patients.

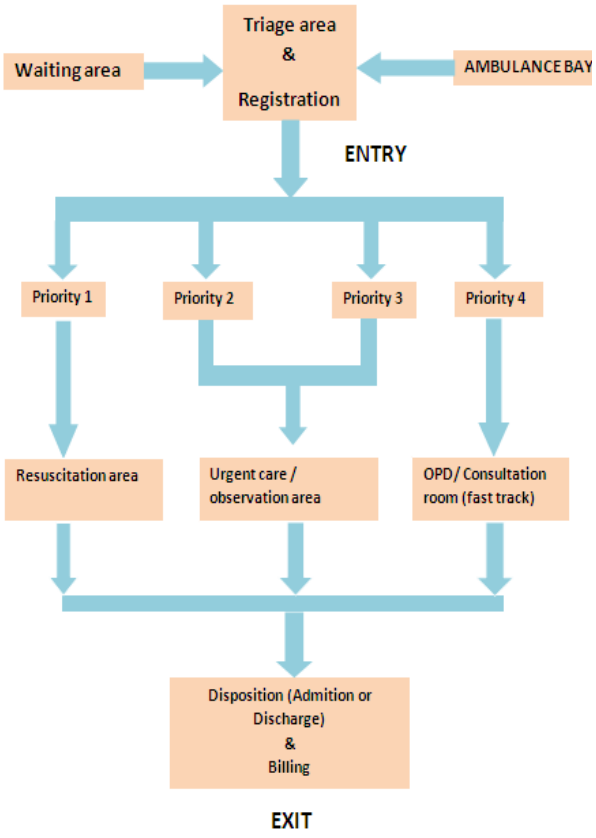
On disposition, the patients are moved into the hospital or discharged through an exit , away from the entry area .Billing counters can be situated at the exit. Bed side billing can also be done.

For low volume emergency departments and HCO's with limited space, A flow pattern in picture 2 can be followed. The entry and exit is through the same point and the registration and billing counter is essentially located at the entry/exit point. No separate triage room or space is provided and all the patients visiting ER are allotted a bed straight away and a bed side triaging is done.

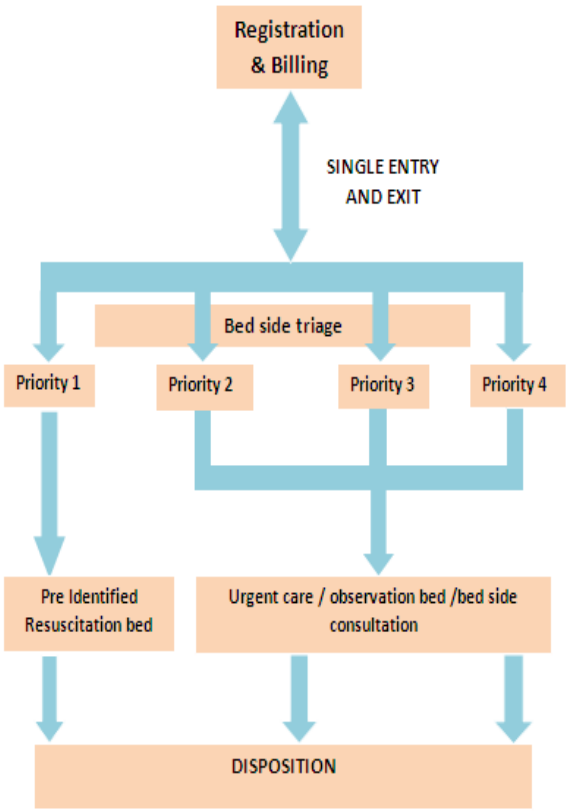
All priority 1 patients are either moved to the bed identified for resuscitation purpose or resuscitation can happen in the same bed .Priority 2, 3 and 4 are treated in emergency beds (Priority 4 can also be treated in ER doctor consultation room (if available)

On disposition, the patients are moved into the hospital or discharged through the same entry/exit point Billing counters can be situated here and bed side billing can also be done.

Recommended ER flow patterns

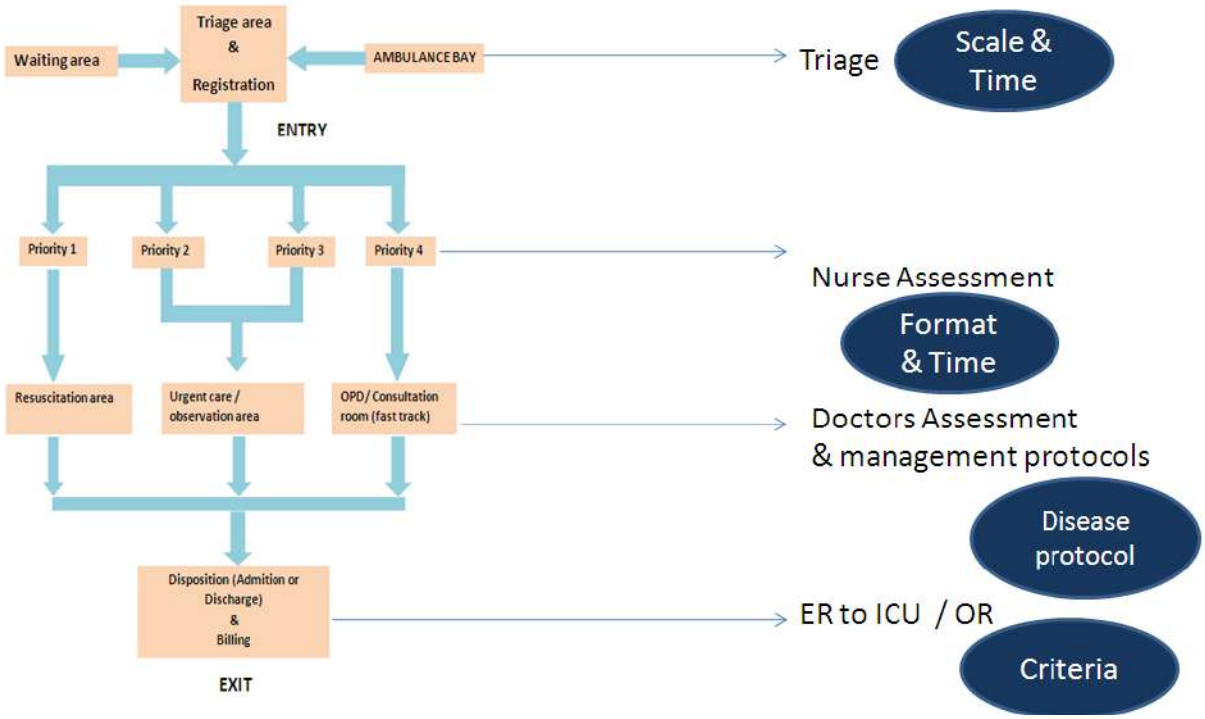


Flow model 1



Flow model 2

Health QUEST – Area of Focus



TRIAGE GUIDELINES

Definition of Triage

A process for sorting injured & sick patients into groups based on their need for or likely benefit from immediate medical treatment. Triage is used in hospital emergency rooms, on battlefields, and at disaster sites when limited medical resources must be allocated.

National Standards

The National Accreditation Board for Hospitals (NABH) is the apex organization which develops & defines healthcare standards, and is also responsible for the accreditation and certification of hospitals in India. However many specific areas, including emergency department triaging, are currently undefined and yet to be developed.

International Standards

The Joint Commission (www.jointcommission.org) is the apex organization for accreditation of hospitals in the United States and globally. The Joint Commission standard for triaging patients is outlined below for understanding the importance of triaging in emergency departments and emergency rooms.

Area	What is recommended ?	Expected Outcome
Triage	An Uniform triage system	1. Less waiting time for those who deserve emergency care 2. less Mortality and Morbidity
Nurses Initial Assessment	Systematic Assessment case sheet	1. Identification of life threatening issues first – Eelier intervention - Reduced mortality 2. Re triage – Reduced Mortality
Doctor Initial Assessment	Systematic Assessment case sheet for medical / trauma and pediatric emergency	1. Identification and medical intervention of life threatening issues first –Reduced mortality 2. Earlier transfer to tertiary care facility for treatment if existing facility is inadequate for handling – Reduced morbidity and mortality
Assessment and Treatment protocol	Common condition in Indian ER – Poisoning general management guideline Stroke – Management guideline	1) Reduced mortality in poisoning 2) Reduced Morbidity in Stroke
Transfer out protocol	ER to ICU ER to OT	1) Reduced mortality 2) Appropriate bed resource utilization in the institution

Standard No	Standard	Measurable Elements
Access to Care and Continuity of Care (ACC) 1.1	**Patients with emergent, urgent or immediate needs are given priority for assessment and treatment.**	1. The hospital uses an evidence-based triage process to prioritize patients with immediate needs.
		2. Staff are trained to use the criteria.
		3. Patients are prioritized based on the urgency of their needs.
		4. Emergency patients are assessed and stabilized within the capacity of the hospital, prior to transfer to another facility.
		5. Stabilizing treatment provided prior to transport is documented in a record maintained by the transferring hospital.

Goals of Triage

1. To rapidly identify patients with urgent, life threatening conditions.
2. To determine the most appropriate treatment area for patients presenting to the emergency department (ED).
3. To decrease congestion in emergency treatment areas.
4. To provide ongoing re-assessment of patients.
5. To provide information to patients and families regarding services expected care and waiting times.
6. To contribute information that helps to define departmental capabilities.

Triage Categorization and Definitions

Priority 1 (Immediate)

Conditions that are considered threats to life or limb or have an imminent risk of deterioration requiring immediate aggressive interventions. These are patients that have cardiac arrest, or require active and aggressive resuscitation, or are pre-arrest or post-arrest. Their treatment is often started in the pre-hospital setting and further aggressive or resuscitative efforts are required immediately upon arrival at the emergency department.

Priority 2 (Urgent)

Conditions that could potentially progress to a serious problem requiring emergency interventions. These patients have serious illness or injury and have the potential for further deterioration that may then require resuscitation. They need prompt treatment to stabilize developing problems and treat acute conditions. These patients may have normal vital signs but their presenting problem suggests a more serious diagnosis.

Priority 3 (Non Urgent)

Conditions that may be acute but non-urgent, and which do not pose any immediate risk to the patient. This may include conditions which may be part of a chronic problem with or without evidence of deterioration. The investigation or interventions for most of these illnesses or injuries could be delayed.

Priority 4 (Dead)

Patients who arrive to the emergency department without signs of life and resuscitation is not attempted due to prolonged cardiac arrest, are categorized as Priority 4 at the time of triage.

A triage level must be recorded on all patients, during all shifts. This includes all ambulance patients.

Timelines for Physician Assessment

(Measured from time patient arrives into the emergency department)

Triage Category	Time to Physician Assessment
Priority 1	Patient to be seen immediately. No waiting.
Priority 2	Patient to be seen within 30 minutes of arrival.
Priority 3	Patient to be seen within 2 hours of arrival.
Priority 4	No time limit.

Color Categorization

Color categorization distinguishes the concerned treatment areas within an emergency department, and also distinguishes individual patients based on their assigned triage categories.

Triage Category	Color Code
Priority 1	RED
Priority 2	YELLOW
Priority 3	GREEN
Priority 4	BLACK

Examples of Presenting Complaints & Case Definitions

These are not all inclusive. Case definitions may consist of objective criteria like heart rate, respiratory rate, blood pressure, etc, or may consist of subjective criteria like chest pain, headache, severe pain, etc, or include both. A detailed final list can be made after reviewing/adjusting geographical differences.

PRIORITY 1
Physician to see patient immediately upon patient arrival.

1. **Cardiac Arrest:** Patients with cardiac and /or pulmonary arrest (or appears to be imminent).
2. **Major trauma:** Severe injury of any single body system or multiple system injury(ISS>16) Head injury with GCS<10; severe burns (>25% TBS or airway problems), chest/abdominal injury with any or all of: altered mental state, hypotension, tachycardia, severe pain, respiratory signs or symptoms.
3. **Shock States:** Conditions where there is an imbalance between oxygen supply (cardiogenic, pulmonary, blood loss, disorders of oxygen affinity) and demand (hyperdynamic states) or utilization (sepsis syndrome). Hypotension and or tachycardia and possibly bradycardia in advanced/pre arrest situations.
4. **Unconscious:** Intoxications/overdoses, CNS events, metabolic disturbances can all have an alteration of mental function from disorientation/confusion to completely unresponsive or actively seizuring. Airway protection and supportive care with prompt assessment to determine the cause/treatment are of critical importance. Hypoglycemia is a rapidly reversible problem, which should be ascertained with bedside screening tests.
5. **Severe Respiratory Distress:** There are many causes for respiratory distress but benign reasons can only be diagnosed by exclusion. Serious intracranial events, pneumothorax, near death asthma (unable to speak, cyanosis, lethargic/confused, tachycardia/bradycardia, O2 sat <90%) COPD exacerbations, CHF, anaphylaxis and severe metabolic disturbances (renal failure, Diabetic Ketoacidosis). These patients require rapid assessment of the ABC's and physician intervention. Medications and equipment for management of respiratory and ventilatory failure (Endotracheal intubation-RSI, BIPAP) bronchodilators, inotropes, vasodilators need to be made available

PRIORITY 2
Physician to see patient within 30 minutes of patient arrival.

1. **Altered mental state:** Infectious, inflammatory, ischemic, traumatic, poisoning, drug effects, metabolic disorders, dehydration …can all affect sensorium from simple cognitive deficits to agitation, lethargy, confusion, seizures, paralysis, coma. Even subtle changes can be associated with serious life threatening and treatable problems. Young children with irritability and poor feeding are examples of altered mental state that could represent serious bacterial infection or dehydration.
2. **Head injury:** This problem appears in several triage levels. The more severe or high risk patients require a rapid MD assessment, to determine the requirements for airway protection/CT scanning or neurosurgical intervention. These patients usually have an altered mental state (GCS<13). Severe headache, loss of consciousness, confusion, neck symptoms and nausea or vomiting can be expected.
3. **Severe trauma:** These patients may have high-risk mechanisms and severe single system symptoms or multiple system involvement with less severe signs and symptoms in each ($ISS^3$9). Generally the physical assessment of these patients should reveal normal or nearly normal vital signs (Abnormal VS, level I).
4. **Neonates**: Children < 7 days are at risk for hyperbilirubinemia, undiagnosed congenital heart abnormalities and sepsis. The signs of serious problems may be very subtle.

5. **Eye pain:** Chemical exposures (acid or alkali) cause severe pain and blurred vision is usually due to photophobia and runny eyes (blephorrhea). Other painful conditions such as glaucoma and iritis may have associated visual deficits and require prompt physician assessment.

6. **Chest pain:** Patients with non-traumatic, visceral pain are most likely to have significant coronary syndromes (AMI, Unstable angina). Sudden sharp pains: can be associated with chest wall problems, but can also be due to pulmonary embolus, aortic dissection, pneumothorax, pneumonia, or other serious problems associated with vascular or viscous rupture. Previous MI, Angina or Pulmonary embolus: Patients with a prior history of these conditions should be level II no matter what the character of the pain.

7. **Overdose:** Intentional overdoses are particularly unreliable when trying to determine which agents have been ingested and the actual quantity. These patients require early physician assessment, or advice, with regard to the need for toxic screening, monitoring or methods of preventing absorption, enhancing elimination or administration of antidotes. Patients with any signs of toxicity (altered mental state, abnormal vital signs) should be seen very quickly (<5 minutes).

8. **Abdominal pain:** Pain severity alone, cannot predict whether serious surgical or medical conditions are present. Visceral pains (constant, ache, pressure, burning, squeezing) with associated symptoms(nausea, vomiting, sweat, radiation, bump or reverberating pain) with vital sign abnormalities(hypertension, hypotension, tachycardia, fever) are much more likely to be serious problems which require prompt investigation, treatment, or pain relief. Crampy, intermittent or sharp brief pains without vital sign abnormality usually may be may be delayed. There is significant overlap between benign conditions and catastrophes such as ruptured AAA (age >50), ectopic pregnancy (females 12-50), perforated viscous, appendicitis, bowel obstruction, ascending cholangitis.

9. **Gastrointestinal Bleed:** Upper GI causes are more likely to cause instability. Vomiting gross blood, coffee ground emesis and melena are typical of UGI sources. Maroon stool, dark blood or right red blood can also be from UGI sources but are more likely to be lower GI. The source is not as important as how to deal with the patient with hemodynamic instability. One set of normal vital signs carries no guarantee of hemodynamic stability.

10. **Cerebrovascular Accident:** Patients with major neurological deficits may require airway protection or emergent CT scanning to determine criteria for thrombolysis, anticoagulation, neurosurgical intervention or prognostication. If the time of onset of symptoms is <4 hours then time to CT scanning is critical element in treatment strategies.

PRIORITY 3
Physician to see patient within 2 hours of patient arrival.

1. **Head Injury:** Minor head injury, alert (GCS 15), no vomiting, neck symptoms and normal vital signs.

2. **Minor trauma:** Minor fractures, sprains, contusions, abrasions, lacerations, requiring investigation or intervention. Contusions, abrasions, minor lacerations (not requiring closure by any means), overuse syndromes (tendonitis), and sprains. Normal vital signs, moderate pain (4-7/10).

3. **Abdominal pain:** Acute pain of moderate intensity (4-7/10) or in a child in "no acute distress". Vital signs should be normal and the patient should not appear to be in acute distress. Constipation can cause very severe pain or on occasion be confused with other more serious problems.
4. **Headache:** Not sudden, not severe, not migraine, no associated high-risk features (see level II and III headache). Infectious problems like sinusitis, URI, or Flu like illnesses may cause these. Pain should be no more than moderate (4-7/10) and normal vital signs.
5. **Ear ache:** Otitis media and externa can cause moderate (4-7/10) to severe (8-10/10) pain.
6. **Chest pain:** These patients should have no acute distress, pain (4-7/10), no shortness of breath, no visceral features, no previous heart problems, normal vital signs. The pain is usually pleuritic (sharp, worse with deep breath, cough, movement, palpation). These patients may have had a chest wall injury or some strain of the muscles from cough or physical activity.
7. **Suicidal/Depressed:** Patients complaining of suicidal thoughts or have made gestures but do not seem agitated. Normal vital signs.
8. **Corneal Foreign body:** If pain is mild or moderate (4-7/10) and no change in visual acuity.
9. **Sore throat**: Patients with minor complaints, not severe and no respiratory symptoms / compromise.
10. **Vaginal bleeding:** Can be normal menses or painless bleeding in postmenopausal patients.

Example of Triaging based on Physiological Objective Criteria

	Priority 1	Priority 2	Priority 3
GCS	Unresponsive or GCS < 8	Altered Sensorium or GCS 9 – 12	GCS 13 – 15
Temperature	>105 deg F or <95 deg F	103 – 104 deg F	102 deg F or less
Heart Rate	Pulse Not felt or <40 or >130	<60 or >110	100-109/min
Blood Pressure	Not recordable or SBP <90 or >180 SBP or >110 DBP	>160 SBP	>140 SBP
Respiratory Rate	Not breathing or <10/min or >40/min	>30/min	>20/min
Oxygen Saturation	<85% on room air	<90% on room air	>90% on room air
Pain score	8-10/10	4-7/10	1-4/10

Nursing Re-assessment

Triage is a dynamic process and patients may move up or down on the urgency continuum while waiting for access to treatment areas, physician assessment, results of investigation or response to treatment. It is important that periodic re-assessment be done by the nursing personnel.

Triage Category	Frequency of Nurse Re-assessment
Priority 1	Patient to be continuously monitored.
Priority 2	Patient to be reassessed every 30 minutes.
Priority 3	Patient to be reassessed every 2 hours.
Priority 4	No reassessment required.

Role of Triage Nurse

The triage nurse should have rapid access or be in view of the registration and waiting areas at all times.

He/she would perform a brief 2 to 5 minute interview which would provide enough critical information to determine patient acuity and any immediate care needs.

He/she would perform the following duties:

- Greets patient and family in a warm empathetic manner.
- Performs brief visual assessments.
- Documents the assessment.
- Triages patient into priority groups using appropriate guidelines.
- Transports patient to treatment area when necessary.
- Gives report to the treatment nurse or emergency physician, documents who report was given to and returns to the triage area.
- Keeps patients/families aware of delays.
- Reassesses waiting patients as necessary.
- Instructs patients to notify triage nurse of any change in condition.

Skills Required by Triage Nurse

Communication skills are crucial. Must interact with patient - family - police - EMT - visitors.
Must have tact, patience, understanding, and discretion.
Organizational skills - patient line-ups, inquiries, etc. (Constantly under patient scrutiny)
Able to perform in hectic situations. Can recognize who is sick. (Depends on experience, skill and expert clinical judgment).

Accurate assignment of triage levels is based on:

- Practical knowledge gained through experience and training.
- Correct identification of signs or symptoms.
- Use of guidelines and triage protocols.

Example of Triage Assessment

1. Chief complaint: what is the patient's statement of the problem
2. Validation and assessment of chief complaint:

A. Subjective: Onset/Course/Duration

When did it start (be exact with time)?

What were you doing when it started?

How long did it last? · Does it come and go?

Is it still present?

Where is the problem?

Describe character and severity if painful (Pain scale).

Radiation?

Aggravating or alleviating factors?

If pain is or was present: Character and intensity (pain scale) to be documented.

Previous history of same? If yes, what was the diagnosis?

B. Objective: this part of the triage assessment may be deferred to the treatment area if the patient requires rapid access to care / interventions (Priority 1 and 2).
Physical appearance - color, skin, activities
Degree of distress: severe distress; NAD (no acute distress)
Emotional response: anxious, indifferent
Complete Vital Signs if time allows or necessary for assignment of triage level
Physical assessment

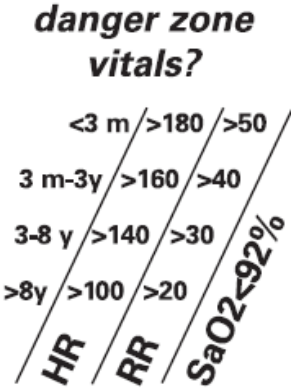
Triage Documentation Standard

1. Date and time of triage assessment.
2. Triage Nurse's name.
3. Chief complaint or presenting concerns.
4. Limited subjective history: onset of injury/symptoms
5. Objective observation.
6. Triage Level
7. Location in the department.
8. Report to treatment nurse.
9. Allergies
10. Medications
11. Diagnostic, first aid measures, therapeutic interventions.
12. Reassessment(s).

NURSES Initial Assessment protocol

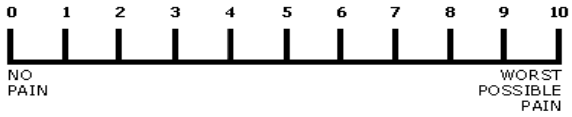
Name:		Age:	Sex:	MLC : ☐ Yes ☐ No
UHID No:	**AR No:**	**Weight:**	**Time of Arrival:**	
Mode of Arrival: ☐ EMS ☐ Self	**Allergies:**	**Attending emergency Physician:**		

Vitals	
HR	
RR	
BP	
Temp	
Spo2	
CBG	



Alert Doctor Immediately

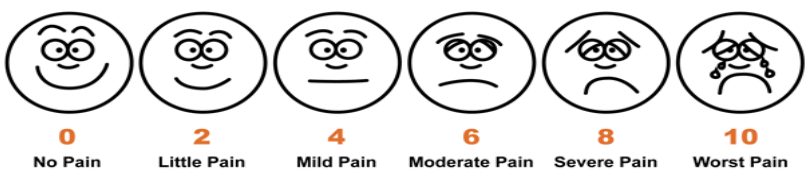
Adult Pain Score:



ADULT	Score	INFANT
Eye opening	**E**	**Eye opening**
Spontaneous	**4**	Spontaneous
To speech	**3**	To speech
To pain	**2**	To pain
No response	**1**	No response
Best motor response	**M**	**Best motor response**
Obeys verbal command	**6**	Normal Movements
Localizes pain	**5**	Localizes pain
Flexion – withdraws from pain	**4**	Withdraws from pain
Flexion – abnormal	**3**	Flexion – abnormal
Extension	**2**	Extension
No response	**1**	No response
Best verbal response	**V**	**Best verbal response**
Oriented and converses	**5**	Coos, Babbles
Disoriented and converses	**4**	Cries but consolable
Inappropriate words	**3**	Persistently irritable
Incomprehensible sounds	**2**	Grunts to pain / restless
No response	**1**	No response
GC score		**/15**

Level of consciousness: ☐ Alert ☐ Response to verbal commands ☐ Response to pain only ☐ Unresponsive

Paediatric Pain Scale:



Triage Priority: (1) (2) (3) (4) (5)

Nursing Notes:

Time							
Temperature							
BP							
Pulse							
RR							
O2							
RBS							
Pain Score							
Signature of the nurse							

Investigations Done:

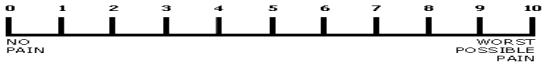
Medication Given	Time	Route	Dose	Staff Nurse Signature

Disposition: ☐ **Ref. to OPD** ☐ **Discharged** ☐ **Admitted [ICU/ PICU / NICU / OT / Private room / Sharing room / GW]** ☐ **DAMA** ☐ **Transferred to other hospital**

Signature of the staff Nurse: **Date:**

Employee ID: **Discharge Time:**

DOCTORS INITIAL ASSESSMENT – Medical Emergency

Name:			**Age:**	**Sex:**	**MLC :** ☐ Yes ☐ No
UHID No:	**AR No:**	**Weight:**	**Time of Arrival:**		
Mode of Arrival: ☐ EMS ☐ Self	**Allergies:**	**Pain Score:** 			
Chief complaints:					
Airway ☐ Patent ☐ Suctioning ☐ Head tilt/Chin lift ☐ Nasal or Oro pharyngeal airway					
Breathing Rate: /min	**Depth:** ☐ Adequate ☐ Inadequate		**SpO2:**	**Air entry:**	
Intubated: ☐ Yes ☐ No	**Size of tube:**	Depth of fixation:	**Indication for intubation:**		
Circulation : HR /min	**BP** mmHg	**Disability:** GCS – E V M =			
Pupils RT side size : mm	☐ Reactive ☐ Non reactive	**LT side size:** mm	☐ Reactive ☐ Non reactive		
H/o present illness:					
Significant Past History:					
Current Medications:					
Personal History:					
Menstrual History:					
General Examination:	☐ **Pallor** ☐ **Icterus** ☐ **Cyanosis** ☐ **Clubbing** ☐ **Palpable Lymph nodes** ☐ **Edema** ☐ **Dehydration**				
Nutrition Assessment	☐ **Looks appropriate for age** ☐ **Mal nourished**				

Systemic examination :

Provisional diagnosis:

Management in ER & Plan of care:

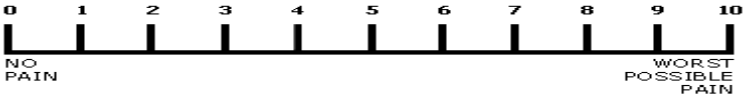
Other Consultations:

Preventive aspects:

Vitals		
	On arrival	At disposition
HR		
RR		
BP		
Temp		
Spo 2		
CBG		

Investigations :

Reassessment Pain Time:



Score:

Disposition: ☐ **Deceased** ☐ **Discharged** ☐ **Admitted** ☐ **DAMA** ☐ **Transferred to other hospital**

Special advice:	**Diet**	**Fluid restriction (if applicable)**

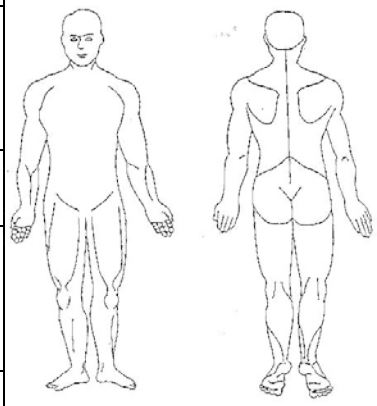
Appropriate disposition advice: ☐ Verbal ☐ Leaflet

Name& Signature of the Emergency physician:	**Date:** **Time:**

DOCTORS INITIAL ASSESSMENT – Trauma Emergency

Name:	**Age:**	**Sex:**	**Time of arrival:**
AR No:	**Alleged history:** ☐ Road Traffic Accident ☐ Self Fall ☐ Work Place Injury		**Mode of Arrival:** ☐ EMS ☐ Self
UHID No:	0 1 2 3 4 5 6 7 8 9 10 NO PAIN WORST POSSIBLE PAIN **Pain Score**		**MLC :** ☐ Yes ☐ No
H/O: ☐ Vomiting ☐ Headache ☐ Seizure ☐ Amnesia to Events ☐ ENT bleed ☐ Loss of Consciousness**:** _____ Duration			

PRIMARY SURVEY

Airway / C spine ☐ Patent ☐ Suctioning ☐ Jaw Thrust ☐ Oro pharyngeal Airway ☐ NRBM ☐ Cervical Collar			
Breathing Rate: /min	Depth: ☐ Adequate ☐ Inadequate	SpO2:	**Exposure**: 
Intubated: ☐ Yes ☐ No	Size of tube:	Depth of fixation:	
Air entry:	Indication for intubation:		
Circulation : HR /min	BP: mmHg	**Disability:** GCS – E V M = /15	
Pupils: RT side size : mm ☐ Reactive ☐ Non reactive LT side size: mm ☐ Reactive ☐ Non reactive			

SECONDARY SURVEY

Allergy :	
Past Medication:	
Past Medical / Surgical History / LMP:	
Last Meal (Time):	
Event:	

Head to Toe Examination

Head	**Face**	**ENT**
Eyes	**Neck**	**Chest**
Abdomen	**PELVIS:** ☐ Stable ☐ Unstable ☐ Pelvic binder	
Upper limb	**Lower Limb**	
Back & Spine	**Per Rectal Examination**	

E - FAST: ☐ Positive ☐ Negative

Investigations:

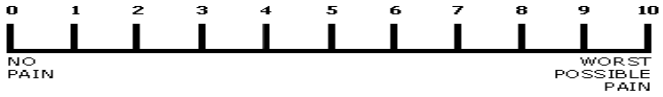
☐ Gastric Tube ☐ Foleys Catheterization

Total Urine Output in ER:

Management in ER & Plan of care:

Vitals at Disposition	
HR	
RR	
BP	
Temp	
Spo 2	
CBG	

Other Specialty Consultation:



Reassessment Pain Score: **Time:**

Disposition: ☐ Discharged ☐ Admitted ☐ DAMA ☐ Transferred to other hospital ☐ Deceased

Appropriate disposition advice: ☐ Verbal ☐ Leaflet

Name & Signature of the Emergency physician:	**Date:**	**Time:**

PEDIATRIC EMERGENCY INITIAL ASSESSMENT

Name:		Hosp ID No:	Age:
Sex: M / F	Date:	Time of Arrival :	Time of Transfer:
Referred by:	Weight:	Temperature:	CBG:

COMPLAINTS:

☐ Breathlessness:	☐ Toxin/ Trauma ☐ Noisy Breathing ☐ Edema ☐ Diarrhea ☐ GI Bleed ☐ Distension ☐ Vomiting ☐ Abdominal pain	Duration:
☐ Convulsions ☐ Posturing ☐ Upward gaze		
ALC ☐ Lethargy ☐ Incessant cry ☐ Not as usual		Drugs
Fever:		
Others:		

Co- Morbidities	CVS	RS	CNS	Metabolic/ Endocrine
Renal Disease	GI / Liver Disease	Haemato Oncology	Immuno Deficiency	

ASSESSMENT			**INTERVENTION**
Airway	☐ Stable ☐ Unstable ☐ Obstructed		
Breathing	RR WOB: ☐ Grunt ☐ Retractions ☐ Shallow ☐ Normal Type of breathing: ☐ Thoracic ☐ Abdominal Added Sounds: ☐ Crepts ☐ Wheeze Color: $SPO_{2:}$		
Circulation	HR: Heart sounds: Core - Peripheral Temperature Pulse: CRT: ☐ Warm BP: MAP: ☐ Cool below Ankle Liver Span: ☐ Cool Below Thigh		
Disability	☐ A ☐ -V ☐ -P ☐ -U		
	Pupil size:		
	Nystagmus:		
	Eye Position: ☐ Mid Position ☐ Conjugate Deviation		
	Posture: ☐ Decorticate ☐ Decerebrate ☐ Flaccid		

Physiological Status

Airway	Stable	Unstable	Obstructed	Intubated
Breathing	Normal	Effortless Tachypnea	Respiratory distress	Respiratory Failure
Circulation	Normal	Compensated Shock	Hypotensive Shock	
Disability	Normal	ALOC	ICP	Seizure

Systemic examination :	
Provisional Diagnosis (Disease Based)	
Management in ER & Plan of care	**Investigations**
Other Consultations:	
☐ **Intubation** ☐ **Needle Thoracocentesis** ☐ **Inotropes** ☐ **CPR** **Notes:**	
Disposition: ☐ **Deceased** ☐ **Discharged** ☐ **Admitted** ☐ **DAMA** ☐ **Transferred to other hospital**	
Admitted In: ☐ **Wards** ☐ **NICU** ☐ **PICU**	

Special advice:	**Diet**	**Fluid restriction (if applicable)**
Signature of Attending Emergency Physician:		**Signature of Attending Nurse:**

DISEASE SPECIFIC PROTOCOLS

GENERAL MANAGEMENT OF POISONING

Airway & Breathing

Intubate when low GCS (8 or <8) , signs of upper airway edema or hemodynamic instability.
Elective intubation in case of Hair dye poisoning and Endosulphan

Circulation

ECHO and IVC diameter guided Fluid therapy and vasopressors
Refractory Hypotension – GIK and IABP

Gather information
Decontamination
Prevention of re exposure
Antidotes
Standardized ICU care which includes DVT prophylaxis, Stress ulcer prophylaxis, nutritional supplementation, infection control and other supportive care.

Key Points

- Decontamination
- GI - Gastroc :avage
- Skin. Eyes, Hair & Body Wash
- Activated Charcoal
- First Dose – 1gm/kg body weight
- Subsequent dose – 0.5gm/kg at 4th hourly

Investigations

- Investigations (5 G's in ER)
- ABG – Sytemic Acidosis – NaHco3
- Renal Replacement Therapy
- CBG – Very important TCA, oleander, digoxin, OPC and many more
- Beta HCG (Females) – consider pragnant until ruled out
- USG-Gives us an idea about fluid requirement and cardiac condition, poor cardiac contraction warrents IABP
- RFT, LFT, Electrolytes
- Toxic Screening

Dispostion

- Never disharge without psychiatric counseling
- Treat the patient & not just the poison alone
- Additional injuries & co morbids needs attention

Gross Decontamination

Decontamination is generally achieved by undressing patients completely and washing them thoroughly with copious amounts of water.

Decontamination area

Gross decontamination area should occur prior to the patient's entry into the ICU of the hospital.

The towels used to dry patients and patient clothing, shoes, socks, watches, and jewelry should be handled as hazardous waste.

Eyes

- Ocular exposures should be treated immediately by copious irrigation (usually 2 L) with NS.
- Lid retractors may be required for adequate irrigation.
- Alkalies require speci□c considerations.
- Unlike acids which can be washed off, alkalies penetrate deep into tissues. Lengthy continuous irrigation (possibly 1 or even 2 h) may be required, until the tears in the conjunctival sac have stabilized .
- The pH of normal tears is slightly acidic. The pH of NS solution is 5.6.
- Equilibration of 10 min or longer may be required for accurate pH determination.
- Ophthalmologic consultation is recommended.

Gastrointestinal Decontamination

- Each of the methods used to decontaminate the gastrointestinal (GI) tract have potential
- benefits and risks that must be considered prior to their use.
- The three general methods of decontamination involve removal of the toxin from stomach via the mouth, binding it inside the gut lumen, mechanically □ushing it through the GI tract. The toxin ingested, the time course, the patient's clinical status, and the skills of the physician at the bedside determine the choice of method(s) used.

Gastric lavage

Indication:

- Most of toxin ingestion at the life threat in doses.
- Peak effect within 1-2hrs of toxin ingestion
- After 2hrs post toxin ingestion in case of delayed gastric emptying and sustained realease tablet

Contraindications:

- Unprotected airway in patients with decreased level of conscious.
- Convulsion patients
- In patients with high risk of aspiration
- Clinically signi□cant gastrointestional hemorrhage/ perforation
- Ingestion of corrosive agent(acid/alkali)
- Ingestion of petroleum distillates
- Use of water gastric lavage should be avoided in aluminium/zinc phosphide poisoning.
- Use of water gastric lavage, it can cause hyponatremia
- Marked hypothermia

Activated Charcoal

The most appropriate agent to decontaminate the GI tract is activated charcoal, which is produced by pyrolysis of carbonaceous materials and “activation” by steam cleaning to increase its surface area.

Activated Charcoal works by absorbing the toxin within the gut lumen, making the toxin less available for absorption into the tissues.

It also enhances elimination by establishing a free-drug concentration gradient favoring movement into the GI lumen to enhance elimination (‘GI dialysis”).

The benefits of this technique:

Capability to decontaminate the gut without requiring invasive procedures, its rapid administration, and its proven safety in both adults/ and childen.

Activated charcoal is typically given in a slurry of water or juice by mouth or through a nasogastric tube, in an activated charcoal-drug dose 1kg/kg

Contraindications:

C- Corrosive, Cyanide

H-Heavy metals

A-Alcohol

R-Rapid onset of poison (cyanide)

C-Chlorine

O-Others(Iron)

A-aliphatic hydrocarbon

L-Lithium

Gastroindestinal perforation

Small obstruction

Unprotected airway

Dosage/Administrations:

Activated charcoal is best administered as a slurry form (1:8) AC with liquid

Single dose 1gm/kg via through oral/nasogatric.

MDAC – 0.5mg/kg – via through oral/nasogastric every 2-6hrs for 2days.

STROKE – CARE/ THROMBOLYSIS PROTOCOL

Patient name:		**Registration:**	**Age/Sex:**
Duration from onset:<4.5 hrs(ALERT STROKE TEAM IMMEDIATELY) **Emergency Physician Neurologist Radiologist Intensivist**			
Baseline Assessment	**Airway:** Patent Advanced airway	**Breathing:** RR:	**SPO2:**
RS		**Circulation Bp:**	**HR:**
Disability:**GCS E /V /M = /15**	**CBG:**	**IV access**	**Temp :**
Investigation	**Coagulation profile (PT/INR Elecrolytes: Creat Urea ECG**		
Plain CT Brain			

Thrombolysis check list (applicable if Thrombolysis/Mechanical Lysis is considered)

S.N	Condraindications	Yes	No
1	Intracranial hemorrhage (ICH,SAH,SDH.ETC)		
2	Major Infarction* (>1/3rd Cerebral hemisphere)		
3	CNS lesions with high likelihood of hemorrhage (Brain tumors, Abscess, vascular malformation, Aneurism, contusion)		
4	Suspicion of Subarachnoid hemorrhage		

S.N	Relative Contraindications	Yes	No
1	Recent surgery / trauma (< 15 days)*		
2	Recent Intracranial, spinal, surgery, head trauma or stroke (< 3months)*		
3	History of intracranial hemorrhage, brain aneurism, Vascular malformation, brain tumor.*		
4	Active internal bleeding (<22days)		
5	Platelets less than 100,000/Ul, PTT>40 sec after heparin use, PT>15, INR>1.7 or Known bleeding diathesis.*		
6	Left heart thrombus documented *		
7	Increased risk of bleeding due to any of the following* Acute pericarditis Sub-acute bacterial endocarditis Hemostatic deficits including those secondary to severe hepatic or renal disease Pregnancy Diabetic hemorrhagic retinopathy or other Hemorrhagic opthalmic conditions Septic thrombophlebitis at AV cannula sites Patient currently receiving oral anticoagulants,eg.Warfarin sodium and INR>1.7 Age >80yrs Full dose IV rPA given previously		
8	Life expectancy < 1 year due to severe co morbid illness *Not contraindicated for mechanical clot Lysis		

Signature & Name of the Doctor:

Instructions	Scale definition	Score
1a. Level of Consciousness	0 = Alert 1 = Not alert, but arousable by minor stimulation. 2 = Not alert, requires repeated stimulation to attend 3 = Responds only with reflex motor or autonomic effects or totally unresponsive, flaccid, are flexi.	
1b. LOC Questions	0 = Answers both questions (age & Month) 1 = Answers one question 2 = Answers neither question	
1c. LOC Commands	0 = Performs both tasks 1 = Performs one task 2 = Performs neither task	
2. Best Gaze	0 = Normal 1 = Partial gaze palsy. 2 = Forced deviation or forced gaze paresis.	
3. Visual.	0 = No visual loss 1 = Partial hemianopia 2 = Complete hemianopia 3 = Bilateral hemianopia	
4. Facial Palsy:	0 = Normal symmetrical movement 1 = Minor paralysis 2 = Partial paralysis 3 = Complete paralysis of one or both sides.	
5 & 6. Motor - Arm and Leg:	0 = No drifts RT arm score = 1 = Drift, LT arm Score= 2 = Some effort against gravity 3 = No effort against gravity, limb falls. RT leg score= 4 = No movement LT leg Score= UN = Amputation, joint fusion explain:	
7. Limb Ataxia:	0 = Absent 1 = Present in one limb 2 = Present in two limbs UN = Amputation or joint fusion	
8. Sensory	0 = Normal 1 = Mild to moderate sensory loss 2= Severe to total sensory loss; patient is not aware of being touched in the face, arm, and leg.	
9. Best Language	0 = No aphasia, normal 1 = Mild to moderate aphasia 2 = Severe aphasia 3 = Mute, global aphasia; no usable speech or auditory comprehension.	
10. Dysarthria	0 = Normal 1= Mild to moderate; patient slurs at least some words and, at worst, can be understood with some difficulty. 2= Severe; patient's speech is so slurred as to be unintelligible in the absence of or out of proportion to any dysphasia, or is mute/anarthric. UN = Intubated or other physical barrier, explain	
11. Extinction and Inattention (formerly	0 = No abnormality. 1 = Visual, tactile, auditory, spatial, or personal inattention or extinction to bilateral simultaneous stimulation in one of the sensory modalities 2 = Profound hemi-inattention or hemi-inattention to more than one modality. Does not recognize own hand or orients to only one side of space.	

TOTAL SCORE _____

Signature and Name of the Doctor:_____

NIH STROKE SCALE

STROKE –CARE/THROMBOLYSIS PROTOCOL

NIH stroke score		**Pre t-PA Check list (All boxes must have been checked before starting t- PA)**	
0= No stroke		Onset of symptoms < 4.5 hrs	
1-4= Minor stroke		No hemorrhage (ICH/SAH/SDH) in CT	
5-15= Moderate stroke		No major contraindications for Thrombolysis	
15-20= Moderate/severe stroke		Stroke team Activated	
21-42= Severe stroke		NIH stroke score > 4 and < 21	
		Consent obtained	
		Informed risks/complications and cost Fact	

TRANSFER OUT TO ICU PROTOCOL FROM EMERGENCY DEPARTMENT

ADMISSION CRITERIA

- ICU admission criteria should select patients who are likely to benefit from ICU care.
- ICU care has been demonstrated to improve outcome in severely ill, unstable patient populations.
- The ICU admission decision may be based on several models utilizing prioritization, diagnosis, and objective parameters models.

Prioritization Model

Priority 1: These are critically ill, unstable patients in need of intensive treatment and monitoring that cannot be provided outside of the ICU. Usually, these treatments include ventilator support, continuous vasoactive drug infusions, etc. Priority 1 patients generally have no limits placed on the extent of therapy they are to receive.

Examples of these patients may include post-operative or acute respiratory failure patients requiring mechanical ventilatory support and shock or hemodynamically unstable patients receiving invasive monitoring and/or vasoactive drugs.

Priority 2: These patients require intensive monitoring and may potentially need immediate intervention. No therapeutic limits are generally stipulated for these patients. Examples include patients with chronic co morbid conditions who develop acute severe medical or surgical illness. These patients may receive intensive treatment to relieve acute illness but limits on therapeutic efforts may be set such as no intubation or cardiopulmonary resuscitation.

Examples include patients with metastatic malignancy complicated by infection, cardiac tamponade, or airway obstruction.

Diagnosis Model

This model uses specific conditions or diseases to determine appropriateness of ICU admission.

A. Cardiac System

1. Acute myocardial infarction with complications
2. Cardiogenic shock
3. Complex arrhythmias requiring close monitoring and intervention
4. Acute congestive heart failure with respiratory failure and/or requiring hemodynamic support
5. Hypertensive emergencies

6. Unstable angina, particularly with dysrhythmias, hemodynamic instability, or persistent chest pain
7. S/P cardiac arrest
8. Cardiac tamponade or constriction with hemodynamic instability
9. Dissecting aortic aneurysms
10. Complete heart block

B. Pulmonary System

1. Acute respiratory failure requiring ventilatory support
2. Pulmonary emboli with hemodynamic instability
3. Patients in an intermediate care unit who are demonstrating respiratory deterioration
4. Need for nursing/respiratory care not available in lesser care areas such as floor or intermediate care unit
5. Massive hemoptysis
6. Respiratory failure with imminent intubation

C. **Neurologic Disorders**

1. Acute stroke with altered mental status
2. Coma: metabolic, toxic, or anoxic
3. Intracranial hemorrhage with potential for herniation
4. Acute subarachnoid hemorrhage
5. Meningitis with altered mental status or respiratory compromise
6. Central nervous system or neuromuscular disorders with deteriorating neurologic or pulmonary function
7. Status epilepticus
8. Brain dead or potentially brain dead patients who are being aggressively managed while determining organ donation status
9. Vasospasm
10. Severe head injured patients

D. Drug Ingestion and Drug Overdose

1. Hemodynamically unstable drug ingestion
2. Drug ingestion with significantly altered mental status with inadequate airway protection
3. Seizures following drug ingestion

E. Gastrointestinal Disorders

1. Life threatening gastrointestinal bleeding including hypotension, angina, continued bleeding, or with comorbid conditions
2. Fulminant hepatic failure
3. Severe pancreatitis
4. Esophageal perforation with or without mediastinitis

F. Endocrine

1. Diabetic ketoacidosis complicated by hemodynamic instability, altered mental status, respiratory insufficiency, or severe acidosis
2. Thyroid storm or myxedema coma with hemodynamic instability
3. Hyperosmolar state with coma and/or hemodynamic instability
4. Other endocrine problems such as adrenal crises with hemodynamic instability
5. Severe hypercalcemia with altered mental status, requiring hemodynamic monitoring
6. Hypo or hypernatremia with seizures, altered mental status
7. Hypo or hypermagnesemia with hemodynamic compromise or dysrhythmias
8. Hypo or hyperkalemia with dysrhythmias or muscular weakness
9. Hypophosphatemia with muscular weakness

G. Surgical

1. Post-operative patients requiring hemodynamic monitoring/ventilatory support or extensive nursing care

H. Miscellaneous

1. Septic shock with hemodynamic instability
2. Hemodynamic monitoring
3. Clinical conditions requiring ICU level nursing care
4. Environmental injuries (lightning, near drowning, hypo/hyperthermia)
5. New/experimental therapies with potential for complications

Objective Parameters Model

They may be modified based on local circumstances. Data demonstrating improved outcome using specific criteria levels are not available.

Vital Signs

* Pulse < 40 or > 150 beats/minute
* Systolic arterial pressure < 80 mm Hg or 20 mm Hg below the patient's usual pressure
* Mean arterial pressure < 60 mm Hg
* Diastolic arterial pressure > 120 mm Hg
* Respiratory rate > 35 breaths/minute

Laboratory Values

* Serum sodium < 110 mEq/L or > 170 mEq/L
* Serum potassium < 2.0 mEq/L or > 7.0 mEq/L
* PaO2 < 50 mm Hg
* pH < 7.1 or > 7.7
* Serum glucose > 800 mg/dl
* Serum calcium > 15 mg/dl
* Toxic level of drug or other chemical substance in a hemodynamically or neurologically compromised patient

Radiography / Ultrasonography /Tomography (newly discovered)

* Cerebral vascular hemorrhage, contusion or subarachnoid hemorrhage with altered mental status or focal neurological signs
* Ruptured viscera, bladder, liver, esophageal varices or uterus with hemodynamic instability
* Dissecting aortic aneurysm

Electrocardiogram

* Myocardial infarction with complex arrhythmias, hemodynamic instability or congestive heart failure
* Sustained ventricular tachycardia or ventricular fibrillation
* Complete heart block with hemodynamic instability

Physical Findings (acute onset)

* Unequal pupils in an unconscious patient
* Burns covering > 10% BSA
* Anuria
* Airway obstruction
* Coma
* Continuous seizures
* Cyanosis
* Cardiac tamponade

Quality of conformance

In terms of "expecting the unexpected", both environmental and human aspects need to be factored. Environmental factors should include steps to deal with equipment failure (e.g. ventilator malfunction, pump failure), loss of power (electricity), failure of supply of oxygen etc. Human aspects would include worker absenteeism, etc.

Two aspects are important in paying attention to detail viz. checklists and protocols. Checklists ensure that errors and minimized and every aspect of a particular procedure is executed (e.g. transfer out checklist) while protocols ensure that the minimum standards for a particular modality is uniformly followed.

Checklists	Protocols
Triage & Initial Assessment – Nurses	ER to ICU transfer protocol
Initial Assessment – Doctor (Adult)	ER to OT transfer protocol
Initial Assessment – Doctor (Pediatric)	General Management of poisoning
Stroke Checklist	

ESTABLISHING A QUALITY DEPARTMENT

Establishment of Quality Department is essential in order to examine the association between the scope of quality improvement (QI) implementation in hospitals and hospital performance on selected indicators of quality.

Various key performance indicators (KPI) may be set by an identified champion/s from the Emergency Department who may be certified through programs such as AHPI (certified internal auditor program)/ CAHO – Certified Professional in Quality Implementation in Hospital (CPQIH) & with help from external agencies such as NABH. Reviews on various aspects of improving Key Performance Indictors (KPI) must be taken up as a continuous process in order to reduce errors. coordinate care among settings and practitioners and ensure relevant, accurate information is available when needed as critical elements in providing high level of care. Quality control practices followed by the ISRO look at zero errors, however in collaboration with external agencies such as NABH, AHPI, CAHO and QCI Emergency Departments across the country can move towards minimizing errors.

CALIBRATION OF INSTRUMENTS

1. It is extremely important in achieving quality control of the highest standard in medical equipment.
2. Periodic checks at least once a year is essential in achieving this goal.
3. Can be done for a range of equipment including Defibrillators, Ventilators, Pulse Oxymeters, Infusion Pumps, Patient Monitors etc.
4. This may be done as per a set of National and international standards by trained engineers with help of specialized testing and calibrating equipment as per manufacturer recommendations.
5. It should be concluded by documenting test results and issuing a calibration report.

Any measuring equipment or device needs to be tested and checked for its accuracy and calibrated whenever need arises. Testing is done as per domestic standards which implies in accordance with manufacturer specifications, for both safety and performance tests. The results need to be formally documented.

Key Parameters for testing and calibrating for example may include

1. Defibrillators: Electrical safety tests, Biphasic energy measurements, ECG, performance and arrhythmia simulation, wave form simulation
2. Pulse Oxymeter : Electrical safety, O2 saturation, Heart Rate, Pulse amplitude, Selectable pigmentation and ambient light condition
3. Infusion Pumps: Flow rates, Occlusion alarm tests, Pressure
4. Ventilators: Modes, Lung Parameters etc.

The entire activity must be subjected to appropriate methods of internal control and inspection.

SHARING BEST PRACTICES

A "Best Practice" can be defined as a technique or methodology that has proven reliably to lead to a desired result.

At a minimum, a best practice should:

- Demonstrate evidence of success
- Affect something important (eg. safety, wait time)
- Have the potential to be replicated to other settings
- Evidence based protocols/guidelines must be incorporated to deliver care
- Guidelines can improve patient safety, streamline methods of care, lower costs and increase efficiency
- Communication and academic discussions among Clinicians and Department staff may ensure a smooth process for implementation of guidelines eg. Hand washing practices/ Reducing rates of Central venous catheter related infection.
- Ensure guidelines are updated regularly
- Institutional support from leadership and making evidence based guidelines a habit among all levels of staff

AVOIDANCE OF MANUAL INTERVENTION / DIGITIZATION

Opportunities for using data to improve the health system are partially driven by technological advances. New analytical methods, more efficient processing, and automation of routine analyses and analytics, for example, make it easier to draw insights from health data and to present the resulting information in an actionable format .

In the clinical setting, secondary use of health data can improve quality initiatives and the effectiveness of front-line care.

For health system management, health data can be used to manage and improve the effectiveness and efficiency of the health system by informing program, policy and funding decisions. For example, costs can be reduced by identifying ineffective interventions, missed opportunities and duplication of services.

To facilitate health research, health data can be used to support research that informs clinical programs, health system management, and population and public health. Such research spans multiple fields.

PROCESSING PATIENT FEEDBACK

Patient feedback systems are used to :

- Know their experiences when visiting the hospital;
- Understanding of the services hospitals offer; and
- Opinions on changes you may have recently introduced or plan to make

With a good feedback system, one can increase your understanding of what patients think about a hospital, understand areas
of concern and take action to transform the experience for patients. One can make changes and use the system to monitor patient reaction, gradually improving the practice based
on accurate feedback .

Few key considerations worth noting:

- Patient experience measures should be developed with patient input to ensure that they are representative of their needs , values and preferences
- These measures reveal critical information about the extent to which care is truly patient centred
- Patient experience measures provide a rigorous, validated alternative to the subjective reviews that are posted on a large number of review sites

ER PATIENT SATISFACTION SCORE SAMPLE FORMAT

ACCIDENT AND EMERGENCY MEDICINE	1 Very poor	2 poor	3 Fair	4 Good	5 Very Good
ARRIVAL					
Cleanliness of the Emergency Department					
Waiting time before staff noticed your arrival					
Waiting time in the treatment area, before you / your relative or child was seen by a doctor					
NURSES					
Courtesy of the nurses (Greeting / Introducing)					
Nurses' concern for you / your relative or child privacy					
Nurses' concern to keep you informed about the treatment plan					
Nurses response when you wanted / expected them at your bed side.					
DOCTORS					
Courtesy of the Emergency Room Doctor (Greeting / Introducing)					
Degree to which the ER doctor took the time to listen to you / your relative or child complaints					
ER Doctor's concern to keep you / your relative informed about emergency treatment & further Treatment plan					
Degree to which the ER doctor spent his/her total time with you / your relative or child					
How well you / your relative or child pain was controlled					
Doctors response when you wanted / expected them at your bed side.					
TESTS					
Concern shown for you / your relative or child comfort when his/her blood was drawn					
OTHERS					
How well were you kept informed about delays (Lab reports / specialist consultation / Admission / Discharge)					
Information you were given about caring for you / your relative or child at home (e.g. taking medications advised, getting follow-up medical care)					
Billing / Admission / Discharge coordination by the coordinator					
General behaviour of staffs / doctors (Loud chatting, laugh,any disturbing behavior in the emergency Room)					
OVERALL ASSESSMENT					
Likelihood of your recommending our Emergency Department to others					
Overall rating of care received during your / your relative / your child's visit					
Any other specific feedback on a particular staff / Doctor / team ?					

SPEEDY SERVICE

Other than the time lines mentioned at the 4 priority levels, other measures that may be undertaken to reduce times:

- Gather prior information about arrival of patient
- Delegate Documentation to other trained staff
- Create appropriate policies in order to reduce time
- Use telecommunication systems to deliver relevant information about patient from the time of first paramedic contact

IMPROVED REVIEW MECHANISM

AUDIT :

Clinical audit is the review of clinical performance against agreed standards, and the refining of clinical practice as a result – a cyclical process of quality improvement in clinical care.

Clinical audit is the systematic critical analysis of the quality of healthcare, including the procedures used for diagnosis, treatment and care, the use of resources and the resulting outcome and quality of life for patients.

Clinical audits monitor the use of particular interventions, or the care received by patients, against agreed standards. Any deviation from 'best practices' can then be examined in order to understand and act upon the causes.

1. Standards-based audit (criteria-based audit)
   This is the recommended process. Current practice is compared against defined criteria, standards or best practices, through the 'audit cycle'

2. Peer review audit
   With the benefit of hindsight, the quality of services provided is assessed by a team, reviewing case notes and seeking ways to improve clinical care. This is especially applicable in 'interesting' or 'unusual' cases.

3. Significant event audit
   Adverse occurrences, critical incidents, unexpected outcomes, and problematic cases causing concern are reviewed systematically and solutions implemented.

4. Surveys
   Targets for opinions or suggestions may include patients or special focus groups. Information gathered is then analyzed and change implemented as appropriate.

Stages of an Audit :

1. Prepare and plan for the project
2. Select an area to auidt
3. Defining criteria and setting up standards
4. Collection of data
5. Analyze results
6. Identify solutions for improvement and implement changes
7. Re audit to monitor the impact of changes (close audit loop)

This must be led by Senior clinicians in the department and must be reported to the audit review boards and discussed with higher stakeholders for implementation and continuous improvement

TEST OPTIMIZATION

In the Emergency Department, accurate diagnosis in a minimum of time is critical to ensure the best patient outcomes. Every minute is essential. High risk patients with potentially life threatening conditions must be identified quickly and appropriate treatment initiated. At the same time, cost containment and optimized patient flow management are also essential.

Use of protocols play an important role for example the latest guidelines for diagnostic management of acute venous thromboembolism, which recommend using algorithms that combine clinical probability assessment with a quantitative D-Dimer test . This limits the number of required imaging tests, offering cost saving and prevention of patient harm or Troponin I may safely rule-out and accurately rule-in acute Myocardial Infarction (Non ST Elevation Myocardial Infarction) in 70% of suspected chest pain patients when sent at an appropriate time.

Patient-centered outcomes research as applied to optimization in tests such as those mentioned above or diagnostic imaging includes the engagement of patients in the decision-making process to order imaging, deliver the results to patients and caregivers, and follow up incidental findings from the diagnostic test. One aspect of patient-centered care is the process of shared decision-making, which allows patients and their providers to make health care decisions together, taking into account the best scientific evidence available, as well as the patient's values and preferences.

Clinical decision rules (CDRs) are evidence-based algorithms derived from original research and are used to provide guidance for clinical decision-making. They can either be "directive" (suggesting a course of action) or "assistive" (providing evidence to enhance clinical judgment). Well-validated CDRs can potentially reduce the use of diagnostic tests and empower clinicians with risk assessments for a given constellation of clinical symptoms and signs. They can also serve to reduce inappropriate variation in practice by offering evidence to assist the clinician at the point of care.

WORK CULTURE

SAFETY

Various factors compromise the security of working doctors in the emergency rooms. Few of these include :

1) 24 hour accessability of the emergency department
2) Lack of adequately trained armed or security guards
3) Patient pain and discomfort
4) Family member stress due to patient's condition and fear of the unknown
5) Family member anger related to hospital policies and the health care system in general or Cramped space
6) Long wait times

At a minimum, workplace violence prevention programs should:

1. Create and disseminate a clear policy of zero tolerance for workplace violence, verbal and nonverbal threats and related actions.
2. Ensure that managers, supervisors, coworkers, clients, patients and visitors know about this policy.
3. Ensure that no employee who reports or experiences workplace violence faces reprisals.
4. Encourage employees to promptly report incidents and suggest ways to reduce or eliminate risks.
5. Require records of incidents to assess risk and measure progress.
6. Outline a comprehensive plan for maintaining security in the workplace. This includes establishing a liaison with law enforcement representatives and others who can help identify ways to prevent and mitigate workplace violence.
7. Assign responsibility and authority for the program to individuals or teams with appropriate training and skills.
8. Ensure that adequate resources are available for this effort and that the team or responsible individuals develop expertise on workplace violence prevention in health care and social services.
9. Affirm management commitment to a worker-supportive environment that places as much importance on employee safety and health as on serving the patient or client

REFERENCE TO INTERNATIONAL STANDARDS

Developing benchmarks to incorporate best practices is absolutely essential to maintain quality in health care. Quality Governing bodies such as QCI and accreditation boards like the NABH work in collaboration with hospitals across the country to achieve the same. Bench marking of a partcular standard may be derived from the best eviidences in clinical practice or standards set by external agencies such as the WHO or NABH. Further, continuous audits and statiscal analysis by existing quality departments across hospitals may ensure implementation and impact of implementation as a pre-requiste to continuous qualty improvement. Potential key performance indicators may also be identified.

Also benchmarks can be internal based on the measuered performances of the department.

COMMUNICATION

All emergency departments has to ensure that the patients, relatives, the primary physician are well informed about the clinical status of the patient through a structured communication protocol. One of the best references for health care communication best practice is the “Communication, Care, Cure” by Dr Alexander Thomas. A communication checklist to ensure adequate communication has taken before disposition needs to be implemented in all emergency departments.

COMMUNICATION SHEET

Patient Name : **Hospital ID:** **Date:**

Triage	Red	Yellow	Green	Black	**Check**
Priority	1	2	3	4	✓
Pre-Resuscitation Briefing to patient/attender					
Post Resuscitation debriefing to patient/attender					
PLAN OF CARE to patient/attender					
NATURE OF ILLNESS to patient/attender				Stable	
				Sick	
				Critical	
PROCEDURES TO BE UNDERTAKEN to patient/attender				Life saving	
				Others	
LAB / Diagnostics reports to patient/attender				Critical	
				Non Critical	
Life Threatening Events / Injuries to patient /attender					
Handover during shift change/transfer in ER(Doctor to doctor/ doctor to staff)					
Name& Sign of the Doctor who has taken over					
Name& Sign of the staff who has taken over					
Update to admitting primary treating physician					
Handover in treating unit (example ICU) Name& Sign of the doctor who has taken over in treating unit					
All boxes need to be checked/filled for safe disposition					

Name & Sign of Attending Emergency Physician :

Attending Emergency Nurse :

QUALITY OF PERFORMANCE

Two sub domains could be considered – quality indicators and performance analysis

Quality indicators	Performance analysis
Door to triage time (Nurse)	Audits
Door to Doctor time	Doctor Initial Assessment time Audit
Door to needle time in Stroke thrombolysis	Audit
Pain score assessment	Audit
Investigation return time	Audit
Nurse / Patient ratio	Audits
Patient satisfaction level	Feedback
Time taken for discharge	Audit
Mortality – ER mortality	Audit
Process parameters - length of stay, Left without been seen by doctor, Pain assessment	Audit and RCA
Safety - patient falls, medication error, failed-intubation rate	Incident reporting &RCA
Infections - hand hygiene compliance	Audit

Door to Triage Time

Indicator	Descriptor
Description	Time Interval of Patient Arrival to nurse triage
Type of parameter	Outcome
Formula	Time from patient arrival to time when triage is completed for a particular category of patients
Benchmark	Does not exist
Action plan	Ensure quality in design, conformance

Door to Doctor Time

Indicator	Descriptor
Description	Incase of emergency the time shall begin from the time the patient's arrival at the emergency till the time that the initial assessment is completed
Type of parameter	Outcome
Formula	Sum of the time taken for assessment / Total number of patients in emergency
Benchmark	Does not exist
Action plan	Ensure quality in design, conformance

Door to needle Time in stroke thrombolysis

Indicator	Descriptor
Description	Incase of a cute onset ischemic stroke in window period
Type of parameter	Morbidity in stroke
Formula	Number of stroke patients thrombolysed / Number of eligible stroke patients for thrombolysis
Benchmark	Does not exist
Action plan	Ensure quality in design, conformance

Mortality parameter

Indicator	Descriptor
Description	Standardized mortality rate (SMR)
Type of parameter	Outcome
Formula	Number of deaths / Number of discharges and deaths x 100
Benchmark	WHO parameter?
Action plan	Ensure quality in design and conformance

Patient satisfaction (Effective Communication)

Indicator	Descriptor
Description	Efficacy of communication
Type of parameter	Process
Formula	Quarterly Average score / Max Score possible x 100
Benchmark	Not known
Action plan	Through Patient satisfaction

Patient fall rates

Indicator	Descriptor
Description	Patient fall rate
Type of parameter	Safety; morbidity
Formula	Number of falls/number of bed days
Benchmark	8.46/1000 bed days
Action plan	Ensure quality in design (beds) and conformance (sedation)

Medication errors

Indicator	Descriptor
Description	Medication error
Type of parameter	Safety
Formula	(Number of errors/number of bed days) x 1000
Benchmark	1.2 to 947/1000 bed days (reported); no benchmark
Action plan	Clinical pharmacists; process (2-people check)

Compliance to hand-hygiene protocols

Indicator	Descriptor
Description	Compliance to hand hygiene
Type of parameter	Infection; outcome; safety
Formula	(Number adhered/Total number of procedures) x 100
Benchmark	90% adherence
Action plan	Surveillance; health education

Investigation return time

Indicator	Descriptor
Description	Radiology CT investigation report
Type of parameter	Adherence to protocol
Formula	Time of order to time of reporting
Benchmark	60 minutes
Action plan	Clinical Audit

Length of Stay in ER

Indicator	Descriptor
Description	Average length of stay
Type of parameter	Adherence to protocol ,safety
Formula	Total length of stay of all patients in hours / total number of patients
Benchmark	240 minutes
Action plan	Audit

Nurse Patient ration in ER

Indicator	Descriptor
Description	Nurse per bed per shift
Type of parameter	Safety, mortality, morbidity
Formula	Number of nurse / number of beds in each shift
Benchmark	Does not exists
Action plan	Audit

Pain Management in ER

Indicator	Descriptor
Description	Proportion of patients presenting with pain in whom validated pain score is documented
Type of parameter	Key performance indicator
Formula	Patients with pain assessment using validated score / Total number of patients presented with pain x 100
Benchmark	Does not exists
Action plan	Audit

Time taken for discharge

Indicator	Descriptor
Description	Discharge is the process by which a patient is shifted out from the ED with all concerned medical summaries after ensuring stability
Type of parameter	Safety
Formula	Sum of time taken for discharge / Number of patients discharged
Benchmark	Does not exists
Action plan	Audit

Left Against medical Advice

Indicator	Descriptor
Description	Percent of patients who leave the ED before examination
Type of parameter	Safety
Formula	Total number of patients who leave ER before seen by doctor / total number presented to ER during the time of study X 100
Benchmark	Does not exists
Action plan	Audit

Non conformance control and management:

Any non conformance observed should be properly reported through Incident reporting system which will be reviewed by a multidisciplinary committee and Quality department of the hospital.

The Non conformances could be

a) Near Miss

b) Medical error

c) Sentinel event

An RCA for all the non conformances (Near miss, Medical error) post event by a institutional quality team monthly and in case of sentinel event – Immediately post event. All NCR's recorded and discussed in periodic Quality reviews .

Configuration Control and Management under Quality of Design :

Any process change in hospital flow system or physical layout or functions related to assignment pattern of Doctors /staff need to reported and discussed in the leadership team meet of the institution along with the justification of such a change and approval.

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Contact details

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The effectiveness of the healthcare delivery system, depends on a very complex and varying interplay of several factors. This makes it vulnerable to a high incidence of errors, especially in the emergency and Critical Care departments. Even in the better developed healthcare systems of the west, it is estimated that the incidence of preventable errors leading to patient death is equivalent to a few aeroplane crashes for every 100 flights.

When Dr. Alexander Thomas shared this startling information with Dr. K Kasturirangan, former chairman ISRO, the revelation led to an interesting series of events that has come up with a solution to the problem. ISRO, one of the largest and most successful space organisations in the world, has an immaculate performance record. The thought dawned; why not incorporate ISRO's best practices into healthcare, specifically in the areas of emergency and critical care, to make patient care safer?

This suggestion was explored by Chairman, ISRO, Shri A S Kiran Kumar along with AHPI (the Association of Healthcare Providers -India), CAHO (the Consortium of Accredited Healthcare Organisations), SEMI (the Society of Emergency Medicine India), ISCCM (the Indian Society of Critical Care Medicine) and the National Accreditation Board for Hospitals and Healthcare Providers (NABH). Under his exemplary leadership and farsightedness, this document, which is the result of the collaboration between these organisations, is a joint endeavour to improve patient safety in the high mortality areas of emergency and critical care medicine.

This document can be used as a ready reckoner in the emergency and intensive care unit set up to improve patient safety.

The Health QUEST Team