FOREWORD

Trauma has been one of the world leading health problems especially with high rate of morbidity and mortality in the third world country. In Ethiopia, Nowadays, the burden of trauma become a major challenge due to urbanization, increasing industrialization and infrastructure development, high number of population and changes in way of living. To accommodate the situation Federal Ministry of Health has been playing a great role on establishing Trauma center with focus on preventing injury and promoting safety.

This Trauma Management System guideline is the result of a tremendous amount of effort from FMOH, as well as many other contributors. It is the first for its kind in a nation that helps to improve outcomes for injured patients through better trauma management system, organization and planning of trauma care services.

This guideline is intended to primarily serve health care providers and mangers at all levels of health care system. It is believed to aid the target users by way of providing clear guidance in the provisions of standardized trauma care in their respective setups and level of care. Finally, I wish to extend my heartily gratitude for all individuals and institutions that have contributed to the realization of this document.

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Abbreviations

AaBT	Addis Ababa Burn & Trauma
ATLS	Advanced trauma life support
BLS	Basic Life support
CT	A computerized tomography
DALY	Disability Adjusted Life Years
ED	Emergency Department
EMS	Emergency medical services
EMTF	Emergency medicine task force
F MOH	Federal Ministry of Health
GCS	Glasgow Coma Scale
HIV	Human Immunodeficiency Virus
ICU	Intensive Care Unit
KPIs	Key Performance Indicators
MCIs	Mass Casualty Incidents
MRI	Magnetic Resonance Imaging
OR	Operation Room
QMO	Quality Management office
RTA	Road Traffic accident
RTI	Road Traffic Injury
SOPs	standard operating procedures
TASH	Tikur Anbessa Specialized Hospital
TBSA	Total Body Surface Area
WHO	World Health Organization

1. Introduction

Injury has been traditionally been defined as physical damage to a person caused by an acute transfer of energy (mechanical, thermal, electrical, chemical, or radiation energy) or by the sudden absence of heat or oxygen. Injuries are most commonly categorized due to unintentional trauma (such as road vehicular accidents resulting in fractures, head injuries, burns, lacerations, falls, domestic, industrial and sport accidents) and intentional trauma (for instance from self-inflicted injuries and violence). Another dimension is the occurrence of war-related trauma in some regions, further compounding the burden of trauma. Furthermore, undocumented traumatic injuries are often encountered in the informal health sector that runs parallel to structured health systems, such as traditional bone setters.

Trauma accounts for a significant proportion of death and disability globally, and the impact is particularly enormous in developing low- and middle-income countries. It also a major but neglected public health challenge that requires concerned efforts for effective and sustainable prevention. Worldwide, an estimated 1.2 million people are killed in road crashes each year and as many as 50 million are injured furthermore, according to the World Health Organization, the number of road traffic deaths is expected to increase by 80% up to 2020. Globally, road traffic injuries are ranked ninth among the leading causes of disability adjusted life years lost (DALY), and their ranking is projected to rise to third by 2020. World report on road traffic injury showed that the number of road traffic injuries has continued to rise in the whole world, but there has been an overall down ward trend in road traffic deaths in high-income countries since the 1970s and an increase in many of the low-income and middle income countries. Deaths related to road traffic injury (RTI) are predicted to increase by 83% in low-income and middle-income countries and to decrease by 27% in high-income countries. 90% of road traffic deaths occurred in low-income and middle income countries, where 81% of the world's population live and own about 20%of the world's vehicles.

African countries had the highest mortality rate, with 28.3 deaths per 100,000 populations. The problem is increasing at a fast rate due to rapid population growth, urbanization and other factors while road traffic accidents account for about one-quarter of injury-related deaths in the continent

Overall, in Egypt 64%, in Tunisia 58%, and in Morocco51% were injury-related deaths in 2008. In Libya 43%, in Djibouti 42%, in Mauritius 37%, in Namibia 36%, and in Niger 34% have road traffic accident related deaths. The most economically active people (aged 15–59) are at the greatest risk of dying as a result of RTI. For this age group, road traffic accidents affected more than three times as many males as females. Overall, 5% of deaths among males aged 15–59 are attributable to road traffic accidents, but this percentage rises to 6.5% for males in the 15–29 age group in Sub-Saharan Africa. Kenya has one of the highest road fatality rates in Africa at68 deaths per 10 000 registered vehicles and between 45 and 60% of admissions to surgical wards in public hospitals as a result of road traffic injuries. Nine of the 36 articles reported percentage distribution of Mortality by Mechanism of injury and the rates of death from RTAs and interpersonal violence are generally higher with an average weighted pool percentage of 37.5% and 24.1% respectively.

The Ethiopian National Road Safety Coordination Office cites a road crash fatality rate of 114 deaths per 10 000 vehicles per year. In Ethiopia RTAs were the leading cause of injury among lists of unintentional injuries followed by fall (16%) machine/tools injury (5.9%), burn (5.3%), poisoning (1.0%) and Animal bite (1.3%). Trauma from interpersonal violence is the leading causes of intentional injury (24.4%) reported followed disproportionately low incidence of Fire arm (5%) and Self-harm injuries (2.1
Tikur Anbessa Specialized Hospital served as a trauma center in our country for many years. Mean while due to rapid population growth and an increment in need for health service care there is a high trauma patient flow where only one center could not handle them anymore. Therefore federal ministry of health took the initiative together with stakeholders to expand the field in two hospitals in addition to TASH, (AaBT & Alert) and tried to improve the survival outcome of injury by emphasizing on restoring post trauma function appearance and confidence by enabling a considered multidisciplinary approach at all stages of managements.
Strategies considered in this trauma management guidelines are to include trauma as part of the national health agenda, drive effective prevention program, including trauma educationalcampaigns in Schools and community, create a central registry of trauma to document extent of traumas and Improve pre-hospital care in addition to that promotion of better referral

systems based on triage, develop regional centers of excellence with advanced trauma care are some priority areas nationally basic trauma care providing at primary and basic hospitals, to achieve health needs based on priorities defined locally, with optimization of existing facilities to achieve minimally acceptable standards of care, Implement cost-effective treatment approaches(re-use/recycle/adapt available resources) and to develop a national body of trauma professionals to educate healthcare staff is mandatory.

Trauma patients require specialized treatment and access to care. Available literature strongly supports the belief that trauma-related mortality can be reduced through early definitive care delivered via a multidisciplinary approach and early access to the patients within the golden hours. In the developing countries like ours, there is a wide gap between the number of trauma patients and available resources to manage them. There is only three functional specialized trauma unit/center in our country. So, some of severe trauma patients, who require specialized care, are forced to be managed in general hospitals in the hands of general practitioners or surgeons who do not have specialized training in managing trauma patients. In addition to that there is a high flow of patients to the available trauma center with unnecessary referral which can be managed by lower health care level. Our community is not aware of the preventive measures of injuries and inadequate manpower due to that there is higher mortality and morbidity from trauma. To overcome the above listed problems there is a need to develop national trauma system guideline.

Rational

Although injury is not necessarily the first condition that comes to mind when one considers the health problems of the developing world, it actually represents a major issue unfortunately, the available evidence suggests that this situation will only worsen in the foreseeable future. By the year 2020, initial projections were that injury will account for fully 20% of the global burden of disease, with road traffic injuries representing the third leading cause of lost DALYs. Even with updated estimates accounting for higher rates of HIV incidence and prevalence compared to the initial data set used in the burden of disease study, road traffic crashes alone are projected to rank fourth. Although injuries are causing devastating problems, in Ethiopia little attention is given to injuries where as Injuries constitutes around a half of all surgical emergencies and was the primary

reason for an emergencies hospital visit in Addis Ababa. With effective and efficient resource allocation, health policy and management would make a difference in the diagnostic and therapeutic perspectives.

Trauma is a major public problem (challenge) in our country. There are several guidelines done globally but there is no guideline in our country Ethiopia related to trauma Therefore, this guideline will be important to provide a quality service for acute and chronic trauma patients and ensure coordinated, organized and safe admission, discharge and transfer of patients which overall decreases the burden of death and disabilities. It also provides the baseline information for policy makers, health professionals and to develop further guidelines related to trauma. With a well designed trauma management guidelines and effective and efficient resource allocation, health policy and management would make a difference in the diagnostic and therapeutic perspectives.

General objectives

- To develop trauma system standards that promotes prevention and ensure access to quality of trauma care so as to reduce burden of trauma and maximized survival and functionality.

Specific objective

- Ensure appropriate utilization of available resources.
- Promote effective communications among the trauma facilities.
- Provide optimal patient care by defining specific responsibilities for each level of Trauma care
- To aid physicians and nursing staff in determining whether a patient is appropriate for admission and discharge by setting Trauma patient's admission and discharge criteria.
- TO provide a coordinated and systematic means of delivering care to trauma patients in the Nation.
- To improve the outcomes of trauma patients through efficient use of pre-hospital and hospital resources.

Aim

- Aims at designing a trauma system that can provide a practical framwork for trauma management at the national level.

Scope

- This guideline is applicable for all health facilities that provide trauma care system.

Definitions of terms

Trauma - a term derived from the Greek for "wound"; it refers to any bodily injury.
Trauma care system - an organized approach to treating patients with acute injuries; it provides dedicated personnel, facilities, and equipment for effective and coordinated trauma care.
Injury - the result of an act that damages, harms, or hurts; unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical or chemical energy or from the absence of such essentials as heat or oxygen.
Dispatch - coordination of emergency resources in response to a specific event.
Emergency medical services (EMS) - an arrangement of personnel, facilities and equipment for the effective and coordinated delivery of emergency health services to public.
Emergency medical services system (EMS) - a system that provides for the arrangement of personnel, facilities, and equipment for the effective and coordinated delivery of health care services in appropriate geographical areas under emergency conditions.
Response time - the time lapse between when an emergency response unit is dispatched and arrives at the scene of the emergency.
Designation - formal recognition of hospitals as providers of specialized services to meet the needs of the severely injured patient; usually involves a contractual relationship and is based on adherence to standards.

Current Status

Current Status of Trauma Care and Trauma Management System in Ethipia

- Trauma management 1903-1987: Trauma care provided as part of medi cal care in Hospitals established for army units (D. Menlik, Jugol, later Hiwot Fana)

- 1987-2006: with Health system development reforms Health systems categorized into primary, general and tertiary care. Trauma and emergcy management were provided at all levels with varying levels of care. But there was no recognizable prehospital care apart from transportation by Red Cross and community interventions.
- 2006-now: by 2006 at TASH emergency medicine task force (EMTF) was organized to establish emergency medicine in Ethiopia. In the past 10 years the task force, along with the support of different partners and the university has introduced Emergency medicine residency for physi cians with 15 graduates now; Emergency and critical nursing specialty at MSc level; established emergency medicine department at TASH; has emergency medicine training center which is providing short courses and so far over 9000 professionals at different levels have been certified. The task force has also been closely supporting FMOH emergency and critical care development and has been vital in assisting on establishment of emergency coordination team, trauma units and ICUs .It is also giving technical support to fire and emergency authority in Addis Ababa. Currently about 10 hospitals are staffed by either emergency physicians and/or Emergency and Critical Care nurses graduates from the postgradu ate programs.
- Previously it was only TASH which was giving specialty care to all cate gories of trauma patients but currently trauma center is established at AaBET(St paul) and ALERT hospital to handle all patients. Specialized burn care center is only located at Yekatit 12 hospital.
- In the country there was no any prehopsital care activity but in the past decade in Addis Ababa fire and emergency authority has been established and providing coordinated care in these emergencies. Moreover, in Addis Ababa there is Emergency coordination team which is coordinating all emergencies at prehospital and facility and levels and is creating harmo nies referral from one facility to the other.

The hospital care is being designed and under frequent improvement. As to the pre-hospital care, there are public and private agencies working in separate disintegrated way. These shows lack of an integrated system where there are more than 3 call systems where they are not linked….. Plus, there are no

clearly defined plans for future plan. An overarching plan to identify goals and objectives to address important trauma system development issues such as trauma center location and category, regional trauma system design, EMS field triage criteria and destination protocols, data needs, and development and implementation of a performance improvement system is needed to guide and refocus the energy of the many dedicated and limited Emergency and trauma professionals across Ethiopia.

System Integration

Trauma system integration is essential for the daily care of injured people and includes such services as mental health, social services, child protective services, and public safety. The trauma system should use the public health approach to injury prevention to contribute to reducing the entire burden of injury in the nation or region. This approach enables the trauma system to address primary, secondary, and tertiary injury prevention through closer integration with community health programs and mobilizing community partnerships. The partnerships also include mental health, social services, child protection, and public safety services. Collaboration with the public health community also provides access to health data that can be used for system assessment, development of public policy, and informing and educating the community.

Integration with EMS is essential because this system is linked with the emergency response and communication infrastructure and transports severely injured patients to trauma centers. Triage protocols should exist for treatment and patient delivery decisions. Regulations and procedures should exist for online and off -line medical direction. In the event of a disaster affecting local trauma centers, EMS would have a major role in evacuating patients from trauma centers to safety or to other facilities or to make beds available for patients in greater need.

The trauma system is a significant state and regional resource for the response to mass casualty incidents (MCIs). The trauma system and its trauma centers are essential for the rapid mobilization of resources during MCIs. Preplanning and integration of the trauma system with related systems (public health, EMS, and emergency preparedness) are critical for rapid mobilization when a disaster or MCI occurs. The extensive impact of

disasters and MCIs on the functioning of trauma centers and the EMS and public health systems within the affected region or state must be considered, and joint planning for optimal use of all resources must occur to enable a coordinated response to an MCI. Trauma system leaders need to be actively involved in emergency management planning to ensure that trauma centers are integrated into the local, regional, and state disaster response plans.

Current challenges in trauma management

- Inadequate pre-hospital trauma care protocol
- Lack of knowledge and skilled personals of emergency trauma care staff
- Brain Drain of health professionals
- Lack of trauma patients admission, transfer and discharge criteria
- Limited trauma centers
- Poor or absence of trauma system integration
- Inadequate training of health professionals on trauma care
- Lack of awareness among hospitals' senior management on emergency care
- Lack of Appropriate infrastructure and resources
- Lack of community awareness on trauma management and their pater naization of traditional healers like. wogesha before visiting or consider ing the health professionals.

Level of trauma care

Level I

Elements of Level I Trauma Centers Include:

- 24-hour in-house coverage by general surgeons (emergency Medicine), and prompt availability of care in specialties such as orthopedic surgery, neurosurgery, anesthesiology, vascular surgery ,emergency medicine, radiology, internal medicine, plastic surgery, oral and maxillofacial, pedi atric gynecology & obstetricians, neonatologists and critical care. Cardac surgery, hemo dialysis and micro vascular surgery are available in Level I Trauma Center.
- 24 hrs blood transfusion availability, (A minimum number of blood stocked)
- 24hrs functional laboratory service
- 24 hrs OR availability

- 24 hrs ICU coverage
- 24 hrs availability of advanced imaging (CT scan, MRI, Angiography)
- Advanced pre hospital and liasioning service
- Referral resource for communities in nearby regions.
- Provides leadership in prevention, public education to surrounding com munities.
- Provides continuing education of the trauma team members.
- Incorporates a comprehensive quality assessment program.
- Operates an organized teaching and research effort to help direct new innovations in trauma care.
- Program for substance/ Sexual abuse screening and patient intervention.
- Meets minimum requirement for annual volume of severely injured patients.
- Provides trauma prevention and to continuing education programs for staff.
- Provide proper rehabilitation for those who need the service
- Ensures Trauma team preparedness,

Level II

A Level II Trauma Center has the ability to provide prompt assessment, resuscitation, stabilization, OR Service and intensive care for injured patients.

Elements of Level II Trauma Centers Include:

- 24-hour immediate coverage by emergency medicine physicians and the prompt availability of general surgeons, Gynecologist & obstetri cian, pediatrician, internist and anesthesiologists, orthopedics surgeon
- 24 hrs availability of OR services.
- 24 hrs availability of blood transfusion (minimum stock available)
- 24 hrs availability of imaging services (x-ray, U/S, CT Scan???)
- Incorporates a comprehensive quality assessment program
- Has developed transfer agreements for patients requiring more compre hensive care at a Level I Trauma Center.
- Provides back-up care for rural and community hospitals.
- Offers continued education of the nursing and allied health personnel or the trauma team.

Involved with prevention efforts and must have an active outreach program for its referring communities

Level III

A Level III Trauma Center has demonstrated an ability to provide advanced trauma life support (ATLS) prior to transfer of patients to a higher level trauma center. It provides evaluation, stabilization, and diagnostic capabilities for injured patients.

Elements of Level III Trauma Centers Include:

- Basic emergency department facilities to implement ATLS protocols and 24-hour laboratory coverage. Available trauma nurse(s) and physi cians available upon patient arrival.
- May provide surgery and critical-care services if available
- Has developed transfer agreements for patients requiring more compre hensive care at a Level I or Level II Trauma Center.
- Incorporates a comprehensive quality assessment program
- Involved with prevention efforts and must have an active outreach program for its referring communities.

Level IV

Trauma Center provides initial evaluation, stabilization and diagnostic capabilities and prepares patients for transfer to higher levels of care.

Elements of Level IV Trauma Centers Include:

- Basic emergency department facilities to implement ATLS protocols
- Available trauma nurse(s) and physicians available upon patient arrival.
- Has developed transfer agreements for patients requiring more compre hensive care at a Level I though III Trauma Centers.
- The documents below are only be used for level 1 and 2 trauma center.

Criteria for Adult Trauma Alert

A. Mandatory Criteria

1. Trauma Alert Red

A Trauma Alert Red will be issued for any trauma patient: if patient exhibits two or more of the following criteria:

- Any with documented hypotension (Systolic B/P < 90)
- GSW to neck, chest or abdomen
- GCS < 8 with mechanism attributed to trauma
- Patient with respiratory compromise or obstruction:

Indicates intubation of trauma patient from the scene Includes intubated patients transferred from referring hospital with ongoing respiratory comprise .Does not include intubated patients from referring hospital who are stable from a respiratory standpoint

- Transfer trauma patients receiving blood to maintain vital signs

2. Trauma Alert? orange

- A Trauma Alert ?orange will be issued if a patient exhibits one or more of the following criteria: -
- Any intubated trauma patient
- Respiratory rate < 10 or > 30
- Glasgow Coma Scale (EMV) < 12
- Penetrating trauma to head
- Stab wounds to neck, chest, abdomen, back or pelvis
- 2nd or 3rd degree burn > 20% TBSA
- Spinal Cord Injury – Suspected or known
- Pregnant trauma patient > 24 weeks gestation
- Age > 65 with significant chest, abdomen, pelvic or extremity injury
- 2 or more proximal extremity fractures, open fracture and/or pelvic fracture
- Amputation above ankle or wrist
- Emergency Medicine Attending discretion

B. Potential Criteria (High index of suspicion for major injury)

- The characteristics of the accidents or injuries listed below indicate that patient condition may necessitate a Trauma Alert.
- Evidence of high energy dissipation:

1) Falls > 20 ft.
2) Rollover MVC
3) Crash speed change > 40 mph
4) Motorcycle crash speed > 20 mph & separation of rider
5) Pedestrian struck by motor vehicle

6) Ejection of patient
7) Same vehicle occupant fatality
8) Intrusion into vehicle > 12 inches
9) Blast injury

- Multiple system trauma involving more than one surgical specialty
- Pre-existing cardiac, pulmonary, or systemic medical disease
- Patient age > 55 years
- Victim extrication time > 20 minutes

2 Initiation of Trauma Alert

The Trauma Service authorizes the following individuals to initiate a Trauma Activation, if any mandatory or potential criteria are met during transport or upon arrival:

- Pre-hospital ambulance
- Emergency Department charge nurse
- Surgical resident (based on the availability)
- Emergency Department physician, Trauma Service senior resident, or attending may initiate a Trauma Alert at his/her discretion regard less of mandatory criteria met.

3. Trauma Alert Activation Process

A. Notification

A). When authorized personnel request a Trauma Alert Red/Trauma Alert the ED charge nurse will:

- Notify the ER physician and other staff members.
- Document the patient's name, time and injury type.

B).The ED charge nurse/coordinator/senior resident

- Notify the Blood Bank by phone (Trauma Alert Red/Trauma Alert only)
- Document all notifications in the Trauma Alert Log and denote Trauma Alert Red or Trauma Alert.

B. The Trauma Alert Team consists of:
Emergency Medicine Rotation

- Emergency Medicine specialist
- Emergency Medicine Residents
- Surgery Chief Resident
- OB Chief Resident (OB cases only)
- Emergency Department Nurses
- Emergency Department Paramedics
- Radiology Technologist
- Respiratory Therapist
- CT Scan Technologist (notified)
- Operating Room Charge Nurse (notified only)
- Ultrasound Technologist Radiologist or Radiographer

Trauma Alert Responsibilities

Trauma Team Physicians

When physicians assigned to the Trauma Team are notified that a Trauma Activation is in effect they will:

- Report to the ED within five minutes of notification. .
- The Trauma Service Primary Call Resident will notify capacity command center staff of potential admission.

Trauma Alert Emergency Department Nurses

When a Trauma Activation is issued the ED charge nurse and primary patient care nurse will:

- Designate a Trauma Nurse #1 and a Trauma Nurse #2.
- Designate a Trauma Nursing Care Technician.
- Designate a Blood Bank runner.
- Assign other personnel roles and responsibilities as designated in the Trauma Resuscitation Roles and Responsibilities.
- Assist with preparation of trauma resuscitation room for patient.
- Document the names and arrival times of Trauma Team personnel.

DISCHARGE CRITERIA FOR TRAUMA

After patient has been admitted or observed

- If stable vital sign
- No ongoing hemorrhage
- Admitting physicians requirement for discharge has been met
- No progress of the parameters and/or marked improvement of paramters that are being observed, after checking documented follow up chart since the time of admission and/or time of diagnosis of the pathologic entity.
- Also according to the facility capacity.

Transfer protocol

Initiating a referral and transport

1. The referring hospital (through the liaison office) should contact the receiving hospital and the liaison at referring Hospital must confirm that the admission is accepted.
2. Once acceptance of the patient is confirmed, mode of transport is consiered by the referring physician or nurse based on:

a. Patient's medical needs during transport time
b. Need to minimize out of hospital transport time

3. While transporting the patient by ambulance:

a. The referring hospital will contact an ambulance service of its choice that is capable of providing the level of care required. (FEBRA, Tebita, Red Cross). Preferably in consultation with referral center (Emergency Meical Service Coordinators).
b. The sending facility is deemed ultimately responsible for decisions regarding the mode of transfer.
c. If the patient requires a level of care during transport outside the scope of practice of the ambulance staff, the hospital should provide for a supplemental provider capable of providing the care required.
d. The following patient information should be provided:

i. Approximate age
ii. Mechanism of injury
iii. Suspected major injuries or medical condition
iv. Level of consciousness and airway status

v. History, including medication
vi. Most recent vital signs
vii. Ongoing therapies
viii. Specialized equipment, e.g. ventilator, etc
ix. Call back number
x. Referring facility and physician
4. A copy of all medical record must be sent with the patient and include the following:
a. physician notes
b. nursing notes
c. medication and fluid records
d. copies of x-rays
e. laboratory results

Prompt Transport

Do not delay – transport while awaiting laboratory or radiology results. Results can be communicated by phone/fax/e-mail as they become available. Or any other simpler options…

Trauma system Monitoring and Evaluation

Monitoring evaluation can be done at pre hospital care level, trauma centers or hospitals. In different levels systems in place to make trauma care effective and performances can be monitored and evaluated. Institutions themselves, regional health bureaus and FMOH can perform M/E using various methodologies.

System Monitoring (input, process, output)

- Training of human resource on trauma appropriately like NEMTEM, BLS, PTC, ATLS, etc.
- Physical capacity of ambulance, EM departments setups, ICU,OR, radiology, Laboratory etc to cope with designated levels of trauma care
- Multidisciplinary trauma committee(EM, Orthopedics, Neuro sugery, General Surgery, Pediatrics, ICU)

- Presence of appropriate guidelines, SOPs, QI initiatives, etc

Performance Monitoring at hospitals or trauma centers

Performance improvement is a method of improving medical care by monitoring the elements of diagnosis, treatment and outcome and is conducted through medical audit. It evaluates the performance of both individual providers and the system in which they work. Medical audit consisted of a system of counting procedures, complications and deaths. Quality assurance was built upon audit by reviewing medical records for documentation of predetermined criteria, which were felt to reflect an acceptable quality of delivery of medical care. For performance monitoring health facilities conduct the following activities:

1.1. Trauma registry should conduct in health facilities using standard format and data base prepared by FMOH.
Detailed information on injury severity and health outcomes is The recording of injury severity in hospitals; The anatomical areas involved; causes of injured and pre hospital care activity; the measurement of survivor outcomes; and post injury measures of disability (at least on discharge from hospital or at 30 days post impact)

1.2. Morbidity and mortality conferences: These involve a discussion of deaths and complications in search of preventable factors. It can be performed once within a week to once within a month.

1.3. Preventable death studies: These employ reviews of deaths, either at an individual hospital or within a given system, looking for deaths which are considered, by consensus, preventable. It can be conducted once within a month.

1.4. Check KPIs quarterly.

1.5. Quality of documentation and charting once monthly 5% of charts for quality assurance

1.6. Morning sessions and rounding

Prehospital care

- Review of Prehospital care triaging and severity, Arrival at the Golden hour(1-2hrs),
- Testing if communication through public access number is working.
- Report review
- Critical incident review,
- outcome studies
- Pre hospital trauma registry

Monitoring system used by FMOH, Regional Health bureaus and Hospital Quality Management Offices

- **supportive supervision**

  To assess the performance of trauma care at different level of service integrated supportive supervision is needed. It will be performed twice per year towards various level of care like EMS and Facilities
- **Annual review**

  Trauma and issues related like burn and poisoning will get priority by the ministry and regional health departments and there will be annual review on selected KPIs like Injury severities, Injury prevention work, mortality and length of hospitalization.
- Periodic reports and data bases analysis
- Hospitals' Quality Management office (QMO)

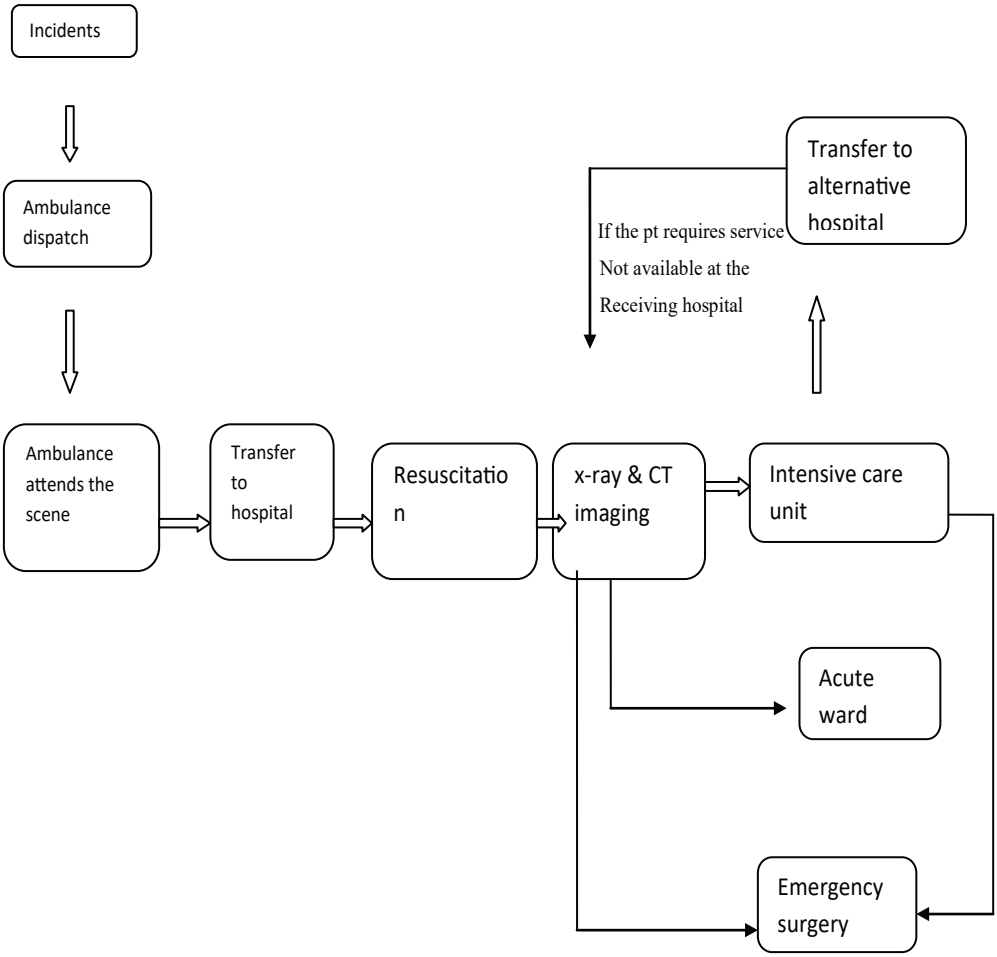
  Hospitals will establish interdisciplinary trauma team. The hospitals' QMO will follow the QI process of trauma centers or units and the Mor bidity and Mortality peer review will take place twice a year.

Depending on the strength of the hospital team detailed quality improvement indicators also can be developed like outcome according to severity index or anatomical parts injured like head injuries; performance of specific surgical procedures and evaluation of outcome; speed- Speed of treatment in the hospital (EX door to procedure time or CT scanning), speed of arrival to Emergency Rooms, extent of work according to protocols.

Annexes

Annex 1

Patient pathway for major trauma



Annex 2

Trauma registry form

DATE: REGISTRY DATA FIELD	REGISTRY DATA
MRN:	
NAME:	
Age:	
ETHINICITY:	
SEX:	
ARRIVAL MODE:	
PRE-HOSPITAL care get by	
INJURY DATE:	
INJURY TIME:	
CITY OF INJURY (TEXT):	
SAFETY EQUIPMENT:	
WORK RELATED:	
Road Traffic accident	
INDUSTRY:	
OCCUPATION:	
ED DATE OF ARRIVAL:	
ED TIME OF ARRIVAL:	
INITIAL ED VITAL SIGNS	
BP:	
HR:	
RR:	

O2 SATS:	
GCS TOTAL:	
TEMP:	
TEMP SOURCE (TEXT):	

Trauma Report format

	Activity	Number					
1	Number of trauma patient seen	R	O	Y	G	B	Total
2	How many neurologic patient seen (head and spine injuries)						
3	How many orthopedic patient seen						
4	How many Multiple trauma patient						
5	How many Soft tissue injuries						
6	Destination of the patient	Transfer to ward					
		Transfer to ICU					
		Transfer to OR					
		Transfer to other hospital					
7	Outcome of the patient	Dead					
		Improved and discharge home					
		Link to other unit and discharged home.					
8	Average Length of stay in the trauma center	Less than 24hrs					
		Greater than 24hrs					
9	Nurse to patient ratio	1:5 for ward 1:1 for ICU					
10	Who determines/decide on admission &discharge of trauma patient	Senior consultant	X				
		GP	X				
		Nurse	_				
11	Trauma management/care protocol	Yes					
12	Referral IN with communication						
13	Referral OUT with communication						

14	Number Trauma patient transfer in from Addis Ababa		
15	Number of trauma patient transferred in from region (out of Addis Ababa)		
16	Does the hospital have assign trauma center director?	Yes No	
17	Does the hospital has separate trauma registry book	Yes No	
18	Maximum consultation hrs trauma patient wait in ED	Less than 24 hrs	X
		Greater than 24hrs	
19	Number of trauma patient due to RTA		
20	Number of trauma patient other than RTA (fall, fighting etc..)		
21	Number of trauma patient who have got pre hospital care		

REFERENCES

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3. Institute of Medicine. 1988. Injury Control: A Review of the Status and Progress of the Injury Control Program.
4. America Trauma Society, trauma center levels Explained doc.
5. Eastern Association for the Surgery of trauma.