Standards for Trauma Centers

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Health Policies and Standards Department

Health Regulation Sector (2023)

INTRODUCTION

Health Regulation Sector (HRS) forms an integral part of Dubai Health Authority (DHA) and is mandated by DHA Law No. (14) of the year (2021) amending some clauses of law No. (6) of 2018 pertaining to the Dubai Health Authority (DHA), to undertake several functions including but not limited to:

- Developing regulation, policy, standards, guidelines to improve quality and patient safety and promote the growth and development of the health sector;
- Licensure and inspection of health facilities as well as healthcare professionals and ensuring compliance to best practice;
- Managing patient complaints and assuring patient and physician rights are upheld;
- Governing the use of narcotics, controlled and semi-controlled medications;
- Strengthening health tourism and assuring ongoing growth; and
- Assuring management of health informatics, e-health and promoting innovation.

The Standards for Trauma Centers aims to fulfil the following overarching DHA Strategic Priorities (2022-2026):

- Pioneering Human-centered health system to promote trust, safety, quality and care for patients and their families.
- Make Dubai a lighthouse for healthcare governance, integration and regulation.
- Leading global efforts to combat epidemics and infectious diseases and prepare for disasters.

- Foster healthcare education, research and innovation.
- Strengthening the economic contribution of the health sector, including health tourism to support Dubai economy.

ACKNOWLEDGMENT

The Health Policy and Standards Department (HPSD) developed this Standard in collaboration with Subject Matter Experts and would like to acknowledge and thank these health professionals for their dedication toward improving quality and safety of healthcare services in the Emirate of Dubai.

Health Regulation Sector

Dubai Health Authority

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EXECUTIVE SUMMARY

Trauma Centers are health facilities prepared to receive and manage injured patients and are usually part of a trauma system in which there is a connection between trauma facilities and coordination regarding the transfer of patients according to the injury and required resources. The purpose of this document is to set appropriate standards for the optimal care of the trauma patient, ensure the right infrastructure and staff requirements, assure the provision of the highest levels of safety and quality for trauma centers and thus, improving healthcare services in the Emirate of Dubai. It has been developed to align with the evolving healthcare needs and international best practice. The Trauma Center standards describes different levels of trauma centers I, II, III and IV and their criteria including licensure requirements, health facility requirements, staffing requirements, medical equipment and IT requirements, services requirements and patients' rights and responsibilities, as well as policies and procedures which include disaster preparedness. Trauma Centers must be able to provide the necessary care according to their level.

DEFINITIONS

Conventional radiography: or (General Radiology) are images of the skull, chest, abdomen, spine, and extremities produced by the basic radiographic process.

Emergency Unit: A Health facility that is open 24 hours, 7 days a week. Patients shall be admitted, transferred or discharged within 4 hours. An emergency unit is consultant-led (onsite emergency trained physician), with a multidisciplinary team and nursing support, and possess diagnostic, surgical and pharmacy capabilities to manage an emergency or life-threatening condition including but not limited to: chest pain or pressure, difficulty breathing, major wounds, stroke, head, neck or back Trauma, severe or uncontrolled bleeding, loss of vision, compound fracture, convulsions, seizures or loss of consciousness, foreign body, poisoning, severe abdominal pain, acute delirium or mental impairment, Obstetrics and gynaecology-related problems.

Hospital Disaster Plan: Hospital disaster plans detail the hospital's role in community emergency preparedness, implementation of specific procedures, management of key materials and activities, staff preparation, deployment and roles, management of patient care services, disaster drills, and monitoring and evaluation of hospital performance.

Laboratory, Microbiology, Pathology Room: A designated area for performing immediate laboratory investigations such as arterial blood gas analysis and microscopy/ point of care testing (POCT).

Medication Room: For the storage of medications used within the Emergency Unit. Must have a secure entry with a self-closing door and staff only access and should include CCTV surveillance.

Resuscitation Room: Used for the resuscitation and treatment of critically ill or injured patients.

Resuscitation Team: Consists of a range of medical practitioners who are specially trained to deal with emergencies, including: Medical doctors, anaesthetists, intensive care doctors, critical care nurses and resuscitation officers.

Triage: Triage is the process of rapid sorting or prioritizing patients into specific care categories depending on the number and severity of casualties and the resources available at that time.

Trauma: A medical Injury of different severity levels that requires immediate management. Major trauma: Describes serious and often multiple injuries where there is a strong possibility of death or disability.

Trauma Center: A health facility equipped with adequate personnel and resources including diagnostic, surgical and pharmacy capabilities to provide comprehensive emergency medicine to patients with severe injuries.

Examples of these trauma cases include: Chest pain or pressure, Difficulty breathing, major wounds, stroke, head, neck or back Trauma, severe or uncontrolled bleeding, loss of vision, compound fracture, convulsions, seizures or loss of consciousness, foreign body, poisoning, severe abdominal pain, acute delirium or mental impairment, Obstetrics and gynaecology-related problems. Trauma Centers are categorized in this standard into 4 levels according to facility size and resources:

- **Level I Trauma Centers:** Manage the most severe injuries and must have adequate resources and personnel for every aspect of injury from prevention through rehabilitation as well as education and research. Level I trauma centers are usually university-based teaching hospitals in order to take advantage of the large resources.

- **Level II Trauma Centers:** Manages the majority of the trauma patients and should provide initial definitive trauma care, regardless of the severity of injury, however level II trauma centers may not be able to provide the same comprehensive care as a Level I trauma center. Therefore, patients with more complex injuries may have to be transferred to a Level I center.
- **Level III Trauma Centers:** Manages Minor and moderate injuries. serves communities that do not have immediate access to a Level I or II. can provide prompt assessment, resuscitation, emergency operations and stabilization and also arrange for transfer to a facility that can provide definitive trauma care when needed.
- **Level IV Trauma Centers:** Provide initial evaluation and assessment to minor and moderately injured patients, but most patients will require transfer to higher-level trauma centers. Usually located in remote areas where higher levels of trauma care are not available.

Trauma Medical Director (TMD): Leads the trauma center and has the following capabilities:

a. DHA licensed consultant general surgeon with specialization or experience in managing severe polytrauma patients.
b. The TMD must have the authority to manage all aspects of trauma care.

Trauma registry: is essential to the performance improvement and patient Safety (PIPS) program. Data findings must be used to identify injury prevention measures.

Trauma System: Iincludes trauma centers and health facilities prepared to receive and manage injured patients with a connection and coordination between them regarding the transfer of patients according to the injury and required resources.

ABBREVIATIONS

ACLS : Advanced Cardiac Life Support.

ATLS : Advanced Trauma Life Support.

BLS : Basic Life Support.

CME : Continuing Medical Education.

CPR : Cardiopulmonary Resuscitation.

CSSD : Central Sterile Services Department.

CT : Computed Tomography.

DHA : Dubai Health Authority.

EU : Emergency Unit.

HRS : Health Regulation Sector.

ICU : Intensive Care Unit.

NICU : Neonatal Intensive Care Unit.

OT : Operation Theatre.

PALS : Paediatric Advanced Life Support.

PHTLS: Prehospital Trauma Life Support.

PIPS : Performance Improvement and Patient Safety.

TC : Trauma Center.

TMD : Trauma Medical Director.

TNCC : Trauma Nursing Core Course.

TPA : Third-Party Administrator.

TTA : Trauma Team Activation.

1. BACKGROUND

Trauma Center are health facilities equipped with adequate resources and personnel to manage different aspects of injury including diagnostic, surgical and pharmacy capabilities. Examples of these trauma cases include: Chest pain or pressure, Difficulty breathing, major wounds, stroke, head, neck or back Trauma, severe or uncontrolled bleeding, loss of vision, compound fracture, convulsions, seizures or loss of consciousness, foreign body, poisoning, severe abdominal pain, acute delirium or mental impairment, Obstetrics and gynaecology-related complaints. The American College Of Surgeons- Committee On Trauma classification scheme for trauma centers (Level I through Level IV) aims to match the needs of injured patients to the capabilities of the trauma facility and to ensure the best distribution of resources in a certain area to achieve the goal of optimal care for injured patients. Trauma Centers can be licenced as Level I, II, III or IV based on certain criteria including services, resources and requirements (level IV being the minimum requirement). This document covers the scope and the requirements of each level.

2. SCOPE

2.1. Trauma services in DHA licensed health facilities.

3. PURPOSE

3.1. To assure provision of the highest levels of safety and quality in trauma services in Dubai Health Authority (DHA) licensed health facilities.

4. APPLICABILITY

4.1. DHA licensed healthcare professionals and health facilities providing trauma services.

5. **STANDARD ONE:** REGISTRATION AND LICENSURE PROCEDURES

5.1. All health facilities providing trauma services shall adhere to the United Arab Emirates (UAE) Laws and Dubai regulations.

5.2. Health facilities aiming to provide trauma centre services shall comply with the DHA licensure and administrative procedures available on the DHA website https://www.dha.gov.ae

5.3. Licensed health facilities opting to add trauma services shall inform Health Regulation Sector (HRS) and apply for "amend facility license" to obtain permission to provide the required service.

5.4. Hospitals providing trauma services can be classified as level I, II, III or IV trauma centers. The requirements for each level are clarified in this document (level IV being the minimum).

5.5. The health facility shall maintain charter of patients' rights and responsibilities posted at the entrance of the premise in two languages (Arabic and English).

5.6. The health facility shall have in place a written plan for monitoring equipment for electrical and mechanical safety, with monthly visual inspections for apparent defects.

5.7. The health facility shall ensure it has in place adequate lighting and utilities, including temperature controls, water taps, medical gases, sinks and drains, lighting, electrical outlets and communications.

6. **STANDARD TWO:** HEALTH FACILITY REQUIREMENTS

6.1. Trauma Centers shall adhere to the requirements of their level according to the categories listed in this standard.

6.2. All trauma centers should install and operate medical equipment in accordance to the manufacturer's specifications.

6.3. The trauma center design shall provide assurance of patients and staff safety.

6.4. All trauma centers shall ensure easy access to the health facility and treatment areas for all patient groups.

6.5. Trauma Centers should be clearly identified from all approaches with Illuminated signposting to allow visibility at night.

6.6. All trauma centers shall be equipped to receive people of determination.

6.7. The emergency unit must be located on ground floor, with an easy access for walk-in patients and for patients brought by ambulance. It must be equipped and staffed sufficiently.

6.8. Car parking should be close to the entrance, well-lit and available exclusively for patients, their relatives and staff. Parking areas should be available close to the Emergency Unit for urgent call-in staff.

6.9. Ambulance drop-off bays must be available according to the number of emergency beds as per the table in **(Appendix 1)**.

6.10. Well-equipped ambulance vehicles must be ready with qualified medical staff for patient transportation if required.

6.11. There must be a Decontamination area for patients who are contaminated with toxic substances. It may be integrated with the Ambulance bay or directly accessible from the ambulance bay without entering any other part of the unit. The decontamination area consists of shower heads in a section of the ambulance bay ceiling or a dedicated internal room with a shower hose spray. The decontamination area should have a separate drainage system.

6.12. There must be a clear display of scope of services, patient and family rights and responsibilities and clear direction signage for service areas.

6.13. All trauma centers shall have appropriate equipment and trained healthcare professionals to manage critical and emergency cases.

7. **STANDARD TWO:** GENERAL TRAUMA CENTER REQUIREMENTS

7.1. Staffing:

7.1.1. All healthcare professionals shall hold an active DHA full time professional license and work within their scope of practice.

7.1.2. A Consultant physician/surgeon should be available full-time to lead the service. (Refer to each trauma level staff requirements)

7.1.3. Additional physician/s should be available full-time according to patient volume.

7.2. Trauma centers should adhere to the DHA Standard for Point of Care Testing.

7.3. Medical Equipment & Supplies:

7.3.1. Minimum medical equipment & supplies must be available as per the table in **(Appendix2).**

7.4. Pharmacy and Therapeutic Drugs:

7.4.1. Pharmacy services should ensure adequate stocking, storage and dispensing mechanisms for medications in a proper storage unit adhering to local laws, DHA Pharmacy Guidelines and DHA Emergency Medication Policy.

7.4.2. Pharmacy services must be available 24/7.

7.5. All trauma centers shall have IT, Technology and Health Records services which include but are not limited to:

7.5.1. Electronic Medical Record (EMR) System (with Medical file, nursing notes, lab, pharmacy and radiology systems availability/integration)

7.5.2. An integration with NABIDH platform.

7.5.3. Picture archiving communications systems (PACS) should be in place for access to patient imaging results.

7.5.4. Wireless network setup for ease of communication.

7.5.5. Telehealth technology and support services where applicable.

7.5.6. Availability of Computers, laptops and tablets for physicians, nurses, and administrative staff where needed.

7.5.7. Patient call, nurse assist call, emergency call systems must be available.

7.5.8. Telephones should be available in all offices, at all staff stations, in the clerical area and in all consultation and other clinical rooms.

7.5.9. All trauma centers shall comply with the Policy for Data and Health Information Protection and Confidentiality and DHA standards for telehealth services.

7.6. Requirements for Triage, Referral and Patient Transfer:

7.6.1. All health facilities transfer policies must comply with the DHA Patient referral and inter-facility transfer policy.

7.6.2. Direct contact of the physician or midlevel provider with a physician at the

7.6.3. receiving hospital is essential.

7.6.4. Transfer agreements between facilities are crucial. (Refer to DHA Policy: Patient Referral and Inter-Facility Transfer)

a. Both sending and receiving trauma centers must maintain a transfer registry including documented approvals with the date, time and case details prior to patient transfer.

7.6.5. The patient must be rapidly assessed and assigned to the appropriate care zone according to the 5 triage categories:

a. Category 1: - People who require to have immediate treatment and assessment simultaneously.

b. Category 2: - People who require treatment within 10 minutes, deemed as having an imminently life-threatening condition

c. Category 3: - People who require treatment within 30 minutes, deemed as having a potentially life-threatening condition

d. Category 4: - People who require treatment within 60 minutes, deemed as having a potentially serious condition

e. Category 5: - People who require treatment within 120 minutes, deemed as having a less urgent condition.

7.6.6. Trauma centers must have a plan approved by the TMD that determines which types of neurosurgical injuries may remain and which should be transferred.

7.6.7. Transfer agreements must exist with appropriate Level I and Level II trauma centers.

7.6.8. Trauma centers must have protocols for patient resuscitation and monitoring during transportation.

7.6.9. Trauma patients must not be admitted or transferred by a primary care physician without the knowledge and approval of the trauma lead.

7.6.10. If complex cases are being transferred out, a contingency plan should be in place and must include the following:

a. Initial evaluation and stabilization of the patient by the trauma surgeon to provide.

b. Transfer agreements with similar or higher-verified trauma centers.

c. Direct contact with the accepting facility to arrange for expeditious transfer or ongoing monitoring support.

d. Monitoring of the efficacy of the process by the PIPS programs.

7.6.11. For all patients being transferred for specialty care, such as burn care, microvascular surgery, cardiopulmonary bypass capability, complex

ophthalmologic surgery, or high-complexity pelvic fractures, agreements with a similar or higher-qualified verified trauma center should be in place.

7.6.12. As per the Executive Regulations Law No. (11) of the year 2013 concerning Health Insurance in Dubai and related administrative decision; patients presenting with medical emergencies and/or trauma must be granted immediate emergency care regardless of the facilities network of health insurance providers.

7.6.13. Receiving facility can submit a claim to the insurance provider to cover the cost of providing emergency services even if they are outside of the insurance network.

7.6.14. The receiving facility must notify the health insurance companies /TPAs within 24 hours of the emergency admission.

7.7. Trauma centers shall have the following policies and procedures:

7.7.1. Interfacility transfer agreements and transport policy.

7.7.2. Resuscitation protocols.

7.7.3. Complex cases management plan.

7.7.4. Surge capacity and diversion policy

7.7.5. Patient Assessment Policy.

7.7.6. Admission policy

7.7.7. Against medical advice AMA (leaving or discharge)

7.7.8. Consent form policy.

7.7.9. Triage policy.

7.7.10. Medication management policy.

7.7.11. Scope of practice based on services and trauma level

7.7.12. Privilege policy.

7.7.13. Emergency call system policy.

7.7.14. Morbidity and mortality (M&M) policy.

7.7.15. Sentinel event policy.

7.7.16. Policy for Emergency release of blood.

7.7.17. Process of accreditation and its initiation.

7.7.18. Multidisciplinary trauma peer review committee.

7.7.19. Tele-medical referral/ consultation service.

7.7.20. Performance monitoring and Quality improvement plans (strategic and operational plans).

7.7.21. Safety management system that includes fire safety, hazardous waste management, emergency plans, security, and any other risks planning and management.

7.7.22. The criteria for a graded trauma team activation (TTA).

7.7.23. Hospital Admin Escalation process.

7.7.24. Prehospital trauma care protocol.

7.7.25. Trauma team members.

7.7.26. Transfusion protocol developed with the Blood bank.

7.7.27. Clinical practice guidelines, protocols, and algorithms derived from evidenced-based validated resources.

7.7.28. Contingency plans.

7.7.29. Protocols for Orthopaedic emergencies including:

a. Type and severity of pelvic and acetabular fractures that will be treated at the institutions as well as those that will be transferred.

b. Timing and sequence for the treatment of long bone fractures in patients with multiple injuries.

c. The wash out time for open fractures.

7.7.30. Response parameters for time-critical injuries must be determined and monitored.

7.7.31. Data reporting.

7.7.32. Data Confidentiality.

7.7.33. Data Validity Monitoring

7.7.34. Trauma registry.

7.7.35. Hospital disaster plan and disaster drills

7.7.36. Management of Organ Donors and Brain Death Declaration.

7.8. Disaster Preparedness:

7.8.1. The trauma center must develop plans for dealing with Internal and external disaster emergencies in the community.

7.8.2. The trauma center must appoint a Disaster Management Committee.

7.8.3. The trauma center must participate in regional disaster management plans and exercises.

7.8.4. Drills that test the hospital's disaster plan must be conducted at least twice a year, including actual plan activations that can substitute for drills.

7.8.5. All trauma centers must have a hospital disaster plan described in the hospital's policy and procedure manual or equivalent.

7.9. All trauma centers shall include the following specialty care units:

7.9.1. Emergency Unit

7.9.2. Medical Imaging Unit

7.9.3. Pharmacy Unit

7.9.4. Catering Unit

7.9.5. CSSD

7.9.6. Outpatients Unit or referral agreements (for patient follow-up and referrals for further investigation).

7.9.7. Inpatient Unit.

7.9.8. Clinical Information system (HIS)/ Health Records Unit (EMR).

7.9.9. Ambulance Services.

7.9.10. Security room.

7.9.11. Reception.

7.9.12. Waiting area.

7.9.13. At least one Airborne Infection Isolation (AII) Room must be provided. This room should be located at the entry to the Inpatient Unit and must have a viewing window from outside the room and a dedicated toilet.

7.9.14. Triage room:

a. The Triage may be performed at the reception desk.

b. Triage areas should be located to allow maximum visibility for incoming ambulances, incoming ambulant patients and waiting areas.

c. The Triage nurse may interview patients, perform observations and provide first aid in relative privacy in a triage cubicle.

d. Triage should have an examination couch with appropriate privacy screening.

e. Patients should be grouped by acuity or by specialty distinct zones provided with good functional relationships to key areas of the unit and external units as noted in Functional Relationships.

f. Planning should provide a clear path of travel for each zone with a minimum of cross traffic.

g. There must be a display of triage schemes.

7.10. Trauma Centers must have dedicated rooms for the following:

7.10.1. Radiology.

7.10.2. Laboratory, Microbiology and Pathology rooms and blood bank services.

7.10.3. OT Rooms and Cubicles

7.10.4. Consultation/ Examination rooms

7.10.5. Treatment & Procedure Rooms:

a. Acute Treatment rooms for assessment and treatment of severe conditions.

b. Minimum of four (4) treatment rooms must be available.

7.10.6. Medication Room:

a. The room should be accessible to all clinical areas and have a lockable drug refrigerator which should be temperature/ humidity monitored and alarmed.

b. Minimum Stock Medication requirements shall be available as per (Appendix3).

c. Minimum Emergency Medication Requirements shall be available as per the DHA Emergency Medication Policy, available on this link: https://www.dha.gov.ae/uploads/112021/3f5565de-9eb7-46c9-9480-17190a531903.pdf.

d. Medication preparation area with basins.

7.10.7. Dedicated Patient Resuscitation Room for trauma, equipped with the following:

a. Medication as per Emergency Medication Policy.

b. Equipment and supplies listed in **(Appendix 2).**

7.10.8. Support Areas:

a. Handwashing stations, Linen and mobile Equipment.

b. Clean Utility

c. Cleaners Room

d. Dirty Utility and Disposal Rooms

e. Meeting Room.

f. Store rooms (Storage available for general medical/surgical supplies, medications and equipment. The area is under staff control and out of the path of normal traffic).

7.10.9. Staff Areas:

a. Change Rooms with toilets, shower and lockers

b. Staff Room

c. Offices and Workstations

d. Meeting rooms that may be used for teaching functions.

7.11. The trauma center must have a Performance Improvement and Patient Safety (PIPS) program (adult/pediatric). The trauma center's PIPS program must have a multidisciplinary trauma peer review committee chaired by the TMD and with representatives from the following specialties if available in that facility level:

7.11.1. General Surgery

7.11.2. Orthopedic Surgery

7.11.3. Emergency Medicine

7.11.4. ICU

7.11.5. Anesthesia

7.11.6. Neurosurgery

7.11.7. Radiology

7.11.8. Each member of the committee must attend at least 50 percent of all multidisciplinary trauma peer review committee meetings and must be involved in protocol development and trend analysis that relate to their specialty.

7.11.9. The TMD must have authority to recommend changes for the trauma panel based on performance review.

7.11.10. All trauma centers must use a risk adjusted benchmarking system to measure performance and outcomes.

7.11.11. The trauma PIPS program must integrate with the hospital quality and patient safety program as well as participation in the disaster committee.

7.11.12. The following must be continuously evaluated by the trauma PIPS process:

a. Mortality data, adverse events and problem trends, and selected cases involving multiple specialties.

b. Availability of the operating room personnel and timeliness of starting operations.

c. The need for pulse oximetry, end-tidal carbon dioxide detection, arterial pressure monitoring, pulmonary artery catheterization, patient rewarming, and intracranial pressure monitoring.

d. All ICU admissions and transfers of ICU patients to ensure that appropriate patients are being selected to remain at the trauma center vs. being transferred to a higher level of care.

e. Provision of timely and appropriate ICU care and coverage.

7.11.13. The trauma center must implement at least two programs that address one of the major causes of injury in the community and means of prevention.

7.12. Documented Evidence:

7.12.1. Trauma registry data must be collected and used.

7.12.2. Reports on Monthly Percentage of Emergency Admissions must be provided.

7.12.3. Reports on total number of emergency cases categorized based on the emergency/ triage category must be provided.

7.12.4. Reports on total number of Functioning Beds in the EU and beds outside the EU.

7.13. Other Required Services:

7.13.1. Laundry.

7.13.2. Equipment maintenance.

7.13.3. Medical waste management as per Dubai Municipality requirements.

7.13.4. Housekeeping.

8. **STANDARD THREE:** LEVEL IV TRAUMA CENTER REQUIREMENTS

(In addition to the above General Trauma Center Requirements)

8.1. Scope:

8.1.1. Level IV trauma centers provide initial evaluation and assessment to minor and moderately injured patients that require basic resuscitation; stabilization and minor procedures along with medical services provided by General Practitioners or specialists and shall be supported by Registered Nurses. Most patients will require transfer to higher-level trauma centers.

8.1.2. Level IV trauma centers shall be equipped to provide Advanced Trauma Life Support (ATLS) if needed.

8.1.3. General Hospitals <100 beds

8.2. Operating Hours:

8.2.1. Level IV trauma centers must be Open 24 hours a day/ 7 days a week.

8.3. Staffing: (In addition to the requirements in point 7.1)

8.3.1. Trauma team members are listed in the table in **(Appendix 4).**

8.3.2. Level IV trauma centers shall be led by a Trauma Medical Director (TMD) who must be a DHA licensed Consultant physician/surgeon or General Practitioner with previous experience in emergency or trauma centers and with enough time and leadership capabilities to manage the connection with other trauma centers.

8.3.3. At least one consultant, specialist, or GP is required to be available per shift.

8.3.4. The attending surgeon is expected to be present in the EU upon patient arrival.

8.4. Response Time (tracked from patient arrival):

8.4.1. Maximum acceptable response time is 30 minutes.

8.5. Staff Training and Certifications:

8.5.1. Level IV trauma healthcare professionals who participate in the initial evaluation of trauma patients must demonstrate current verification in:

a. Basic life support (BLS)

b. Advanced Trauma Life Support (ATLS)

c. Advanced Cardiac Life Support (ACLS)

d. At least one (1) healthcare professional with Pediatric Advanced Life Support (PALS) available in each shift.

e. Basic Hazmat Life Support (BHLS)

f. All providers should attend trauma-related continuing medical education (CME) of at least 8 hours yearly.

g. The TMD should attend Medical Disaster Management and Emergency Preparedness Course.

8.6. Radiology and Laboratory Requirements:

8.6.1. On-site Conventional radiography must be available 24/7

8.6.2. On site laboratory services must be available 24/7 for the standard analysis of blood, urine, and other body fluids, including micro-sampling when appropriate.

8.6.3. The blood bank must be capable of blood typing and cross-matching. (Refer to Standards for Blood Bank Services).

9. **STANDARD FOUR:** LEVEL III TRAUMA CENTER REQUIREMENTS

(In addition to the above General Trauma Center Requirements)

9.1. Scope:

9.1.1. Level III trauma centers manage Minor and moderate injuries.

9.1.2. Hospitals with <100 beds.

9.2. Operating Hours:

9.2.1. Level III trauma centers must be open 24 hours / 7 days a week with access to comprehensive emergency services.

9.3. Staffing: (In addition to the requirements in point 7.1)

9.3.1. Level III trauma team members are listed in the table in **(Appendix4)**

9.3.2. Level III trauma centers shall be led by a Trauma Medical Director (TMD) who must be a DHA licensed Consultant physician/surgeon with previous experience in emergency or trauma centers and with enough time and leadership capabilities to manage the connection with other trauma centers.

9.3.3. Trauma Resuscitation Team must be available 24/7.

9.3.4. The attending surgeon is expected to be present in the operating room for all operations.

9.3.5. The patient-to-nurse ratio in the ICU must not exceed two to one.

9.3.6. A surgeon must serve as co-director or director of the ICU and be actively involved in, and responsible for, setting policies and administrative decisions related to trauma ICU patients.

9.4. Response Time (tracked from patient arrival):

9.4.1. Maximum acceptable response time is 30 minutes.

9.4.2. The consultant/specialist surgeon should be in the emergency unit on patient arrival, with adequate notification from the field.

9.4.3. Anesthesiology services must be available within 30 minutes for emergency operations and managing airway problems.

9.4.4. In-house anesthesia services are not required, but an anesthesiologist must be available within 30 minutes.

9.4.5. Qualified radiologists must be available within 30 minutes in person or by teleradiology for the interpretation of radiographs.

9.4.6. Physician coverage of the ICU must be available within 30 minutes, with a formal plan in place for emergency coverage.

9.4.7. The trauma resuscitation team must be available within 15 minutes.

9.5. Radiology, Imaging, Diagnostics:

9.5.1. Medical Imaging Unit:

a. Conventional radiography must be available 24/7

b. Computed tomography (CT) scan 24/7

9.6. Laboratory:

9.6.1. Clinical Laboratory services must be available 24/7.

9.6.2. The lab must be able to cover the following minimum specialties: hematology, clinical chemistry, Immunology and serology, microbiology, anatomic pathology, cytopathology to meet the expected workload.

9.6.3. Coagulation studies, blood gas analysis and microbiology studies must be available 24/7.

9.6.4. Blood bank must be capable of blood typing and cross-matching.

9.6.5. The blood bank must have an adequate supply of packed red blood cells and fresh frozen plasma available within 15 minutes.

9.6.6. The blood bank must have an adequate supply in-house of red blood cells, fresh frozen plasma, platelets, cryoprecipitate and coagulation factors.

9.7. Medical Equipment & Supplies must be available as listed in the table in **(Appendix2)** in addition to:

9.7.1. Intracranial pressure monitoring equipment must be available in facilities that admit neurotrauma patients.

9.7.2. Equipment to perform a craniotomy must be available in facilities that offer neurosurgery services.

9.7.3. Dialysis capabilities or a transfer agreement with a facility that provides it.

9.8. Staff Training and Certifications:

9.8.1. All healthcare professionals who provide patient care must maintain valid training/certification in:

a. Cardiopulmonary Resuscitation (CPR).

b. Basic Life Support (BLS)

c. Advanced Cardiac Life Support (ACLS).

d. Advanced Trauma Life Support (ATLS)

e. Prehospital trauma life support (PHTLS)

f. Trauma nursing core course (TNCC)

g. Basic Hazmat Life Support (BHLS)

h. At least one (1) healthcare professional with Pediatric Advanced Life Support (PALS) available in each shift.

i. The TMD should attend Medical Disaster Management and Emergency Preparedness Course.

j. All providers should attend trauma-related continuing medical education (CME) of at least 8 hours yearly.

k. Trauma surgeons must be credentialed for pediatric trauma care if the trauma center admits more than 100 injured children /year.

l. Radiologists and Anesthesiologists taking call must have successfully completed an anesthesia residency program and must be currently board certified.

m. The trauma medical director, trauma program manager, and liaisons to the trauma program in: emergency medicine, orthopedics, critical care, and neurosurgery must obtain 16 hours annually or 48 hours in 3 years of trauma-related education (continuing medical education [CME] or CE).

9.9. Specialty Care Units: (in addition to point 7.9)

9.9.1. Intensive Care Unit (medical and pediatric)

9.9.2. Mortuary Unit

9.9.3. Operating Unit (Emergency OT available within 15 minutes).

9.9.4. Obstetric and Gynecologic Unit.

9.9.5. Neonatal Intensive Care Unit (NICU).

9.9.6. Pediatric trauma.

9.10. Academia:

9.10.1. Educational committees for physicians must be in place.

9.10.2. The trauma center should be able to offer trauma-related education to nurses involved in trauma care.

10. STANDARD FIVE: LEVEL II TRAUMA CENTER REQUIREMENTS

(In addition to the above General Trauma Center Requirements)

10.1. Scope:

10.1.1. Level II trauma centers manage moderate and severe injuries.

10.1.2. General Hospital >100 beds.

10.2. Operating Hours:

10.2.1. Must be Open 24hours a day / 7 days a week with access to comprehensive emergency services.

10.3. Staffing: (In addition to the requirements in point 7.1)

10.3.1. Level II trauma team members are listed in the table in (Appendix4).

10.3.2. Level II trauma centers shall be led by a Trauma Medical Director (TMD) who must be a DHA licensed Consultant physician/surgeon with previous

experience in emergency or trauma centers and with enough time and leadership capabilities to manage the connection with other trauma centers.

10.3.3. Trauma Resuscitation Team must be available 24/7.

10.3.4. The attending surgeon is expected to be present in the operating room for all operations.

10.3.5. The patient-to-nurse ratio in the ICU must not exceed two to one.

10.3.6. The trauma surgeon on call must be dedicated to a single trauma center while on duty. A backup call schedule for trauma surgery must be available.

10.3.7. Qualified attending surgeons must: Participate in major therapeutic decisions, be present in the emergency unit for major resuscitations, be present at operative procedures, be actively involved in the critical care of all seriously injured patients.

10.3.8. A resident in postgraduate year 4 or 5 or an attending emergency physician who is part of the trauma team may be approved to begin resuscitation while awaiting the arrival of the attending surgeon but cannot independently fulfill the responsibilities of, or substitute for, the attending surgeon.

10.3.9. The emergency unit must have a designated emergency physician director supported by an appropriate number of additional physicians to ensure immediate care for injured patients. An emergency physician must be present in the EU at all times.

10.3.10. Neurotrauma director must be a neurosurgeon highly experienced in the care of injured patients.

10.3.11. Neurotrauma care must be continuously present.

10.3.12. If one neurosurgeon covers two centers within the same limited geographic area, there must be a backup schedule.

10.3.13. Anesthesia services in Level II trauma centers must be available in-house 24/7.

10.3.14. Anesthetic care of injured patients must be supervised by an anesthesiologist who is highly experienced in the care of injured patients.

10.3.15. A surgeon must serve as co-director or director of the ICU and be actively involved in, and responsible for, setting policies and administrative decisions related to trauma ICU patients.

10.4. Response Time (tracked from patient arrival):

10.4.1. Maximum acceptable response time is 15 minutes.

10.4.2. The consultant/specialist surgeon should be in the emergency unit on patient arrival, with adequate notification from the field.

10.4.3. Orthopaedic Team must be available in the trauma resuscitation area within 30 minutes after consultation has been requested by the surgical trauma team leader for multiply injured patients.

10.4.4. Anaesthesiology services must be available within 30 minutes for emergency operations and managing airway problems.

10.4.5. Qualified radiologists must be available within 30 minutes in person or by teleradiology for the interpretation of radiographs.

10.4.6. Qualified radiologists must be available within 30 minutes to perform complex imaging studies, or interventional procedures.

10.4.7. The MRI technologist may respond from outside the hospital within 1 hour of being called.

10.4.8. Neurotrauma care must respond within 30 minutes.

10.5. Specialty Care Units: (in addition to point 7.9)

10.5.1. Intensive Care Unit (medical and pediatric)

10.5.2. Mortuary Unit

10.5.3. Operating Unit (Emergency OT available within 15 minutes).

10.5.4. Obstetric and Gynecologic Unit.

10.5.5. Neonatal Intensive Care Unit (NICU).

10.5.6. Pediatric trauma.

10.5.7. Burn care

10.5.8. Microvascular surgery

10.5.9. Cardiopulmonary bypass capability

10.5.10. High-complexity pelvic fractures

10.5.11. Complex ophthalmologic surgery

10.5.12. Cardiac Investigation Unit (particularly Cardiac Catheter Laboratories)

10.5.13. Coronary Care unit

10.5.14. Endoscopy Unit

10.5.15. Mental Health Unit

10.5.16. Rehabilitation Unit

10.5.17. At least one Airborne Infection Isolation (AII) Room must be provided. This room should be located at the entry to the Inpatient Unit and must have a viewing window from outside the room and a dedicated toilet.

10.5.18. Mental Health Assessment Rooms

10.5.19. Short-Stay Unit/ Emergency Medical Unit for extended observation and management of patients

10.5.20. Operating Rooms. Promptly available for emergency musculoskeletal operations and equipped with resources including instruments, equipment, and personnel.

10.5.21. A PACU with qualified nurses must be available 24 hours per day to provide care for the patient if needed during the recovery phase. The PACU must have the necessary equipment to monitor and resuscitate patients, consistent with the process of care designated by the institution.

10.6. A Helicopter landing site must be available in close proximity to the resuscitation area.

10.7. Radiology, Imaging, Diagnostic:

10.7.1. Medical Imaging Unit:

a. Conventional radiography must be available 24/7.

b. Computed tomography (CT) scan must be 24/7.

c. Magnetic resonance imaging (MRI) must be available 24/7.

d. Fluoroscopy, ultrasound, Point of Care US, mammography, and other interventional radiographic procedures and immediate access to those modalities must be available 24/7.

10.7.2. trauma center must have a mechanism to view radiographic imaging from referring hospitals.

10.7.3. Interventional radiologic procedures and sonography must be available 24/7.

10.7.4. The MRI technologist may respond from outside the hospital within 1 hour of being called.

10.8. Laboratory:

10.8.1. Clinical Laboratory services must be available 24/7.

10.8.2. The lab must be able to cover the following minimum specialties: hematology, clinical chemistry, Immunology and serology, microbiology, anatomic pathology, cytopathology to meet the expected workload.

10.8.3. Coagulation studies, blood gas analysis and microbiology studies must be available 24/7.

10.8.4. Blood bank must be capable of blood typing and cross-matching.

10.8.5. The blood bank must have an adequate supply of packed red blood cells and fresh frozen plasma available within 15 minutes.

10.8.6. The blood bank must have an adequate supply in-house of red blood cells, fresh frozen plasma, platelets, cryoprecipitate and coagulation factors.

10.9. Medical Equipment & Supplies must be available as listed in the table in (**Appendix2**) in addition to:

10.9.1. Equipment to perform a craniotomy.

10.9.2. Cardiopulmonary bypass equipment and a contingency plan if it is not immediately available.

10.9.3. End-tidal carbon dioxide detection.

10.9.4. Arterial pressure monitoring.

10.9.5. Pulmonary artery catheterization.

10.9.6. Intracranial pressure monitoring equipment.

10.9.7. All necessary equipment for musculoskeletal trauma care.

10.9.8. Cardiopulmonary bypass equipment immediately available, and an immediate transfer plan to an appropriate center if not available.

10.9.9. Acute hemodialysis.

10.9.10. The ICU must have the necessary equipment to monitor and resuscitate patients.

10.10. Staff Training and Certifications:

10.10.1. Cardiopulmonary Resuscitation (CPR).

10.10.2. Cardiopulmonary Resuscitation (CPR).

10.10.3. Basic Life Support (BLS)

10.10.4. Advanced Cardiac Life Support (ACLS).

10.10.5. Advanced Trauma Life Support (ATLS)

10.10.6. Prehospital trauma life support (PHTLS)

10.10.7. Trauma nursing core course (TNCC)

10.10.8. Basic Hazmat Life Support (BHLS)

10.10.9. At least one (1) healthcare professional with Pediatric Advanced Life Support (PALS) available in each shift.

10.10.10. Trauma surgeons must be credentialed for pediatric trauma care if the trauma center admits more than 100 injured children /year.

10.10.11. The TMD should attend Medical Disaster Management and Emergency Preparedness Course.

10.10.12. Radiologists and Anesthesiologists taking call must have successfully completed an anesthesia residency program and must be currently board certified.

10.10.13. All providers should attend trauma-related continuing medical education (CME) of at least 8 hours yearly.

10.10.14. The trauma medical director, trauma program manager, and liaisons to the trauma program in: emergency medicine, orthopedics, critical care, and neurosurgery must obtain 16 hours annually or 48 hours in 3 years of trauma-related education (continuing medical education [CME] or CE).

10.11. Academia:

10.11.1. Educational committees for physicians must be in place.

10.11.2. The trauma center should be able to offer trauma-related education to nurses involved in trauma care.

10.11.3. The trauma center must have an Education Unit.

10.11.4. The trauma center must provide training/ residency program.

10.11.5. There must be an Affiliated University with the trauma center.

10.11.6. The trauma center must provide research.

11. STANDARD SIX: LEVEL I TRAUMA CENTER REQUIREMENTS

(In addition to the above General Trauma Center Requirements)

11.1. Scope:

11.1.1. Level I Trauma Centers manage the most severe injuries.

11.1.2. General Hospitals >100 beds.

11.2. Operating Hours:

11.2.1. A Level I facility must be open 24 hours a day, 7 days a week with access to comprehensive emergency services.

11.3. Staffing: (In addition to the requirements in point 7.1)

11.3.1. Level I Trauma Team Members are listed in (Appendix4).

11.3.2. Level I trauma centers shall be led by a Trauma Medical Director (TMD) who must be a DHA licensed Consultant physician/surgeon with previous experience in emergency or trauma centers and with enough time and leadership capabilities to manage the connection with other trauma centers.

11.3.3. Trauma Resuscitation Team must be available 24/7.

11.3.4. The attending surgeon is expected to be present in the operating room for all operations.

11.3.5. The patient-to-nurse ratio in the ICU must not exceed two to one.

11.3.6. The trauma surgeon on call must be dedicated to a single trauma center while on duty. A backup call schedule for trauma surgery must be available.

11.3.7. Qualified attending surgeons must Participate in major therapeutic decisions, be present in the emergency unit for major resuscitations, be present at operative procedures and be actively involved in the critical care of all seriously injured patients.

11.3.8. A resident in postgraduate year 4 or 5 or an attending emergency physician who is part of the trauma team may be approved to begin resuscitation while awaiting the arrival of the attending surgeon but cannot independently fulfill the responsibilities of, or substitute for, the attending surgeon.

11.3.9. A designated emergency physician director supported by an appropriate number of additional physicians to ensure immediate care for injured patients. An emergency physician must be present in the EU at all times.

11.3.10. Neurotrauma director must be a neurosurgeon highly experienced in the care of injured patients.

11.3.11. Neurotrauma care must be continuously present and respond within 30 minutes.

11.3.12. If one neurosurgeon covers two centers within the same limited geographic area, there must be a backup schedule.

11.3.13. Anesthesia services must be available in-house 24/7.

11.3.14. Anesthetic care of injured patients must be supervised by an anesthesiologist who is highly experienced in the care of injured patients.

11.3.15. A surgeon must serve as co-director or director of the ICU and be actively involved in, and responsible for, setting policies and administrative decisions related to trauma ICU patients.

11.4. Response Time (tracked from patient arrival):

11.4.1. Maximum acceptable response time is 15 minutes.

11.4.2. The consultant/specialist surgeon should be in the emergency unit on patient arrival, with adequate notification from the field.

11.4.3. Orthopedic Team must be available in the trauma resuscitation area within 30 minutes after consultation has been requested by the surgical trauma team leader for patients with multiple injuries.

11.4.4. Anesthesiology services must be available within 30 minutes for emergency operations and managing airway problems.

11.4.5. Qualified radiologists must be available within 30 minutes in person or by teleradiology for the interpretation of radiographs.

11.4.6. Qualified radiologists must be available within 30 minutes to perform complex imaging studies, or interventional procedures.

11.4.7. The MRI technologist may respond from outside the hospital within 1 hour of being called.

11.4.8. Neurotrauma care must respond within 30 minutes.

11.5. Specialty Care Units: (in addition to point 7.9)

11.5.1. Intensive Care Unit (medical and pediatric)

11.5.2. Mortuary Unit

11.5.3. Operating Unit (Emergency OT available within 15 minutes).

11.5.4. Obstetric and Gynecologic Unit.

11.5.5. Neonatal Intensive Care Unit (NICU).

11.5.6. A pediatric emergency unit area.

11.5.7. A pediatric intensive care area.

11.5.8. Burn care.

11.5.9. Microvascular surgery

11.5.10. Cardiopulmonary bypass capability

11.5.11. High-complexity pelvic fractures

11.5.12. Complex ophthalmologic surgery

11.5.13. Cardiac Investigation Unit (particularly Cardiac Catheter Laboratories)

11.5.14. Coronary Care unit

11.5.15. Endoscopy Unit

11.5.16. Mental Health Unit

11.5.17. Rehabilitation Unit

11.5.18. Mental Health Assessment Rooms

11.5.19. Short-Stay Unit/ Emergency Medical Unit for extended observation and management of patients

11.5.20. Operating Rooms. Promptly available for emergency musculoskeletal operations and equipped with resources including instruments, equipment, and personnel.

11.5.21. A PACU with qualified nurses must be available 24 hours per day to provide care for the patient if needed during the recovery phase. The PACU must have the necessary equipment to monitor and resuscitate patients, consistent with the process of care designated by the institution.

11.6. Radiology, Imaging, Diagnostic:

11.6.1. Medical Imaging Unit:

a. Conventional radiography must be available 24/7

b. Computed tomography (CT) scan must be 24/7

c. Magnetic resonance imaging (MRI) must be available 24/7

d. Fluoroscopy, ultrasound, Point of Care US, mammography, and other interventional radiographic procedures and immediate access to those modalities must be available 24/7.

11.6.2. Trauma Centers must have a mechanism to view radiographic imaging from referring hospitals.

11.6.3. Interventional radiologic procedures and sonography must be available 24/7.

11.6.4. The MRI technologist may respond from outside the hospital within 1 hour of being called.

11.7. Laboratory:

11.7.1. Clinical Laboratory services must be available 24/7.

11.7.2. The lab must be able to cover the following minimum specialties: hematology, clinical chemistry, Immunology and serology, microbiology, anatomic pathology, cytopathology to meet the expected workload.

11.7.3. Coagulation studies, blood gas analysis and microbiology studies must be available 24/7.

11.7.4. Blood bank must be capable of blood typing and cross-matching.

11.7.5. The blood bank must have an adequate supply of packed red blood cells and fresh frozen plasma available within 15 minutes.

11.7.6. The blood bank must have an adequate supply in-house of red blood cells, fresh frozen plasma, platelets, cryoprecipitate and coagulation factors.

11.8. Medical Equipment & Supplies must be available as listed in the table in **(Appendix2)** in addition to:

11.8.1. Equipment to perform a craniotomy.

11.8.2. Cardiopulmonary bypass equipment and a contingency plan if it is not immediately available.

11.8.3. Intracranial pressure monitoring equipment.

11.8.4. End-tidal carbon dioxide detection.

11.8.5. Arterial pressure monitoring.

11.8.6. Pulmonary artery catheterization.

11.8.7. All necessary equipment for musculoskeletal trauma care.

11.8.8. Cardiopulmonary bypass equipment immediately available, and an immediate transfer plan to an appropriate center if not available.

11.8.9. Acute hemodialysis.

11.8.10. The ICU must have the necessary equipment to monitor and resuscitate patients.

11.9. Staff Training and Certifications:

11.9.1. Cardiopulmonary Resuscitation (CPR)

11.9.2. Basic Life Support (BLS).

11.9.3. Advanced Cardiac Life Support (ACLS).

11.9.4. Advanced Trauma Life Support (ATLS)

11.9.5. Prehospital trauma life support (PHTLS)

11.9.6. Trauma nursing core course (TNCC)

11.9.7. Basic Hazmat Life Support (BHLS)

11.9.8. At least one (1) healthcare professional with Pediatric Advanced Life Support (PALS) available in each shift.

11.9.9. The TMD should attend Medical Disaster Management and Emergency Preparedness Course.

11.9.10. Trauma surgeons must be credentialed for pediatric trauma care if the trauma center admits more than 100 injured children /year.

11.9.11. Each trauma center must have someone in a leadership position that has injury prevention as part of his or her job description.

11.9.12. Level I trauma centers must actively participate in national and citywide trauma system meetings and committees that provide oversight. A level I trauma center must also be the local trauma authority and assume the responsibility for providing training for prehospital and hospital-based providers.

11.9.13. Radiologists and Anesthesiologists taking call must have successfully completed an anesthesia residency program and must be currently board certified.

11.9.14. All providers should attend trauma-related continuing medical education (CME) of at least 8 hours yearly.

11.9.15. The trauma medical director, trauma program manager, and liaisons to the trauma program in: emergency medicine, orthopedics, critical care, and neurosurgery must obtain 16 hours annually or 48 hours in 3 years of trauma-related education (continuing medical education [CME] or CE).

11.10. Academia:

11.10.1. Educational committees for physicians must be in place.

11.10.2. The trauma center should be able to offer trauma-related education to nurses involved in trauma care.

11.10.3. The trauma center must have an Education Unit.

11.10.4. The trauma center must provide training/ residency program.

11.10.5. There must be an Affiliated University with the trauma center.

11.10.6. The trauma center must provide research.

11.10.7. The trauma center must provide some means of referral and access to trauma center resources.

11.10.8. The facility must have peer reviewed publications related to the trauma team.

11.10.9. The administration of a Level I trauma center must demonstrate support for research by, for example, providing basic laboratory space, sophisticated research equipment, advanced information systems, biostatical support.

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APPENDIX

APPENDIX 1: REQUIRED AMBULANCE DROP-OFF BAYS

Number of ambulance drop-off bays required by the number of EU beds	
Number of EU beds	**Number of ambulance drop-off bays**
Up to 15	2
Up to 25	3
Up to 35	3-4
Up to 45	5
Up to 55	6
55+	6+
Note: Beds = Acute beds + Resus + Trauma but not observation or fast track.	

APPENDIX 2: MINIMUM MEDICAL EQUIPMENT AND SUPPLIES

SN	A. Minimum Medical Equipment and Supplies
1.	A crash cart equipped with a defibrillator, necessary drugs and other CPR equipment and test strips.
2.	Resuscitation Kit, Cardiac board and Oral airways
3.	Laryngoscope with blades
4.	Diagnostic set
5.	X-ray viewer
6.	Patient trolley with IV stand
7.	Wheelchair
8.	Nebulizer
9.	Autoclave
10.	Refrigerator with temperature control
11.	Floor Lamp (Operating light mobile)
12.	Pelvic binders
13.	Chest tubes
14.	Sets of instruments which include suturing set, dressing set, foreign body removal set or minor set and cut down set.
15.	Portable Vital Signs Monitor (ECG, Pulse-Oximetry, Temperature, NIBP, EtCO2)
16.	Portable transport ventilator with different ventilation mode (IPPV, SIMV, spontaneous, PS).
17.	Suction apparatus that meets operating room standards.
18.	Glucometer
19.	Alcohol meter
20.	Rapid fluid infusers
21.	Thermal control equipment for patients
22.	Equipment for bronchoscopy
23.	Equipment for Gastrointestinal endoscopy

24.	Resuscitation fluids
25.	Intraoperative radiologic capabilities
26.	Equipment for fracture fixation
	B. Disposable supplies including
1.	Suction tubes (all sizes)
2.	Tracheotomy tube (all sizes)
3.	Catheters (different sizes)
4.	IV sets
5.	Blood transfusion set
6.	Syringes (different sizes)
7.	Dressings (gauze, sofratulle, etc.)
8.	Crepe bandages (all sizes)
9.	Splints (Thomas splints, cervical collars, finger splints)
10.	All types of fluids (e.g. D5W, D10W, Lactated Ringers, Normosol R, Normosol M, Haemaccel, etc.)
11.	Suction tubes (all sizes)
12.	Tracheotomy tube (all sizes)
13.	Catheters (different sizes)
14.	IV sets
15.	Blood transfusion set
16.	Syringes (different sizes)
17.	Dressings (gauze, sofratulle, etc.)
18.	Crepe bandages (all sizes)
19.	Broslow tape, US
20.	Splints (Thomas splints, cervical collars, finger splints)
21.	All types of fluids (e.g. D5W, D10W, Lactated Ringers, Normosol R, Normosol M, Haemaccel, etc.)
	C. Resuscitation Area Equipment

1.	Cardiac monitor machine with facility for ECG, printing, NIBP, SpO2, temperature probe, invasive pressure, CO2 monitor.
2.	A procedure light similar to a small, single arm operating light
3.	Equipment to hang IV fluids and attach infusion pumps
4.	Wall mounted diagnostic set (ophthalmoscope/auroscope)
5.	Clinical scrub basin with paper towel and soap fittings
6.	Overhead X-ray or mobile digital x-ray
7.	Display of resuscitation flow chart (as per scope of service)

APPENDIX 3: MINIMUM MEDICATION SUPPLY

Medication / Item	Quantity
Stock Medications	
Hydrocortisone (Solu-Cortef) 100mg/2ml injection	2
Chlorphenamine 10mg/ml injection	2
Metoclopramide HCl 5mg/ml injection	2
Paracetamol 1000mg/100ml	2
Diclofenac Sodium 75mg/3ml Injection (3ml)	2
Furosemide 20mg/2ml Injection	2
Ventolin Solution (nebule)	2
Tazocin	2
1st-Generation Cephalosporin	2
Benzyl Penicillin 1 M IU	2
Benzathine Penicillin 1.2 M IU	6
IV Fluids	
Dextrose 5 % in water (D5W) Intravenous Solution 500 ml	2
Sodium Chloride 0.9% Intravenous Solution 500ml	2
D50 water 500 ml	2
25% Dextrose 500 ml	2
Lactated Ringers Intravenous Solution 500 ml (D5RL)	2
Other Fluids	
Water for injection 10 ml	5
Water for injection 100ml	2
Normal Saline 10 ml	As required
Required Items for Emergency Bag	

IV Tubing/Set	As required
IV Cannulas	2 in different sizes 3- way connectors as required
Scalp Veins set - in different sizes	As required
Syringes - in different sizes	As required
Other consumables	
Airways with different sizes	10
Alcohol swabs	As required
Cotton Balls	3
Sterile Gauze	5
Plasters/Tegaderm	2
Disposable Gloves	2
Dressing Set	5
Sterile Tongue Depressor	2
Tourniquets	1
Scissors	1
Pen Torch	1
BP apparatus	1
Stethoscope	As required
Sterile Gloves in different sizes	As required
Band aids	As required
ambu bags	1 adult and 1 pediatric

APPENDIX 4: TRAUMA TEAM MEMBERS AND MINIMUM REQUIRED STAFF

Trauma Team Members	Level I	Level II	Level III	Level IV
General surgeon (team leader) 24/7	✔	✔	✔	✔
Emergency physician 24/7	✔	✔	✔	✔
Emergency unit nurses. 24/7	✔	✔	✔	✔
Trauma Resuscitation Team 24/7	✔	✔	✔	✔
A laboratory technician On-call 24/7	✔	✔	✔	✔
A radiology technologist 24/7	✔	✔	✔	✔
Radiologist 24/7	✔	✔	✔	
Radiographer On-call 24/7	✔	✔	✔	
CT technologist On-call 24/7	✔	✔		
MRI technologist On-call 24/7	✔	✔		
Critical care physician/ Intensivist Full time	✔	✔	✔	
Critical Care Nurses (24/7)	✔	✔	✔	
An anesthesiologist 24/7	✔	✔	✔	
Orthopedic Surgeon (on-call and promptly available 24/7)	✔	✔	✔	
Internal medicine	✔	✔	✔	
Neurosurgery	✔	✔		
Thoracic surgery	✔	✔		
Vascular Surgery	✔	✔		
Cardiac surgery	✔	✔		
Urology	✔	✔		
Cardiology	✔	✔		

Maxillofacial	✔	✔		
Ophthalmology	✔	✔		
Otolaryngology	✔	✔		
Gastroenterology	✔	✔		
Hand Surgery	✔	✔		
Plastic Surgery	✔	✔		
Obstetric and gynecologic surgery	✔	✔		
Otolaryngology	✔	✔		
Microvascular Surgery	✔	✔		
Infectious disease	✔	✔		
Pulmonary medicine	✔	✔		
Nephrology	✔	✔		
Dialysis team	✔	✔		
Surgical and emergency residents (if applicable)	✔	✔		
Occupational therapist	✔	✔		
Speech therapist	✔	✔		
Respiratory therapist (On-Call 24/7)	✔	✔	✔	
Physical therapist	✔	✔	✔	
Rehabilitation Specialists	✔	✔		
Nutrition support	✔	✔	✔	✔
Social worker	✔	✔	✔	✔
Administrator and Security officers	✔	✔	✔	✔