

Medical Emergency Dispatch Center Management and Protocol Implementation Guideline

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Abstract: *Emergency medical service system is a network of resources to deliver emergency care to the community out of health facility and in health care facilities. Through this system the health sector can maintain the continuum of care of the injured and acutely ill adults, children and mothers. Emergency incidents are unpredictable and can happen at any time to any one therefore establishing the system is found one of the modern medical approaches. This medical emergency dispatch center management protocol implementation guideline aim to decrease morbidity and mortality of acutely ill and injured patients through well organized and standardized dispatch process and improved coordination of pre health facility emergency medical services. A systematic search was performed Central Register of Controlled Trials up to 16th of September, 2020. A combination of keywords and Medical Subject Heading terms relevant to “emergency medical dispatch criteria” were used, to search for articles published between 2015 and 2020. Finally, this paper evaluates two dynamic relocation policies that an ambulance service provider in the Harar ME-CC are modified for operational use and implemented in a software tool for real time decision support to allocate the “right resources at the right time at the right place,” within given budget constraints, is optimized.*

Keywords: Emergency medical dispatch, Emergency medical services, Medical order entry systems

1. Introduction

An ambulance is a medically equipped vehicle which transports patients to treatment facilities, such as hospitals. Typically, out-of-hospital medical care is provided to the patient.

Ambulances are used to respond to medical emergencies by emergency medical services. For this purpose, they are generally equipped with flashing warning lights and sirens (Services, 2007). They can rapidly transport paramedics and other first responders to the scene, carry equipment for administering emergency care and transport patients to hospital or other definitive care (Clara, 2015). Most ambulances use a design based on vans or pick-up trucks (Li & Saydam, 2016). Others take the form of motorcycles, cars, buses, aircraft and boats (Van Buuren, 2018).

Historically, ambulance begins in ancient times, with the use of carts to transport incurable patients by force (Hanfling et al., 2012). Ambulances were first used for emergency transport in 1487 by the Spanish, and civilian variants were put into operation during the 1830s (Bohm & Kurland, 2018). Advances in technology throughout the 19th and 20th centuries led to the modern self-powered ambulances (Safeer et al., 2014).



Figure 1: First 1487 Spanish Ambulance



Figure 2: Advances during the American Civil War 1861-1865



Figure 3: First hospital ambulance 1867, London

2. Background

In life-threatening emergency situations in which every second counts, the timely arrival of an ambulance can make the difference between survival and death. In practice, the response-time targets, defined as the maximum time between the moments an incoming emergency call is received the moment when onsite medical aid is provided, are often not met. It is a challenge to dispatch Emergency medical Services (EMS) appropriately with limited resources and maintaining patient safety; this requires accurate dispatching systems. Emergency Medical Services (EMS) system's mission is to provide timely and effective treatment to anyone in need of urgent medical care throughout their jurisdiction. The default dispatch policy is to send the nearest ambulance to all medical emergencies and it is widely accepted by many EMS providers.

2.1. Functional types

Ambulances can be grouped into types depending on whether or not they transport patients, and under what conditions (Graham-Little, 1939; Reuter-Oppermann et al., 2017). In some cases, ambulances may fulfill more than one function (such as combining emergency ambulance care with patient transport):

Emergency ambulance: The most common type of ambulance, which provides care to patients with an acute illness or injury. These can be road-going vans, boats, helicopters, fixed-wing aircraft (known as air ambulances), or even converted vehicles such as golf carts.

Patient transport ambulance: A vehicle, which has the job of transporting patients to, from or between places of medical treatment, such as hospital or dialysis center, for non-urgent care. These can be vans, buses, or other vehicles.

Ambulance bus: A large ambulance usually based upon a bus chassis, that can evacuate and transport a large number of patients.

Charity ambulance: A special type of patient transport ambulance is provided by a charity for the purpose of taking sick children or adults on trips or vacations away from hospitals, hospices, or care homes where they are in long-term care.

Bariatric ambulance: A special type of patient transport ambulance designed for extremely obese patients equipped with the appropriate tools to move and manage these patients.

Rapid organ recovery ambulance: collects the bodies of people who have died suddenly from heart attacks, accidents and other emergencies and try to preserve their organs.

Types of Ambulance



2.2. Emergency Medical Dispatch Center Protocol

Emergency Medical Service System /EMSS/ is a network of resources to deliver emergency care to the community out of health facility and in health care facilities. Through this system the health sector can maintain the continuum of care of the injured and acutely ill adults, children and mothers. Emergency incidents are unpredictable and can happen at any time to any one therefore establishing the system is found one of the modern medical approaches. The main actors of the pre-facility emergency medical services are; Trained Community First Responders, EMS providers, different ambulance care provider companies and Dispatch centers. In order the EMSS to deliver its emergency services effectively and efficiently the system should have a call center or Public Safety Answering Point (PSAP) where the community is going to report during emergency conditions and not only the call center but also to have easy reporting mechanism. For this purpose, many countries has established emergency call center or Community Safety Answering Points where people can report their emergency conditions using 3-digit telephone, then this center distributes the emergency condition to the respective organizations such as to the police, fire, emergency medical care dispatchers and to others organizations as required. This type of organization enables the community to report to one center whatever the emergency type and the center analyzes and disseminate the information to the respective organizations and the response will be integrated and without delay, so the period of suffering of the injured or acutely ill patients will be shortened and more life will be saved.

Currently the Harar ME-CCare has given due attention to the development of effective and efficient emergency medical services throughout the eastern nation. Dedicated directorate is established to guide the national EMS development. Harar ME-CCare is assisting the city emergency program through direct supportive supervision, training and producing and distributing guide lines and protocols. To improve the pre-health facility emergency and ambulance service purchase of additional ambulances is ongoing and the targeted objective is to improve the ambulance to population ratio from current 1:47,000 to 1:

25,000 at the end of 2018. In addition to increasing the number of ambulances attention is also given to improve the quality of the pre-hospital services through increasing number of EMT trainee, equipping ambulances with medical equipment and to insure effective utilization of the ambulances establishment of ambulance dispatch center is found also essential. Therefore establishment of a dispatch centers and introducing national ambulance dispatch system protocol is found instrumental for the further improvement of the overall system and this document is expected to guide the improvement process.

3. Operational Definitions

3.1. Call center / Community Safety Answering Point

Is an organization that serves as a report receiving center for all types of emergencies such as related to crime (police), fire, emergency medical conditions and the like. After receiving an emergency call the call center distributes the information to respective organizations and more than one organization may get the information in similar time so they will dispatch their response without delay and will act also in collaboration. Ideally there will one national call center but the dispatch centers might be designated to respective organizations. Such system helps the community to call to one center for different emergencies and they don't need to memorize different phone numbers for different type of emergencies. Usually the phone number to contact call center is 3-digit telephone type.

3.2. Emergency Medical Care: is a medical care given by EMS professionals at the scene and in ambulances

3.3. Emergency Medical Service (EMS) - providers: are professionals working at the scene and ambulances and they could Emergency Medical Technicians (EMT) or paramedic. EMT could be with basic or intermediate level according the training level or period

3.4. Emergency Medical Service System/EMSS/: is a network of resources to deliver emergency care for the community at out of health facility and in health care facilities, and includes prevention of emergency conditions and rehabilitation of emergency affected patients

3.5. Emergency conditions: any medical emergency conditions of all age, gender, events (medical, injury, obstetric gynecology, children)

3.6. Emergency Medical Dispatch/Ambulance Dispatch/Center: Is an organization that is linked to the call center or CSAP in order to serve as mediator between the community and EMS providers for farther detailed integration about the medical illness characteristics in order to allocate the proper level of responses? The center is equipped with electronic and computerized communication devices, protocols, professionals who are capable to handle and prioritize the response and GIS that displays the ambulance station locations.

3.7. Emergency Medical Dispatcher: Is a professional who links the caller requesting emergency medical assistance and the emergency medical service (EMS)? Emergency Medical Dispatcher plays a role of an organizer of the EMS system to respond to a reported and subsequently verified medical emergency. Dispatchers needs to have appropriate training on program administration, periodical supervision, and medical direction, so they can accurately collect information from the caller, select an appropriate method of response, provide pertinent information to responders and give appropriate aid and direction to care takers of the patient or caller. To perform the job there should be also a written and medically approved, emergency medical dispatch protocol that helps their decisions concerning EMS responses in a safe, reproducible, and non-arbitrary manner.

3.8. Medical oversight: is a qualified emergency physician who provides emergency medical consultation for dispatchers and ambulance crew. Is responsible for ambulance crew and dispatchers service evaluation and improvement of the quality of care and he/she can act directly or indirectly.

3.9. Emergency Medical Dispatch protocol: Is a written structure of actions for the evaluation of, response to, and provision of care to emergency patients? A written dispatch protocol directs the EMD to complete a specific chief-complaint, preplanned interrogation with a caller in order to accurately assess and act on the medical emergency. It helps also to interrogate the caller to identify the demographics, general medical problem of the patient and to determine the status of consciousness and breathing in a systemized way. Systematized interrogation is an essential component of a comprehensive medical dispatch protocol, even for those systems not prioritizing between advanced life support (ALS) and basic life support (BLS) calls. Appropriate use of a medical dispatch protocol helps the EMD to avoid making mistakes of the medical emergency and incorrect dispatching decisions. When dispatchers fail to use medical dispatch protocols, they may be prone to assess the situation based on inadequate information, and may fail to identify the patient's chief complaint and, therefore, may provide inadequate response or advice.

3.10. Ambulance station: Is an area or location where ambulances placed. In emergency, medical system of a city; there are plenty of ambulance stations but there should be one EMD. Ambulance stations are selected and mapped using different criteria, that includes population size, distance to health facility, exposure and frequencies of emergencies or accidents incidents, Road jamming (for cities) and type of road. Considering this criteria station will be established in Harar City administration.

4. Rationale

Harari and East Hararghe zonal woredas have procured more than 100 ambulances during the last 4-5 years and more than 50 ambulances are under purchase, therefore the management of the ambulances and over all the pre hospital emergency services needs to be addressed properly in order to meet the seated objectives and purposes of all this investment. In any system there is scarcity of resources and this scarcity will be doubled when there is no proper regulation and management. Ambulances needs to be dispatched according to the level of incident severity, prioritization of calls is mandatory and all this functions has to be guided and supported by protocols. Thus this protocol will guide the dispatchers to provide a consistent, systemized ambulance dispatch service for the countries pre hospital emergency medical services improvement. This

document gives also emphasis on EMD training, continuing education, importance of medical direction, and data generation for continuous quality assurance and quality improvement.

5. Objectives

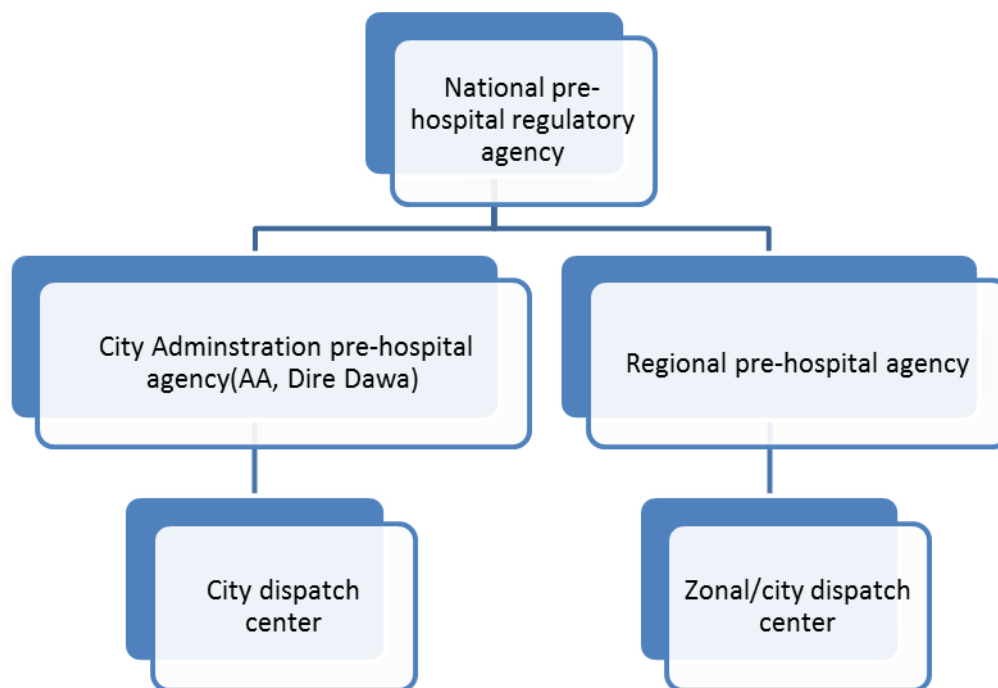
5.1 General Objective

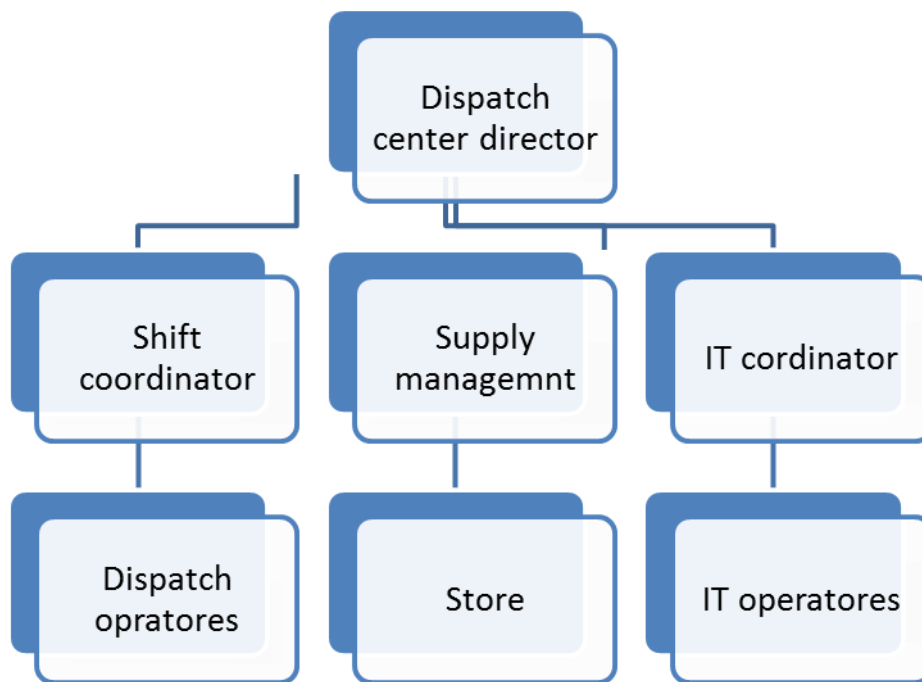
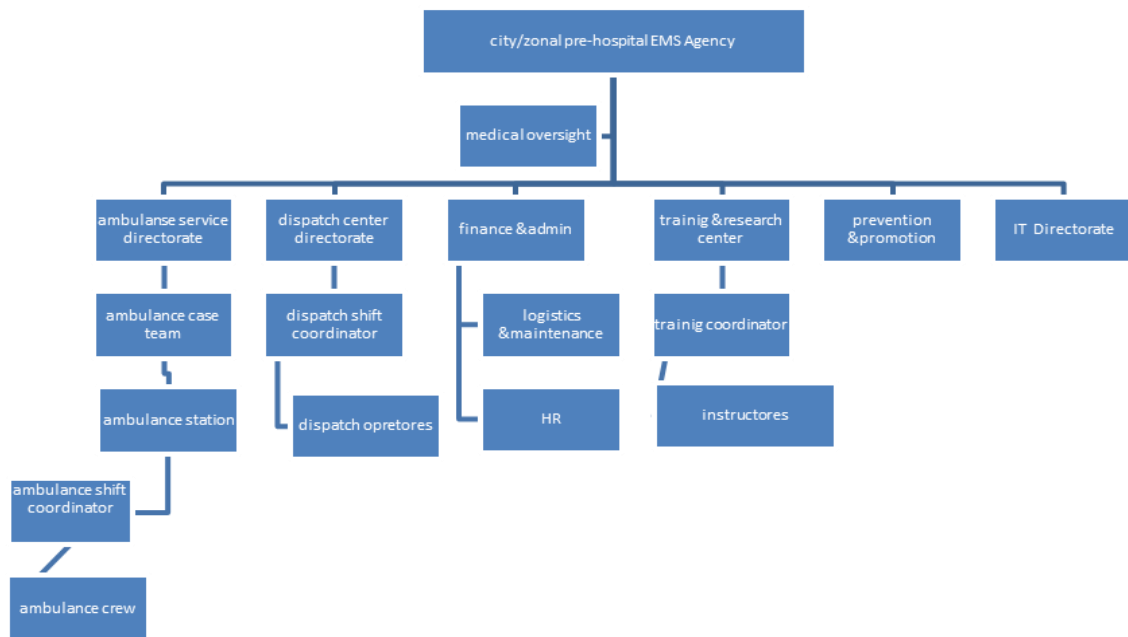
- To decrease morbidity and mortality of acutely ill and injured patients through well organized and standardized dispatch process and improved coordination of pre health facility emergency medical services.

5.2 Specific Objectives

- To establish clear protocol for the medical dispatcher to dispatch ambulances properly
- To Improve access and quality of pre facility emergency care and Ambulance services
- To improve the ambulance utilization and implementation of the national ambulance service standard

6. Pre-hospital emergency services Organogram





6.1. Dispatch Center

Dispatch center will be established at Harar City administrations. Dispatch centers should have its organizational structure, Human Resources, Logistics and administration and call takers station. To prepare the number of call taker station we have used as a baseline Fire and Emergency, protection and Rescue Authority current Data. The Minimum required dispatch center should have at least 1 station. Each station area should have at least 1.5x1.5 square meter and with Computer. Call Takers shall work with 8 hrs shift. 3 call operators in station per shift.

The dispatch center should have:

- Cafeteria for call operators
- Rest room

- Office for dispatcher head, dispatcher coordinator
- Office for human resources
- Logistics room and office

The minimum Criteria (requirement) for call operator shall be:

- At least EMT graduate with good result and 2 years' service or BSC graduate in Emergency and Critical Care, or BSC nurse with emergency training
- A good communication skill in Amharic and Afaan Oromo and at least one other local language of dispatch center.
- Basic knowledge of Computer
- At least One month training in Pre-hospital dispatching

6.2. Ambulance station:

Is an area or location where ambulances placed. In emergency medical system of a city or region there are plenty of ambulance stations but one EMD. Ambulance stations are selected and mapped using different criteria that includes:

- Population size,
- Distance to health facility,
- Exposure and frequencies of emergencies or accidents incidents,
- Road jamming (for cities),
- Type of road.

During planning of ambulance stations all this criteria should be considered for all rural and urban areas of the country.

6.3. Emergency Medical Dispatch principles

- The nearest available ambulance shall be tasked to the highest priority incident
- Dispatchers shall use protocols properly, and have good judgment to assign priority according the reported severity of the case
- The Dispatcher may preserve the availability of ambulances by stand in line mechanism for priority incidents until sufficient resources are available
- When response is going to be delayed Dispatchers shall inform the caller of estimated time of arrival and follow the patient's condition using relevant questioning of the care taker and advise a care to be given by bystanders or provide to use other alternatives

6.4. Role and responsibilities of EMD

- Identifying basic caller information: incident exact place type of incident: trauma, medical illness, labor and deliver, child, related,
- Telephone interrogation: Based on the information given by the bystander or care taker or a patient him/her self, recognize and classify the severity of the incident, according the protocol
- Instruction: If there is a report of cardiac arrest confirm the arrest by guiding how to identify cardiac arrest and when confirmed advise how to initiate early cardiopulmonary resuscitation (CPR) at the scene. When available advise early defibrillation with AED
- Resource allocation, and coordination: Mobilize the nearest ambulance and choose the ambulance type basic vs. advanced according the severity of the incidence
- When necessary communicate supervisor and/or health facility for interface
- Maintain Field communication and coordination when required
- When there is dead body on arrival the dispatcher should report to police
- When there is death during resuscitation the dispatcher should instruct the ambulance crew to take the body to respective hospital

6.4.1. EMD during disaster

Should act according the city or the zone, or the region or the national disaster and outbreak preparedness plan should work closely with disaster and outbreak center at each level. Should have its own disaster plan and conduct drills in collaboration with stakeholders.

6.4.2. Stakeholders

Are organizations who are engaged directly or indirectly on emergency conditions? This includes: police, fire and emergency, health facilities, other pre-hospital providers.

6.5. Dispatch Pre-Arrival Instructions/DPAI/

- Dispatch Pre-Arrival Instruction (DPAI): is providing medically approved and scripted instructions to deliver necessary aid to the patient prior to EMS arrival.
- Not all patients or care takers will receive DPAIs.
- Some DPAIs include: CPR, Childbirth, Choking, bleeding, burn, unconscious patients,

6.6. Response determinant

- Very urgent: patients who are unconscious, no breathing, major bleeding, deep and massive burn, hypoglycemia, 2nd stage labor, chest pain, cardiac arrest, severe dehydration, convulsion,
- Urgent: conscious but weak (difficulty to talk, respiratory distress/fast breathing, open fracture, 1st stage labor, child with fever, acute abdomen,
- None-urgent: conscious with closed fracture, controlled bleeding, lacerations, controlled bleeding, cough, fever, etc

7. Response modes

Response mode is a standard developed in order an ambulance siren and light is used according the dispatch level. And guides the EMS team when and how ambulance light or siren has to be used. When dispatch order is given to the nearby ambulance crew by the dispatcher the ambulance will get priority according the level and the traffic police will guide the road utilization. The dispatcher decides what type of ambulance (basic or advanced) and as the same time according the information gathered about the event or patient he/she will also give the urgency level and the response mode.

7.1 Types of response modes

- Non-Emergency – ABCD intact but has some acute illness that needs to visit health facility and the Ambulance has to be dispatched without LIGHT & SIREN, and the ambulance is basic/EMT ambulance.
- Emergency BLS – Basic Life Support Ambulance with LIGHTS & SIREN (EMT)
- Emergency ALS – Advanced Life Support Ambulance with LIGHTS & SIREN (Paramedic)

7.2. Emergency medical Dispatcher requirements

- 10+completed
- Basic computer training
- At least one month training on EMD
- Applicants with BLS certification are more desirable

7.3. Training requirement guideline

- Introduction to the software on EMD
- Medical terminology
- BLS
- Communication skills
- Client Interrogation skills and practice
- Dispatch pre-arrival instruction implementation

7.4. Quality assurance and improvement of the EMD

- Professionals: To maintain and to improve the quality the strategy has to address the professionals' certification, recertification, and continuous updating training
- Equipment and technology should be assessed and has preventive maintenance and back up
- Performance: should be continuously evaluated against seated standards and indicators

7.5. Patient transfer and handover from scene to health facility

This process must be smooth and with common understanding to shorten the process time and facilitate treatment.

- Role and responsibility of dispatchers and ambulance crew: early notification on the incoming critically sick emergency patients, and victims of mass incident minimum 5 minutes before arrival to health facility or scene departure. enquire help from the accepting health facility when necessary, handover patient's status verbally and completed patient care chart, deliver copy of the patient care to accepting emergency team
- Accepting health facility emergency team role and responsibility: wait for the incoming patient prepared, hand over should be without delay within two minutes, accept and signed the ambulance patient care chart, give on site feedback, and written feedback

7.6. Emergency Medical response protocol

Emergency Medical response is a written structure of actions for the evaluation of the incident, response to the event, and provision of care to the emergency patients. A written dispatch protocol directs the EMD to complete a specific chief-complaint, pre-planned interrogation with a caller to accurately assess and act on the medical emergency. It helps also to interrogate the caller to identify the demographics, general medical problem of the patient and to determine the status of consciousness and breathing in a systemized way. Systematized interrogation is an essential component of a comprehensive medical dispatch protocol, even for those systems not prioritizing between advanced life support (ALS) and basic life support (BLS) calls. Appropriate use of a medical dispatch protocol helps

the EMD to avoid making mistakes of the medical emergency and incorrect dispatching decisions. When dispatchers fail to use medical dispatch protocols, they may be prone to assess the situation based on inadequate information, and may fail to identify the patient's chief complaint and, therefore, may provide inadequate response or advice.

8. Benefits of using a protocol

- To help all essential questions will be asked about the event
- Helps the dispatcher to determine the responses level and mode
- Helps to minimize long conversation and to speed the response
- Helps to use specifically defined Determinant Descriptors
- Helps to make the service persistent and minimizes individual variation
- Defines incident characteristics and facilitate decisions
- Protocols can be used for QA and QI
- All callers can expect the same level of service according the code.
- Reduces inconsistency which lessens the risk for errors thus reducing liability Biases can cause a dispatcher who isn't following a set structure to "lead" a caller along inappropriate information gathering pathways
- protocols help analyze and classify symptoms
- Protocols organize vast amounts of information for consideration by the decision maker.
- Protocols show the interrelationship of various data, forcing consideration of all possible decision choices and safeguarding against stereotyping.
- Protocols can help to reconstruct the decision-making process

8.1. Emergency Medical Dispatch protocol requirement

- Be medically approved
- Be uniform throughout each EMS jurisdiction
- Use standard response classification codes
- Be followed consistently and non-arbitrarily by all EMD's
- Define the types of cases requiring an ALS versus a BLS

8.2. Contents of the Emergency Medical Dispatch protocol

- Systematized caller-interrogation questions that are specific chief-complaint
- Systematized pre-arrival instructions
- Protocols that determine ambulance response mode according the chief complaint severity
- Referenced information for dispatcher use.

8.3. Data to be generated from the protocol for reporting

- Total number of call (number of true and false calls, inappropriate)
- Callers by age and sex
- Number of non-emergency
- Incident type: acute medical illness, injuries,
- Mode of dispatch: very urgent, urgent, not urgent, non-emergency

- Number of calls not got ambulance dispatch
- Ambulance response time
- Total time taken to complete ambulance response
- Death on the way to health facility
- Number of patients unavailable during arrival

Annex

Annex 1: EMD requirement

The minimum Criteria (requirement) for call operator shall be:

- At least EMT graduate with good result and 2 years' service or BSC graduate in Emergency and Critical Care, or BSC nurse with emergency training
- A good communication skill in Amharic and Afaan Oromo and at least one other local language of dispatch center is.
- Basic knowledge of Computer
- At least One month training in Pre-hospital dispatching

EMD JOB DISCRPTION

- Achieve Emergency Medical Dispatch status following the one month training
- Handle incoming emergency, urgent and non-urgent calls
- Have Contingency plans and procedures to accommodate any system failures.
- Precisely analyze information provided by the caller to allow appropriate resources to be prioritized and allocated at the earliest possible opportunity
- Based on the callers information ascertain scene safety and inform to the responding crew
- Be professional and patience while responding to angry and distressed callers
- Provide telephone advice and guidance to callers regarding any emergency conditions medical using the Medical Priority Dispatch System.
- Collaborate with health professionals working in health institutions
- Work closely with other emergency service agencies, fire, police, private and NGO ambulances
- Have clear knowledge on how and when to involve medical oversight on a variety of issues such as: Incidents that have potential to become large scale including all Chemical Biological Radio-active Nuclear (CBRN)
- Maintain good documentation and reporting procedures
- Use the appropriate trust reporting mechanisms for any adverse incidents
- Share best practice with colleagues
- Make suggestions for improvements and developments to systems and processes to the appropriate managers
- Maintain own Continuing Professional Development
- Maintain principles of patient confidentiality
- Adhere to the Emergency Medical Dispatch Code of Ethics
- Attend all mandatory training required to maintain Emergency Medical Dispatch registration
- Should recertification training every 2years

Annex 2: Dispatch director requirement

- He /she should have MSC on emergency care and 2years relevant experience, or Bsc on emergency and CC and 3 years relevant service, or if the above candidates are not available BSC nurse with short term training on emergency and 5years service
- Applicant with leadership experience and management training are encouraged
- Show Willingness and dedication to take the responsibility

Dispatch director job description

- He/she is responsible for planning, monitoring and evaluation of the dispatch center activates
- She/he should be innovative to motivate workers in the facility
- He/she should develop necessary budget for the dispatch center
- He/she should have good communication skills
- She/he should work closely with community and stakeholders
- Work closely with ambulance service section or case team
- Develop regular capacity building plan and follow its implementation
- Regularly evaluate the quality of services of the dispatch center
- Encourage staffs to conduct QIP and research and secure budget for it
- Develop schemes for meeting with the staff and give feedback on the achievements gaps and take majors to improve the gaps
- Analyze the data regularly, monthly, quarterly and yearly respond accordingly and report to respective body
- Adopt and develop service standards

Annex 3: Dispatch coordinator requirement

- Paramedic graduate with good result and 2 years' service or EMT with good results and 3 years' experience, or with BSC graduate in Emergency and Critical Care, and 2 years' experience, or BSC nurse with short emergency training and 3 years at pre-hospital centers or other relevant area
- Good communication skills in Amharic and Afaan Oromo and at least one other local language of dispatch center are.
- Basic knowledge of Computer
- At least One month training in Pre-hospital dispatching
- Job description
- He is accountable to the dispatch director
- Coordinate the dispatch shift workers and work flow
- He/she should have skills on problem solving
- should be decision maker without delay and to insure the continuity of the service
- Should behave as a role model
- Monitor the data quality at every shift
- Supervise each dispatcher
- Submit service report to the dispatch head
- Assist dispatchers and ambulance crew as needed
- Facilitate smooth work flow between dispatchers and ambulance crew

- Act per the disaster preparedness plan protocol for disaster response

Ambulance dispatcher protocol

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI (Post-dispatch instruction)</i>
E				
1. Cardio respiratory arrest	1. Does the patient have a response? 2. Is the victim breathing?	E 1.No breathing and unconscious	BLS/ALS (siren with light)	Start chest compression (do 30 chest compression on the middle of chest and then give two mouth to mouth breathing.
2. Loss of consciousness	Is the patient breathing?	E 1.No breathing and unconscious	BLS/ALS (siren with light)	Start chest compression (do 30 chest compression on the middle of chest and then give two mouth to mouth breathing.
		D1. Unconscious and breathing	BLS/ALS (siren with light)	lie the patient in recovery position
3. Chocking	<ul style="list-style-type: none"> • Are the victims' hands on his/her neck • No verbalization? • No response? • No breathing? 	E 1. No breathing and unconscious	BLS/ALS (siren with light)	Start chest compression (do 30 chest compression on the middle of chest and then give two mouth to mouth breathing.
		E1. Hands on the neck, conscious and no verbalization	BLS/ALS (siren with light)	Perform abdominal trust until the foreign body comes out.
		A1. Patient is coughing but restless	BLS (light only)	encourage the victim to cough
Chief complaint	Key questions	Descriptors	Response	PDI
4. Drowning	<ul style="list-style-type: none"> • Does the patient have a response? • Is the patient breathing? 	E 1.no breathing and unconscious	BLS/ALS (siren with light)	Start chest compression (do 30 chest compression on the middle of chest and then give two mouth to mouth breathing.
		D1. Unconscious and labored breathing	BLS/ALS (siren with light)	lie the patient in recovery position
		A1. Conscious and breathing	BLS (light only)	prevent hypothermia by covering the victim with blanket
5. Hanging	<ul style="list-style-type: none"> • Does the patient have a response? • Is the patient breathing? 	E 1.No breathing and unconscious	BLS/ALS (siren with light)	Start chest compression (do 30 chest compression on the middle of chest and then give two mouth to mouth breathing.
		D1. Unconscious and breathing	BLS/ALS (siren with light)	lie the patient in recovery position
		A1. Conscious and breathing	BLS (light only)	reassure the patient

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
D				
1.Chest pain	<ul style="list-style-type: none"> • How long does the chest pain stay? • Is there difficulty of breathing? • Does the patient have sweating? • Do you have dizziness 	D1. pain stays longer than 30 min	BLS/ALS (siren with light)	Give aspirin Give nitroglycerine Put the patient in position of comfort
		D2. patient have difficulty of breathing	BLS/ALS (siren with light)	-Give aspirin -Give nitroglycerine -Put the patient in position of comfort

	and light headedness?	C1. pain stays less than 30 min Pain relieved during rest No heavy sweating No dizziness and light headedness	BLS (siren with light)	-Give nitroglycerine if available -Put the patient in position of comfort -Loosen tight clothing
2.Bleeding	1.Is it serious and active 2. Is the victim alert 3. Is all body part gone (amputation) 4. Is it multisite	D1.serious active bleeding D2.Amputation D3. Multiple site active bleeding	BLS/ALS (siren with light)	-Apply pressure over the site -Elevate the limb above the level of the heart -Apply tourniquet if amputated
		C1 single site and active bleeding	BLS (Siren and light)	-Apply pressure over the site - Elevate the limb above the level of the heart
		A1 minor bleeding or laceration	BLS (light only)	apply pressure over the site

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
3.Burn	1. Which area of the body is involved in the burn injury? 2.Total body surface area involved 3.Mechanism of burn 4. Is burning process still on?	D1. Facial burn	ALS (siren with light)	-Put the patient in well-ventilated area if suffocated -Copious irrigation with tap water if it is chemical burn,
		D2. Burning process still on Stop burning process	ALS (siren with light)	-Copious irrigation with tap water if it is chemical burn. -Turn off the electric source if electrical burn. -If scaled remove clothing and immerse the affected area in tap water. -Do not remove any adherent material and clothing if flame burn -Cover the patient with a blanket or let the victim roll over the ground if flame burn
		C1. Burn involving extremities, trunk and back C2.Contact burn with severe burn.	ALS (light only)	Stop the burning process Cover the burn Give NSAIDS if available
		A1 or Omega 1..Minor thermal burn on fingers	Referral/BLS (light only)	Rinse the affected finger in the water. If the pain is not relieved after 10 min, cover the site and go to health institution

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
4.Seizure	<ul style="list-style-type: none"> • Duration and frequency of seizure • Presence of loss of consciousness • Is the victim febrile? • Is the victim pregnant? • Associated injuries 	D1. Seizure lasting >30 minutes and recurrent seizures without complete regain of consciousness	ALS (siren with light)	-Put the victim in left lateral position -Remove any nearby objects and protect the victim's head -Loosen tight clothing -Time the duration of seizure -Avoid suffocation and do not restrain the patient -do not put anything per mouth
		D2. Associated injuries	ALS (siren with light)	-Bleeding, see bleeding protocol Fracture , see fracture protocol
		D3.seizing pregnant women	ALS (siren with light)	put her in LLP
		D4. Febrile seizure	ALS (siren with light)	-Apply cold compress -Administer antipyretics avoid extra clothing

		A and B. Seizure stopped and victim is awake	(BLS light only)	Link with the nearby health facility
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<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
5. Poisoning	1. What is the type of poison ingested? 2. Symptoms (increased secretions, LOC , body temperature)	D1. Organophosphate poisoning (Malathione, herbicides and pesticides)	ALS (siren with light)	-Put the victim in left lateral position -Do not give anything by mouth -Remove clothing and wash the victim's body (after putting on PPE) -Do not attempt to induce vomiting
		D2. CO poisoning	ALS (siren with light)	-Rescue the patient -Ventilate the victim -If LOC, see protocol for LOC
		C. Poisoned victim and no LOC	ALS (siren with light)	Do not attempt to induce vomiting
6.Shortness of breath	<ul style="list-style-type: none"> • Is there difficulty of breathing? • Is the patient asthmatic • Does the patient have chest pain? • Can the patient talk full sentences? 	D1. Asthmatic patient and can only talk in words	ALS (siren with light)	Give 8-10 puffs of salbutamol if available Put the patient to sitting/ semi sitting position
		D2. Chest pain	ALS (siren with light)	See chest pain protocol
		C. Difficulty of breathing and the patient can talk in phrases	ALS (with light only)	-Put the patient to sitting/ semi sitting position -Put the patient to well-ventilated area

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
7. Epistaxis	1. Is the patient still bleeding? 2. Does the patient applied direct pressure for more than 20 minutes	D1. Still bleeding after applying direct pressure for 20 minutes	ALS (siren with light)	-pack the nostril with cotton/ clean cloth -Calm the patient and instruct to avoid talking -Instruct the patient to spit out the blood -Tell him/her to avoid swallowing of the blood -Avoid leaning backward position
		A/B. The patient is still bleeding but did not applied direct pressure on the nostrils	BLS (only with light)	-Instruct the patient to spit out the blood -Tell him/her to avoid swallowing of the blood -Instruct the patient to lean forward slightly and pinch his/ her nostrils for 10-20 minutes -Avoid leaning backward position

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
8. Febrile child	<ul style="list-style-type: none"> • How old is the child? • Is there bulging fontanel or neck stiffness? • Is there history of malaria? • Is the child unable to eat or breast feed? 	D1. Age less than 2 months	ALS (siren with light)	-Apply cold compress -Administer antipyretics if available -Continue breast feeding
		D2. Bulging fontanel or neck stiffness	ALS (siren with light)	-If there is LOC put him/ her in LLP and see protocol for LOC -Apply cold compress -Administer antipyretics if available
		D3. History of malaria?	ALS (siren with light)	-Apply cold compress -Administer antipyretics if available

	<ul style="list-style-type: none"> Is there any seizure episode? 	D4. Febrile and unable to eat or breast feed	ALS (siren with light)	-Apply cold compress -Administer antipyretics if available
		D5. Febrile child with seizure	ALS (siren with light)	-Apply cold compress -Administer antipyretics if available -See seizure protocol
		C1. Febrile child and able to	ALS (with light only)	-Eat and breast feed -Apply cold compress -Administer antipyretics if available
		C2. Febrile child but not seizing	ALS (with light only)	Apply cold compress Administer antipyretics if available

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
9.weaknes of extremities	<ul style="list-style-type: none"> Is there history of fall down injury? Is there history of LOC? Is there a unilateral facial drop and arm drift? Is there any speech difficulty? Is there history of hypertension? 	D1. Weakness of extremity with facial drop and arm drift	ALS (siren with light)	-Put the patient in recovery position -Protect the patient from falling
		D2. Weakness of extremity with history of falling injury	ALS (siren with light)	-Put the patient in recovery position -Protect the patient from falling -If there is bleeding, see bleeding protocol -If there is associated fracture, see fracture protocol

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
10. Fracture	<ol style="list-style-type: none"> Do you have pain? Is there more than one site of injury? Do you have difficulty of using affected part? Do you have bleeding from the site? 	D1.If severe pain , multiple site and unable to use affected part	ALS (siren with light)	-Provide analgesics if available & patient is conscious -Apply splint (with available device) -Make the alignment in a normal anatomical position. -Tie the affected part (limb) with the normal part.
		D2. Severe bleeding	ALS (siren with light)	Go to the bleeding protocol.
		C. Single site lower extremity and unable to use affected part	ALS (with light only)	Same management as the management of D1.
		C2. Single site lower extremity fracture and no difficulty of using affected part	ALS (with light only)	-Provide analgesics -Don't try to move the affected part (immobilize)
		A. Single site forearm and no difficulty of using affected part	BLS (only with light)	-Reassure the patient -Link to nearby facility.

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
11. Sprain	<ul style="list-style-type: none"> Do you have a pain? Where is the site of pain? Is there any swelling at the site? Is there any misalignment? 	C1. If there is pain and swelling	ALS (with light only)	-Rest the affected part, -Immobilize the affected part. • Apply ice, elevate your limb • Give analgesics if available
		C2. If there is misalignment	ALS (with light only)	Go to the fracture protocol
		A. If there is pain only.	BLS (only with light)	-Rest the affected part, -Apply ice. • If no response go to nearby health facility.
12. Persistent vomiting and diarrhea in children.	<ol style="list-style-type: none"> How frequent is the vomiting and diarrhea. Is there any sunken eye ball? Is the baby alert. Is the baby eager to drink? 	D1. Very frequent vomiting, diarrhea& sunken eye ball or decrement in urine output, not alert. (Sever DHN)	ALS (with light only)	Give the baby ORS per each loss if he / she can drink.
		C. frequent diarrhea	ALS (with light)	Give the baby ORS per each loss if he

		and vomiting & sunken eye ball, Eager to drink.	only)	/she can drink.
		A. Less frequent diarrhea, alert baby & no sunken eye ball.	BLS (only with light)	Link to nearby health facility.

<i>Chief complaint</i>	<i>Key questions</i>	<i>Descriptors</i>	<i>Response</i>	<i>PDI</i>
13. Vaginal bleeding	<ul style="list-style-type: none"> Is she term pregnant or early pregnancy? Is the bleeding massive? Is she confused? Does she has active bleeding? Does she gave birth recently? 	D1. Severe bleeding after birth	ALS (siren with light)	Apply pressure on lower abdomen Massage the lower abdomen
		D2 sever bleeding at term	ALS (siren with light)	Calm the patient and advice to minimize movement
		D3. sever vaginal bleeding with confusion	ALS (siren with light)	Put her on shock position
14. Cord prolapse	<ul style="list-style-type: none"> When was the incident happened? Is it term pregnancy? 	D1. cord prolapse at term and early	ALS (siren with light)	Advice the women to lie on knee chest position
15. Abdominal pain	<ul style="list-style-type: none"> How long does the pain persist? Is there vomiting, and diarrhea? Is there abdominal distention? Is he/she has confusion? 	D1. Abdominal pain over 6 hours	ALS (siren with light)	Put the patient on NPO
		D2. Abdominal pain with vomiting and diarrhea	ALS (siren with light)	Put the patient on shock position
		D3. Abdominal pain with distention	ALS (siren with light)	Put the patient in his/het comfortable position and monitor breathing
		D4. Abdominal pain with confusion		
16. Snake bite	<ol style="list-style-type: none"> How long the incident happened? Is the patient confused? 	D1 snake bite of short duration	ALS (siren with light)	Tourniquet above site of the wound Keep the patient immobilized Clean the wound
		D2 snake bite with confusion		Put the pt in shock position Tourniquet above site of the wound Keep the patient immobilized Clean the wound

Entry questions for any patients:

<i>Key questions</i>	<i>Response</i>	<i>General PDI (post-dispatch instruction)</i>	<i>Specific post-dispatch instruction</i>
• Where is the address of the emergency			
• What is the phone number you are calling from?			
<ul style="list-style-type: none"> Tell me exactly what happened: Hanging Drowning 	If yes for question A&B, send BLS/ALS (with siren and light) immediately	I am sending the ambulance to help you now. Stay with a patient do these: <ul style="list-style-type: none"> Hanging: cut him/her down immediately, loosen the noose, then tell me if she/he is breathing Strangulation: Loosen anything around the neck, then tell if she/he is breathing Suffocation: remove anything covering the face or in the mouth, then tell me if she/he is breathing Drowning: do not go in the water unless it is safe to do so Unsafe scene: if it is too dangerous to stay where you are, and you think you can leave safely, get away and call us from somewhere safe 	After finishing the general PDI, go to specific protocol with the respective chief complaint
• Are you with the patient now?			
• How many people are hurt?	If yes for question		

<ul style="list-style-type: none"> Road traffic accident Multiple victims 	A&B, send BLS/ALS (with siren and light) immediately		
<ul style="list-style-type: none"> How old is she/he? 			
<ul style="list-style-type: none"> Is she/he awake 	If no responsive, send BLS/ALS (with siren and light) immediately		After finishing the general PDI, go to specific protocol with the respective chief complaint
<ul style="list-style-type: none"> Is she/he breathing 	If no breathing, send BLS/ALS (with siren and light) immediately		After finishing the general PDI, go to specific protocol with the respective chief complaint

N. B:

Nomenclature of ΩABCDE is different in different countries: For example, E (Edward), D (David), C (Charles), and B (Boy), A (Adam) and Ω (Omega). We could possibly call it E (Ertale), D (Derash), C (Chamo), B (Belay), A (Awash),Ω (Omega). The important thing is having standard abbreviation called ΩABCDE.

For us: ‘E’ category needs BLS/ALS ambulance with siren and light. Since we might not have ALS, we can use BLS

‘D’ category needs BLS/ALS ambulance with siren and light.

‘C’ category needs BLS ambulance with siren and light

‘B’ category needs BLS ambulance with only light

‘A’ category needs BLS ambulance with only light or we might not send depending on the condition

‘Ω’ category needs no ambulance/ only advice to visit health institutions

Table 1: EMS response

Clinical Status	Code	Description	Essential Response	Response to scene	Vehicle type	Additional Response	Further extra response	Other resources
1 Life threatening	Echo	Life threatening – Cardiac or respiratory arrest	Ambulance with minimum Paramedic	Lights and siren	Ambulance	a) Advanced Paramedic. b) Responders (CFR if no hazards, trauma or DNAR) c) Minimum 3 to 4 practitioners or responders on scene	Ambulance Officer according to operational requirements	HEMS, Fire Service, Garda, Coast Guard, Utility services as required
	Delta	Life threatening other than cardiac or respiratory arrest	Ambulance with minimum Paramedic	Lights and siren	Ambulance	a) Advanced Paramedic for specified DCR codes. b) Responders (minimum EFR) if able to get to scene prior to ambulance.	Ambulance Officer according to operational requirements	HEMS, Fire Service, Garda, Coast Guard, Utility services as required
2 Serious not life threatening	Charlie	Serious not life threatening – immediate	Ambulance with minimum Paramedic	Lights and siren	Ambulance	Advanced Paramedic for specified DCR codes	Ambulance Officer according to operational requirements	HEMS, Fire Service, Garda, Coast Guard, Utility services as required
	Bravo	Serious not life threatening – urgent	Ambulance with minimum Paramedic	Lights and siren	Ambulance		Ambulance Officer according to operational requirements	HEMS, Fire Service, Garda, Coast Guard, Utility services as required
3 Non serious or life threatening	Alpha	Non serious or non life threatening	Ambulance with minimum EMT	Lights and/or siren discretion	Ambulance or Intermediate Care Vehicle		Ambulance Officer according to operational requirements	HEMS, Fire Service, Garda, Coast Guard, Utility services as required
	Omega	Minor illness or injury	Ambulance with minimum EMT	Lights and/or siren discretion	Ambulance or Intermediate Care Vehicle		Ambulance Officer according to operational requirements	HEMS, Fire Service, Garda, Coast Guard, Utility services as required

Emergency interfacility transfer (Protocol 37)

Protocol 37 Emergency Interfacility Transfer for Model 2, 3 and 4 hospitals							
Activation	Description	Echo	Delta	Charlie	Bravo	Alpha	Omega
CNM, Registrar or Consultant	Transport for time critical clinical procedure	Not applicable	Immediate response	Response within 30 minutes	Response greater than 30 minutes but within 60 minutes	Response greater than 60 minutes	Not applicable
Vehicle type		N/A	Intermediate Care Vehicle or ambulance	Intermediate Care Vehicle or ambulance	Intermediate Care Vehicle or ambulance	Intermediate Care Vehicle or ambulance	N/A
Crew type for Model 3 or 4 hospital transports	Clinical care will remain the responsibility of the transferring hospital	N/A	EMT	EMT	EMT	EMT	N/A
Crew type for Model 2 hospital transports	Without medical and/or nursing team travelling	N/A	Paramedic	Paramedic	Paramedic	Paramedic	N/A
Notes							
1. Interfacility transfer is defined as a patient transfer between any two model 3 or 4 hospitals.							
2. Protocol 37 may only be used for a time critical procedure available only at another hospital.							
3. In general an ICV with EMT crew will be used for protocol 37 transfers with the referring hospital to supply a medical team and all medications, if required.							
4. The Advanced Paramedic role is not for interfacility patient transfer.							
5. Should ALS be required for a Model 2 hospital it may be organised through the control manager.							

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