Prehospital emergency care - operational guidance for ambulance systems

World Health Organization

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Contents

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Abbreviations

ALS	advanced life support
APP	advanced prehospital provider
BLS	basic life support
BPP	basic prehospital provider
CFAR	community first aid responder
CPR	cardiopulmonary resuscitation
DNR	do not resuscitate
ECS	emergency care system
EMS	emergency medical services
MCI	mass casualty incident
MCO	medical control officer
PP	prehospital provider
PPE	personal protective equipment
QI	quality improvement
SOP	standard operating procedure
WHO	World Health Organization

Glossary

Access number (also referred to as "universal access number"): local telephone number that activates a prehospital provider.

Advanced life support (ALS): In addition to provision of all basic life support functions, provision of advanced care for a critically ill patient may include advanced airway management, advanced procedures such as chest drain placement, administration of intravenous or intraosseous therapy and advanced patient monitoring. The scope of practice by provider level may differ by system.

Ambulance: Motor vehicle equipped to transport and provide care during transport of ill or injured patients. An ambulance must have two separate compartments: a driver compartment and a patient care compartment. Ambulances may be land, air or water vehicles. All ambulances should be registered and accredited by the prehospital component of the emergency care system regulatory authority.

Ambulance base station: Location equipped to provide support for ambulance personnel and ambulance functioning, including provisions for restocking. In some systems, ambulance staging posts and ambulance stations have overlapping functions.

Ambulance fleet: The collection of ambulances operated under a specific emergency medical service (EMS).

Ambulance receiving and drop-off area: A location for dropping off patients accessible to ambulances at a receiving facility. Ideally, the site should be used only for ambulance reception. There should be a separate entrance for all other patients.

Ambulance staging post or launch: Designated area in which ambulances await dispatch instructions to respond to calls. In some systems, ambulance staging posts and stations have overlapping functions.

Basic life support (BLS): Provision of initial, non-invasive life-saving care, including basic airway repositioning, cardiopulmonary resuscitation (CPR), control of external bleeding and immobilization of the spine and fractures. The specific scope of BLS is determined nationally.

Call handling: Receiving, interpreting and prioritizing incoming calls for emergency medical assistance.

Community first aid responder (CFAR): Trained layperson certified as part of an organized system to provide simple initial care for the acutely ill and injured, including airway repositioning, control of external bleeding and splinting. Unlike a bystander who may have received training in first aid, a CFAR is part of an

organized system and can be called upon to respond to an emergency scene by a specific, pre-arranged mechanism.

Complex event: An event that results in acute injury or illness but also has an element of ongoing risk that may hamper access to and/or treatment of patients.

Decontamination: In the context of environmental cleaning, refers to removal or inactivation of dangerous substances or microorganisms from objects or people so that they are safe for contact.

Destination triage: Decision, usually guided by a protocol, on the most appropriate facility for a patient given his or her need.

Dispatcher: An individual trained and certified in receiving emergency calls from the public and in determining the nature of the emergency, if applicable (for example, medical or other), registering the call, prioritizing the call and the PP response, providing the ambulance with the correct location of the call, when necessary, providing pre-arrival caller instructions and coordinating communications as determined by the regulatory authority for the emergency care system (ECS).

Diversion: A temporary state declared by a receiving facility indicating that the facility is experiencing conditions that limit its capacity to provide care and that ambulances should, when possible, transport patients to another facility. Facilities on diversion continue to accept patients who arrive by means other than ambulance. Diversion may be declared for various reasons, including crowding, human or material resource shortages or infrastructure failures.

Do not resuscitate (DNR) order: A formal document prepared in advance according to local regulations by which a person documents his or her refusal of specific life-saving interventions even if they are medically indicated. Local regulations should specify requirements for valid DNR documentation and the rights and responsibilities of providers with respect to DNR orders.

ECS: The subset of the health-care system that responds to emergency health conditions. The ECS covers system activation, first aid, prehospital care, facility-based emergency care and the legislation and policies that govern emergency care.

ECS regulatory authority: The agency mandated by the government and health authorities to oversee emergency care. Depending on the context, pre-hospital and facility emergency care may be governed by the same or different agencies.

ECS regulatory authority advisory committee: A committee comprised of local stakeholders (independent from the ECS regulatory authority) that advises the ECS regulatory authority.

ECS regulatory authority director: While the title of this person may differ by region, the term is used in this document to refer to the person in charge of the

ECS regulatory authority, who oversees the entire ECS (including the prehospital component) in the region and determines policy on how standards are implemented in the region.

ECS regulatory authority PP certification register: A listing of all PPs certified and permitted to work by the ECS regulatory authority.

ECS regulatory authority training centre accreditation register: A listing of all prehospital training centres accredited by the ECS regulatory authority.

Emergency communication and dispatch centre (also referred to as "ambulance dispatch centre", "emergency medical services communication and dispatch centre", "communication and dispatch centre", "emergency call and dispatch centre", "ambulance dispatch centre", "emergency dispatch centre" and "dispatch centre"): Facility approved by the ECS regulatory authority to continuously receive, register and process calls from the access number and to assign and dispatch an ambulance in response.

Emergency event director: A senior PP with experience in managing special events and mass gatherings, who oversees coordination of medical services for such events.

Event aid station: A fixed or mobile facility at an event or mass gathering that can provide initial care to acutely ill or injured participants, and is dedicated to a specific event or event venue and does not function at the same time as part of the surrounding health system. Examples of aid stations include first aid tents, mobile clinics, dedicated ambulances and temporary medical facilities converted from meeting rooms.

Incident command system: A standardized, hierarchical structure that allows a cooperative response and oversight of coordinated, systematic implementation of the emergency response plan.

Incident commander: While the title of this person may differ by region, the term is used in this document to refer to the person in charge of coordinating an incident command system in a mass casualty incident.

Mass casualty incident (MCI, also known as multiple casualty incident): An event that results in more patients at one time than can be managed by locally available resources with routine procedures (generally four or more victims). Examples include a road traffic crash, a building fire or a large-scale event such as an earthquake or mass toxic exposure.

Medical control: A system of clinical governance that provides real-time (online) and protocol-based (offline) medical direction to PPs to ensure that patient care meets agreed standards.

Medical control officer (MCO): A provider with advanced experience in emergency care (often a doctor) who is authorized to provide remote advice to

PPs. MCOs must not only meet clinical training requirements but should undergo specific training in the standards and protocols of prehospital emergency care. In smaller ambulance services, the function of MCO is covered by the medical director, whereas larger organizations may have two posts with separate functions, with the MCO reporting to the medical director.

Medical director: The senior medical provider (often a doctor) who oversees and is responsible for all care in an ambulance service to ensure patient-centric, evidence-based medical care, with the goal of improving patient outcomes and public health. The medical director must be trained in prehospital emergency care standards and protocols and is responsible for ensuring that the PPs in the organization are up to date on current protocols and follow those protocols. The medical director is also responsible for reviewing cases for quality and addressing any issues that arise.

Non-ambulance patient transport vehicle: Vehicle that is eligible to transport patients without providing care and is overseen by the local regulatory authority.

Patient transport failure: A PP could not transport a patient to the hospital in spite of the patient's willingness to be transported, for example, due to family or bystander interference or vehicle failure.

Patient transport refusal: An emergency patient does not allow prehospital personnel to transport him or her to the hospital, for example by stating that they are no longer in pain or refusing treatment on religious grounds

Personal protective equipment (PPE): Equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses that may result from contact with infectious, chemical, radiological, physical, electrical, mechanical or other hazards. Medical non-sterile and surgical sterile gloves, surgical masks, goggles or face shields and gowns are considered essential PPE that must always be available to a PP. Other types of PPE may be required in some circumstances.

Prehospital Provider (PP): An individual who is certified and registered by the ECS regulatory authority to provide clinical services.

Prehospital service provider organization: Any organization that is dedicated, staffed and equipped to provide prehospital emergency care, including public safety agencies, private ambulance companies and nongovernmental organizations. In this document, we refer to these organizations as EMS.

Prehospital supervisor: A senior PP working outside the emergency communication and dispatch centre (usually at the prehospital scene) with supervisory authority over other PPs on duty.

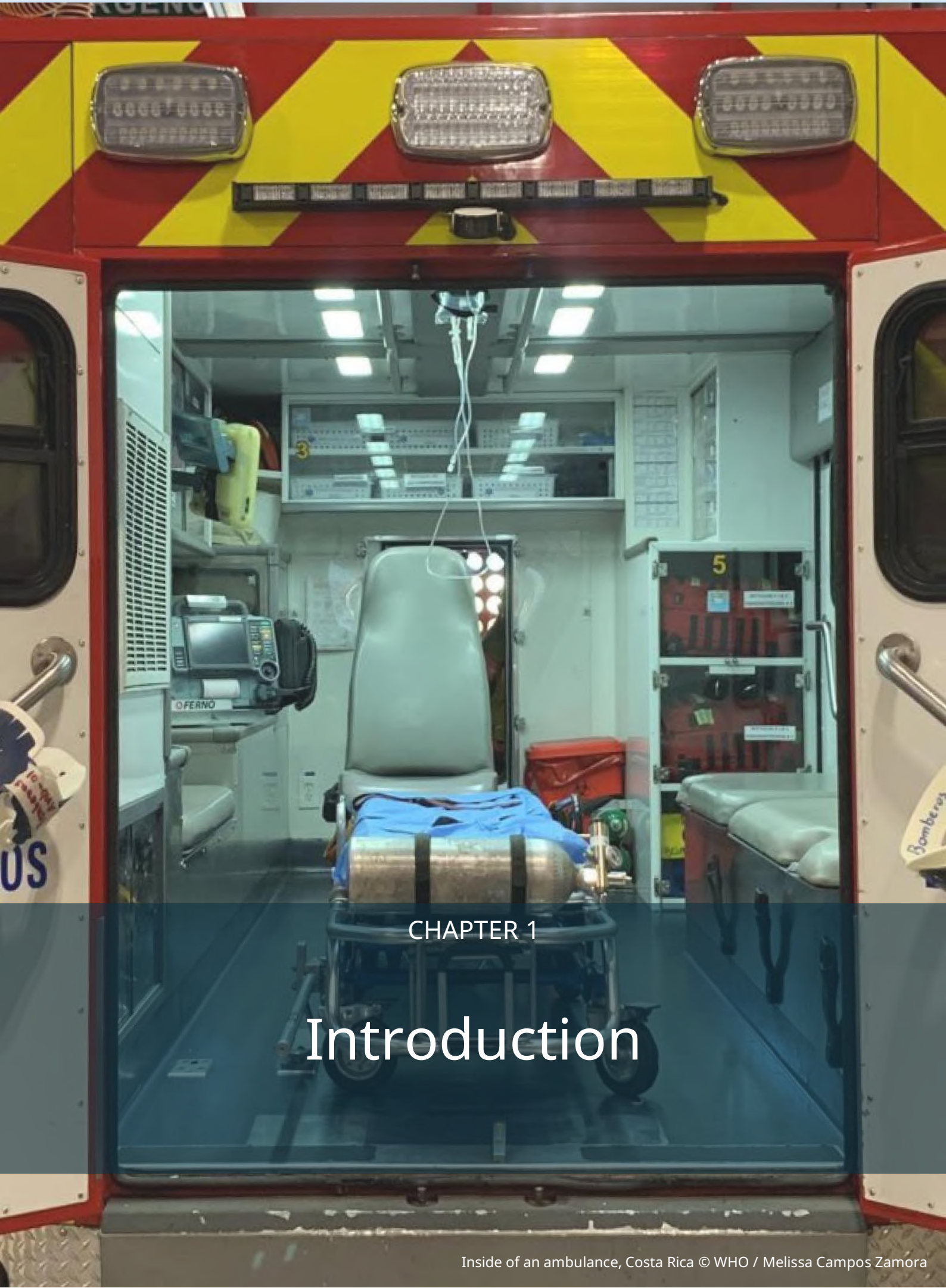
Referral: Direction of an individual to an appropriate facility or health practitioner for a specific health need.

Response prioritization: Classification of a prehospital caller's complaints into a standardized prehospital response acuity level. Depending on the system, prioritization determines the type of personnel and resources that will be sent in response and the order in which calls will be responded to if demand outstrips available resources.

Roadworthy state: The state of an ambulance that ensures that it operate safely on the road.

Scene survey: An assessment of the safety of the prehospital setting to which providers are called. This should be completed on arrival of PPs at the scene before any patient care is undertaken.

Special event or mass gathering: Predictable and/or permitted (by governing authorities) gathering of many individuals for a common purpose. Examples include political gatherings or demonstrations, road races, concerts and religious and cultural festivals.



CHAPTER 1

Introduction

Inside of an ambulance, Costa Rica © WHO / Melissa Campos Zamora

1 Introduction

Timely care and rapid transport save lives, reduce disability and improve long-term outcomes in a wide range of conditions across the life course, including injury, complications of pregnancy, exacerbations of noncommunicable diseases, acute infections and sepsis. The primary purpose of prehospital emergency care is to respond rapidly in times of need and to provide assessment, immediate management and transport of patients to appropriate medical facilities. Strengthening health systems to deliver effective prehospital care – including linkages from communities to facilities and between facilities – is essential to meeting people's health needs and making progress towards universal health coverage through a primary health care approach.

Despite the proven potential of prehospital systems to reduce disability and save lives, they are often underdeveloped. Many health systems lack an enabling regulatory framework, coordination mechanisms, trained personnel and adequate equipment and infrastructure, resulting in delayed or inadequate emergency care and poor outcomes. Even in resource-challenged contexts, however, standard operational frameworks and protocols can increase the effectiveness of prehospital care and help ensure that all individuals have access to timely, high-quality emergency care, regardless of their location.

The WHO Emergency Care System Framework (Fig. 1) is designed to support policy-makers in assessing or strengthening their national ECSs. It provides a framework for characterizing system gaps, setting priorities for planning and funding and establishing monitoring and evaluation strategies for system strengthening and development. The framework captures essential emergency care functions at the scene of injury or illness, during transport and through to emergency unit and early inpatient care. Different systems may achieve each function in different ways, according to their available resources. For example, "system activation" may be optimized in a high-resource setting by providing a universal access number with centralized, computerized dispatch. In other settings, "system activation" may be achieved with simple mobile phone-based protocols. The framework and the associated WHO Emergency Care System Assessment tool, allow policy-makers to use these essential functions to identify gaps in care delivery and to create context-relevant plans for priorities in system development.

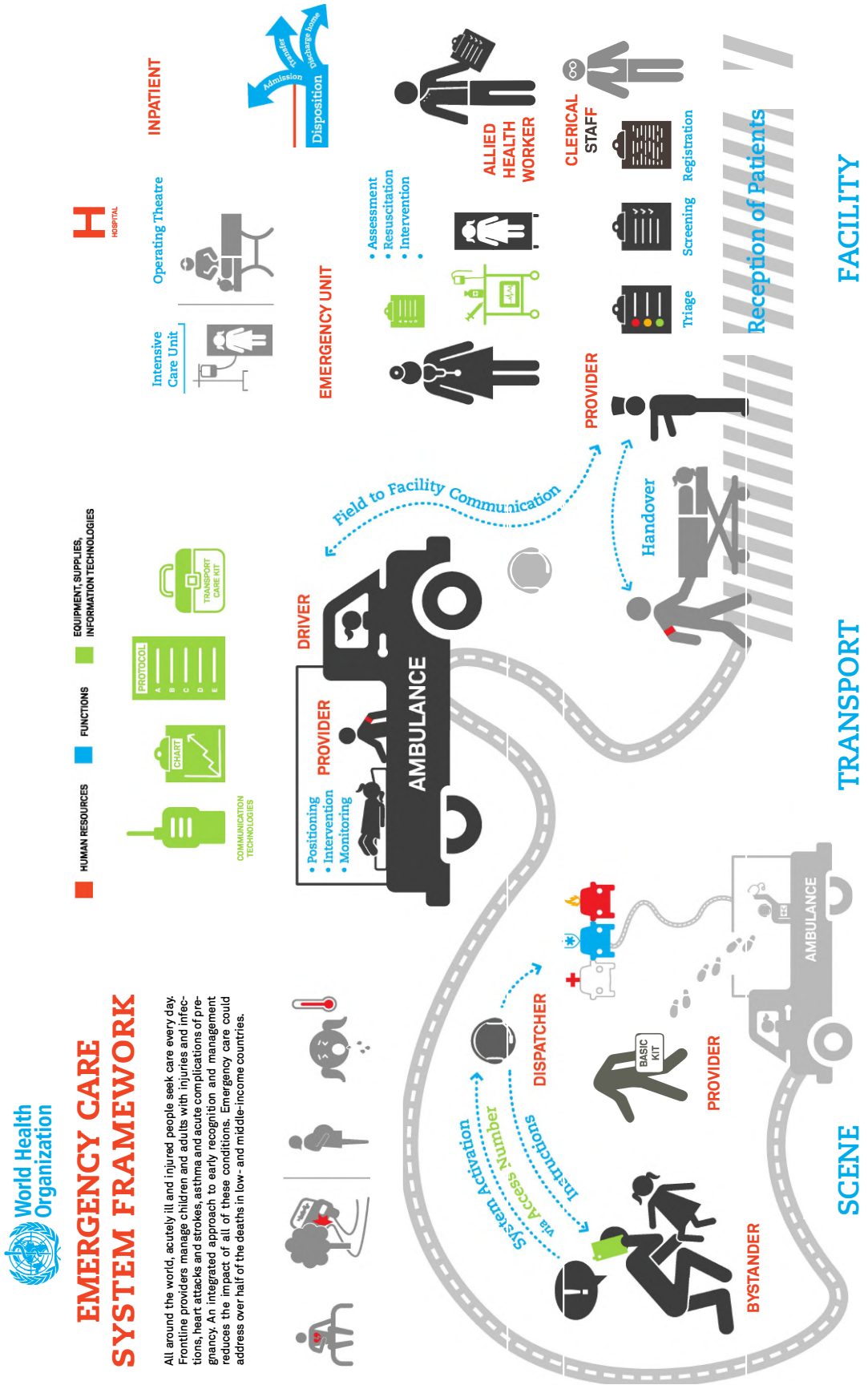


Fig. 1. WHO Emergency Care System Framework

Key functions of prehospital care include the following.

At the scene:

- Bystander response
  - system activation: use of an easily accessible mechanism – such as a universal access number – to trigger dispatch of resources and to provide advice on care remotely to bystanders at the scene; and
  - bystander care: provision of immediate first aid by bystanders at the scene.
- Dispatch
  - instruction to bystanders: provision of basic information by the communication centre to the caller to aid the patient before arrival of dispatched resources; and
  - dispatch of personnel: coordination of and sending appropriate resources in response to emergency calls (system activation calls).
- Provider response
  - scene control: management of safety and command and coordination at the scene;
  - scene care: delivery of immediate medical intervention by trained responders at the scene;
  - field-to-facility communication: communication between PPs or the communication centre and either the receiving medical facility or the facility providing medical oversight to the prehospital service provider organization; and
  - destination triage: decision, usually guided by a protocol, on the most appropriate facility for a patient given his or her need.

Transport:

- Patient transport: safe conveyance of patients to health-care facilities equipped to provide on-going or definitive care
- Transport care: delivery of medical interventions during transport.

These functions ensure that the system can be rapidly activated, can respond promptly and can assess, manage and transport acutely ill or injured people to health-care facilities. Fig. 2 illustrates the steps in responding to an emergency in the prehospital environment.

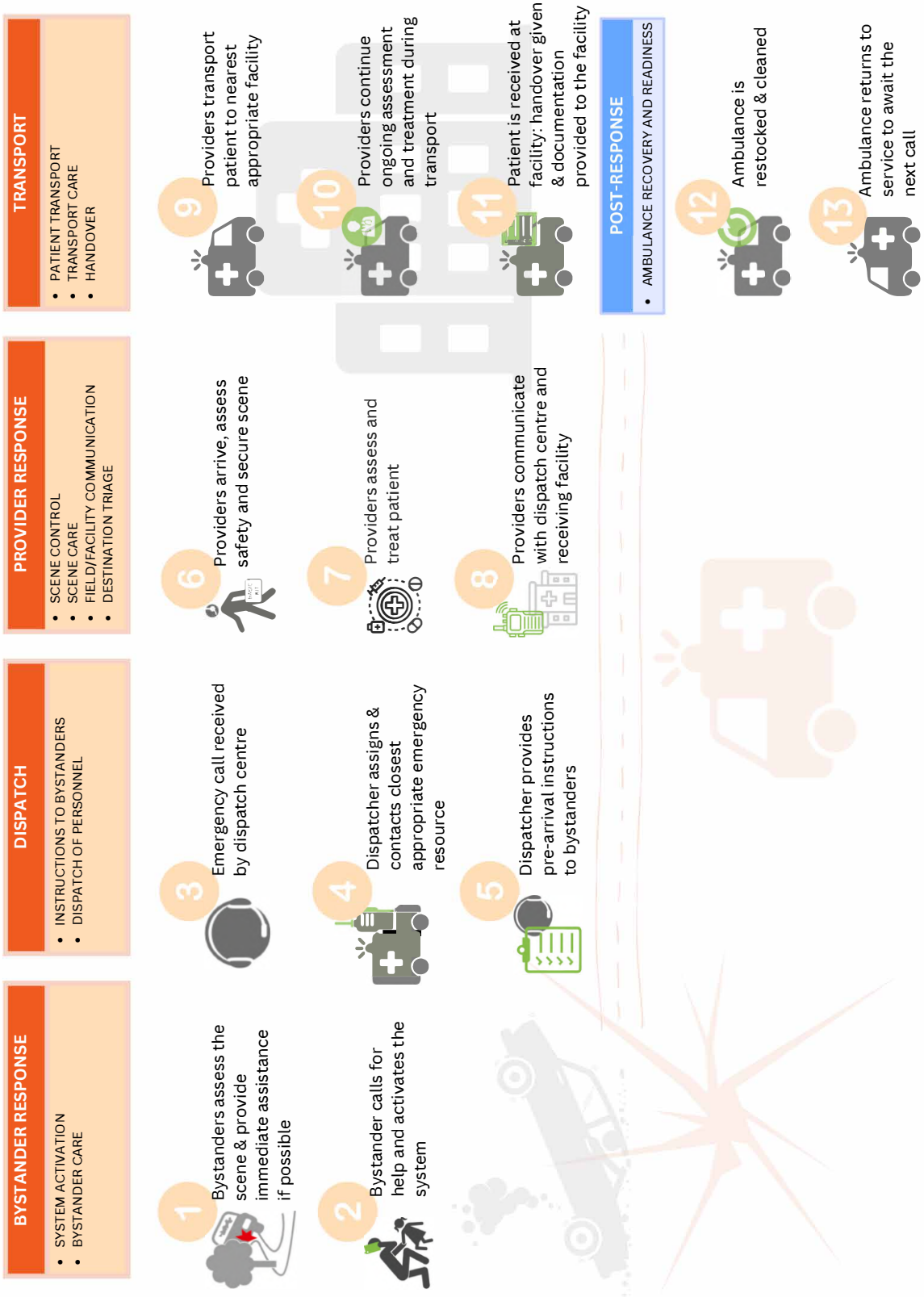


Fig. 2. Key functions in response to a prehospital emergency

The aim of this document is to provide operational guidance on addressing common challenges in the provision of high-quality prehospital emergency care by providing a framework for developing and strengthening prehospital systems. By providing best practices and adaptable standards and protocols, it seeks to support systems at various stages of development, ultimately improving clinical outcomes.

The document is intended to support countries in developing comprehensive standard operating procedures (SOPs) for the organization and delivery of high-quality, person-centred prehospital care, both on the scene and in ambulances. The operational guidance covers approaches for effective system design; policies and protocols for processes; standards for staffing, equipment, supplies and medications; and clinical algorithms for key conditions based on WHO guidance.

The guidance is intended to be used in conjunction with other resources in WHO's Prehospital Toolkit, available on WHO's website, which include the Community First Aid Response and Basic Ambulance Provider learning programmes, the Prehospital Emergency Care Assessment Tool and referral and transfer forms and checklists. The prehospital toolkit builds on and supersedes the 2005 WHO publication, Prehospital trauma care systems.

This operational guidance does not cover all elements of prehospital care but focuses on ambulance services and associated processes. In particular, community first aid response programmes – a key part of prehospital emergency care in many settings – are covered elsewhere. In addition, this guidance addresses general-purpose ambulances and not specialized vehicles such as intensive care or neonatal ambulances.

Several factors should be considered in using the guidance.

- Prehospital ambulance services are at various stages of development in different countries. Some of the recommendations in this publication may not be directly applicable in all services.
- The clinical algorithms provided here are not meant to supplant clinical judgement or seeking the advice of health-care specialists, particularly for discussion and evaluation of complex cases.
- Clinical providers working in prehospital settings must always consider their own safety. The protocols provided here do not replace formal training in scene safety and response.
- Throughout this publication, we have used standard generic job titles, which may differ from those used in countries. The titles are not intended as recommendations for change and should be adapted to the local context where necessary. We have ensured that the terms are used consistently in this document to facilitate replacement with local terms.

Community first aid responders (CFARs)

In some settings, formal ambulance services are supported by CFARs, who work with the ECS (e.g. at a community clinic, with a community response organization or as police or fire fighters). They may include community members, first responders (e.g. police, fire fighters), community health workers, health-care assistants and other allied health professionals. A CFAR should have the skills and knowledge necessary to approach a scene safely, recognize an emergency condition, safely provide first aid to patients with either medical or traumatic emergencies, and facilitate timely, safe transfer and handover to a higher level of care.

CFARs can play a key role in the ECS. For example, they can provide critical support in locations where formal ambulance services are in the early stages of development or as a supplementary service in areas that are hard to access. In situations of active conflict or a legacy of explosive ordinance, training and deployment of CFARs has been shown to save lives.[1]

The document is structured into chapters, which provide practical resources for prehospital ambulance services that can be adapted to local contexts. It covers operational standards and resources (chapter 2), communication and dispatch centres (chapter 3), medical control (chapter 4) and clinical protocols (chapter 5). Templates for standards, operational resources and clinical algorithms can be downloaded from the WHO website.

The document is intended primarily for ambulance service managers, medical coordinators and health workers in the field. It will also serve to guide national and subnational planners responsible for the organization of prehospital ECS.

[1] Husum H, Gilbert M, Wisborg T, Van Heng Y, Murad M. Rural prehospital trauma systems improve trauma outcome in low-income countries: a prospective study from North Iraq and Cambodia. J Trauma. 2003;54(6):1188–96. https:// doi.org/10.1097/01.TA.0000073609.12530.19.

CHAPTER 2

Operational standards

WHO support to ambulance project in Afghanistan © WHO / Zakarya Safari

2 Operational standards and resources

2.1 Introduction

These operational standards and tools are intended to support use of a standardized approach to managing a prehospital system, with the ultimate goal of improved patient outcomes. The resources presented here should be adapted to fit countries' needs and according to local context, laws, and regulations.

The standards are organized into four categories – system regulation, operations, communications and special considerations. The communications standards and tools should be used in conjunction with chapter 3, Communication and dispatch centres. The standard on medical control should be used in conjunction with chapter 4.

With the exception of the first standard (Purpose and process), the templates are presented in the same format to facilitate immediate use once they have been updated with information relevant to the local jurisdiction, which should be entered into the templates where indicated and the templates adapted as necessary to the local context. Relevant local information should be entered into the templates where indicated by three asterisks within square brackets – [*** XXX ***] – and templates adapted as needed to local context.

Each template begins with a background and context that explain its significance and use. The section on "purpose" states the intended use of the standard, and "authority" describes the relevant local authorities for implementation of the standard. The section on "implementation management" lists the relevant local and national bodies. Definitions from the glossary that are directly relevant to the standard are listed. The next section lists the processes necessary to ensure implementation and measure compliance, and the section on procedure details how the standard is to be implemented in service.

The resources for ambulance services consist of operational processes and protocols. Some resources provide guiding principles for local authorities to develop context-appropriate materials. Others are ready-to-use forms, templates and guidance that can be used directly in ambulance systems, although they should be adapted as necessary to local regulations, customs and practices. For example, the scope of practice of basic and advanced providers (and therefore the medications and equipment they require in their vehicles) differ by country. The associated resources presented here should be amended as appropriate.

The purpose of this chapter is to suggest standards and supporting resources for ambulance services that are formalizing their operational practices. It provides an overview of the most important components and processes that should be considered in ambulance systems.

2.2 System regulation standards

2.2.1 Purpose and process

The purpose of this standard is to review the process by which relevant authorities periodically review and revise standards and protocols. [*** Insert names of locally relevant authorities here.***]

Definitions:

Emergency Care System (ECS): The subset of the health-care system that responds to emergency health conditions. The ECS covers system activation, first aid, prehospital care, facility-based emergency care and the legislation and policies that govern emergency care.

ECS regulatory authority: The agency mandated by the government and health authorities to oversee emergency care. Depending on the context, pre-hospital and facility emergency care may be governed by the same or different agencies.

ECS regulatory authority advisory committee: A committee comprised of local stakeholders (independent from the ECS regulatory authority) that advises the ECS regulatory authority.

ECS regulatory authority director: While the title of this person may differ by region, the term is used in this document to refer to the person in charge of the ECS regulatory authority, who oversees the entire ECS (including the prehospital component) in the region and determines policy on how the standards are implemented in the region.

Medical control: A system of clinical governance that provides real-time (online) and protocol-based (offline) medical direction to PPs to ensure that patient care meets agreed standards.

Prehospital Provider (PP): An individual who is certified and registered by the ECS regulatory authority to provide clinical services.

Policy:

The ECS regulatory authority is responsible for those in the health system who access emergency care, including the prehospital system. This body is responsible for reviewing prehospital standards and clinical protocols, adapting them to local conditions according to local regulations and legislation and overseeing their implementation by PPs.

The ECS regulatory authority reviews each prehospital standard and clinical protocol and, after evaluation of the capabilities of the PPs in their jurisdiction, sets the level(s) of care to be provided and completes each document with the

specification where noted. [*** Insert local regulations and/or legislation here.***]

The ECS regulatory authority establishes a process to review and update the prehospital standards and clinical protocols, as follows. Local regulations and legislation for prehospital standards and clinical protocols may be updated as frequently as necessary for efficient administration and operation of the prehospital component of the ECS, ideally every 2 years.

The ECS regulatory authority institutes a method for including public comments by PPs and other relevant organizations (e.g. public safety agencies, medical professional organizations, prehospital patients, health-care facilities) in their decisions. The authority adheres to these procedures in order to provide consistent, provider-informed, outcome-based improvements in prehospital care. A process should also be established to solicit and include feedback from standard users in a regular, pre-determined, publicized manner to continuously include advances in the science of prehospital care at all levels in these standards.

Public comment:

The ECS regulatory authority director, with the medical director (if not the same), shall follow local procedure for approval of the final, locally appropriate standard by local governmental authorities. See operational resource: *Recommended public comment process for local components of prehospital standards and clinical protocols*.

Policy release without public comment:

The ECS regulatory authority shall reserve the right to make minor revisions to policies without public comment in order to ensure administrative continuity of the prehospital component of the ECS. Minor revisions include grammatical or format editing and/or minor corrections to outdated information.

The ECS regulatory authority director may immediately and without prior notice implement a new or significantly revised standard to protect public health and safety. Standards released under these circumstances shall be valid for [*** Insert local specified interval, suggested minimum of 90 days***] from the initial effective date and shall be released for [*** Insert local specified interval, such as 30 days from the initial effective date***] days for public comment according to procedures outlined in operational resource: *Recommended public comment process for local components of prehospital standards and clinical protocols*.

The ECS regulatory authority director may extend a policy without public comment once, for a period of [*** Insert local specified interval, such as 180 days***] days from the initial effective date.

Process for exemption from a policy:

A request by a PP for exemption from a policy must be submitted in writing to the ECS regulatory authority director, including the reasons for the requested exemption and substantive supporting documentation to justify the request. At the request of the ECS regulatory authority director, the ECS regulatory authority advisory committee will review the request at their next scheduled meeting to determine approval or denial of the request.

The ECS regulatory authority will review the exemption request, the supporting documentation and recommendations to determine whether to approve or deny the request. The ECS regulatory authority director will notify the PP of a decision within [*** Insert local specified interval, such as a minimum of 60 days***] days of the date of the advisory committee review. The decision of the ECS regulatory authority director is final.

Standards distribution:

The ECS regulatory authority is responsible for distributing the final standard to PPs by email, posting on its website or other available means.

All ambulance services are responsible for:

- distributing new or revised standards to staff before the implementation date and providing training on all relevant standards; and
- making a standards manual available to employees (paper or electronic version).

2.2.2 Prehospital emergency care coordinating authority

A prehospital response requires the collaboration of many government bodies (health, infrastructure, security), and coordination of these groups is important. In this standard, "government" refers to the relevant government of the jurisdiction and "health authority" to the relevant health authority for the jurisdiction. While the prehospital response may be governed by several government sectors, the clinical aspects of the regulatory functions should be under the jurisdiction of governmental health agencies, at a minimum.

Purpose:

The purpose of the prehospital emergency care coordination standard is to define the relations among government, health authority, ECS regulatory authority, emergency medical service (EMS) and PPs.

Authority:

[*** Insert relevant local authorities here. ***]

Implementation management:

ECS regulatory authority

Definitions:

ECS regulatory authority: The agency mandated by the government and health authorities to oversee emergency care. Depending on the context, pre-hospital and facility emergency care may be governed by the same or different agencies.

EMS: Any organization that is dedicated, staffed and equipped to provide prehospital emergency care, including public safety agencies, private ambulance companies and nongovernmental organizations.

PP: An individual who is certified and registered by the ECS regulatory authority to provide clinical services.

Standard:

Governmental and health authorities shall determine regulations for prehospital emergency care and be responsible for designating the ECS regulatory authority.

The ECS regulatory authority must certify, accredit and keep a record of all EMS, training centres and receiving facilities.

The ECS regulatory authority shall ensure compliance of the EMS with all prehospital emergency care standards, including processes, equipment, vehicles, staffing and clinical protocols, as a condition of their accreditation or certification.

In all cases, organizations, vehicles and individual personnel must be accredited and certified by the ECS regulatory authority for the provision of prehospital services.

The ECS regulatory authority shall have a medical director or a provider with advanced emergency medicine experience to provide medical direction.

All EMS must be under the direction of an experienced clinical provider with advanced emergency care experience. [*** Insert local regulations or legislation here.***]

The EMS shall provide data at the request of the ECS regulatory authority according to the quality improvement (QI) programme standard.

All ECS data must be shared with the ECS regulatory authority and may be shared, according to local protocols, for the purpose of improving care according to the QI programme standard.

Procedure:

The ECS regulatory authority shall establish an advisory committee to ensure a systematic mechanism for regular inclusion of input from relevant entities, including academics, professional societies, PPs and other relevant technical experts.

The ECS regulatory authority will provide written documentation of initial and ongoing accreditation of EMS. EMS will provide a written commitment to maintain continuous compliance with all relevant standards throughout the period of accreditation.

Responses to requests for accreditation will be provided in writing within [*** Insert local specified interval***] days.

The ECS regulatory authority shall develop a process for permitting all ambulances used by approved EMS to provide prehospital emergency care.

2.2.3 Training and certification of PPs

The ECS regulatory authority should determine the minimum standards for training and certification of PPs. The standards should be reviewed regularly (annually or biannually). The ECS regulatory authority should also set criteria for who is allowed to train as a PP. The criteria often include age, previous training, certification or education, and physical ability.

Purpose:

The purpose of the standard is to define training, initial and in-service or continuing training, and certification requirements for dispatchers, first responders and basic and advanced PPs.

Authority:

[*** Insert relevant local authorities here***]

Implementation management:

ECS regulatory authority

Ministry of education

Public educational institutions

Private and nongovernmental education institutions

Definitions:

Advanced PP (APP, also known as advanced ambulance provider)**:** A formal ECS health-care practitioner who has been trained in advanced prehospital care, holds a valid license and is certified by the ECS regulatory authority to function within a defined advanced scope of practice.

Basic PP (BPP, also known as basic ambulance provider)**:** A formal ECS health-care practitioner who has been trained in basic prehospital care, holds a valid license and is certified by the ECS regulatory authority to function within a defined basic scope of practice.

Community First Aid Responder (CFAR): Trained layperson certified as part of an organized system to provide simple initial care for the acutely ill and injured, including airway repositioning, control of external bleeding and splinting. Unlike a bystander who may have received training in first aid, a CFAR is part of an organized system and can be called upon to respond to an emergency scene by a specific, pre-arranged mechanism.

Dispatcher: An individual trained and certified in receiving emergency calls from the public and in determining the nature of the emergency, if applicable (for example, medical or other), registering the call, prioritizing the call and the PP response, providing the ambulance with the correct location of the call, when necessary, providing pre-arrival caller instructions and coordinating communications as determined by the regulatory authority for the emergency care system (ECS).

ECS regulatory authority PP certification register: A listing of all PPs certified and permitted to work by the ECS regulatory authority.

ECS regulatory authority training centre accreditation register: A list of all prehospital training centres accredited by the ECS regulatory authority.

EMS: Any organization that is dedicated, staffed and equipped to provide prehospital emergency care, including public safety agencies, private ambulance companies and nongovernmental organizations.

Initial training: The education and training provided to student PPs before they are eligible for professional certification with the ECS regulatory authority (e.g. WHO Basic Ambulance Provider course).

In-service training and continuous professional development: Education and training provided to certified, registered PPs during their professional career to maintain, develop and enhance their knowledge and skills.

Standard:

This standard applies to all training centres operating under the authority of the ECS regulatory authority and all EMS, whether public or private.

For initial training:

- All students will meet the requisite entry requirements as set forth by the ministry of education.
    - Dispatchers must adhere to [*** Insert local regulations and/or legislation here. ***].
    - APP and BPP must be [*** Insert local age requirement, such as a minimum of 18 years or older***] years of age and be certified as a BPP or APP [*** Insert local regulations and/or legislation here.***].
- The ECS regulatory authority will define standards, and review and revise them specifically [*** Insert locally specified interval, such as a minimum of annually or biannually***] for:
    - dispatchers and PPs (e.g. employment regulations, conduct) and
    - training centres (e.g. training duration, QI standards).
- The ECS regulatory authority will maintain up-to-date registers of:
    - all certified PPs and

    - all accredited training centres.
- Training centres will be responsible for providing an approved curriculum and materials for students and instructors, for maintaining class rosters, for evaluating students' results and for copies of final certification documents.

For in-service training:

- The ECS regulatory authority will set and regularly review in-service training requirements for ongoing certification of dispatchers, BPP and APP.
- All registered PPs will undergo regular in-service training in line with locally agreed requirements [*** Insert local regulations and/or legislation here. ***].

For ECS regulatory authority certification registers:

- The ECS regulatory authority provider register will:
    - include the details of all dispatchers, BPPs and APPs who have been certified and whether they are currently compliant with local requirements for continuous professional development;
    - include documentation of any incident of noncompliance with protocols or other queries on patient care related to a specific provider according to the QI programme standard; and
    - ensure that all PPs meet minimum criteria for certification, including age and education.
- The ECS regulatory authority register of training centre accreditation will include records of all accredited in-service dispatcher and training centres, including any incidents of noncompliance with standards.

Procedure:

The ministry of health or education will define the requisite entry requirements for initial training.

The training centre will confirm that all students meet defined entry requirements before enrolment in initial training.

The ECS regulatory authority will ensure that all training centres offer training courses for dispatchers, BPP and APP in accordance with agreed national curricula. See operational resource: *Training and certification of prehospital providers* and operational resource *Ambulance provider level and scope of practice*.

The ECS regulatory authority will accredit all training centres that offer initial and in-service training that comply with agreed standards and will maintain a register

(the ECS regulatory authority training centre accreditation register) of such centres.

The ECS regulatory authority will keep records of all accredited training centres, including any incidents of noncompliance with standards.

For certification as a dispatcher:

- All applicants must complete an application form and provide all the information requested on the form, in accordance with local procedures.
- All applicants must complete a training course in prehospital emergency care and dispatch, including call taking, call prioritization, call dispatching, providing pre-arrival instructions, communications equipment and relevant local standards as required by the ECS regulatory authority [*** Insert relevant details of application and submission here.***]

For certification as a CFAR:

- All applicants must complete an application form and provide all the information requested on that form, in accordance with local procedures.
- All applicants must complete a training course in patient assessment and treatment with assistance to the appropriate CFAR level, EMS organization policies and other system protocols and standards as required by the ECS regulatory authority [*** Insert relevant details of application and submission here. ***]

For certification as a PP:

- All applicants must complete an application form and provide all the information requested on that form, in accordance with local procedures.
- All applicants must complete a training course in prehospital emergency care patient assessment and treatment to the appropriate basic or advanced level, EMS policies and other system protocols and standards as required by the ECS regulatory authority [*** Insert relevant details of application and submission here. ***]

The applications, rosters, student evaluations and other materials will be available for ECS regulatory authority review according to the QI programme standard.

The ECS regulatory authority will oversee the practice and compliance of registered dispatchers, CFARs, BPPs and APPs. Depending on any infraction and its consequences, this may include education, remediation and/or professional sanctions as determined by the ECS regulatory authority.

2.2.4 Quality improvement programme

A robust QI programme is essential for all aspects of health care to ensure the safety and efficacy of services. Prehospital care is no exception. Locally relevant prehospital indicators should be evaluated to ensure the quality of care, and any gaps should be reviewed and addressed within a specified time.

Purpose:

The purpose of the standard is to ensure systematic monitoring and evaluation to maintain efficient, effective, high-quality emergency care in the prehospital component of the ECS.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

EMS

Definitions:

Case review: review of individual cases of prehospital care for timeliness and compliance with relevant prehospital standards and clinical protocols.

Prehospital patient outcome indicator: direct indicator of the outcome of a patient's medical treatment.

EMS QI plan: A plan developed, maintained and regularly reported by the EMS to the ECS regulatory authority so that it can evaluate the quality of care and services delivered and the utility of the QI measures used.

Prehospital system process indicator: to measure prehospital system operations and performance.

Standard:

The ECS regulatory authority will create a mechanism for monitoring and continuously review the QIs. See operational resource: *Suggested prehospital quality improvement targets*.

The ECS regulatory authority will maintain a case review reporting system for use by clinical providers, other personnel or other appropriate agencies to report incidents in the provision of prehospital emergency care. These include:

- unexpected patient death during or immediately after care;
- poor performance of patient care procedures, with either actual or potential poor patient outcome as a result;
- acute injury of a prehospital staff member on duty resulting in actual or potential poor patient outcome;
- equipment or staffing failure resulting in actual or potential poor patient outcome;
- failure to follow the patient reception protocol of the ambulance operation standard;
- dispatch error (such as incorrect address) resulting in actual or potential poor patient outcome;
- any prehospital staff assault or alleged patient assault;
- ambulance crash resulting in staff or patient injury;
- any instance in which concern about scene safety led to a delay in patient care;
- any instance in which an ambulance was found not to meet organizational hygiene standards by the prehospital supervisor, ECS regulatory authority or independent health officials;
- any instance in which pre-hospital ambulance staff were found to be intoxicated during duty hours; and
- any instance in which an ambulance was missing while on duty, resulting in inability of the emergency communication and dispatch centre or prehospital supervisor to contact it.

The ECS regulatory authority will maintain a continuous QI advisory group composed of the medical director (and a Medical Control Officer (MCO) in a larger EMS), appropriate local government representative(s) and representatives of all EMS system providers. The group shall meet regularly every [*** Insert local specified interval.***] to:

- review QI indicators for the prehospital component of the ECS (see operational resource: *Suggested prehospital quality improvement targets*);
- review summaries of ECS regulatory authority case reports; and
- provide input to the ECS regulatory authority on any revisions to standards, clinical treatment protocols or training activities.

EMS QI plans must include the following:

- appropriately trained and certified staff;
- a log of daily ambulance use, including mileage and data on patient transport;
- adequate functional equipment and supplies to ensure delivery of care according to prehospital emergency care treatment protocols, including maintenance of prehospital staff skills and competence;

- documentation of medical care and operational requirements;
- transport and facilities;
- public education on prevention;
- reporting of infectious diseases, reportable conditions or incidents;
- QIs, including benchmarks as defined by the jurisdictional ECS regulatory authority; and
- performance improvement plans with curricula to address any deficiencies identified in the QI programme.

The EMS should plan and demonstrate QI in measurable terms, as described in their QI plans.

The ECS regulatory authority shall regularly review the after-action reports required by the prehospital emergency care services for special events to ensure the adequacy of prehospital resources at special events in its jurisdiction.

The ECS regulatory authority must avoid conflict of interest, such as owning an EMS or receiving facility.

If there is any deviation from standards, the EMS shall seek approval from the ECS regulatory authority before such deviation.

Procedure:

Outcomes and process data are reviewed regularly by the ECS regulatory authority.

All recommendations from case incident reviews are tracked to completion of the stated goals.

All EMS must dedicate sufficient resources and staff to execute their QI plans.

Regular audits must be conducted on the quality of prehospital care delivery by the ECS regulatory authority or a designated governmental agency [*** Insert local specified interval, such as for annual audits.***].

The ECS regulatory authority will report on progress in the QI plan to the relevant government authority, which in turn will monitor the ECS regulatory authority's QI management performance.

The ECS regulatory authority and the EMS will report prehospital data as required by the government authority [*** Insert local specified interval, such as quarterly submissions.***].

The EMS shall regularly (for example, every month) document best cases as a part of reward and recognition of staff to support a culture of quality in prehospital care.

2.2.5 Protocol development and revision

As best practices and resources may change, protocols should be reviewed regularly within a specified time.

Purpose:

The purpose of the standard is to provide a mechanism for ongoing revision of protocols and for the development of new protocols.

Authority:

[*** Insert relevant local authority here.***]

Implementation management:

ECS regulatory authority

Definitions:

Medical director: The senior medical provider (often a doctor) who oversees and is responsible for all care in an ambulance service to ensure patient-centric, evidence-based medical care, with the goal of improved patient outcomes and public health. The medical director must be trained in prehospital emergency care standards and protocols and is responsible for ensuring that the PPs in the organization are up to date on current protocols and follow those protocols. The medical director is also responsible for reviewing cases for quality and addressing any issues that arise.

Protocol: Defined written guidance to be followed in specific situations, such as a clinical condition or an administrative situation.

Standard:

The ECS regulatory authority is responsible for developing and updating policies and protocols for the administration and operations of the prehospital EMS. The medical director retains the final decision in matters pertaining to the planning, implementation and evaluation of all prehospital emergency care standards and protocols.

Standards and protocols shall be updated [*** Insert local specified interval.***] to adapt to advances in the provision of emergency care.

A process shall exist for all stakeholders to propose changes or additions to the protocol.

When changes are made, it is the responsibility of the ECS regulatory authority to distribute information on the changes to all stakeholders and to ensure that training is updated to include any changes before they are implemented.

Procedure:

A protocol review committee should be formed that includes the medical director, representatives of the hospital emergency unit and representatives of both basic and advanced providers.

The committee should review all protocols [*** Insert local specified interval. ***] to identify any changes to the practice of emergency care.

Once a required change is identified, comments should be solicited from the committee, and any changes should be voted on by the committee

The protocol committee will distribute any new or changed protocols to all emergency care services under its command, both to EMS and to local health facility emergency units. Each service is responsible for confirming that training has been provided on any new or changed protocols by all PPs before implementation of the protocol.

Any stakeholder in the prehospital system can submit a request for an addition to or modification of a protocol to the protocol review committee, which will respond to such a request within [*** Insert local specified interval, such as 90 days***].

2.3 Ambulance operations standards

2.3.1 Ambulance provider level and scope of practice

Definition of a scope of practice for providers helps to standardize a system. Once BPP and APP levels have been defined, emergency care practitioners in facilities can better understand what can and cannot be done in the prehospital setting, and the transfers of care between prehospital and facility become smoother and safer for all. Some systems have more than two levels of PP. If this is the case, the standards below should be modified to reflect this.

Purpose:

The purpose of the standard is to define the responsibilities and scope of practice of BPPs and APPs.

Authority:

[*** Insert relevant local authorities here. ***]

Implementation management:

ECS regulatory authority

[*** Insert local regulations and/or legislation here.***]

Definitions:

APP (also known as advanced ambulance provider)**:** A formal ECS health-care practitioner who has been trained in advanced prehospital care, holds a valid license and is certified by the ECS regulatory authority to function within a defined advanced scope of practice.

BPP (also known as basic ambulance provider)**:** A formal ECS health-care practitioner who has been trained in basic prehospital care, holds a valid license and is certified by the ECS regulatory authority to function within a defined basic scope of practice.

EMS: Any organization that is dedicated, staffed and equipped to provide prehospital emergency care, including public safety agencies, private ambulance companies and nongovernmental organizations.

Scope of practice: The procedures, actions and processes that a PP is permitted to undertake in keeping with the terms of their professional certification.

Standard:

This policy applies to all PPs operating under the authority of the ECS regulatory authority, as either a BPP or a APP. Other tiers of PPs may be designated by local standards. [*** Insert local standards here. ***]

All PPs shall operate within the scope of practice (BPP or APP) applicable to their level of certification or registration as designated by the ECS regulatory authority. Personnel shall not exceed their scope of practice. See operational resource: *Ambulance provider level and scope of practice*.

While working formally in a ECS, all PPs shall wear a standardized uniform (to be determined by the EMS) with their name and official qualification (determined by the ECS regulatory authority) clearly indicated.

Procedure:

The ECS regulatory authority shall:

- organize administration of standardized testing for certification [*** Insert local regulations and/or legislation here.***];
- keep a register of accredited training centres for BPP and APP courses;
- register all BPPs and APPs on central registries [*** Insert local regulations and/or legislation here.***]; and
- develop and publicize a process for amending the scope of practice of PPs.

In the event of a complaint about a PP performing care outside their scope of practice:

- The complainant should have easy access to complaint registration.
- The ECS regulatory authority will investigate each complaint and provide written feedback to the complainant within an agreed time according to the QI programme standard.
- The ECS regulatory authority will initiate agreed corrective action for PPs found to be performing duties outside their scope of practice. Depending on the infraction and the consequences, this may include education, remediation and/or professional sanctions as determined by the ECS regulatory authority.

2.3.2 Prehospital emergency care response operations

A key element of a functional prehospital component of an ECS is that care and monitoring are provided during transport. It is not sufficient that a patient only be transported from one location to another. Therefore, there must be at least two personnel in an ambulance: one who is at least certified as a BPP and another to drive the ambulance. Often, both are certified PPs and may alternate driving and patient care from case to case. The driver must, however, at a minimum, be trained in first aid in order to be able to assist the PP on the scene and at the facility if necessary.

In settings where there is unreliable access to facility care, improving access to any form of transport may improve outcomes. Patient transport other than by ambulance is not a formal component of prehospital ECS, as care cannot be provided during transport

It is suggested that, for adequate ambulance supervision, one prehospital supervisor be available per 10 ambulances.

As ambulances are a significant investment and are often not available in sufficient numbers to meet needs, even in high-resource settings, ambulances should be used only for patients who require medical care whenever possible. They should therefore not be used for non-medical purposes or for transporting dead bodies (if there are local standards for declaring death before arrival at a hospital).

During large surge events, the EMS may be asked to provide assistance in areas outside those in which they usually work. Some regulations on certification or differences in scope of practice might prohibit this. In such systems, policy-makers should plan for possible surge and set mechanisms to facilitate ensure such support.

Purpose:

The purpose of the standard is to describe the daily functioning and management of ambulance fleets to support prehospital care.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

EMS

Definitions:

Access number (also referred to "universal access number"): local telephone number that activates a prehospital provider (PP).

ALS: In addition to provision of all basic life support functions, provision of advanced care for a critically ill patient may include advanced airway management, advanced procedures such as chest drain placement, administration of intravenous or intraosseous therapy and advanced patient monitoring. The scope of practice by provider level may differ by system.

Ambulance: Motor vehicle equipped to transport and provide patient care during transport for ill or injured patients. An ambulance must have two separate compartments including a driver compartment and a patient care compartment. Ambulances may be land, air, or water vehicles. All ambulances should be registered and accredited by the prehospital component of the Emergency Care System regulatory authority.

Ambulance base station: Location equipped to provide support for ambulance personnel and ambulance functioning, including provisions for restocking. In some systems, ambulance staging posts and ambulance stations have overlapping functions.

Ambulance fleet: The collection of ambulances operated under a specific emergency medical service (EMS).

Ambulance receiving and drop-off area: A location for dropping off patients accessible to ambulances at a receiving facility. Ideally, the site should be used only for ambulance reception. There should be a separate entrance for all other patients.

Ambulance staging post or launch: Designated area where ambulances await dispatch instructions to respond to calls. In some systems, ambulance staging posts and ambulance stations may have overlapping functions.

BLS: Provision of initial, non-invasive life-saving care, including basic airway repositioning, cardiopulmonary resuscitation (CPR), control of external bleeding and immobilization of the spine and fractures. The specific scope of BLS is determined nationally.

MCO: A provider with advanced experience in emergency care (often a doctor) who is authorized to provide remote advice to PPs. MCOs must not only meet clinical training requirements but should undergo specific training in the standards and protocols of prehospital emergency care. In smaller ambulance services, the function of MCO is covered by the medical director, whereas larger organizations may have two posts with separate functions, with the MCO reporting to the medical director.

Non-ambulance patient transport vehicle: Vehicle that is eligible to transport patients without providing care and is overseen by the local regulatory authority.

Patient contact interval: The time from when providers arrive on the scene and identify the patient until patient handover or until the patient no longer requires or desires transport or treatment.

Patient encounter: A patient's interaction with prehospital ECS, beginning with contact for initial dispatch and ending with patient handover or when the patient no longer requires or desires transport or treatment. Encompasses the entirety of the patient's contact with prehospital ECS.

Standard:

Both public and private ambulance organizations shall have adequate financial resources to provide continuous prehospital care.

All ambulances must operate for an EMS and have a permit from the ECS regulatory authority.

Vehicles used to transport patients but cannot provide care are not considered to be ambulances.

Ambulances must have appropriate markings and safety and medical equipment that is functional at all times, as required by the supplies and equipment standard determined by the ECS regulatory authority.

Ambulance equipment must be sufficient to support basic life support (BLS) and advanced life support (ALS) at all times, as described in the supplies and equipment standard.

All ambulances must be staffed by at least two personnel. Each ambulance should have at least one BPP or APP who is trained and currently certified, who remains in the patient compartment to provide clinical monitoring and management during transport. The other must be a licensed, qualified driver with training in driving large emergency vehicles and must be, at a minimum, trained in first aid. Each driver should be trained specifically according to local protocols for driving an ambulance.

- If there is only one trained PP, the driver must assist prehospital personnel on the scene (when not driving). All permitted ambulances shall operate within the ambulance service area of the jurisdiction, as defined by the ECS regulatory authority.

In special circumstances and with the approval of the ECS regulatory authority, both ambulances and PPs may work outside their service area (if applicable) and apply the standard of care appropriate to the circumstance [*** Insert local regulations and/or legislation here.***].

Procedure:

All patient care during a contact must be documented. See operational resource: *Prehospital standardized clinical form and reference card*.

Patient contact begins with assessment of an individual by prehospital personnel.

Patient contact ends when one of the following occurs:

- The patient is formally handed over to a health worker in a facility.
- The patient refuses transport and can complete a non-transport document or has appropriate DNR documentation, as described in the patient transport denial standard.
- The unit is cleared from the scene by contact with an MCO, such as when a patient dies, the ambulance out of service or the patient flees.

Some ambulance dispatches do not result in patient contact, such as when:

- No patient is present at the scene.
- No service is requested at the scene.
- The service requested is cancelled en route.
- These situations must be recorded in the ambulance dispatch centre log as directed by the emergency communication and dispatch centre standard.

During patient contact, at least one PP must continually monitor the patient [*** Insert local regulations and/or legislation here.***].

All ambulances must be inspected daily by their EMS personnel. A structured tool should be used to guide transition of ambulance shifts from one team to another. Handover is an opportunity to review the previous shift, identify and correct any deficiencies noted, confirm that the ambulance is adequately stocked, and ensure that the paperwork is complete. See operational resource: *Equipment and medication for basic and advanced ambulances*, and operational resource: *Ambulance shift handover*.

All personnel are responsible for ensuring that the vehicles they use are hygienic at all times.

- Each vehicle is to be inspected and cleaned after conveying a patient**.** The last crew to use a vehicle will be held responsible for the state of cleanliness of that vehicle.
- Ambulances must be cleaned at two levels: thoroughly once every 24 h and routinely after every patient call, according to cleaning standards. See operational resource: *Ambulance cleaning and decontamination*.

Receiving facilities must have an ambulance receiving area that can receive the patient and appropriate personnel, including security measures, to immediately take handover of the patient from the ambulance crew. The ambulance receiving

area must have sufficient access to allow transport of a non-ambulatory patient into the facility for further care.

The ambulance fleet must be adequately supervised with a minimum of one prehospital supervisor on duty and be immediately available to prehospital personnel, dispatchers and medical directors for assistance.

The ECS regulatory authority will oversee practice and compliance and will take the necessary actions to improve compliance when standards are not met. [*** Insert local ECS regulatory authority actions and penalties.***]

When possible, ambulances should be used only for patients who require medical care. To ensure that they are available for patients who need transport, they should not be used for nonmedical purposes or to transport dead bodies if there are local standards for declaring a death before arrival at a hospital.

Patients should be transported by an ambulance whenever possible to enable monitoring.

2.3.3 Destination policy

"Destination" refers to the facility to which PPs intend to deliver a patient. The term "destination triage" refers to deciding the most appropriate facility, given the patient's needs, if there are several facilities that can deliver appropriate care in the system. Certain patients might have to be taken to facilities that are not the closest; for example, a severely injured patient may require specific trauma care.

When such resources exist, the facilities should be identified and accredited by the ECS regulatory authority. Criteria should be defined for deciding when the closest facility should be bypassed for one with the relevant capability. In determining such criteria, considerations include clinical condition, family or physician preference (for example, if a patient has a complicated chronic illness and the treatment plan and all records are at a particular facility) or if the intended receiving facility is in ambulance diversion status (it currently cannot safely receive new patients). Patients whose condition is so unstable that they will probably not survive transport to a more appropriate hospital further away should be taken to the closest hospital for intervention before transfer to the intended facility. In these (and other locally designated conditions), the recommended policy is for the provider to call medical control for advice, although medical control clearance is not required if it is not feasible or available.

Additionally, the ECS regulatory authority should guide facilities on when ambulance diversion is and is not appropriate. At least in some settings, ambulance diversion is associated with increased population mortality; therefore, such a decision should not be taken lightly. Standardized criteria for ambulance diversion should be developed collaboratively and distributed to facilities.

Decisions on diversion should be made by a centralized entity, such as an emergency communication and dispatch centre, which has a broad perspective of the current availability of system resources. Diversion periods should be defined and should be as short as possible so that care capability can be re-established at the receiving facility. If a facility requests diversion, it should be responsible for informing the emergency communication and dispatch centre of their availability to accept patients in ambulances.

Purpose:

The purpose of the standard is to identify approved ambulance transport destinations for [*** Insert region***], and to delineate clinical, service-based or other criteria for when a patient should be transported to an appropriate health-care facility.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

EMS

Emergency communication and dispatch centres

ECS regulatory authority

Receiving facilities

Ministry of health

Definitions:

Diversion: A temporary state declared by a receiving facility indicating that the facility is experiencing conditions that limit its capacity to provide care and that ambulances should, when possible, transport patients to another facility. Facilities on diversion continue to accept patients who arrive by means other than ambulance. Diversion may be declared for various reasons, including crowding, human or material resource shortages or infrastructure failures.

Do not resuscitate (DNR) order: A formal document prepared in advance according to local regulations by which a person documents his or her refusal of specific life-saving interventions even if they are medically indicated. Local regulations should specify requirements for valid DNR documentation and the rights and responsibilities of providers with respect to DNR orders.

Interfacility transfer: Movement of a patient from one health-care facility to another in an ambulance or a non-ambulance transport vehicle.

Mass Casualty Incident (MCI) (also known as multiple casualty incident): An event that results in more patients at one time than can be managed by locally available resources with routine procedures (generally four or more victims). Examples include a road traffic crash, a building fire or a large-scale event such as an earthquake or mass toxic exposure.

Standard:

Each system should have a clear protocol for guiding decisions on destinations. In some situations, a patient's needs are not best served by transport to the closest hospital, and an alternative destination is preferable. Such situations may depend on the patient's condition or on the service.

This policy applies to all PPs, emergency communication and dispatch centres, EMS (public, private and nongovernmental) under the regulatory authority of the ECS and all receiving health-care facilities (public, private and nongovernmental) under the authority of the ministry of health.

This policy does not apply to interfacility transport; however, if a patient becomes unstable during interfacility transport, the ambulance should divert to the nearest appropriate facility according to this standard.

Special considerations are required for:

- pronouncement of death [*** Insert local regulations and/or legislation here.***], which specifies:
    - the appropriate destination for the patient;
    - whether PPs are allowed to determine death; and,
    - if so, clinical findings that allow prehospital determination of death. See operational resource: *Declaration of death and management of the deceased.*
- those with DNR orders: Confirm the validity of the DNR paperwork and follow orders when confirmed.
- those who refuse transport: follow local protocols and complete the relevant paperwork. See operational resource: *Transport or treatment refusal form*.

Procedure:

The choice of destination may be guided by distance, patient acuity or condition, destination capability or case-specific medical control guidance.

All patients are to be taken to the closest, most appropriate receiving facility. If the closest facility cannot deliver the required care, it can be bypassed to a higher level of care for certain patients. See operational resource: *Regional health facility capabilities* for a list of health facility capabilities in [*** Insert location name.***]. The ECS regulatory authority is to maintain and regularly update this document.

Condition-specific destination guidelines may be created at the discretion of the ECS regulatory authority. These will be based on regional hospital capability. Examples of condition and service-specific protocols include trauma, neurosurgery and requirement for intensive care. If such guidelines are created, identified receiving facilities shall assist in guideline development, provider training and QI. See operational resource: *Condition-specific destination guidelines.* [*** Insert local regulations and/or legislation here.***]

When a PP is uncertain about the most appropriate destination, advice should be sought from medical control, according to the medical control standard.

In an MCI, destination decisions should be based on the approved mass casualty destination plan. [*** Insert local regulations and/or legislation here.***] See operational resource: *Mass casualty destination plan*.

Decisions on destination should adhere to local regulations. [*** Insert local regulations and/or legislation here.***].

The ECS regulatory authority must ensure regular quality assurance of all ambulance destination decisions according to the QI standard.

All prehospital staff, including ambulance personnel and dispatchers, are to receive training in destination protocols and when to contact emergency communication and dispatch centres or medical control for assistance according to the training and certification of PP standards.

The ECS regulatory authority will oversee the practice of and compliance with this standard in all hospitals, EMS and emergency communication and dispatch centres and will take the necessary actions to improve compliance if the standards are not met. [*** Insert local regulations and/or legislation here.***]

2.3.4 Supplies and equipment

This standard describes the supplies and maintenance necessary to ensure that ambulances are prepared at all times to respond safely and reliably to emergencies. The following guidance does not supersede any relevant government standards, and additional supplies and equipment, maintenance and checks may be necessary, depending on the setting. These should be added to the standards by local policy-makers.

Purpose:

The purpose of the standard is to establish consistent minimum equipment and supplies standards for prehospital vehicles.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

EMS

Definitions:

Ambulance: Motor vehicle equipped to transport and provide care during transport of ill or injured patients. An ambulance must have two separate compartments: a driver compartment and a patient care compartment. Ambulances may be land, air or water vehicles. All ambulances should be registered and accredited by the prehospital component of the emergency care system regulatory authority.

Roadworthy state: The state of an ambulance that ensures that it operate safely on the road.

Standard:

This policy does not supersede any relevant local governmental vehicle code or related requirements.

All ambulances shall be inspected by the ECS regulatory authority in order to receive a permit to operate in the local area. Inspections shall be carried out at the time of issuing of the initial permit and at set intervals thereafter. Ambulances must demonstrate compliance with the equipment standards in this policy to qualify for a permit, should be able to provide proper care and should

have two-compartment designations [*** Insert local regulations and/or legislation here.***].

Vehicles used by prehospital personnel should be in a roadworthy state. This includes but does not supersede any relevant government standard.

- Lights, windscreen wipers, brakes, seatbelts, doors and warning devices must be functional.
- The windscreen must not impair the driver's vision.
- Tyres must have an appropriate tread and not be overly worn as to be dangerous for use.
- The license or identification plate must be clear and visible according to government and/or regional standards.
- A working fire extinguisher should be available at all times.
- Fuel levels should be adequate for the expected use of the vehicle.
- Oil, brake fluid, radiator water and battery should be maintained as per local public safety vehicle ordinance standards. [*** Insert local regulations and/or legislation here.***]
- All ambulances should be insured according to local standards (for example for collision and liability coverage). [*** Insert local regulations and/or legislation here.***]
- All ambulances should be fitted with appropriate, functioning personnel and patient restraints, including seatbelts, door locks and a stretcher lock.

All ambulances shall stock the prescribed equipment and supplies. See operational resource: *Equipment and medication for basic and advanced ambulances.*

The quantities of stocked supplies should be based on consideration of the amounts usually used during a shift plus additional quantities to maintain adequate supplies for periods of high demand or delays in restocking.

Every prehospital response vehicle should, when feasible, have appropriate equipment for maintaining the cold chain for medical supplies.

Every prehospital response vehicle shall have a telecommunication device such as a long-range radio of appropriate frequency, in compliance with [*** Insert local regulations and/or legislation here.***].

Prehospital response vehicles shall not stock medications, medical devices or other supplies or equipment that has not been approved by the EMS.

Procedure:

Each EMS shall create a checklist of equipment and medications for basic and advanced ambulances for every prehospital response vehicle. The list should include the minimum number of each type of equipment required on each unit

according to the ambulance operations standard. See operational resource: *Equipment and medication for basic and advanced ambulances.*

PPs or other responsible crew members shall inspect their vehicle, ideally once before each working shift or at least once every 24 h, to verify that the minimum equipment is present on the vehicle. A crew member shall attest to the completeness of the inspection by signing a checkout sheet. The equipment and medication checklist for basic and advanced ambulances includes the minimum standard supplies and equipment.

The EMS shall maintain the equipment and medication checklist for basic and advanced ambulances in their records for [***Insert local specified interval.***].

QI should include equipment failure, deficiencies or vehicular defects as per the QI standard. Defects and faults are to be recorded on the vehicle checklist and immediately reported verbally to the shift supervisor. Both the respective crew member and the shift supervisor must sign and date the equipment and medication checklist for basic and advanced ambulances.

If the equipment in a prehospital vehicle is insufficient, the supervisor of the prehospital personnel who report to the EMS shall be alerted, and a replacement vehicle shall be procured, if possible, until the equipment shortage is resolved. If the equipment shortage or a vehicular malfunction identified is critical, the vehicle should be retired from service until the equipment shortage or vehicular malfunction is sufficiently addressed and resolved.

2.3.5 Medical control

Medical control consists of the provision of assistance to PPs who encounter a complex case by a senior provider (often a doctor). Protocols for automatic medical control contact (for example, when to give a particular medication) should be established, as should as the option to contact medical control when a PP is unsure of the best course of action in either determining the destination or managing a patient's care. Locally appropriate training standards should be developed for MCOs, who must be aware of what is and is not feasible in the prehospital setting and knows the scope of practice of PPs.

Purpose:

The puspose of the standard is to define the role of medical control in the prehospital component of the ECS, and to establish medical, operational and staff standards for providing medical control to PPs.

Authority:

[*** Insert relevant local authorities here. ***]

Implementation management:

ECS regulatory authority

Medical control facility

Definitions:

Medical control: A system of clinical governance that provides real-time (online) and protocol-based (offline) medical direction to PPs to ensure that patient care meets agreed standards.

Medical control facility: A medical or administrative facility that can maintain communication with PPs and holds records of the medical director's guidance to PPs; e.g. an emergency communication and dispatch centre.

MCO: A provider with advanced experience in emergency care (often a doctor) who is authorized to provide remote advice to PPs. MCOs must not only meet clinical training requirements but should undergo specific training in the standards and protocols of prehospital emergency care. In smaller ambulance services, the function of MCO is covered by the medical director, whereas larger organizations may have two posts with separate functions, with the MCO reporting to the medical director.

Standard:

An MCO will be available 365 days/year, 7 days/week, 24 h/day to provide medical direction and consultation to prehospital personnel on patient treatment protocols, including:

- direction on treatment, based on the PP report; and
- consultation on medical questions.

All interactions between the MCO and prehospital personnel will be documented by both parties and the records stored for review. [*** Insert local regulations and/or legislation here.***]

The ECS regulatory authority will specify the communication equipment to be used for all medical control calls. [*** Insert local regulations and/or legislation here.***]

Only the MCO can authorize deviation from standards or clinical protocols by PPs.

Procedure:

An MCO will provide remote advice in accordance with the MCO training programme, prehospital emergency care clinical protocols, prehospital emergency care standards and training designated by the ECS regulatory authority.

MCOs shall:

- be licensed to practise in the appropriate jurisdiction;
- complete a course in medical control;
- be familiar with local prehospital emergency care clinical protocols; and
- have passed an examination approved by the ECS regulatory authority.

The medical control facility will maintain a roster of MCOs and verify the MCO course and examination.

The medical control facility will have a QI plan to ensure that medical control is performed in accordance with this standard and will review all medical control calls for appropriate direction in accordance with the ECS regulatory authority QI plan.

The medical control facility will maintain a record of all medical control calls (See operational resource: *Medical control record*), including:

- prehospital provider identification,
- prehospital assessment,

- interventions before contact and
- medical direction given.

The ECS regulatory authority will specify a mechanism for maintaining all necessary communication equipment for real-time discussion between the MCO and PPs. [*** Insert local regulations and/or legislation here.***]

MCOs must participate in the initial and continuous training of PPs.

2.3.6 Infection prevention and control

Infection prevention and control is a daily activity for all health-care providers. Standard precautions must be adhered to at all times and, depending on context, be complemented by precautions to prevent transmission. Policy-makers should adapt the standards to local circumstances. Examples of isolation precautions also include special forms of transport according to the isolation precautions required (e.g. airborne or droplets). For patients with certain highly contagious infectious diseases, only special ambulances and equipment should be authorized for use. Standards for special units will be developed with public health authorities appropriate to the circumstance.

Purpose:

The purpose of the standard is to protect the PP, the public and the environment from infectious diseases

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

EMS

Definitions:

Deceased patient removal: The management and transport of a deceased patient.

Decontamination: In the context of environmental cleaning, refers to removal or inactivation of dangerous substances or microorganisms from objects or people so they are safe for contact.

- ***Routine cleaning of surfaces and equipment:*** removal of visible soil, organic and inorganic material from objects and surfaces, manually or mechanically, with water with detergents or enzymatic products.
- ***Routine decontamination of patients and personnel for all exposures:*** decontamination of hands with an antiseptic hand rub or antiseptic handwash as necessary, adequate removal and disposal of PPE, adequate removal and disposal of contaminated clothing and other practices specified in local standards.

- ***Decontamination of surfaces and equipment in special situations:*** cleaning, disinfecting and reprocessing reusable equipment and surfaces when actions beyond routine cleaning are required, such as for airborne, droplet, contact and bloodborne agents, and management of environmental exposures. The recommendations depend on the nature of transmission of the agent or vector to be removed or neutralized.
- ***Decontamination of patients and personnel in special situations:*** infection control measures beyond routine cleaning according to decrease exposure to hazardous and infectious agents, including by removal or neutralization of contamination from airborne, droplet, contact, blood and environmental exposures.

Health-care risk waste: Infectious or hazardous by-products of a health-care facility that require special treatment, such as sharps, non-sharp items contaminated with body fluids, blood and body fluids, body parts and tissues, genotoxins, chemicals, pharmaceuticals and radioactive materials.

Infection prevention and control: Risk assessment and use of standard and transmission-based precautions to protect health-care providers from infection and to prevent the spread of infection.

Personal Protective Equipment (PPE): Equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. Such injuries and illnesses may result from contact with infectious, chemical, radiological, physical, electrical, mechanical or other hazards. Medical non-sterile and surgical sterile gloves, surgical masks, goggles or face shields and gowns are considered essential PPE that must always be available to a PP. Other types of PPE may be required in some circumstances.

Post-exposure prophylaxis: Treatment after occupational exposure to bloodborne pathogens such as HIV, hepatitis B virus and meningococcus to decrease the risk of disease transmission. The procedures for assessing the need for prophylactic treatment after exposure will depend on the employer.

Standard:

This standard applies to all patients and prehospital personnel.

The policy for environmental cleaning of an ambulance must be clearly defined in a written policy, with standards and procedures agreed upon between the ECS regulatory authority, prehospital service provider organizations and relevant government and public health authorities. The procedures and responsibilities for cleaning and the frequency of cleaning must be clearly stated.

Proper PPE, cleaning supplies and health-care waste disposal equipment (including sharps containers) will be maintained in every ambulance according to the supplies and equipment standard.

All patient equipment that is exposed to patient bodily fluids must either be for single use or can be re-sterilized according to the guidelines of the local health authority, including emerging labour, delivery and perinatal care kits. [*** Insert local regulations and/or legislation here.***]

If the prehospital emergency care team suspects a notifiable or highly contagious condition (e.g. Ebola virus disease or Severe Acute Respiratory Syndrome), local mechanisms for screening emergency patients should be followed and the appropriate local public health authority alerted. Follow special regular and/or special decontamination procedures according to the local public health standards. [*** Insert local regulations and/or legislation here.***]

The PP should receive the primary and booster vaccinations applicable for specific communicable diseases according to the local public health authority. [*** Insert local regulations and/or legislation here.***]

If PPs are exposed to a highly contagious condition, they should undertake the applicable post-exposure procedures according to the local public health authority and should be reported to the ECS regulatory authority according to QI standards. [*** Insert local regulations and/or legislation here.***]

PPs should inform the EMS if they have a contagious illness.

In a disease epidemic or pandemic, the EMS will support rapid response teams or integrated disease surveillance, as requested by the local public health authority.

In the case of outbreaks, the destination of transfer of patients should be determined according to the instructions of the local authority. [*** Insert local regulations and/or legislation here.***]

Dead bodies will be managed and/or transported in accordance with the agreed ECS regulatory authority and government protocols. [*** Insert local regulations and/or legislation here.***]

Procedure:

Prehospital personnel should use universal precautions for all patient contacts and should follow the direction of the ECS regulatory authority. See operational resource: *Standard precautions*.

Patients with possible public health-relevant or infectious diseases must be identified by the emergency communication and dispatch centre, the PP or the public health authority.

For patients with possible public health-relevant or infectious diseases, other PPE will be required for isolation, according to the relevant local public health authority standards [*** Insert local regulations and/or legislation here.***]

- The ECS regulatory authority shall be responsible for notifying all EMS of any such isolation standards.
- The EMS shall be responsible for notifying and protecting their PPs according to any such isolation standards.

Highly infectious patients should be transported according to the ambulance operations standards.

If a PP becomes aware that a patient has been exposed to an infectious disease, they must immediately follow the appropriate decontamination and prophylaxis procedures and report the exposure to the ECS regulatory authority and the local public health authority according to the QI standard.

The EMS must be able to dispose of biomedical waste collected during patient care or ambulance patient transport safely in predetermined, appropriate waste disposal facilities.

The ECS regulatory authority in coordination with the local public health authority should set the standard of infection control. The EMS should be compliant with the ECS regulatory authority standards, and the ECS regulatory authority should enforce those standards.

The EMS should provide training in infection control in accordance with the ECS regulatory authority. Failure to maintain current training will result in ECS regulatory authority action.

Ambulance compartments, including patient compartments, should be cleaned according to the ambulance operations standards. See operational resource: *Ambulance cleaning and decontamination*.

Dead bodies should be managed and/or transported in accordance with local policy. [*** Insert local regulations and/or legislation here.***]

2.3.7 Scene safety

The safety of PPs is paramount. If they are injured, not only do they become new patients but the health workforce available to take care of the population is reduced. Sometimes, however, patients pose a threat of infectious disease, physical violence or other risk to safety. Patients have the right to privacy, self-determination and respect for their dignity, provided they are not posing a threat to responding personnel, themselves or other bystanders. If they are posing a threat, they shall be treated in accordance with public safety or the local police authority according to use of the clinical protocol for altered mental status or the behavioural emergencies clinical protocol.

Purpose:

The purpose of the standard is to ensure the safety of all people on the scene and during transport, including health-care workers, patients and bystanders; to meet the priorities of responders to ensure the safety of PPs, the patient and bystanders, to stabilize the incident, to preserve property and to protect the environment; and to reduce occupational injuries.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

EMS

Definitions:

Complex event: An event that results in acute injury or illness but also has an element of ongoing risk that may hamper access to and/or treatment of patients.

Hazard: A threat to the safety and health of all individuals (first responders, PPs, patients, bystanders) at the scene of a prehospital emergency care call. May include violence by bystanders, traffic, dangerous substances or a building at risk of collapse.

Scene (also referred to as "prehospital setting" or "field"): Site at which PPs first encounter a patient.

Standard:

At the scene of a medical emergency, all PPs shall operate within their scope of practice and follow the standards and clinical protocols approved by the ECS regulatory authority.

Scene safety shall be ensured by the local public safety or police authority so that care can be delivered safely. PPs shall have the authority for medical decisions and the well-being of patients.

Scene safety includes safety from all hazards, including infectious diseases, injury and the environment. See operational resource: *Scene safety*.

For common situations (including complex events) that require numerous resources, the relevant lead agency should be determined beforehand. For example, crime scenes and road traffic crashes may require coordination with police and ambulance services, while fires may require coordination with fire services, ambulance services and police. Regular exercises should be conducted according to the MCI standard. See operational resource: *Elements to be considered in developing a prehospital mass casualty incident plan*.

Procedure:

Establishment of scene safety is the initial component of a scene survey. PPs shall enter a scene and begin providing care only if the scene is determined to be safe.

PPs are responsible for protecting themselves by complying with PPE (body substance isolation) according to the infection prevention and control standard.

If no one else is present, PPs shall evaluate the scene for hazards and, if possible, mitigate them before starting or continuing to provide care.

The EMS shall be responsible for identifying and reporting scene hazards. The ECS regulatory authority shall be responsible for coordinating the response to identified hazards with other authorities.

If a scene cannot be rendered safe, PPs shall stand at a safe distance and notify their dispatcher and/or prehospital supervisor. After resolution of the call, they will submit an exception report.

Appropriate documentation shall be completed:

- Any ongoing hazard at a scene shall be reported to the MCO, the public safety or local police authority and the ECS regulatory authority for the specific hazard. (Examples are suspected carbon monoxide poisoning in a building to the MCO, a traffic hazard to the local police authority, and potential ongoing violent behaviour to the local police authority.)

- Any injury, illness or high-risk exposure occurring during care should be promptly reported to the ECS regulatory authority.

2.3.8 Scene management

To establish minimum standards for scene management and procedures for patient encounters initiated outside of dispatch-initiated responses.

Purpose:

The purpose of the standard is to define on-scene roles and hierarchy; to establish minimum standards for scene management; and to establish procedures for patient encounters initiated outside dispatch-initiated responses.

Authority:

[*** Insert relevant local authorities here. ***]

Implementation management:

EMS

Definitions:

Medical personnel on scene: A physician, medical officer or another practitioner unaffiliated with the prehospital response who is already at the scene and who interacts with the prehospital personnel.

Patient encounter initiated by staff: An acute incident resulting in the need for emergency care service that occurs in view of prehospital personnel on duty, whether they are dealing with another prehospital call for service or in between calls. Thus, the encounter is initiated by PPs (by contacting dispatch) and not by the community.

Scene (also referred to as "prehospital setting" or "field"): Site at which PPs first encounter a patient.

Standard:

While on the scene of a medical emergency, all PPs shall operate within their scope of practice and follow the standards and clinical protocols approved by the ECS regulatory authority.

The most highly trained PP on a scene is responsible for patient care and safety once a response has been initiated. This responsibility can be transferred only to a provider of equal or higher training. Thus, responsibility for a patient shall pass from the CFAR to the PP, once present. When advanced providers are in

attendance, they shall have authority over basic providers in providing medical care for a patient.

Scene safety shall be ensured by the local public safety or police authority to ensure that care can be delivered safely. PPs shall have authority for medical decision-making and the well-being of patients.

The lead agency for common situations, including complex events, that require several resources should be determined in advance. For example, crime scenes and road traffic crashes may require coordination between police and ambulances, while fires may require coordination among fire, ambulance and police services. Exercises should be conducted regularly according to the standard for mass casualty incidents and surges. See operational resource: *Elements to be considered in developing a prehospital mass casualty incident plan*.

Procedure:

Once the PP arrives on the scene, the senior member of the crew shall be responsible for patient care, assisted by other first-responding providers, until discharged by the senior PP. If there is conflict about scene management, the senior crew member shall contact the MCO for assistance and, if he or she is unavailable, the EMS event director. Conflicts must be reported in the case review reporting system outlined in the QI standard.

All patients who are identified by PPs shall be either transported or released on the scene according to the patient transport refusal standard.

Medical personnel on the scene who are not a part of the formal prehospital response may assist the PPs to assess and prepare the patient for transport. The senior PP shall attempt to confirm that the medical personnel at the scene are appropriately licensed or certified. The medical personnel on the scene may not direct the crew to exceed their scope of practice or deviate from prehospital care system standards or clinical protocol unless they are willing to render care directly to the patient and accompany the patient while being transported to a receiving facility. Patients may be transported only to authorized receiving facilities as designated by the destination policy standard. Any conflicts are to be resolved as described above.

During a special event, PPs shall follow the prehospital emergency care plan for that event according to the standard for prehospital ECS for special events. See operational resource: *Definitions for special event medical resources* and *Minimum resources for special events*.

Patient encounter initiated by staff: If a PP witnesses an incident or a patient requiring care (such as a patient or bystander who flags down an ambulance), the PP shall do one of the following:

- If en route to a scene or transporting a severely ill patient, they shall contact the emergency communication and dispatch centre and request an additional ambulance to attend to the new patient and if possible, inform the party.
- If they are in between prehospital responses, they shall stop and evaluate the situation. If a patient is present, they shall contact the emergency communication and dispatch centre and initiate a standard call.

All patient contacts shall be documented according to the ambulance operations standards.

2.4 Communication standards

2.4.1 Emergency communication and dispatch centres

Emergency communication and dispatch centres are the central coordination hub of the prehospital component of the ECS. They rely on communication technology, such as radios and mobile phones. Thus, it is essential that emergency communication and dispatch centres have comprehensive standards as well as back-up plans in the event of equipment failure.

Purpose:

The purpose of the standard is to establish the minimum standards for emergency communication and dispatch centres serving the prehospital component of the ECS.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

Emergency communication and dispatch centre

ECS regulatory authority

Definitions:

Call handling: Receiving, interpreting and prioritizing incoming calls for emergency medical assistance.

Dispatching: Assigning a response to a call according to a prioritization system approved by the ECS regulatory authority.

Emergency communication and dispatch centre (also referred to as "ambulance dispatch centre", "emergency medical services communication and dispatch centre", "communication and dispatch centre", "emergency call and dispatch centre", "ambulance dispatch centre", "emergency dispatch centre" and "dispatch centre"): Facility approved by the ECS regulatory authority to continuously receive, register and process calls from the access number and to assign and dispatch an ambulance in response.

Response prioritization: Classification of a prehospital caller's complaints into a standardized prehospital response acuity level. Depending on the system, prioritization determines the type of personnel and resources that will be sent in

response and the order in which calls will be responded to if demand outstrips available resources.

Standard:

The primary function of the emergency communication and dispatch centre is to match the emergency care resources to patient needs by processing all calls for emergency assistance quickly, efficiently and accurately. See operational resource: *Medical dispatch workflow* and operational resource: *Priority based dispatch.*

Only emergency communication and dispatch centres designated by the ECS regulatory authority may respond to a call for the prehospital component of the ECS with appropriate technology.

Ambulance dispatchers must be trained in the appropriate regional standards and local regulations.

The emergency communication and dispatch centre is responsible for verifying the location of the incident and providing pre-arrival instructions. See operational resource: *Medical dispatch pre-arrival instructions.*

The emergency communication and dispatch centre is responsible for documenting the details of each call and its outcome.

Emergency communication and dispatch centres must have a mechanism for direct communication with dispatchers of other regional services, such as police and fire departments, and with neighbouring medical, police and fire departments in the case of a large-scale disaster.

Emergency communication and dispatch centres must have a system for disposition of non-emergency calls.

In MCIs, the emergency communication and dispatch centre becomes the command-and-control centre for ambulance response, in conformity with the MCI standards.

Emergency communication and dispatch centres must have an electronic means for recording all calls for both documentation purposes and for QI review according to QI standards.

All dispatchers in the emergency communication and dispatch centre should be certified (in e.g. knowledge, appropriate language skills) according to the training and certification standard.

The emergency communication and dispatch centre must be able to process calls in languages other than the national language(s).

The emergency communication and dispatch centre must test their communications systems daily.

The emergency communication and dispatch centre shall execute the prehospital emergency care standards appropriate to its function as outlined by the ECS regulatory authority (e.g. maintaining and communicating to PPs the current status of receiving facility ambulance diversion, directing ambulance staging post and launch positions to change temporarily because of call volume or location).

The emergency communication and dispatch centre must have a system for resolving grievances according to QI standards.

The emergency communication and dispatch centre may house the MCO.

Procedure:

The service provided must be available 24 h/day.

The emergency communication and dispatch centre will generate a unique identifying incident number for each call and provide this number to the prehospital personnel.

The emergency communication and dispatch centre must categorize calls into, at a minimum, "highest priority" and "other", with priority of PP response given to high acuity calls.

The ECS regulatory authority-approved dispatch prioritization system must be used for all calls. The emergency communication and dispatch centre shall coordinate with the ambulances in the region for tracking from call initiation to closure. See operational resource: *Priority based dispatch.*

The emergency communication and dispatch centre must be able to communicate with the responding EMS units and hospitals.

Dispatchers will maintain certification [***Insert local regulations and/or legislation here.***].

The emergency communication and dispatch centre will maintain a log of all incoming calls, with their initial data and disposition.

In the event of an MCI, the emergency communication and dispatch centre will implement the MCI communications plan per the MCI standard.

The emergency communication and dispatch centre will provide data for system performance management and develop and execute a QI plan as required by the QI programme standard.

The emergency communication and dispatch centre must have a standardized contingency plan in case of communication equipment failure.

2.4.2 Field communications

Communication between providers on the scene and the rest of the ECS is important to ensure good-quality care. PPs might have to communicate with dispatch, medical control, the receiving facility and sometimes with patients or callers. Communication with the receiving facility is especially important in critical cases so that the facility can prepare for the patient's arrival. It is recommended that the facility be alerted at least 5 min before arrival.

Other important information that should be included in a dispatch notification or prehospital report includes (See operational resource: *Prehospital intervals*):

- time call received;
- time of dispatch instruction;
- time of vehicle departure on the call;
- time of arrival at the scene;
- time of departure from the scene;
- time of arrival at the hospital;
- time in the hospital;
- time returned to service; and
- any change in ambulance service status.

The ECS regulatory authority should determine which of these communications are important for their system and to whom they should be reported. The most important are time of dispatch, time of arrival at the scene, time of departure from the scene, time of arrival at the hospital and any change in ambulance service status.

Purpose:

The purpose of the standard is to direct prehospital personnel when to contact the patient or caller, the receiving facilities, the MCO and prehospital supervisors or other public safety personnel; to provide guidelines for providing clear, concise reports, and to provide consistent back-up procedures in case of communication failure.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

PPs

EMS

Definitions:

Back-up plan for primary communication failure: An alternative means for communicating with MCOs and receiving facilities when primary communications methods have failed. The plan should include an explicit operating procedure to be followed if all communication methods fail.

MCO: A provider with advanced experience in emergency care (often a doctor) who is authorized to provide remote advice to PPs. MCOs must not only meet clinical training requirements but should undergo specific training in the standards and protocols of prehospital emergency care. In smaller ambulance services, the function of MCO is covered by the medical director, whereas larger organizations may have two posts with separate functions, with the MCO reporting to the medical director.

Prehospital supervisor: A senior PP working outside the emergency communication and dispatch centre (usually at the prehospital scene) with supervisory authority over other PPs on duty.

Primary communication method: The telecommunications system (often radio or mobile phone) used routinely by PPs to communicate with receiving facilities and other providers in the field.

Scene (also referred to as "prehospital setting" or "field"): Site at which PPs first encounter a patient.

Standard:

Field personnel shall have a primary method of communication with the emergency communication and dispatch centre, prehospital supervisors and receiving facilities that ensures constant direct communication.

The receiving facility should receive notification of the transport of all prehospital emergency patients to their location.

The receiving facility should receive notification on the standard reporting format. See operational resource: *Facility pre-arrival report form*.

Notification should be provided [*** Insert local specified interval, such as a minimum of 5 min before arrival***] during patient transport and in all cases before the predicted arrival.

The receiving facility shall maintain a communication system to receive such notification and train all appropriate facility personnel in communication procedures.

Medical control should be contacted when the clinical protocol used to guide the care of a patient requires it. PPs may contact medical control when they so require, at their discretion.

A plan for a communication failure should be in place so that field providers can contact the emergency communication and dispatch centre, prehospital supervisors and receiving facilities.

Communication during MCI incidents should be guided by the regionally approved MCI standard.

Procedure:

The PP must inform dispatchers of a change in location or status.

The dispatcher must provide the following information to the patient or caller:

- estimated time of arrival and
- re-confirmation of the location of a patient.

Prehospital personnel must provide minimum information to the receiving facility. See operational resource: *Facility pre-arrival report form*.

PPs must report the following information to the appropriate authority (prehospital supervisor or dispatch) in writing or verbally:

- requirement for ambulance repair or fuel;
- patient refusal of transport (in accordance with the patient transport refusal standard);
- need for additional personnel at the scene for patient access, stabilization or movement;
- need for additional resources for scene safety (in accordance with the scene safety standard); and
- any acute injury or illness in the ambulance crew.

Handover a patient between the PP and a health worker in the facility should follow a structured procedure. See operational resource: *SBAR handover tool*.

Only ECS regulatory authority-approved PPs shall communicate the above procedures.

A plan for use during a communication failure must be developed and distributed [*** Insert local regulations and/or legislation here.***]

The MCI communication plan will be implemented when indicated, consistent with the MCI and surge standard. See operational resource: *Elements to be considered in developing a prehospital mass casualty incident plan.*

2.5 Standards for special considerations

2.5.1 Mass casualty incidents and surge

PPs and EMS must always be prepared to respond to an MCI or surge, as the number of patients may exceed the available resources. Preparedness for such situations requires planning and drills to practise procedures and protocols that are often not used daily.

Purpose:

The purpose of the standard is to provide the structure and process for emergency care by all organizations in the prehospital system during an MCI of any magnitude and to coordinate that care with public safety in order to minimize deaths and disability resulting from such events.

Authority:

[*** Insert relevant local authorities here***]

Implementation management:

ECS regulatory authority

EMS

Definitions:

Incident commander: While the title of this person may differ by region, the term is used in this document to refer to the person in charge of coordinating an incident command system in a mass casualty incident.

Incident command system: A standardized, hierarchical structure that allows a cooperative response and oversight of coordinated systematic implementation of the emergency response plan.

MCI (also known as multiple casualty incident): An event that results in more patients at one time than can be managed by locally available resources with routine procedures (generally four or more victims). Examples include a road traffic crash, a building fire or a large-scale event such as an earthquake or mass toxic exposure.

Standard:

In an MCI, scene safety is paramount. PPs shall take all steps possible to minimize their risk, including rapid establishment of an incident command system and appointment of an incident commander.

The MCI plan for an ECS must be a sub-plan of the appropriate jurisdictional general emergency management plan. It is critical to ensure that prehospital components are included in facility, regional and national emergency response plans [*** Insert reference to local emergency management plan here.***] See operational resource: *Elements to be considered in developing a prehospital mass casualty incident plan.*

The most senior PP who arrives on the scene shall become the medical group supervisor and work directly with the incident commander. He or she shall prioritize medical tasks and assign personnel as available in order to:

- determine and report to the emergency communication and dispatch centre the number of victims;
- organize and begin medical triage of all victims;
- provide medical care according to priority after triage;
- transport victims to the appropriate receiving facilities according to severity or acuity;
- treat and refer low-acuity victims;
- track patients from initial triage to transport to the receiving facility;
- decontaminate and clean personnel and equipment after incident closure;
- identify, address and mitigate any personnel stress; and
- return to normal PP service as soon as possible.

Prehospital supervisory personnel and the medical director shall be notified, and additional prehospital resources shall be requested as necessary.

The emergency communication and dispatch centre shall alert the ECS regulatory authority to request out-of-jurisdiction prehospital care resources as required by the incident commander on the scene.

Procedure:

The prehospital MCI management plan must be coordinated with local public services and health facilities. It must also be included in the national emergency response plan.

A single MCI and field triage tool should be agreed upon by all regional agencies to ensure ready communication among agencies in a large response.

All EMS and receiving facilities shall train appropriate personnel in use of the standard upon hiring and participate in all MCI exercises and drills as determined

by the ECS regulatory authority [*** Insert local specified interval, such as a minimum of annually***]. Exercises and drills shall include scene safety elements such as bystander management, mitigation of physical risks such as spilt fuel or contamination and communication with other public safety agencies, hospitals and emergency communication and dispatch centres.

During an MCI, documentation may be modified to allow rapid identification, treatment and transport of casualties. For PPs, the documentation should include at a minimum:

- age,
- sex,
- triage category and
- destination.

The receiving facility documentation should include at a minimum, all the data above, plus:

- patient name,
- unique patient identification number,
- patient's condition,
- interventions performed and patient's response (if any) and
- patient disposition.

Transport destinations for MCI patients shall be those of the destination policy when possible. The ECS regulatory authority shall develop a primary and back-up patient distribution plan for MCI patients.

All attempts shall be made by PPs to maintain the normal standard of care to MCI patients.

Training in MCI response and scene safety approved by the ECS regulatory authority shall be conducted by all EMS and receiving facilities [Insert local specified interval, such as a minimum of annually].

2.5.2 Patient refusal of transport

Patients have the right to refuse care, for whatever reason. Systems should be prepared to address such circumstances, and PPs should have policy and legal protection when such standards are followed.

Purpose:

The purpose of the standard is to ensure uniform practice of patient refusal of transport in the prehospital component of the ECS in accordance with patient safety practices and universal patient rights.

Authority:

[*** Insert relevant local authorities here.***]

Implementation management:

ECS regulatory authority

EMS

Definitions:

Patient transport failure: A PP could not transport a patient to the hospital in spite of the patient's willingness to be transported, for example, due to family or bystander interference or vehicle failure.

Patient transport refusal: An emergency patient does not allow prehospital personnel to transport him or her to the hospital, for example by stating that they are no longer in pain or refusing treatment on religious grounds.

Standard:

The ECS regulatory authority, in conjunction with local public safety authorities, defines the standards for patient refusal or failure of transport for the EMS in a written agreement. [*** Insert local regulations and/or legislation here.***] See operational resource: *Transport or treatment refusal form*.

[*** Insert local regulations and/or legislation on the scope of PP (with or without medical control) to determine when clinical intervention is not indicated for a non-responsive patient, such as one who appears to have been dead for a long time.)***] Additionally, a locally approved protocol should be in place on the transport of an otherwise non-viable patient from an unsafe scene.

In the case of refusal of transport by a patient, the PP shall assess the capacity of the patient to make such a decision. If the patient is found to have such capacity, the PPs shall counsel the patient and family members (if present) on potentially increasing severity of their illness or injury, including the death of the patient, and advise them to go to the nearest registered medical practitioner or hospital in a private vehicle if they change their minds. Patient(s) and family members should be informed that they can call again for assistance or transport at any time and should be given time to ask questions. If the patient still refuses further care, he or she should sign a statement documenting understanding of the risk and confirming their refusal of further care. See operational resource: *Transport or treatment refusal form.*

- Refusal of patient transport is applicable only to adults [Insert local regulations and/or legislation here.].
- In all cases of patient transport failure, the MCO or EMS event director should be consulted before the PP leaves the scene and a case report sent to the ECS regulatory authority.

A valid advance medical directive in the form of a DNR order or otherwise should be honoured by PPs when it is shown by the patient's family or caretaker, and it should be communicated to the emergency communication and dispatch centre or prehospital supervisor. [*** Insert context-appropriate guidance on the rights and responsibilities of PPs when family members or proxies refuse life-saving interventions in the absence of a formal DNR order***].

During an MCI, PPs should follow the MCI standard for patient triage and documentation.

Procedure:

PPs document patient refusal or denial as required on the ambulance operations standard and patient transport refusal form, as appropriate; counsel family members; and communicate with the emergency communication and dispatch centre and prehospital supervisor as necessary. See operational resource: *Transport or treatment refusal form.*

PPs should review the DNR (when available) and document their review on the patient record. When possible, the documentation should include a photograph of the DNR certificate.

If a patient refuses transport but refuses to sign the refusal form, the name and signature of a witness should be obtained.

2.5.3 Prehospital emergency care services for special events

The term "special events" as used here is a planned increase in the number of potential patients in a given setting. Prehospital response can be hampered if such events are not anticipated and adequate resources are not pre-positioned. Strategies should be in place for ensuring access to all areas to reach potential patients and also to leave the scene for transport. Pre-positioning of prehospital assets entails placing supplies and personnel strategically around the venue to facilitate the response to a potential emergency. Events that do not exceed the medical capabilities normally present shall be exempted from this standard.

Purpose:

The purpose of the standard is to establish minimum standards for prehospital care at mass gatherings and special events in order to provide both the community standard of emergency care to participants in the event and to preserve the standard of emergency care to the community outside the event.

Authority:

[*** Insert relevant local authorities here***]

Implementation management:

ECS regulatory authority

EMS

Definitions:

Event aid station: A fixed or mobile facility at an event or mass gathering that can provide initial care to acutely ill or injured participants, and is dedicated to a specific event or event venue and does not function at the same time as part of the surrounding health system. Examples of aid stations include first aid tents, mobile clinics, dedicated ambulances and temporary medical facilities converted from meeting rooms.

Event director: A senior PP with experience in managing special events and mass gatherings, who oversees coordination of medical services for such events.

Special event or mass gathering: Predictable and/or permitted (by governing authorities) gathering of many individuals for a common purpose. Examples include political gatherings or demonstrations, road races, concerts and religious and cultural festivals.

Additional definitions are provided in operational resource: *Definitions for special event medical resources.*

Standard:

Every prehospital ECS plan for a special event must include:

- an individual designated as the EMS event director for the event;
- a communications plan in which the EMS event director is linked with:
    - all PPs providing care at the event;
    - other public safety services, such as police and fire department; and
    - the emergency communication and dispatch centre for the jurisdiction.
- as many event aid stations and PP mobile resources as necessary to provide the community standard of prehospital care for participants at the event;
- a safety plan for PPs and patients under their care; and
- a mass casualty management plan for PPs to organize care for patients during an MCI at the event.

The EMS event director is responsible for:

- a prehospital emergency care plan [*** Insert local regulations and/or legislation here***].
- training the appropriate personnel in the prehospital emergency care plan for the event;
- procuring sufficient resources to deliver the medical care outlined in the plan;
- maintaining records of the medical care provided [*** Insert local regulations and/or legislation here***]; and
- submitting a summary of the care provided and any unexpected (outside of the event prehospital emergency care plan) medical issues at the event to the ECS regulatory authority as required by the QI standard. This document should be submitted within [*** Insert local specified interval***] days after the event.

Procedure:

A prehospital emergency care plan for special events and mass gatherings should be developed early enough that the ECS regulatory authority can review it and modify, approve or disapprove it before the event.

The authority for approving the prehospital emergency care plan for special events and mass gatherings shall be the ECS regulatory authority, in consultation with the relevant government authority.

The mass casualty management plan shall conform to the ECS MCI standard. See operational resource: *Elements to be considered in developing a prehospital mass casualty incident plan.*

Adhere to the relevant minimum staffing and equipment standards. See operational resource: *Minimum resources for special events.*

PPs at an event may be trained in use of communications and MCI plans at any time before the start of the event.

A summary of the medical care rendered shall be submitted by the EMS event director within [*** Insert local specified interval***] of the end of the special event or mass gathering to the ECS regulatory authority.

2.6 Operational resources: key processes and protocols

The operational resources presented here can be used with the standards described above or in conjunction with local standards. The resources are forms, templates and guidance that can be used directly by ambulance systems, although they should be adapted as necessary to local regulations, customs and practices. For example, scope of practice of basic and advanced providers (operational resource: *Ambulance provider level and scope of practice*) and therefore the medications and equipment required in ambulances (operational resource: *Equipment and medication for basic and advanced ambulances*) will differ by country, and the resources should be amended as appropriate. Guiding principles are provided for resources that will have to be developed locally. If you would like to access editable versions, please email emergencycare@who.int.

These resources can be downloaded directly from the WHO prehospital website.

2.6.1 Recommended process for public comment on local components of prehospital standards and protocols

When introducing or amending prehospital standards and protocols, complete the following four public consultation steps:	
All new or significantly revised current prehospital standards and protocols (either operational or clinical) are to be released by the ECS regulatory authority via email and posted on the authority's website for public review and comment prior to becoming effective. Written comments should be accepted by the ECS regulatory authority by the date listed on the public comment notice and webpage. The ECS regulatory authority should allow a minimum of 14 days for public comment.	☐
All comments received during the comment period will be reviewed by the ECS regulatory authority for either inclusion or exclusion in the policy. A summary of the comments received, their disposition, and final policy drafts will be reviewed at the next ECS regulatory authority advisory committee meeting following the ending of the public comment period.	☐
The ECS regulatory authority advisory committee shall provide a recommendation to the ECS regulatory authority director to accept or reject the draft version of the standard / protocol revisions. The ECS regulatory authority director may accept or reject the ECS regulatory authority advisory committee's recommendation when determining the final standard / protocol content.	☐
The ECS regulatory authority director shall follow local procedure for approval of the final standard / protocol by local governmental authorities.	☐

2.6.2 Training and certification of prehospital providers

TOPIC	ASSOCIATED STANDARD	KEY TRAINING CONSIDERATIONS
Define the responsibilities and scope of practice of basic and advanced ambulance providers	Ambulance provider level and scope of practice	Patient assessment and treatment with assistance to the appropriate level of health facility
Patient contact	Prehospital emergency care response operations	• Required documentation • Initial assessment • Monitoring • Patient hand-over
Daily ambulance inspection	Prehospital emergency care response operations & Supplies and equipment	• Adequate use of supplies and equipment checklist • Identify the minimum number of each piece of equipment required for patient care • Identify the minimum number of stock supplies for patient care • Report defects and faults / request for vehicle maintenance
Patient triage	Destination policy	• Use of prehospital triage • Training in destination protocols • Focused interventions on red category patients
Destination: Special considerations Death	Destination policy	*Permission to confirm death* • Clinical findings • Appropriate destination
Destination: Special considerations Do Not Resuscitate	Destination policy & Patient transport refusal	Validity of DNR paperwork
Call processing	Emergency communications and dispatch centres	Call taking, prioritization and dispatching How to provide a quick, efficient and accurate assistance • Verifying the incident location • Providing pre-arrival instructions • Communication with responding units • Management of mass casualty incidents
Providing reports	Field communications	• Use of telecommunication devices • Notification to the receiving facility • Use of standard reporting format
Incidents of concern with potential poor patient outcome	Quality improvement programme	• Unexpected patient death • Acute injury of prehospital personnel on duty • Dispatch error • Ambulance crash
Medical control advice	Medical control	• Identify the situations that will require medical control advice • How to report a patient to the Medical Control Officer
Infection prevention and control	Infection prevention and control	• Adequate use and disposal of PPE • Isolation and notification of highly contagious conditions • Decontamination and prophylaxis procedures • Health care waste disposal
Scene safety and first steps of care	Scene safety	• Establishing scene safety and mitigation of physical risks • Coordinating medical care and resolving conflict • Bystander management • Preparing the patient to transport • Patient's rights protection
MCI training and management	Mass casualty incidents and surge	• Disclosing MCI plan • Establishment of incident command system • MCI rapid documentation • Standard triage system use
Patient refusal of care or transport	Patient transport refusal	• Risks to mention when documenting patient refusal • Benefits of care • Transport alternatives

2.6.3 Level and scope of practice of prehospital providers

PREHOSPITAL BASIC	PREHOSPITAL ADVANCED **Advanced scope includes basic scope**
PROTOCOLS WITH TRAINING AND CAPACITY TO PERFORM	
Recognition of danger signs in children and adults	Acuity-based triage of children and adults
Vital signs measurement	
Basic life support	Advanced life support
Neonatal resuscitation (including kangaroo care and thermal care for preterm newborns)	Full supportive care for preterm newborns
Basic approach to Difficulty in Breathing, Shock, Altered Mental Status and Unconsciousness, Trauma	Advanced approach to Difficulty in Breathing, Shock, Altered Mental Status and Unconsciousness, Trauma
Oral rehydration	IV fluid resuscitation
Basic case-based syndromic surveillance and reporting	
Communicable disease transmission precautions and destination triage	
Disaster and mass casualty protocols	
PROCEDURES	
Safe transport positioning (for airway and spinal protection when relevant)	
Oral and nasal airway placement	Endotracheal intubation
	Surgical airway
BVM ventilation	
Oxygen administration	
	Needle decompression for tension pneumothorax
	IV fluid infusion (peripheral) for neonates, children, adults
Safe physical restraint	
	Nasogastric tube placement
Prevent heat loss	Active rewarming: non-invasive
External haemorrhage control (direct pressure, wound packing and tourniquet)	
Splinting for extremity injury	
	Placement of external traction for lower extremity fracture
Management of labour and delivery in low risk women (in emergency)	
Uterine massage for pregnancy-related haemorrhage	
Recognition of clinical hypoglycaemia	
DIAGNOSTICS	
Point of care testing - glucose	12 lead ECG
	Point of care ultrasound

2.6.4 Suggested targets for prehospital quality improvement

TARGET NAME	TARGET DEFINITION *HOW TO CALCULATE*	PROPOSED TARGET
OPERATIONS		
1. Ambulance uptime	Percentage of ambulances on-road (functional) at given point of time *# functional/total # ambulances*	>90%
2. Average ambulance recovery interval time	Arrival of ambulance at receiving facility to return of ambulance to service/available for dispatch *total recovery intervals (minutes)/# incidents*	average <30 minutes
3. Percentage of vehicle crash cases	Ambulance involved in a motor vehicle crash and taken out of service *# out of service due to crash / total # ambulances*	<2%
4. Number of certified emergency responders	Total number certified emergency responders per population *# providers (basic and advanced providers, dispatchers) employed by organization / agreed population denominator*	locally developed
5. Time to first provider (prehospital provider with dedicated training in emergency care) **in severe injury from road crash**	From initiation of first call to emergency communication and dispatch centre to arrival of first prehospital provider on scene *total response times (minutes)/# incidents*	average <15 minutes
6. Scene time interval	Total length of time from arrival at scene to departure from scene. *total scene time (minutes)/# incidents*	average <20 minutes
EMERGENCY COMMUNICATION AND DISPATCH CENTRE		
7. Percentage of calls with delayed response	Inability to answer call within 30 seconds of first ring (either when call is successfully answered later than 30 seconds, or call drops after 30 seconds) *# calls >30 seconds / total # calls*	0%
8. Activation interval time	Initiation of response to call (answering the phone) to dispatch of ambulance (identifying the appropriate unit and transmitting the information necessary for it to start heading to the patient) *total activation time (seconds) / total # calls*	average <180 seconds
9. Percentage of vehicle busy cases	Active call waiting to be dispatched, but no ambulance is available to dispatch to call location *# calls no ambulance available / total # calls*	<5%
CARE DELIVERY		
10. Percent of adult patients with initial respiratory rate <8 that receive breathing intervention	Breathing interventions include airway manoeuvre, oxygen administration, bag valve mask ventilation, beta-agonist. *# patients with intervention / # patients with RR <8*	*>80%*
11. Percent of adult patients with shock given IV fluids (shock: any etiology; clinical parameters of shock as defined by prehospital service)	IV fluids started in the field (where permitted within scope of practice) *# patients with shock and documented administration of IV fluids / # patients with shock*	*>80%*
12. Percentage of patients with severe pain who received analgesia.	Patients reporting severe pain who receive pharmaceutic analgesia *# patients with severe pain and documented administration of analgesia / # patients with severe pain*	>80%

2.6.5 Prehospital standardized clinical form and reference card

WHO PREHOSPITAL FORM

☐ MASS CASUALTY

Caller name		**Date**		**Call Received**	
Caller phone		☐ **Scene call** ☐ **Inter Facility Transfer**		**En route to Scene**	
Patient name		**Run number**		**Arrived at Scene**	
Date of birth/age		**Scene location & type**		**Transporting**	
Sex ☐ Male ☐ Female		☐ Residence ☐ School ☐ Public Building ☐ Health Facility ☐ Street ☐ Other		**At Facility**	
Patient address				**In Service**	
Occupation					

Chief complaint ☐ Injury	Initial VS		**Time**
	HR	**RR**	**BP**
	Temp	**RBS**	**SpO2** % on

Care in progress on arrival

Pregnant: ☐ Yes ☐ No ☐ Unknown

HIGH RISK SIGNS

A/B	☐ Stridor, cyanosis, respiratory distress	**C**	☐ Poor perfusion, weak fast pulse, cap refill >3s, heavy bleeding ☐ Adult: HR <50 or >150 ☐ Child lethargy, sunken eyes, slow skin pinch, poor drinking
D	☐ Unresponsive ☐ Acute convulsions ☐ Hypoglycaemia ☐ Acute focal neurologic deficit ☐ Altered mental status with fever or hypothermia or stiff neck or headache		
Other	☐ High risk trauma ☐ Threatened limb ☐ Snake bite ☐ Poisoning, ingestion, chemical exposure ☐ Violent or aggressive ☐ Temp >39˚C or <36˚C ☐ Acute testicular pain or priapism ☐ Pregnant with high risk findings ☐ Adult severe chest or abdominal pain or ECG with ischaemia ☐ Infant <8 days ☐ Infant <2 months with temp >39˚C or <36˚C		

TRIAGE CATEGORY (circle): **RED YELLOW GREEN.** Triaged for

PRIMARY SURVEY

A **Airway** ☐NML	☐ Voice changes ☐ Stridor ☐ Oral/Airway burns ☐ Angioedema **Obstructed by** ☐ Tongue ☐ Blood ☐ Secretions ☐ Vomit ☐ Foreign body	**Airway:** ☐ Repositioning ☐ Suction ☐ OPA ☐ NPA ☐ LMA ☐ BVM ☐ ETT **C-spine stabilized** ☐Not needed ☐Done
B **Breathing** ☐NML	**Spontaneous Respiration** ☐ Yes ☐ No **Chest Rise** ☐ Shallow ☐ Retractions ☐ Paradoxical **Trachea** ☐ Midline ☐Deviated to ☐L ☐R **Breath Sounds** ☐ NML	☐ **Oxygen** L/min ☐ NC ☐ Face mask ☐ Non-rebreather mask ☐ BVM ☐ BiPAP/CPAP ☐ Other
C **Circulation** ☐NML	**Skin** ☐ Warm ☐ Dry ☐ Pale ☐ Cyanotic ☐ Moist ☐ Cool **Capillary refill** ☐ <3 sec ☐ ≥3 sec **Pulses** ☐ Weak ☐ Asymmetric **JVD** ☐ Yes ☐ No ☐ **Active bleeding** site	☐ **Bleeding controlled** Time (bandage, tourniquet, direct pressure) **Access** ☐ IV site size ☐ IO site size ☐ **IVF** ml ☐NS ☐LR ☐ Other ☐ **Pelvis stabilized** ☐ **Femur fracture stabilised**
D **Disability** ☐NML	**Blood glucose** (as needed): **Responsiveness** ☐ A ☐ V ☐ P ☐ U **GCS** (E V M) **Moves Extremities** ☐ L arm ☐R arm ☐L leg ☐R leg **Pupils** Size L R Reactivity L R	☐ **Glucose checked** ☐ **Glucose given** ☐ **Naloxone given**
E **Exposure** ☐NML	☐ **Exposed completely**	**ENTER ADDITIONAL EXAM FINDINGS ON REVERSE**

S A M P L E		
Signs/symtoms	☐ Unknown	
Allergies	☐ Unknown	
Medications	☐ Unknown	
Past medical	☐ Unknown	
Past surgeries	☐ Unknown	
Last ate (hrs)	☐ Unknown	
Events (and ROS)	☐ Unknown	

Form to be used with WHO Reference Card.
See who.int/emergencycare for more information.

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PRIMARY SURVEY (CONT.)

IF INJURY

☐ **Intentional** ☐ **Unintentional** ☐ **Self-inflicted**
☐ Fall ☐Hit by falling object ☐ Stab/Cut ☐Gunshot ☐Sexual assault
☐ Other blunt force trauma ☐ Suffocation, choking, hanging
☐ Drowning: Life vest: Y / N ☐ Burn caused by
☐ Poisoning/toxic exposure
☐ Unknown ☐Other

Road traffic incident:
☐ Driver ☐ Car ☐ Airbag
☐ Passenger ☐ Bike ☐ Seatbelt
☐ Pedestrian ☐ Motorbike ☐ Other restraint
☐ Ejected ☐Other ☐ Helmet
☐ Extricated

PHYSICAL EXAM

☐NML	**General**		☐NML	**Pelvis/GU**	
☐NML	**HEENT**		☐NML	**Neurologic**	
☐NML	**Respiratory**		☐NML	**Psychiatric**	
☐NML	**Cardiac**		☐NML	**MSK**	
☐NML	**Abdominal**		☐NML	**Skin**	

ADDITIONAL INTERVENTIONS

Medications given
☐ Bronchodilators
☐ Epinephrine
☐ Aspirin
☐ Seizure medication
☐ Analgesia
☐ IV fluid infusion
☐ Other

Procedures
☐ Wound Bandaging
☐ Burn Dressing
☐ Splinting/reduction
☐ Pelvic stabilization
☐ ECG
☐ Other

ASSESSMENT (include brief summary and differential) **AND PLAN:**

REASSESSMENT at (time) HR RR
Temp SpO2 % on RBS Pain
☐ **Unchanged**

REASSESSMENT at (time) HR RR
Temp SpO2 % on RBS Pain
☐ **Unchanged**

REASSESSMENT at (time) HR RR
Temp SpO2 % on RBS Pain
☐ **Unchanged**

Presumptive Diagnoses

DISPOSITION

DISPOSITION

Handover time

Handover to
(name, cadre & signature)

Vitals at (time) **HR** **RR**
Temp **BP** **SpO2** **% on**
Plan discussed with patient? ☐ Yes ☐ No

Provider(s) name

Provider(s) signature & date

Form to be used with WHO Reference Card.
See who.int/emergencycare for more information.

PAGE 2

WHO PREHOSPITAL CARD

This card is intended to help prehospital providers to use the WHO prehospital standardized clinical form in their practice. It is presented as a section of the form followed by brief instructions on how to complete that section. Where items are obvious, we have not provided explanatory text.

Whenever possible, use the blue spaces to offer additional information in free text.

WHO PREHOSPITAL FORM

☐ MASS CASUALTY

Caller name		**Date**		**Call Received**	
Caller phone		☐ **Scene call** ☐ **Inter Facility Transfer**		**En route to Scene**	
Patient name		**Run number**		**Arrived at Scene**	
Date of birth/age		**Scene location & type**		**Transporting**	
Sex ☐ Male ☐ Female		☐ Residence ☐ School ☐ Public Building ☐ Health Facility ☐ Street ☐ Other		**At Facility**	
Patient address				**In Service**	
Occupation					

Chief complaint ☐ Injury		Initial VS		**Time**	
		HR	**RR**	**BP**	
		Temp	**RBS**	**SpO2** % on	

Care in progress on arrival	**Pregnant:** ☐ Yes ☐ No ☐ Unknown

MASS CASUALTY: Check box if patient is part of a mass casualty incident
SEX: Biological sex, differs from patient defined gender category.
PATIENT ADDRESS: Be as specific as possible. At a minimum, enter the city and sub-district. Note if homeless.
OCCUPATION: Be as specific as possible (e.g., farm labourer or farm manager instead of farming)
SCENE LOCATION & TYPE: Be as specific as possible, using landmarks if necessary. At a minimum, enter the city and sub-district
CHIEF COMPLAINT: Always in the patient's own words. Tick if injury.
CARE IN PROGRESS ON ARRIVAL: Describe any care that has been or is being provided on your arrival
INITIAL VITAL SIGNS: Always take a complete set of vital signs if possible and list time in 24-hour format
NORMAL VITAL SIGNS – FOR ALL: SpO2 >92% on room air, temp 36˚C - 38˚C
Paediatric: **Adult:** HR 60-100 bpm, RR 10-20, SPB >90

AGE	RESPIRATORY RATE
<2 months	40-60 breaths per minutes
2-11 months	25-50 breaths per minute
1-5 years	20-40 breaths per minute

AGE	PULSE RATE RANGE
0-1	100-160
1-3	90-150
3-6	80-140

*Record O2 saturation and amount/route of O2, eg. 94% on 2L by NC
PREGNANT: always consider pregnancy in women and girls of child bearing age.
PAIN SCORE: Ask the patient to choose the face that best represents the pain they are experiencing. Remember that treating pain does not obscure diagnosis later.

HIGH RISK SIGNS

A/B	☐ Stridor, cyanosis, respiratory distress	**C**	☐ Poor perfusion, weak fast pulse, cap refill >3s, heavy bleeding ☐ Adult: HR <50 or >150 ☐ Child lethargy, sunken eyes, slow skin pinch, poor drinking
D	☐ Unresponsive ☐ Acute convulsions ☐ Hypoglycaemia ☐ Acute focal neurologic deficit ☐ Altered mental status with fever or hypothermia or stiff neck or headache		
Other	☐ High risk trauma ☐ Threatened limb ☐ Snake bite ☐ Poisoning, ingestion, chemical exposure ☐ Violent or aggressive ☐ Temp >39˚C or <36˚C ☐ Acute testicular pain or priapism ☐ Pregnant with high risk findings ☐ Adult severe chest or abdominal pain or ECG with ischaemia ☐ Infant <8 days ☐ Infant <2 months with temp >39˚C or <36˚C		

TRIAGE CATEGORY (circle): **RED YELLOW GREEN.** Triaged for

HIGH RISK SIGNS: Check each appropriate box if patient meets that criterion.
TRIAGE CATEGORY: Record colour designation using standardized triage tool.
TRIAGED FOR: Record main reason for choice of triage category (colour designation).

Form to be used with WHO Reference Card.
See who.int/emergencycare for more information.

PAGE 1

PRIMARY SURVEY

A Airway ☐NML	☐ Voice changes ☐ Stridor ☐ Oral/Airway burns ☐ Angioedema **Obstructed by** ☐ Tongue ☐ Blood ☐ Secretions ☐ Vomit ☐ Foreign body	**Airway:** ☐ Repositioning ☐ Suction ☐ OPA ☐ NPA ☐ LMA ☐ BVM ☐ ETT **C-spine stabilized** ☐Not needed ☐Done
B Breathing ☐NML	**Spontaneous Respiration** ☐ Yes ☐ No **Chest Rise** ☐ Shallow ☐ Retractions ☐ Paradoxical **Trachea** ☐ Midline ☐Deviated to ☐L ☐R **Breath Sounds** ☐ NML	☐ **Oxygen** L/min ☐ NC ☐ Face mask ☐ Non-rebreather mask ☐ BVM ☐ BiPAP/CPAP ☐ Other
C Circulation ☐NML	**Skin** ☐ Warm ☐ Dry ☐ Pale ☐ Cyanotic ☐ Moist ☐ Cool **Capillary refill** ☐ <3 sec ☐ ≥3 sec **Pulses** ☐ Weak ☐ Asymmetric **JVD** ☐ Yes ☐ No ☐ **Active bleeding** site	☐ **Bleeding controlled** Time (bandage, tourniquet, direct pressure) **Access** ☐ IV site size ☐ IO site size ☐ **IVF** ml ☐NS ☐LR ☐ Other ☐ **Pelvis stabilized** ☐ **Femur fracture stabilised**
D Disability ☐NML	**Blood glucose** (as needed): **Responsiveness** ☐ A ☐ V ☐ P ☐ U **GCS** (E V M) **Moves Extremities** ☐ L arm ☐R arm ☐L leg ☐R leg **Pupils** Size L R Reactivity L R	☐ **Glucose checked** ☐ **Glucose given** ☐ **Naloxone given**
E Exposure ☐NML	☐ **Exposed completely**	**ENTER ADDITIONAL EXAM FINDINGS ON REVERSE**

Primary Survey		Interventions for Abnormal Primary Survey	
Airway: Normal (NML) if: •Patent (they can speak normally) •NO signs of obstruction, stridor, angioedema or burns		•Repositioning: Head-tilt/chin-lift or jaw thrust •OPA/NPA (oro-/naso-pharyngeal airway) •LMA (laryngeal mask airway) •BVM (bag valve mask) •ETT (endotracheal tube)	
Breathing: Normal if: •Rate normal •Effort normal, sounds clear	Abnormal - •Decreased breath sounds •Crepitations •Rhonchi •Wheezing	Supplemental Oxygen. Record flow rate L/min •NC (nasal cannula) •BVM (bag valve mask) •NRB (non-rebreather mask) •CPAP/BiPAP (continuous or bi-level positive airway pressure)	
Circulation: Normal if: •Warm & dry •Pulse strong & symmetric (upper & lower extremities)	Abnormal - •JVD (jugular venous distention) •Prolonged capillary refill (>3 sec) •Pale/cyanotic/moist/cool skin	Access (document site and size) •IV (intravenous) •IVF (intravenous Fluids) •IO (intraosseous) •NS (normal saline) •LR (Lactated Ringers)	
Disability: Normal if: •Alert (A) •Oriented to person/place/time •No focal neuro deficit •Blood glucose: > 3.5 mmol/L •Pupils equal and reactive	Abnormal - •Responds only to Verbal (V), Pain (P), or is Unconscious(U) •Motor or sensory deficit •Blood glucose: <3.5mmol/L •Large, pinpoint or unequal. Fixed, slow or nonreactive (NR). Enter size then reactivity.	**GCS Eye Opening** 4 – Spontaneously 3 – To verbal command 2 – To pain 1 – No response **GCS Verbal** 5 – Talking and oriented 4 – Confused 3 – Inappropriate words 2 – Incomprehensible sounds 1 – No response	**GCS Motor** 6 – Obeys commands 5 – Localizes pain 4 – Withdraws to pain 3 – Flexes to pain 2 – Extends to pain 1—No response *Qualified GCS: Check box if patient sedated, intubated or vision obstructed.

S	**Signs/symtoms**	☐ Unknown
A	**Allergies**	☐ Unknown
M	**Medications**	☐ Unknown
P	**Past medical**	☐ Unknown
	Past surgeries	☐ Unknown
L	**Last ate** (hrs)	☐ Unknown
E	**Events (and ROS)**	☐ Unknown

Medication: include prescription medicines, traditional medicines, herbs, supplements. Bring all medications to the facility.
Past Medical History: Note key medical and surgical conditions
Events (and Review of Symptoms):
•Describe the signs and symptoms and their duration
•Note activity at time on onset
•Note if anything makes the symptoms better or worse
•Ask about any history of similar episodes and any prior evaluations interventions
•Note if the patient has taken anything for the symptoms

PRIMARY SURVEY (CONT.)

IF INJURY

☐ **Intentional** ☐ **Unintentional** ☐ **Self-inflicted**
☐ Fall ☐Hit by falling object ☐ Stab/Cut ☐Gunshot ☐Sexual assault
☐ Other blunt force trauma ☐ Suffocation, choking, hanging
☐ Drowning: Life vest: Y / N ☐ Burn caused by
☐ Poisoning/toxic exposure
☐ Unknown ☐Other

Road traffic incident:
☐ Driver
☐ Passenger
☐ Pedestrian
☐ Ejected
☐ Extricated
☐ Car
☐ Bike
☐ Motorbike
☐Other
☐ Airbag
☐ Seatbelt
☐ Other restraint
☐ Helmet

If Injury:
•Check appropriate boxes that describe the mechanism. If burn or poison/toxin, write the cause.
•If road traffic incident: check appropriate boxes for the incident, and use of helmets, seatbelts or airbags. Check box if the patient was ejected from the vehicle or had to be extricated. Document what was hit or crashed with. Where known, document number of persons involved, estimated speed, severity of damage.

PHYSICAL EXAM

☐NML	**General**		☐NML	**Pelvis/GU**	
☐NML	**HEENT**		☐NML	**Neurologic**	
☐NML	**Respiratory**		☐NML	**Psychiatric**	
☐NML	**Cardiac**		☐NML	**MSK**	
☐NML	**Abdominal**		☐NML	**Skin**	

PHYSICAL EXAM: Normal (Do NOT mark normal unless all key elements are normal). If not examined, write "not done."
General: Well developed, well nourished, awake, alert
Head/Eyes/Ears/Nose/Throat (HEENT): Normocephalic, atraumatic. Pupils: equal and reactive, ocular movements intact, conjunctivae normal. This section includes the neck: trachea midline, neck supple, good range of motion (ROM)
Respiratory: Normal effort, no added breath sounds, normal expansion, atraumatic
Cardiac: Normal rate and rhythm, strong pulses, normal sounds
Abdominal: Soft and non-tender, bowel sounds normal
Pelvis/Genitourinary (GU)/Rectal: Pelvis-Stable, no pain to palpation. GU/Rectal-External genitalia normal, no blood at meatus, normal urine colour, atraumatic, normal rectal tone, no rectal bleeding.
Neurologic (Neuro)/Psychiatric: Oriented x3, cranial nerves (CN) intact, no focal weakness or sensory deficits. Calm, normal mood.
Musculoskeletal (MSK): Range of motion normal, no trauma or deformity, normal distal pulses, atraumatic
Skin: Warm, intact, normal capillary refill, atraumatic

ABNORMAL PHYSICAL EXAM FINDINGS (specify right or left when needed to clarify findings)
General: Distressed, malnourished, diaphoretic, uncooperative, sedated, lethargic
Head/Eyes/Ears/Nose/Throat (HEENT): Bleeding from ears, skull fracture, penetrating head/face injury, scalp haematoma, scalp/face laceration, signs of basilar skull fracture (Racoon's/Battle's sign, cerebrospinal fluid leak). Unequal pupils, eye injury. C-spine tenderness, haematoma, superficial neck injury, limited ROM, neck crepitation, penetrating neck injury (through platysma)
Respiratory: Respiratory rate low or high, absent breath sounds, decreased breath sounds, crackles, wheezes, crepitations, paradoxical chest wall movement, sucking chest wound, subcutaneous emphysema/crepitus, penetrating injury, tenderness, superficial injury
Cardiac: Irregular heart rate, bradycardia, tachycardia, asymmetric pulses
Abdominal: Distension, tenderness, rebound, tense, evisceration, mass, penetrating abdominal injury, abnormal bowel sounds
Pelvis/GU/Rectal: Unstable, pain at palpation, superficial injury, penetrating injury, rectal bleeding, flank ecchymoses, superficial injury, penetrating injury
Neuro/Psychiatric: Disoriented, sensory or motor deficit (right / left, arm/leg), abnormal gait or coordination, seizure activity. Suicidal, homicidal, hallucinations, depressed, anxious
MSK: Joint swelling, decreased ROM, extremity deformity, open fracture, spine tenderness, spine deformity, superficial injury, penetrating injury
Skin: Laceration, bruising, rash

ADDITIONAL INTERVENTIONS

Medications given
☐ Bronchodilators
☐ Epinephrine
☐ Aspirin
☐ Seizure medication
☐ Analgesia
☐ IV fluid infusion
☐ Other

Procedures
☐ Wound Bandaging
☐ Burn Dressing
☐ Splinting/reduction
☐ Pelvic stabilization
☐ ECG
☐ Other

ASSESSMENT (include brief summary and differential) **AND PLAN:**

REASSESSMENT at (time)		HR		RR						☐ **Unchanged**
Temp		SpO2		% on		RBS		Pain		
REASSESSMENT at (time)		HR		RR						☐ **Unchanged**
Temp		SpO2		% on		RBS		Pain		
REASSESSMENT at (time)		HR		RR						☐ **Unchanged**
Temp		SpO2		% on		RBS		Pain		

Presumptive Diagnoses

ADDITIONAL INTERVENTIONS
MEDICATIONS: Specify type of medication and time, dose, route. Specify any fluids given - fluid, route, volume. Sign here.
PROCEDURES: Include outcome in the free text area. if you have done ECG, describe findings here. Specify limb splinted and how, location of fracture reduced and method, location of any wounds or burns dressed and how this was performed.
ASSESSMENT & PLAN: include summary & differential diagnosis, and the plan
REASSESSMENT: Time, vitals and clinical condition for at least two different assessments during transport. Indicate the changes in the right column. Tick unchanged if no changes.
PRESUMPTIVE DIAGNOSES: List all working diagnoses or impressions, and injuries found

DISPOSITION

DISPOSITION

Handover time

Handover to
(name, cadre & signature)

Vitals at (time) **HR** **RR**
Temp **BP** **SpO2** **% on**
Plan discussed with patient? ☐ Yes ☐ No

Provider(s) name

Provider(s) signature & date

DISPOSITION: Write name of destination facility (including clinical area e.g. emergency unit, ward) and time of handover to facility based staff
Handover to: Write name, cadre of provider receiving handover and obtain signature
Vitals at Disposition: Enter final set of vital signs taken before handover and time taken
Providers(s): List names of all prehospital providers involved in care with signatures and date.

2.6.6 Equipment and medication for basic and advanced ambulances

EQUIPMENT FOR **ALL** AMBULANCES
3 pages

Resuscitation: general
High acuity grab bag
Delivery set
Cord clamp
Birth kit
Neonatal resuscitation kit
Warming blanket
Paediatric length-based tape (e.g. Broselow or PAWPER tape)
Resuscitation: airway
Oral airways (#00 - 6)
Nasal airways (12 - 36F)
Oxygen supply (cylinder with regulator, or other source; with flow meter)
Nasal cannula (adult, paediatric and neonatal sizes)
Oxygen mask (adult, paediatric and neonatal sizes)
Magill forceps, including paediatric sizes
Suction device: manual (bulb) or foot pump
Suction device: manual (bulb) - infant
Suction catheters
Suction collection vessel
Suction device: powered (electric or pneumatic)
Resuscitation: breathing
Bag–valve–mask (adult, paediatric and neonatal sizes)
PEEP valve for bag-valve-masks
Nebulizer
Nebulization masks (paediatric and adult sizes)
Nebulizer tubing and connectors
Metered-dose inhaler spacer
Resuscitation: circulation
Arterial tourniquet
Intravenous infusion set (lines, connectors)
Intravenous cannulas size 14 - 24
Tourniquets for IV start
IV poles or hooks
Syringe (2, 5, 10, 20, 50cc)
Needles (range of gauges and lengths; safety, single use)
Insulin needles and syringes (safety, single use)
Automated external defibrillator (AED)
Bedside diagnostics
Clock, timer or watch with second hand
Stethoscope
Digital thermometer (32 - 43 Celsius)
Penlight
Pulse oximetry
Sphygmomanometer
Blood pressure (BP) cuff (small - large adult; paediatric sizes)
Tongue depressors

Point of care testing
Quality controls for blood glucose meter
Blood glucose meter
Blood glucose meter test strips
Finger-stick lancets
Splinting, immobilisation & patient movement
Sheet or binder for pelvic fractures
Splint material (i.e. stocking, gauze padding, premade splint)
Elastic bandages
Cervical collars, adult small - large
Cervical collars, paediatric sizes
Physical restraints
Stretchers and gurneys (wheeled stretchers)
Vacuum mattress
Carrying sheet
Portable stretcher
Stair chair or carry chair
Scoop stretcher
Long backboard / spine board complete with head immobiliser (blocks) and securing straps
Extrication device
Wounds & dressings
Chlorhexidine 5% solution
Povidone iodine 10% solution
Adhesive tape
Cotton wool
Non-sterile dressings
Vaseline or paraffin gauze
Sterile dressings
Burn dressings
Eye pads
Minor procedures
Non-sterile pad with impermeable barrier
Lubricating jelly
Tampons
Bowls (kidney, emesis)
Procedure (kick) bucket
PPE/IPC
Soap
Hand disinfectant
Ethanol 70% solution
Environmental disinfectant
Cleaning equipment (e.g. sponges, buckets, mops, brooms)
Cleaning protective equipment (e.g. thick gloves, boots)
Hair covers
Goggles
Mask with face shield
Surgical mask N-95 respirators
Sterile gloves (range of sizes)

Impermeable aprons
Non-sterile gowns (multiple sizes)
Waste bags
Biohazard and contaminated supply bags
Safe biological waste disposal containers
Safe final disposal of biological waste
Sharps disposal (single use cardboard box/locked plastic box; puncture proof)
Safe final disposal of sharps
Decontamination pack
Chlorine releasing agents (0.5-1% available chlorine)
Miscellaneous
Oral medication administration supplies (e.g. cups, dropper)
Medication and medication dispensing storage and organization system
Sanitary pads
Urinals
Bed pans
Linen (e.g. sheets, pillowcases, towels, patient gowns)
Pillows
Blankets
Ambulance operations
Trauma shears
Helmets, heavy gloves, heavy eye protection
Reflective wear for crew
Mass casualty incident kit
Fire response kit
Seat belt cutter
Fire extinguisher
Flashlights or headlamps + spare batteries
Traffic signalling device (reflective triangles)
Outdoor lighting
Jumper cables
Maps of local area
Two-way communication device
Internal communication between driver and patient compartment
Triage protocols (posters and cards)
Triage tags
Standardised clinical chart (e.g. paediatric, medical, trauma, obstetric)
Condition specific protocols (posters or cards/book)
Printed book of disaster protocols (multiple copies for administrative and clinical areas)
Pre-printed disaster intake forms
Important telephone number/radio frequency list
Shortwave radio or dedicated telephone line
Death kit (any necessary documentation, tags, or labels for transporting dead patient to morgue)
Body bags

ADDITIONAL EQUIPMENT FOR **ADVANCED** AMBULANCES

ADVANCED ambulances should have ALL preceding equipment AND all items listed on this page

1 page

(to be read in conjunction with *Equipment for all ambulances*)

Resuscitation: airway
Nasogastric (NG) tube (5 - 18F)
Syringe (60cc catheter tip)
Dual-tube laryngeal mask airway (LMA) (#2 - 7)
Bougie endotracheal tube introducer
Laryngoscope set (range of blades and sizes)
Endotracheal tubes (#2.5 - 8.5)
Paediatric sizes for laryngoscope
Surgical cricothyroidotomy set
Tracheostomy tubes (4 - 10mL inner diameter)
Oesophageal detector device (e.g. CO2 colorimeter)
Resuscitation: breathing
Chest tube insertion set
Chest tubes (10 - 36F)
Underwater seal system (or equivalent)
Heimlich valve and catch bag
Continuous or bi-level positive airway pressure machine (CPAP, BiPAP)
CPAP, BiPAP neonatal mask
CPAP, BiPAP child mask
Mechanical Ventilator
Circuit/tubing for mechanical ventilation
Resuscitation: circulation
Pressure bag for IV infusion
Blood administration set
Intraosseous needle driver (electric or manual)
Intraosseous needle or equivalent (15, 25 and 45mm)
Defibrillator with pacing and synchronized cardioversion capabilities
Defibrillator pads
Bedside diagnostics
ECG machine
ECG paper, leads and suction attachments/stickers
Razor
Electronic cardiac monitor
Electronic cardiac monitoring leads with suction attachments
Splinting, immobilisation & patient movement
Extrication device
Wounds & dressings
Minor surgical set
Scalpel
Sutures (absorbable and non-absorbable; sizes 2-0 - 6-0)
Forceps (artery, dressing)
Minor procedures
Urinary catheter (5 - 22F)
Urinary straight catheter

MEDICATIONS FOR **ALL** AMBULANCES

1 page

WHO EML Section	Medication
2. Medicines for pain and palliative care	Non-opioid analgesic (e.g. Paracetamol PO, Ibuprofen PO/IM)
	Antiemetic PO
3. Antiallergics and medicines used in anaphylaxis	Epinephrine IM
4. Antidotes and other substances used in poisonings	Activated charcoal
5. Medicines for diseases of the nervous system	Diazepam PR
	Magnesium sulfate IM
12. Cardiovascular medicines	Aspirin PO
22. Medicines for reproductive health and perinatal care	Oxytocin IM; if no cold storage, Carbetocin IM or Misoprostol PO
25. Medicines acting on the respiratory tract	Inhaled bronchodilator
26. Solutions correcting water, electrolyte and acid–base disturbances	Oral rehydration solution
	IV Solution for flush
	Oral (buccal) Glucose
Additional medications	Topical agents for burn dressing

IM – Intramuscular **IV** – Intravascular **PO** – per os (oral)
PR – per rectum **SL** – Sublingual

ADDITIONAL MEDICATIONS FOR **ADVANCED** AMBULANCES

ADVANCED ambulances should have ALL medication for all ambulances AND all items listed below

1 page (to be read in conjunction with *Medications for all ambulances*)

WHO EML Section	Medication
1. Anaesthetics, preoperative medicines and medical gases	General Anaesthetics (e.g. Midazolam, Ketamine, Etomidate) IV
	Local Anaesthetics e.g. Lidocaine
2. Medicines for pain and palliative care	Opioid analgesia (e.g. Morphine) IV
	Antiemetic (e.g. Ondansetron, Metoclopramide) IM/IV
3. Antiallergics and medicines used in anaphylaxis	Hydrocortisone IM/IV
4. Antidotes and other substances used in poisonings	Atropine IV
	Naloxone IM/IV
	Flumazenil IV
5. Medicines for diseases of the nervous system	Antiepileptic Diazepam, Midazolam IM/IV
	Anxiolytic Diazepam, Lorazepam IM/IV
6. Anti-infective medicines	First dose of antibiotic for systems with long transport times IM/IV
	First dose of antimalarial
12. Cardiovascular medicines	Glyceryl trinitrate SL
	Isosorbide dinitrate PO
	Adenosine IV
	Amiodarone IV
	Vasopressor e.g. Dopamine IV
16. Diuretics	Diuretics e.g. Furosemide IV
20. Muscle relaxants and cholinesterase inhibitors	Suxamethonium chloride IV
22. Medicines for reproductive health and perinatal care	Tranexamic acid IV
	Ergometrine IM/IV
25. Medicines acting on the respiratory tract	Nebulized bronchodilator
26. Solutions correcting water, electrolyte and acid–base disturbances	IV Fluids e.g. normal saline, Ringer's lactate
	IV Fluids containing Dextrose
Additional medications	Antihistamine e.g. Diphenhydramine PO

IM – Intramuscular **IV** – Intravascular **PO** – per os (oral)
PR – per rectum **SL** – Sublingual

2.6.7 Ambulance shift handover

Date and shift	Off going		Incoming
Ambulance number	YES ☐ NO ☐	**Medications handed over**	YES ☐ NO ☐
Radios handed over	YES ☐ NO ☐	**Keys handed over**	YES ☐ NO ☐
Batteries changed (radios, monitors)	YES ☐ NO ☐	**Ambulance inspection form completed** *(if in use in service)*	YES ☐ NO ☐
Ambulance fuel level checked	YES ☐ NO ☐	**All paperwork completed**	YES ☐ NO ☐
Ambulance issues & action taken			
Equipment issues & action taken			
Unusual events requiring supervisor follow up			
Crew names and signatures	Off going		Incoming

2.6.8 Ambulance cleaning and decontamination

It is the responsibility of all personnel to ensure that the vehicles they use are hygienically clean at all times.

THE MINIMUM STANDARDS FOR CLEANING ARE:

- Cleaning must be carried out by well-trained staff with dedicated equipment.
- Training of staff must be provided by the ambulance service in collaboration with local IPC teams and public health authorities.

- Vehicles must have smooth non-porous surfaces and removable rubber mats to enable adequate cleaning and disinfection procedures.
- Beds and seats used for patient transport, handles, and any items touched during transfer are to be wiped using a microfibre or cotton cloth or disposable paper towel with clean water and neutral detergent using physical friction to remove organic remnants.
- All work areas should be cleaned with soap and water and disinfected with an appropriate hospital-grade disinfectant solution at least once a day, depending on the workload.
- Floors are cleaned daily using clean water and a neutral detergent; surfaces must be dry before vehicle returns to service.

- The sequence of cleaning starts at the cleanest areas and works towards the contaminated areas, ideally proceeding from highest surfaces to lowest surfaces in a systematic manner. If separate cleaning teams are involved, the cleaning areas/tasks are the responsibility of the individual teams assigned to these areas.
- Provision should be made for storage of cleaning equipment, such as cloths, mops, and buckets, where equipment will be washed, cleaned, and dried (cleaned cloths, mops and buckets are stored inverted) or packed in a leak-proof bag to send to the laundry.

- Non-sharps disposable items, including paper towels, single-use PPE, packaging, and other single-use materials must be collected in leak-proof bin liners (garbage bags) and disposed of using locally applicable waste management strategies for domestic and infectious waste.
- Sharps should always be disposed of in designated sharps containers as infectious waste.

PROCEDURE

1. Cleaning after each patient transport

- Carefully dispose of sharps into a designated container.
- Place potentially infectious health care waste in a clearly marked biohazard waste bag.
- Clean and disinfect all equipment used during the patient encounter following local protocols. A hospital-grade disinfectant solution (e.g. chlorine, hydrogen peroxide, quaternary ammonium) must be applied to surfaces for disinfection (as locally available)
- Use leak-proof bin liners (garbage bags) to collect all single-use items after use.
- If reusable equipment was used for an invasive procedure (e.g. respiratory equipment), send to a hospital medical device reprocessing department for high-level disinfection or sterilization when indicated by manufacturer directions.
- Restock the vehicle.

PROCEDURE (cont.)

2. Routine scheduled cleaning (daily)

Patient Compartment

- Remove all equipment and sweep out the compartments; clean with soap and water applied by cloth followed by disinfection using a second (clean) cloth.
- Remove stretchers; clean and disinfect all components including mattress and belts.
- Remove and clean and disinfect wall suction.
- Remove the contents of cabinets and shelves; clean and disinfect all surfaces.
- Clean (wipe with small amount of soap and water) and dry all packaged items before returning to the cabinet or shelf; inspect for damage, expiration dates or repair/replace as needed.
- Sweep, vacuum, clean, and disinfect floor.
- Clean and disinfect all interior surfaces, including ceiling and walls.
- Clean and disinfect all chairs, bench seats, and seat belts.
- Empty and clean all waste containers with soap and water.
- Clean interior windows with soap and water, or window cleaner.
- Check functioning of compartment ventilation/heating/cooling devices.
- Clean air filters on compartment ventilation devices according to manufacturer directions.

Driver's compartment

- Remove all equipment from the front of the vehicle.
- Clean and vacuum floor.
- Clean and disinfect all interior surfaces, including walls, doors, radio equipment, windows, and dashboard.

---

3. High risk contamination

Safety precautions and procedures are to be followed with high-risk contamination. The emergency communication and dispatch centre or Medical Control Officer informed immediately. The ambulance concerned must be sealed for a minimum of 24 hours before any decontamination of the vehicle takes place.

Personnel carrying out decontamination must follow the following protection procedures:

- Put on appropriate PPE:
  - Medical mask (disposable)
  - Eye protection (goggles)
  - Medical gloves (disposable)
  - Fluid-resistant gown (disposable) of good length and long sleeves tucked underneath cuffs of rubber gloves.
  - Rubber boots
- Allow any spillages on surfaces to soak into paper towels before physical removal, and place in a sealed bag, mark as bio-hazardous and send for incineration. Proceed with cleaning and disinfection after removing spills.
- Collect disposable equipment and place in a sealed bag, mark as bio-hazardous and send for incineration.
- Sharp objects must be placed in the sharp container to prevent sharps injuries and penetration of the bag.
- All surfaces must be cleaned, by wiping with a hospital-grade disinfectant solution and allowing it to dry.
- Collect contaminated clothing, blankets etc., place in a sealed bag, mark as bio-hazardous, and hand to a supervisor for autoclaving.
- Place all other equipment place in a sealed bag, mark as bio-hazardous and hand to a supervisor for cleaning and sterilisation

Source: https://www.who.int/publications/i/item/9789240051065
https://www.cdc.gov/healthcare-associated-infections/media/pdfs/environmental-cleaning-rls-508.pdf

General instructions for surface cleaning and disinfecting in patient care areas

World Health Organization

Step 1.

Gather supplies

- Clean set of personal protective equipment (PPE) for each area cleaned.

- At least 2 clean cloths for each area for cleaning (e.g. a single patient space).
  - More cloths may be needed if space is heavily contaminated.

- Bucket containing detergent (soapy water).
- Bucket containing disinfectant solution.
- Bucket containing clean water (optional).

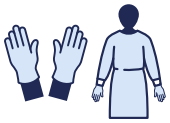
- Waste bin or bag.

Step 2.

- Perform hand hygiene.

Step 3.

- For general cleaning, wear a gown (or apron) and gloves.



Step 4.

- Clean surfaces using a cloth soaked in soapy water.

- After cleaning, dispose of the cloth appropriately as waste or laundry.

Step 5.

- Disinfect high-touch surfaces (or all surfaces if isolation area) using a cloth soaked in disinfectant.

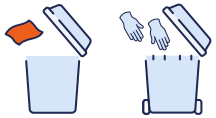
- Allow surfaces to remain untouched and unused until after the contact time specified by the disinfectant manufacturer.

Step 6. (optional)

- As an optional step, remove disinfectant residue from surface using a cloth soaked in clean water.

Step 7.

- After cleaning each individual patient space or area, dispose of used cloths and PPE as waste or laundry in appropriate waste bin or laundry container.



Step 8.

- Perform hand hygiene.

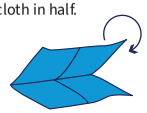
How to fold and use a cloth for cleaning and disinfection

Step 1.

Use two clean cloths at minimum (one for cleaning, one for disinfection) for each patient space.

Step 2.

Fold cloth in half.

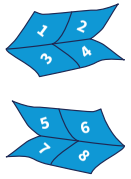


Step 3.

Then fold the cloth in half again.

Step 4.

You now have eight different surfaces on the cloth (4 surfaces on front, 4 surfaces on back).

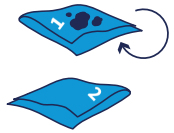


Step 5.

Soak the cloth in each bucket only once. Do not dip the cloth in the bucket a second time as this will contaminate the solution.

Step 6.

Switch to a different cloth surface when soiled or when cleaning a different object or furnishing in the patient space to avoid spreading contamination.



Step 7.

When all sides have been used, dispose of the cloth appropriately as waste (if single-use) or place in laundry container and use a new cloth to continue the task. Always use clean cloths when moving to a different patient's space.

2.6.9 Declaration of death and management of dead bodies

DEFINITIONS OF TERMS AND CONCEPTS

- **Declaration**: The statement by a trained, qualified, and registered healthcare provider (prehospital provider or physician) that a person is dead.
- **Death notification form**: Legal document through which local authorities are notified of the death and cause of death for national mortality statistics. May also be referred to as a "Death Certificate".
- **Certification**: The determination by a physician, who is licensed and registered by the local regulatory authority, of the cause of death of a patient as determined by local regulations.
- **Natural death***: Fatalities resulting from illnesses, diseases, or old age. These deaths are generally caused by internal conditions of the body that are not within voluntary control and are not deliberate or intentional. There is no significant contribution from external factors, and blameworthiness on the part of any person cannot be readily inferred. Examples of natural causes of death include coronary artery disease and cancer.
- **Unnatural death***: Any death that is not natural in origin. These deaths include suicide, homicide, falls, drowning and anaesthetic deaths. Typically, the cause of unnatural death may only be notified by a pathologist/forensic practitioner after a medico-legal autopsy and in accordance with local regulations.

*Different jurisdictions may categorize and report unnatural deaths in different ways.

WHO CAN DECLARE DEATH

- Physicians or prehospital providers (within scope authorised by local regulations).
- Any person who is legally and professionally authorized to administer a Death notification form (within scope authorised by local regulations).
- The local ECS regulatory authority determines death protocols for ambulance services, but the clinical decision and responsibility for the declaration of death lies with the healthcare provider.
- Declaration of death is a clinical statement and must not be confused with the issuing of a formal death notification form. A final death notification form (*death certificate*), which certifies the cause of death, is issued by local authorities.

Advice should be sought whenever needed, especially when deviations from protocols may be necessary.

CLINICAL CRITERIA FOR DEATH

In some cases, prehospital practitioners will use a facility-based protocol for declaration of death. In other jurisdictions, the regulatory authority may have introduced its own clinical criteria involving examination or diagnostics.

MANAGEMENT OF THE DECEASED

Handling of deceased patients/persons from incident scenes

Dead individuals should be removed from incident scenes, out of public view, within the shortest possible time frame.

- **Natural deaths at home**

For natural deaths at home, in many settings private undertakers handle removal and the family medical practitioner completes necessary documentation. The attending prehospital provider's role in such circumstances would be to take a history to determine any causal relationship between the death and prior incidents or injuries.

- **Crime scenes**

At crime scenes, death declaration should occur promptly, with forensic pathology services removing the body. Local authorities (e.g. police) should allow controlled access for healthcare professionals to declare death.

- **Unnatural deaths**

Patients that die of unnatural causes and are declared dead at the scenes of incidents, hospitals or police stations should be removed by the forensic pathology services or to a state mortuary (in accordance with local regulations).

- **Death during transit**

Patients who die in transit in ambulances may be declared dead according to local regulations and standing operating procedures and delivered to the state mortuary, hospital mortuary, or private mortuary as appropriate. In many settings this does not apply and the patient is transported to the closest emergency unit.

Documentation

Prehospital providers should typically complete a declaration of death form in duplicate when declaring death, with copies for the mortuary and the attending provider's records.

Suspicion of unnatural death

If the prehospital provider suspects that death is due to unnatural causes, they should report the incident to a supervisor who must report to the appropriate local authorities (e.g. police services).

2.6.10 Form for refusal of transport or treatment

PATIENT REFUSAL OF TRANSPORT OR TREATMENT		
I, the undersigned, have been advised that medical assistance on my behalf is necessary, and that refusal of assistance and transport may result in my death, or imperil my health. Nevertheless, I refuse to accept assistance and/or transport and assume all risks and consequences of my decision. I thereby release the provider of the ambulance service from any liability arising from my refusal.		
Patient name:	**Patient signature:**	**Date:**
Witness name:	**Witness signature:**	**Date:**
Prehospital provider name:	**Prehospital provider signature:**	**Date:**
Ambulance service name:		
Risks of refusal discussed with patient:	**Circumstances/reasons stated by patient for refusing care or transport:**	
Benefits of care or transport discussed with patient:		
Alternatives to transport discussed with patient:		

2.6.11 Regional health facility capabilities

THIS SHOULD BE LOCALLY DEVELOPED, CONSIDERING THE TEXT BELOW

The intent of this is to facilitate destination triage decision making – ensuring that the patient is taken to the closest, most appropriate facility at the earliest stage. It should contain relevant information about health facilities in the geographic vicinity, at a minimum:

- Location
- Contact details
- Emergency unit contact details
- In-patient service availability (e.g. trauma surgery, stroke unit, intensive care unit)

2.6.12 Condition-specific destination guidelines

THIS SHOULD BE LOCALLY DEVELOPED, CONSIDERING THE TEXT BELOW

Patients should be transported to the ***closest, most appropriate*** facility given their condition and needs. For most situations, this will be the closest facility capable of providing initial assessment and treatment of emergency conditions.

However, there are certain cases in which patients should go to specific facilities that might be further away rather than the closest facility, which is condition-specific triage. Condition-specific triage will be dependent on regional resources and context.

In a system where these resources exist, the following should occur:

1.Facilities with specific capabilities should be identified and accredited by the ECS regulatory authority. This database should be readily available to support clinical decision making.

2.Criteria should be created to decide when the closest hospital should be bypassed for a destination with relevant capabilities with the following considerations:

- Clinical condition
- Family or physician preference
- Receiving facility ambulance diversion status

Note that patients whose condition either worsens or is so unstable that they will likely not survive to a more appropriate hospital further away should be taken to the closest hospital for intervention prior to transfer to the intended facility.

Consider the need for provider medical control contact.

3.Conditions should be identified based on regional resources. Examples include:

- Trauma
- Burn
- Obstetrics
- Paediatrics
- Suspected stroke
- Suspected myocardial infarction

4.For each condition identified for condition-specific triage, clear requirements should be developed that include:

- Facility requirements
  - Staff requirements
  - Resource requirements
- Field triage guidelines
  - Scoped to level of prehospital provider.
  - Patient condition criteria
  - Distance and location criteria
- A matrix of regional facilities be agreed upon and distributed to providers and facilities.
  - Designation of facilities should be approved by the ECS regulatory authority.
- Quality assurance and feedback

2.6.13 Mass casualty destination plan

1. A "patient transport area" should be established on scene in accordance with the MCI plan. Patients should be staged for transport here, and the transport officer will be stationed here.

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2. The transport officer coordinates all transportation of patients to facilities. Specifically, the transport office

a. Determines facility availability.
b. Determines need for non-facility destinations as needed to support surge.
c. Maintains direct communication with all destinations to update availability in real time.
d. Determines need for vehicles and level of prehospital care transport.
e. Determines need for other transport vehicles (e.g. buses)
f. Matches patients needing transportation with vehicles and destinations.
g. Tracks all patient movement, recording the patient, vehicle, and destination.
h. Maintains direct communication with the Incident Commander.

---

3. Facilities will surge their patient care operations through their pre-planned surge protocols to accommodate M patients. This may be by setting up alternate care areas through the re-purposing of current patient care sites or by setting up disaster tents on the hospital property.

---

4. Patients will be distributed to facilities in a managed process to even the distribution across facilities to avo overburdening any facility.

a. Facilities should have a pre-defined capacity for initial patients in a surge situation.
b. This process should take into account regional condition-specific triage guidelines.
c. Destinations should be determined with consideration to the self-triage of the affected population to the facilities nearest the incident.

---

5. Mutual aid policies with surrounding regions should be established to allow for transportation to facilities in surrounding regions in a surge situation.

---

6. A final document should be produced within 24 hours of the incident's conclusion that reports all patient transport their destination, and transport mechanisms.

This document should be used to inform preparation for future events.

---

7. All MCI destination plans should be made in coordination with regional and national agencie

2.6.14 Medical control record

MEDICAL CONTROL FIELD CONTACT RECORD				
Date:		**Medical control facility:**		
Time:		**Medical Control Officer name:**		
Field unit:		**Prehospital provider name:**		
Reason for call:	Medication request	Care refusal	Destination request	Death pronouncement
	Other:			
Details:				
Vital signs:	HR:	BP:	RR:	SpO2:
Outcome:				
Comments:				
Quality review:				
Medical Control Officer signature				

2.6.15 Standard precautions

1. HAND HYGIENE

- **Hand washing** (40–60 sec): wet hands and apply soap; rub all surfaces; rinse hands and dry thoroughly with a single-use towel; use towel to turn off faucet.
- **Hand rubbing** (20–30 sec): apply enough hand sanitizer product to cover all areas of the hands; rub hands until dry.

Summary indications:

Follow WHO's 5 moments for hand hygiene:

- **Moment 1:** Before touching a patient
- **Moment 2:** Before a procedure
- **Moment 3:** After a procedure or exposure to body fluids
- **Moment 4:** After touching a patient
- **Moment 5:** After touching a patient's surroundings

https://www.who.int/docs/default-source/patient-safety/how-to-handwash-poster.pdf
https://www.who.int/docs/default-source/patient-safety/how-to-handrub-poster.pdf

2. GLOVES

- Wear when touching blood, body fluids, secretions, excretions, mucous membranes, non-intact skin.
- Change between tasks and procedures on the same patient after contact with potentially infectious material.
- Remove after use, before touching non-contaminated items and surfaces, and before going to another patient. Perform hand hygiene immediately after removal.

3. FACIAL PROTECTION (EYES, NOSE, AND MOUTH)

- Wear (1) a surgical or procedure mask and eye protection (eye visor, goggles) or (2) a face shield to protect mucous membranes of the eyes, nose, and mouth during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.
- In case of suspected respiratory or other highly transmissible infections, you may need to upgrade to transmission-based precautions.

4. MOISTURE-RESISTANT GOWN

- Wear to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
- Remove soiled gown as soon as possible and perform hand hygiene.

5. PREVENTION OF NEEDLESTICK AND INJURIES FROM OTHER SHARP INSTRUMENTS

Use care when:

- Handling needles, scalpels, and other sharp instruments or devices.
- Cleaning used instruments.
- Disposing of used needles and other sharp instruments (e.g. IV catheters, disposable scalpels, lancets) in the sharps container. These should never be pushed or forced into the container and must not go beyond the indicated line as needlestick injuries may result.

6. RESPIRATORY HYGIENE AND COUGH ETIQUETTE
Persons with respiratory symptoms should apply source control measures: • Cover their nose and mouth when coughing/sneezing with tissue or mask (or a sleeve or flexed elbow), dispose of used tissues and masks, and perform hand hygiene after contact with respiratory secretions.
7. ENVIRONMENTAL CLEANING
• Use adequate procedures for the routine cleaning and disinfection of environmental and other frequently touched surfaces.
8. LINENS
Handle, transport, and process used linen in a manner which: • Prevents skin and mucous membrane exposures and contamination of clothing. • Avoids transfer of pathogens to other patients and or the environment. • Always keep clean and used linens in separate compartments
9. WASTE DISPOSAL
• Ensure safe waste management. • Treat waste contaminated with blood, body fluids, secretions, and excretions as clinical waste, in accordance with local regulations. • Any material directly associated with specimen or bodily fluid processing should be treated as clinical waste. • Discard single-use items properly.
10. PATIENT CARE EQUIPMENT
• Handle equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of pathogens to other patients or the environment.
11. OTHER CONSIDERATIONS
• Limit the number of accompanying personnel involved in direct care of the patient. • Limit the amount of equipment and consumables in the care cabin to what is required for a single transfer to avoid contamination and reduce potential damage of materials due to decontamination procedures. • Do not take family members alongside the patient unless a parent is accompanying a sick child. • Provide and instruct the parent on the use of PPE and hand hygiene. • Optimize ventilation in vehicles during transport. Natural ventilation is preferred to reduce risk of transmission of infectious particles.

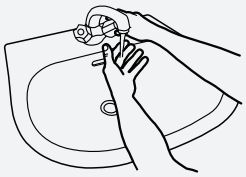
Source: https://www.who.int/publications/m/item/standard-precautions-in-health-care

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

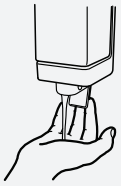
Duration of the entire procedure: 40-60 seconds

0



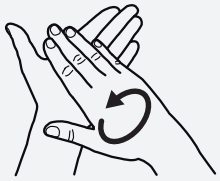
Wet hands with water;

1



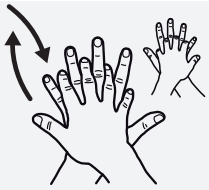
Apply enough soap to cover all hand surfaces;

2



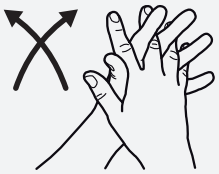
Rub hands palm to palm;

3



Right palm over left dorsum with interlaced fingers and vice versa;

4

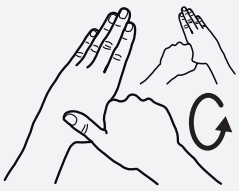


Palm to palm with fingers interlaced;

5

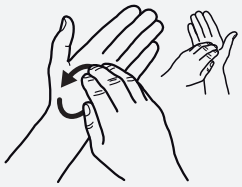
Backs of fingers to opposing palms with fingers interlocked;

6



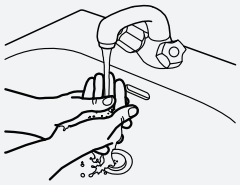
Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8

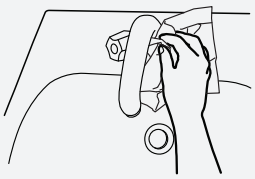


Rinse hands with water;

9

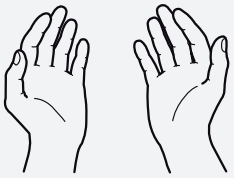
Dry hands thoroughly with a single use towel;

10



Use towel to turn off faucet;

11



Your hands are now safe.

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | **SAVE LIVES** Clean **Your** Hands

How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

Duration of the entire procedure: 20-30 seconds

1a

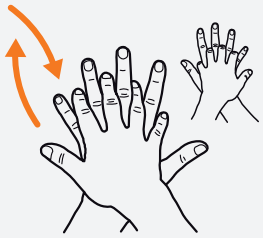
1b

Apply a palmful of the product in a cupped hand, covering all surfaces;

2

Rub hands palm to palm;

3



Right palm over left dorsum with interlaced fingers and vice versa;

4

Palm to palm with fingers interlaced;

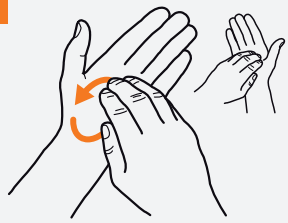
5

Backs of fingers to opposing palms with fingers interlocked;

6

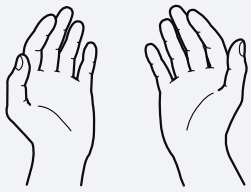
Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



Once dry, your hands are safe.

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES Clean Your Hands

2.6.16 Scene safety

Determining and maintaining scene safety is the highest priority for prehospital providers.

Scene safety is dynamic and must be constantly re-evaluated. If a previously safe scene becomes unsafe, providers should adapt their response as needed to maintain safety for all.

If a provider becomes ill or injured, not only can they no longer help the original patient(s), but they may require assistance themselves. Safety priority is prioritized in three tiers; each should be considered and addressed:
1. Safety of yourself **2. Safety of the sce** **3. Safety of the patie**

Safety considerations for each stage of prehospital response are detailed below

CALL-TAKING AND DISPATCH	
• Personal and health data security • Communications security • Co-dispatching appropriate services when needed e.g. police services	
INITIAL RESPONSE	
• Vehicle safety standards, including certification and preventative maintenance • Road traffic safety standards, including speed limit guidelines	• Emergency vehicle operation training, including use of emergency lights and sirens • Personal safety, including seatbelt use and mobile device use
SCENE	
• Safe parking that provides for safe patient compartment accessibility; in a dangerous area, parking by reversing into a space can allow a more rapid exit • Protocols for roadway responses: parking angle (e.g. fend off position), safety vest use, and flare/triangle use • Scene size up from the vehicle prior to entry • Review of any known information about prior dispatches to the address • Awaiting police arrival for high-risk call types with possible severe or ongoing violence, e.g. gunshots or stabbings • Awaiting fire department arrival prior to approaching a structure on fire or with a possible toxic exposure	• Awaiting public utility arrival when concerned for electrical hazards, e.g. downed power lines or electrified railways • Donning and doffing appropriate PPE • Identifying animals and taking appropriate precautions • Ensuring adequate light in dark environments, and avoid looking at bright sources (e.g. smartphone screens) • Practicing safe lifting techniques to avoid injury to providers or patient • Maintaining a clear exit pathway and strategy at all times • Management of bystanders in public or crowded scenes • Securing vehicle to prevent theft or vehicle or equipment while at scene • Specific protocols should be developed for special contexts such as wilderness, high-angle, water, confined space, etc. Safe response to these contexts will typically require additional training
DURING TRANSPORT	
• Proper use of safety restraints for all passengers, including patients • Safe stretcher locking device to prevent movement • Securing all equipment prior to vehicle movement	• Use of sharps containers and safe biohazard waste disposal • If interventions are required that require the provider to remove their seatbelt, ambulance should pull over and stop • Ongoing use of safe driving practices
AT FACILITY	
• Safe lifting and patient movement practices	• Safe parking of vehicles and avoidance of engine idling
FOLLOWING CALL	
• Decontamination to level required based on call • Safe disposal or all sharps and biohazard waste • Restocking of all equipment used	• Correction of any other safety issues identified during previous call • Debriefing as required with partner or agency, including mental health support as appropriate

2.6.17 Elements to be considered in developing a prehospital mass casualty incident plan

SITUATION ANALYSIS
• The role and place of the prehospital system in the healthcare system and the community. • The hazards and risks that can be reasonably expected.
ROLES AND RESPONSIBILITIES
• The overall command structure: functions, roles, responsibilities, composition, place. • Standard Operating Procedures (SOPs) and Supplemental Emergency Response Plans (SERPS – i.e., developed by the various components of the system for organizing their own activities). • Job descriptions for key personnel (also known as *job action sheets*).
TRIGGERING THE PLAN
• The alarm and its processing • The activation of the plan and its tiers • Mobilizing personnel (e.g., "call back" procedures for staff who are not at work when the incident occurs)
OPERATIONAL AREAS

• Scene safety assessment: determining the positioning of scene resources, need for decontamination capability, need for additional resources such as public safety /police /environmental hazard control resources.
• Forward control post
• Inner cordon
• Outer cordon
• Main treatment areas
  ◦ First aid post
  ◦ Casualty clearing station
• Transportation related
  ◦ Central holding area
  ◦ Patient transport area
  ◦ Access route
  ◦ Egress route
• Communications
• Hospitals
  ◦ Receiving area designation developed with local hospitals
• Family and media centres
• Management of fatalities on scene

SUPPORT FOR OPERATIONAL AREAS
• Security • Essential supplies • Maintenance of critical equipment • Ancillary services • Continuity of operations • Psychosocial support (for patients, families, staff)
COORDINATING WITH OTHER PUBLIC SERVICES AND HEALTH FACILITIES

• Coordination mechanisms with other public services (Memoranda of Understanding; Standard Operating Procedures).
  ◦ Police, fire, utilities
  ◦ Health care facilities
• Medical charts and special forms used in emergency situations when the plan is activated; this includes patient tracking.
• Communication systems and sharing of information procedures.

COMMUNITY RELATIONS
• Relationship with the community (including the key services such as fire and police).
PREPAREDNESS
• Training of staff • Exercises • Validation of the plan • Revision and updating of the plan • Special sub plans for fire, terrorist attack, chemical, and epidemic incidents.

2.6.18 Definitions for special event medical resources

Resource	Definition
Emergency care access number	Event staff and/or safety personnel have the capability to notify any medical emergency and to provide access per prehospital service provider organization standards.
Aid station with basic prehospital provider	A fixed or mobile facility with the ability to provide basic care staffed by at least one basic prehospital providers or higher skill level personnel. Basic care is defined as treatment of minor medical conditions and injuries by care providers who have received training in first aid, at the basic level. Examples of first aid care are cleaning, bandaging, and treating simple wounds such as scrapes and shallow cuts, providing cold packs for musculoskeletal strains and bruises, and giving drinking water and a place to rest for patients who are mildly dehydrated. Each fixed aid station should have an AED (if locally available) and MCI treatment kit present at all times. Examples of an aid station are a tent, a clinic, an ambulance, or vehicle of some type. The aid station must have emergency care access number communications capability. Basic prehospital providers who are employees of locally permitted ambulance services are recommended due to their familiarity with local policy, procedure, and protocol. It is also recommended that any event employing multiple aid stations also have a designated emergency event director and establish a liaison with the emergency communication centre and any relevant public safety organizations to improve coordination.
Aid station with advanced provider: nurse or physician	A similar facility to an aid station with a basic prehospital providers but staffed by at least one advanced provider such as a nurse or physician, holding a current local license. The nurse or physician should be experienced in emergency medical care and triage of seriously ill or injured patients to higher levels of care and should have training in the management of MCIs. Physicians and/or nurses are recommended for larger crowd sizes or events needing sobering services; advanced prehospital provider may be substituted for smaller size crowds as outlined in operational resource: *Minimum resources for special events.*
Mobile resources	Mobile (“roving”) medical resources are non-ambulance based basic prehospital providers, or higher-level providers, that are deployed throughout the footprint of a special event and may be on foot, bicycles, or motorized transport cart/vehicle (small 4 wheel drive all-terrain vehicle, moped, motorcycle, etc.) Mobile resources must be able to provide, as a minimum, first aid care at a BLS level, and must have communication capability, by radio, cell phone, or other medium. Each mobile resource should carry an AED at all times (where available).

2.6.19 Minimum resources for special events

Event type	Estimated crowd size*	CPR & emergency number access	Aid station with basic prehospital provider[1]	Aid Station with advanced prehospital provider or higher	Advanced ambulance[2]	Mobile resources
Athletic/sporting event[3]	<2,500	Required	Recommended	Recommended		
	2,500 - 15,500	Required		Required	Required (may need multiple units)	Required
	15,500 - 50,000	Required		Required	Required (may need multiple units)	Required (multiple units)
	>50,000	Required		Required	Required (multiple units)	Required (multiple units)
Other events (e.g concerts, festivals, other non-mobile events)	<2,500	Required	Recommended	Recommended		
	2,500 - 15,500	Required	Required	Recommended	Required (may need multiple units)	Recommended
	15,500 - 50,000	Required		Required	Required (may need multiple units)	Required
	>50,000	Required		Required	Required (multiple units)	Required (multiple units)

* Maximum number of attendees at peak time
1 - Automatic external defibrillator required for all events larger than 2,500 attendees
2 - Multiple ambulances may be required depending on event history and size. Recommend 1 unit per 10,000 participants or spectators (additional resources may be necessary for isolated or hard-to-access areas)
3 - More than 1 aid station is recommended for parades/sporting events taking place over 2 km or more. Mobile refers to the event changing geographic location such as a road race, bicycle event, or open water competition. Non-mobile events take place within the same venue.

2.6.20 Medical dispatch workflow

Emergency call (answered by call taker)
Initial assignment to medical, fire, police, or other
If medical: follow the **5 steps** below

1. Identify location and call-back informati

2. Assign priori (refer to operational resource: *Priority based dispatch*)

Emergency priority:	**All other priorities:**
• Immediate resource dispatch • Collect further information	• Collect further information • Resource dispatch

3. Pre-arrival instructions (refer to operational resourc *Medical dispatch pre-arrival instructions*)

4. Documentati

5. Call-taker closes call & becomes available for next call; ongoing call management passes to dispatch

INFORMATION TO BE COLLECTED FOR EACH CALL	
• caller name • call back details • patient complaint • patient age and sex	• location • time stamps: call received, answered, dispatched • further information (complaint specific)

2.6.21 Priority based dispatch

THIS SHOULD BE LOCALLY DEVELOPED, CONSIDERING THE TEXT BELOW

The goal of priority based dispatch is to allocate the appropriate type and quantity of resources to a request for assistance within a predefined targeted time frame.

- The medical dispatch triage system should be capable of taking input from the caller and produce an output that fits into the resource matrix of the local system.
- The output from the triage system should be standardized and reproducible with different dispatchers utilizing the same resources for callers reporting similar medical conditions.
- The medical dispatch triage system should be developed in the context of locally available resources and needs.

KEY ELEMENTS OF THE SYSTEM

- A call-taker receives the call and determines it to be medical in nature.
- A call type is assigned, coding the call to a chief complaint.
  - Chief complaint list is predetermined locally.
  - The call type should produce a standard response from the list of components below.
- For each chief complaint, a brief algorithm should be developed based on simple questions that the call-taker can ask the caller to determine the level of response needed.
- Levels of response should be predetermined in the context of locally available resources.

DEFINING THE LEVEL OF RESPONSE

Level of response should be defined by a matrix including the following components:

- Time sensitivity
  - Immediate (may use lights and sirens for response)
  - Urgent
  - Non-urgent
- Appropriate level of service
  - Basic ambulance
  - Advanced ambulance
  - Higher-level services (e.g. helicopter, physician, etc.)
  - Non-medical technical support (e.g. police, fire, utilities, search and rescue, etc.)
- Number of resources needed
  - Single
  - Multiple
- Geographic location of call in relation to responding resources
  - Projected response and transport times
- System status
  - Availability of ambulances at current time

2.6.22 Medical dispatch pre-arrival instructions

THIS SHOULD BE LOCALLY DEVELOPED, CONSIDERING THE TEXT BELOW

The goal of medical dispatch pre-arrival instructions is to provide simple procedures to a caller that can be executed by the caller without any formal training. They should be scripted and dispatchers should be trained in their delivery.

Instructions should be developed for a predetermined list of conditions. The conditions chosen for pre-arrival instructions should have time-sensitive interventions.

The interventions chosen should be simple, with a low risk of harm to the patient or the lay provider and require minimal supplies.

EXAMPLES OF CONDITIONS THAT MAY BE SUITABLE FOR PRE-ARRIVAL INSTRUCTIONS

- CPR (context dependant for compressions instructions)
- Irregular breathing (Heimlich, check airway, sweep, recovery position)
- Unconscious (recovery position)
- Bleeding control (using available materials for pressure dressing/tourniquet)
- Childbirth (positioning, standard simple things to help/avoid)
- Seizure (remove harmful objects)
- Safety of scene (separate patient from ongoing dangers while avoiding injuring self)

INSTRUCTIONS SHOULD INCLUDE RECOMMENDATIONS FOR THE FOLLOWING

- Stay with the patient until help arrives
- Enhance safety of the scene if possible (e.g. traffic indicators for a road traffic crash)
- Call back if the condition worsens or changes
- Help guide prehospital personnel to the patient from nearest access point

2.6.23 Prehospital intervals

INTERVAL	DESCRIPTION	SUB-INTERVAL	DESCRIPTION OF SUB-INTERVAL
Response interval	Time from the receipt of the emergency call until the emergency vehicle arrives on the scene.		
On-scene interval	Time from when the first emergency vehicle arrives at the scene of the emergency to when the vehicle leaves the scene either with the patient, transporting them to a health facility, or when it has been determined that a patient no longer requires treatment or transport. This is an aggregate of time spent on the scene, composed of several components.	Patient access	Time taken to reach the patient from the moment the emergency vehicle arrives on the scene.
		Initial assessment	Duration of the initial medical assessment of the patient.
		Scene treatment	Time spent providing medical treatment on the scene.
		Patient removal	Time taken to remove the patient from the scene to the ambulance.
Transport interval	Time from leaving the scene to arriving at the health facility.		
Delivery interval	Time from health facility arrival to the transfer of patient care to the facility staff.		
Recovery interval	Time taken for providers and equipment to be ready for another incident.		

2.6.24 Facility pre-arrival report form

Use this tool to help facilitate efficient and safe communication during handover of a patient from prehospital provider to higher level of care.

KEY CONSIDERATIONS IN NOTIFYING A RECEIVING FACILITY:	
Always confirm the name of the contacted receiving facility via closed loop communication method (e.g. have the receiving facility confirm they are receiving the transmission).	☐
If there are multiple receiving facilities in the system, have the receiving facility identify itself during the communication.	☐
Keep reports as brief as possible and use clear speech.	☐

ALWAYS REPORT THE FOLLOWING INFORMATION TO THE RECEIVING FACILITY:	
Confirm that the receiving facility can clearly hear the transmission.	☐
Prehospital provider ID number or identifier.	☐
State the reason for contacting the receiving facility or physician (e.g., consult, notification of transport).	☐
Transport priority and estimated time of arrival.	☐
Number of patients.	☐
Report patient's: age, gender, chief complaint, and mechanism of injury or onset of illness.	☐
Level of consciousness.	☐
Complete set of pertinent vital signs that could be obtained.	☐
Pertinent positive, and negative, physical findings.	☐
Pertinent medical history that may relate to, or complicate, the chief complaint.	☐
Interventions already initiated, patient's response (including pertinent vital signs trends), and any problems encountered (e.g., unable to control airway or stop haemorrhage).	☐
Other special situations (e.g., infectious disease, contaminated patient, hazardous material exposure requiring decontamination prior to entry of receiving facility).	☐
High-acuity conditions requiring additional support include trauma with shock, cardiac arrest, stroke, neonate, or obstetrics delivery imminent	☐

ALWAYS CONFIRM THAT THE REPORT HAS BEEN RECEIVED IN FULL:	
Always confirm via closed loop communication method that the receiving facility has correctly noted all of the transmitted information	☐

2.6.25 SBAR handover tool – out of hospital

Use this tool to help facilitate efficient and safe communication during handover of an emergency patient from community, clinic or prehospital ambulance transfer.

S Situation

- **Identify yourself, your role & location** ☐
- **Identify patient** (name, age, sex) ☐
- **State major problem** (medical or trauma) ☐
- **State reason for transfer or handover** ☐
  (e.g. needs ongoing emergency care for bleeding)

B Background

Describe:

- ***What*** **the patient is complaining of** ☐
- ***When*** **the patient became ill or injured** ☐
- ***Where*** **the patient became ill or injured** ☐
- ***How*** **the patient became ill or injured** ☐
- **Any past medical or surgical history, medications or allergies** ☐

A Assessment

Describe any findings and care provided for:

- **Check for major bleeding** ☐
- **Airway problem** ☐
- **Breathing problem** ☐
- **Circulation problem** ☐
- **Disability problem** ☐
- **Exposure** ☐

Describe any medication taken or given ☐

R Recommendation

- **State your recommendation** (what you feel should happen next) ☐
  (e.g. transfer for ongoing emergency care)
- **Describe any concerns** ☐
  (e.g. social, security, infectious risk)

Confirmation: Ask the receiver to repeat back key information and clarify any questions.

CHAPTER 3

Communication and dispatch centres

Ambulance communications, occupied Palestinian territory © WHO

3 Communication and dispatch centres

3.1 Introduction

In the prehospital component of the ECS, individual ambulance service organizations provide the primary response to emergencies and, in many settings, facilitate and coordinate transfer between facilities. An integrated system of communication and dispatch is essential for coordinating prehospital response, for providing instructions to bystanders and for ensuring the timely arrival of medical assistance to those in need. The capacity of a system to assess emergency calls, prioritize responses and deploy resources determines efficient prehospital services. This begins with the initial contact made to the emergency services number, which should be widely available and free to use.

Communication and dispatch centres coordinate ambulance services and are a key link in the chain of survival, by bridging the gap between emergencies and the interventions required. They are responsible for coordinating and allocating resources according to the severity and location of emergencies. Trained dispatchers use tools and protocols to assess incoming calls, determine the appropriate response level, dispatch ambulances and other resources to the scene and facilitate communication to the receiving facility.

Effective communication between dispatchers and PPs in the field is essential for seamless coordination of prehospital response. PPs rely on real-time updates and directions to locate patients and assess scene safety, and dispatchers depend on feedback from the field to adapt to evolving situations, allocate additional resources if necessary and provide support throughout the response.

In some settings, technological advances have revolutionized communication and ambulance dispatch, accelerating response times and improving coordination. Even in resource-constrained settings, where such technologies may not be readily available, effective use of simple communication mechanisms can help to maximize response efficiency. When communication and dispatch centres are used effectively, they improve efficiency and response time and provide culturally sensitive, dynamic public health assistance and access to emergency care advice and response.

This chapter provides guidance to ambulance systems in developing communication and dispatch centres. It summarizes the most important components and decisions to be considered. The chapter covers five topics: the main components of dispatch, levels of organization, core functions, ethical considerations and prehospital times. Considerations of financing and funding are beyond the scope of this chapter. The operational standards described in chapter 2 are directly relevant to this chapter.

3.2 Main components of a dispatch system

Emergency medical dispatch has been defined as "a system of communication designed to reliably allow the public to access available emergency medical resources"[1] The system should be timely, safe, locally appropriate and reliable. It has six main components:

- communication infrastructure,
- technological infrastructure,
- personnel and personnel training,
- protocols and SOPs,
- quality assurance and performance monitoring and
- data management and reporting.

Communication infrastructure

Communication infrastructure consists of all the physical and virtual systems and network infrastructure necessary to transfer information from callers to the emergency communication and dispatch centre, from the centre to the responding units, to receiving facilities and to any other relevant stakeholder. The infrastructure should allow both inbound (e.g. receiving emergency calls or requests for interfacility transfer) and outbound communication (e.g. to responding units, other agencies or receiving facilities) and call transfer. Multiparty conferencing for field-to-facility communication should also be possible.

Access to the emergency communication and dispatch centre should be via a toll-free (no cost) universal access number or short code to ensure that cost does not represent a barrier to accessing the service. Reasonable steps should be taken to ensure that the emergency communication and dispatch centre is accessible to people with disabilities (e.g. those with hearing and/or speech impairments).

All communications infrastructure should have back-up systems in case of power outages or other failures, such as paper-based systems. A nearby back-up dispatch centre should be considered.

The system of communication for standard operations should also be backed by a contingency plan on maintenance of the dispatch function during a disaster, including back-up communications, movement of the centres to a pre-designated site or sites and recruitment of back-up personnel.

[1] Mould-Millman NK, de Vries S, Stein C, Kafwamfwa M, Dixon J, Yancey A et al. Developing emergency medical dispatch systems in Africa – Recommendations of the African Federation for Emergency Medicine/International Academies of Emergency Dispatch Working Group. Afr J Emerg Med. 2015;5(3):141–7. https://doi.org/10.1016/afjem.2015.06.005.

All incoming and outgoing communications should be recorded to allow QI, medicolegal coverage and research. This will also provide a reference if an emergency call is disconnected or information lost.

Technological infrastructure

The technological infrastructure consists of the hardware and software in an emergency communication and dispatch centre required for execution of its functions. It may also include the hardware (computers, screens) and software programs installed in emergency vehicles and at receiving facilities.

A computer-aided dispatch system should be considered to provide real-time tracking of status and live-tracking of all emergency vehicles. This can assist dispatchers in selecting the closest, most appropriate vehicle to respond to an incident. Call-taking and dispatch screens should be provided with mapping software.

Call line (or caller) identification and location-based services should be included in the software system. These allow transmission of a caller's telephone number and location into the computer-aided dispatch system in case of accidental disconnection.

Up-to-date hardware and software should be purchased or developed locally to ensure efficiency and reliability. Software and hardware should be integrated appropriately to allow for real-time monitoring of service and quality indicators, routing of inbound and outbound communications and updating of call-taker and dispatcher status.

When selecting headsets for an emergency communication and dispatch centre, it is important to consider not only comfort and durability but also sound quality and noise cancellation. Background noise and difficulties in communication can increase the time for call-taking and reduce the accuracy of the information captured. It may also increase frustration in both callers and call-takers, which may affect service quality and efficiency.

A communication and dispatch centre computer-aided dispatch system may be integrated into public safety software, that of other agencies or facility communication systems to ensure seamless communication and data transfer. When resources allow, taking calls via video-conferencing can improve communication by providing not only verbal descriptions but also visual information, potentially improving the accuracy and efficiency of a prehospital response.

Cybersecurity should be a priority to prevent cyberattacks, hacking and malware infection.

Personnel and personnel training

Personnel are the human resources required to fill the functions of the emergency communication and dispatch centre. At a minimum, they should include emergency call-takers or operators, dispatchers, supervisors and medical oversight. It is also advisable to have technical support on site to manage any faults and thus minimize down-time. The communication and dispatch centre should operate 24 h/day and should be staffed accordingly, although staffing can be adjusted to call volumes and diurnal variations.

Finding and placing the correct personnel for a communication and dispatch centre is critical to its successful operation. Pre-employment processes such as well-considered job descriptions and competence-based skills assessments and interviews should be used. All personnel should be trained specifically for their job. For call handlers and dispatchers, this should include basic emergency care relevant to their function, computer literacy and training in use of the hardware and software used, call handling, handling and de-escalation of critical incidents, empathy, language and communication skills, mapping, cultural sensitivity and documentation. When it is not feasible to recruit personnel with basic clinical training, technology should be used to guide triage and clinical decisions. When possible, the training of call-takers and dispatchers in each ECS should be standardized and should result in central accreditation and certification. All personnel should be required to undergo continuous professional development and training. Coaching may be provided to promote quality. As training of dispatchers requires significant time to achieve a stable, mature level, frequent turnover of dispatchers is not advisable for effective operation of the dispatch centre. Similarly, hiring of part-time dispatchers is not recommended.

Protocols and SOPs

Clear protocols and/or SOPs should be developed for call-handling, dispatch and multi-agency responses. The protocols and SOPs should be developed for the ECS in which they are used. The SOPs should guide call-takers and dispatchers in various scenarios of emergency and other difficult situations in order to provide pre-arrival instructions (e.g. bleeding control, cardiac arrest, stroke detection). Examples include cases of suicidal ideation and other behavioural emergencies, hostage situations and violence (including domestic violence), child callers, language discordance, MCIs and various clinical situations. SOPs should also be developed for fake or prank calls.

SOPs should include standard language to improve caller compliance. Call-taking, and telephone triage in particular, should be supported by standard, concise wording in simple, clear language, with clear criteria for acuity. Triage systems should be locally appropriate and monitored for accuracy either

technologically or in a printed format. Triage criteria should be reviewed regularly for accuracy.

Protocols and SOPs should be indexed and stored accessibly for easy reference. They should be reviewed and updated regularly to remain responsive to the needs of the centre. The leadership of the centre should also have the authority to approve and implement the protocols and SOPs, which should be developed with the direct input of the MCO. There should be medical oversight at the dispatch centre to assist in this process.

QI and performance monitoring

Monitoring and QI are conducted continually in a communication and dispatch centre to assess and enhance prehospital response operations. QI includes tracking key performance indicators, reviewing recorded calls and incidents to monitor them for compliance with protocols, identifying areas for improvement and implementing measures to improve the overall quality of the service.

The centre should have clear performance indicators and QI processes. A quality manager may be appointed to oversee quality and performance and should be supported by a team of coaches and trainers with the relevant skills, experience and accreditation. The communication and dispatch centre may be equipped with monitoring dashboards to allow real-time feedback on call volumes, occupancy, agent status and waiting and processing times.

Key metrics should be developed and monitored for quality. These may include the times for answering calls, waiting and processing; call volume and occupancy; emergency vehicle response times; the accuracy of telephone triage; and compliance with protocols. Metrics specific to the technology used, such as system processing speed and downtime, should also be monitored and optimized. Chapter 2 proposes quality indicators for dispatch centres.

Personnel should clearly understand these metrics and what is expected. Good performance should be celebrated or rewarded. Documented processes could be established for personnel who recurrently transgress the requirements to avoid any threat to patient safety.

Data management and reporting

Data on performance and quality should be collected, stored, monitored and reported. They may also be used for QI and research. Data must be backed up and stored securely; they may include audio files of recorded conversations. All user actions should be recorded and stored, with a timestamp for quality assurance, clinical governance and medico-legal review. Access to data should be regulated.

A minimum dataset for a communication and dispatch centre should be developed, with standard reports on essential metrics. Confidentiality should be maintained, and callers and staff should be aware that information is being collected and stored.

In settings with limited technology but with printers for documentation, paper versions of the software, such as call handlers forms, dispatch forms and call registers, may be used and completed manually.

3.3 Levels of organization

The level of organization of a dispatch centre refers to whether it is part of other emergency services and whether it is centralized or decentralized. The level of organization cannot be prescribed, as needs differ. Policy-makers should consider the advantages and disadvantages of combined dispatch before deciding on a level of organization. The tables below outline some of the advantages and disadvantages of combining an ambulance dispatch centre with other emergency services (Table 1) and of centralized and decentralized dispatch (Table 2).

Table 1. Advantages and disadvantages of combined dispatch

Advantages	Disadvantages
Combined dispatch: A system in which several emergency services, such as fire, police and emergency medical services, have a single call and dispatch centre	
Streamlined communication Resource optimization Unified protocols Situational awareness Multi-agency collaboration	Complex training Potential volume overload Risk of miscommunication
Separated dispatch: A system in which distinct, specialized dispatch centres for different emergency services are responsible for call handling and dispatch	
Expertise in each specialized area Efficient handling of service-specific protocols Less overload Clear accountability	Lack of interagency coordination Limited situational awareness Resource duplication Escalated costs Public confusion Delay or misdirection in transfer of calls

Table 2. Advantages and disadvantages of centralized and decentralized dispatch

Advantages	Disadvantages
Centralized dispatch: A system in which a single, central dispatch manages and coordinates all emergency calls and responses	
Resource optimization Streamlined communication Economies of scale resulting in cost savings Quality control Consistency in protocols and standards Access to expertise	Overload during mass incidents Dependency on technology Loss of local knowledge and community connection Lack of back-up or redundancy
Decentralized dispatch: A system in which several, localized dispatch centres are responsible for managing and coordinating emergency calls and responses for its own region	
Local knowledge Redundancy Scalability Cultural sensitivity Localized decision-making	Resource inefficiency Lack of standardization Challenges in interagency collaboration Limited access to expertise Lack of back-up or redundancy

3.4 Core functions

The communication and dispatch centre provides five core functions, which are:

- inbound communication,
- call processing and prioritization,
- outbound communication,
- incident management and
- monitoring and QI.

Inbound communication

Inbound communication (call handling) consists of receiving and handling emergency calls or requests for assistance from the public. In some dispatch centres, health-care provider requests for interfacility transfer may also be received. Careful consideration should be given to the benefits of an interactive voice response system to direct callers as opposed to delaying call answering. Inbound communication requires skilled call takers who collect essential information on the location of a patient, the caller's contact details and the nature and urgency of the situation. Ideally, this should be done with prepared questions that are culturally appropriate and in keeping with the burden of

disease in the setting. The call results in allocation of a triage category according to urgency. If a call is deemed to be urgent, the call-handler should immediately dispatch the closest, most appropriate emergency vehicle through a computer-aided system.

The call-taker should provide essential pre-arrival instructions for scene safety, preparation for the response and directed instructions for providing life-saving interventions or stabilization of a patient. Importantly, call-takers should have the requisite skills to handle a situation calmly, with empathy, and also control the conversation to ensure that all the essential details are collected efficiently. In multilingual and multicultural settings, call-takers with relevant language proficiencies are essential. If necessary, translation services can be contracted.

Call processing and prioritization

Regardless of the system used, all calls should be allocated a level of urgency or triage. Telephone triage consists of analysing the information provided by a caller to determine whether a response is necessary, its priority and which unit to send. This is essential, because, with limited resources, prioritizing one case for a swift response often results in delaying another case, which can affect clinical outcomes. Additionally, in ECS with various levels of prehospital personnel, dispatching an inappropriate cadre can delay specific interventions or waste resources. In contrast, responding to a low-acuity patient with lights and sirens when not justified may pose risks to the lives of the crew and other road users.

Telephone triage systems cannot always be transferred between settings, because triage decisions in more developed systems are often made according to established processes and criteria with standardized training throughout the dispatch system. Additionally, systems with more resources may have higher rates of "over-triage" to ensure low rates of "under-triage". As each setting has its own burden of disease, pre-test probability and baseline accuracy may vary. Other factors are the different rates of language proficiency and baseline literacy in different populations, such as in multicultural settings with significant migration. It is important to note that selection in dispatch systems is based on the descriptions provided by the caller; however, colloquialisms and certain socio-cultural aspects cannot be accounted for in international criteria. Simple translation of these criteria is not sufficient in such cases.

Outbound communication

Outbound communication (dispatching) involves processing information and relaying the information to emergency vehicles. This is done by a trained

dispatcher or, in the case of urgent incidents, by the call-taker if the system allows for this. In some systems, the call-taker and the dispatcher are the same person. Dispatching may also be automated by integrating triaging and dispatch software systems or manually through telecommunication systems.

The essential information to be relayed includes the location of the incident, the nature and urgency of the emergency and the number of victims. This should be done through a reliable communication system with built-in redundancies. It results in dispatch of the closest, most appropriate emergency vehicle. The dispatcher is expected to determine the capacity, location and appropriateness of the available resources in order to execute the dispatch. In some instances, it might be necessary for the emergency vehicle to be put into contact with the scene of the incident, which should also be facilitated by the dispatcher.

Outbound communication may be with receiving facilities to determine their capacity to receive certain patients and to relay information on the patient's condition and estimated time of arrival. The dispatch system should therefore also be able to support field-to-facility communication. Outbound communication can include transfer of calls to other communication centres or agencies, such as security services.

Incident management

Incident management in a communication and dispatch centre involves systematic coordination and control of resources to respond to emergencies. The function includes allocating appropriate response units, coordinating with other agencies if necessary and managing resources efficiently to address the incident in a timely, effective manner. A trained dispatcher sees an incident through to completion and supports responding emergency vehicles by addressing any problem that might arise. In mass casualty incidents or disasters, a multi-agency incident management team may be brought together under an incident commander.

Monitoring and QI

Monitoring and QI refer to ongoing processes within the communication and dispatch centre to assess and enhance the performance of emergency response operations. This involves tracking key performance indicators, reviewing recorded calls and incidents to monitor for compliance with protocols, identifying areas for improvement, and implementing measures to enhance the overall quality of service. Personnel should be clear on these metrics and what is expected. Good performance should be celebrated or rewarded. To avoid any threats to patient safety due to poor performance, there should be documented

processes to follow for personnel who have recurrent transgressions. Continual improvement should be undertaken for human performance and accuracy of protocols. Appropriate retraining and remediation procedures should be put in place. Chapter 2 of this document suggests potential QI targets for dispatch centres.

3.5 Ethical considerations

Appropriate triage and health-care rationing

Dispatchers should be provided with guidance and SOPs on the ethical challenges of the prioritization and distribution of limited resources. Triage and rationing of resources should be guided by local needs and community participation while maximizing efficiency and minimizing resource wastage. An evidence-to-decision framework, such as WHO integrate, can be used in making decisions. Policies should be developed to guide appropriate deployment of resources in ethically challenging circumstances.

Cultural sensitivity

Call-takers and dispatchers should be trained in and display cultural sensitivity to diverse backgrounds and beliefs of callers. This should include cultural norms, linguistic nuances and differences in how emergencies are perceived, experienced and communicated.

Data security

As a dispatch centre handles much sensitive and confidential data, protecting the privacy and confidentiality of all data is essential. Staff should be trained in confidentiality and integrity. Only the necessary data should be collected, and they should be securely stored and transmitted. Cybersecurity should be robust to minimize the risk of threats or unauthorized access and disclosure.

3.6 Prehospital intervals

Although time-based indicators may not be an accurate reflection of quality of emergency care, they are well-defined and easy to measure, making them an attractive indicator of ambulance service performance – especially in emerging systems.

There is no international standard response interval, as this is influenced by many factors, including:

- the demand for ambulances, population size and other socio-demographic factors;
- the geographical area covered;
- the resources available;
- seasonal factors such as inclement weather; and
- travel factors, such as traffic conditions and road infrastructure.

Performance metrics should be developed locally and measured to track compliance with identified targets (e.g. time targets should be met 80% of the time).

The term “interval” (e.g. “response interval”) is preferred to “time” (e.g. “response time”), as “interval” refers to the temporal distance between two events, while the term “time” should be reserved for the specific time at which an event occurred. Fig. 3 illustrates the main intervals useful for assessing ambulance performance.

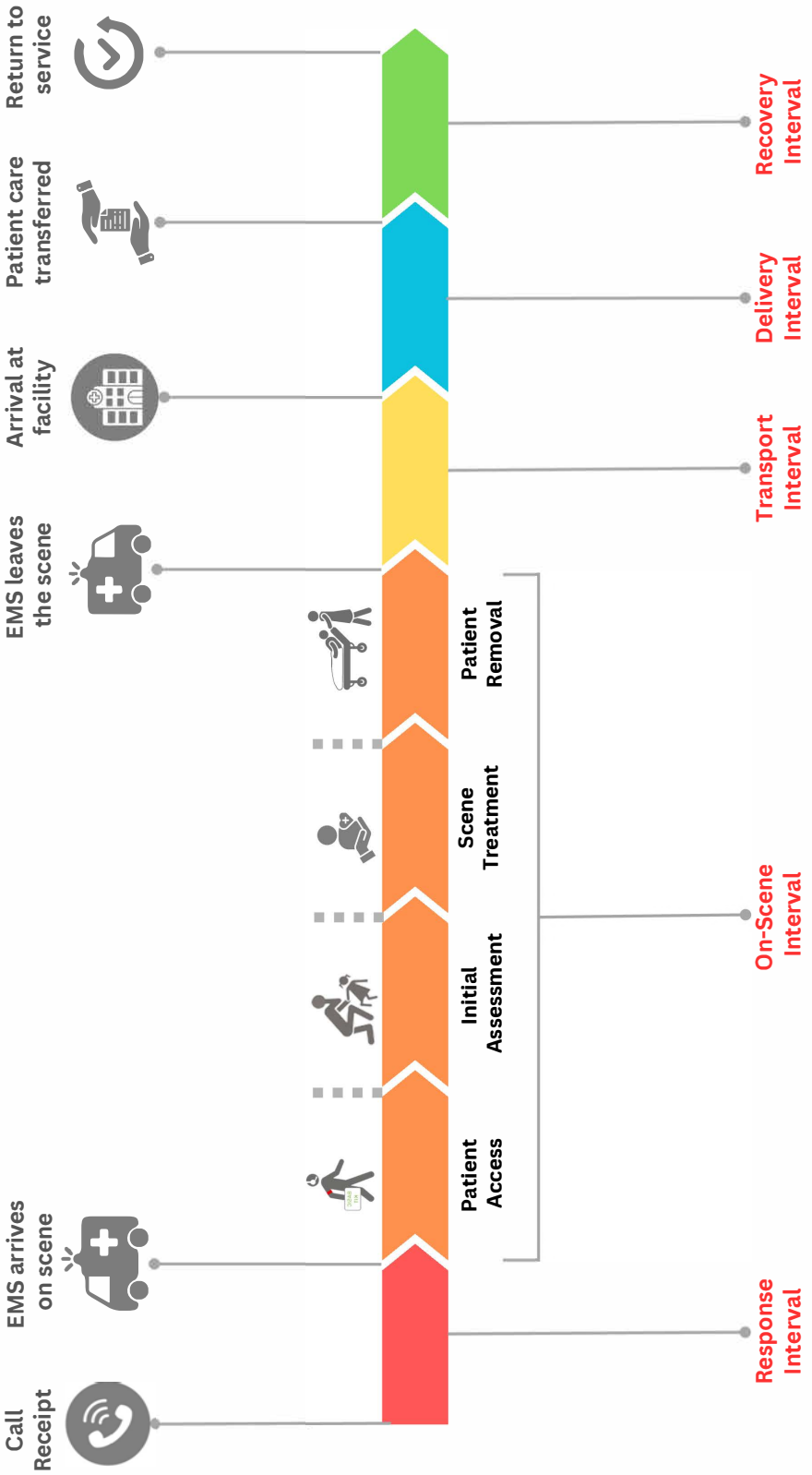


Fig. 3. Prehospital intervals

Recommendations (such as those provided in operational resource: *Prehospital intervals*) should be adapted to different settings, guided by the following considerations.

- Infrastructure and resource limitations: The number of ambulances, road infrastructure and the distribution and capacity of health facilities should be taken into account when determining appropriate prehospital intervals, including mission time.
- Training and staffing constraints: Limited availability of trained prehospital personnel, including those lost to migration, can have a large impact on the services provided, which may affect the on-scene interval.
- Case acuity: On-scene delivery and recovery intervals may be prolonged in some health system according to the acuity of cases.
- Communication and dispatch systems: Call processing may be prolonged according to the dispatch system of a given service and lack of integration of technological or location-based services.
- Cultural and societal factors: The response time interval shapes the public's perception of the quality of care offered by an ambulance service provider. Community education should be provided to facilitate appropriate use of ambulances by minimizing their use for low-acuity cases.
- Quality of care: While prehospital intervals are easy to use measures, time is only a small element of the quality of care. Other metrics, such as patient satisfaction, adherence to clinical guidelines, clinical effectiveness and patient safety are arguably more important metrics of the quality of care. Prehospital intervals should be interpreted in the context of a robust QI and clinical governance system.
- Use of geospatial planning: Geospatial planning improves resource allocation to optimize prehospital intervals and identify areas with limited coverage.

Given these considerations, prehospital interval targets might have to be more flexible, nuanced and contextual rather than universally applied. Prehospital interval goals should be developed according to regional needs, the available resources and the geographical and infrastructural challenges of each area. The focus should be on incremental improvements and realistic goal-setting with the available resources and infrastructure.

CHAPTER 4

Medical control

Prehospital providers in an ambulance, Ukraine © WHO / Christopher Black

4 Medical control

4.1 Introduction

The aim of prehospital ambulance organizations is to deliver high-quality care, with the ultimate goal of the best outcomes for their patients. Medical control is central to this, and all ambulance services should have such a system, however basic.

Medical control is a system of clinical governance that provides real-time (online) and protocol-based (offline) medical direction to PPs to ensure that patient care meets agreed standards. Medical direction is usually provided by a senior clinician (often a doctor), known as the MCO.

PPs should deliver protocol-based care (offline medical control); however, systems should be in place for accessing real-time (online) medical control when they encounter a complex case, when administering certain medications and when they are unsure of the best course of action in managing a patient's care or determining a destination.

Locally appropriate training curricula and standards should be developed for MCOs, as this cadre must adequately trained and know what is and is not feasible in the prehospital setting. MCOs must be intimately familiar with the scope of practice of the providers under their direction.

This chapter covers considerations for medical control and provides standardized procedures for efficient oversight of PPs, with an overview of the most important functions and decisions to be considered. The guidance is designed to support ambulance service leaders (such as a medical director or MCO) in leading their clinical staff in providing person-centric, evidence-based prehospital care. It should be adapted to the local context, laws and regulations of each country.

The chapter covers six topics: regulation and system oversight; operations; training and certification; clinical care and patient disposition; QI, data and research; and other considerations. Operational standards described in chapter 2 of this document are directly relevant to this chapter.

4.2 Regulation and system oversight

Medical oversight of ambulance systems represents the clinical practice of prehospital care, which may be physician practice designated as a recognized subspecialty of emergency medicine in some jurisdictions. The goal of a clinician in providing medical oversight is to lead the system's providers at all levels to deliver patient-centred, evidence-based medical care, with the goals of improving patient outcomes and public health. The role of prehospital medical practice in general is dynamic and evolving over time. It is linked to public safety

agencies, such as police and fire service, medical facilities such as hospitals, training facilities, academic institutions and the over-arching health authority.

The health authority with regulatory power in any given jurisdiction must recognize the importance of medical oversight of its ambulance system(s) and develop a close reporting and supportive relationship with the medical director. Regulations on prehospital care should be considered as having the same authority as other health regulations. While the care provided by ambulance personnel in the field has both clinical and operational components, authority over clinical protocols and policies must be vested in the overarching health regulation authority or the ECS regulatory authority.

Ambulance system regulations and capabilities must match both the needs of the population being served and the resources available. Many ambulance systems have structural features that enable them to provide care at their current level, which should be strengthened to achieve optimal patient outcomes with current resources. Some ambulance systems may have strong individual components but no overarching structure to coordinate the work of providers. Still other systems may have evolved organically but with no strong elements or structures and are exploring ways of developing effective care with the resources available.

Regardless of the stage of development, those providing medical oversight must have a clear idea of the current situation and should be involved from the outset in a system assessment that includes all the components of prehospital care.

Medical oversight

Medical oversight of an ambulance system is provided by the medical director, whose goal is to lead PPs at all levels to provide patient-centred, evidence-based medical care. In smaller ambulance services, the function of the MCO is covered by the medical director, whereas larger organizations may have two posts with separate functions (with the MCO reporting to the medical director). The term "medical director" is used throughout this chapter (except for "Training and certification"), but each system should determine the allocation of resources and tasks best suited to the local context.

Organizational position

The incumbent should have an appropriate:

- title, such as medical director or MCO;
- rank in the organization equivalent to that of the person responsible for operational oversight and decision-making in the organization's governing body; and

- place in the organizational chart of the health authority to ensure direct connection with positions essential to accomplishment of the function (such as operations director, disaster preparedness director, hospital or health-care system chief executive officer).

Authorities

Within locally relevant regulations, the incumbent should usually have the authority to:

- grant, suspend or revoke the permission of a PP to practise (with due process);
- approve medical equipment for the system to purchase;
- implement and manage clinical protocols;
- conduct QI activities;
- establish education and continuing education requirements to address QI issues;
- access all patient care data and records to provide adequate oversight of care; and
- respond directly to the field to provide care if appropriate.

In some settings, several of these items may be done centrally or by a designated body.

Resources

Ideally, the incumbent should have:

- an equipped response vehicle, including medical supplies and PPE;
- the communications equipment necessary to provide contracted functions (mobile, radio, Internet);
- office space and staff assistance, as appropriate;
- legal liability coverage through relevant regulations or insurance; and
- compensation sufficient to fulfil the role.

Qualifications and certification

Medical directors have essential duties in both the medical and the PP community. To be effective in medical oversight, the medical director must be a currently licensed provider in the jurisdiction of the ambulance system that they supervise and must maintain their licensure and qualifications over time by attending any required continuing education or examination in their jurisdiction.

They may also pursue dedicated training in emergency care, which can be:

- in-person, standardized medical training, such as for an ambulance medical director;
- specialist training in emergency medicine; or
- doctoral or post-doctoral training in emergency medicine.

It is recommended that the medical director also be familiar with the training courses in which the PPs in their jurisdiction will participate, including:

- as a medical dispatcher;
- prehospital QI;
- prehospital emergency care training, as a first responder at BLS and ALS levels and WHO Basic Emergency Care and Basic Ambulance Provider courses; and
- a course for ambulance provider instructors.

Medical directors should, if possible, have some time for clinical practice in the jurisdiction in which the clinicians they oversee practice, to improve direct contact with PPs, provide clinicians with direct, real-time experience of the medical director's care, and increase the medical director's credibility and contextual knowledge.

PP education

The medical director will be crucial role in supporting, overseeing and updating the education provided to prehospital personnel and the members of the public in their jurisdiction. In some settings, this may be done partly centrally or by a designated body. Prehospital personnel are generally trained in the following tasks. The involvement of the medical director at each level may differ.

- Call takers and dispatchers

A call taker is an individual inside or outside the ambulance system who interacts with a caller, while a dispatcher interacts with the responders. The two functions can be provided by one individual in small ambulance systems. The medical director is involved in establishing and implementing protocols and procedures related to call handling, including training. The medical director also implements the evidence-based, context-appropriate pre-arrival instructions that are given to callers.

A dispatcher is trained in prioritizing calls and the PP response, providing ambulances with the correct location of each call and, when necessary, providing pre-arrival caller instructions and coordinating communications, as determined by the ECS regulatory authority. The medical director is involved in establishment and implementation of protocols and procedures for determining the priority of calls and the resource type that might be most appropriate for a specific patient. In some settings, this may require reference to non-emergency or primary care services.

- First responder

A first responder is a non-clinical person trained in first aid and integrated into the prehospital response system. Layperson first responder systems, such as the WHO Community First Aid Response programme, can support the development of formal ambulance systems. A CFAR is a trained layperson certified as part of an organized system to provide simple initial care for acutely ill or injured patients, including airway repositioning, control of haemorrhage and splinting. Unlike a bystander who may have received training in first aid, a CFAR is part of an organized system and can be called upon to respond at an emergency scene by a specific, pre-arranged mechanism.

The medical director is involved mainly in review and alignment of the curriculum for first responders to current evidence and context and to oversee instructor qualification.

- BPP

A BPP is a formal ECS health-care practitioner who has been trained in basic prehospital care, holds a valid license and is certified by the ECS regulatory authority to function within a defined scope of practice.

At this level, the medical director is involved in review and alignment of the curriculum to current evidence and context and in screening and training instructors; they may be involved in assessment of student competence at the conclusion of training. The medical director is also responsible for ensuring continuous education and development of this cadre of clinicians.

- APP

An APP is a formal ECS health-care practitioner who has been trained in advanced prehospital care, holds a valid license and is certified by the ECS regulatory authority to function within a defined advanced scope of practice.

At this level, the medical director is involved in clinical training, screening students and instructors, review and alignment of the curriculum with current evidence and context, and assessment of student competence at the conclusion of training. The medical director is also responsible for ensuring continuous education and development of this cadre of clinicians.

4.3 Operations

Interface between health facilities and the ambulance system

The interface between health facilities and PPs can be divided into two broad categories: health facilities that give direct medical advice to PPs in the field while they are treating patients and those that receive ambulance patients from providers directly from the field.

The medical director establishes and monitors engagement between hospitals and health clinics and the ambulance system for exchange of patient data to facilitate care and provide feedback and QI to PPs.

For facilities with direct medical oversight, the medical director is involved in two ways:

- training of personnel training, so that all the clinicians on duty at the facility are knowledgeable in PP training, scope of practice and clinical protocols and can therefore provide valuable advice and recommendations that can be followed by the personnel with whom they are in contact; and
- ensuring that any such facility can ensure rapid communication between the field and facility providers to minimize any delay that could affect the care provided.

The latter can be centralized at one facility or distributed among several facilities in the community. The medical director must ensure that the quality of direct medical oversight is as consistent and helpful as possible to both patients and crews.

Facilities that receive patients from the ambulance system should ensure communication that provides the facility with enough advance notice to be adequately prepared for the arrival of patients from the prehospital system. While this duty can be delegated to non-physician staff, such as nurses and other facility personnel trained in activation protocols for facility resources, the content of such criteria and the QI mechanisms to ensure their reliable use should be reviewed and approved by the medical director. While this task is not as complex as overseeing direct medical consultation, it is an important part of successful treatment of ambulance patients, especially if specialty centres of care (such as trauma centres) are designated for the system.

All fixed facilities that interact with the ambulance system should have specified processes for data exchange to provide the data on patient outcomes necessary to ensure good emergency patient care. Facilities should be represented on the ambulance system teams that develop and monitor clinical protocols and, ideally, should participate in training of prehospital clinicians in their jurisdiction. The minimum recommended data for such engagement are details of the treatment a patient received before arrival at the facility, the patient's outcome when discharged and summary data for the medical director and team to monitor system performance. Data points are determined by processes for system quality and performance improvement provided by both the ambulance system and fixed facilities to the medical director and the ECS regulatory authority.

Interface with system administration and operations

PPs and other elements of the ambulance system may be administered by leaders in public safety, health authority or public works. The medical director must be closely involved with the areas of system administration that directly and indirectly impact patient care or monitoring of quality. The first is finance and resource allocation. Budgetary decisions that affect patient care depend on the needs and resources of a system. Ensuring that adequate resources are available for accurate, consistent dispatch, rapid access to patients with time-sensitive conditions and rapid transport to a receiving facility that can care for a patient's needs are the shared responsibility of administrators and the medical director.

The primary responsibility for the safety and well-being of providers is that of their employer; however, the medical director must provide input to their expectations of provider performance and the working conditions necessary to ensure that level of care. This may include conditions that affect provider fatigue, exposure to trauma, violence, PPE for infectious diseases, emotional support and recovery from difficult patient encounters, ongoing education and training, and career longevity.

The medical director must be involved in the designation and oversight of receiving centres appropriate for ambulance patient care. They may include trauma and specialty care as well as direct medical oversight. The basis for such decisions must be the adequacy of the medical care delivered to patients from the ambulance system.

Prehospital clinician care may be affected by differences in the authority of the health system and of the legal system, depending on the jurisdiction. The medical director must be involved in defining the interface of the system with such issues. This may include:

- appropriate use, storage and monitoring of controlled substances;
- appropriate levels of care and its reimbursement from the health funding authority; and
- compliance of PPs with relevant civil rights and anti-discrimination laws.

Any ambulance system is likely to face conflicts between differing rules and regulations because of the many domains in which it works. The medical director should bring a perspective of the emergency care clinician to "deconflicting" competing rules and regulations by prescribed involvement in the administrative processes established to deal with such conflicts.

Medical directors should be aware of and be involved in legislative advocacy to support their clinicians, patients and systems. This will take different forms, depending on the local context. Any involvement of the medical director in

change and improvement will provide benefits to patients in the foreseeable future.

4.4 Training and certification of MCOs

The ECS regulatory authority should determine the minimum standards for training and certification of PPs, including MCOs. The standards should be reviewed annually or biannually. Additionally, the ECS regulatory authority should set parameters for the desired profile of MCOs according to the context. These often include age, training, certification, education and physical ability. The requirements for both initial and in-service training and certification for MCOs must be defined.

MCOs:

- must be licensed to practise in the appropriate jurisdiction;
- must be familiar with local prehospital emergency care clinical protocols;
- should complete a course of instruction on prehospital medical oversight and medical control; and
- should pass an examination approved by the ECS regulatory authority.

4.5 Clinical care and patient disposition

Direct medical oversight: field clinical supervision

An advantage of direct medical oversight in the field (i.e. interaction with PPs during their time with patients) is the opportunity for education and evaluation, which are not available remotely. Medical directors can sometimes use their teaching experience to advise PPs at a time most relevant to the patient's outcome. PPs are also more likely to remember education received with an emotional component that enables them to remember the experience better and to use it in future patient encounters. Role modelling is better than classroom education for both simple and complex assessments and interventions.

The medical director must be careful not to disrupt a provider's interaction with a patient or be seen as authoritarian or disrespectful of a clinician and their work. Prehospital working conditions are not inferior to but are different from in-facility working conditions. The difficulty of providing an assessment or treatment on the ground, with poor lighting, in a wet or cold environment cannot be overlooked in the advice they give to providers in the field. When possible, treatment plans should be implemented by PPs with input and guidance from the medical director rather being handed to the supervisor.

Clinical supervision in the field can be provided in several ways:

- by using a private vehicle to monitor ambulance system communications to determine which calls should be responded to;
- in shifts with a supervisor in the ambulance, who provides a second presence on the scene and uses equipment and resources in a supervisor vehicle; or
- by using a dedicated official response vehicle with appropriate safety, communications and treatment equipment.

Each option has benefits and risks. A decision on how field clinical supervision is to be done is made with input from the health authority, the administrative leadership and the medical director. The overarching goal should be the safety of the patient and the provider, with targeted intervention of the medical director to improve patient outcomes.

Direct patient care in the field

The medical director can assist prehospital clinicians in providing advanced care in the field. While direct care for patients in the field is not a requirement of the oversight function, it has some benefits and some drawbacks. The procedural expertise of the medical director and potential use of medications to facilitate the procedure that are not available to PPs are important benefits. The drawbacks include lack of familiarity of the medical director with the prehospital environment, limited positioning of back-up support, requirements for specific, special equipment and medication for a procedure, and the possibility of a more severe or acute condition, which may result in a lower success rate than the medical director is used to and delay transfer to facility-based care. The threshold for these interventions must be determined for each patient, field experience and the time criticality of the procedure.

In rare circumstances, patient safety requires that the medical director interrupt the PP and assume care of a patient. A supervisor in the field should therefore have the appropriate tools.

Clinical oversight of implementation of prehospital clinical protocols

Prehospital systems must have locally appropriate clinical protocols to guide patient care within the scope of practice of PPs. WHO has developed evidence-based protocols to guide management of most cases in prehospital practice in a syndromic approach. See chapter 5.

Medical directors who provide remote clinical oversight to PPs must use clinical protocols with which PPs are familiar and must understand the specific circumstances in which they can be consulted to assist in clinical decision-

making. Much of the work of medical directors tends to focus on sicker patients. The specific clinical circumstances may include:

- a decision to intubate (for APPs);
- guidance on the destination facility;
- administration of certain medications, such as sedation, activated charcoal or magnesium sulfate;
- a decision on when to start and stop resuscitation in cases of drowning; and
- initiation of antibiotics (for APPs).

Clinical protocols

Clinical protocols are the key guiding element for PPs in providing consistent, high-quality care. They express the health regulation authority's intentions for care and cover the spectrum from pre-arrival instructions that dispatchers give to callers on how to treat a patient until the provider arrives, through first responder care of the patient, to treatment by providers and, if appropriate, providers who transport patients between facilities. Clinical protocols should include destination triage. In some settings, clinical protocols may also address on-scene discharge or referral to other health-care services for non-emergencies.

The following principles should guide the medical director's involvement in clinical protocols within the scope of practice of PPs in their system. Clinical protocols should be:

- in compliance with established competency frameworks and scopes of practice of the different cadres of providers, where relevant or established;
- designed to address complaints that are routinely encountered by providers;
- based on the most recent, relevant evidence in the literature;
- based on or tailored to field practice and not hospital-based practice;
- adjustable to the patient's age and concomitant conditions such as pregnancy, where appropriate;
- user-friendly, regardless of the format (e.g. algorithm, list, text);
- written in local languages and at a level appropriate to the level of education of the provider;
- updated regularly (such as every 1–2 years) according to the ambulance system's QI programme;
- include only medications that can be obtained by prehospital clinicians and alternatives when relevant; and
- contextual within the resources available in the health system.

The medical director should involve various professionals, such as PPs, pharmacists and dispatchers, on the clinical protocol design and implementation

team. Current clinical protocols must be available to and ideally taught as a core element of the curriculum of PP training programmes in their jurisdiction.

Role of telemedicine

Telemedicine provides an opportunity for remote patient consultation and care. Its use in some settings by PPs has the potential to enhance the quality of care by decreasing the time to definitive care, guiding decisions on destination, increasing diagnostic accuracy and improving the quality of remote guidance by medical directors.

4.6 QI, data and research

EMS clinical governance

Clinical governance is the framework within which a health institution (such as an ambulance organization) is accountable for continuous improvement of the quality and safety of its services and for maintaining high standards of care by creating an environment in which high-quality care is provided. Medical oversight recognizes the value of a robust clinical governance framework in delivering high-quality prehospital care services. The medical director must ensure sound governance at all stages, particularly in clinical care. The goal is to provide the highest quality of care possible in the local context in line with internationally recognized best practice.

The approach to clinical governance may be considered as having seven pillars:

- education and training,
- clinical audit,
- clinical effectiveness,
- risk management,
- research and development,
- patient and public involvement and
- information management.

Common areas for effective clinical governance in ambulance systems are:

- a unified governing body for setting regulations, standards, minimum qualifications and accreditation;
- provider training and continuous professional development;
- introduction of SOPs; and
- adoption of clinical protocols.

The medical director should foster a culture of positive clinical governance to ensure delivery of effective prehospital care, the health and well-being of employees, minimal associated risks and high-quality education for clinically competent staff who undergo in-field assessments and audits of clinical practice in various areas.

QI programme

A robust QI programme is essential for all aspects of health care to ensure the safety and efficacy of services. Locally relevant prehospital indicators should be evaluated to ensure the quality of care, and any gaps should be reviewed and addressed within a specified time. It is important to ensure systematic monitoring and evaluation of the ambulance system to maintain efficient, effective, high-quality emergency care in the prehospital component of the ECS.

The provision of care of the highest possible quality by the ambulance system should be the underlying goal of the medical director. This requires establishment of high-quality care as a core value of system providers and the governing authority, constantly ensuring high-quality care and developing metrics to determine the appropriateness and success of the care delivered, which is a primary responsibility of the medical director.

The QI process must not be perceived as disciplinary or punitive by providers. When QI is integrated into overall management of the care rendered, it is done in real time and results in the engagement and empowerment of the entire team of providers. Development of a quality and performance system concurrently with development of clinical protocols and policies on team actions and documentation will result in the best outcome with the least additional administrative burden. A culture of accurate documentation, for example, provides better data for observing the results of adjustments to field treatments or patient destinations. Inclusion of quality measures in protocols allows rapid assessment according to evidence-based guidelines on patient encounters.

When possible, electronic collection of data is encouraged for documentation, so that the medical director can benchmark data with national and international data sets. This may also allow inclusion of data from recording devices, such as patient monitors or defibrillators, when they are used in the ambulance system.

Patient outcome data should be included whenever possible. The medical director should develop this resource by obtaining data from the facilities or destinations to which patients are transported by the ambulance system, and, when possible, these data should be accessible by prehospital clinicians to obtain feedback. While an electronic data bridge between field and hospital providers can provide rapid, detailed data for appropriate analysis and system feedback, simpler systems such as PP outcome request forms that clinicians at fixed

facilities can use for QI with ambulance systems are also useful to ensure high-quality emergency care.

QI and performance improvement in research in low- and middle-income countries is critically important. Much current prehospital practice is based on experience in high-income countries, and the results of common therapies and the practices of prehospital clinicians outside these settings are largely unknown. Medical directors' involvement in public health education and in improving quality may assist an ambulance system in co-developing and responding to patient-reported outcomes and experiences. Services can thus become truly responsive to community needs and become more community-oriented, with the patient and the extended community at the centre of its operations.

Prehospital research

The importance of research in an ambulance system is to provide information that cannot be extrapolated from studies in hospitals and clinics. Most emergency medical research for guiding medical practice is conducted in fixed facilities, where not only is the physical environment more stable but the resources are likely to be much greater than in the working environment of PPs. While medical directors may be familiar with the research that provides evidence for providing high-quality care, they should seek relevant research, participate when possible in this emerging field of medical research and, if no prehospital-specific studies are available to set system policy and protocol, to interpret or modify hospital and clinic research results to make them relevant to the prehospital environment.

Participation in research is therefore important. Much current research is done in well-resourced environments. Therefore, studies in low- and middle-income countries is all the more valuable to determine the best evidence-based practice. It is the medical director's duty to present the value and benefits of research to system leaders and clinicians.

- PPs should be persuaded that the extra work that research requires results in long-term improvements in their practice and potentially in their work environment.
- EMS administrators should recognize that, while research involves manageable risks and probably minor expense, the long-term payoffs of improving the evidence base for prehospital practice are lower risk and higher benefit, often including better preservation of life and function, resulting in a positive economic outcome for patients and societies.
- The medical director must ensure that participation in research projects conforms to the setting involved, so that PPs and patients do not become

frustrated with unachievable tasks and/or the impossibility of fulfilling patients' requests.
- The medical director must act to change the system, with allies among other system participants. Well-executed research often contributes to PPs' sense of worth, lifts the spirits of providers and helps them to recognize their role in providing good individual patient care and also in improving health-care systems and society.

Many types of prehospital research can be considered. In all cases, QI may benefit from such opportunities. The medical director must therefore be acquainted with basic study design and execution, including the conformity of their system to the requirements of a research oversight body such as an institutional review board or other oversight body to protect research subjects. Numerous standardized research training resources are available.

Public education

Medical directors should also be involved in assessing and providing education to the public on emergency care in their jurisdiction. Members of the public often have to react quickly and appropriately to common medical incidents, which vary from setting to setting. The public must know about the existence and capabilities of the ambulance system, how they can access it and the conditions appropriate for this type of service.

Verification of prehospital provider competency

The medical director must ensure certification by the relevant authority in their jurisdiction of the ability of the PPs to provide the level of care desired. This may be done centrally or by a designated body. Ability is classified into two broad domains:

1. Being physically and emotionally capable of providing care: This domain is judged by the provider's employer and may be subject to health authority regulation in terms of age and physical ability to assist patient mobility, as well as suitability to interact with potentially vulnerable people. In certain circumstances, however, such as health emergencies, the medical director is involved in setting the requirements for entry into the profession while avoiding any form of discrimination and the self-care actions that providers should take in order to render care safely.
2. Being prepared cognitively to provide the care: This domain is the responsibility of the medical director and may be shared with relevant educational authorities. The medical director must review the training records

of providers to ensure that their skill is at the appropriate level for consistent performance in patient assessment, care and transport, if appropriate.

After initial verification of competence, a mechanism should be found to sustain skills in patient care. This could include periodic and regular re-certification (re-creation of the initial certification requirements) and regular, less intensive skills practice, with tracking and review of the provider's performance. While these tasks can be the responsibility of designated bodies or delegated to appropriate individuals, the medical director must remain aware of providers' competence. As part of regular assessments of quality, they should ensure that the appropriate clinical governance structures review the ability of PPs to practise in situations in which doubt is cast on the appropriateness of a provider's actions.

4.7 Other considerations

MCIs

PPs and their organizations must always be prepared to respond to MCIs or surge, when the number of patients outstrips the available resources. Preparedness for these situations requires planning and drills to practise procedures and protocols that are not often used daily. It is the responsibility of the medical director to ensure that the ambulance organization they oversee adheres to the structure and process for emergency care during an MCI of any magnitude and to coordinate such care with public safety bodies in order to minimize death and disability.

In keeping with the responsibilities determined by the ECS regulatory authority, the medical director should ensure the following.

- Training in MCI response and scene safety approved by the ECS regulatory authority is conducted regularly in all prehospital systems and receiving facilities.
- Prehospital components are included in facility and regional emergency response plans.
- The principles and procedures of scene safety are adhered to during an MCI, and all possible steps are taken to minimize risk to PPs, including rapid establishment of an incident command system and appointment of an incident commander.
- MCI field supervisory personnel should understand and fully play their role in direct collaboration with the incident commander. In some systems, a medical director can provide oversight remotely; in others, they may be required on site.
- Efficient communication is established and maintained between field supervisory personnel, the medical director and the facility.

- All the necessary prehospital resources are available or have been requested out of the jurisdiction, as required by the incident commander on the scene.
- Adequate documentation is maintained both on the scene and at the medical control facility.

Mass gatherings and special events

The term "sp ecial events" as used here to refer to a planned increase in the number of potential patients in a given setting. Prehospital response can be hampered if such events are not anticipated and adequate resources are not pre-positioned. The medical director is responsible for ensuring that the ambulance system they oversee implements minimum standards for prehospital care at mass gatherings and special events in order to provide both the community standard of emergency care to participants and to preserve the standard of emergency care to the community outside the event.

In keeping with the responsibilities determined by the ECS regulatory authority, the medical director should ensure that:

- All PPs regularly receive training in special events approved by the ECS regulatory authority.
- A plan is available for prehospital emergency care, which includes designation of an individual as the EMS event director for the event, a communications plan, establishment of aid stations and mobile PP resources, and a safety plan for providers and patients under their care.
- The designated EMS event director understands his or her responsibilities, including the prehospital emergency care plan, training the appropriate personnel in following the plan, and procuring sufficient resources to deliver the medical care required.

CHAPTER 5

Clinical protocols

WHO Academy: Mass Casualty Management Training, France © WHO / Pierre Berendes

5 Clinical protocols

5.1 Introduction and purpose

In the prehospital setting, timely recognition and management of medical emergencies can mean the difference between life and death. Clinical protocols provide structured, evidence-based guidance to ensure that PPs – both basic and advanced – can deliver consistent, high-quality care in unpredictable, high-pressure environments. Protocols are used to standardize assessment and treatment approaches, enhance decision-making and support seamless coordination with health-care facilities.

This chapter presents a series of clinical algorithms that are aligned with international best practice and are adaptable to different health systems. They provide clear, step-by-step recommendations for the management of common life-threatening conditions, ensuring that PPs – regardless of their level of training – deliver safe, effective, timely care. The protocols can support countries in strengthening the delivery of prehospital emergency care, reducing variations in care delivery and improving clinical outcomes.

The clinical protocols are for basic and advanced PPs. They are designed to assist prehospital leaders in ensuring the quality of services provided. Use of these protocols supports provision of people-centred, evidence-based prehospital care.

The 21 clinical protocols in this chapter are available for downloading from WHO's prehospital website. They are intended to be suitable for direct implementation in ambulance systems. In all the protocols, assumptions have been made about scope of practice and available equipment and resources (for example, oxygen saturation monitor or electrocardiogram monitor). These will differ by service, and the protocols should be amended accordingly. As systems are in different stages of development in different settings, some of the content of the protocols may not be directly applicable for all services. They should be adapted to local needs according to context, laws, regulations, resource availability and scope of practice.

Medication charts are provided for basic and advanced providers. These list the indications, dosage and route of administration of the emergency medications cited in the protocols.

While the protocols cover the most common complaints encountered in prehospital emergency care, a protocol will not be perfectly fit every situation. In such cases, medical control should be contacted or the protocols used only for general guidance.

The text of the protocols is kept to a minimum to facilitate their use in clinical practice. Their introduction into service should be accompanied by provider training and medical oversight as part of a QI programme.

Clinical providers working in prehospital settings must always consider their own safety. The protocols provided here do not replace formal training in scene safety and response.

5.2 Use of the clinical protocols

1. Commence your interaction with every patient using the **standard approach**:

- Ensure safety.
- Wear appropriate PPE.
- Greet the patient and identify yourself as a prehospital provider.
- Begin every assessment with a survey to identify and manage immediately life-threatening problems, as detailed in the protocol: *standard approach to all patients*.
  - The CABCDE approach should be used in the first 5 minutes and repeated when a patient's condition changes. This approach is used in both adults and children, although some aspects of assessing and managing children are different from those in adults.
  - Always check for danger signs in children.

2. Depending on the patient's presenting complaint, **use the relevant clinical protocol** to guide assessment and management.

3. **Follow the protocol to assess and manage the patient**. Follow the protocol from top to bottom, ideally completing each action before progressing to the next (if you are a single provider; a clinical team can do several steps in parallel). Note that some protocols include cross-references to other protocols: check the other protocol for relevant management steps.

4. **Use the colour-coded text** to determine whether you are authorized to perform certain tasks or to administer certain medications according to your scope of practice:
   - black text: to be done by all providers
   - red text: to be done only by advanced providers.

5. **Use the symbols to guide decisions on care and management**:
   - Blue diamond – clinical decision (e.g. "Active bleeding" – if active bleeding is evident, follow the arrow to the right ("Yes"); otherwise, continue to the next step of the protocol).

   - Grey rectangle – action (e.g. "Wheezing → bronchodilator". If there is wheezing, administer a bronchodilator by the most appropriate route within the scope of practice.)

   - Yellow rectangle – information. These boxes provide details for clinical decision-making and management.

   - Pink rhomboid – cross-reference to another protocol.

   - Red rectangle – recommend reference to medical control for advice.

6. Several of the protocols refer to "per local protocol". In these cases, **follow local guidance in clinical decision-making**.
7. In most protocols, medications are identified by name only. **Use the medication charts to calculate drug doses and determine the route of administration**. Use clinical judgement to decide whether to use weight-based calculations for older children and adolescents.
8. On completion of a specific clinical protocol, **follow the standard approach**:
   - Place the patient in a position of comfort.
   - Transport to the closest, most appropriate destination.
   - Document your care and hand over the patient.

Special considerations in the assessment of children:

The protocols apply to both adults and children, unless specified otherwise. For use of the protocols for children, this chapter provides ranges of normal vital signs, danger signs and special considerations.

Special considerations in the assessment of women and girls:

Always consider the possibility of pregnancy. Later stages of pregnancy change a woman's physiology and anatomy, and this should be taken into consideration in assessment and management. In some circumstances, pregnancy will change clinical management – for example, certain medications should be avoided.

Destination triage may also be affected by a pregnancy: a shocked woman with a possible ruptured ectopic pregnancy should be taken to the closest facility with emergency surgical services, for example, or a patient might have to be taken straight to the labour and delivery suite instead of the general emergency unit.

CPR:

A decision about whether CPR is appropriate for a patient depends on many factors, including the cause of the condition, available resources and relevant institutional protocols and practices. In many situations, it may be appropriate to initiate but then terminate CPR after a certain interval; in others, CPR may be inappropriate. The decision about whether to initiate CPR and when to stop may differ by region, and protocols should be developed in advance by the relevant authorities. Decisions should be made case by case according to local protocols and in discussion with medical control.

While the protocols presented here address several aspects of resuscitation, they do not cover general CPR protocols. Medical directors should determine appropriate CPR protocols.

5.3 Clinical protocols

NORMAL ADULT VITAL SIGNS

Pulse rate: 60–100 beats per minute
Respiratory rate: 10–20 breaths per minute
Systolic blood pressure >90 mmHg
Oxygen Saturation > 92%

Estimating systolic blood pressure
(not reliable in children and the elderly):
Carotid (neck) pulse → SBP ≥ 60 mmHg
Femoral (groin) pulse → SBP ≥ 70 mmHg
Radial (wrist) pulse → SBP ≥80 mmHg

SAMPLE History

Signs & Symptoms
Allergies
Medications
PMH
Last oral intake
Events

SPECIAL CONSIDERATIONS IN THE ASSESSMENT OF CHILDREN

A

- Children have bigger heads and tongues, and shorter, softer necks than adults. Position airway as appropriate for age.
- Always consider foreign bodies.

B

- Look for signs of increased work of breathing (e.g. chest indrawing, retractions, nasal flaring).
- Listen for abnormal breath sounds (e.g. grunting, stridor, or silent chest).

AGE	NORMAL RESPIRATORY RATE (breaths per minute)
<2 months	40–60
2–12 months	25–50
1–5 years	20–40

C

- Signs of poor perfusion in children include: slow capillary refill, decreased urine output, lethargy, sunken fontanelle, poor skin pinch.
- Look for signs of anaemia and malnourishment (adjust fluids).
- Remember that children may not always report trauma and may have serious internal injury with few external signs.

AGE (in years)	NORMAL HEART RATE (beats per minute)
<1	100–160
1–3	90–150
4–5	80–140

D

- Always check AVPU.
- Hypoglycaemia is common in ill children.
- Check for tone and response to stimulus.
- Look for lethargy or irritability.

E

INFANTS AND CHILDREN HAVE DIFFICULTY MAINTAINING TEMPERATURE

- Remove wet clothing and dry skin thoroughly. Place infants skin-to-skin when possible.
- For hypothermia, cover the head (but be sure mouth and nose are clear).
- For hyperthermia, unbundle tightly wrapped babies.

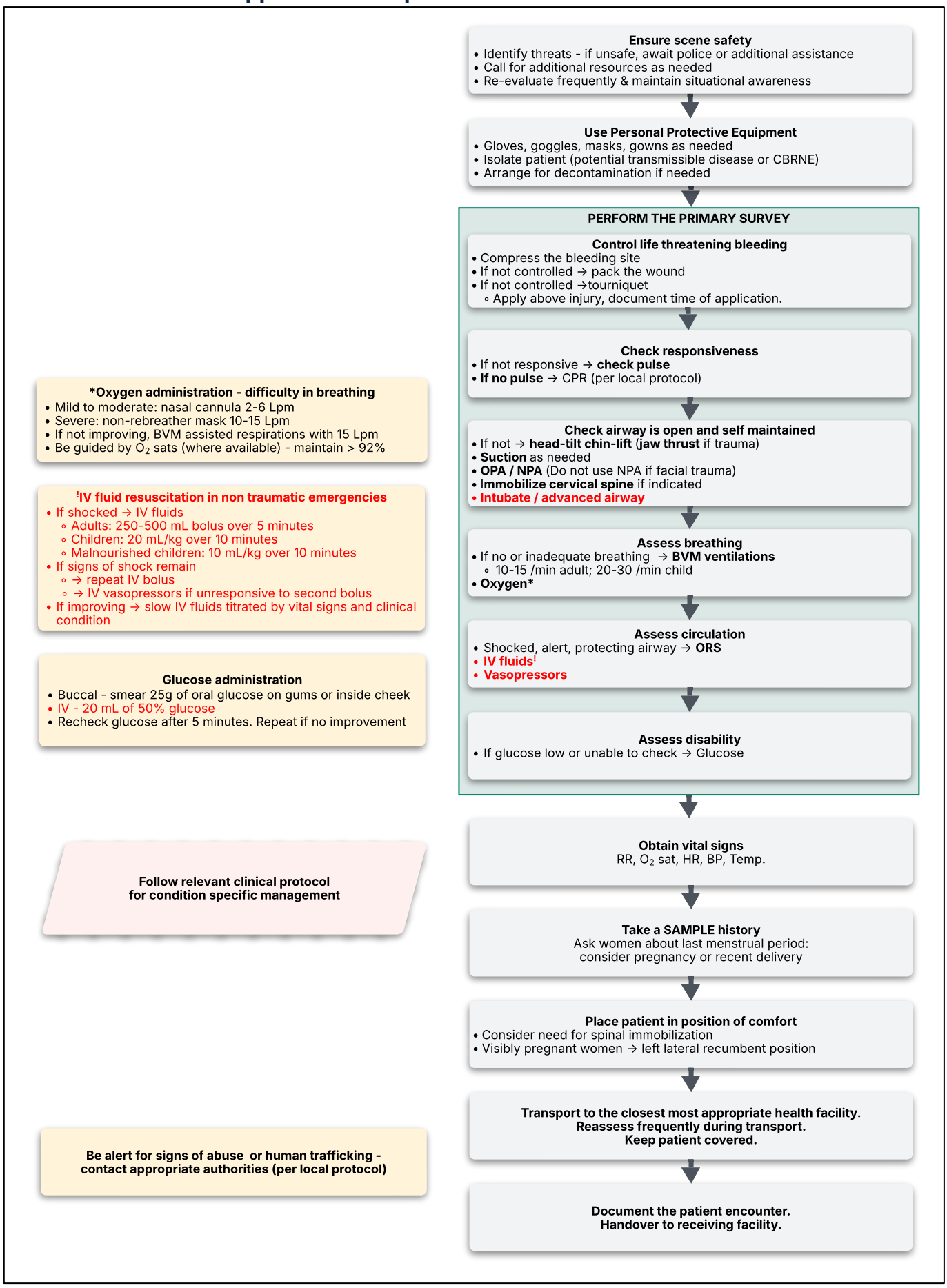
DANGER SIGNS IN CHILDREN

- Signs of airway obstruction (unable to swallow saliva/ drooling or stridor)
- Increased breathing effort (fast breathing, nasal flaring, grunting, chest indrawing or retractions)
- Cyanosis (blue colour of the skin, especially at the lips and fingertips)
- Altered mental status (including lethargy or unusual sleepiness, confusion, disorientation)
- Moves only when stimulated or no movement at all (AVPU other than "A")
- Not feeding well, cannot drink or breastfeed or vomiting everything
- Seizures/convulsions
- Low body temperature (hypothermia)

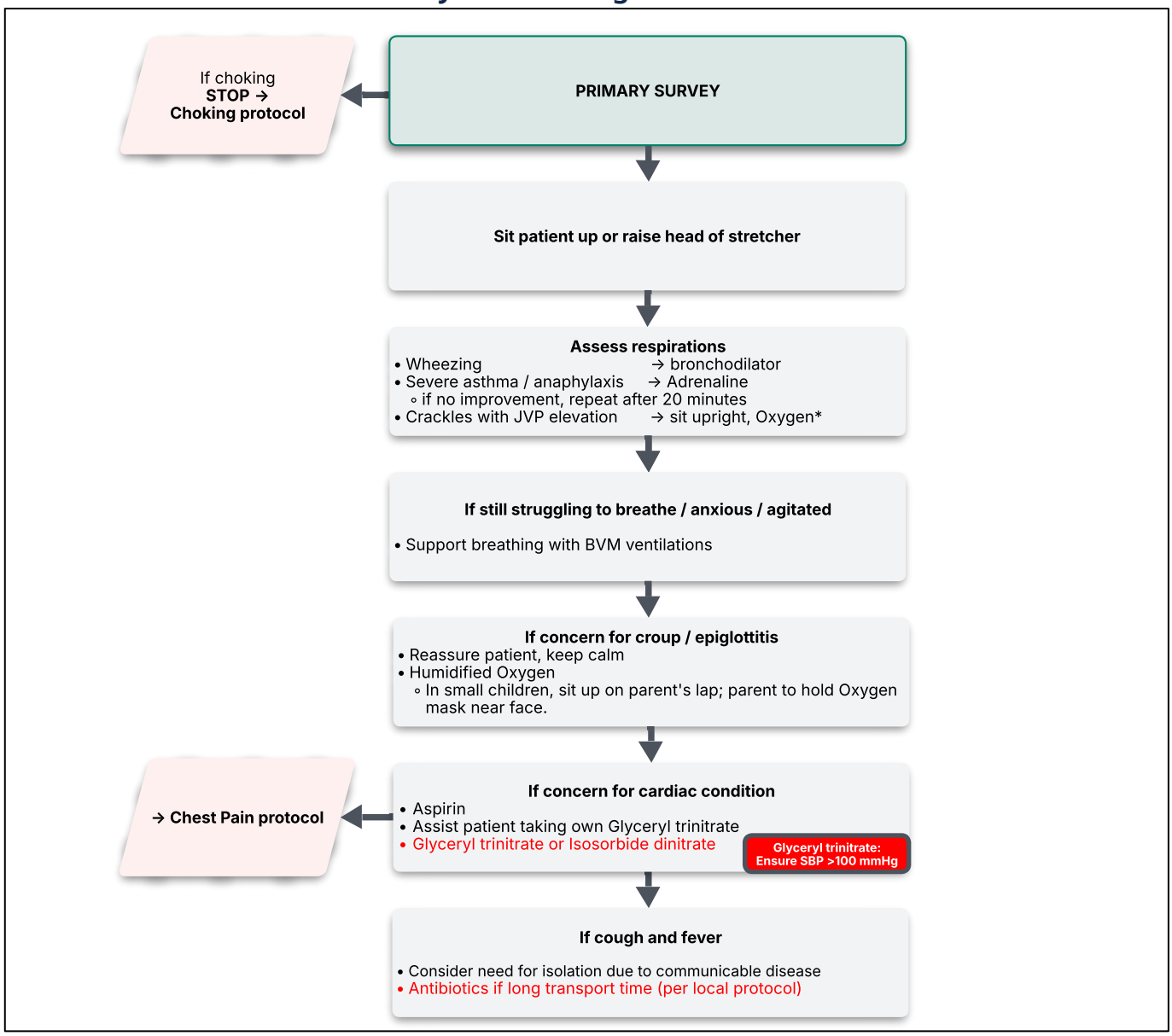
ESTIMATED WEIGHT in KILOGRAMS for CHILDREN 1–10 YEARS OLD:

[age in years + 4] x 2

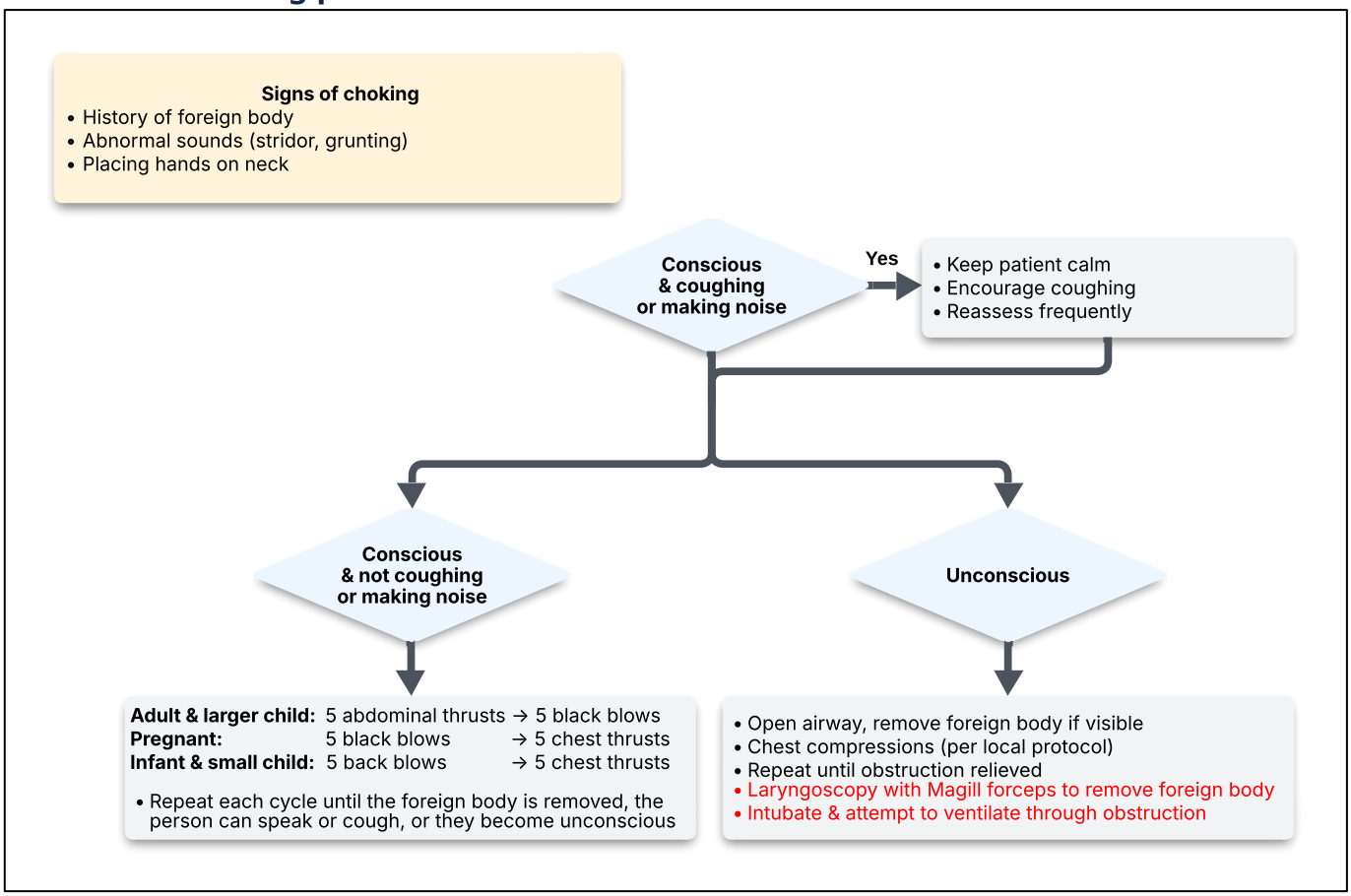
5.3.1 Standard approach to all patients



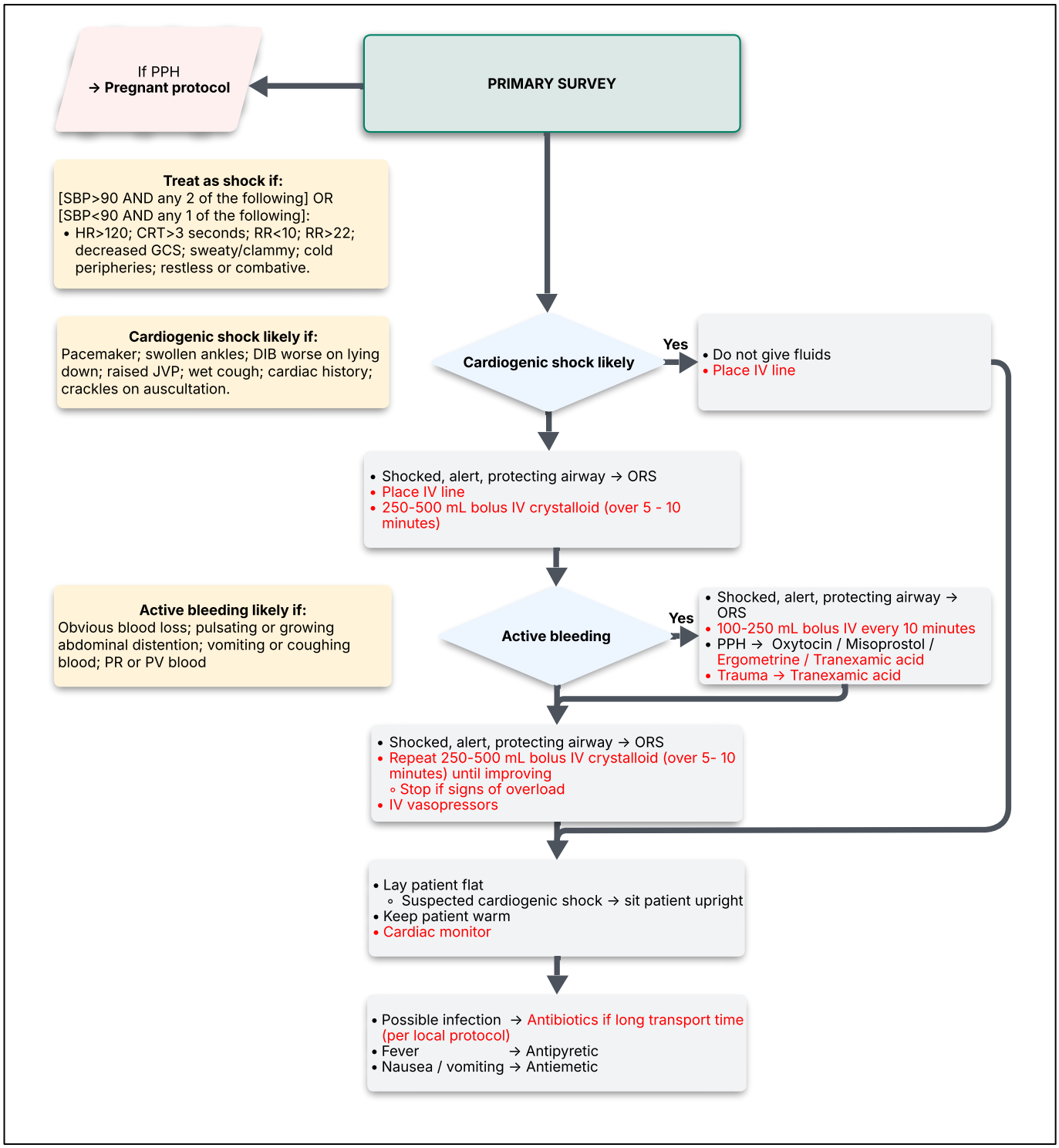
5.3.2 Patient with difficulty in breathing



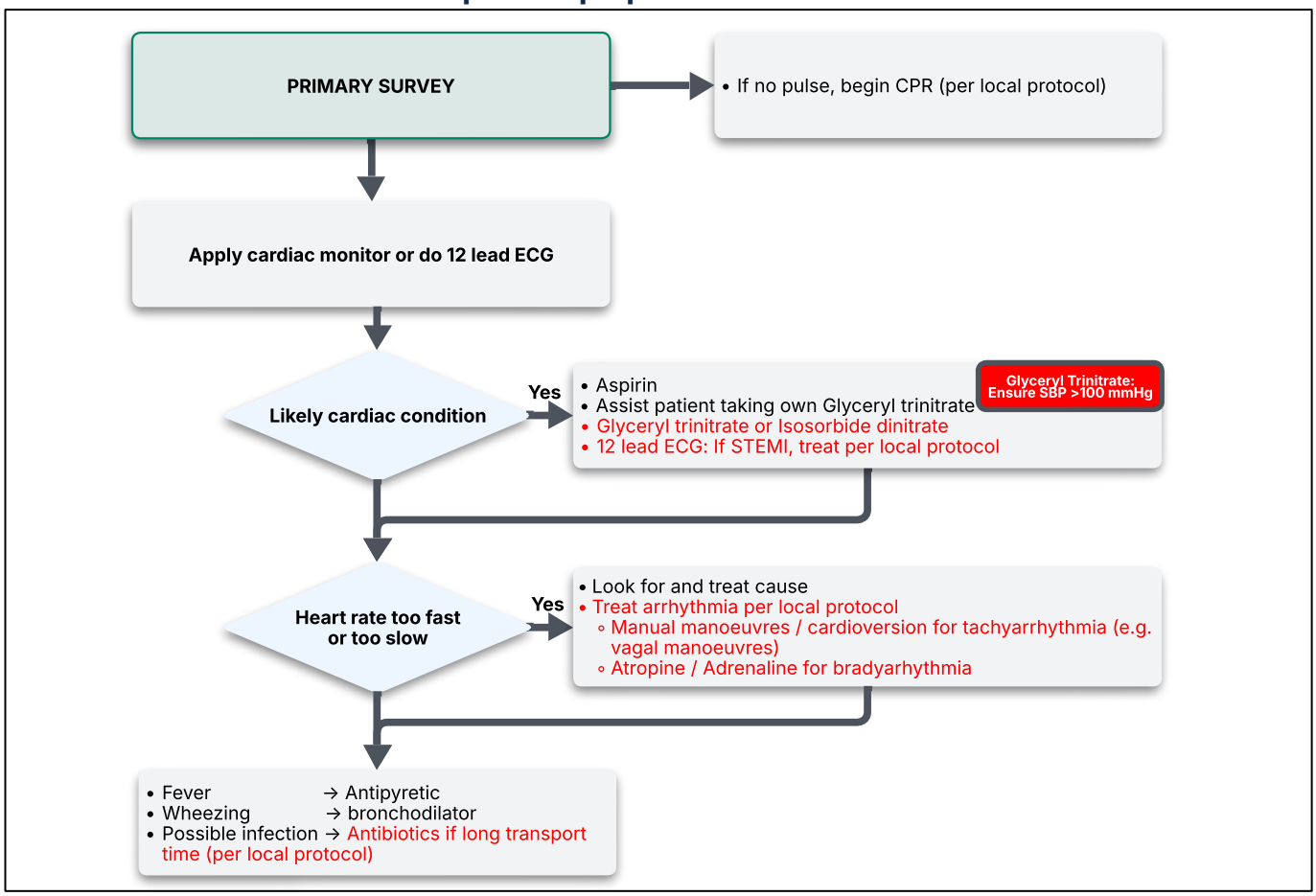
5.3.3 Choking patient



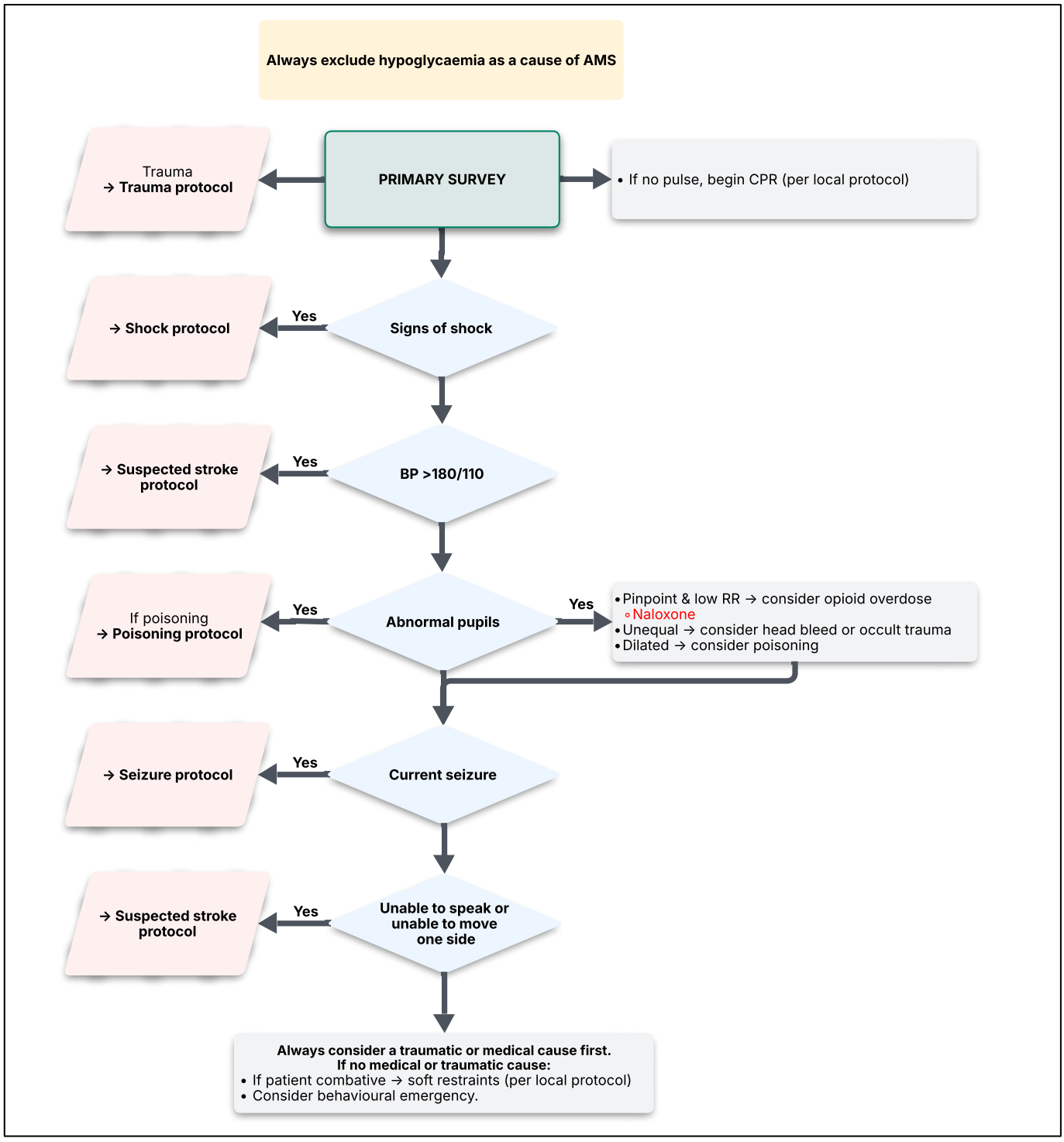
5.3.4 Patient in shock



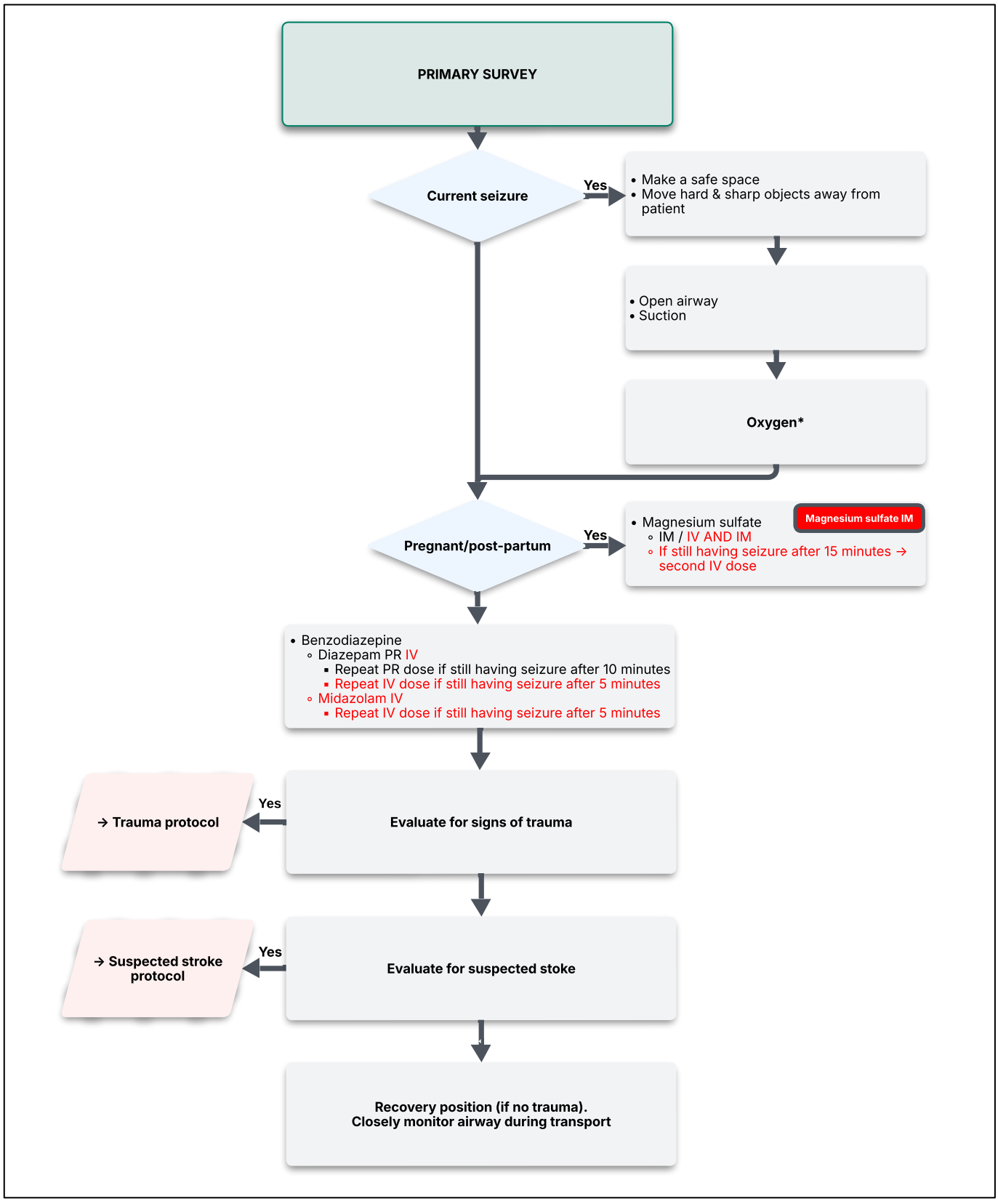
5.3.5 Patient with chest pain or palpitations



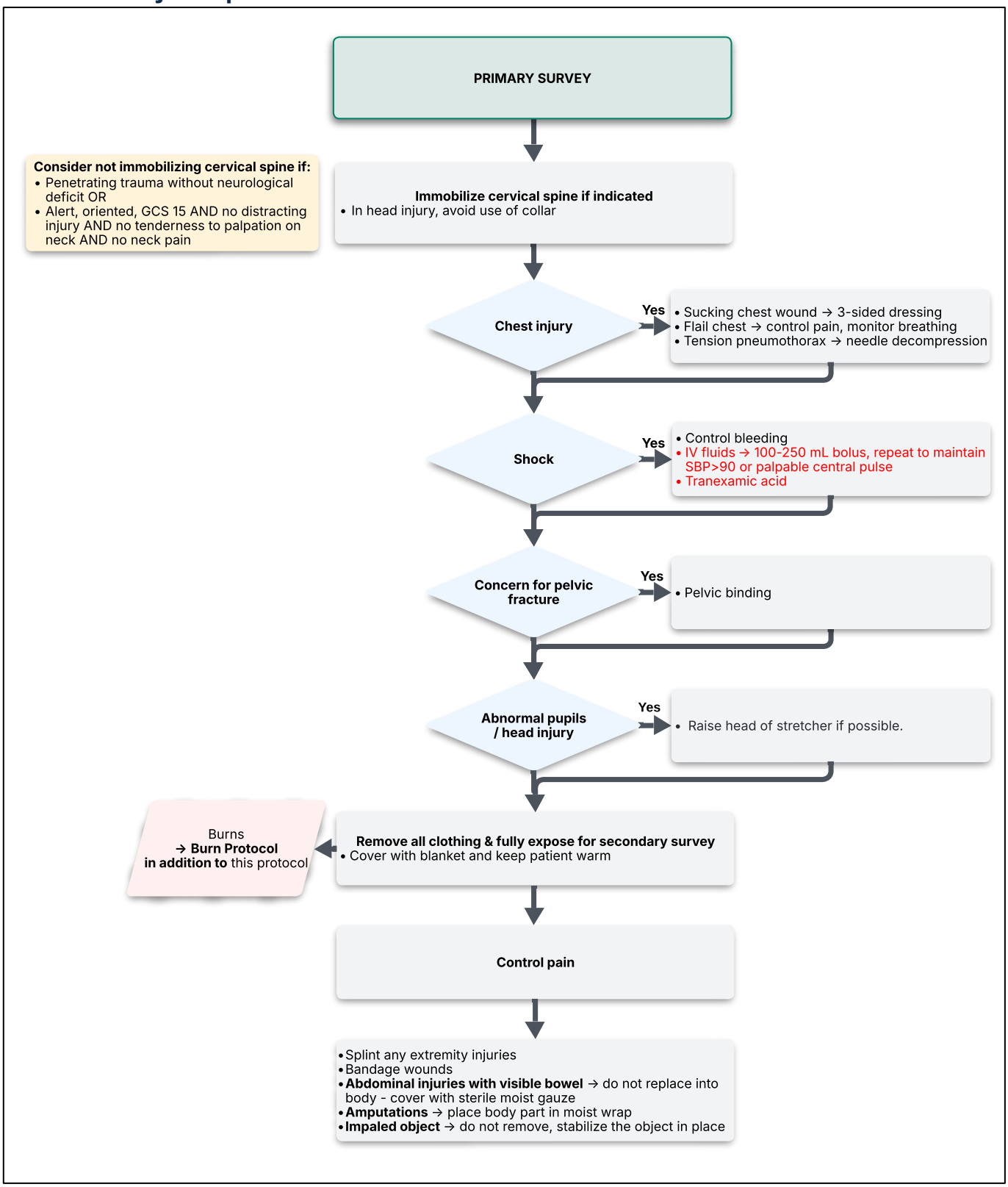
5.3.6 Patient with altered mental status



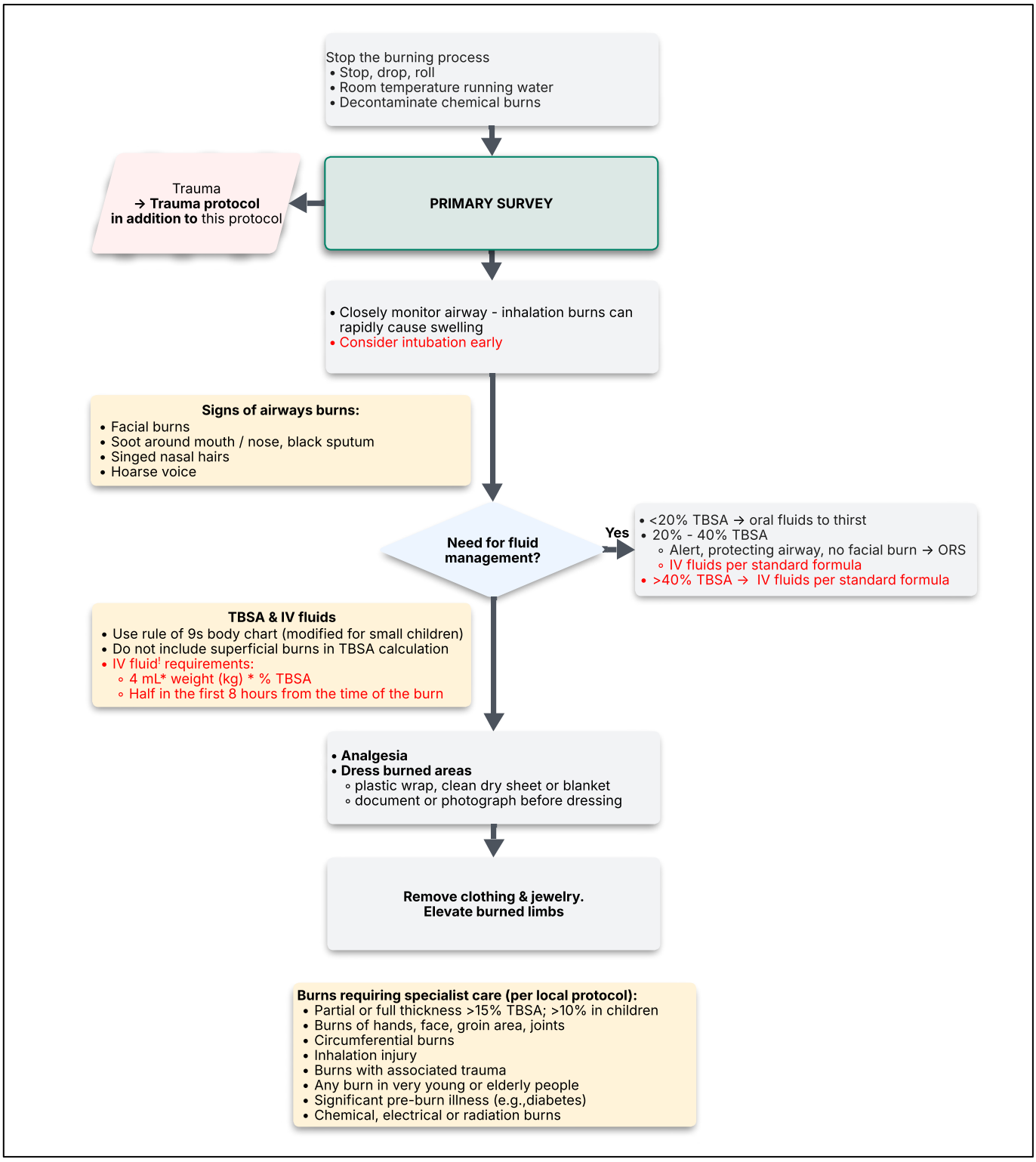
5.3.7 Patient with seizures



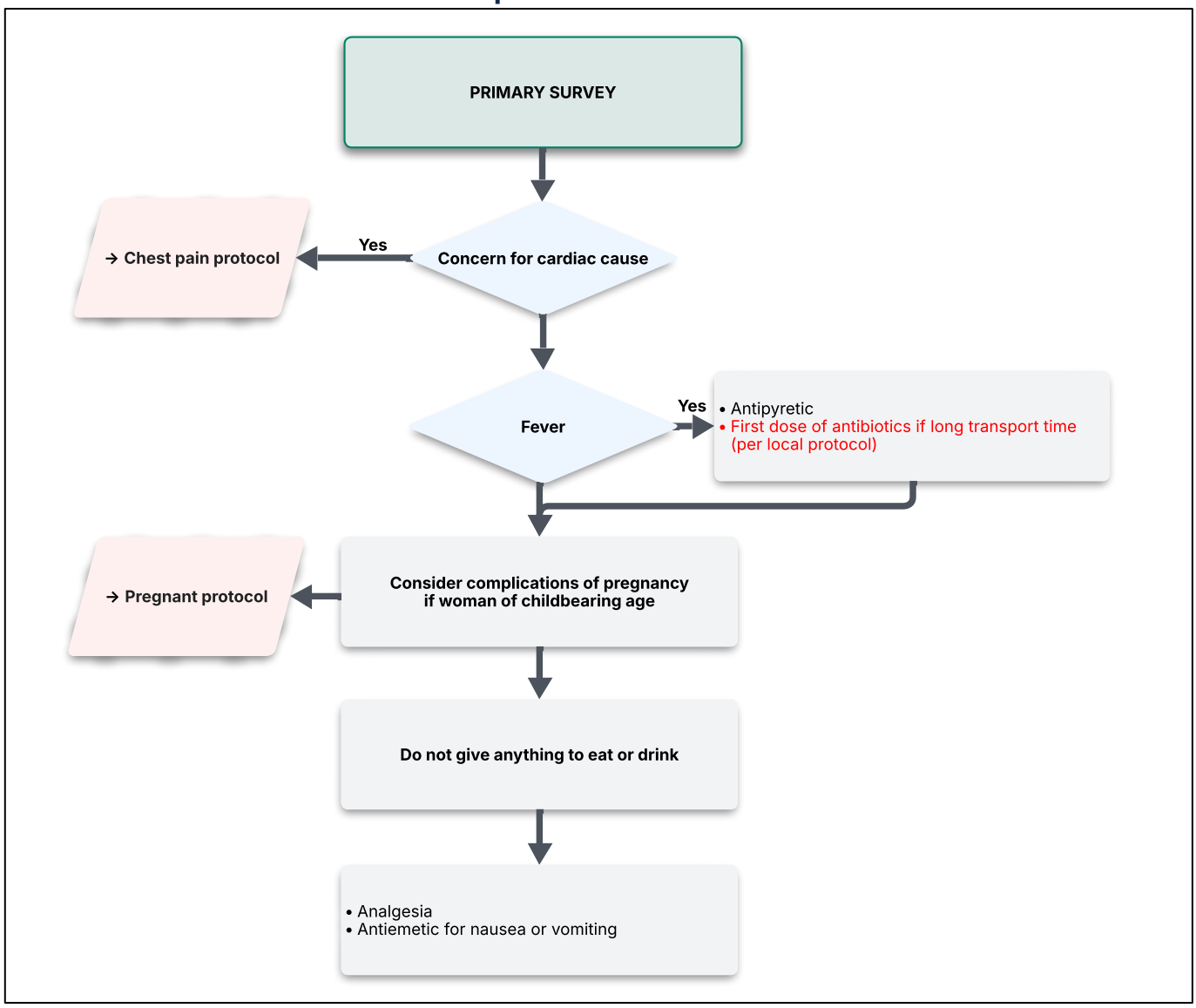
5.3.8 Injured patient



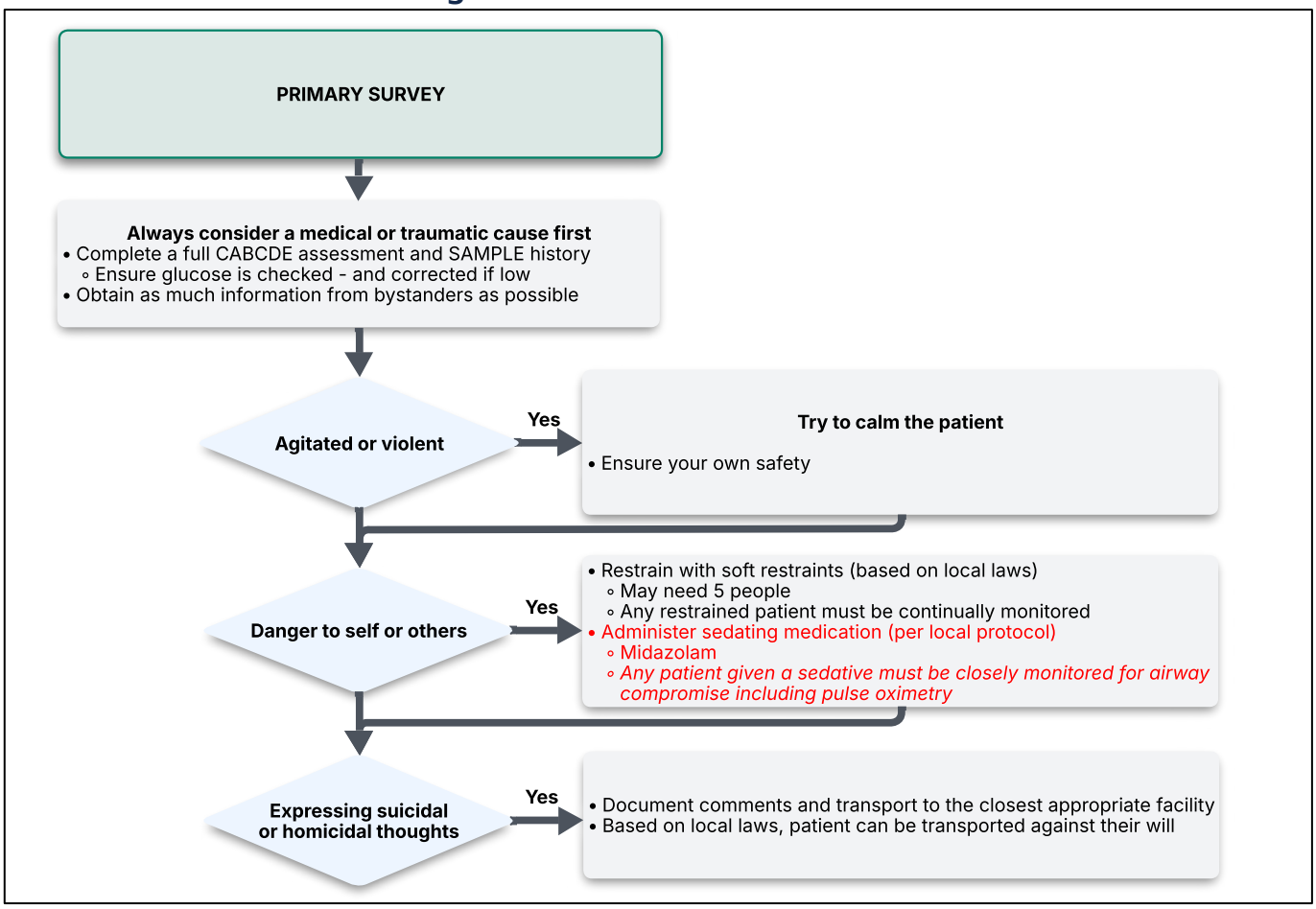
5.3.9 Patient with burns



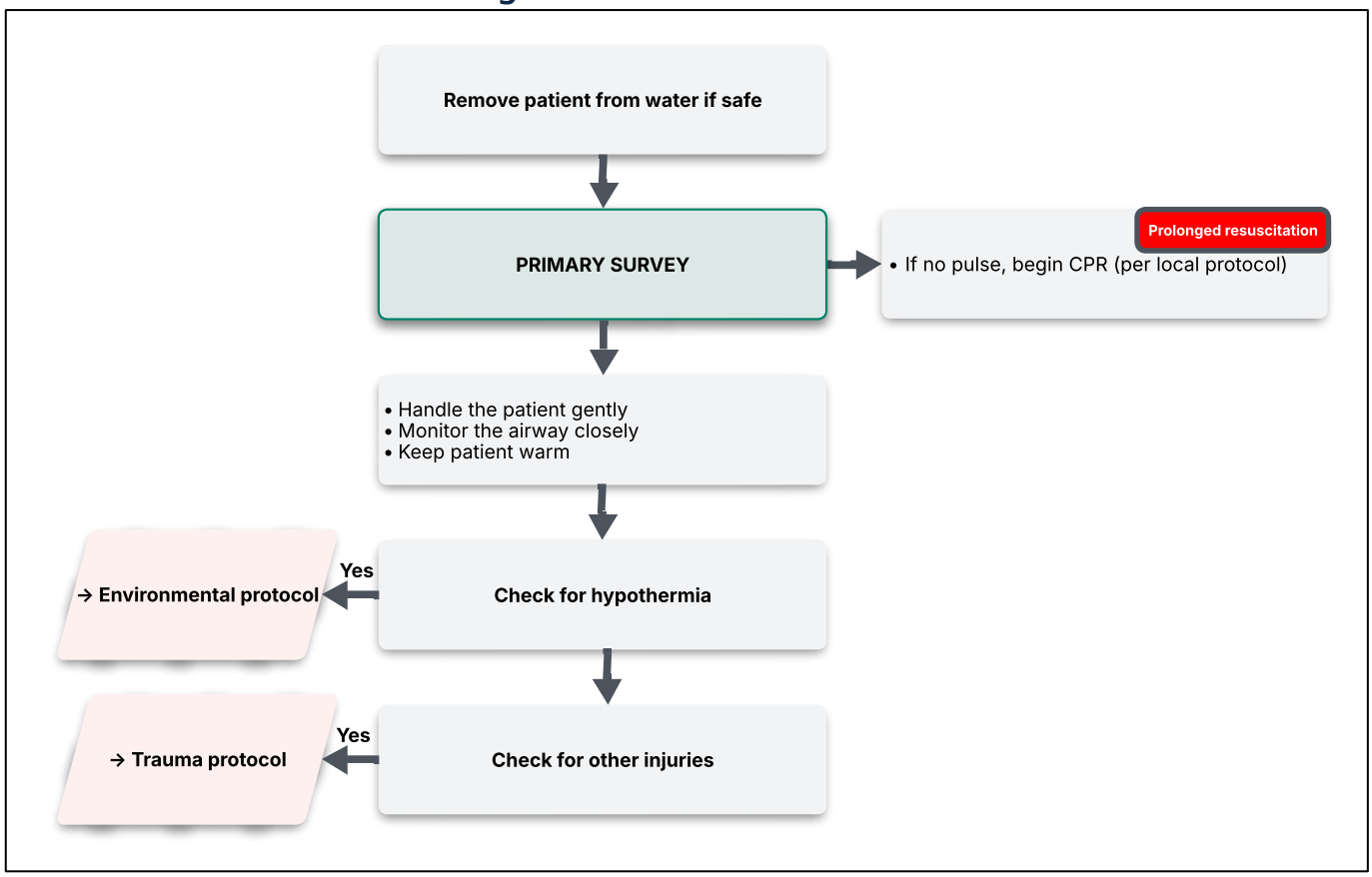
5.3.10 Patient with abdominal pain



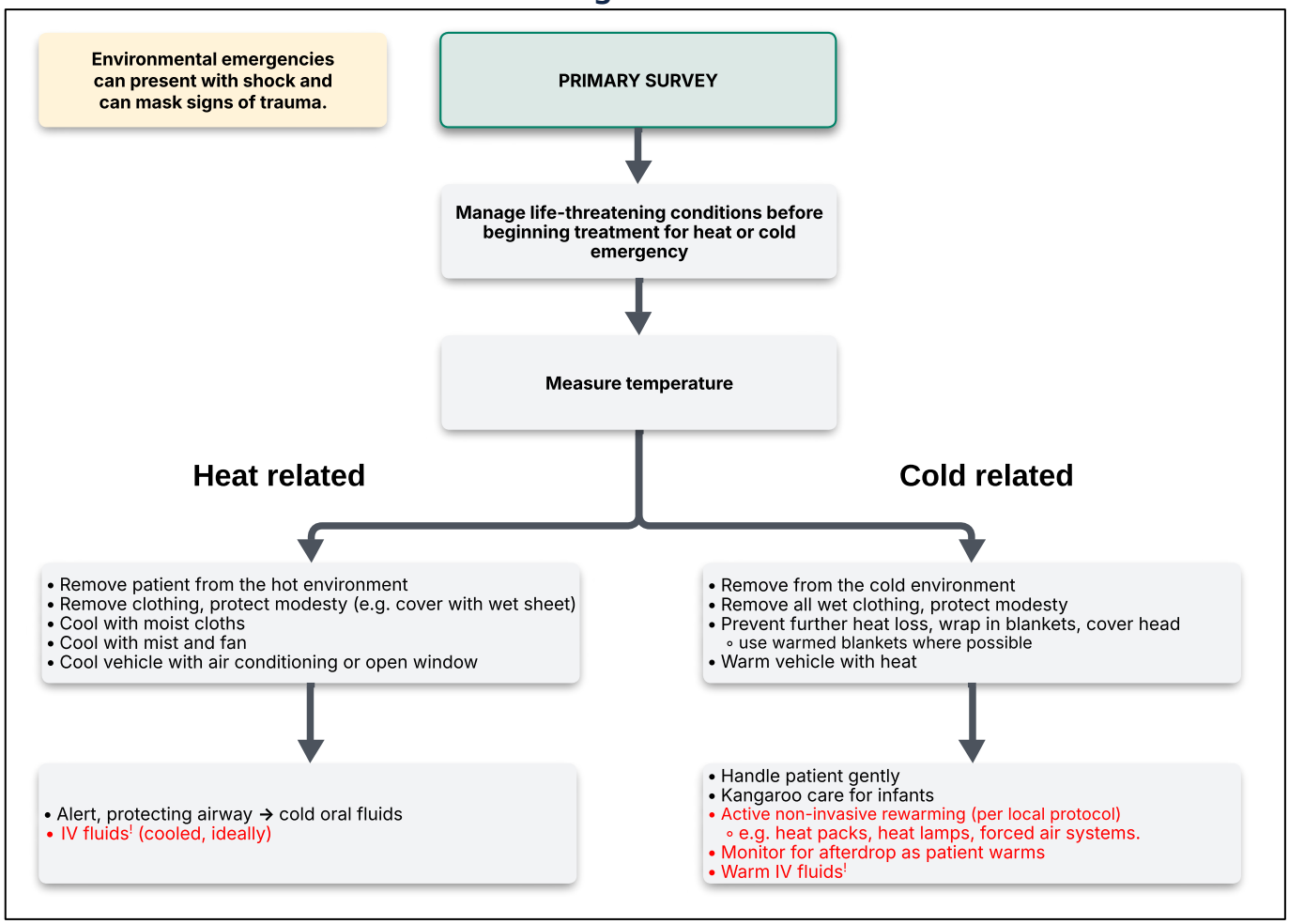
5.3.11 Behavioural emergencies



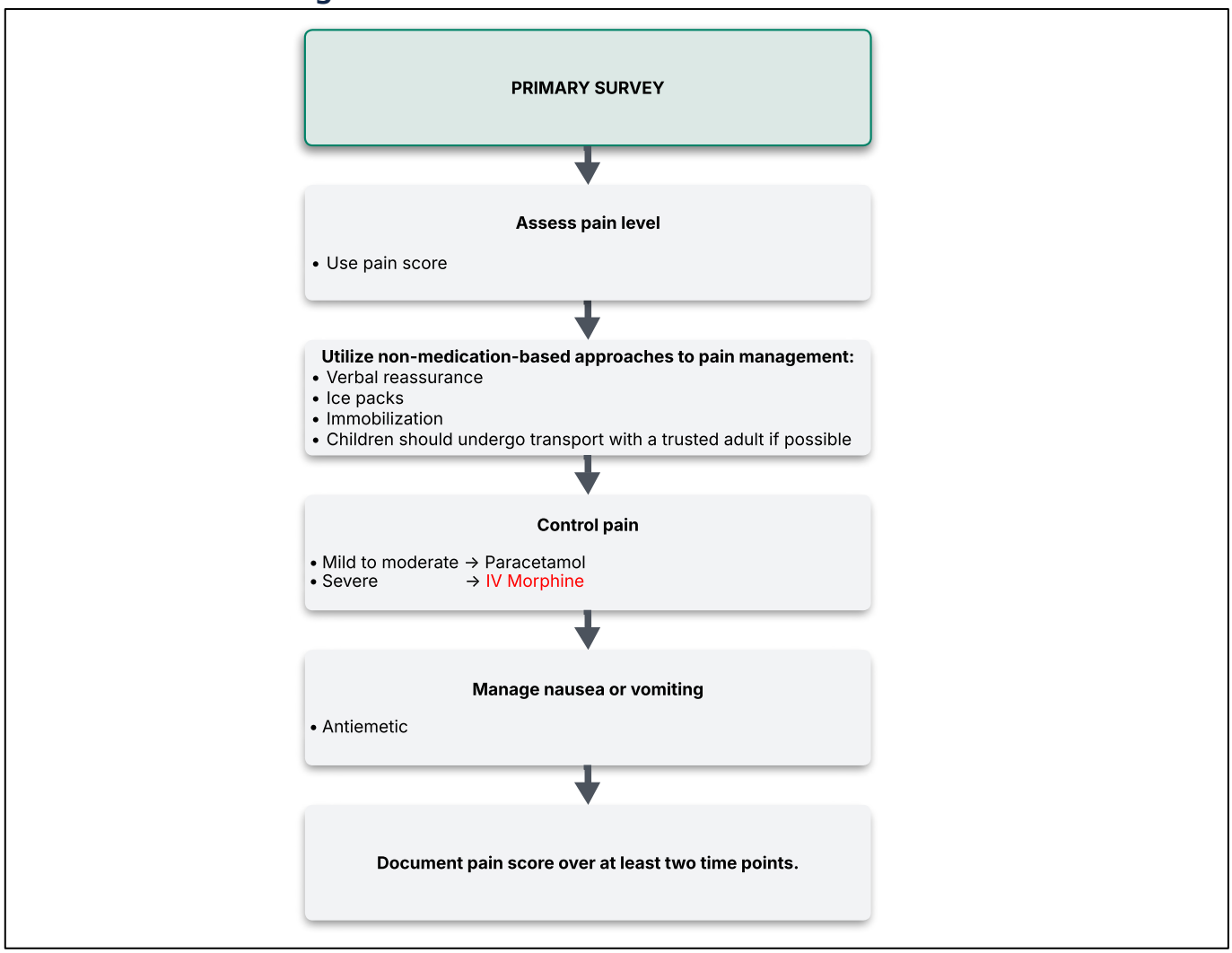
5.3.12 Survivor of drowning



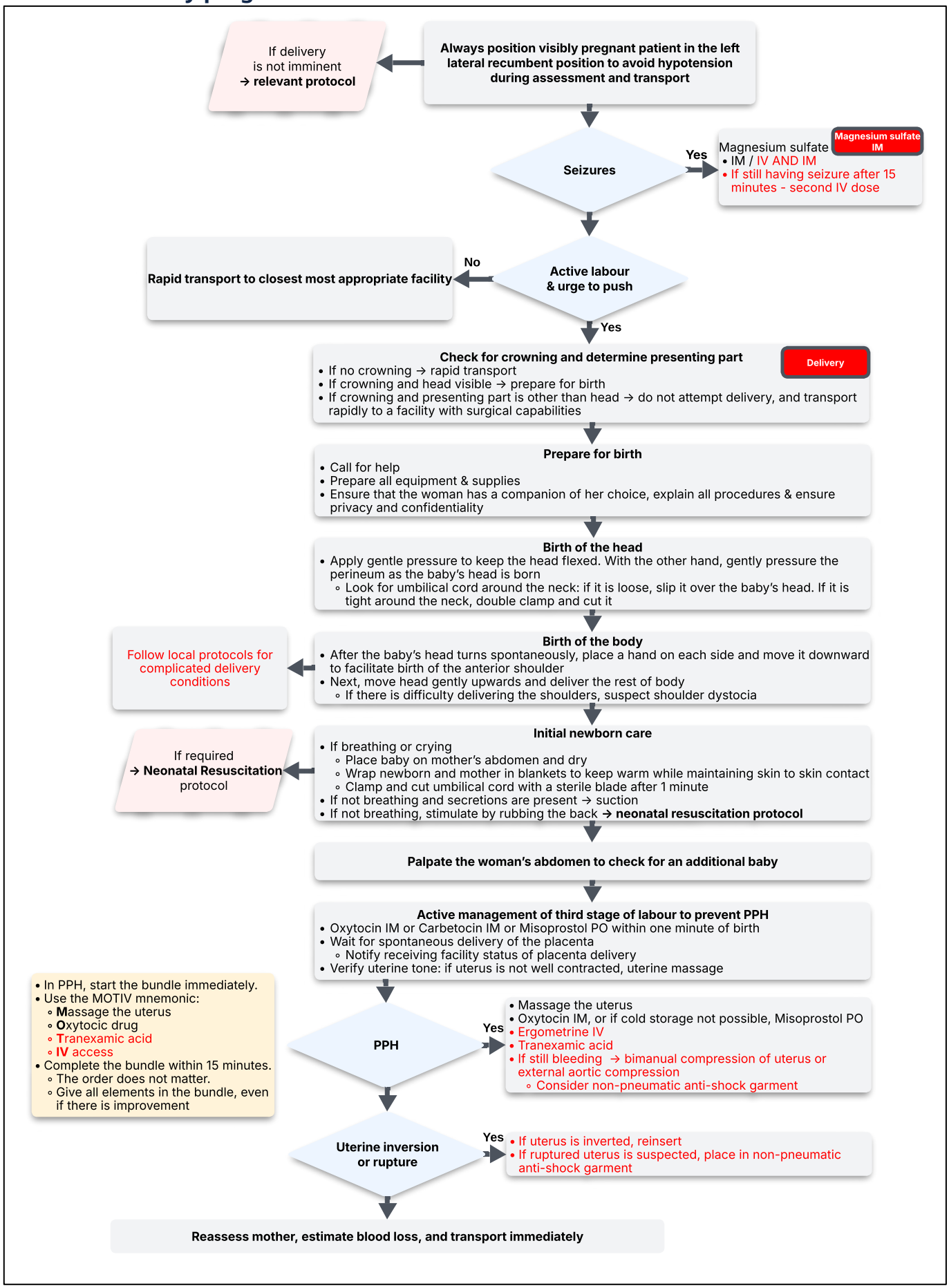
5.3.13 Heat- and cold-related emergencies



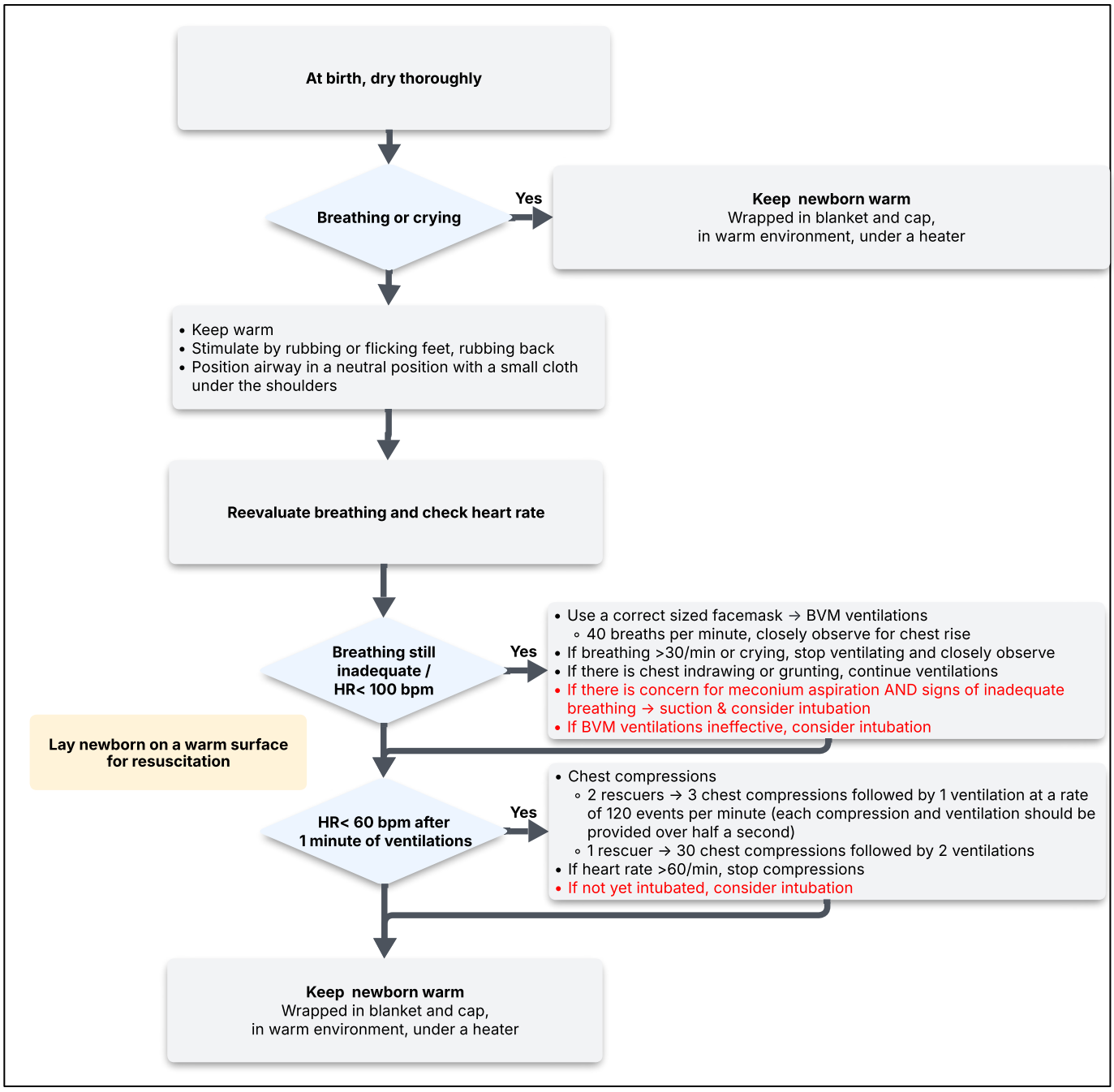
5.3.14 Pain management



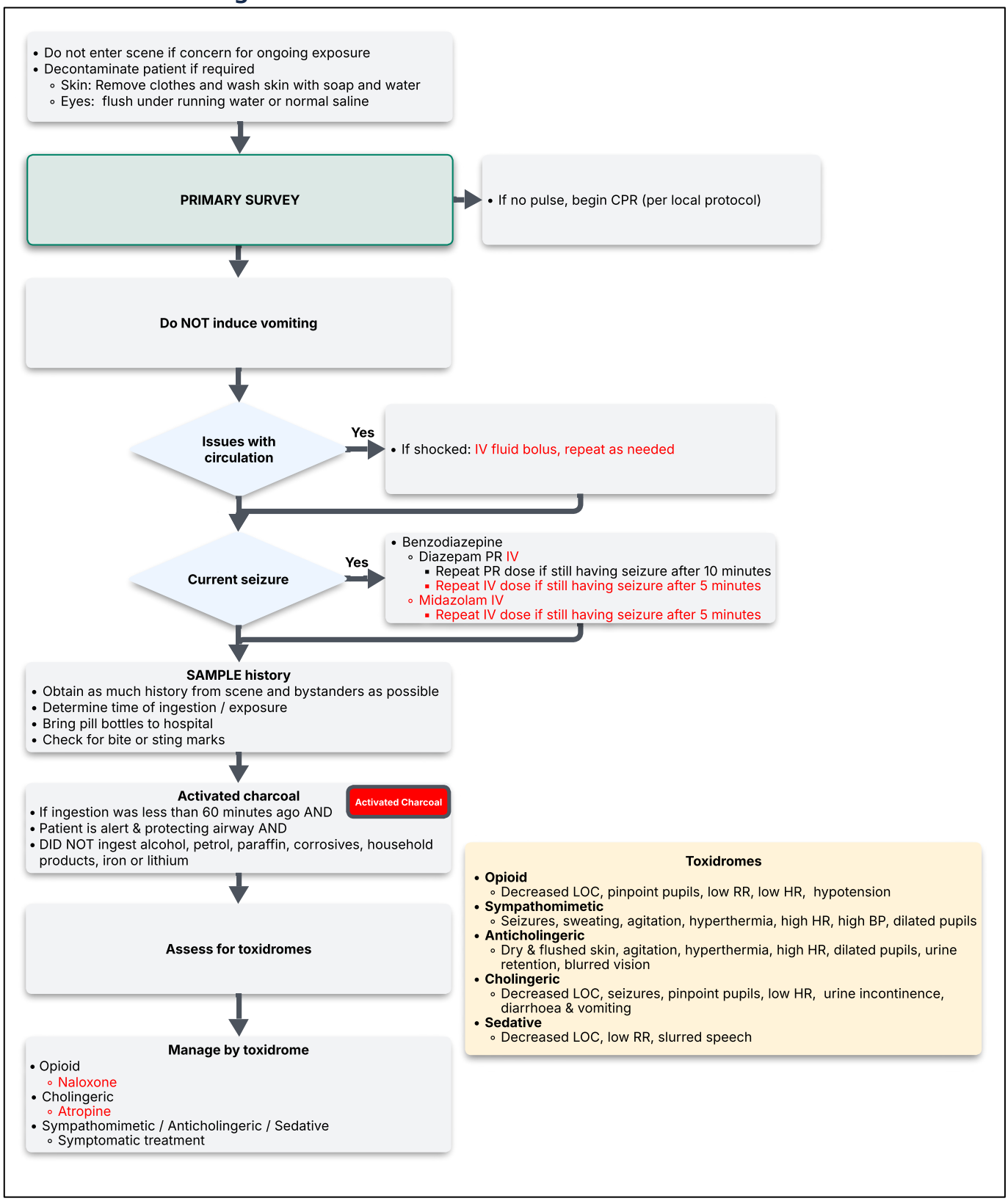
5.3.15 Visibly pregnant woman



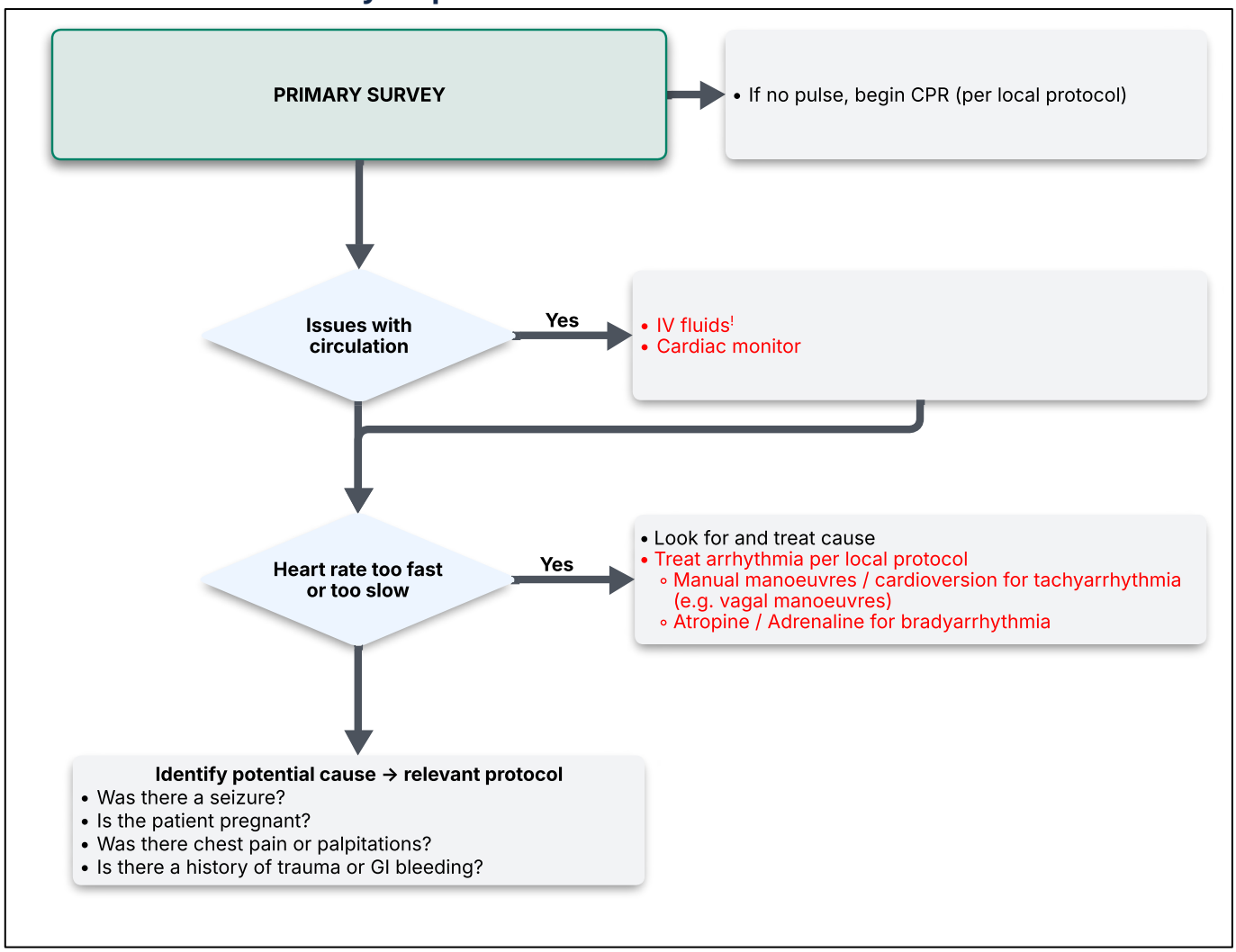
5.3.16 Neonatal resuscitation



5.3.17 Poisoning or overdose



5.3.18 Patient with syncope



5.3.19 Suspected sepsis

Suspect sepsis in ADULTS if all 3 are present:
- Evidence of an infection AND
- Physiologic derangement AND
  - HR>90, RR>20, temp <36 or >38, confusion or AMS
- Signs of shock
  - HR>130, RR>30, SBP<90, VP or U on AVPU

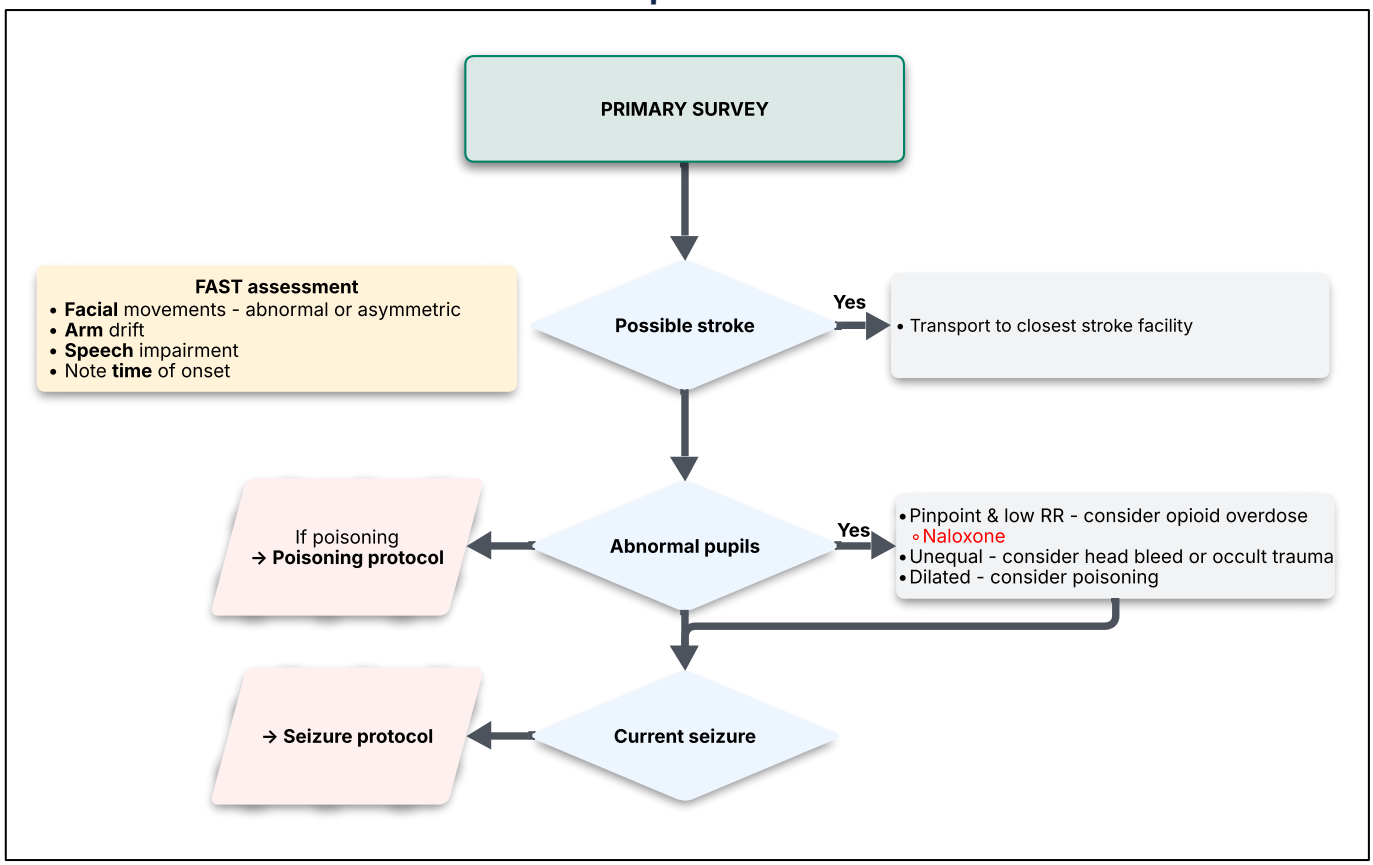
Suspect sepsis in CHILDREN if:
- Evidence of an infection AND
- Signs of shock
  - feeble rapid pulse, rapid breathing, cool or pale extremities
  - altered mental status

PRIMARY SURVEY

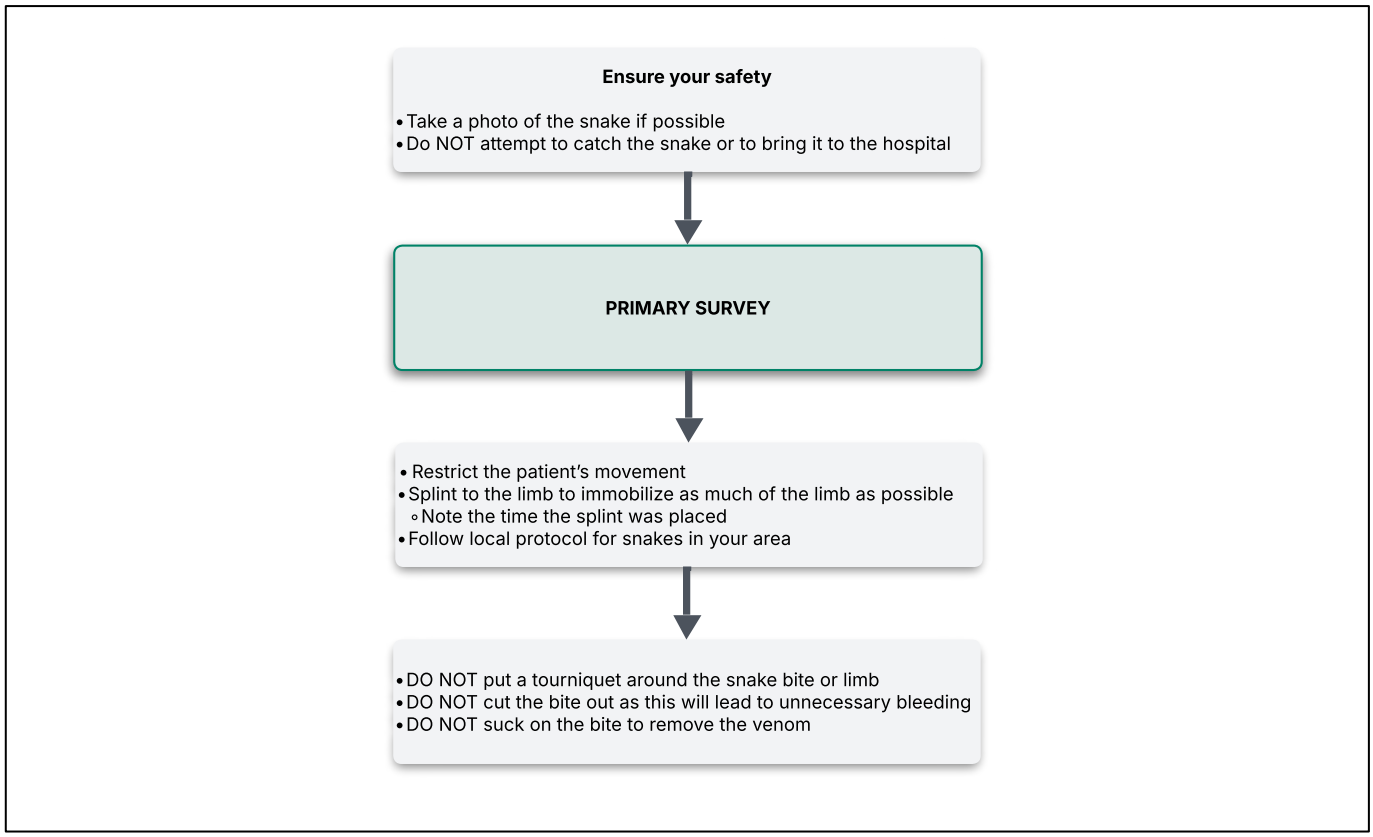
- Shocked, alert, protecting airway → ORS
- If shocked → IV fluids
  - Adults: 30 mL/kg crystalloid bolus
  - Children: 20 mL/kg crystalloid bolus
  - Malnourished children: 10 mL/kg crystalloid bolus
- If signs of shock remain → repeat IV bolus
- If signs of shock remain → IV vasopressors
- Cardiac monitor

- Fever → Antipyretic
- Antibiotics if long transport time (per local protocol)
- Identify the potential source of infection if possible
  - Wound cleaning if long transport time (per local protocol)

5.3.20 Patient with weakness or suspected stroke



5.3.21 Patient with snakebite



5.4 Prehospital medications

Prehospital medications: basic ambulance provider

MEDICATION	DOSAGE	INDICATION
Acetylsalicylic acid (Aspirin)	**Oral tablet: 300 mg** 300 mg (preferably chewed or in water) immediately as single dose.	Concern for acute coronary syndrome
Activated charcoal	**Powder or liquid suspension.** **Adults**: 50-100 g (1 g/kg) **PO** **Children**: 1 g/kg **PO** Avoid if ingested household products, paraffin, petrol, corrosive poisons (acids/bases), iron, lithium, or alcohol.	Poisoning
Adrenaline (Epinephrine)	**Solution: 1 mg in 1 mL ampoule (1:1000)** **Adults:** 50 kg or above: 0.5 mg **IM** (0.5 mL of 1:1000) 40 kg: 0.4 mg **IM** (0.4 mL of 1:1000) 30 kg: 0.3 mg **IM** (0.3 mL of 1:1000) Repeat every 5 minutes as needed. **Children:** **Anaphylaxis**: 0.15 mg **IM** (0.15 mL of 1:1000). Repeat every 5 minutes as needed. **Severe Asthma**: 0.01 mg/kg **IM** up to 0.3 mg. Repeat every 15 minutes as needed.	Anaphylaxis/severe allergic reaction and severe wheezing
Carbetocin	**Solution: 100 mcg in 1 mL** Give a single dose of 100 mcg **IM** following a vaginal delivery.	Prevention of postpartum haemorrhage
Diazepam	**Rectal solution: 2 mg per mL** **Adults:** First dose: 10 mg **PR** Second dose after 10 minutes: 10 mg **PR** **Children:** First dose: 0.5 mg/kg **PR** Can repeat half of first dose after 10 minutes if seizures/convulsions continue. **MONITOR BREATHING CLOSELY in all patients given diazepam.**	Seizures/convulsions
Glucose (Dextrose)	**Solution: 50% dextrose (D50)** 2–5 mL of 50% dextrose **OR** sugar solution in buccal space.	Hypoglycaemia
Magnesium sulfate	**Solution: 1 g in 2 mL ampoule , 5 g in 10 mL ampoule (50% or 500 mg/mL)** 10 g **IM** (5 g in **each** buttock). **If transport delays continue:** Give 5 g of 50% solution **IM** in alternate buttocks every 4 hours.	Eclampsia or pregnant with seizure/convulsion
Metoclopramide	**Oral tablet: 10 mg (hydrochloride); oral liquid: 5 mg/5 mL** **Adults**: 10 mg **PO** stat **Children and adolescents**: 0.1-0.2 mg/kg **PO**; max 10 mg/dose.	Nausea/ vomiting

MEDICATION	DOSAGE	INDICATION
Misoprostol PO	**Oral tablet: 200 µg** Prevention: 600 µg **PO** stat Treatment: 800 µg **SL** stat.	Prevention and treatment of postpartum haemorrhage
Ondansetron	**Oral solid: 4 mg, 8 mg; oral liquid: 4 mg/5 mL** **Adults**: 4-8 mg **PO** stat **Children**: **PO** <15 kg: 0.2 mg/kg/dose; 15 to 30 kg: 4 mg; >30 kg: 8 mg Not to be given in children 1 month or younger.	Nausea/ vomiting
Oxytocin	**Solution: 10 IU in 1 mL ampoule** **Immediately after birth / identifying haemorrhage:** give 10 IU **IM** **If placenta manually removed / uterus does not contract:** repeat 10 IU **IM.**	Prevention and treatment of postpartum haemorrhage
Paracetamol (acetaminophen)	**Oral tablet: 250 mg, 500 mg**; **rectal suppositories: 250 mg, 500 mg** **Adults:** 500 mg–1 g **PO/PR** every 6 hours Max 4 g daily or max 2 g daily if liver impairment/ cirrhosis **Children:** 10–15 mg/kg **PO/PR** up to four times per day.	Mild to moderate pain, fever, headache
Salbutamol (Albuterol)	**Inhaler: 100 mcg per puff** **Adults:** Prime with 5 puffs and give 2 puffs via spacer every 2 minutes until improved. **Children:** Prime with 5 puffs and give 2 puffs into spacer. Keep spacer in mouth for 3–5 breaths. Repeat until 6 puffs given for < 5 years, or 12 puffs for > 5 years. For severe wheezing, above doses can be given several times in an hour.	Severe wheezing

Prehospital medications: advanced ambulance provider

MEDICATION	DOSAGE	INDICATION
Acetylsalicylic acid (Aspirin)	**Oral tablet: 300 mg** 300 mg (preferably chewed or in water) immediately as single dose.	Concern for acute coronary syndrome
Activated charcoal	**Powder or liquid suspension.** **Adults**: 50-100 g (1 g/kg) **PO** **Children**: 1 g/kg **PO** Avoid if ingested household products, paraffin, petrol, corrosive poisons (acids/bases), iron, lithium, or alcohol.	Poisoning
Adrenaline (Epinephrine)	**Solution: 1 mg in 1 mL ampoule (1:1000)** **Adults:** 50 kg or above: 0.5 mg **IM** (0.5 mL of 1:1000) 40 kg: 0.4 mg **IM** (0.4 mL of 1:1000) 30 kg: 0.3 mg **IM** (0.3 mL of 1:1000) Repeat every 5 minutes as needed **Children:** **Anaphylaxis**: 0.15 mg **IM** (0.15 mL of 1:1000). Repeat every 5 minutes as needed **Severe Asthma**: 0.01 mg/kg **IM** up to 0.3 mg. Repeat every 15 minutes as needed	Anaphylaxis/severe allergic reaction and severe wheezing
	Infusion (adults): Give continuous **IV** infusion of 0.01 to 0.5 µg/kg/minute; titrate based on target BP or evidence of end-organ perfusion.	Distributive / Cardiogenic shock
Atropine	**Solution: 1 mg (sulfate) in 1 mL ampoule** **Adults:** 2 mg **IV**, every 3-5 minutes, doubling until clinical effect achieved. **Children:** 0.05 mg/kg **IV**, every 3-5 minutes, doubling until clinical effect achieved. Not to be given in children 3 months or younger.	Poisoning
Carbetocin	**Solution: 100 mcg in 1 mL** Give a single dose of 100 mcg **IM/IV** following a vaginal delivery.	Prevention of postpartum haemorrhage
Diazepam	**Rectal solution: 2 mg per mL solution 5 mg/ 1 mL ampoule** **Adults:** First dose: 10 mg slow **IV** push or 20 mg **PR** Second dose after 10 minutes: 5 mg slow **IV** push or 10 mg **PR** **Children:** First dose: 0.2 mg/kg slow **IV** push or 0.5 mg/kg **PR**. Can repeat half of first dose after 10 minutes if seizures/convulsions continue **MONITOR BREATHING CLOSELY in all patients given diazepam.**	Seizures/convulsions
Ergometrine	**Solution**: **200 µg (hydrogen maleate) in 1 mL ampoule** Give 0.2 mg **IV**; repeat every 2-4 hours as needed, max 5 total doses.	Prevention and treatment of postpartum haemorrhage

MEDICATION	DOSAGE	INDICATION
Glucose (Dextrose)	**Solution: 50% dextrose (D50), 25% dextrose (D25), or 10% dextrose (D10)** **Adults and children greater than 40 kg:** 25–50 mL **IV** of D50, or 125–250 mL **IV** of D10 **Children up to 40 kg:** 5 mL/kg **IV** of D10 (preferred) 2 mL/kg **IV** of D25 1 mL/kg **IV** of D50 **If no IV access:** 2–5 mL of 50% dextrose **OR** sugar solution in buccal space.	Hypoglycaemia
Glyceryl trinitrate	**Sublingual tablet: 500 mcg** 500 mcg **SL** every 5 minutes up to 3 doses if SBP >100 mmHg.	Concern for acute coronary syndrome
Isosorbide dinitrate	**Sublingual tablet: 5 mg** 5-10 mg **SL** every 2 to 4 hours if SBP >100 mmHg.	Concern for acute coronary syndrome
Magnesium sulfate	**Solution: 1 g in 2 mL ampoule, 5 g in 10 mL ampoule (50% or 500 mg/mL)** Give 4 g **IV <u>slowly</u>** over 20 minutes (Take 8 ml (four 2 ml vials) and dilute with 12 ml of sterile water. This gives 20 ml of 20% solution or 4 gm of magnesium sulfate. Administer as an IV loading dose over 5 min.) **AND** give 10 g **IM** (use the 5 g/10 mL solution) with 1 mL of 2% lidocaine **in each** buttock. **If unable to give IV,** give 10 g **IM** injection only (as above, 5 g in each buttock). **If seizures/convulsions recur** after 15 minutes give additional 2 g (10 mL of 20% solution) **IV** over 5 minutes. **If transport delays continue:** Give 5 g of 50% solution **IM (**with 1 mL of 2% lidocaine) in alternate buttocks every 4 hours.	Eclampsia or pregnant with seizure/convulsion
Metoclopramide	**Oral tablet: 10 mg (hydrochloride); oral liquid: 5 mg/5 mL; solution: 5 mg/mL (hydrochloride) in 2 mL ampoule.** **Adults**: 10-20 mg **IV** stat; 10 mg **PO** stat **Children and adolescents**: 0.1-0.2 mg/kg **PO**; max 10 mg/dose.	Nausea/ vomiting
Midazolam	**Solution: 1 mg/mL** **Adults**: 0.5-2.5 mg **IV** over 1 to 2 minutes; repeat every 2 to 5 minutes as needed; titrate to clinical effect; usual total dose: 5 mg **Children**: 0.1-0.15 mg/kg **IM**, max 10 mg; 0.25-0.5 mg/kg PO, max 20 mg **IV** dose**:** • ≥6 months to <6 years: 0.05-0.1 mg/kg; max dose: 6 mg. • ≥6 years: 0.025-0.05 mg/kg; max dose: 10 mg. • Adolescents: 1-2.5 mg over ≥2 minutes; max dose: 10 mg.	Sedation
	Adults: 10 mg **IV** repeat after 5 minutes if still having seizure. **Children:** 0.2 mg/kg **IV** repeat after 5 minutes if still having seizure.	Seizure
Misoprostol PO	**Oral tablet: 200 µg** Prevention: 600 µg **PO** stat Treatment: 800 µg **SL** stat.	Prevention and treatment of postpartum haemorrhage

MEDICATION	DOSAGE	INDICATION
Morphine	**Solution: 10 mg in 1 mL ampoule** **IV** stat doses of 0.05 mg to 0.1 mg/kg/dose titrated (typically 3-7 mg per dose). Repeat as needed **Use with caution in the elderly, children and obese patients.** **MONITOR BREATHING CLOSELY in all patients given morphine.** **Monitor respiratory rate, sedation, nausea and vomiting.**	Severe pain
Naloxone	**Solution: 400 µg/mL (hydrochloride) in 1 mL ampoule** **IV:** 100 µg single dose **OR** **IM:** 400 µg single dose May repeat every 5 minutes as needed. May require 0.4 mg/hr infusion for several hours for long-acting opioids.	Opioid overdose
Ondansetron	**Oral solid: 4 mg, 8 mg; oral liquid: 4 mg/5 mL; solution: 2 mg/mL in 2 mL ampoule.** **Adults**: 4-8 mg **PO/IM/IV** stat **Children**: **IV** 0.15 mg/kg/dose **IV** stat; max 8 mg/dose **PO** <15 kg: 0.2 mg/kg/dose; 15 to 30 kg: 4 mg; >30 kg: 8 mg Not to be given in children 1 month or younger.	Nausea/ vomiting
Oxytocin	**Solution: 10 IU in 1 mL ampoule** **Immediately after birth / identifying haemorrhage:** Give 10 IU **IM/IV AND** start IV fluids with 20 IU/L at 60 drops/minute. **Once placenta is delivered, continue** IV fluids with 20 IU/L at 40 drops/minute if still bleeding. **If placenta manually removed / uterus does not contract:** repeat 10 IU **IM**. Continue IV fluids with 20 IU/L at 20 drops/minute for 1 hour after bleeding stops. **Max Dose:** 3 L of IV fluids containing oxytocin.	Prevention and treatment of postpartum haemorrhage
Paracetamol (acetaminophen)	**Oral tablet: 250 mg, 500 mg**; **rectal suppositories: 250 mg, 500 mg** **Adults:** 500 mg–1 g **PO/PR** every 6 hours Max 4 g daily or max 2 g daily if liver impairment/ cirrhosis **Children:** 10–15 mg/kg **PO/PR** up to four times per day.	Mild to moderate pain, fever, headache
Salbutamol (Albuterol)	**Inhaler: 100 mcg per puff** **Adults:** Prime with 5 puffs and give 2 puffs via spacer every 2 minutes until improved. **Children:** Prime with 5 puffs and give 2 puffs into spacer. Keep spacer in mouth for 3–5 breaths. Repeat until 6 puffs given for < 5 years, or 12 puffs for > 5 years. **Nebulizer: (Adults)** 5 mg in 5 mL sterile saline. **(Children)** 2.5 mg in 3 mL sterile saline. For severe wheezing, above doses can be given several times in an hour.	Severe wheezing
Tranexamic acid	**Solution: 100 mg/mL in 10 mL ampoule.** **Adult**: 1 g in 200 mL **IV** over 10 minutes (within 3 hours of injury) Follow initial dose with a continuous infusion of 1 g over 8 hours.	Severe bleeding following injury
	1 g **IV** as soon as possible after birth. Repeat after 30 minutes if bleeding continues, or if bleeding restarts within 24 hours of first dose.	Treatment of postpartum haemorrhage

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Annex

Methods

WHO guidance was used for the core content for this publication and was refined by expert consensus and consultations with international experts, followed by review by the technical advisory group for integrated clinical care (TAG IC2) and expert peer review. Appropriate structured literature reviews were conducted throughout preparation of the document.

Experts in the subject developed, reviewed and reached consensus in several rounds of consultation. Participants were selected from WHO networks among prehospital or emergency care experts in geographically diverse setting who had extensive experience of prehospital care, emergency care, MCIs, natural disasters, road traffic incidents, conflict and civil unrest. A total of 30 experts were invited to participate, and 22 were available throughout preparation of the publication. WHO staff maintained overall control of the process and made final decisions.

Much of the content was taken from WHO guidance:

- Sasser S, Varghese M, Kellermann A, Lormand JD. Prehospital trauma care systems. Geneva: World Health Organization; 2005 (https://iris.who.int/handle/10665/43167).
- World Health Organization, International Committee of the Red Cross Basic Emergency Care: approach to the acutely ill and injured: participant workbook. Geneva: World Health Organization; 2018 (https://iris.who.int/handle/10665/275635. License: CC BY-NC-SA 3.0 IGO).
- SEARO IMAI district clinician manual: hospital care for adolescents and adults: guidelines for the management of illnesses with limited-resources. New Delhi: WHO Regional Office for South-East Asia; 2021 (https://iris.who.int/handle/10665/77751. License: CC BY-NC-SA 3.0 IGO).
- Pocket book of hospital care for children. Guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013 (https://iris.who.int/handle/10665/81170).
- Manual for participants. Emergency triage assessment and treatment (ETAT). Geneva: World Health Organization; 2005 (https://iris.who.int/bitstream/handle/10665/43386/9241546875_eng.pdf).
- Prehospital emergency medical system readiness: Checklist for COVID-19. Washington DC: Pan American Health Organization; 2020 (https://iris.paho.org/handle/10665.2/52169?locale-attribute=pt).
- Standards and recommendations for burns care in mass casualty incidents. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/379543. License: CC BY-NC-SA 3.0 IGO).
- Mass casualty management systems: strategies and guidelines for building health sector capacity.
  Geneva: World Health Organization; 2007 (https://iris.who.int/handle/10665/43804).
- Mass casualty management system. Course manual. Washington DC: Pan American Health Organization; 2019 (https://iris.paho.org/handle/10665.2/51484).

- Classification and minimum standards for emergency medicine teams. Geneva: World Health Organization; 2021 (https://iris.who.int/handle/10665/341857. License: CC BY-NC-SA 3.0 IGO).
- A guidance document for medical teams responding to health emergencies in armed conflicts and other insecure environments. Geneva: World Health Organization; 2021 (https://iris.who.int/handle/10665/341858. License: CC BY-NC-SA 3.0 IGO).
- Public health for mass gatherings: key considerations. Geneva: World Health Organization; 2015 (https://iris.who.int/handle/10665/162109).
- World Health Organization, International Society of Surgery/Société internationale de Chirurgie, International Association for the Surgery of Trauma and Surgical Intensive Care. Guidelines for essential trauma care. Geneva: World Health Organization; 2004 (https://iris.who.int/handle/10665/42565).
- Framework for the care of acute coronary syndrome and stroke. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/380065. License: CC BY-NC-SA 3.0 IGO).
- Update of the Mental Health Gap Action Programme (mhGAP) guidelines for mental, neurological and substance use disorders. Geneva: World Health Organization; 2015 (https://iris.who.int/handle/10665/204132).

Operational tools

The standards, supporting tools and operational resources were developed from WHO guidance, when available, and by expert consensus and review. The 18 standards include no clinical or operational guidance that necessitated a structured literature review. Most of the 25 operational resources include no clinical or operational guidance that necessitated a systematic literature review.

The lists of equipment and medication for basic and advanced ambulances were prepared by consensus from:

- the WHO list of essential medicines;
- World Health Organization, International Committee of the Red Cross. Basic Emergency Care: approach to the acutely ill and injured: participant workbook. Geneva: World Health Organization; 2018 (https://iris.who.int/handle/10665/275635. License: CC BY-NC-SA 3.0 IGO);
- IMAI district clinician manual: hospital care for adolescents and adults: guidelines for the management of illnesses with limited-resources. Geneva: World Health Organization; 2012 (https://iris.who.int/handle/10665/77751); and
- MeDevPacks (online). Geneva: World Health Organization (https://medevis.who-healthtechnologies.org/medevpacks/packs/PACK_0844).

The protocol for ambulance cleaning and decontamination was developed by consensus from the following core content:

- Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries: trainer's guide and modules and resources.

Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/366379 and https://iris.who.int/handle/10665/366380. License: CC BY-NC-SA 3.0 IGO).

- Minimum standards and recommendations for medical teams responding to highly infectious disease outbreaks. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/377995. License: CC BY-NC-SA 3.0 IGO).
- Best practices for environmental cleaning in healthcare facilities: in resource-limited settings. Version 2. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases; 2019 (https://www.cdc.gov/healthcare-associated-infections/media/pdfs/environmental-cleaning-rls-508.pdf).

The protocol for the SBAR handover tool – out of hospital was developed by consensus from the following core content:

- World Health Organization, International Committee of the Red Cross. Basic Emergency Care: approach to the acutely ill and injured: participant workbook. Geneva: World Health Organization; 2018 (https://iris.who.int/handle/10665/275635. License: CC BY-NC-SA 3.0 IGO).

The protocol for standard precautions was developed by expert consensus from the following core content:

- How to handwash? Geneva: World Health Organization; 2009 (https://www.who.int/docs/default-source/patient-safety/how-to-handwash-poster.pdf).
- How to handrub? Geneva: World Health Organization; 2009 (https://www.who.int/docs/default-source/patient-safety/how-to-handrub-poster.pdf).
- Standard precautions in health care. Aide-memoire. Geneva: World Health Organization; 2007 (https://www.who.int/publications/m/item/standard-precautions-in-health-care).

Dispatch centres

The content on communication and dispatch centres was developed from WHO guidance, where available, and through expert consensus and review. The chapter contains no clinical or operational guidance that necessitated a systematic literature review.

Medical control

The content on medical control was developed from WHO guidance, where available, and through expert consensus and review. The chapter contains no clinical or operational guidance that necessitated a systematic literature review.

Clinical protocols

Clinical protocols were aligned with the WHO Basic Emergency Care course for each provider level, basic and advanced. The protocols were derived mainly from five WHO publications:

- World Health Organization, International Committee of the Red Cross. Basic Emergency Care: approach to the acutely ill and injured: participant workbook. Geneva: World Health Organization; 2018 (https://iris.who.int/handle/10665/275635. License: CC BY-NC-SA 3.0 IGO).
- IMAI district clinician manual: hospital care adolescents and adults: guidelines for the management of illnesses with limited-resources. Geneva: World Health Organization; 2012 (https://iris.who.int/handle/10665/77751).
- Pocket book of hospital care for children. Guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013 (https://iris.who.int/bitstream/handle/10665/81170/9789241548373_eng.pdf?sequence=1).
- Emergency triage assessment and treatment (ETAT). Manual for participants. Geneva: World Health Organization; 2005 (https://iris.who.int/bitstream/handle/10665/43386/9241546875_eng.pdf).

Other WHO sources that were directly relevant to the publication were:

- Framework for the care of acute coronary syndrome and stroke. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/380065. License: CC BY-NC-SA 3.0 IGO).
- Update of the Mental Health Gap Action Programme (mhGAP) guidelines for mental, neurological and substance use disorders. Geneva: World Health Organization; 2015 (https://iris.who.int/handle/10665/204132).
- Standards and recommendations for burns care in mass casualty incidents. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/379543. License: CC BY-NC-SA 3.0 IGO).
- Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Second edition. Geneva: World Health Organization; 2017 (https://iris.who.int/handle/10665/255760. License: CC BY-NC-SA 3.0 IGO).

The content on basic ambulance providers was taken from the WHO Basic Emergency Care course and adapted to the prehospital environment and was reviewed by the expert group.

The content on advanced ambulance providers was taken from WHO sources, adapted to the prehospital environment and reviewed by the expert group.

All the protocols were reviewed by TAG IC2 and underwent external peer review. WHO staff maintained the final decision on content.