

# MINIMUM TECHNICAL STANDARDS AND RECOMMENDATIONS FOR REHABILITATION

## Emergency Medical Teams



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## Foreword

Emergencies, particularly sudden-onset disasters, can result in a surge of traumatic injuries that strain health systems and leave a legacy of disability in their wake. Responding to the needs of the people affected can be challenging in settings with limited health and rehabilitation infrastructure, where many emergencies occur. The World Health Organization (WHO) Emergency Medical Team (EMT) initiative supports populations devastated by such situations by ensuring a rapid, professional, coordinated medical response by both national and international teams.

Rehabilitation has been increasingly recognized as a necessary aspect of medical response and patient-centred care, as demonstrated by its inclusion in *the Classification and minimum standards for foreign medical teams in sudden onset disasters (1)*. This document, a first of its kind, clearly sets out the standards for rehabilitation and provides guidance on building or strengthening the capacity of EMTs in this area.

The importance of early rehabilitation for functional outcomes is well documented. Rehabilitation needs can persist far beyond the departure of EMTs; therefore, close, supportive collaboration must be established with local services. Emergency response presents an opportunity to rebuild devastated health systems and build local rehabilitation capacity. This document emphasizes the importance of aligning practices to the local context and maximizing opportunities for training and mentorship. The minimum standards and recommendations described will result in faster access of patients to rehabilitation services and equipment and a better transition between EMTs and local health facilities.

The process to develop this document has been highly consultative and is the product of a collaboration between WHO and global experts from the rehabilitation field. However, like all minimum standards, it should be viewed as a `living` document that evolves over time as new insights and evidence come to hand from users, recipients of medical and rehabilitation services in emergency settings, and practitioners.

I would like to extend my sincere appreciation to all of the contributors to this document, both those who participated in formal working groups, and those who provided their input through informal channels. Finally, I would like to thank Jody-Anne Mills for shepherding this document from its inception to final publication; a significant achievement indeed.

Ian Norton  
Manager Emergency Medical Teams  
Emergency Management and Operations  
World Health Organization, Geneva

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## Working Group

### ***CBM***

Valerie Scherrer

### ***International Committee of the Red Cross (ICRC)***

Barbara Rau

Michael Rechsteiner/Claude Tardif

### ***Handicap International***

Peter Skelton

### ***WHO***

Jody-Anne Mills

### ***Independent participants***

Julian Clausse

James Gosney, Jr

Geraldine Jacquemin

Fiona Stephenson

## WHO Reviewers

Alarcos Cieza, Robert Holden, Ian Norton, Bronte Martin, and Flavio Salio.

## External Reviewers

Esha Thapa Dhungana, Filipinas G Ganchoon, Oliver Hagon, Diana Hiscock, Fary Khan, Ilan Kelman, Karen Livingstone, Nelson Olim, Steve Mannion, Angel Vicario Merino, Colleen O'Connell, Nelson Olim, Tony Redmond, Aleema Shivji, Michiel Steenbeek, Harald Veen, and Joan Wilson.

## Reviewing Organizations

International Society for Physical and Rehabilitation Medicine (ISPRM)

International Society for Prosthetics and Orthotics (ISPO)

International Spinal Cord Society (ISCoS)

Rehabilitation International (RI)

World Confederation for Physical Therapy (WCPT)

World Federation of Occupational Therapists (WFOT)

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Rita Appiah

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## Executive summary

This document is the result of collaboration between a working group of rehabilitation experts convened by WHO and external consultations. It is thus based on collective experience in rehabilitation during responses to recent large-scale emergencies and also on published data. In time, the minimum standards for rehabilitation in emergencies will be part of a broader series of publications based on the *Classification and minimum standards for foreign medical teams in sudden onset disaster (1)*. The purpose of this document is to EMTs (formerly known as “foreign medical teams”) on building or strengthening their capacity for and work in rehabilitation within defined coordination mechanisms. The standards and recommendations given in this document will ensure that EMTs, both national and international, will better prevent patient complications and ensuing impairment and ensure a continuum of care beyond their departure from the affected area.

This document gives the minimum standards for EMTs in regard to the workforce, the field hospital environment, rehabilitation equipment and consumables and information management. Notably, the standards call for:

- at least one rehabilitation professional per 20 beds at the time of initial deployment, with further recruitment depending on case-load and local rehabilitation capacity;
- allocation of a purpose-specific rehabilitation space of at least 12 m<sup>2</sup> for all type 3 EMTs; and
- deployment of EMTs with at least the essential rehabilitation equipment and consumables according to type.

EMTs are encouraged to exceed the minimum standards outlined in this document; supplementary recommendations are included. All teams on the Global Classification List of quality assured teams are required to use the minimum technical standards for rehabilitation, and demonstration of adherence to the standards will be necessary for verification. Support in achieving the minimum standards will be available through EMT mentoring, if necessary.

Table 1. Summary of rehabilitation technical standards and demonstration for EMTs required for verification

	Type 1	Type 2	Type 3	Page
<b>Team Configuration</b>	Having capacity to provide at least basic outpatient rehabilitation is recommended for fixed and mobile type 1 EMTs.	<b>Minimum technical standard</b> The EMT should deploy with at least one rehabilitation professional per 20 beds. This number should be increased in accordance with need.		p 12
	Not applicable.	<b>Demonstration by EMT for verification</b> The EMT can provide a list of rehabilitation professions available for deployment with the EMT, the number of which is sufficient for at least one per 20 beds (the EMT should declare their bed capacity) for the duration of the team's intended length of stay.		
<b>Equipment and consumables</b>	Type 1 EMTs are encouraged to deploy with the list of recommended rehabilitation equipment for type 1 EMTs.	<b>Minimum technical standard</b> The EMT should deploy with at least the minimum rehabilitation equipment and consumables listed in table 4, with quantity sufficient to be self-sufficient for at least two weeks. Alternatively, the EMT can have a documented agreement with another EMT or organization for its provision in the event of deployment.		p 16–22
	Not applicable.	<b>Demonstration by EMT for verification</b> The EMT can present all essential rehabilitation equipment and consumables, or provide a documented agreement with another EMT or organization for its provision in the event of deployment.		
<b>Rehabilitation space in field hospitals</b>	Not applicable.	Allocation of rehabilitation space is recommended, especially for type 2 teams intending to remain for three weeks or longer.	<b>Minimum technical standard</b> The EMT should allocate a space for rehabilitation of at least 12 sq m within their facility.	P 22
	Not applicable.	Not applicable.	<b>Demonstration by EMT for verification</b> The EMT can present a tent of at least 12 sq m and show accommodation of this space in their field hospital blueprint.	
<b>Rehabilitation research in emergency response</b>	<b>Minimum technical standard</b> If research is being undertaken during deployment, the EMT should maintain all professional, institutional and national ethical standards for research with human participants.			P 30
	<b>Demonstration by EMT for verification</b> Demonstration for EMT verification is not applicable for this minimum technical standard. If conducting research during deployment, the EMT should be able to present forms for ethical approval and consent signed by all study participants (if applicable) and from the health facility involved.			

**Table 2. Summary of technical standards for specialized care teams for rehabilitation and demonstration required for verification**

Specialized care teams for rehabilitation		Page
<b>Team configuration</b>	<p><b>Minimum technical standards</b> A specialized care team for rehabilitation should be comprised of at least three rehabilitation professionals. Teams should be multidisciplinary and include at least one physiotherapist as well as at other rehabilitation discipline(s) (occupational therapy, psychiatry, and/or rehabilitation nursing).</p>	p 14
	<p><b>Demonstration by team for verification</b> The team can provide a list of three or more professionals representing at least two rehabilitation disciplines (one of which is physiotherapy), who are available for rapid deployment.</p>	
<b>Qualification and experience</b>	<p><b>Minimum technical standard</b> Rehabilitation professionals in a specialised care team for rehabilitation should have at least a bachelor's degree or equivalent in their respective discipline and at least three years' experience in trauma injury rehabilitation. At least one team member (preferable the team leader) should have experience in emergency response and all team members should have undergone training in working in austere environments.</p>	p 14
	<p><b>Demonstration by team for verification</b> The team can provide copies of professional qualifications and declarations of at least three years clinical experience in trauma injury rehabilitation.</p>	
<b>Rehabilitation equipment</b>	<p><b>Minimum technical standard</b> Specialized care teams for rehabilitation should have capability to rapidly provide the equipment listed in Table 7.</p>	p 15
	<p><b>Demonstration by team for verification</b> The team can present either a stockpile of the rehabilitation equipment listed in Table 7, or documentation of an arrangement to have the equipment rapidly provided (including financial and logistical capability) in the event of the team's deployment.</p>	
<b>Length of stay</b>	<p><b>Minimum technical standard</b> A team that embeds into an EMT should stay for the minimum length of stay of that EMT (three weeks for a type 2; four-six weeks for a type 3). A team that embeds into a local facility should plan to stay for at least one month.</p>	p 15
	<p><b>Demonstration by team for verification</b> A team should declare its intended length of stay (no less than three weeks), to facilitate appropriate placement with an EMT or local facility if deployed.</p>	

# 1. Background and scope

The growing number of medical teams responding to emergencies reflects the good intentions of the global humanitarian community (1). The influx of EMTs<sup>i</sup>, however, presents immense coordination challenges, and responses to emergencies such as that to the earthquake in Haiti illustrate the need for increasing the professionalization and standardization of emergency response. *Classification and minimum standards for foreign medical teams in sudden onset disaster* (1), hereafter referred to as the EMT classification and minimum standards document has been integral to these efforts by providing benchmark requirements for medical teams seeking to respond to emergencies and coordinating their deployment by classifying teams according to their capability: type 1, 2, 3 or specialized care team (Table 2).

The volume of traumatic injuries and the exacerbation of chronic medical conditions that can arise in emergencies place considerable demands on the ministry of health and the health and rehabilitation infrastructure of the affected country and can leave a legacy of disability for years to come (2, 3). The EMT classification and minimum standards document recognizes that “rehabilitation is one of the core functions of trauma care systems in regular health care and, as such, EMTs should have specific plans for the provision of rehabilitation services to their patients post sudden onset disaster”. Indeed, the importance of rehabilitation as an integral part of acute care, including optimizing surgical and long-term patient outcomes and their subsequent quality of life, is well documented (4–7). The clinical and social cost-effectiveness of rehabilitation, in terms of speeding recovery and promoting return to work and life, is another critical consideration in emergency response, in which efficient use of resources is paramount (6, 8–10). Nevertheless, previous responses to emergencies have clearly lacked sufficient rehabilitation capacity, with often devastating consequences for the affected individuals, families and communities (5, 7, 11). The minimum standards for rehabilitation of EMTs are essential for addressing this issue and support seminal international disability policy; they are aligned with the United Nations Convention on the Rights of Persons with Disabilities (12), which states that people with disabilities have the right to access health and health-related rehabilitation. Further, the standards will facilitate implementation of the objectives of the WHO Global Disability Action Plan 2014–2021 (13) to remove barriers and improve access to health services and programmes.

As rehabilitation needs often persist beyond the departure of EMTs, the standards and recommendations of this document emphasize the importance of strengthening and using the capacity of local service providers to sustain care (including provision of assistive devices) and social support for patients with long-term or permanent disability. Organizations with a long-standing presence and with capacity-building experience in the affected area are usually

i The previous name of ‘foreign medical teams’ was officially replaced with ‘emergency medical teams’ in 2015 to reflect that teams responding to emergencies can be both national and international.

best positioned to support overwhelmed services in the response and development phases following an emergency. Building local capacity is imperative to halt the perpetual cycle of disability and poverty seen in low- and middle-income countries in particular (14, 15).

The minimum technical standards and recommendations outlined in this document are designed to improve the predictability, standardization and efficiency of rehabilitation provision in emergency response by EMTs. Deployment and response should be strictly aligned with the needs of the affected region, involve and support existing local service providers or facilities and reflect the epidemiological profile of the emergency (1, 16). Although the need for international medical teams and rehabilitation varies considerably in different response scenarios, rehabilitation remains an essential element, particularly as disability may follow a wave of traumatic injury or widespread disease (2).

**Table 3. WHO classification of EMTs**

Type	Description	Capacity	Minimum length of stay
<b>1 Mobile</b>	Mobile outpatient teams: teams to access the smallest communities in remote areas.	> 50 outpatients a day	2 weeks
<b>1 Fixed</b>	Outpatient facilities with or without tented structure.	> 100 outpatients a day	2 weeks
<b>2</b>	Inpatient facilities with surgery.	> 100 outpatients and 20 inpatients 7 major or 15 minor operations a day	3 weeks
<b>3</b>	Referral level care, inpatient facilities, surgery and high dependency.	> 100 outpatients and 40 inpatients, including 4–6 intensive care beds 15 major and 30 minor operations a day	4–6 weeks
<b>Specialized care team</b>	Teams that can join local facilities or EMTs to provide supplementary specialist care.	Variable	Variable

## SCOPE

This guidance document extends the minimum standards for rehabilitation in emergencies proposed in the EMT classification and minimum standards document. These standards are for use in the context of sudden-onset disasters, such as earthquakes, characterized by significant, acute traumatic injury and a surge of related health needs. They are also applicable to complex or conflict emergency response, although the patterns of injury, disease, and rehabilitation needs in these situations may be different. The role of rehabilitation in outbreak response is variable and is addressed specifically at the conclusion of the section on technical standards (p. 32).

Because of the extensive need for mental health services and the significant impact of psychosocial health on individual and community well-being in emergencies, a separate EMT guidance document will be dedicated to this topic. Disability inclusion is addressed in these standards in terms of physical access to services and discharge considerations. Disability in emergencies is addressed more fully in the *WHO guidance note on disability and emergency risk management for health* (7) and other publications. The coordination and arrival procedures for EMTs do not necessarily apply to organizations already providing care under existing agreements with host countries and who are increasing their staff numbers to cope with the surge in demand during emergencies.

The main aim of this guidance document is to inform established and prospective international and national EMTs. It is also relevant to:

- local health facilities and providers, including international and nongovernmental organizations;
- EMT coordinators, including the relevant sectors of the ministry of health in the affected country; and
- professional registration bodies and societies representing rehabilitation workers, donors and the global rehabilitation community.

## 2. Rehabilitation in emergency response

The WHO *World report on disability* (17) defines rehabilitation as “a set of measures that assist individuals who experience, or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments” (p. 96). The targets of rehabilitation are body functions, structures, activities, participation and environmental and personal factors. This definition is aligned with the *International classification of functioning, disability and health* (18), which presents a conceptual framework of functioning and disability, whereby disability is understood to be the result of the interaction of impairment with environmental factors. A sound understanding of the concepts of rehabilitation and disability is important for all those involved in patient care – not only rehabilitation personnel. They imply the need to provide assistance for patients to achieve and maintain optimal functioning and independence, which, in an acute situation, may involve therapeutic mechanisms such as mobilization and active participation in self-care as soon it is safe, protection of body structures to prevent complications and education for skills in self-management and decision-making (17). These activities require the participation of all members of the multidisciplinary team.

Emergency situations often result in damaged infrastructure and disrupted health systems and often occur in remote, underserved areas. In many cases, people are displaced or live in temporary shelters with limited provision for those with disabling injuries, especially when they have impaired mobility. Social and cultural barriers can further compound the extent of disability. Obtaining the necessary follow-up care and rejoining the community after discharge can be especially problematic in an emergency (11, 19). Rehabilitation professionals are well placed to address these challenges and can add considerable value to patient care. Furthermore, by assisting in discharge planning and identifying local providers for ongoing care, rehabilitation professionals can help ensure appropriate and efficient patient flow through an EMTs.

## 3. Technical standards and recommendations

Technical standards reflect the priority of EMTs to save lives and prevent impairment and associated disability. They acknowledge the importance of continuing sustainable care for patient outcomes and of referral to and strengthening of local services. The minimal technical standards and recommendations for rehabilitation in EMTs are described below, with suggestions for implementation and the rationale. The minimum technical standards are those verified during the peer review process and the recommendations are suggestions for further improving the performance of EMTs in meeting the needs of patients in emergency response.

### 3.1 Rehabilitation workforce

A concern in previous emergency responses has been the lack of integration of rehabilitation professionals into EMTs and lack of coordination with surgical and medical members of the EMT, which detracted from patient-centred care. These standards emphasize the importance of including rehabilitation professionals<sup>ii</sup> in patient care at the earliest stage of response (7, 22, 23) and collaborating with services that have a long-term presence in the affected region (21).

Rehabilitation professionals who are integrated into EMTs in the acute phase of a response are likely to see people with a broad range of injuries and conditions and should therefore be adequately experienced in trauma and medical rehabilitation. Specialized rehabilitation skills become increasingly necessary as patients with amputations and spinal cord injuries progress or gaps in clinical specialization are identified; the EMT should therefore plan the inclusion of appropriately qualified professionals to meet this need after the acute phase of care.

Rehabilitation professionals should have adequate training prior to deployment in how to practice and adapt their skills to austere environments as part of planning and quality assurance. They should therefore be integrated into multidisciplinary training programmes as necessary (21, 22, 24–26).

ii Refer to page 35 for a description of rehabilitation professionals.



### 3.1.1 Skill requirements

#### Recommendations for optimal patient care

1. Rehabilitation professionals with an arriving team should be experienced in trauma and medical rehabilitation with experience and/or training to work in austere environments.
2. Rehabilitation professionals should comply with the same requirements for practice as in their home country (such as professional registration and licensing) and should work within their scope of practice. Those from countries in which there is no professional certification may practice under the direction and authority of their EMT clinical lead with approval of the ministry of health of the host country<sup>iii</sup>.

**Type 1:** Type 1 EMTs should be able to provide basic rehabilitation care OR refer patients to an appropriate EMT or existing local facility.

**Types 2 and 3:** Types 2 and 3 EMTs, with one or numerous rehabilitation professionals, should be able to autonomously provide rehabilitation for patients (including pediatric and geriatric) with:

- fracture, including those with external fixation or traction;
- amputation;
- peripheral nerve injury; and
- burns, grafts or flaps.

Type 2 and 3 EMTs should be able to provide early rehabilitation to patients with acquired brain injury and spinal cord injury while they await specialist rehabilitation.

**Essential** clinical rehabilitation skills to be represented in the EMT:

- basic splinting;
  - assistive device prescription fitting and training;
  - positioning and patient mobilization, including early mobilization;
  - education and re-training of patients and care providers in daily activities;
  - provision of psycho-social support, for example, psychological first aid (17); and
  - respiratory care<sup>iv</sup>, including sputum clearance techniques.
3. Rehabilitation professionals should be deployed primarily on the basis of demonstrated essential skills; however, those deployed within the first 2 weeks of response should have at least 2 years of clinical experience and more if working in a specialization.
  4. EMTs are encouraged to prepare terms of reference for rehabilitation professionals and define team roles before deployment.
  5. Rotation of rehabilitation staff is decided by the EMT; however, a minimum stay of 3 weeks is recommended to provide continuity of care, with sufficient time planned for handover.
  6. Efforts should be made through maintain consistency in the treatment approaches of different rehabilitation professionals by the use of guidelines, protocols and common pre-deployment training.

iii This provision is included in acknowledgement of the lack of formal professional credentialing procedures in some countries, which does not always reflect a lack of experienced and skilled rehabilitation personnel. In situations when a host ministry of health does not accept rehabilitation personnel without credentialing, or when there are not adequately skilled rehabilitation in the home country, these teams should liaise with IOs or NGOs to establish an agreement regarding the temporary recruitment of their rehabilitation professionals.

iv In the context of this document, respiratory care refers to rehabilitation interventions to facilitate healthy lung function and breathing technique. This may include measures to assist with airway clearance, enhancing ventilation, managing dyspnoea, or optimizing cardiorespiratory function and fitness. Such interventions should be conducted according to practices within the professional's home country.

### 3.1.2 Team configuration

#### Minimum technical standard to achieve verification

1. Types 2 and 3 EMTs must deploy with at least one rehabilitation professional per 20 beds.

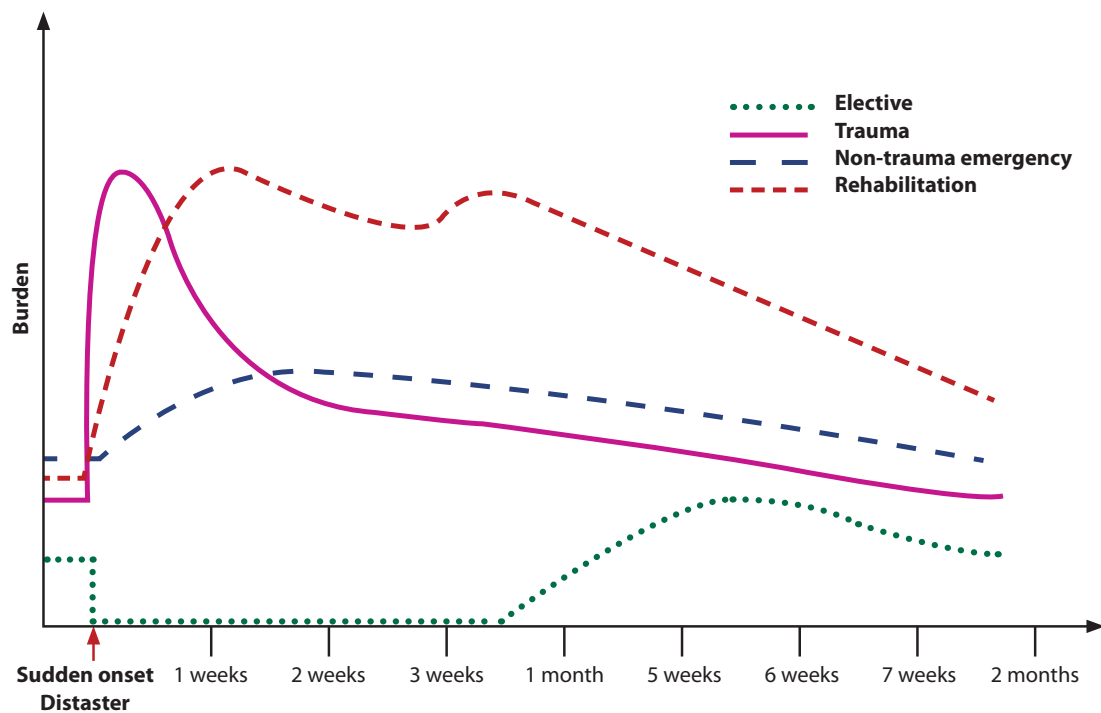
#### Recommendations for optimal patient care

1. Types 2 and 3 EMTs are encouraged to further strengthen their rehabilitation capacity by either deploying additional rehabilitation professionals or recruiting local personnel, as appropriate (see considerations below).
2. Type 1 EMTs are encouraged to consider including rehabilitation capacity.
3. Nursing staff with relevant trauma rehabilitation experience should be used to augment the rehabilitation capability of EMTs.

### Considerations for the deployment of additional rehabilitation personnel

**Phase of response:** The patient load increases over time, and discharge planning can be time-consuming, especially in areas with extensive destruction of infrastructure or which are geographically isolated. Patients cannot necessarily be discharged when they become medically stable, as they may require further inpatient rehabilitation. The demand for outpatient rehabilitation is likely to increase over time, creating additional and evolving service needs. Experienced professionals should be included during the acute phase of the response; less experienced staff can either accompany experienced colleagues to provide additional support or be deployed during later phases of the response.

**Case-load and nature of the emergency:** The number and specialities of rehabilitation professionals in EMTs should be guided by the anticipated needs at all stages of the response. The influx of cases and the corresponding “waves” of need for rehabilitation have different patterns in different emergencies. Rehabilitation demands may also differ over time and this should be considered in deploying personnel. The conceptual model in Fig. 1 indicates trends in the rehabilitation burden in sudden-onset disasters. The initial spike in trauma and non-trauma emergencies corresponds to a spike in rehabilitation burden, which peaks again in the post-acute period as complications arise and patients are prepared for discharge.

**Figure 1. Trends in rehabilitation burden in sudden-onset disasters over time (20)**

**Existing rehabilitation capacity:** It is essential that EMTs do not duplicate existing rehabilitation services but rather integrate with refer to local service providers, when they exist. Consideration should be given to the levels of skills and experience of local staff and the infrastructure and equipment. When local capacity is limited, EMTs may offer to supplement the services, with a focus to build local capacity. This will provide both valuable support for patient care and promote sustainable rehabilitation services for patients with long-term needs after the departure of the EMT (16, 21).

### 3.1.3 Multidisciplinary practice

#### Recommendations for optimal patient care

1. EMTs are encouraged to fully integrate rehabilitation personnel into the multidisciplinary team and ensure that they participate in daily ward rounds and other consultations.
2. Rehabilitation personnel should be involved in deciding on the referral or discharge of any patient with significant functional limitations and on follow-up requirements.
3. Pre-deployment training should emphasize multidisciplinary practice and patient-centred care.

## 3.2 Specialized care teams for rehabilitation

Specialized care teams for rehabilitation are national or international teams deployed at the request of the ministry of health/coordination cell of the host country to be embedded into an EMT or a local facility to augment their rehabilitation capacity and provide specialist rehabilitation care. Other specialist care teams, such as those for spinal cord injury, burns, and orthoplastics, for which rehabilitation is particularly relevant, should refer to the minimum technical standards for their respective speciality for the rehabilitation capacity required for their verification. As per the classification and minimum standards for EMTs (1), specialized care teams for rehabilitation should comply with the same guiding principles and core standards as EMTs.

The minimum technical standards for team configuration, qualification and experience, equipment and length of stay are detailed below. While the rehabilitation disciplines represented in a team and the specializations of its members may vary, the teams should, at a minimum, comply with the skill requirements for rehabilitation detailed in section 3.1.1. 'Skill requirements'.

Prior to their deployment, teams should endeavour to communicate with the EMT or local facility that they will embed into to determine what rehabilitation equipment and consumables are readily available and what is most needed. In addition to the equipment listed in Table 7, specialized care teams for rehabilitation should deploy with the assessment and monitoring equipment listed under Table 5, and any equipment or consumables specific to their specialization(s) (such as splinting equipment, or bandages for stump care).

Specialised care teams for rehabilitation should declare their intended length of stay (no less than three weeks) to the EMT coordination cell/Ministry of Health to facilitate deployment into an appropriate EMT or local facility; specialised care teams are required to either depart with the EMT they embed into, or make an alternative arrangement with another EMT or local facility (1).

### 3.2.1 Team configuration of specialized care teams for rehabilitation

#### Minimum technical standard to achieve verification

1. Teams should be comprised of at least three rehabilitation professionals.
2. Teams should be multidisciplinary and include at least one physiotherapist as well as other rehabilitation discipline(s) (occupational therapy, physiatry, and/or rehabilitation nursing).

### 3.2.2 Qualification and experience

#### Minimum technical standard to achieve verification

1. Rehabilitation professionals in a specialised care team for rehabilitation should have at least a bachelor's degree or equivalent in their respective discipline and at least three years experience in trauma injury rehabilitation. At least one team member (preferably the team leader) should have experience in emergency response and all team members should have undergone training in working in austere environments.

### 3.2.3 Rehabilitation equipment

#### Minimum technical standard to achieve verification

1. Specialized care teams for rehabilitation should have capability to rapidly provide the equipment listed in Table 7.

### 3.2.4 Length of stay

#### Minimum technical standard to achieve verification

1. A team that embeds into an EMT should stay for the minimum length of stay of that EMT (three weeks for a type 2; four-six weeks for a type 3). A team that embeds into a local facility should plan to stay for at least one month.

## 3.3 Step-down facilities and rehabilitation

In the context of emergency response, the concept of a “step-down facility” would be an inpatient unit with the capacity to provide interim care for medically stable patients while preparing them for discharge into the community. After an emergency, the demand for acute surgical and medical services directly related to the event generally decreases over time, which could allow some EMTs to convert their field hospitals into step-down facilities in order to ensure efficient use of resources. Teams that convert to step-down facilities or deploy specifically for this purpose should do so in consultation with the ministry of health/coordination cell, and plan to remain in the field for an extended duration, allowing adequate time for local facilities to prepare to continue the required care.

Step-down facilities should be capable of providing medical and nursing support as well as rehabilitation, with an emphasis on preparing patients with long-term impairments, their care providers, and local rehabilitation personnel to adequately manage ongoing needs beyond the departure of the EMT. This would inherently require increased allocation of space and workforce for rehabilitation that would need to be carefully considered. In the 2015 Nepal earthquake, four step-down facilities were used, formed by field hospitals and local facilities and often supported by international partners, to provide longer-term supportive care and rehabilitation. These step-down facilities remained operational for several months (several local-facilities continued to be used as step-down facilities for over a year) and were staffed predominantly by Nepalese physiotherapists and nurses, who were able to assist with linking those with ongoing health and social support needs to appropriate local services when needed.

### 3.4 Rehabilitation equipment and consumables

Table 4 lists the minimum rehabilitation equipment and consumables for type 2 and 3 EMTs required for verification, and table 5 and 6 provide lists of rehabilitation equipment and consumables that are recommended to optimise patient care. The lists of equipment and consumables in tables 4-6 are not exhaustive or necessarily specific to rehabilitation; several items have been included because they are important for patient care but are occasionally not provided by EMTs. Teams should therefore cross-check any other lists of equipment and consumables to avoid unnecessary duplication. Tables 4-6 do not include basic medical and nursing equipment such as gloves and catheters; EMTs are assumed to provide these items. Long-term mobility devices are discussed at the end of this section, as their provision requires early, careful consideration and referral to local services.

The quantities provided in tables 4 and 5 are guides only and are based on the minimum bed capacity for type 2 and 3 EMTs as stated in the EMT classification and minimum standards document (1): 20 beds for type 2 and 40 for type 3, plus outpatients. The quantities, where provided, should allow a team to be self-sufficient for approximately two weeks. If the team intends to exceed the minimum bed capacity and/or remain in the field for longer, the quantities of equipment and consumables should increase correspondingly. Estimates of quantity for rehabilitation equipment and consumables for type 1 EMTs are not given as they vary based on their size and capacity to provide rehabilitation and their status as a fixed or mobile team.

When EMTs provide assistive devices, such as crutches or a wheelchair, to a patient for temporary use when discharged, it is advised that they arrange a return policy. This helps avoid 'dumping' of devices when they are no longer needed.

#### Minimum technical standard to achieve verification

1. EMTs should bring the essential equipment and consumables for their type (table 4) when they deploy, so that they can be self-sufficient for at least the first 2 weeks of response. Alternatively, they should have a documented agreement with an organization to provide this equipment rapidly in the event of deployment.

#### Recommendations for optimal patient care

1. EMTs are encouraged not to expect that equipment will be provided by another EMT (unless there is a documented agreement) or the host country.
2. Rehabilitation materials should be carefully selected according to the anticipated need, team capacity, local needs and expected case-load.
3. Wheelchairs, orthotics and prosthetics for long-term use should be obtained from a local supplier, where one is available; otherwise, the EMT should seek guidance from the host ministry of health/coordination cell.
4. EMTs should maintain an inventory of equipment and consumables and plan for their replenishment on the basis of their case-load and length of stay.

**Table 4. Minimum rehabilitation equipment and consumables for verification of type 2 and 3 EMTs**

Item	Quantity		Notes
	Type 2 (per 20 beds plus outpatients)	Type 3 (per 40 beds plus outpatients)	
<b>Inpatient wheelchairs</b>	2	4	Need not be configured to each patient; should be used for transport only in the facility.
<b>Pairs of crutches</b>	20 adult 10 pediatric	60 adult 30 pediatric	Include extra rubber tips and gutter crutches (desirable). Ensure adjustable or a range of sizes, including for pediatric patients.
<b>Walking frames</b>	4	8	Consider a range of sizes, including provision for pediatric patients.
<b>Pressure-relieving mattresses</b> <i>To remain in the hospital</i>	4	8	Mattresses should be made of a high-specification foam. Air devices with pumps (such as alternating air mattresses) are not suitable for EMTs because of the danger of over- or under-inflation, unreliable or incompatible power sources and maintenance. Pressure-relieving mattresses do not replace manual pressure relief and repositioning.
<b>Prefabricated ankle and foot orthoses</b>	5 right and 5 left for shoe sizes 38–45 5 right and 5 left for shoe sizes 35–40	10 right and 10 left for shoe sizes 38–45 10 right and 10 left for shoe sizes 35–40	Consider a range of sizes, including provision for pediatric patients.
<b>Rigid adjustable cervical collars</b>	5	10	Consider a range of sizes, including provision for pediatric patients.
<b>Plaster of Paris bandages</b>	100	200	Consider a range of sizes: 10–15 cm are most commonly used. Sufficient quantity for both splinting and casting.
<b>Plaster cutters</b>	1	1	
<b>Plaster spreaders</b>	1	1	
<b>Slings</b>			Suitable for temporary support and elevation of the upper limb.
<b>Stump compression bandages</b>	10	20	Suitable for both upper and lower limb amputations.
<b>Tubular compression bandages</b>			Consider a range of sizes, including provision for pediatric patients.
<b>Compression bandage</b>			Consider a range of sizes suitable for both upper and lower limbs.
<b>Incentive spirometer</b>	Desirable	1 portable plus single-patient use mouthpieces	

Table 5. Recommended rehabilitation equipment and consumables for type 2 and 3 EMTs

Item	Quantity		Notes
	Type 2 (per 20 beds plus outpatients)	Type 3 (per 40 beds plus outpatients)	
Stump boards	3	6	Boards can be constructed or purchased in the host country. A pre-made example can be useful to ensure appropriate design if being constructed.
Patient transfer boards for chair to bed and bed/trolley to bed	1	2	
Leg raisers for wheelchairs	1	2	Provide for both left and right lower limbs. Consider different sizes for the wheelchairs.
Portable commodes (chairs for shower/toilet)	1	2	A waterproof chair with an opening in the seat can be used for both toileting and showering.
Discharge wheelchairs	4	8	Should meet ISO7176 standards, and be appropriate for the patient, but not bespoke. All wheelchairs should have at least a cushion and preferably a pressure-relieving (high-specification foam or gel) cushion, depending on the patient's risk for pressure sores.
Pressure-relieving cushions for wheelchairs	Align quantity with number of wheelchairs	Align quantity with number of wheelchairs	Number and size depend on the wheelchairs. Ensure some high pressure-relieving cushions (made of high-specification foam and/or gel) for patients at risk for pressure sores. Air cushions are not recommended because of the risk for over- or under-inflation and maintenance. Prescribe with user training in pressure-relieving techniques.
<b>Additional pillows for positioning</b> <i>To remain in the hospital</i>			May be supplemented with foam blocks and wedges. Attempt to obtain additional pillows from the host country once in the field.
<b>Slide sheets</b> <i>To remain in the hospital</i>	10	20	A slide sheet should not be shared between multiple patients.



Item	Quantity		Notes
	Type 2 (per 20 beds plus outpatients)	Type 3 (per 40 beds plus outpatients)	
<b>Prefabricated wrist splints and positioning splints (palmar orthoses)</b>	10	20	Consider a range of sizes, including provision for pediatric patients.
<b>Splinting kit</b> <i>Thermoplastic sheets</i> <i>Heat gun</i> <i>Portable water heater (pan)</i> <i>Velcro (adhesive hook and non-adhesive loop)</i> <i>Splinting scissors</i> <i>Neoprene glue</i> <i>Padding</i>	1 kit	1 kit	Consider a range of thermoplastics. Ensure heat gun is compatible with power supply. Include materials for dynamic splints if a qualified professional is available to make them, e. g. hooks, rubber bands, nylon thread.

In addition to the above materials, rehabilitation professionals should have access to the following assessment and monitoring equipment:

- stethoscope
- blood pressure monitor
- percussion/reflex hammer
- goniometer (suitable for large-joint measurements; consider additional for hand and wrist measurements)
- tape measure (suitable for measuring edema and general purposes).

**Table 6. Recommended rehabilitation equipment and consumables for type 1 EMTs**

Item	Notes
<b>Pairs of crutches</b>	Include extra rubber tips and consider included gutter crutches. Consider adjustable crutches and a range of sizes, including provision for pediatric patients.
<b>Adjustable walking frames</b>	Consider a range of sizes, including provision for pediatric patients.
<b>Plaster of Paris bandages</b>	Consider a range of sizes: 10–15 cm are most commonly used.
<b>Wheelchairs</b>	Should be suitable for temporary use in the community. Attempt to arrange a return policy with patients.
<b>Walking sticks</b>	Include extra rubber tips. Ensure a range of sizes, including pediatric. If not adjustable, use a saw to cut them to length.
<b>Plaster cutters and spreaders</b>	
<b>Tubular compressive bandages</b>	Consider a range of sizes, including provision for pediatric patients.
<b>Prefabricated wrist splints</b>	Consider a range of sizes, including provision for pediatric patients.
<b>Prefabricated ankle and foot orthoses</b>	Consider a range of sizes, including provision for pediatric patients.
<b>Adjustable neck collars</b>	Consider a range of sizes, including provision for pediatric patients.
<b>Compression bandages</b>	Consider range of sizes suitable for upper and lower limbs.
<b>Elastic exercise bands</b>	Consider range of strengths. Quantity sufficient for distribution to individual patients.

**Table 7. Minimum equipment for verification of specialized care teams for rehabilitation**

Item	Quantity	Notes
<b>Pairs of crutches</b>	30	Consider a range of sizes, including pediatric. Consider including pairs of gutter crutches. Additional pairs of crutches may need to be sought locally or from the team's stock.
<b>Wheelchairs appropriate for discharge</b>	10	Wheelchairs for discharge should meet ISO quality standards <sup>v</sup> . Consider wheelchairs with adjustable features. Additional wheelchairs may need to be acquired locally or from the team's stock.
<b>Pressure-relieving mattresses</b>	4	See note for pressure relieving mattresses in Table 4. Additional mattresses may need to be sought locally or from the team's stock.
<b>Adjustable walking frames</b>	4	Consider a range of sizes, including pediatric. Additional walking frames may need to be sought locally or from the team's stock.

<sup>v</sup> [http://www.iso.org/iso/iso\\_catalogue/catalogue\\_tc/catalogue\\_tc\\_browse.htm?commid=53792](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=53792)

Note: Standards for electric wheelchairs are not applicable in this case. Compliance with ISO standards can be confirmed with the wheelchair manufacturer.

**Table 8. Additional equipment and consumables for EMTs providing care to patients with spinal cord injury**

<b>Item</b>	<b>Quantity per patient with spinal cord injury (2 months)</b>	<b>Notes</b>
<b>Abdominal binders</b>	1 per patient	Range of sizes. Have altered locally if necessary.
<b>Anti-embolism stockings</b>	3 pairs per patient	Range of sizes. Compression suitable for patients with spinal cord injury.
<b>Catheters</b>	Indwelling: 4 per patient Intermittent: 24–60 per patient	Size 12 for women Size 14 for men Size 8 for children
<b>Urine collection</b>	Urometer bags: 1 per patient Urine collection bags: 10 per patient (changed weekly) Leg bags: 10 per patient	
<b>Lubricant</b>	For bowel care and catheter insertion: 250 per patient in single-use packets, or 2 tubes per week per patient	
<b>Glycerine suppositories</b>	120 per patient	
<b>Hand-held mirror</b>	1 per patient	For use in preventing and monitoring pressure sores and intermittent female catheterization.
<b>Sensory and motor assessment equipment</b>	1 per team	

Patients with spinal cord injury may be managed for varying periods of time by type 2 or 3 EMTs or specialist care teams embedded into another EMT or local health facility. Because the capacity of each of these types of teams is different, quantities in table 8 are given per patient.

### Considerations for provision of mobility devices

Many patients will require an orthotic or prosthetic device or wheelchair (here collectively referred to as “mobility devices”) for the rest of their lives. These devices should therefore meet the user’s requirements and environment, provide a proper fit, alignment and support that meets sound biomechanical principles and be safe, durable, affordable and maintainable in the country of use (27–29). Mobility devices should always be provided with appropriate physical rehabilitation and training. Mobility devices for long-term use are thus best provided by local services that can adapt them to the local context and remain available for follow-up, including maintenance and or replacement. If a patient requires a long-term mobility device, the rehabilitation professional should refer the patient to a local provider (in accordance with the practices of the host country) and plan for assessment and prescription as early as possible (Fig. 2). If local services do not exist, the EMT should ask the host ministry of health/ coordination cell for guidance.

Sometimes, temporary mobility devices are necessary for purposes such as facilitating smooth, timely discharge. In these situations, the devices should be configured to the user’s needs as closely as possible meaning it fits them, can be self-propelled (if the person is capable) and can be used in the local terrain. Subsequent provision of an appropriate long-term device should be planned early.

## 3.5 Field hospital accessibility and rehabilitation space

A field hospital or a facility that is modified for people with restricted mobility is beneficial for patients, their care providers and health personnel. Barrier-free environments promote the recovery of autonomy and reduce the demands on nursing staff and care providers. The dimensions necessary for independent mobility and manoeuvrability in fixed structures generally also apply to temporary facilities. For more detailed guidance on the accessibility of a physical environment, see references 30–32.

A certain amount of rehabilitation intervention can occur within a patient’s bed space, however, where space is restricted, and when patients remain in the field hospital for several days or weeks, it becomes increasingly important to have additional allocated space for rehabilitation professionals to work with patients and for mobilization.

### Minimum technical standard to achieve verification

1. Type 3 EMTs should allocate rehabilitation space in their facilities of at least 12 m<sup>2</sup>.

## Recommendations for optimal patient care

1. Type 2 EMTs that intend to remain in the field for 3 weeks or longer should allocate rehabilitation space in their facilities of at least 12 m<sup>2</sup> if they stay more than 3 weeks.
2. All EMTs should endeavor to maximize the physical accessibility of their facility through applying the following measures:

### General

- Pathways to places accessed by patients (such as latrines) should be flat or ramped where necessary, and the ground should be compacted or levelled to facilitate safe, independent access for people with restricted mobility, such as those using a wheelchair or crutches, older people and pregnant women.
- At least one latrine should be gender neutral to allow a care provider of the opposite sex enter with the patient.
- Any ramp should have a gradient of 1:20 and be equipped with a handrail 85–95 cm high (adjusted to the average height of the population).
- All doors should be 90 cm wide; if possible, sliding doors should be used, otherwise, they should open outwards.

### *All emergency exits should remain unobstructed*

Step-down facilities should ease patients' return to their home environment by ensuring that utilities such as latrines, showers and washrooms are as similar as possible to those in the host country. They should be adapted to maximize patients' independence and safety. Consideration should be given to making similar adaptations in their homes, preferably by referral to a local organization.

### *Latrines*

- The minimum surface of a latrine should include a turning circle of 150 cm to allow full maneuvering of a wheelchair (ISO measurements are 80 × 130 cm).
- Grab bars should be mounted at a height of 85–95 cm from the floor.
- Latrines, commodes or other seat adaptations should be 45–50 cm high and 45–50 cm from the wall on which the grab bar is positioned.
- Washbasins should be 65–70 cm from the ground and extend 35–45 cm from the wall.

### *Doorways*

- Operational devices on doors, such as levers or pull handles, should be easy to grip with one hand.

### *Showers and washrooms*

- Showers or washrooms should have a seat 45–50 cm high, positioned for easy access to the showerhead or water source.
- A grab bar should be positioned on the wall opposite the seat and around the back wall, mounted at a height of 85–90 cm.

## 3.6 Considerations for patient management

Using EMT patient discharge and referral pathways, as shown in Fig. 2, can help optimize follow-up and patient outcomes. Planning for discharge from the early stages of care, including making arrangements with family and identifying referral needs, can facilitate a more safe and timely discharge. Furthermore, systematic communication with the host ministry of health/coordination cell and other facilities will help reveal service gaps that need to be addressed.

Completeness of rehabilitation referral forms that include information on assistive devices, functional status and follow-up requirements helps facilitate the transfer of key patient information necessary for ongoing care (22, 25, 35). Fig. 2 shows where use of a rehabilitation referral form is necessary. An example of an EMT rehabilitation referral form can be found in Annex 3 (a copy can be downloaded from the EMT website and modified as desired).

### 3.6.1 Rehabilitation considerations by type of injury

Table 9 includes key considerations for the rehabilitation of common traumatic injuries managed by EMTs, as well as for those that present with a pre-existing disability. Rehabilitation of people with specific types of injuries by EMT type is described in Annex 2.

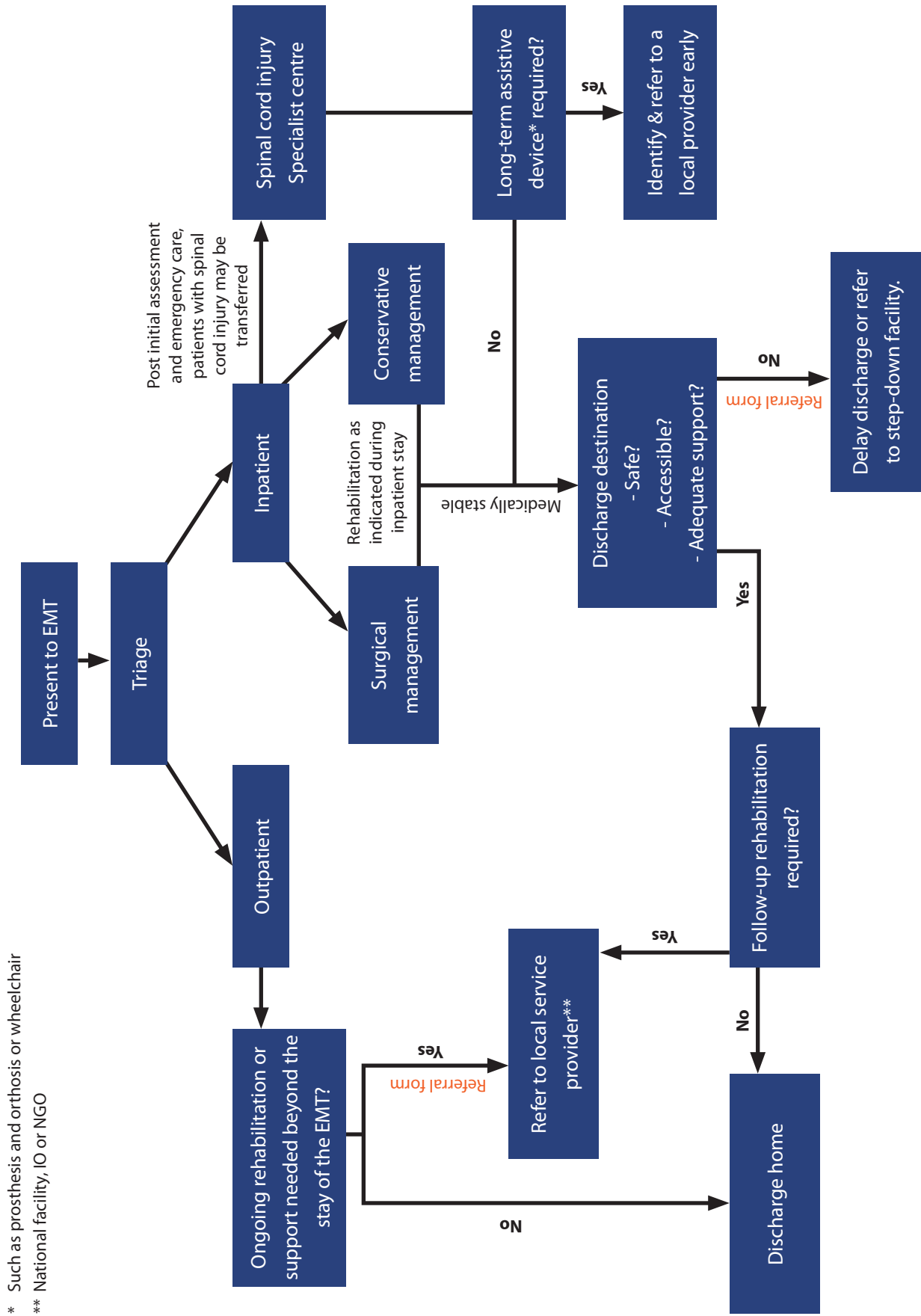
**Table 9. Considerations for rehabilitation after common severe traumatic injuries and pre-existing disability in emergencies**

<b>Patients with spinal cord injury</b>	
<ol style="list-style-type: none"> <li>1. The host ministry of health/coordination cell should be informed of all patients with suspected spinal cord injury via the established reporting system.</li> <li>2. EMTs are encouraged to identify safe transfer options early for patients who have sustained spinal cord injuries, so that they are managed at a specialized centre with experienced rehabilitation staff.</li> <li>3. People with a long-term wheelchair requirement should be referred to local providers early.</li> <li>4. Support from peers with spinal cord injuries can be beneficial; therefore, links should be established with local disabled people's organizations and any community-based rehabilitation programmes after the acute phase.</li> </ol>	<p><b>Rationale</b></p> <p>Management of patients with spinal cord injury in specialized centres reduces complications and the length of stay (4). The host ministry of health/coordination cell can help in identifying spinal injury centres or specialized care teams.</p>
<b>Patients with amputation</b>	
<ol style="list-style-type: none"> <li>1. Where possible, rehabilitation input should commence from the pre-operative stage of care to advise on the implications of level of amputation for fitting and use of a prosthetic.</li> <li>2. Links with local prosthetic providers and prescription of appropriate assistive devices should be established as early as possible 1.</li> <li>3. Support from peers with amputations can be beneficial; therefore, links should be established with local disabled people's organizations and any community-based rehabilitation programmes after the acute phase.</li> </ol>	<p><b>Rationale</b></p> <p>Prescription of appropriate assistive devices promotes independence and facilitates discharge. Lack of appropriate rehabilitation in amputation care can result in contractures and other complications, which can delay the fitting of a prosthetic device, restrict functional performance and sometimes require further surgery (33).</p>
<b>Patients with traumatic brain injury</b>	
<ol style="list-style-type: none"> <li>1. Cognitive and neurological changes should be monitored with regular, documented assessments.</li> <li>2. Depending on the anticipated duration of inpatient stay and rehabilitation needs, plans for referral to a step-down facility should be made early and local rehabilitation providers and support networks identified.</li> <li>3. If long-term mobility deficits are anticipated, a local provider of appropriate and mobility aids should be identified early.</li> </ol>	<p><b>Rationale</b></p> <p>In emergencies, mild traumatic brain injuries may be missed, as attention is paid to more visible injuries. Severe traumatic brain injuries are often rare, because of low survival rates. In settings where ventilation equipment is readily available, however, people with severe brain injuries may survive. They will require extensive rehabilitation throughout the continuum of care and perhaps for months or years. A plan for continuing care and links with local service providers are therefore necessary.</p>

<p><b>Patients with traumatic brain injury continued</b></p> <ol style="list-style-type: none"> <li>1. EMTs should identify referral pathways for microsurgery for patients for whom this is considered beneficial.</li> <li>2. Patients with long-term or permanent nerve injury should be considered for provision of an orthotic device, which should be sought from a local provider to replace any temporary device provided by the EMT.</li> </ol>	<p><b>Rationale</b></p> <p>Orthotic devices can require continuing maintenance or renewal during the patient's life and in many cases have to be custom-made. Devices should therefore be obtained from a local provider (27, 28).</p>
<p><b>Patients with fracture</b></p> <ol style="list-style-type: none"> <li>1. When an inpatient is discharged, restrictions such as weight bearing and follow-up plans such as for removal of a cast or an external fixator should be clearly documented and communicated to the patient, and a telephone number should be obtained for further communication.</li> </ol>	<p><b>Rationale</b></p> <p>In previous emergency responses, many patients have been lost to follow-up after discharge into the community. Patients immobilized for long periods can develop significant complications, such as contractures or joint ossification. Patients should therefore be given clear information about plans for follow-up and the implications of not receiving timely care (1, 23).</p>
<p><b>Patients with burns</b></p> <ol style="list-style-type: none"> <li>1. Rehabilitation should aim to start in the most acute phase of care. For inhalation burns, respiratory care, such as chest physiotherapy, should be started from day 1 of patient care.</li> <li>2. When long-term functional implications of scarring are suspected, the patient should be referred to appropriate specialist care, including rehabilitation.</li> <li>3. EMTs should aim to identify local services that can provide long-term follow-up (≤ 18 months) for patients who have severe (second- or third-degree) burns, especially when they cross-joints, are on the face or on any part of the hand.</li> <li>4. A rehabilitation specialist competent in splinting and scar management, including compression bandaging, should treat patients with severe burns, if possible.</li> </ol>	<p><b>Rationale</b></p> <p>Specialist rehabilitation care is particularly important in the care of patients with severe burns due to the critical impact that positioning and wound care can have on the long-term functional outcome for the patient. Pain and contracting skin can result in patients resting in flexed positions that can compromise range of motion as scars mature. The process of scar maturation can persist for up to two years and therefore consideration of long-term follow up is imperative (34).</p>
<p><b>Patients with Peripheral nerve injury</b></p> <ol style="list-style-type: none"> <li>1. EMTs should identify referral pathways for microsurgery for patients for whom this is considered beneficial.</li> <li>2. Patients with long-term or permanent nerve injury should be considered for provision of an orthotic device, which should be sought from a local provider to replace any temporary device provided by the EMT.</li> </ol>	<p><b>Rationale</b></p> <p>Orthotic devices can require continuing maintenance or renewal during the patient's life and in many cases have to be custom-made. Devices should therefore be obtained from a local provider (27, 28).</p>
<p><b>People with pre-existing disability</b></p> <ol style="list-style-type: none"> <li>1. EMTs should aim to ensure that people with pre-existing disability are triaged according to their health needs and are referred to appropriate services when indicated, such as for social support or for provision of assistive devices.</li> </ol>	



**Figure 2. EMT rehabilitation referral pathway**



\* Such as prosthesis and orthosis or wheelchair

\*\* National facility, IO or NGO

### 3.6.2 Discharge and referral

#### Recommendations for optimal patient care

1. EMTs should plan for discharge and referral from the early stages of care in order to identify service gaps, which should be promptly communicated to the host ministry of health/coordination cell.
2. To ensure that referrals for rehabilitation are managed effectively, the patient and the referring EMT should both keep a copy of the referral, which should contain the following information, at a minimum:
  - required assistive devices provided;
  - functional status, including mobility and precautions; and
  - requirements for follow-up with the referral team (e.g. for surgical review, removal of an external fixator or follow-up X-ray).
3. EMTs should endeavour to discharge patients only when they can safely access their discharge destination (with or without assistance) and when they have adequate support to cope.
4. Patients who require care after the treating EMT leaves should be referred to another EMT, a step-down facility or a local service provider. EMTs should keep an updated list of all patients who require rehabilitation follow-up after discharge or after the departure of the EMT and communicate the list to the host ministry of health/ coordinating cell as requested. The list should include, at a minimum, the patient's name, a telephone number (if available), the diagnosis, the discharge destination and the reason for follow-up.
5. Patients should be referred for follow-up as close to home as possible.
6. EMTs should maximize opportunities to prepare patients, their families and care providers for discharge by education and functional retraining.

### 3.7 Building rehabilitation capacity

The provision of specialist care by EMTs during emergency response can result in the survival of patients with conditions that might otherwise have been fatal. In low- and middle- income countries, the health and rehabilitation infrastructure and personnel may be under-equipped to provide the necessary services for these patients, such as those with high-level spinal cord injuries or traumatic brain injuries. In response to this ethically challenging situation, local health or community personnel, care providers and the patients themselves should be mentored, coached or trained to ensure sustainable care (12, 21, 37). This is best done in partnership with local service providers, when possible. Rehabilitation professionals should also seize opportunities for applying safe, applicable local rehabilitation initiatives. Care should be taken to ensure that the people who are trained are competent and continue to work only within the scope of practice for which they have been trained. Training care providers for basic roles can also relieve pressure on over-stretched service providers.

#### Recommendations for optimal patient care

1. EMTs should maximize opportunities to exchange rehabilitation knowledge and competencies with local personnel of various disciplines.
2. Training of local health workers should be consistent with local practice; local rehabilitation standards should be acknowledged (36).

### 3.8 Information management

Documentation and reporting are essential for accountability, planning and effective communication during an emergency response (16, 19, 25).

#### 3.8.1 Health records

Maintaining quality documentation in the context of emergencies can be challenging, yet it is important that rehabilitation entries in the patient's health record follow international professional standards (38-40).

#### Recommendations for optimal patient care

1. Notes on rehabilitation, including interventions, assessments and assistive devices, should be incorporated into the patient's main health record, which should remain with the patient when he or she is referred or discharged (in accordance with the minimum standards for EMTs (1)).

### 3.8.2 Data collection and reporting

In the context of emergencies, people with significant impairments can be particularly vulnerable and require ongoing support beyond the departure of the EMT. It is therefore important that (with the person's consent) the host ministry of health/coordination cell is informed when a person with significant pre-existing impairment(s) is admitted for care. Sharing of such information can help facilitate appropriate referral and provision of supports following discharge. This can assist with EMT coordination, for planning by the ministry of health and social services, and for local service providers such as those providing prosthetic and orthotic devices and organizations providing rehabilitation in the community. In addition, data on injuries and disabilities, which has been limited in emergency response to date, could be used for further longitudinal research to guide future response (5, 21, 22)

## 3.9 Research in emergency response

Further research is urgently required to guide rehabilitation in emergency response. Such research has been severely hampered by lack of data on injury, disability and long-term functional outcomes, which is necessary to ascertain access to and the impact of rehabilitation expertise within EMTs and in emergency response more widely (16, 21). Consensus is required on an international classification of injuries relevant to emergency response; however, opportunities for high-quality mixed-method research will be generated by building research capability into the daily operation of EMTs, for example by systematic data collection and reporting. The aim of the studies should be to improve rehabilitation service provision not only by EMTs but also by local health providers.

### Minimum technical standard to achieve verification

1. Ethical standards for research with human participants should be maintained in emergency response, especially in regards to permission and confidentiality (1, 36, 41).

### Recommendations for optimal patient care

1. Clinical care should take priority over research, which itself should be focused on improving the delivery and outcomes of rehabilitation.
2. People conducting research should collaborate with local academic institutions and undertake to build national capacity.
3. When local partners are involved, they should share the leadership of the project and ownership of the data.

## 4. Rehabilitation in outbreak response

The role of rehabilitation in outbreak response is generally not adequately understood or considered by the humanitarian response community. This is probably the result of a misconception that rehabilitation is confined to management of traumatic injuries, such as occur during earthquakes and typhoons. Rehabilitation is in fact essential in much broader contexts: rehabilitation professionals play a significant role in the return to functional activities, such as in the management of cardiorespiratory conditions, acute and chronic pain, deconditioning, fatigue and sensory and cognitive impairment (42). Lack of attention to the long-term sequelae of some outbreaks is another reason for the limited involvement of rehabilitation in such events. The Ebola virus outbreak clearly demonstrated the prolonged health consequences for many of those effected, including significant myalgia and arthralgia, as well as sensory and cognitive impairments that effected their ability to return to their usual occupations (42).

In outbreak emergencies, local health systems can decompensate drastically, as people, including health professionals, avoid health facilities for fear of contamination and the health facilities are overwhelmed with infected patients. The breakdown of rehabilitation services in this context can lead to secondary complications, while lack of management of noncommunicable diseases can lead to increased morbidity and disability. Responding EMTs should assess the potential for both scenarios and coordinate rehabilitation services accordingly. In addition, EMTs should consider the role of rehabilitation professionals in interdisciplinary training, such as respiratory management in influenza outbreaks and education of patients and care providers for self-management of chronic conditions (43).

### Considerations for EMTs responding to outbreaks

1. EMTs should to be aware of the acute and long-term rehabilitation needs of their patients and deploy rehabilitation staff accordingly.
2. Clear processes should be established for referral to long-stay or other service providers for people with rehabilitation needs.
3. EMTs should be aware of the increased vulnerability of people with disability due to potential difficulties accessing health services and information.
4. EMTs should anticipate the delayed or long-term complications of diseases (such as the various sequelae experienced by Ebola survivors, including arthralgia and myalgia (42)) and provide adequate education to patients and others involved.
5. Provision of rehabilitation services should be carefully weighed against risk and the mechanisms in place to mitigate it.

## 5. Process and methods for preparing this document

The EMT minimum technical standards and recommendations for rehabilitation were developed under the auspices of the WHO EMT Secretariat and endorsed by the EMT strategic advisory group. An evidence-based and expert consensus process was used, and the project was guided by a consultant working within the Secretariat.

**1.** In stage 1, a literature review was undertaken in PubMed and Embase and of “grey literature”, and relevant references were extracted from the reference lists of selected articles. Benchmarking was conducted against relevant guidelines and publications. Relevant resources were also provided by members of the working group and compiled for review.

**2.** In stage 2, the minimum standards and recommendations for rehabilitation were prepared by a working group convened by WHO at WHO headquarters in Geneva. The working group consisted of independent advisers and participants nominated by organizations with significant roles in providing rehabilitation in emergency response, including representatives of the disciplines of physiotherapy, occupational therapy, orthotics and prosthetics, nursing and rehabilitation medicine. Members of the working group were required to have operational experience in emergency response, and was geographically and gender-balanced.

The standards and recommendations were based on the available evidence; however, because of the limited published data and technical information on rehabilitation in emergencies, the document relied strongly on the expert opinion of the working group.

**3.** Stage 3 consisted of the first round of feedback. A comprehensive consultation was conducted, in which the document was sent to professional bodies, relevant nongovernmental and international organizations and individuals for review. This maximized accuracy, ensured consensus on key points and increased the credibility of the standards and recommendations.

**4.** At a second meeting at WHO headquarters in Geneva, the working group considered and integrated the input of the consulted stakeholders into the document.

**5.** The second round of feedback constituted stage 5, in which the updated document was disseminated to a smaller group of stakeholders, consisting of those with operational experience in establishing, practicing in or coordinating EMTs. The working group reviewed the feedback from these experts by e-mail and teleconference, and the document was revised accordingly.

**6.** Stage 6 involved piloting the minimum technical standards and recommendations during the verification process of four EMTs (all type 2). Lessons learnt through this process were fed back to the WHO EMT Secretariat, and several of the standards and recommendations were revised in response.

**7.** In the final stage of the development process final edits to the document were made and it was endorsed by the EMT strategic advisory group.

# Glossary

## Assistive device

Any device designed, made or adapted to help a person perform a particular task, such as wheelchairs, prostheses, mobility aides, hearing aids or visual aids. Products may be specially produced or generally available for people with a disability (17, p 301; 44).

## Austere

“An austere environment is a setting where access, transport, resources or other aspects of the physical, social, or economic environments impose severe constraints on the adequacy of immediate care for the population in need.” (45)

## Community-based rehabilitation

“A strategy within general community development for rehabilitation, equalization of opportunities, poverty reduction and social inclusion of people with disabilities. Community-based rehabilitation is implemented through the combined efforts of people with disabilities themselves, their families, organizations, and communities, and the relevant governmental and nongovernmental health, education, vocational, social and other services.” (7, p. 302).

## Disabled people’s organization

Representative organizations or groups of people with disability and of children with intellectual, auditory or visual impairment, their relatives and carers. The primary aim of these organizations is empowerment and self-advocacy (46).

## Emergency medical team (EMT)

EMTs are groups of health professionals and supporting staff outside their area of origin (nationally or internationally), who provide health care specifically to populations affected by emergencies. They include governmental (both civilian and military) and nongovernmental teams. EMTs respond to sudden-onset disasters to treat trauma and surgical cases. Their value in other types of emergencies, such as communicable disease outbreaks, has been demonstrated more recently.

## EMT coordination cell

A coordination cell aims to support (not replace) the host ministry of health (or equivalent national authority) in coordinating all responding EMTs to best meet the excess health care needs resulting from the emergency or from damage to existing capacity. The coordination cell matches available resources to identified needs, ensuring optimal resource use and maximum collective outcomes.

## Global Classification List of quality assured teams

The Global Classification List of quality assured teams captures all known EMTs that agree to comply with published principles and minimum standards (1). The list includes all EMTs for which self-reported information has been checked by peer review and all EMT organizations that have also received satisfactory WHO and peer site visits to validate their pre-deployment capability. Quality assurance is also conducted during deployment in joint visits by WHO and the ministry of health of the registering country to ensure compliance with the capabilities declared before arrival. One objective of the list is to discourage individuals from arriving unannounced at an emergency; the EMT initiative encourages such individuals to join recognized EMTs.

## Local service provider

For the purposes of this document, a local service provider is any national service or facility or international or nongovernmental organization that has been present in the affected region for a long time and can provide services sustainably.

## Multidisciplinary practice

In the context of this document, multidisciplinary practice comprises various disciplines working collaboratively in patient treatment, whereby each specialization provides complementary services to achieve comprehensive health care.

## Outbreak

In the context of this document, outbreaks refer to communicable disease outbreaks, defined by WHO as the “occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season. A communicable disease outbreak may occur in a restricted geographical area, or may extend over several countries. It may last for a few days or weeks, or for several years.” (43). Examples include poliomyelitis, Ebola virus disease and severe acute respiratory syndrome (SARS).

## Rehabilitation personnel

Rehabilitation personnel include both rehabilitation professionals and informally trained health workers who support or conduct the work of rehabilitation professionals in their absence or because of a limited number.



## Rehabilitation professional

Rehabilitation professionals cover a range of professions, including physical therapy, physiotherapy, occupational therapy, orthotics and prosthetics, rehabilitation nursing, physical rehabilitation medicine (physiatry), psychology, speech and language therapy, nutrition and social work. These professionals ideally work collaboratively in a multidisciplinary team, each contributing their specialty to achieve comprehensive care (4, 7, 19, 46). The scope of practice, qualifications and registration of each profession varies by country; therefore, this document recommends deployment on the basis of the skills and experience necessary to work effectively in austere environments and meet the needs that present in emergency contexts.

## Specialized care team

Specialized care teams are national or international teams embedded into an EMT or a local hospital to provide specialist care. They adhere to the same guiding principles and core standards as EMTs (1).

## Step-down facility

A step-down facility is an inpatient unit with a mandate to provide interim care for medically stable patients while they are prepared for discharge into the community.

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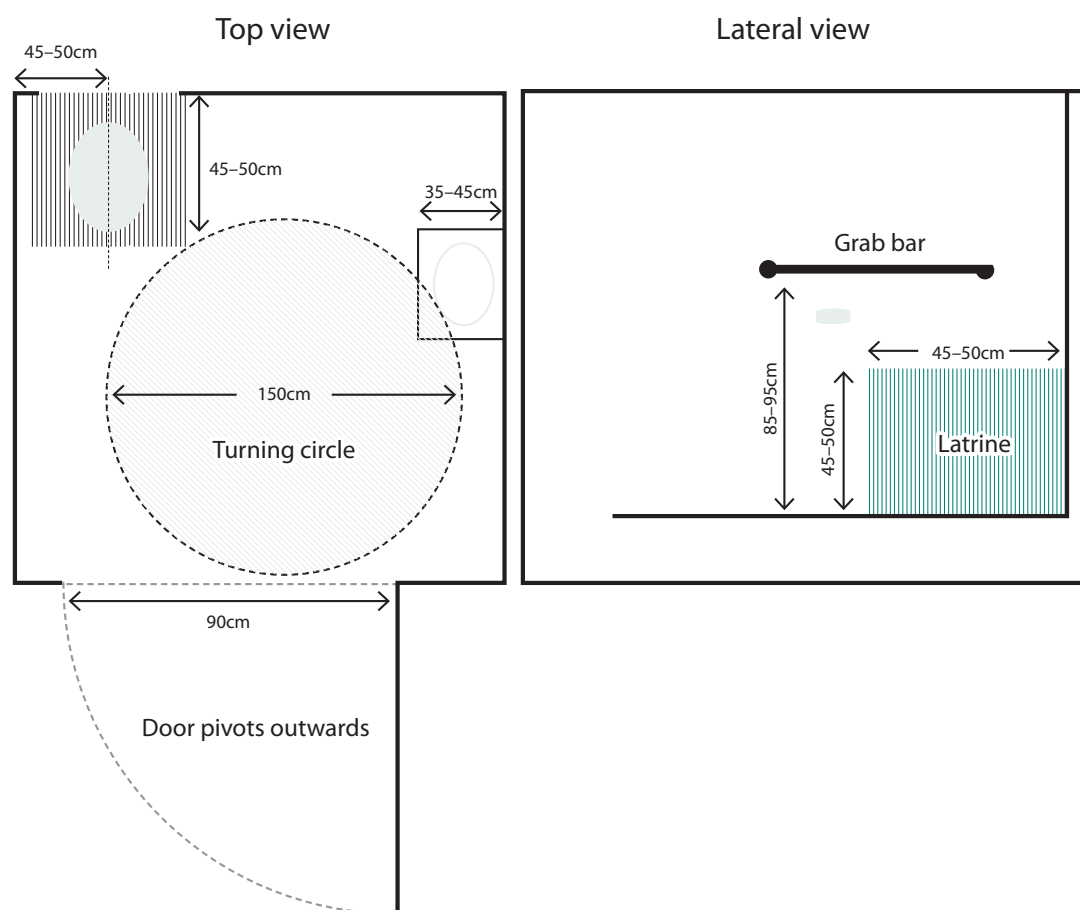
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## Annex 1. Dimensions and gradients for accessibility in field hospitals

Dimensions for wheelchair-accessible latrines



### Recommended slope of ramps

Maximum slope	Maximum length (m)	Maximum rise (m)
1:20	–	–
1:16	8	0.5
1:14	5	0.35
1:12	2	1.15
1:10	1.25	0.12
1:08	0.5	0.06

### Reference

United Nations (2003–2004) Accessibility for the disabled: a design manual for a barrier free environment. New York: Secretariat for the Convention on the Rights of Persons with Disabilities (<http://www.un.org/esa/socdev/enable/designm/>, accessed 25 June 2015).

## Annex 2. Overview of rehabilitation input by EMT type, and specific discharge considerations

	Type 1	Type 2	Type 3	Referral and discharge considerations
<b>Basic fracture (conservative management)</b>	<ul style="list-style-type: none"> <li>• Provide clear guidance on weight-bearing status</li> <li>• Provide assistive devices</li> <li>• Advise on range of motion (ROM) and functional use</li> </ul>	<ul style="list-style-type: none"> <li>• As type 1</li> </ul>	<ul style="list-style-type: none"> <li>• As type 1</li> </ul>	<ul style="list-style-type: none"> <li>• Rehabilitation follow-up</li> </ul>
<b>Complex fracture</b>	<ul style="list-style-type: none"> <li>• Stabilize and refer</li> </ul>	<ul style="list-style-type: none"> <li>• Provide assistive devices</li> <li>• Advise on ROM and precautions</li> <li>• Functional retraining</li> <li>• External-fixator care</li> <li>• Pain management</li> <li>• Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>• Provide assistive devices</li> <li>• Advise on ROM precautions</li> <li>• Functional retraining</li> <li>• External-fixator care</li> <li>• Pain management</li> <li>• Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>• Clarify time for removal of external fixator</li> <li>• Progression of weight-bearing status</li> <li>• Education about possible complications</li> <li>• Rehabilitation follow-up</li> </ul>
<b>Spinal cord injury</b>	<ul style="list-style-type: none"> <li>• Neurological assessment</li> <li>• Advice regarding pressure area prevention and care</li> <li>• Refer according to national protocol or specialized care team</li> </ul>	<ul style="list-style-type: none"> <li>• Neurological assessment</li> <li>• Pain management</li> <li>• Functional retraining</li> <li>• Provide temporary wheelchair</li> <li>• Refer according to national protocol or specialized care team</li> <li>• Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>• Neurological assessment</li> <li>• Pain management</li> <li>• Functional re-training</li> <li>• Provide temporary wheelchair</li> <li>• Refer according to national protocol or specialized care team</li> <li>• Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>• Provide temporary assistive devices, including pressure-relieving equipment</li> <li>• Educated on self-care, including bladder and bowel management, and precautions</li> <li>• Referral to local provider for long-term assistive devices</li> <li>• Rehabilitation follow-up</li> </ul>
<b>Burns</b>	<ul style="list-style-type: none"> <li>• Advise on appropriate dressing and refer to specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>• Advise on appropriate dressing</li> <li>• Positioning, including splinting if indicated</li> <li>• ROM, strength and functional retraining</li> <li>• Refer to burns/plastics specialized care team if indicated</li> <li>• Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>• Advise on appropriate dressing</li> <li>• Positioning, including splinting if indicated</li> <li>• ROM, strength and functional retraining</li> <li>• Refer to burns/plastics specialized care team if indicated</li> <li>• Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>• Identify step-down facility if required</li> <li>• Identify providers of local burns/ plastics care and/or specialized burns care team for scar management, including compression garments. Long-term rehabilitation follow up required for scar maturation and risk for contracture.</li> </ul>

	Type 1	Type 2	Type 3	Referral and discharge considerations
<b>Peripheral nerve injury</b>	<ul style="list-style-type: none"> <li>Positioning, including splinting if indicated</li> <li>Patient and care provider education</li> <li>Refer as indicated</li> </ul>	<ul style="list-style-type: none"> <li>Positioning, including splinting if indicated</li> <li>Patient and care provider education</li> <li>ROM, strength and functional retraining</li> <li>Pain management</li> <li>Refer to microsurgery specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>Positioning, including splinting if indicated</li> <li>Patient and care provider education</li> <li>ROM, strength and functional retraining</li> <li>Pain management</li> <li>Refer to microsurgery specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>Identify microsurgery specialist care early if surgical intervention anticipated</li> <li>Referral to local provider for long-term assistive devices (such as orthotics)</li> <li>Education about possible complications, such as contracture</li> <li>Rehabilitation follow-up</li> </ul>
<b>Traumatic brain injury</b>	<ul style="list-style-type: none"> <li>Basic neurological and cognitive assessment</li> <li>Refer as indicated</li> </ul>	<ul style="list-style-type: none"> <li>Neurological and cognitive assessments</li> <li>Positioning, including splinting if indicated</li> <li>ROM, strength and functional retraining</li> <li>Patient and care provider education</li> <li>Refer to neurological specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>Neurological and cognitive assessments</li> <li>Positioning, including splinting if indicated</li> <li>ROM, strength and functional retraining</li> <li>Patient and care provider education</li> <li>Refer to neurological specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>Identify step-down facility if required</li> <li>Identify local providers of neurological rehabilitation. Provide long-term follow up throughout neurological recovery</li> <li>Referral to local provider for long-term assistive devices if indicated</li> </ul>
<b>Wounds</b>	<ul style="list-style-type: none"> <li>Advise on appropriate dressing, and refer as indicated</li> </ul>	<ul style="list-style-type: none"> <li>Advise on appropriate dressing</li> <li>Provide assistive devices</li> <li>ROM, strength and functional retraining</li> <li>Patient and care provider education</li> <li>Refer to plastics specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>Advise on appropriate dressing</li> <li>Provide assistive devices</li> <li>ROM, strength and functional retraining</li> <li>Patient and care provider education</li> <li>Refer to plastics specialized care team if indicated</li> </ul>	<ul style="list-style-type: none"> <li>Identify plastics specialized care team early</li> <li>Progression of weight-bearing status</li> <li>Education about possible complications, such as infection</li> <li>Rehabilitation follow-up if indicated</li> </ul>
<b>Amputation</b>	<ul style="list-style-type: none"> <li>Basic wound management</li> <li>Refer to type 2 or 3 or national facility</li> </ul>	<ul style="list-style-type: none"> <li>Preoperative advice according to prosthetic availability and functional outcomes</li> <li>Stump management</li> <li>Provide temporary assistive devices</li> <li>Pain management</li> <li>ROM, strength and functional retraining</li> <li>Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>Preoperative advice according to prosthetic availability and functional outcomes</li> <li>Stump management</li> <li>Provide temporary assistive devices</li> <li>Pain management</li> <li>ROM, strength and functional retraining</li> <li>Patient and care provider education</li> </ul>	<ul style="list-style-type: none"> <li>Referral to local provider for long-term assistive devices, such as prosthetic and/or wheelchair if indicated</li> <li>Rehabilitation follow-up</li> </ul>

## Annex 3. Example EMT Rehabilitation referral form

Referral to: \_\_\_\_\_

Referral from: \_\_\_\_\_

Reason for referral: \_\_\_\_\_

\_\_\_\_\_

### PATIENT DETAILS

Name (first last): \_\_\_\_\_ Age: \_\_\_\_\_ Gender  Male  Female

Phone: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

History of presenting condition: \_\_\_\_\_

\_\_\_\_\_

Surgical history (include dates): \_\_\_\_\_

\_\_\_\_\_

Post-injury restrictions/precautions (weigh-bearing, range of movement): \_\_\_\_\_

\_\_\_\_\_

Review required?  Yes  No

Details: \_\_\_\_\_

\_\_\_\_\_

Past medical history (include any significant allergies and medications): \_\_\_\_\_

\_\_\_\_\_

### SOCIAL

Care provider/supports: \_\_\_\_\_

Accompanied by care provider?  Yes  No

Education/occupation: \_\_\_\_\_

Discharge destination/accommodation: \_\_\_\_\_

\_\_\_\_\_

### FUNCTIONAL STATUS

Mobility:  Independent  Assistance required  Mobility devices \_\_\_\_\_

ADLs:  Independent  Assistance required  Assistive devices \_\_\_\_\_

Cognition:  Intact  Impaired Details \_\_\_\_\_

Name of referrer: \_\_\_\_\_ Phone: \_\_\_\_\_

Date: \_\_\_\_\_ Signature: \_\_\_\_\_



## Annex 4. Resources

### Emergency response standards

- Norton I, von Schreeb J, Aitken P, Herard P, LaJolo C (2013) Classification and minimum standards for foreign medical teams in sudden onset disaster. Geneva: WHO ([http://www.who.int/hac/global\\_health\\_cluster/fmt\\_guidelines\\_september2013.pdf](http://www.who.int/hac/global_health_cluster/fmt_guidelines_september2013.pdf)).
- Sphere Project (2011) The Sphere handbook: humanitarian charter and minimum standards in humanitarian response. Rugby: Practical Action Publishing (<http://www.sphereproject.org/resources/download-publications/?search=1&keywords&language=english&category=22>).

### Physical accessibility

- United Nations (2003–2004) Accessibility for the disabled: a design manual for a barrier free environment. New York: Secretariat for the Convention on the Rights of Persons with Disabilities (<http://www.un.org/esa/socdev/enable/designm/>).
- Bonnet S (2014) Physical rehabilitation centres: architectural programming handbook. Geneva: International Committee of the Red Cross (<https://www.icrc.org/eng/assets/files/publications/icrc-002-4133.pdf>).

### Disability in emergency response

- WHO (2013) Guidance note on disability and emergency risk management for health. Geneva ([http://apps.who.int/iris/bitstream/10665/90369/1/9789241506243\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/90369/1/9789241506243_eng.pdf)).

### Mental health and psychosocial support

- Inter-Agency Standing Committee (2007) Guidelines on mental health and psychosocial support in emergency settings. Geneva: WHO ([http://www.who.int/hac/network/interagency/news/iasc\\_guidelines\\_mental\\_health\\_psychosocial.pdf?ua=1](http://www.who.int/hac/network/interagency/news/iasc_guidelines_mental_health_psychosocial.pdf?ua=1)).
- WHO (2011) Psychological first aid: guide for field workers. Geneva ([http://whqlibdoc.who.int/publications/2011/9789241548205\\_eng.pdf?ua=1](http://whqlibdoc.who.int/publications/2011/9789241548205_eng.pdf?ua=1)).

### Mobility devices

- WHO (2008) Guidelines on the provision of manual wheelchairs in less-resourced settings. Geneva (<http://www.who.int/disabilities/publications/technology/wheelchairguidelines/en/>).
- WHO, United States Agency for International Development (2011) Joint position paper on the provision of mobility devices in less resourced settings: a step towards implementation of the Convention on the Rights of Persons with Disability related to personal mobility. Geneva, WHO ([http://www.who.int/disabilities/publications/technology/jpp\\_final.pdf](http://www.who.int/disabilities/publications/technology/jpp_final.pdf)).

### Spinal cord injury

- WHO, International Spinal Cord Society (2013) International perspectives in spinal cord injury. Geneva: WHO ([http://apps.who.int/iris/bitstream/10665/94190/1/9789241564663\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/94190/1/9789241564663_eng.pdf?ua=1)).
- EMT: <https://extranet.who.int/emt/page/home>
- Disability and rehabilitation: <http://www.who.int/disabilities/en/>

## Annex 5. External experts and WHO personnel involved in the preparation of this document

### WORKING GROUP

#### **Mr Julian Clause**

*Physiotherapy*

Physiotherapist

Regional University Hospital Center of Lille  
Lille, France

#### **Dr James Gosney Jr.**

*Physical and rehabilitation medicine*

Chair, Committee on Rehabilitation Disaster Relief (CRDR)

International Society of Physical and Rehabilitation Medicine  
Geneva, Switzerland

#### **Dr Geraldine Jacquemin**

*Physical and rehabilitation medicine*

Associate professor- Physical Medicine & Rehabilitation

University of Montreal,  
Montreal, Canada, and  
Valida Rehabilitation Hospital  
Brussels, Belgium

#### **Ms Jody-Anne Mills**

*Occupational therapy*

Consultant

Emergency Medical Teams  
WHO  
Geneva, Switzerland

#### **Ms Barbara Rau**

*Physiotherapy*

Physiotherapy Technical Coordinator  
International Committee of the Red Cross  
Geneva, Switzerland

#### **Mr Michael Rechsteiner**

*Orthotics and prosthetics*

Physical Rehabilitation Project Manager

International Committee of the Red Cross  
Geneva, Switzerland

#### **Ms Valerie Scherrer**

*Occupational therapy*

Director- Emergency Response Unit  
CBM

Brussels, Belgium

#### **Ms Fiona Stephenson**

*Rehabilitation nursing*

Spinal Cord Injury Nurse Specialist  
Consultant

Waterlow Stephenson LTD  
Salisbury, United Kingdom

#### **Mr Peter Skelton**

*Physiotherapy*

Rehabilitation Project Manager,  
Handicap International  
London, United Kingdom

#### **Mr Claude Tardif**

*Orthotics and prosthetics*

Head of Physical Rehabilitation Programme  
International Committee of the Red Cross  
Geneva, Switzerland

**WHO REVIEWERS (Geneva, Switzerland)****Dr Alarcos Cieza***Coordinator*Prevention of Blindness and Deafness,  
Disability and Rehabilitation**Mr Robert Holden***Technical Advisor*Emergency Medical Teams  
Emergency Risk Management and  
Humanitarian Response**Dr Ian Norton***Technical adviser and project leader*Emergency Medical Teams  
Emergency Risk Management and  
Humanitarian Response**Ms Bronte Martin***Technical Advisor*Emergency Medical Teams  
Emergency Risk Management and  
Humanitarian Response**Mr Flavio Salio***Technical Advisor*Emergency Medical Teams  
Emergency Risk Management and  
Humanitarian Response**EXTERNAL REVIEWERS****Ms Esha Thapa Dhungana***Executive Director*Spinal Injury Rehabilitation Centre  
Kavrepalanchok, Nepal**Dr Filipinas G. Ganchoon***Philippine Academy of Rehabilitation  
Medicine*Rehabilitation Disaster Relief Committee  
Chair  
Philippines**Dr Olivier Hagon***Deputy Head-Division of Tropical and  
Humanitarian Medicine*University Hospitals of Geneva  
Geneva, Switzerland**Mr Rajiv S. Hanspal***President*International Society for Orthotics and  
Prosthetics  
Brussels, Belgium**Ms Diana Hiscock,***Disability Advisor*Help Age International  
London, United Kingdom**Dr Ilan Kelman***Reader in Risk, Resilience and Global Health,  
University College London*London, United Kingdom  
Norwegian Institute of International Affairs  
Oslo, Norway**Dr Fary Khan***Director of Rehabilitation*Royal Melbourne Hospital  
Melbourne, Australia**Ms Karen Livingstone***Medical Adviser- Nurse*UK-Med  
Manchester, United Kingdom**Mr Steve Mannion***Consultant Orthopaedic & Trauma Surgeon*Orthopaedic Surgical Advisor, CBM  
Head of Dept of Conflict & Catastrophe  
Medicine, St George's, University of London  
London, United Kingdom

## EXTERNAL REVIEWERS CONTINUED

**Mr Ángel Vicario Merino***Health Advisor*

Fundación Internacional y para  
Iberoamérica de Administración y Políticas  
Públicas – Spanish Cooperation  
Madrid, Spain

**Mr Jan Monsbakken***President*

Rehabilitation International  
Oslo, Norway

**Dr Colleen O’Connell***Assistant Professor- Physical Medicine and  
Rehabilitation*

Dalhousie University Faculty of Medicine  
Chair, Team Canada Healing Hands Inc  
Fredericton, Canada

**Dr Nelson Olim***Senior Surgeon*

International Committee of the Red Cross  
Geneva, Switzerland

**Ms Marilyn Pattison***President*

World Federation of Occupational Therapists  
Adelaide, Australia

**Professor A. D. Redmond***Professor of International Emergency Medicine*

Chairman, UK-Med

Deputy Director

Humanitarian and Conflict Response  
Institute, University of Manchester  
Manchester, United Kingdom

**Ms Aleema Shivji***Director*

Handicap International  
London, United Kingdom

**Mr Michiel Steenbeek**Advisor Physical Impairment and  
Rehabilitation

CBM

Netherlands

**Ms Catherine Sykes***Professional Policy Consultant*

World Federation of Physical Therapy  
London, United Kingdom

**Dr Harald Veen***Chief Surgeon*

International Committee of the Red Cross  
Geneva, Switzerland

**Ms Joan M. Wilson***Head of Emergency Surgery Unit*

Save the Children UK

London, United Kingdom



Emergency Management and Operations  
WHO Health Emergency Programme  
World Health Organization  
Avenue Appia 20  
1211 Geneva 27  
Email: [emteams@who.int](mailto:emteams@who.int)

