

# Orthopaedic Trauma in the Austere Environment

A Practical Guide  
to Care in the  
Humanitarian Setting

Juan de Dios Robinson  
*Editor*

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A Practical Guide to Care in the  
Humanitarian Setting

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*To my father*

*To my Jessica, thank you for your unconditional love and support*

*To Azela, Alan, Marie-Astrid, Alex and Alancito*

*To my friends, mentors, colleagues and patients throughout the world and especially to those who died or were injured during the attack on the MSF Kunduz Trauma Centre, Afghanistan, on October 3, 2015.*



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## Foreword I

Going on a humanitarian deployment in a disaster or conflict zone can be life changing for both the clinician and the patient. It can be both positive and detrimental.

There are two important reasons why a different approach is demanded ‘out there’.

1. Different circumstances: the lack of equipment and consumables, deficient post-operative care, non-reliable sterilisation and no guaranteed lab quality and other minimum requirements to deliver safe surgical treatment. It excludes certain procedures.
2. Different pathology, presented with delay and complications, especially in an armed conflict. It demands a different approach. The challenge of infection is considerable. The ever re-learned lesson of good wound debridement must be strictly applied.

Nowadays, ‘orthopaedic treatment’ is associated with the latest complex technology, mostly not applicable in the austere setting.

However, many modalities of valuable orthopaedic treatment have been forgotten or are considered obsolete for no good reason. You will be reminded of them in this practical guide.

In the past two decades we have learned to achieve better survival rates using Damage Control principles. These principles also apply in the austere setting.

We have the duty and responsibility to deliver quality care. We owe it to our patients to be well trained and well prepared and to adhere to established quality standards.

There is a minimum level of quality below which we cannot go. After the disaster in Haiti, the world realised that relief work can also be harmful. Serious attempts to show that humanitarian aid is beneficial have not been very successful. Humility is good starting point here.

With the ‘Foreign Medical Team’ project, the WHO has now formulated standards for surgical emergency teams, with clarity about treatment protocols and necessary equipment. Training opportunities, such as the ‘Surgical Training in the Austere Environment’ at the London Royal College of Surgeons, can increase further the quality and efficiency of the care as it is delivered ‘in the field’.



This book will contribute to preparedness, and it will enable you to at least avoid making the standard mistakes. It will be to the benefit of the patients.

The needs are evident; there is a lot of work to be done.

I hope to meet you, well prepared, in the austere environment.

Harald Veen, FRCSEd  
Chief Surgeon for the International Committee of the Red Cross  
Geneva, Switzerland

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## Foreword II

It is a great pleasure to write a foreword to this new book on trauma surgery in the austere environment. In the 30 years that I have been involved in international surgery, I have seen an increase in interest and also understanding of the issues that is reflected in the chapters of this book.

Trauma on a global level is increasing. Wars and natural disasters will always be with us, and as motorised transport helps develop low-income regions of the world so road traffic injuries increase, exponentially more so in low- and middle-income countries. Sven Young in his chapter on femoral injuries quotes the WHO estimate that road crashes will be the fifth biggest cause of disability by 2030.

There is increased interest by surgeons globally in trauma and particularly in catastrophes. Many of us took up surgery because we wanted to make a difference to the lives of injured patients and naturally feel a calling to where this need is greatest. With the Internet bringing the need to our living rooms and easy air transport being available, there has been a massive increase in surgical volunteers from high-income countries who want to help both in wars and in natural disasters and also in the chronic disasters of day-to-day trauma in resource-poor settings.

There is also an improved understanding of how to manage trauma in disaster and low-resource settings. We are building up an evidence base in what techniques are effective in terms of rapid and cost-effective return to normal function.

Most gratifying to me however is that there is an increase in preparedness for surgical involvement in global trauma. In the analysis of disasters over the last decade, it is clear that much surgery has been inappropriately performed and organised. Enthusiasm and a sharp knife alone are not sufficient. There needs to be training, preparedness, on-site organisation and integration with existing healthcare systems. This book reflects many of the key initiatives that have been set up, such as the UK International Trauma Register, the Royal College of Surgeons' Surgery in the Austere Environment Course and the WHO cluster system for organisation of healthcare groups in disaster situations. We are not there yet, but we are learning, and this book is a welcome step in that direction.

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## Preface

Disasters, whether natural or human made, are part and parcel of our journey as inhabitants of this planet. There is nothing new about the carnage and misery that sectors of the Earth's population periodically face. The world is increasingly interconnected, and news of a disaster travel rapidly, if not accurately, across the Globe. This has led to an increase in interest among health service professionals in unaffected countries who then flock to help in areas afflicted by the disaster promoted in the media. This raise in interest, however, is not necessarily accompanied by enhanced preparation or training, and a naïve attitude accompanies many of these well-meaning volunteers.

The massive earthquake that struck Haiti in 2010 and the humanitarian effort that followed were the object of a post-mortem that no other disaster response has undergone previously. This examination revealed a lack of preparation from the many volunteers that largely just "showed up" and expected to be of help. This approach has resulted in high levels of complications, neglected external fixators, osteomyelitis from poorly judged internal fixation and unnecessary or poorly performed amputations.

We must maintain a professional attitude in humanitarian work. We must aim to pursue the same levels of excellence that we would normally practise in our respective countries. Participating in a humanitarian mission is not a licence to practise lower standards of medicine. The environment may be austere, but our patient management must live up to the standards that would be expected from us at home. To achieve this, we must prepare to face challenges of a very different nature. We must also think ahead on the consequences of our actions. Who will follow up the patient when we are gone? What are we leaving behind?

Historically, humanitarian orthopaedic care has been reduced to an extra skill required of general surgeons who find themselves working in disaster zones. I feel this is an outdated model, and fully trained orthopaedic surgeons should be actively recruited to serve the musculoskeletal needs of patients in austere environments, just as MSF and EMERGENCY have done. However, orthopaedic surgeons who engage in humanitarian work should be well prepared for that role.

The incentive to produce this book came from my observation of the need to increase the standards of practice and skill in orthopaedic traumatology in the austere environment, as well as the solutions been offered to patients. Despite an image characterised by large mechano-like sets of equipment,

**Table 1** Nationalities, universities, orthopaedic and humanitarian organisations and range of professions of authors contributing to this book

Countries	Universities	Organisations	NGOs	Professions
Afghanistan	Stanford University	OTA	MSF	Vascular surgeons
Belgium	University of Oxford	AOUK	Broken Earth	Orthopaedic surgeons
Canada	University of California San Francisco	AOTrauma	SIGN Fracture Care International	Emergency medicine physicians
United Kingdom	McMaster University	United Kingdom International Emergency Trauma Registry	International Committee of the Red Cross	Physiotherapists
India	Swansea University	World Orthopaedic Concern	Save the Children	Anaesthetists
Italy	Karolinska Institutet	USA Army	CURE International	Plastic surgeons
Iraq	The University of Manchester	National Health Service UK	Emergency	Radiographers
Mexico	Basrah University	Royal Army Medical Corps UK	Interburns	Epidemiologists
Nepal	Imperial College of Science, Technology and Medicine	Orthopaedic Trauma Institute, San Francisco	World Orthopaedic Concern	Engineers
Sweden	University of Minnesota University of Utah University of Newfoundland University of Wisconsin	Institute for Global Orthopaedics and Traumatology	Hospital and Rehabilitation Centre for Disabled Children (HRDC)	
USA		SICOT		

orthopaedic surgeons have the advantage over several other specialties that we do not depend on high technology to make a difference to our patients. It is essential, however, that principles of management are based on the best available evidence, sound clinical skills and experience and patient values. These are the tenants of evidence-based practice.

This book is the culmination of four years of intense work. Its chapters embody the combined experience of over 50 authors. The breadth and depth of the experience contained in this book is summarised in Table 1, which lists the contributors' nationalities, professions, academic centres, organisations and charities.

The aim is to provide a comprehensive source for those who plan to work in the austere environment and those already on the ground, as well as all other staff involved in the care of orthopaedic trauma patients. The book is

divided into different sections, each one designed to provide guidance and information on a defined area;

1. Setting the scene: the austere environment

How best to prepare for a mission in a conflict or disaster zone? What are the different types of scenario you may find yourself in? What is the epidemiology of trauma in austere environments? Can you really practise evidence-based medicine in an austere environment? What are the cultural challenges and ethical dilemmas you may face?

2. What are the causes of orthopaedic trauma in the austere environment?

What are the causes of casualties in the austere environment? How do they differ from those in the developed world? How should you manage a blast injury or a ballistics injury? How will you cope with the complications of bone setters?

3. What are the specific challenges of caring for patients in the austere environment?

In the less developed world, there are serious challenges in the management of orthopaedic injuries not faced as frequently in the developed world, such as malnutrition, AIDS, bone infections and serious complications of fracture mismanagement. How does this affect the management of your patients?

4. Perioperative care in an austere environment

In this section, we provide a comprehensive guide to the perioperative management of the orthopaedic trauma patient for orthopaedic practitioners. We provide thorough coverage of pre-, peri- and postoperative care.

5. Principles of orthopaedic traumatology in the austere environment

This section covers information which will help you gain an understanding on the principles required for the management of orthopaedic trauma in the austere environment, including information relevant to paediatric patients.

6. Practical guides to orthopaedic trauma management in the austere environment

This section covers the management of orthopaedic trauma for each anatomical region.

7. Continuity of care, legacy and resilience

The last section is in many ways the most important of this book, as we highlight the importance of creating proper follow-up of patients, leaving a legacy when we return home and building local resilience to better face the next disaster. We invite the reader to think laterally and consider using technology and lessons from the military.

The result of these unique international collaborations has been a comprehensive guide that will help you better understand the nature of orthopaedic traumatology in the austere environment, how to practise safely at a high standard and how to ensure that the population you have been privileged to serve will continue to benefit from your efforts. I am grateful to all the contributors for their hard work and commitment towards this project and to

Springer for taking up the challenge. I am very proud of the result, but I would invite the reader to forward their thoughts and constructive criticisms. Any omissions or mistakes are my responsibility and would appreciate feedback to improve any future editions. I wish you success in your humanitarian missions.

London, UK

Juan de Dios Robinson

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## Biography

Mr. Juan de Dios Robinson BA MBBS MRCS Dip SICOT FRCS (Tr and Orth) MSc (Trauma Surgery) is a consultant in trauma and orthopaedics at the Major Trauma Centre in St Mary's Hospital, London. Mr. Robinson has had extensive experience in natural and man-made disasters. He has participated in rescue efforts and health projects following earthquakes and conflicts in Latin America and Asia. While working as an orthopaedic trauma consultant in the Medecins Sans Frontieres (MSF) Kunduz Trauma Centre, Afghanistan, he carried out close to 500 surgeries in 5 months. An active member of the UK International Emergency Trauma Register, Mr. Robinson has lectured on civilian orthopaedic trauma in the conflict and low resource environment in Europe, North America, and Asia. He is an ATLS and surgical skills instructor and is also a tutor in the University of Edinburgh Surgical Sciences Qualification.

He was awarded an MBBS by the Imperial College School of Medicine, London, in 1999 and gained his membership from the Royal College of Surgeons of Edinburgh, UK, in 2006. He then passed the Intercollegiate Fellowship in Trauma and Orthopaedics and was elected as a Fellow of the Royal College of Surgeons of Edinburgh in 2011. Mr. Robinson completed prestigious Trauma Fellowships at Dalhousie University, Canada and Oxford. He also holds a Diploma from the International Society of Trauma and Orthopaedics (SICOT) and an MSc in Trauma Surgery (Military) and in completing an MSc in Surgical Science and Practice at the University of Oxford.



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## Part I

# Setting the Scene: The Austere Environment

# How to Prepare for a Mission in a Conflict or Disaster Zone

# 1

Anthony Damien Redmond

## 1.1 Skills and Experience

There is an obvious urge to go and help when a large-scale disaster occurs, fortified by pressure from the media and at times from those around you to respond. However, you must have something to offer to the victims of the conflict and/or disaster over and above what can be offered locally. Otherwise your presence may be adding to, rather than relieving, the burden of the affected country [1, 2]. Incorporating outside help into the host country response will always consume time and resources and must therefore be worth it in terms of a clear added benefit. If you only have generic medical skills and abilities, it is unlikely that you will add anything of great significance over and above what is already available.

Any true benefit you might bring is a function of the additional skills you have brought into play set against the cost to the local community of you being there. The balance tips in your favour when you are highly experienced in working in an austere environment and fully trained in conflict and disaster medicine and surgery and fully self-sufficient in food, water, medicines and medical/surgical equipment.

It is often said that any help is better than no help. This may be true in some circumstances but it is not true when delivering specialist surgical help. The experience of recent earthquakes, for example, has revealed excessively high amputation rates and inadequately performed operations by inexperienced surgeons leading to avoidable disability (Fig. 1.1) [3].



**Fig. 1.1** Inappropriate guillotine amputation

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## 1.2 Invitation to Respond

Particularly in sudden-onset disasters, it is extremely important to understand and accept that it is the locals who are in charge and to behave accordingly [4]. They were there before you arrived and will be there when you have gone. Failure to acknowledge this can be a major contributor to prolonging the period of apparent chaos and disorganisation in the immediate aftermath of a sudden-onset disaster. (Some degree of “chaos” is almost inevitable as the concept of a disaster involves personnel and facilities being overwhelmed.) The most effective medical care to the community can only be given when a degree of organisation and coordination is restored and limited resources are focused on those most in need. Local authorities therefore need to know what assets they have and deploy them to where they will be of most benefit. Incoming teams must therefore identify themselves to the local authorities and work within a local or national framework in order to be most effective. Setting up a parallel system whilst obviously treating some patients will fragment the national response and most importantly prevent appropriate follow-up of patients when the incoming team has gone.

## 1.3 Coordination

Lack of coordination in the immediate aftermath of a large-scale sudden-onset disaster is well recognised. Uninvited medical teams, no matter how good their intentions or even how skilled their members are, run a significant risk of adding to the chaos. For a sudden-onset disaster, the safest way of avoiding contributing to the inevitable immediate chaos is to only go if you have been invited. You are more likely to be invited if you are already part of a recognised national team/response that disaster-prone countries are aware of, such as the UK Emergency Medical Team (EMT) and AUSMAT in Australia or part of an established

international organisation that responds to sudden-onset disasters such as the Red Cross/Red Crescent movement or NGOs such as MSF, IMC, Save The Children and Merlin. The cluster system has been established to coordinate the humanitarian response in the field and the lead for the health cluster is WHO [5].

## 1.4 Standards

The Emergency Medical Teams Initiative at WHO has published classification and standards for incoming emergency medical teams to assist host countries in identifying the medical assets available to them [6]. The term International Emergency Medical Team has been adopted to describe those international medical teams that have registered with the Global EMT Registry and agreed to comply with a set of standards and principles. It encompasses all, civilian/military/governmental/nongovernmental, “groups of health professionals and supporting staff working outside their country of origin, aiming to provide health care specifically to disaster affected populations” [6]. An important recommendation of the group and one that reinforces the above is: “Any individuals or groups that do not fit within the definition and cannot comply with the standard should either consider joining a recognised organisation that provides FMTs or not responding in the aftermath of a sudden onset disaster”.

The classification of teams recommended by the EMT Initiative cumulative with each level adding additional capability.

- FMT Type 1: Outpatient Emergency Care – initial emergency care of injuries and other significant health-care needs
- FMT Type 2: Inpatient Surgical Emergency Care – inpatient acute care and may be fixed and/or mobile general and obstetric surgery for trauma and other major conditions
- FMT Type 3: Inpatient Referral Care – complex inpatient referral surgical care including intensive care capacity

It is recognised that there will be additional specialised care teams that can be incorporated within a type 2, 3, or local hospital. As yet classification does not equate with accreditation. It is a self-declaration of capacity and a commitment to comply with the standards.

## 1.5 Authorisation to Practice

Doctors must be accountable to their patients. National authorities guarantee this by a medical registration system and license to practice. This still applies during a disaster. Of course the special circumstances of a disaster will mean that the usual lengthy process of registration of foreign medical practitioners is too long to allow them to be of any benefit in the acute crisis. Governments overcome this by authorising individual practitioners or more commonly recognised agencies (e.g. Red Cross, MSF) to

practice within that country either for the period of the declared emergency or as part of a longer term registration of that agency (Fig. 1.2). Clearly individuals or groups of medical practitioners who arrive uninvited do not have authorisation to practice and are therefore in breach of a basic medical tenet of good practice. They may also be practising illegally.

It is also important to recognise that particularly for surgery your patients need some form of medical indemnity should things not turn out as planned. Practising without authority and/or illegally will nullify any medical insurance/indemnity you have, placing your patient at further risk.

By joining an established internationally recognised agency, you can be assured that your presence in country following a sudden-onset disaster will be at the invitation of a recognised local authority and that you will have authorisation to practice and appropriate medical insurance/indemnity.



**Fig. 1.2** A mission to China following a massive earthquake. A temporary facility was set up in the hospital grounds as aftershocks continued to rock the hospital's buildings

## 1.6 The Exceptional Circumstances of Conflict

When responding to conflict in another country and not as part of medical support to the armed forces and particularly when working more on one side than another, then it's clear you will have not been invited by everyone involved. However, authority to practice can come from those working for an agency that is recognised to have a legitimate place in the field of conflict such as the UN and in particular the ICRC.

Working in a civil war is unlikely to be the result of an invitation from the existing government. As such you will be working uninvited by at least one faction and without government authority. Your judgement may be that the needs of victims override such concerns but it is important to recognise the circumstances in which you are practising. Detailed preparation has certain key stages.

### 1.6.1 Make Sure This Work Is for You

It is not without risk. It will place considerable physical, emotional and psychological strains upon you and your relationships. If the risk is to be worth the taking, it should produce tangible benefits. These can be secured by appropriate pre-deployment preparation and training.

### 1.6.2 Join an Established Organisation

The appropriate skills and competencies, an authoritative request to respond and an authorisation to practice can all be gained most easily by joining a recognised large international agency.

### 1.6.3 Mental and Physical Fitness

Working in an austere environment requires a certain basic level of mental and physical fitness. Whilst this may not necessarily be an exceptional standard, it must be appreciated that whatever

mental and physical health issues you have before deployment are unlikely to resolve whilst on deployment and may very well be worsened by the mental and physical hardships endured. Becoming ill on mission threatens the success of that mission when resources intended for the victims of the disaster are diverted to you.

### 1.6.4 Garnering Core Skills and Competencies

Medical students and doctors in training are unlikely to be of benefit in an austere environment, as their ability to work independently is limited. The difficulties presented by disasters and conflicts render them places where people should not look to gain basic primary experience. The demands of working there are such that they are better viewed as places to where those with experience are deployed. However, there is obviously a certain "Catch-22" about this. This can be overcome again by deployment through an established agency where experience is gained in the field with the full support around you from those with more experience. In addition to basic general medical and surgical skills, the following are required before deployment.

### 1.6.5 Completion of Training in a Relevant Surgical Specialty

Orthopaedic, plastic and general surgery have a particular relevance in the response to earthquakes where crush injuries predominate. In addition vascular surgery has a special relevance to conflict (Fig. 1.3).

### 1.6.6 Surgical Training for the Austere Environment

Individual surgeons or small groupings responding on an ad hoc basis have raised considerable concerns in recent years due to their lack of measurable impact, lack of accountability, lack of



**Fig. 1.3** Orthopaedic surgeon with rare access to a C-arm applying an external fixator

follow-up and poor standards due to practising outside of their recognised training. Such are the concerns internationally; the foreign medical teams' concept paper produced by the Global Health Cluster and the World Health Organisation specifically emphasises that surgeons responding to sudden-onset disasters should only carry out procedures for which they are licensed to do so in their own country. However, with ever increasing surgical specialisation, it is inevitable that surgeons deployed to a sudden-onset disaster might find themselves faced with a surgical problem outside their area of recognised expertise. It is imperative still that surgeons or indeed any medical practitioner strives to work only within the areas for which they are licensed to practice, whether in their own country or overseas, but faced with a large number of unsorted casualties presenting to limited resources; there may very well not be a realistic opportunity to refer a case onto a more appropriate specialist. Surgeons who respond to disasters need therefore to broaden their skills through further training prior to deployment. The ICRC and other established responders offer such training. In the UK the Royal College of Surgeons of England in collaboration with UK-Med offer the STAE (surgical training for the austere environment) course under the direction of Mr David Nott. Before



**Fig. 1.4** Earthquake in Armenia

deployment, in addition to broadening their technical surgical skills, surgeons also need to have an understanding of humanitarian principles, the social economic and political context in which they may work and the benefits and dangers of surgery in such a setting. In particular they need to understand the importance of follow-up and integration with local health services.

It is in the nature of a large-scale disaster that a range of problems can present to what is ostensibly a specialist surgical facility (Fig. 1.4). Surgeons deployed to earthquakes from overseas, for example, will usually not arrive in time to treat acute life-threatening surgical problems and will be there primarily to carry out limb salvage surgery. They obviously need therefore to understand the principles of wound management and establish skin cover with basic flaps and split skin graft. However coincidental surgical emergencies do arise. An orthopaedic surgeon working in an austere environment needs to be able to do an emergency thoracotomy and other resuscitative surgical procedures as well as laparotomy and packing of the abdomen to reduce/control haemorrhage. Whilst neurosurgery is usually beyond the remit of an International Emergency Medical Team, there are times when limited techniques

can be of benefit and a surgeon needs to understand the principles of when neurosurgical intervention is indicated and when not.

Perhaps the most difficult and at times contentious issue is the management of obstetric emergencies by the non-specialist. Obviously obstetric haemorrhage and obstructed labour are best managed by a specialist obstetrician. However, such expertise may not be readily available in time to save a woman's life. Any surgeon working in an austere environment must therefore already have gained an understanding of when the woman's life depends upon their intervention and be able to safely carry out certain life-saving procedures. These include clearing the os cervix of retained products, controlling haemorrhage using balloon tamponade and deconstructive craniotomy following intrauterine death. In particular a surgeon must already understand the indications for, and be able to carry out, emergency caesarean section.

### 1.6.7 Experience Beyond Surgery

Public health and emergency medicine bring a knowledge of the effects of the disaster/conflict beyond the purely surgical and experience in these specialties can be of great value to a surgeon wishing to deploy [7, 8]. Experiences in obstetrics and paediatrics are also extremely useful, particularly when general health services have been compromised.

It is important in particular to understand public health principles that apply in sudden-onset disasters. For example, it is well established that the risk of epidemics following earthquakes is extremely low. The risk to the health of the living from the unburied dead following a sudden-onset disaster is minimal and so effort should be concentrated on survivors and not on the dead. Mass graves bring untold grief to relatives who are denied the opportunity to give a cultural/religious interment and in fact may not know if someone is dead or alive and ultimately have to identify their remains in extremely difficult circumstances. Governmental authorities may make a decision to remove dead bodies particularly when in large numbers but

this should be viewed more as a civic than a medical issue. When the disaster itself is the consequence of an infectious disease, notably cholera or a viral haemorrhagic fever, the corpses themselves may be infectious for some time after death. In these special circumstances the unburied dead do pose a risk to the living and special measures by the public health authorities need to be employed. This is the exception to the rule.

### 1.6.8 Understanding the Context in Which You Will Work

To be most effective in the field, it is important to understand the nature of conflicts and disasters. There is a body of knowledge around the types of injuries and conditions that commonly occur and the safest approach to their management. There are a number of courses run by a range of agencies including the Red Cross/Red Crescent Movement, MSF, RedR and UK-Med.

It is essential also to understand the roles and responsibilities of key international agencies. Familiarisation with important UN and other large agency websites is an extremely useful exercise as are downloading and reading important documents. The role of the UN is particularly important to understand. There is a United Nations Disaster Assessment and Coordination team that, at the invitation of a country, will send a small team in immediately after the disaster has occurred to do a rapid assessment of needs and publish this online. The UNDAC Field Handbook is an extremely useful guide to needs assessment and the workings of the UN and can be downloaded from its website.

Much of the lack of coordination experienced by incoming teams may be due to lack of awareness of the established coordination mechanisms that will have been already put in place. The UN will have quickly established an On-Site Operations Coordination Centre (OSOCC) and it is to this incoming teams should report. The cluster system is now established and incoming medical team should report to the health cluster and report regularly their activities.

WHO are the lead for the health cluster and they will liaise closely with the National Department of Health to ensure health-care needs are met and health-care resources targeted appropriately.

When working in another country, it is important that members of International Emergency Medical Teams are aware of, and sensitive to, cultural issues that may impact upon their interaction with patients and their relatives. Paramount however is the maintenance of the humanitarian imperative and a commitment to the ethics of good medical practice that accompanies one's registration and licence to practice.

Principles of Conduct for the International Red Cross and Red Crescent Movement and NGOs in Disaster Response Programmes [9].

1. The humanitarian imperative comes first.
2. Aid is given regardless of the race, creed or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone.
3. Aid will not be used to further a particular political or religious standpoint.
4. We shall endeavour not to act as instruments of government foreign policy.
5. We shall respect culture and custom.
6. We shall attempt to build disaster response on local capacities.
7. Ways shall be found to involve programme beneficiaries in the management of relief aid.
8. Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs.
9. We hold ourselves accountable to both those we seek to assist and those from whom we accept resources.
10. In our information, publicity and advertising activities, we shall recognize disaster victims as dignified human beings, not hopeless objects.

### 1.6.9 Field Training

Specialist certification must be harnessed to an understanding of how these specialties are applied within the contingencies and context of a sudden-onset disaster or conflict. It is applying these specialist skills within limited resources

and in an austere environment that completes readiness for deployment. Field training in simulated scenarios can be gained at home and overseas. It is essential to have experience of working in a low-resource setting before responding to a disaster and this is best gained by working with an established agency in one of their programmes. This will give you an understanding of the context in which you might work, working with limited resources and most importantly working within another country's health system.

### 1.6.10 Field Craft

The need for a full field hospital is usually limited; when outside surgical assistance is required, this can be usually accommodated within existing facilities. However it is essential that incoming International Emergency Medical Teams place a minimum burden on local resources and at times they may be required to live in tented accommodation, eat and drink from their own resources and on certain occasions work out of a tented hospital facility (Fig. 1.5). Part of the preparation for deployment is learning how to transport and erect tented living facilities and how to protect one's health and hygiene whilst living in such basic tented facilities.

### 1.6.11 Communications

Anyone who responds to a large-scale emergency must be able to communicate effectively and safely with colleagues both within one's team and also with other agencies. Everyone in the team needs to understand basic radio protocol and to be capable of using a handheld radio themselves, a GPS system and satellite technology so they can communicate with base and with others should they be separated from the team. The UNDAC Field Handbook, available to download from their website, is a very useful aid for this and other practical details of deployment and familiarisation with the UN system in the field [10].

Knowledge of foreign languages is extremely helpful and those employed by the UN are required to be able to communicate in English





**Fig. 1.5** A field hospital operating room in a tent

and French. These days, English is probably the commonest international language in use. However, if one deploys through an established agency and particularly the local authorities, then a translator/interpreter will usually be provided. It takes some experience to communicate efficiently through an interpreter and one must get used to speaking slowly and in short sentences to allow the interpreter time to translate. It is also important to emphasise to the translator/interpreter and they must translate exactly what is said. There are sensitivities however; in some cultures a local translator will not translate intimate questions or comments that might be perceived as critical of someone in authority.

### 1.6.12 Safety and Security

Before deploying with an established organisation you will have had to have completed an online security course and in addition usually attended a

security training exercise. The two commonest online security courses that are recommended by large agencies are those run by the UN and the IFRC [11, 12].

It was often said in the past that the biggest risk to humanitarian workers came from fatal road traffic accidents. This was due largely to inexperienced drivers negotiating poor roads unaccustomed to driving large 4x4 vehicles and failing to wear seat belts. These risks remain but unfortunately personal violence either from opportunistic robbery and/or hostage taking or politically motivated direct targeting of humanitarian workers now ranks alongside road traffic accidents as a leading cause of death amongst humanitarian workers [13]. Such risks cannot be avoided completely but can be mitigated by working with a large experienced organisation, heeding all security advice, not travelling alone and not travelling after dark. Nor are these risks limited to conflict zones. The presence of relatively wealthy aid workers in a

poor country suffering the deprivations of a disaster can always present a target to someone.

Other risks to be mitigated are related to personal health. The commonest risks other than from road traffic accidents come from failure to take adequate malaria prophylaxis and gastrointestinal problems from consuming contaminated food and water. Boil it, cook it, peel it or discard it [14].

The drive to help those clearly in need must not override the need for adequate rest and nourishment. Difficult decisions are not made easier by lack of sleep and hunger. They are made even worse by over indulgence in alcohol.

### 1.6.13 Departure

One of the most important elements of preparation prior to departure from one's own country is preparation for departure from the other country. Each surgeon is responsible for the long-term follow-up of each of their patients. If they are not staying in country long enough to manage this for all their patients, they must establish a care plan and refer the patient onto colleagues or another facility and usually into the local health system.

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# What Can I Do Here? Understanding Your Working Environment

# 2

David Nott

For the past 20 years, I have worked voluntarily in areas of conflict and catastrophe throughout the world. My experience has taught me that it is essential to understand what sort of environment you are working in. Even though you may have the skill set to perform a certain procedure, it is essential that all factors are taken into account. You must ask yourself, what sort of terrain are you in? What is the hospital like? What is the state of the operating theatre? Do you have the right equipment? Do you have enough fluids available? Is the anaesthetist experienced enough? Is there sufficient staff in the recovery area? What are other wards like? Is there enough nursing staff during the day and night? Do they have enough knowledge to inform you when things may not be going well? What are the language barriers? Who will follow up your patient? The list can go on. So how do we decide what sort of environment we are in? It is easy when we are comparing extremes, such as an operating room in Camp Bastion in Afghanistan to a dressing station in Central Africa, but what about the wide range of settings in between?

Over the past 20 years, I have been fortunate to have worked in a variety of situations. The

classifications below are based on my own personal experience, and to my knowledge there are no other similar references in the literature. These classifications are of necessity, arbitrarily. But they will help us understand the different scenarios you may find yourself in.

In general, the situations faced in humanitarian work can be broadly divided into five categories:

1. High public financing (Fig. 2.1)
2. Developed country
3. Lesser developed country
4. Non-state actors, guerrilla groups
5. Natural disaster, earthquake and tsunami

In all the scenarios above, the humanitarian surgeon is limited by the infrastructure, personnel and equipment available, as well as your experience and training.

The first category is exemplified by the defence medical services during the recent wars in Iraq and Afghanistan (Table 2.1). The last 10 years have produced significant advances in the way trauma is managed in war and civilian practice [1]. Since the inception of damage control surgery, a term first coined by Rotondo in 1993 [2] and whose main emphasis was treating the physiology of the trauma patient rather than the injury per se, a significant amount of research has provided more insight into the management of severe trauma. Damage control resuscitation,

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