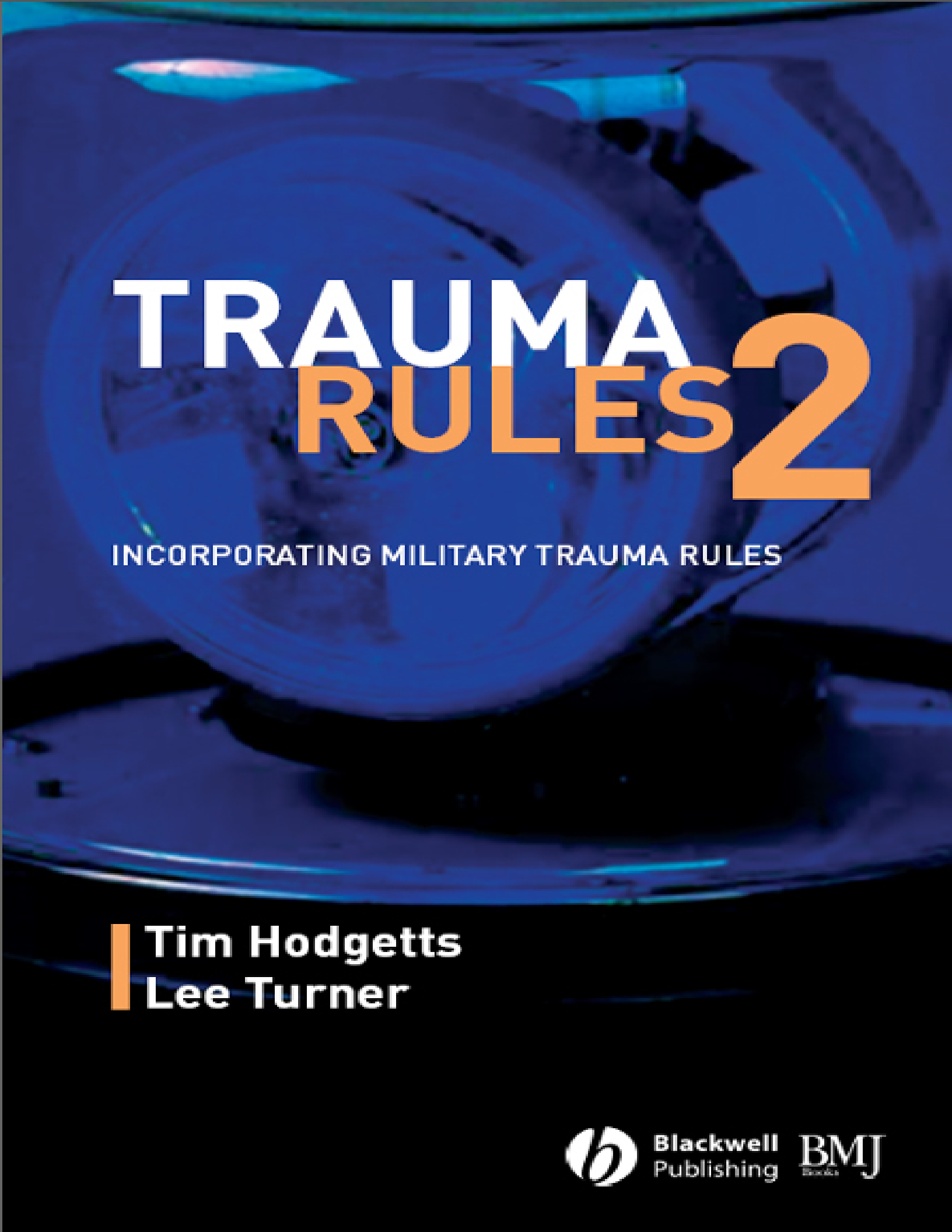

TRAUMA RULES 2

INCORPORATING MILITARY TRAUMA RULES

Tim Hodgetts
Lee Turner

Blackwell Publishing
BMJ Books

To our partners who tolerate our absence on frequent tours of duty

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TRAUMA RULES 2

INCORPORATING

MILITARY TRAUMA RULES

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Preface to the first edition

The management of major trauma may seem to be a complex issue but it can be approached in a systematic manner. This book combines a systematic approach with a novel series of trauma rules to trigger the memory when faced with a seriously injured patient.

Each rule is accompanied by the reason, the exceptions to the rule and, where appropriate, an illustration highlighting a key aspect of the rule.

Learning should be fun, and this book is designed to be fun to read. It is hoped that these trauma rules may be used by those involved in trauma education at all professional levels to emphasize the key issues in trauma management and to perpetuate a high standard of trauma care.

Trauma Rules is an *aide memoire* and supplements existing textbooks on this subject. Readers who require a more extensive understanding of the management of trauma are referred to the following books, also published by BMJ Publishing Group.

- *ABC of Major Trauma*
- *Trauma: Beyond the Resuscitation Room*

Tim Hodgetts
Stephen Deane
Keith Gunning
London and Sydney

Preface to the second edition

This second edition of *Trauma Rules* has been expanded (there are 14 new rules) and thoroughly updated to take account of changes in trauma care practice in the last decade. You will find that many of the rules have multiple references that give weight to your teaching or directions in the resuscitation room.

Perhaps the greatest change in this edition is the addition of military trauma rules. Military trauma is different. There is a different pattern of injury to civilian practice, different human resources and limited diagnostic and treatment facilities in the field. Where important differences exist these are highlighted. But military trauma care is not necessarily to a lesser standard. Indeed, by reading the military rules you will learn a new paradigm for trauma care and be exposed to cutting edge practices that may not yet be widely exploited in civilian trauma care.

We are sure you will enjoy this second edition: above all, learning must be fun!

Tim Hodgetts
Lee Turner
Birmingham and Palmerston North
2006

Rules are made to be broken,

That's not what you should do.

For one of these days these rules

Will help you save a life or two.

The primary directives

Anxiety provokes memory loss: so learn a system and stick to it

The reason

When the chips are down you may only have your own experience to rely on. When your experience is limited you need rules that are easy to remember and easy to apply, even in the most threatening of circumstances. This system is:

Airway, with control of the cervical spine;
Breathing, with oxygen; and
Circulation, with control of external blood loss.

This **ABC** system allows the identification and treatment of life-threatening injuries in a rapid, logical and reproducible order. The patient assessment is extended to include:

Disability (neurological status); and
Exposure, with environmental considerations (control of body temperature).

Together, the initial patient assessment following this **ABCDE** system is known as the 'primary survey'. This is the systematic approach taught on the internationally established *Advanced Trauma Life Support* course [1] (adapted as the *Early Management of Severe Trauma* course in Australia) and *Pre-hospital Trauma Life Support* course [2].

The exceptions

To the beginner in trauma management, there are no exceptions to this rule. This is your code of practice. The experienced clinician,

however, will regard all rules as guidelines but will still closely follow **ABC** principles.

The most common cause of avoidable death in a military conflict is uncontrolled external haemorrhage, particularly from the limbs, following blast and penetrating trauma. Champion has demonstrated that 50% of US battlefield deaths in Vietnam were from exsanguination. Eighty per cent of these were torso injury and 20% were from '*injured vessels that might be controlled by pressure*' (neck, limbs, soft tissues) [3]. Military practice has therefore modified the ABC paradigm (within the *Battlefield Advanced Trauma Life Support* course [4]) to **<C>ABCDE**:

<C>	Control of catastrophic haemorrhage;
A	Airway, with control of the cervical spine *where appropriate*;
B	Breathing, with oxygen *where available*; and
C	Circulation, with control of non-catastrophic external haemorrhage.

Spinal immobilization is designed to protect the cord following blunt trauma with hyperextension/hyperflexion that results in ligamentous instability: the cervical spine will not benefit from immobilization following penetrating trauma.

RULE 2

All 4 one and one for all

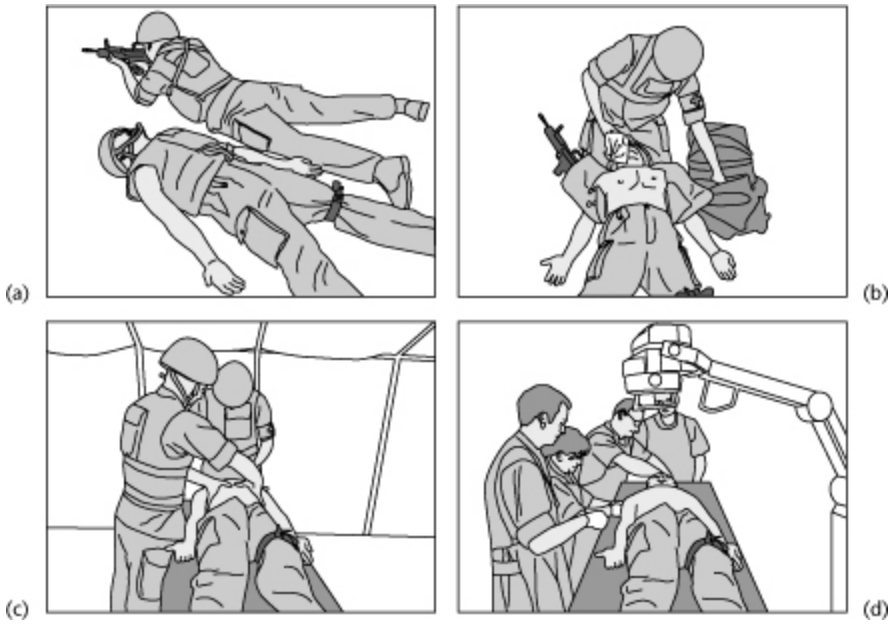

Figure 2.1 The stages of military resuscitation. (a) Care under fire. (b) Tactical field care. (c) Field resuscitation. (d) Advanced resuscitation.

The reason

Common principles can be applied to trauma resuscitation from point of wounding to casualty reception at hospital. In other words there is *one system for all* patients and all

injury mechanisms. This is the <**C**>**ABC** system (see Rule 1).

The capability for trauma resuscitation increases incrementally along the chain of evacuation, with progressively more experienced clinical staff undertaking a greater scope of interventions, supported by a greater choice of diagnostic and treatment options.

In the military there are four clearly definable levels of clinical capability:

1 *Care under fire.* Care while the bullets are still flying is understandably limited and may include application of a tourniquet to arrest catastrophic haemorrhage (<**C**>) together with postural airway drainage (**A**)—lie the casualty face down, or preferably in the *recovery* or *three-quarters prone* position. This may be achievable by self-aid or require buddy aid (first aid).

2 *Tactical field care.* Care at point of wounding (including, for example, a vehicle entrapment) delivered by trained clinical personnel while recognizing a continuing potential security threat (the so-called 'semipermissive environment').

3 *Field resuscitation.* Team-based trauma care far forward in a field environment, with the team led by a doctor trained

in resuscitation principles and supported by paramedical +/– nursing staff. There would be no imaging capability, no surgical intervention and no blood available. This is the level of care referred to in the army as the Regimental Aid Post (RAP) or Battalion Aid Station.

4 *Advanced resuscitation.* Team-based trauma care led by a specialist (emergency physician) and involving, for example, a multidisciplinary team of an anaesthetist, surgeon and specialist emergency medicine nurses. There are diagnostic and interventional skills that are not available further forward.

The exceptions

The ubiquitous civilian trauma care paradigm currently remains as **ABC**. While there is a progressive capability from pre-hospital to hospital, this is defined by the training and equipment of the provider rather than constrained by the threat to physical security.

RULE 3

Civilian and military trauma care is different

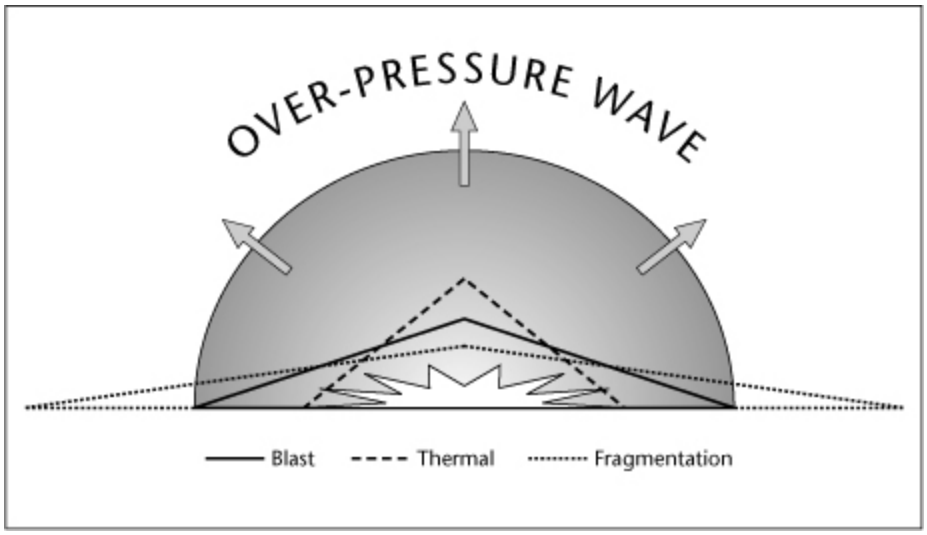

Figure 3.1 Blast injury patterns over distance.

The reason

There are a number of features that differentiate trauma care in a military operational environment from that in a civilian environment.

Injury pattern. Military trauma generates injury patterns rarely seen in civilian practice, with multiple fragment

wounds, blast injury to the lung and bowel, avulsive amputations and contaminated ballistic wounds.

Population at risk. A military population is predominantly males aged 18–40 who have a low co-morbidity for chronic conditions. Children, the elderly and pregnant females will be encountered when the local population is eligible for treatment (and international humanitarian law demands that any individual will be offered *emergency life-saving treatment* who presents to the military medical services).

Physical factors. There may be an adverse climate, with limited climate control; power is unreliable and procedures may have to be undertaken in minimal lighting conditions and without power-dependent diagnostic imaging (plain radiography; computed tomography [CT]); there may be no running water for optimal hygiene; tented treatment areas are difficult to keep clean (for example, high dust level in desert).

Security. Staff may be working under threat of ballistic, blast or chemical attack. Combat body armour and helmets may need to be worn while attending casualties, even in a hospital setting.

Equipment and drugs. You have what you have. The supply chain may be many thousands of miles long and if the resupply chain is interrupted there is no option other