Ballistic Trauma
Second Edition

Ballistic Trauma

A Practical Guide

Second Edition

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Foreword

This is a book first and foremost for surgeons and those who work with them in the management of ballistic trauma and treatment of its victims. But the book is also of value to others with front-line experience and an interest in the issue of harm reduction, whether in war or "peace," on the field of battle or at the scene of a crime. These pages can also be studied fruitfully by politicians, most of whom lack medical or military expertise, in helping them understand the real world consequences of the decisions that they make. (My own special interest, cheerfully declared, is that of a beneficiary—having once been hit by mortar fire as a war reporter, I am grateful for the care of the surgeons and nurses who so expertly put me back together again and returned me to front-line duty).

I believe that we live in the most dangerous times since the global warfare of the mid-twentieth century. Appropriately, the editors of this book have set their remit wider than the most recent advances in the relevant fields of medical science—necessary advances—to keep pace with those in ballistic science, as man finds ever more ingenious ways of killing and maiming his own kind.

Napoleon III is reputed to have declared, "The history of artillery is the history of progress in the sciences, and is therefore the history of civilization." I wonder, where does that leave us in the early twenty-first century? Nowhere very civilized, for sure.

In their preface to the first edition, in 1997, the editors noted: "The lesson of history is that you cannot take the experience of an urban hospital onto the battlefield. It also can be said, that you cannot do the reverse, and nowadays there is further confusion from the deployment of troops to peacekeeping duties performed under the scrutiny of the media. The latter is not the same as war."

A great deal has happened since then, including the events of 11 September 2001, to change or qualify that judgment. Civilian and military targets are attacked, not only by insurgent and revolutionary forces, without distinction, discrimination, or regard to the Geneva Conventions. The front lines are everywhere and all around us, as much in the concrete defences

of the Palace of Westminster as the contested streets of Najaf or the abandoned villages of Darfur. Nor is there any monopoly of virtue—or realistic concept of one side which observes the rules, against another which violates them. This book properly draws attention to the use by the Western powers of the cluster bomb—a weapon that has the properties of an aerially sown antipersonnel mine. The APM is banned by international treaty. The cluster bomb is not. Yet international law prohibits any weapon "of a nature to cause superfluous injury or unnecessary suffering."

One of the most controversial issues covered here is the distinction between civilian and military casualties—insofar as it exists, or indeed if it exists at all. The impact on the human frame and human tissue of a high-velocity bullet or a mortar fragment will be exactly the same, whether the victim is clad in combat fatigues or jeans and a T-shirt. In his firsthand analysis of the circumstances of the siege of Sarajevo from 1992 to 1995 (p. 583) John P. Beavis puts the ratio of civilian to military casualties at 63% to 37%. In the war in Iraq (2003–?) the ratio is probably higher, although the figures are politically sensitive, and therefore not divulged. In other conflicts, such as the wars in Angola and the Drina Valley of Bosnia, I would suggest that a 90% to 10% ratio would be nearer the mark. So much for the advance of civilization through the enlightening power of the artillery shell.

Professionals in the field of ballistic trauma will learn much from each other in this new edition. A more general conclusion they will draw, I hope, is that the present epidemic of global violence is not an acceptable outcome of continuing failures of politics and diplomacy. I am with Robin M. Coupland on this (p. 132): "Armed violence resulting in ballistic trauma should be considered for what it is—a global health issue." Those who deal with the effects of ballistic trauma surely have the least reason to be indifferent to its causes.

There are certain ways of expressing this in plain English, admittedly nonmedical and nonspecialist. One is religious: that we are all members one of another. The other is political: that politics is too important to be left to the politicians.

Martin Bell
London 2004

Preface to the Second Edition: Why This Book, Why Now?

In 1997, Professor J.M. Ryan and others produced the reference work *Ballistic Trauma: Clinical Relevance in Peace and War* (Arnold, 1997). Much of this is still valid, but a number of concepts in care of the ballistic casualty have changed. These include developing ideas on fluid resuscitation and refinement of field protocols based on operational experience.

Authors, editors, and colleagues expressed the view that there was a need for a practical guide encompassing these developments, along the lines of *Conflict and Catastrophe Medicine* (Springer, 2002). The aim was to distill real-life practice and try to capture that which often is lost or diluted in traditional texts.

With 9/11, the world changed. Since then, major conflicts have occurred in Afghanistan and Iraq, and operations are still ongoing. Many of the authors and editors deployed to these conflicts with nongovernmental organizations, Aid Agencies, and the military. Others are working with these injuries on a day-to-day basis at one of the USA's busiest trauma centers.

This has delayed the production of *Ballistic Trauma: A Practical Guide*, but means that people are writing with recent experience of managing ballistic injury. Colleagues returning from deployment have emphasized the need for clear guidance on managing ballistic injury, especially as more and more military reservists are being deployed and their day-to-day work may not include managing these types of injury.

Authors have been given a relatively free hand in structuring their chapters so they would be unconstrained by the book's style and be able to pass on their lessons unhindered.

Finally, our request is that this book be a "living" document. Give us feedback. Record what treatment works and what treatment does not. Use this knowledge to improve the care of the ballistic casualty.

Peter F. Mahoney
James M. Ryan
Adam J. Brooks
C. William Schwab

Preface to the First Edition, *Ballistic Trauma: Clinical Relevance in Peace and War*

This book aims to bring together the science behind and the management of ballistic trauma. It is directed at the surgeon, though perhaps not an expert, who might find him or herself having to deal with patients suffering from penetrating trauma in environments as diffuse as a late twentieth-century hospital or the arduous conditions of a battlefield.

The book also brings together the views of UK and US experts from military and civilian backgrounds. This composite view was deliberate, as it was recognized that these potentially diverse views reflected the complexity of an international problem that increasingly impinges on the practice of surgery in today's world.

The UK editors were the joint professors of military surgery to the three armed services and the Royal College of Surgeons of England, along with a medical scientist with an international reputation in the field of ballistic science. The US editor is Professor and Chairman of the Department of Surgery at the Uniformed Services University of the Health Sciences and has extensive experience in the management of ballistic trauma.

Though the book is influenced heavily by the military background of many of the authors, it is directed at a much wider audience, particularly those who may have to deal unexpectedly with the consequences of the trauma seen in an urban environment. It compares and contrasts the differing civil and military management viewpoints and goes on, where relevant, to debate the areas of controversy in the specialized fields of the relevant authors.

The subject of ballistic trauma is controversial in part because its management depends so much upon the situation in which it occurs. Thus, there often is confusion and a misunderstanding that emanates from the failure to recognize that the location of surgical facilities, the number of injured, and whether the injuries are sustained during peace or war may have a profound effect on the way patients are treated. The lesson of history is that you cannot take the experience of an urban hospital onto the battlefield. It also can be said that you cannot do the reverse, and nowadays there is further confusion from the deployment of troops to *peace-keeping* duties

performed under the scrutiny of the media. The latter is not the same as war.

The book has four sections. The first section is on the science behind understanding ballistic trauma; it also adds to its declared remit by including a chapter on blast injury. The second section is on general principles of assessment and initial management. The third section deals with management from a regional perspective, and the fourth section is on more specific but general problems. The intention is to provide surgeons with an understanding of the fundamentals of ballistic trauma, the mechanisms and some insight into the significance of new weapons, as well as the variations on the principles of management.

The book acknowledges that no single viewpoint can address the management of patients sustaining ballistic injuries and does not fall into the trap of recommending rigid and single guides unless there is a convergence of opinion. Its approach has been to provide a greater understanding so that the clinician facing the clinical problem feels sufficiently informed as to make coherent choices appropriate to the circumstances.

J.M. Ryan
N.M. Rich
R.F. Dale
B.T. Morgans
G.J. Cooper
1997

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Section 1
Introduction, Background, and Science

Introduction

This first section of *Ballistic Trauma* considers wider issues surrounding firearms injury. This includes firearms use and misuse in different countries and cultures, as well as the legal treaties and restrictions that attempt to limit the damaging effects of weapons. These issues are addressed in the chapters on small-arms control and international humanitarian law.

Many health-care professionals have little experience of how firearms and munitions work; this is addressed in the chapters on "Guns and Bullets" and "Bombs, Mines, Blast, and Fragments."

Health-care professionals need to know that the injuries produced by firearms and fragments can be modified by helmets and body armor, as outlined in the chapter on "Ballistic Protection."

The management and handling of the ballistic casualty has associated legal, as well as clinical, implications, and some of the procedures and pitfalls are considered in the "Forensics" chapter.