

TRAUMA DECODED

From Resuscitation to Recovery

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44 chapters · 7 parts · 4 appendices

Evidence reviewed to October 2026

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Medical disclaimer. Trauma care evolves continually. Every effort has been made to ensure that drug doses, thresholds and recommendations reflect current evidence and accepted practice at the date of review. Readers must verify all doses against current product information and local protocols and apply clinical judgement to each patient. The author accepts no liability for injury or loss arising from use of this material.

PREFACE

Most preventable trauma deaths still come from bleeding that was not stopped in time, an airway that was managed at the wrong moment, or a decision that was delayed. The knowledge a student needs to recognise shock, the skill a resident needs to stop it, and the judgement a fellow needs to lead a team through it usually live in three different books.

Trauma Decoded puts them in one. Every topic is written once and taught at three depths. The core text is written so that a strong medical student can follow it; colour-coded layers then extend each section for the resident who must act at three in the morning and for the fellow who must lead, appraise the evidence and build the system. Readers grow into the book rather than out of it.

The timing matters. Between 2023 and 2026 trauma resuscitation changed more than in the decade before. The 11th edition of ATLS put catastrophic haemorrhage ahead of the airway and asked us to resuscitate before we intubate. A run of large randomised trials — on prehospital whole blood, early cryoprecipitate, emergency department REBOA, prehospital tranexamic acid and transfusion thresholds after brain injury — tested practices that had spread on enthusiasm and observational data. Many did not show the benefit we expected. This book is written after those results, and every Evidence Pulse box is dated so that you know how current it is.

The book follows the patient: from the first minutes in the resuscitation room, through each injured region and the operating room, into intensive care, rehabilitation and the conversations that follow, and out into the systems that make good care possible. It ends with a toolkit for those who will read the next trials, teach the next generation and lead the next trauma service.

Trauma care is a team sport played against the clock. I hope this book helps your team play it a little better.

Dr Fuad Mustafa

October 2026

HOW TO USE THIS BOOK

Each chapter follows the same template, so you learn the structure once and can find what you need quickly — including on a phone in a resuscitation room.

L1 • FOUNDATIONS

Medical students and interns. Recognise, name and take the first action. Physiology made visual, mnemonics that hold up, exam-ready facts.

L2 • PRACTICE

Surgical and emergency residents. Decide, do and escalate. Doses, thresholds, procedure steps and when to call for help.

L3 • MASTERY

Trauma and critical care fellows. Lead, critique and build. Trial appraisal, controversies, grey zones and system design.

Inside every chapter

Element	What it gives you
Chapter opener	Outline of the chapter and a one-line principle to carry into the room.
Learning objectives	What each level should be able to do by the end.
The 60-second version	The five things to act on if you read nothing else.
Case thread	A composite patient whose course illustrates the chapter's key decisions.
Algorithms and illustrations	Original decision diagrams and anatomical figures; every caption teaches on its own.
Pearls and pitfalls	What experienced clinicians do, and the errors that actually harm patients.
Evidence Pulse	The trials and guidelines that matter, with a plain-language verdict and a review date.
Self-assessment	Level-tagged questions with explanations.
References	Primary trials and guidelines, so you can read the source.

A note on language and doses

The book uses British English with SI units; pressures are in mmHg. Adult doses appear in the text and paediatric doses in dedicated tables and Appendix A. "Should" is used where guidelines and evidence agree, "consider" where they do not, and controversies are labelled as such. Always check doses against current product information and your local protocols.

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LEARNING OBJECTIVES

- L1** State the xABCDE sequence and explain why catastrophic haemorrhage now comes first; recognise the life threat in each step and its first action.
- L2** Run a parallel primary survey: tourniquets and binders, chest decompression, major haemorrhage protocol, intubation in shock, and the CT-versus-theatre decision.
- L3** Lead the team, appraise the 2023-2026 trials on whole blood, cryoprecipitate, TXA and REBOA, and turn them into local standards.

THE 60-SECOND VERSION

- **Bleeding kills fastest.** Stop massive external bleeding before anything else: pressure, packing, tourniquet, pelvic binder.
- **Shock in trauma is bleeding** until proved otherwise. Give blood products early; minimise crystalloid.
- **Resuscitate, then intubate.** Induction in an under-filled patient can cause cardiac arrest.
- **Treat as you find.** Decompress a tension pneumothorax on clinical grounds; do not wait for an X-ray.
- **The unstable patient never goes to CT.** Find the source with eFAST and plain films, then go where it can be controlled.

CASE THREAD · PART 1 — THE PRE-ALERT

14:05. The ambulance crew calls ahead: "Thirty-four-year-old man, motorcycle against car at around 80 km/h, 20 minutes ago. Open deformed right thigh bleeding through dressings, pain left chest, tender abdomen and pelvis. Heart rate 132, blood pressure 84 systolic, respiratory rate 30, saturations 89% on oxygen, GCS 13. Pressure dressing on the thigh, two cannulas, no fluids yet. Ten minutes out."

You have ten minutes. What do you do with them?

1.1 WHY THE ORDER MATTERS

The primary survey is a priority list ordered by speed of death. Each step deals with a problem that kills faster than the problems that follow it. For four decades this list began with the airway: total airway obstruction kills in about four minutes. But a transected femoral or brachial artery can empty a circulation in less time than it

takes to prepare for intubation, and military experience in the 2000s showed that early tourniquets and haemostatic dressings prevented many deaths that had been considered unavoidable.

The 11th edition of ATLS formalised this by adding a lower-case **x** in front of ABCDE, for exsanguinating external haemorrhage.¹ Commentators have described the change less as a new idea than as recognition of what experienced teams already did, but co-difying it matters because what is taught is what is practised.²

ASSESSMENT SEQUENCE — FIX EACH THREAT AS YOU FIND IT

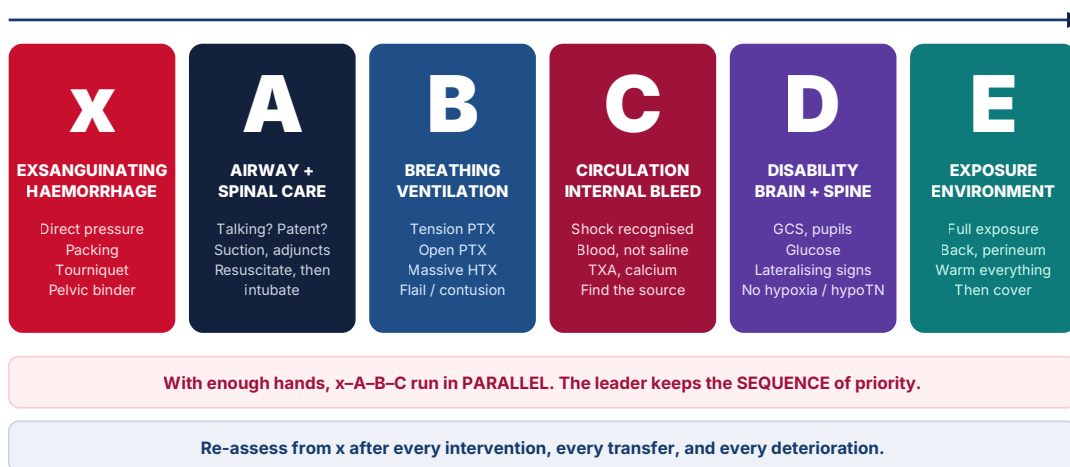


Figure 1.1 The xABCDE primary survey. Each step is assessed in order of how quickly its failure kills. Life threats are treated the moment they are found. With a full team, steps run in parallel, but the leader keeps the order of priority and returns to x after every change.

L1 · FOUNDATIONS — THE LOGIC IN ONE LINE EACH

- **x:** blood you can see leaving the body — the fastest killer you can fix with your hands.
- **A:** no airway means no oxygen to anything, within minutes.
- **B:** an airway is useless if the lungs cannot move air or the chest is full of air or blood.
- **C:** hidden bleeding into chest, abdomen, pelvis and long bones.
- **D:** the brain, which is injured most by low oxygen and low blood pressure — the problems of A, B and C.
- **E:** what you have not seen yet, and the cold that makes bleeding worse.