

MANAGING PENETRATING ABDOMINAL INJURIES: AN ESSENTIAL GUIDE FOR NON-MEDICAL RESPONDERS

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ABSTRACT Penetrating abdominal injuries, resulting from gunshots, stab wounds, or sharp trauma, pose an immediate threat to life due to severe internal bleeding, peritonitis, or multi-organ damage. This guideline provides non-medical professionals with a structured approach to the identification, initial management, and emergency response for such injuries. The recommendations focus on rapid recognition of symptoms, hemorrhage control using hemostatic agents and compressive dressings, pain management, and the critical importance of timely evacuation. Developed with input from trauma specialists and first-aid trainers, this guide translates complex medical protocols into practical, actionable steps for first responders, security personnel, and laypersons in high-risk environments. By equipping non-medical professionals with essential knowledge and skills, this guideline aims to reduce morbidity and mortality associated with penetrating abdominal injuries.

KEYWORDS Penetrating trauma care, Abdominal wound management, Emergency trauma response, How to manage penetrating abdominal injuries, First aid steps for abdominal wounds

Introduction

Penetrating abdominal trauma represents one of the most critical emergency scenarios, often leading to life-threatening complications such as hemorrhagic shock, sepsis, or organ failure if not promptly addressed. While medical professionals are trained to manage such injuries, non-medical individuals—including first responders, security personnel, and civilians—may be the first on the scene. Their ability to recognize the severity of the injury, provide immediate first-aid, and ensure rapid evacuation can significantly impact patient outcomes. This guide serves as a comprehensive resource tailored for non-medical professionals, offering clear, evidence-based recommendations on the

emergency management of penetrating abdominal injuries. It outlines essential steps for controlling bleeding, preventing infection, and stabilizing patients until they reach definitive medical care. By integrating expertise from trauma surgeons, emergency physicians, and military first-aid protocols, this guideline provides practical, life-saving strategies adaptable to both civilian and high-risk environments.[1]

Scope and Purpose

Objectives

The main objective of this guideline is to provide non-medical professionals with a detailed, step-by-step approach to managing penetrating abdominal injuries. Whether caused by a puncture, gunshot wound, or other accidents, these injuries can lead to life-threatening conditions such as severe internal bleeding, peritonitis, or organ damage. The guideline emphasizes the importance of rapid evacuation, even if the patient appears stable, to prevent further complications.

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Expected Health Benefits

- Improved early detection and management of abdominal injuries.
- Reduction in complications such as shock, sepsis, or organ failure by implementing appropriate first-aid measures.
- Timely evacuation to ensure the patient receives surgical treatment in a medical facility.

Target Population

This guideline is designed for non-medical professionals, including first responders, laypersons, healthcare workers with basic first-aid training, and individuals in environments where abdominal injuries may occur, such as workplaces or public spaces.

Stakeholder Involvement

Group Membership

This guideline was developed with input from trauma surgeons, emergency care specialists, and first-aid trainers. Their collective expertise ensures that the recommendations are appropriate for non-medical professionals and that the guidance is based on the latest trauma care practices.

Target Population Preferences and Views

The guideline reflects the input and feedback from non-medical professionals, ensuring the language is clear, practical, and easy to understand. This ensures usability in various emergency situations, even by individuals with minimal medical knowledge.

Target Users

- **Primary Audience:** Non-medical professionals, including first responders, paramedics, security personnel, and individuals with basic first-aid training.
- **Secondary Audience:** Laypersons or civilians who might encounter a penetrating abdominal injury and need to take initial action before professional medical care is available.

Rigour of Development

Search Methods

The evidence for this guideline was gathered from a combination of clinical studies, trauma care protocols, expert recommendations, and military first-aid manuals. Sources include PubMed, MEDLINE, Cochrane, and trauma care journals, as well as military and emergency medicine publications.

Evidence Selection Criteria

- **Study Design:** Observational studies, expert consensus, clinical guidelines, and military trauma protocols.
- **Population:** Patients with penetrating abdominal injuries, including gunshot wounds, stabbings, and other puncture wounds.
- **Outcomes:** Management strategies for preventing shock, bleeding control, and preparation for evacuation.

Strengths and Limitations of the Evidence

Strengths: The guideline is based on well-established clinical practices and trauma care protocols.

Limitations: The application of certain techniques, such as hemostatic tamponade, may not be feasible in all civilian contexts, as it is primarily used in combat or military settings.

Formulation of Recommendations

Recommendations were formulated based on expert consensus and evidence from clinical studies on trauma care, particularly in military and emergency care settings.

Clarity of Presentation

Symptoms and Signs of Penetrating Abdominal Injuries

- Visible wound on the abdomen, back, or lower chest.
- Pain at the site of injury.
- Signs of blood loss (e.g., rapid pulse, low blood pressure, pallor).
- Fever with increasing abdominal pain and distention suggests peritonitis.

What to Do

1. **Seek Immediate Medical Help:** Provide detailed information about the injury, including the mechanism of injury and vital signs.
2. **Initial Management of the Wound:[3]**
 - Apply a hemostatic dressing and compressive bandage.
 - Administer intravenous fluids (0.9% sodium chloride, 1 liter over six hours).
 - Give antibiotics (ceftriaxone 1g IV twice daily or amoxicillin/clavulanic acid 1000 mg thrice daily).
3. **Pain Relief:**
 - Administer morphine (10–15 mg) intramuscularly or intravenously every 3 to 4 hours.
 - If the patient is stable and can swallow, avoid oral intake unless necessary.

Note on Hemostatic Tamponade

Hemostatic tamponade is effective in controlling bleeding but is not a permanent solution. Its use increases the likelihood of survival until surgical intervention.

Applicability

Facilitators and Barriers to Application

Facilitators:

- First-aid training courses focused on trauma care.
- Access to basic first-aid kits with necessary supplies.
- Familiarity with trauma care procedures by first responders.

Barriers:

- Inadequate supplies in remote or rural areas.
- Limited access to medical evacuation.

Implementation Advice/Tools

- Training in hemostatic tamponade and trauma care techniques.
- Availability of instructional materials and online resources.

Key Recommendations (Summary)

- Always consider penetrating abdominal injuries as serious, requiring urgent evacuation.
- Use hemostatic tamponade for bleeding control if available.
- Administer appropriate pain relief (e.g., morphine).
- Ensure rapid evacuation to a surgical facility.
- If an abdominal organ prolapses, cover it with sterile dressings and do not attempt reinsertion.

Conflict of interest:

The authors declare that no conflicts of interest.

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All authors contributed to the literature search and data analysis and drafted and revised the work. All authors read and approved the final manuscript.

Ethical approval

This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

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