

H01: Principles of Major Trauma

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Introduction

Trauma is one of the leading causes of death worldwide. In Canada, trauma is the leading cause of death in people under age 45 and accounts for approximately 16,000 deaths per year. Despite advances in trauma resuscitation, hemorrhage, shock, and coagulopathy remain the main drivers of preventable death after trauma and are responsible for over 40% of all trauma-related deaths.

Initiation of "damage control resuscitation" in the out-of-hospital environment has the potential to reduce complications associated with hemorrhage by intervening at the point of injury and preventing or limiting the development of 'Acute Coagulopathy of Trauma-Shock' (ACoTS). Adopted from damage control surgery, damage control resuscitation prioritizes rapid definitive hemorrhage control, permissive hypotension (in select patients), the minimal use of crystalloid fluid, and timely delivery of balanced blood products.

Essentials

- Rapidly obtain definitive hemorrhage control.
- Maximize tissue oxygenation.
- Prevent or limit the development of hypothermia.
- Minimize the use of crystalloid fluid for volume replacement.
- Initiate rapid conveyance to an appropriate lead trauma hospital or utilize clinical pathway.

Referral Information

- Triage according to the [Pre-hospital Triage and Transport Guidelines for Adult and Pediatric Major Trauma](#) decision tool, including Physiological Criteria, Anatomical Criteria, Mechanism of Injury Criteria, and Special Considerations.

General Information

- Assessment and stabilization should follow the CABCDE pattern: Circulation, airway, breathing, circulation, disability (neurologic status), exposure.

Interventions

First Responder

- Control external bleeding
 - → [D02: Bleeding](#)
 - → [PR03: Tourniquets](#)
 - → [PR04: Wound packing](#)
- Control suspected internal bleeding
 - → [PR02: Pelvic Binders](#)
- Consider [spinal motion restriction](#) based on clinical indications
- Provide appropriate airway management
 - → [B01: Airway Management](#)
- Prevent further heat loss
- Supplemental oxygen as required
 - → [A07: Oxygen Administration](#)

Emergency Medical Responder – All FR interventions, plus:

- Consider [Auto Launch](#) or [Early Fixed Wing Activation](#); convey urgently
- Consider intercept with additional resources
- Consider analgesia as needed
 - → [E08: Pain Management](#)

Primary Care Paramedic – All FR and EMR interventions, plus:

- Consider IV access with minimal use of crystalloid fluid
 - → [D03: Vascular Access](#)
- Consider permissive hypotension in select patients
 - → [D01: Shock](#)
- Control suspected internal bleeding
 - [Tranexamic acid](#) in cases of shock secondary to blood loss and occult bleeding secondary to hypovolemia

Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:

- Consider IV/IO access
 - → [PR12 Intraosseous Cannulation](#)
- Consider anesthesia planning and intubation as required
 - → [PR18: Anesthesia Induction](#)
- Consider analgesia as needed
 - → [E08: Pain Management](#)

Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:

- Consider point of care ultrasound (POCUS)
- Consider advanced anesthesia planning
- Consider balanced [blood product resuscitation](#)

Evidence Based Practice

General Major Trauma Care

Supportive

- [Acetaminophen IV](#)
- [Fentanyl](#)
- [Morphine](#)
- [Nitrous Oxide](#)
- [NSAIDs](#)
- [ALS](#)
- [Blood Glucose Monitoring](#)
- [ETCO2](#)
- [HEMS](#)
- [Ketorolac \(Toradol\)](#)
- [Mechanical Intraosseous Insertion](#)
- [Optimal Trip Destination](#)
- [Point of Care Lactate](#)
- [Trauma Team Activation](#)
- [Acetaminophen PO](#)

Neutral

- [Ketamine](#)
- [Thermostasis](#)
- [Oxygen](#)
- [IV access](#)
- [Manual Intraosseous Insertion](#)
- [Temperature Monitoring](#)

Against

- [Benzodiazepines](#)

