



TRAUMA AND TRAUMA SYSTEMS

DND Primary Care Paramedicine

Module: 05

Section: 01



- Introduction
- Trauma
- Trauma care system
- Trauma center designation
- Role of the Paramedic

- A physical injury or wound caused by external force or violence



- Fourth leading killer in Canada
 - Number one cause of death for persons under age 45
- Most expensive problem in terms of:
 - Productivity losses
 - High cost of initial care, rehabilitation and lifelong patient maintenance

- Penetrating
 - Injury caused by an object breaking the skin and entering the body.
- Blunt
 - Injury caused by the collision of an object with the body in which the object does not enter the body.

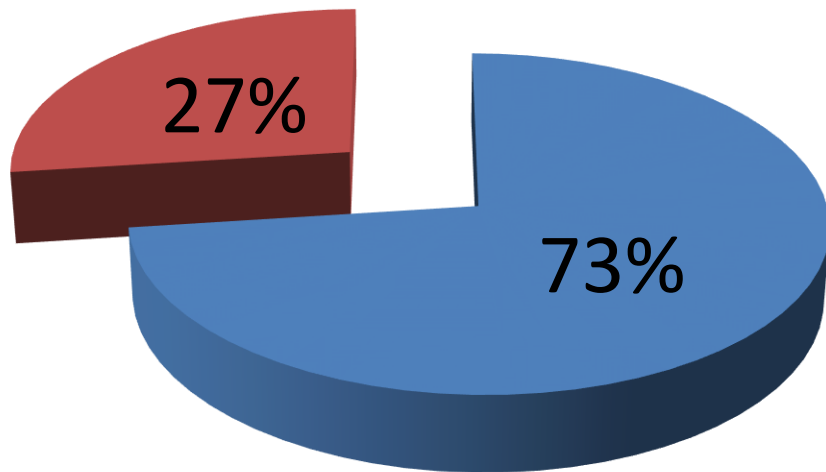
- Presentation often masks patient's true condition
 - Extremity trauma is often obvious and grotesque
 - May be a distraction from internal bleeding and shock which may have a more subtle presentation
- Serious life-threatening injuries occur in less than 10% of injuries
 - Recognition and priority management (triage) become critical to effective management

- Trauma is a major cause of morbidity and mortality.
- The paramedic must have an appreciation of the trauma system and be able to recognize mechanisms of injury to enhance patient assessment.
- Whether we are dealing with a minor or a major trauma, our plan should be consistent and follow an organized routine

Gender Breakdown

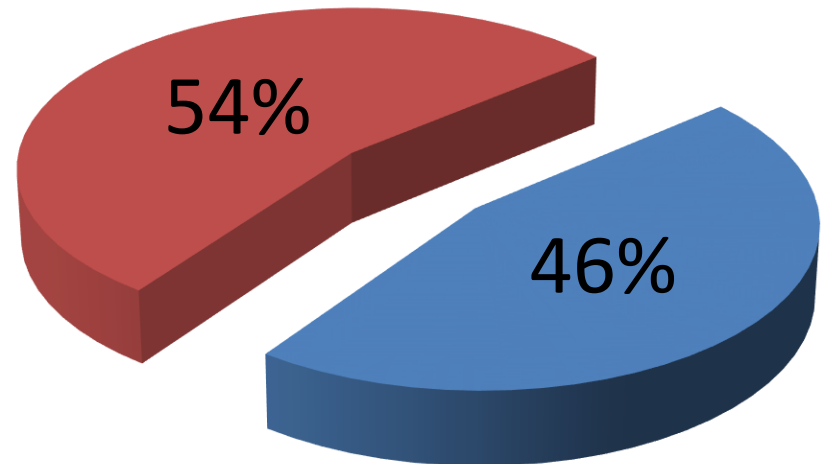
Major Trauma

(Comprehensive Data Set)

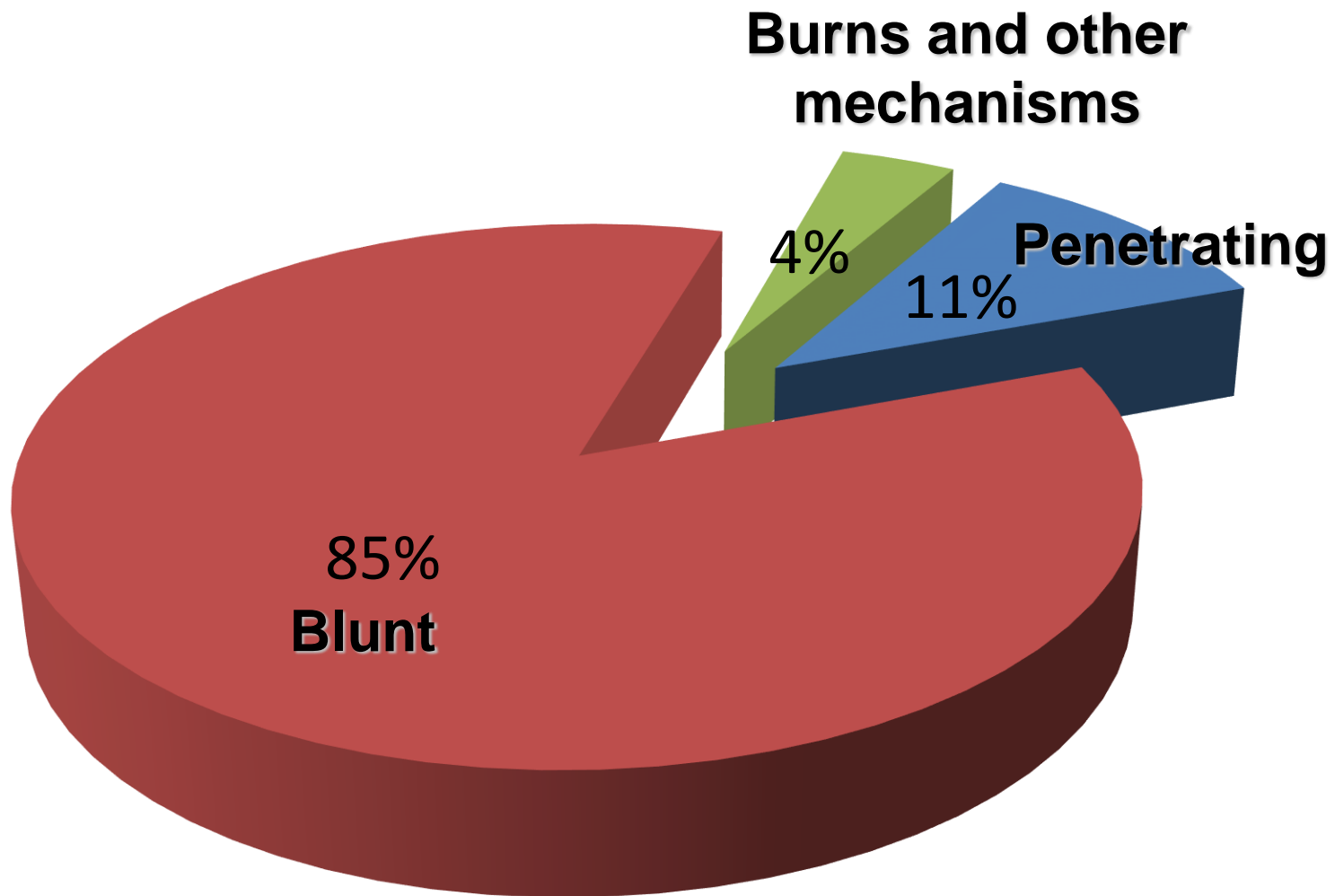


Minor Trauma

(Minor Data Set)



■ Male ■ Female



- Injury Location (body):
 - Head and Neck > 60%
- Age:
 - Minor > 65 y/o
 - Major 20 – 49 y/o
- Location:
 - Minor Home (falls)
 - Major Street and highway (MVCs)
- Time:
 - Major traumas tend to occur more on the weekends
 - Major trauma tends to occur during the summer months



- It is essential that gruesome, non-life-threatening injuries do distract you from more subtle, life threatening problems.



- Serious trauma is a surgical disease
 - Proper care is often immediate surgical intervention
- Care for seriously injured trauma patients is expensive and complicated
 - Well-designed EMS systems allocate limited resources to provide the most efficient and effect care

- Integration of:
 - EMS
 - Hospital Care
- Reduces:
 - Cost
 - Time to surgery
 - Mortality
- Proper Care:
 - Immediate surgical intervention to repair hemorrhage sites



- Current Canadian model for trauma care involves the designation of trauma centres:
 - Tertiary Trauma Centres (TTC)
 - District Trauma Centres (DTC)
 - Primary Trauma Centres (PTC)
 - Or graded Level 1-5, Level 1 = Tertiary Centre
- Trauma systems should be flexible enough to meet local needs
 - Urban versus rural

Mechanism of Injury

- Falls greater than six metres (three times the victim's height)
- Pedestrian/bicyclist versus auto collisions
 - Struck by a vehicle travelling more than 10 km/h
 - Thrown or run over by vehicle
- Motorcycle impact at greater than 30 km/h
- Ejection from a vehicle
- Severe vehicle impact
 - Speed at impact greater than 60 km/h
 - Intrusion of more than 30 cm into occupant compartment
 - Vehicle deformity greater than 50 cm
- Rollover with signs of serious impact
- Death of another occupant in the vehicle
- Extrication time greater than 20 minutes

Significant mechanism of injury considerations with infants and children include the following:

- A fall of greater than three metres (three times the victim's height)
- A bicycle/vehicle collision
- A vehicle collision at medium speed
- Any vehicle collision in which the infant or child was unrestrained

Physical Findings

- Revised Trauma Score less than 11
- Glasgow Coma Scale less than 14
- Systolic blood pressure less than 90
- Respiratory rate less than 10 or greater than 29
- Pulse less than 50 or greater than 120
- Two or more proximal long-bone fractures
- Flail chest
- Pelvic fracture
- Limb paralysis
- Burns to more than 15 percent of body surface area
- Burns to airway or face
- Complete amputation of limb, thumb, or penis; eye avulsion; partial limb amputation (partial amputation of the thumb and penis, depending on severity of the injury)
- Tender, distended abdomen secondary to blunt/penetrating trauma
- Head injury with unilaterally dilated pupil, and/or patient unconscious or level of consciousness decreased or decreasing during assessment

Trauma Centre Designations

- Neurocentres
- Pediatric trauma centres
- Microsurgery
- Hyperbaric centres
- Burn units

- Triage
 - Trauma triage guidelines
- Rapid assessment
- Trauma care
- Transport to the appropriate facility

- Trauma care is divided into 3 separate sections:
 - Pre-incident
 - Incident
 - Post-Incident

- One of the best and most cost effective way to reduce mortality and morbidity is to prevent the trauma in the first place
- Designed to help promote safe practices to the public to help prevent injuries
 - “Injury is No Accident” Campaign
 - P.A.R.T.Y. Program (Prevention of Alcohol & Risk Related Trauma in Youth)
 - Bicycle safety programs
 - Firearm safety
 - Boat safety
 - Child Safety Seat classes and checking

- Prehospital care
 - Management
 - Transportation
 - Triage guidelines





- Acute care
 - Emergency department
 - Interfacility transport
 - Definitive care
 - Trauma critical care
- Rehabilitation
 - Improving 'return to home'
 - Assisting the patient to regain or retrain



- Data and Trauma Registry
 - Data retrieval system for trauma patient information
 - Used to evaluate and improve the trauma system
 - Requires accurate documentation
 - Supports research

- Quality Improvement
 - Quality improvement (QI) and quality management (QM)
 - Another way of examining system performance with an aim of providing better patient care
 - Recommendations may include:
 - Continuing education
 - Protocol modifications
 - Peer review is often a critical component of this process

- Often a difficult decision with significant consequences
- Based on trauma triage criteria
 - Designed for “over-triage””
 - Ensures that patients with subtle signs and symptoms do not get missed
- Best to err on the side of caution

- >6 m fall (3 x height of patient)
- Pedestrian/bicyclist versus auto
 - Thrown or run over by vehicle
 - Struck by vehicle traveling >10 kph
- Motorcycle impact >30 kph
- Ejected from a vehicle

- Severe vehicle impact
 - > 60 km/hr
 - > 30 cm intrusion
 - > 50 cm vehicle deformity
- Rollover with signs of serious impact
- Death of another occupant
- Extrication time > 20 minutes

- >3 m fall (3 x height of patient)
- Bicycle/vehicle collision
- Vehicle collision at medium speed
- Any vehicle collision involving an unrestrained infant or child

- Revised Trauma Score <11
- Pediatric Trauma Score <9
- Glasgow Coma Scale <14
- Systolic blood pressure <90
- Respiratory rate <10 or >29

- > 2 proximal long bone fractures
- Flail chest
- Pelvic fracture
- Limb paralysis
- Burn > 15% BSA
- Burn to face or airway
- Penetrating trunk, neck and head trauma

- Trauma
- Trauma Care System
- Trauma Centre Designation
- Role of the Paramedic