Chapter 22 Trauma Overview

Kinematics of Trauma

- Injuries are the leading cause of death among ______________________ and young adults.
- ________________ introduces the basic physical concepts that dictate how injuries occur and affect the human body.

Energy and Trauma

- Work
  - Force acting over ______________________
- Kinetic energy
  - Energy of ______________________ object
- ________________ energy
  - Product of weight, gravity, and height

Kinetic Energy

- KE = Mass/2 X ______________________²
- Double the speed = ______________________ the KE
- Energy cannot be created or destroyed, only ______________________

Newton’s First Law

- Objects at rest tend to stay at rest, and objects in motion tend to stay in motion, unless they are acted upon by some ________________.

Newton’s Second Law

- Force (F) equals Mass (M) times ______________________ (A)
  - F=MA

Newton’s Third Law

- For every action, there is an ________________ and opposite reaction

Traumatic Injuries

- ________________ trauma
  - Caused by a force to the body
  - Injuries do not penetrate soft tissue or organs
- ________________ trauma
  - Caused by objects such as knives and bullets
  - Injuries pierce the surface of the body

Mechanism of Injury (MOI)

- ________________ is the way in which traumatic injuries occur.
  - Different MOIs produce many types of ________________ .
  - ______________________ to one body system
  - Injuries to many body systems

Vehicular Crashes and Mechanisms of Injury (MOI)

- By ________________ the crash, the MOI may be determined.
  - By determining the MOI, you may be able to ________________ the types of injuries that may have happened at the time of impact.
Vehicular Collisions

- Three types of crashes:
  - Collision of car against another car or _______________________
  - Collision of passenger(s) against ________________________ of car
  - Collision of passenger’s internal ________________________ against the solid structures of the body

Significant Mechanisms of Injury (MOI)

- Severe ________________________ to the frontal part of the vehicle
- Moderate ________________________ from a T-bone accident
- Severe damage from the rear
- Collisions in which ________________________ is involved

Types of Motor Vehicle Collisions

- ________________________
- ________________________
- Rear-end
- Spins
- ________________________

Frontal Collisions (1 of 2)

- Evaluate seat belts and ________________________ .
- Remember that supplemental restraint systems cannot prevent all injuries.
  - You should still suspect that ________________________ injuries have occurred.

Frontal Collisions (2 of 2)

- Check for ________________________ points.
- Steering wheels can also cause chest injuries, especially if no air bag is present.
- Knee strikes dash and knee is injured: ________________________ Injury
- Knee strikes dash resulting in pelvic injury: ________________________ Injury

Rear-End Collisions

- Commonly cause ________________________ -type injuries
- Unrestrained passengers will be thrust ________________________ into the dashboard.
- Back seat passengers wearing only lap belts might have a higher incidence of ________________________ and thoracic spine injury.

Lateral Collisions

- Responsible for the ________________________ incidence of deaths.
- ________________________ whiplash injury is the result.
- There may be intrusion into the passenger compartment.

Rollover Crashes

- Injury patterns differ if patients are ________________________ .
- The most unpredictable injuries are to unrestrained passengers.
• ________________ is the most common life-threatening injury.

19  □  Spins
• Vehicle is put into ________________ motion.
• Vehicle often strikes a fixed object, combining forces of rotation with ________________ impact.

20  □  Car-Versus-Pedestrian Collisions
• Often cause serious injuries to body systems
• Evaluate MOI to determine:
  • Whether patient was ________________ and how far.
  • Whether patient was struck and pulled ________________ car.
• Presume injury to the spinal cord and maintain immobilization.

21  □  Falls
• Injury potential is related to the height of the fall.
• A fall either __________ or three times the person’s height is considered significant.
• Suspect ________________ injuries from a significant fall.

22  □  Considerations for Falls
• The ________________ of the fall
• The ________________ struck
• The part of the body that hit first, followed by the ________________ of energy displacement

23  □  Penetrating Trauma
• ________________ largest cause of death in the United States after blunt trauma
• Penetration can be low-energy, or medium- or ________________-velocity
• The greater the ________________ of penetration, the greater the injuries

24  □  Low-Energy Penetrating Trauma
• Caused accidentally by an object or intentionally with a ________________
• Injury caused by the sharp ________________ of the object moving through the body

25  □  Medium-Velocity and High-Velocity Penetrating Trauma
• Usually caused by ________________
• Bullets can change shape and ricochet within the body.
• Pressure waves cause ________________.
• If possible, identify weapon ________________ and shooting distance.

26  □  Cavitation
• ________________ cavitation is caused by the acceleration of the bullet.
• ________________ cavitation is caused by the bullet path.

27  □  Blast Injuries
• Primary blast injuries
Due entirely to the _______________________ itself
Secondary blast injuries
  • Damage to the body results from being struck by flying _______________________.
  • _______________________ blast injuries
    • Victim is hurled by the force of the explosion.

28 □ Blast Injuries
29 □ Other Blast Injuries
  • _______________________ from hot gases or fires started by the blast
  • _______________________ injury from inhaling toxic gases
  • _______________________ injury from the collapse of buildings
  • Most patients will have some combination of the types of injury.

30 □ Organs Most Affected
  • Organs that contain air are most susceptible to pressure changes.
    • Middle ear
    • _______________________
    • Gastrointestinal tract
  • The _______________________ is most sensitive to blast injuries.

31 □ Blast Injuries
  • _______________________ organs are relatively protected from shock wave injury.
    • May be injured by secondary missiles or a hurled body
  • _______________________ injuries and head trauma are the most common causes of death.
  • Traumatic _______________________ are common