Introduction

- May be life threatening or cause permanent damage
- Trauma to head, neck, torso may result in serious injury
- Injuries without immediate obvious signs and symptoms may involve potentially life-threatening problem
- Any head injury may also injure spine

Common Mechanisms of Head and Spinal Injuries

- Motor vehicle crashes/pedestrian-vehicle collisions
- Falls
- Diving
- Skiing and other sports injuries
- Forceful blunt/penetrating trauma to head, neck, torso
- Hanging incidents

Suspect a Head or Spinal Injury

- With any unresponsive trauma patient
- When wounds or other injuries suggest large forces involved
- Observe patient carefully during the initial assessment

Head Injuries

Injuries to the Head

- May be open or closed
- Bleeding may be profuse
- Closed injuries may involve swelling/ depression at site of skull fracture
- Bleeding inside skull may occur with any head injury

General Signs and Symptoms

- Lump or deformity in head, neck, or back
- Changing levels of responsiveness
- Drowsiness
- Confusion
- Dizziness
- Unequal pupils

General Signs and Symptoms continued

- Headache
- Clear fluid from nose or ears
- Stiff neck
- Inability to move any body part
- Tingling, numbness, or lack of feeling in feet or hands

Assessing an Unresponsive Patient

- If no life-threatening condition perform limited physical examination for other injuries
- Do not move patient unless necessary
- Check for serious injuries
- Stabilize head and neck

Assessing an Unresponsive Patient

- Ask those at scene:
  - What happened
  - Patient's mental status before becoming unresponsive

Assessing a Responsive Patient

- If nature of injuries suggests potential spinal injury, carefully assess for spinal injury during physical examination
- Ask patient not to move more than you ask during the examination

Assessing a Responsive Patient

- Ask:
  - Does your neck or back hurt?
  - What happened?
  - Where does it hurt?

Physical Examination

Perform standard examination

- When checking torso, look for impaired breathing or loss of bladder/bowel control
- Compare strength from one side of body to other
- Assess both feet and both hands at same time

Physical Examination

Perform standard examination

- Don’t assume patient without symptoms has no spinal injury. Consider forces involved
- When in doubt, keep head immobile while waiting for additional EMS

Skill:

Head and Spinal Injury Assessment

Check the victim’s head.

Check neck for deformity, swelling, and pain.


Check sensation in feet.


Ask victim to point toes.


Ask victim to push against your hands with feet.


Check sensation in hands.


Ask victim to make a fist
and curl it in.


Ask victim to squeeze
your hands.

Brain Injuries

Brain Injuries

- Occur with blow to head with/without open wound
- Brain injury likely with skull fracture
- Brain swelling/bleeding

Signs and Symptoms of a Brain Injury

- Severe or persistent headache
- Altered mental status (confusion, unresponsiveness)
- Lack of coordination, movement problems

Signs and Symptoms of a Brain Injury Continued

- Weakness, numbness, loss of sensation, paralysis
- Nausea and vomiting
- Seizures
- Unequal pupils
- Problems with vision or speech
- Breathing problems or irregularities

Concussion

- Brain injury involving temporary impairment
- Usually no head wound or signs and symptoms of more serious head injury
- Victim may have been “knocked out” but regained consciousness quickly

Signs and Symptoms of Concussion

- Temporary confusion
- Memory loss about event
- Brief loss of responsiveness
- Mild or moderate altered mental status
- Unusual behavior
- Headache

Medical Evaluation

- Concussion patient may recover quickly
- Difficult to determine injury severity
- More serious signs and symptoms may occur over time
- Patients with suspected brain injuries require medical evaluation

Emergency Care for Head Injuries

- Perform standard patient care
- Use the jaw-thrust to open airway
- Follow local protocol re: oxygen
- Manually stabilize the head and neck
- Don’t let patient move

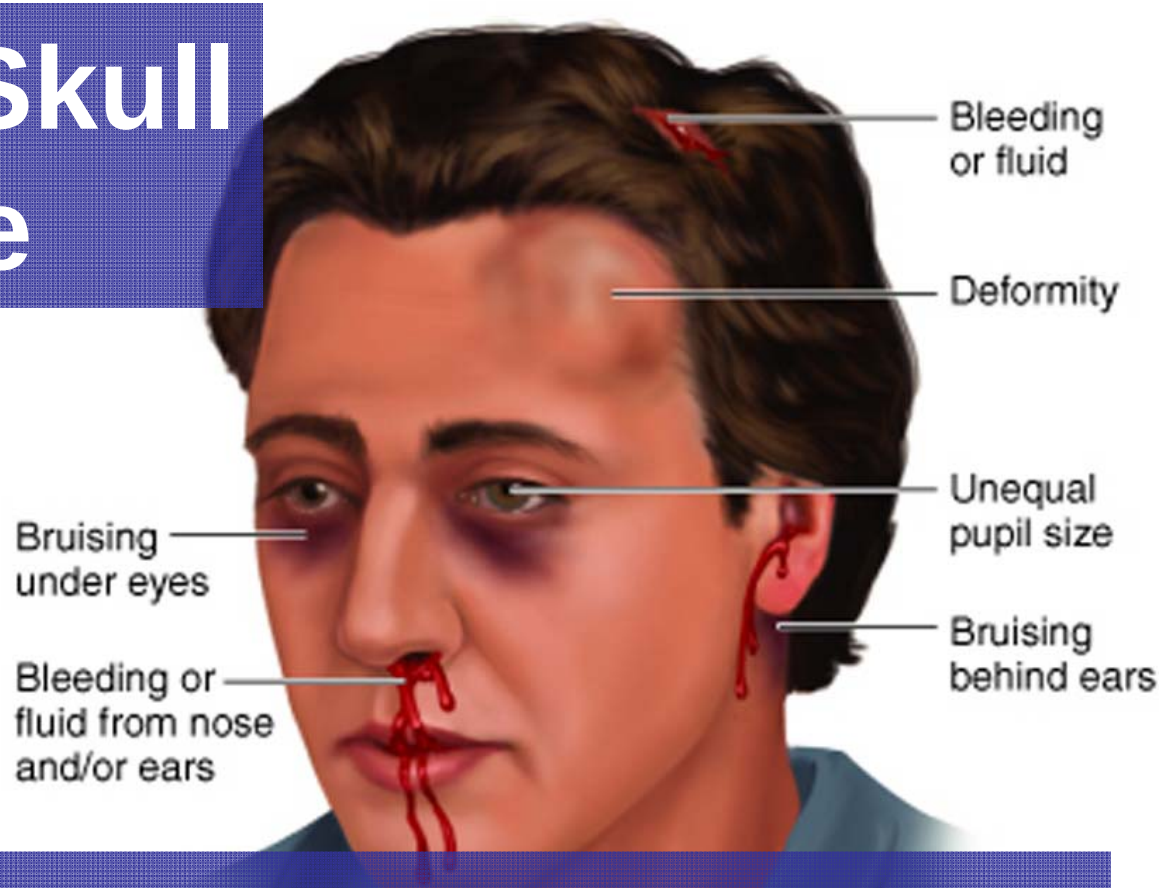
Emergency Care for Head Injuries continued

- Closely monitor mental status
- Control bleeding. No direct pressure on skull fracture
- Monitor vital signs
- Expect vomiting
- Provide additional care for skull fracture

Skull Fracture

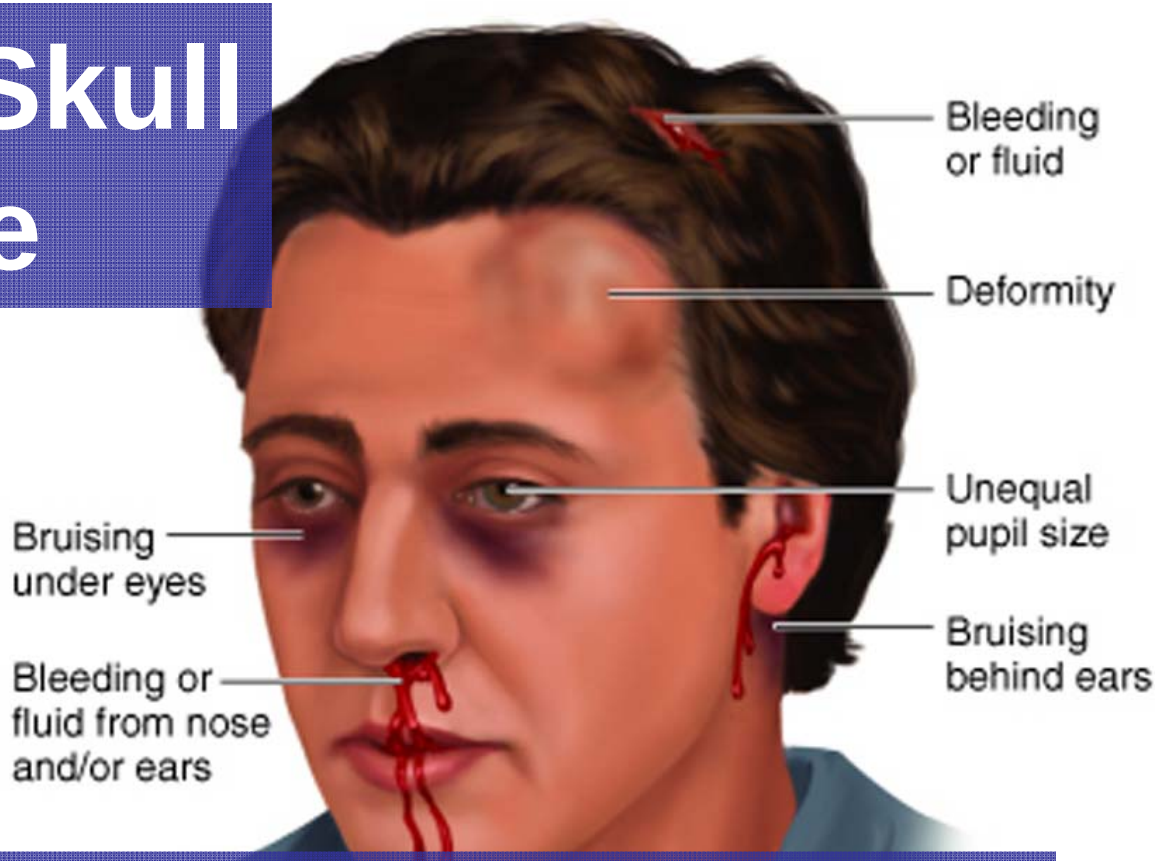
- Check for possible skull fracture before applying direct pressure to scalp bleeding
  - Direct pressure could push bone fragments into brain
- Skull fracture is life threatening

Signs of a Skull Fracture



- Deformed area
- Depressed or spongy area
- Blood or fluid from ears or nose
- Eyelids swollen shut or becoming discolored (bruising)

Signs of a Skull Fracture



- Bruising under eyes (raccoon eyes)
- Bruising behind ears (Battle’s sign)
- Unequal pupils
- An object impaled in skull

Emergency Care for Skull Fractures

- Care as for any head/spinal injury
- Don’t clean wound, press on it, or remove impaled object
- Cover wound with sterile dressing

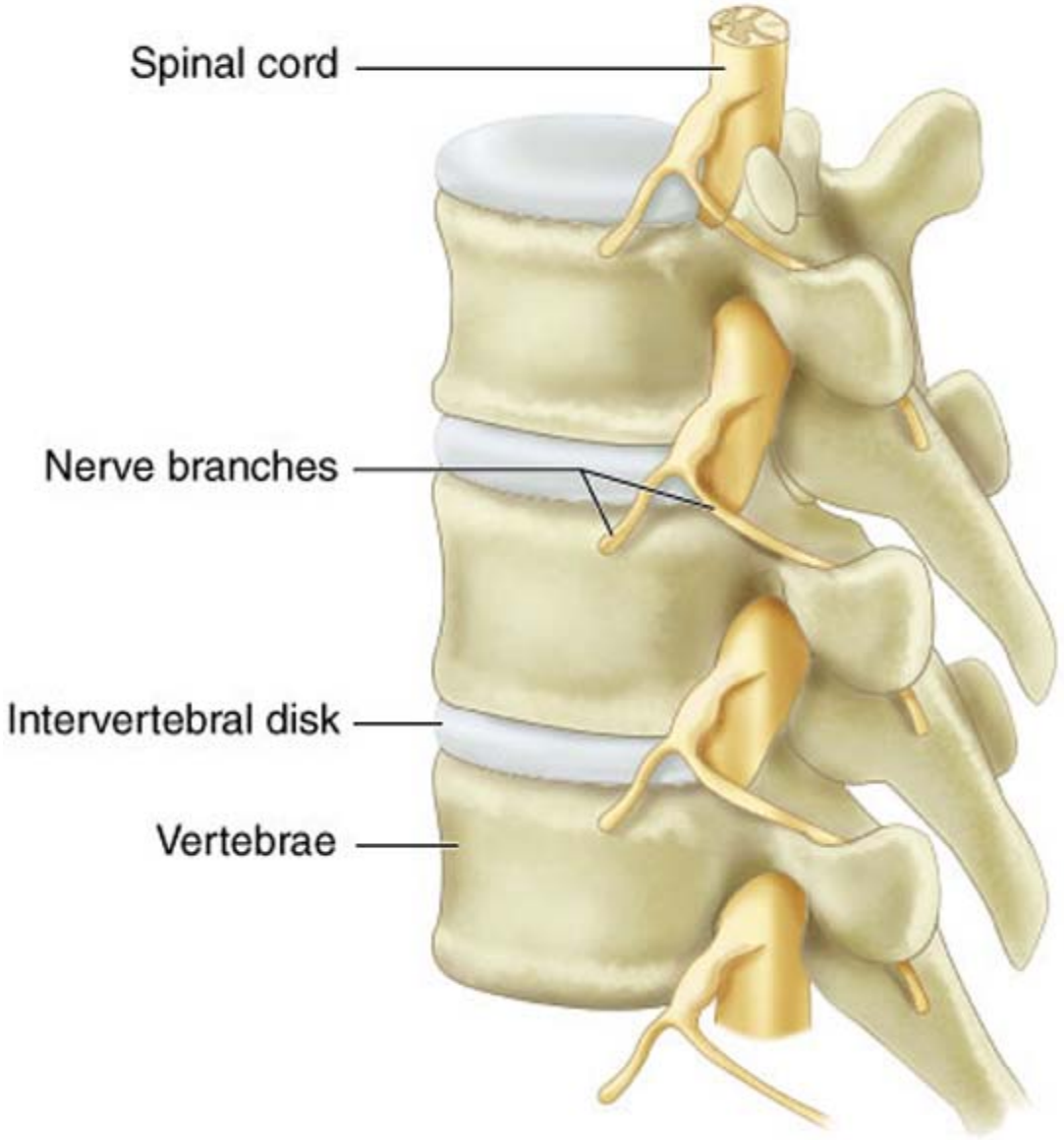
Emergency Care for Skull Fractures

- If bleeding, apply pressure only around edges of wound. Use a ring dressing
- Do not move victim unnecessarily

Spinal Injuries

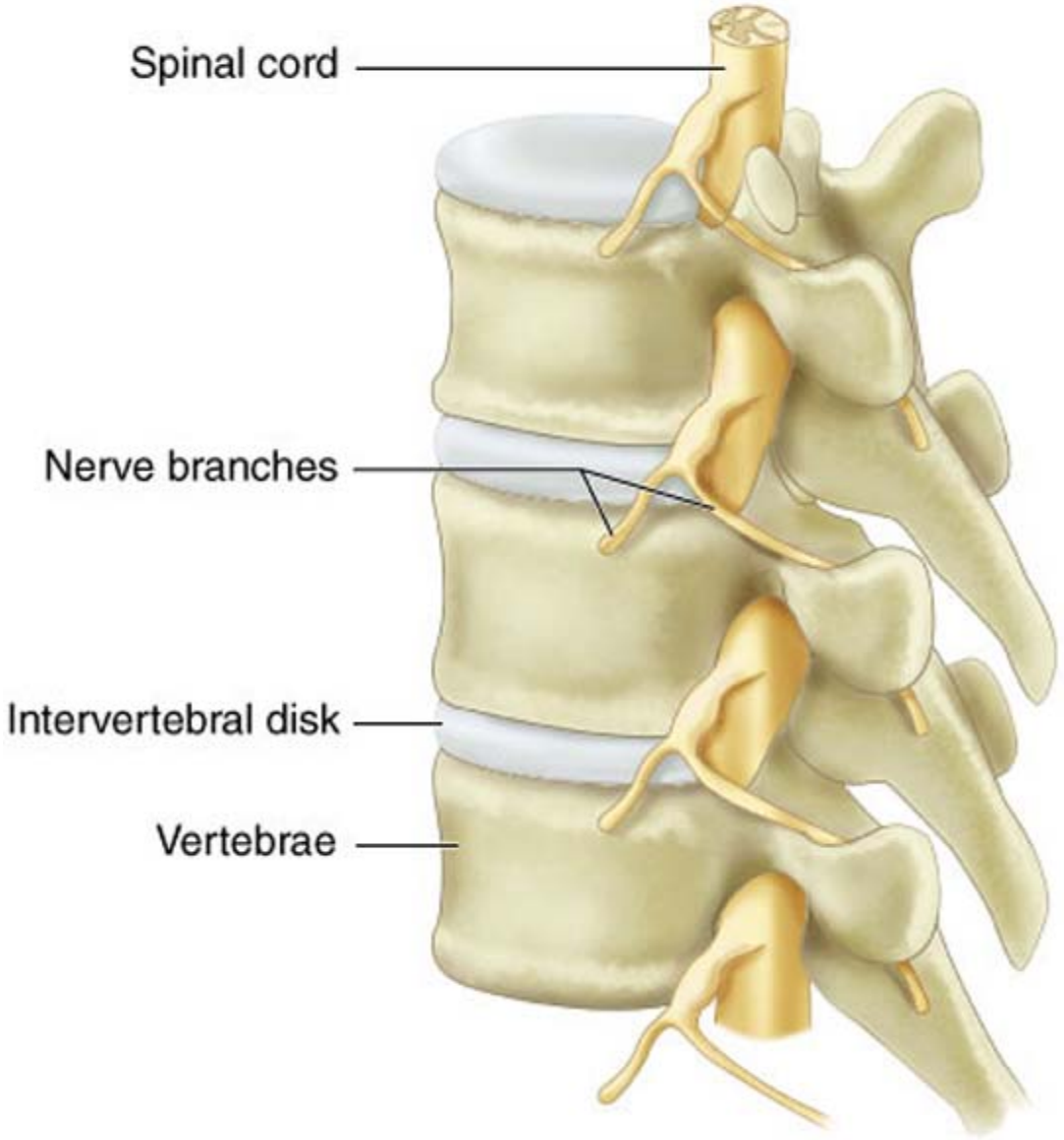
Spinal Injuries

- Fracture of neck or back always serious
  - Possible damage to spinal cord



Spinal Injuries

- Effects of nerve damage depend on nature and location of injury
- Movement of head or neck could make injury worse



Emergency Care for Spinal Injuries

- Perform standard patient care
- Give general care as for any head/spinal injury
- Use constant manual stabilization until patient secured to backboard with head stabilized

Emergency Care for Spinal Injuries

- Support head in position found

Emergency Care for Spinal Injuries

- Maintain airway and provide needed ventilation without moving head
- To position patient for ventilations/CPR, keep head in line with body

Positioning a Spinal Patient

- Move patient only if necessary
- Roll vomiting patient to one side to drain mouth
- Roll facedown patient onto the back for ventilations/CPR
- Use log roll to turn patient
- If alone move vomiting patient into HAINES recovery position

Removing a Helmet

Removing a Helmet

- Remove a helmet only to care for life-threatening condition
- Remove helmet, following local protocol, when faceguard prevents giving ventilations
- With many helmets faceguard can be removed/pivoted so helmet is left on for ventilations
- For athletic helmets, first unsnap and remove jaw pads

Removing Motorcycle Helmets with Non-pivoting Faceguard

- Requires two rescuers
- First Rescuer slides one hand under neck to support base of skull and holds lower jaw with other

Removing Motorcycle Helmets with Non-pivoting Faceguard con't

- Second rescuer tilts helmet back slightly as first rescuer prevents head movement
- Second rescuer pulls helmet back until chin is clear of mouth guard
- Second rescuer tilts helmet forward slightly moving helmet back past base of skull, then slides it straight off

Cervical Collars

- Help stabilize head and neck
- Most First Responders don’t apply cervical collars by themselves but may assist EMTs

Applying a Cervical Collar to a Supine Patient

- Choose correct size. Measure with fingers from top of shoulder to bottom of chin
- First rescuer holds head in line. Second rescuer slips back section of open collar under patient's neck
- Correctly position collar to fit chin and neck

(a)

(b)

(c)

(d)

Applying a Cervical Collar to a Supine Patient Continued

- Close collar with Velcro attachment
- Ensure collar fits correctly, following manufacturer's instructions
- Continue to manually support head and neck in line

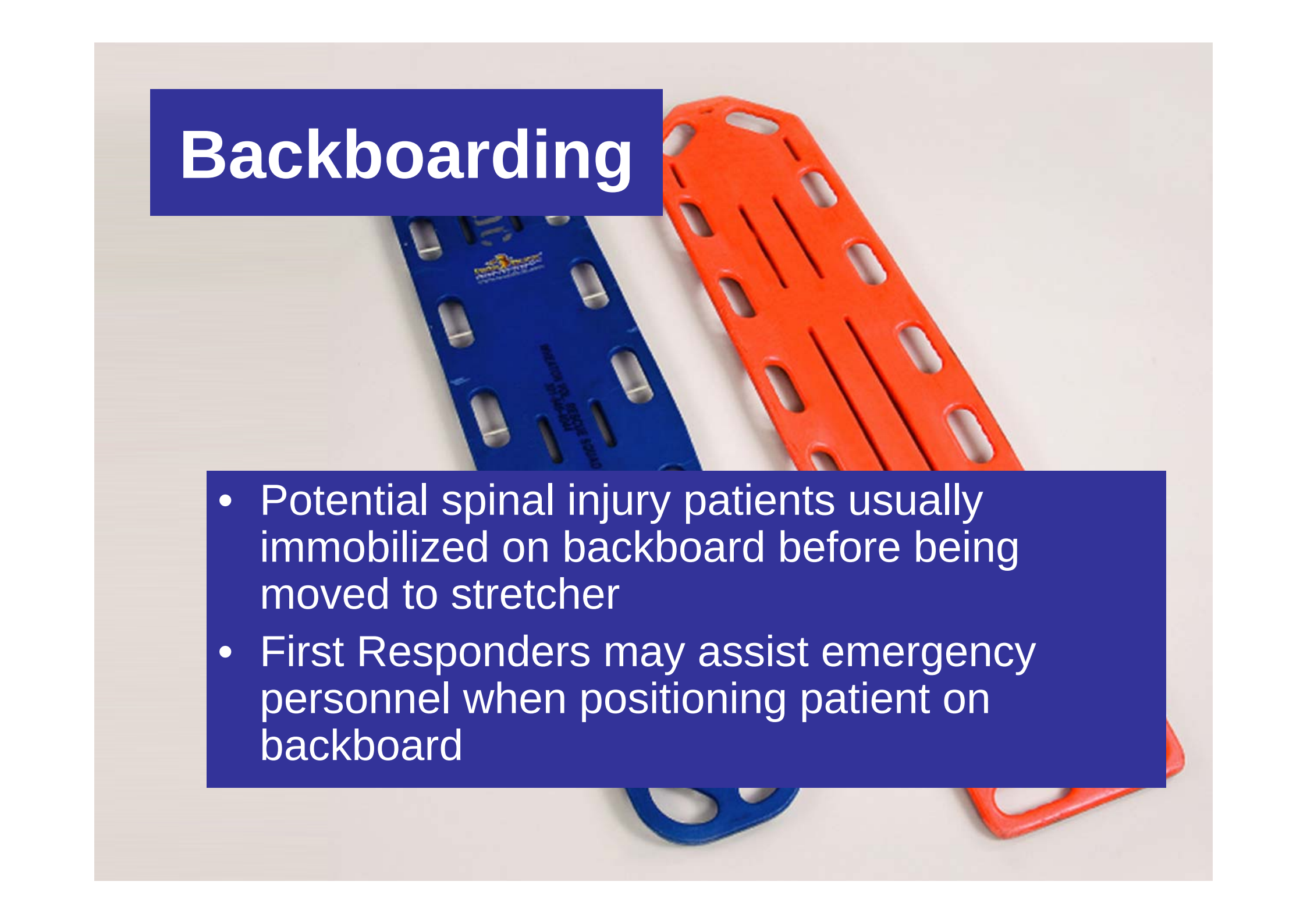
(a)

(b)

(c)

(d)

Backboarding



- Potential spinal injury patients usually immobilized on backboard before being moved to stretcher
- First Responders may assist emergency personnel when positioning patient on backboard

Backboarding continued

- Many backboard types are available
- Use short backboards for patients in seated position or confined space
- Use long backboards in most other situations

Positioning Patients on a Long Backboard

- Three or more rescuers needed
- Position long backboard beside patient
- One rescuer maintains head in line while other rescuers take position
- On cue from rescuer at patient's head, other rescuers roll patient toward them as a unit

Positioning Patients on a Long Backboard Continued

- Slide backboard next to patient
- On cue from rescuer at head, other rescuers roll patient as a unit
- Patient is secured to backboard using straps