CHAPTER 15
Extremity Injuries and Splinting
Lesson Objectives

1. Describe the 3 general types of splints and how to improvise splints with common materials.
2. List the general guidelines for splinting and use of arm slings.
3. Describe how to splint the different areas of the upper and lower extremities.
4. Demonstrate how to apply an arm sling.
5. Demonstrate how to apply a rigid splint to an injured forearm.
6. Demonstrate how to use an anatomic splint for a leg injury.
Splinting

- Movement may worsen musculoskeletal injury and cause more pain.
- Splint injured arm or leg if risk of area being moved (unless help expected quickly).
- Always splint an extremity before transporting victim.
Splinting continued

- Helps prevent further injury
- Reduces pain
- Minimizes bleeding and swelling
Splinting continued

- Splints can be improvised when needed and tied with bandages, belts, neckties, strips of cloth.
- Always check breathing and care for life-threatening conditions first.
- Consider mechanism of injury and possibility of spinal injury.
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Types of Splints

• Rigid splints
• Soft splints
• Anatomic splints
Rigid Splint

- Board
- Plastic or metal
- Rolled newspaper or magazine
- Thick cardboard
Soft Splint

- Pillow
- Folded blanket or towel
- Triangular bandage folded into sling
Anatomic Splint

- Bandage injured leg or finger to uninjured one.
Commercial Splints

Many commercial splints are available.
Securing Splints

- Use bandages, strips of cloth (cravats), Velcro straps around splint and extremity.
- Use knots that can be untied.
- If tape is used, do not tape to skin directly but put a dressing or other material over skin or fold sticky side back on itself.
Guidelines for Splinting

- Dress any open wound first.
- Splint only if it doesn’t cause more pain.
- Splint injury in position found.
- Immobilize entire area:
  - Splint joints above and below injury.
- Place padding between skin and splint.
Guidelines for Splinting continued

- Do not secure splint on open wound.
- Elevate splinted extremity, if possible.
- Apply ice or cold pack to injury around splint.
- Check circulation:
  - Swelling, bluish color, tingling, numbness, cold skin are signs and symptoms of reduced circulation.
  - If reduced circulation, remove splint.
Applying Slings

- Use sling to prevent movement of arm and shoulder and to elevate extremity.
- Splint injury first, when appropriate.
- If you splint injury in position found and this position makes use of sling difficult – do not use sling.
Applying Slings continued

- Do not move arm into position for sling if it causes pain.

- A cold pack can be used inside sling (follow standard time limits: 20 minutes on and 30 minutes off).

- Do not cover fingers inside sling.
CHAPTER 15

Skill: Applying an Arm Sling and Binder

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1. Secure the point of the bandage at the elbow. Use a safety pin or tie the point at the elbow.
Skill: Applying an Arm Sling and Binder continued

2. Position the triangular bandage.
Skill: Applying an Arm Sling and Binder continued

3. Bring up the lower end of the bandage to the opposite side of the neck.
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Skill: Applying an Arm Sling and Binder

continued

4. Tie the ends. Pad under the knot.
5. Tie a binder bandage over the sling and around the chest.
Upper Extremity Injuries

- Shoulder
- Upper arm
- Elbow
- Lower arm
- Wrist
- Hand
Shoulder Injuries

- Involve clavicle, scapula or joint structures
- Goal is to stabilize area with soft splint
- Check circulation:
  - If absent, call 9-1-1.
  - Continue to check once splinted.
Shoulder Injuries  

continued

- Pad hollow areas between body and arm.
- Apply sling and binder to support arm and immobilize against chest:
  - If this causes pain use larger pillow between arm and chest.
Upper Arm Injuries

- Fractures of humerus bone
- Goal is to stabilize bone between shoulder and elbow using rigid splint and sling
- Check circulation:
  - If absent, call 9-1-1.
  - Continue to check when splinted.
Upper Arm Injuries *continued*

- Apply rigid splint along outside of arm.
- Tie above and below the injury.
- Support wrist with sling.
- Apply wide binder to support arm and immobilize it against chest.
- If it causes pain to raise wrist for sling, use a long rigid splint.
Elbow Injuries

- Sprains, dislocations, fractures of bones above or below elbow
- Goal is to stabilize joint from arm to forearm in position found
- Check circulation:
  - If absent, call 9-1-1.
  - Continue to check when splinted.
Elbow Injuries continued

- If elbow bent, apply rigid splint from upper arm to wrist.
- If more support needed, use sling at wrist and binder around chest.
Elbow Injuries continued

- If elbow straight, apply rigid splint from upper arm to hand.
- If more support needed, use binders around chest and upper arm and lower arm and waist.
Forearm Injuries

- Fracture of ulna or radius (or both)
- Goal to stabilize and support area from elbow to hand
CHAPTER 15
Skill: Splinting the Forearm
Skill: Splinting the Forearm

1. Support the arm above and below the injury. Check circulation.
Skill: Splinting the Forearm  

2. Position the arm on a padded rigid splint. If available, add a roller bandage under the fingers.
Skill: Splinting the Forearm continued

4. Put the arm in a sling, and tie a binder over the sling and around the chest.
Skill: Splinting the Forearm continued
Wrist Injuries

- Sprains and fractures
- Goal is to stabilize from forearm to hand
- Soft splint and sling often sufficient, but rigid splint provides more support.
- Check circulation:
  - If absent, call 9-1-1.
  - Continue to check after splinting.
Wrist Injuries continued

- Apply rigid splint on palm side of arm from forearm past fingertips.
- Tie above and below wrist.
- Leave fingers uncovered.
- Support forearm and wrist with sling, and apply binder around upper arm and chest.
Hand Injuries

- Fractures
- Goal is immobilization of hand
- Soft or rigid splint may be used
Hand Injuries  

- Place roll of gauze in palm.
- Bandage entire hand, leaving fingers exposed, if possible, to check circulation.
- Place rigid splint on palm side of hand.
- Pad area between hand and splint.
- Support further with sling and binder.
Finger Injuries

- Fractures and dislocations
- Often splint not required
- Use rigid splint or anatomic splint.
- Use soft splint if person cannot straighten finger without pain.
Lower Extremity Injuries

- Hip
- Upper leg
- Knee
- Lower leg
- Ankle
- Foot
Hip Injuries

- Fractures and dislocations
- First aid similar to that for pelvic injuries
- Call 9-1-1.
- Do not move victim.
Hip Injuries continued

- Immobilize leg and hip in position found.
- Pad between legs and bandage together (unless this causes more pain).
- Treat victim for shock, but do not elevate legs.
Upper Leg Injuries

- Fractures of femur
- Call 9-1-1.
- Keep victim from moving.
- If help may be delayed, splint to stabilize injury.
Upper Leg Injuries continued

• Rigid splint may be unnecessary.
• Provide additional support with folded blankets or coats.
• Rescuer can use an anatomic splint, padding between legs and moving uninjured leg beside injured leg.
Splinting a Femur Fracture

- Check circulation and sensation in foot and toes.
- **Put rigid splint on each side of leg:**
  - Pad body areas and voids.
  - Inside splint should extend from groin past foot.
  - Outside splint should extend from armpit past foot.
Splinting a Femur Fracture continued

- Tie splints with cravats or bandages.
- Check circulation periodically.
Knee Injuries

- Sprains and dislocations
- Do not transport yourself – call 9-1-1.
- Splint knee in position found.
- Apply soft splint by rolling blanket or placing pillow around knee.
- If knee is straight, make anatomical splint:
  - Rigid splints provide additional support.
Splinting the Knee

- If possible, put rigid splint on both sides of leg.
- Pad body areas and voids.
- Check circulation and sensation in foot and toes first and periodically after splinting.
Splinting the Knee continued

- If knee is straight, apply two splints along both sides of knee.
- If knee is bent, splint in position found.
- Tie splints with cravats or bandages.
Lower Leg Injuries

• Fractures of tibia or fibula
• Do not transport victim yourself:
  • Call 9-1-1.
• Immobilize leg from knee to ankle.
• Use soft splint, rigid splint or anatomic splint.
Lower Leg Injuries continued

- Rigid splint applied the same as for knee injury:
  - 3-sided cardboard splint can be used.
CHAPTER 15
Skill: Anatomic Splinting of Leg

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Skill: Anatomic Splinting of Leg

1. Check circulation. Gently slide 4 or 5 bandages or strips of cloth under both legs.

Do not put a bandage over the injury site.
Skill: Anatomic Splinting of Leg continued

2. Put padding between the legs.

Do not move the injured leg.
Skill: Anatomic Splinting of Leg continued

3. Gently slide the uninjured leg next to the injured leg.
Skill: Anatomic Splinting of Leg continued

4. Tie bandages (snug but not tight), starting in the middle, then at the lower leg and then at the top. Check circulation.
Ankle Injuries

- Sprain, fracture or dislocation
- Goal is to immobilize ankle.
- Usually soft splint is best.
- Gently remove shoe to check for circulation, unless this causes significant pain:
  - If circulation absent call 9-1-1.
  - Continue to check after splinting.
Ankle Injuries \textit{continued}

- Position foot in middle of soft pillow.
- Fold pillow around ankle.
- Tie pillow around foot and lower leg.
Foot Injuries

- Fractures and sprains
- Treat identically to ankle injuries.
- With toe fractures, usually no splinting required:
  - If toe significantly bent, more than 1 toe injured or foot very painful, then use pillow splint.
Chapter – Opening Scenario

Your young daughter is playing with two friends in the playground while you watch from a nearby bench. While climbing up a climbing structure, she loses her grip and tumbles to the ground. Although she falls only a couple feet, she lands hard on her arm. When you reach her a few seconds later, she is crying and clutching her arm tightly.

What do you do?
CHAPTER 15

Critical Thinking
Challenge Questions
Scenario 1

A window washer slips in a soapy water spill and falls to the ground from a second-floor scaffold, landing on his shoulder. He is sitting up, holding his upper arm tight against his body with his good hand, and says his shoulder really hurts and he cannot move it. He will not let you open his shirt to inspect the shoulder, but there does not seem to be any bleeding.

What do you do?
Scenario 2

At a company picnic at a state park out of town, a child falls from a tree and fractures her forearm. You give appropriate first aid (RICE), and the parents now will take her to the nearest emergency department.

Should you splint the arm?
If so, describe the steps for doing it.
CHAPTER 15

Discussion and Questions