



Advanced Orthopedic Skills Lab (Limited to 50 participants)

The emergency physician is often called on to perform procedures on patients with bone or joint injuries or diseases. This lab will allow participants to gain hands-on experience in many of these procedures. Techniques for performing joint aspirations and joint relocations and for constructing and applying immobilization splints will be reviewed. Models will be used to allow the participants to practice these skills (This lab is limited to 50 participants.)

- Demonstrate proper technique for aspirating a knee or an ankle joint effusion.
- Demonstrate the immobilization techniques for common orthopedic injuries.
- Demonstrate three techniques for relocation of a dislocated shoulder joint.

TU-105
Tuesday, October 12, 1999
3:00 PM - 5:55 PM
Room #
Las Vegas Hilton

FACULTY

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(Moderator)

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Introduction: Splints provide short term immobilization not only for fractures and **dislocations** that have been reduced, but also severe sprains, wounds or **significant** infections. Splinting is advocated over circumferential casting because it can provide immobilization equal to that of a cast yet poses less risk of potential complications (e.g. neurovascular compromise).

Objectives:

1. State the materials necessary for the applications of splints.
2. Be familiar with various types of splints utilized for certain orthopedic injuries.
3. Recognize the potential complications of improper splinting techniques.

Materials (Table 1):

1. Stockinette: Stockinette is the first layer to be applied. In general, 2-3" widths are best for upper extremities and 4-5" widths for lower extremities. On application, leave 3-4" of stockinette extending beyond the end of the splint so that after the splint is applied, the ends can be folded over and secured with an elastic (ace) bandage for a complete finish.
2. Padding: Cotton padding such as Webril should then be applied smoothly over the stockinette. This should also extend **1-2"** beyond the splint. The circumferential padding should be approximately 2 layers thick and each wrap should **overlap** the previous wrap by **50%**. You may put extra pieces of padding over bony prominences (e.g. lateral or medial malleoli radial or ulnar **styloid**). In general, 2-3" width Webril is used for the upper extremities and 3-4" widths are used for the lower extremities.
3. Plaster vs. Fiberglass: In the past, plaster was the mainstay of splinting, however, fiberglass is gaining in popularity because **it** is lightweight, fast setting and extremely strong. Use of plaster vs. fiberglass is generally a matter of individual preference, although, plaster is much more moldable than fiberglass and should be considered whenever detailed splinting (e.g. thumb **spica**) is needed. If expense is an issue, fiberglass is more expensive than plaster. A number of products incorporate fiberglass in a padded and stockinette already preformed and ready to use. Either plaster or fiberglass needs to come in contact with water in order to form the **final** hardened product. In general, room temperature water is ideal for this process to occur. Warmer water speeds the reaction and because an exothermic reaction occurs, heat is formed. Therefore avoid using hot water (**>104° F/ 40° C**) so as not to burn the patient. The best method to use is a simple spray bottle of room temperature water which can be sprayed sparingly on fiberglass or plaster. Avoid excessively wetting the splinting material.

4. Elastic Bandages: Ace bandages form the outer layer of the splints. Two to three inch size works well for upper extremities, 3-4" sizes for the lower extremities. The ace should overlap the previous layer by 50%. Holes can be cut in both padding and ace wrap for digits. The elastic bandage should be finally secured with metal clips and/or tape.
5. Other Materials: Gloves, aprons and gowns should be worn as needed, as well as a pair of scissors to trim away any sharp edges or over areas of prominence.

TABLE 1

1. STOCKINETTE
2. CAST PADDING
3. PLASTER SPLINTING MATERIAL
4. FIBERGLASS SPLINTING MATERIAL
5. ACE OR ELASTIC BANDAGES
6. GLOVES AND PROTECTIVE GOWNS
7. SCISSORS
6. SPRAY BOTTLE OR WATER SOURCE
9. PREMADE SPLINTS:
 - SHOULDER **IMMOBILIZERS**
 - CLAVICLE STRAP
 - PREMADE** FOREARM AND WRIST SPLINTS
 - KNEE **IMMOBILIZERS**
 - ANKLE BRACES

Specific Splints:

Upper Extremities:

<u>Splint Types</u>	<u>Indications</u>
Long Arm Splints	Mid shaft humeral fractures, elbow fractures, proximal and distal forearm fractures
Sugar Tong Splints	Distal radius (Colles') fractures and navicular (scaphoid) fractures (with a <u>thumb spica</u>)
Short Arm Splints	Torus (buckle) fracture, 1 st metacarpal fractures (with a <u>thumb spica</u>), carpal fractures (e.g. triquetrum) and wrist sprains
Radial Gutter Short Arm Splint	2 nd or 3 rd metacarpal fractures, proximal phalanx fracture 2 nd or 3 rd digits
Ulnar Gutter Splint	4 th or 5 th metacarpal fractures, proximal phalanx fracture 4 th or 5 th digits
Slings	Clavical fractures, proximal humeral fractures, humeral head fractures, post reduction of shoulder dislocation
Finger Splints	Proximal or distal phalanx fractures

Lower Extremities

Long Leg Posterior Splint	Tibial plateau fractures, tibial/fibula shaft fractures, unstable knee injuries, multi-ligament injuries, femoral condyle fractures
Knee Immobilizer	Patellar or quadriceps tendon ruptures, patellar fracture, post reduction patellar dislocation, tibial plateau fracture
Short Leg Posterior Splint	Distal tibia or fibula fractures, ankle fractures, post reduction ankle dislocation, achilles tendon, gastronemius rupture, metatarsal fractures (especially 5 th MT), calcaneal fractures, talus fractures
Sugar Tong Short Splint	Severe ankle fractures (eg bimalleolar, trimalleolar fractures)