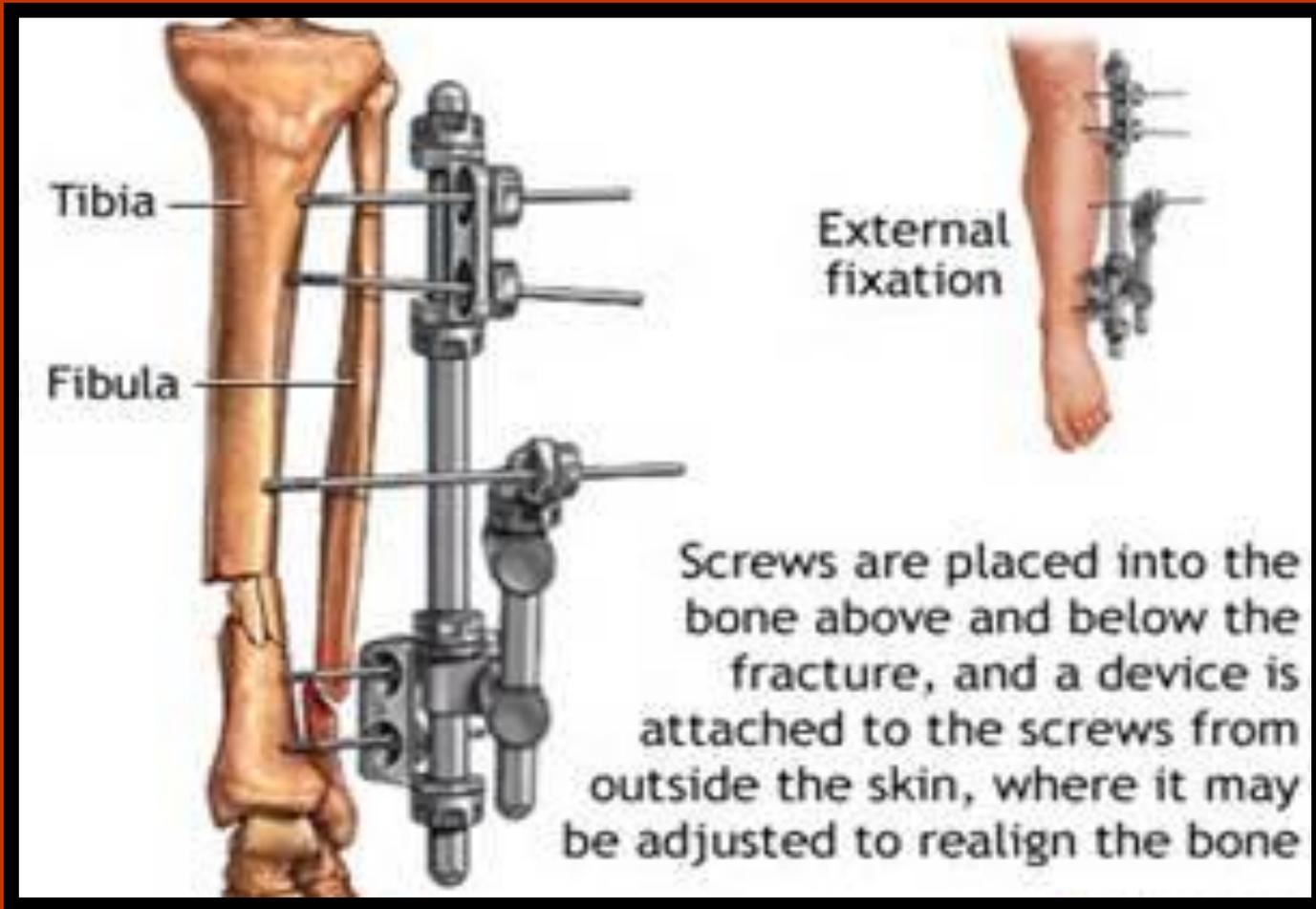


# External Fixation

**Nursing Best Practice  
Guidelines**

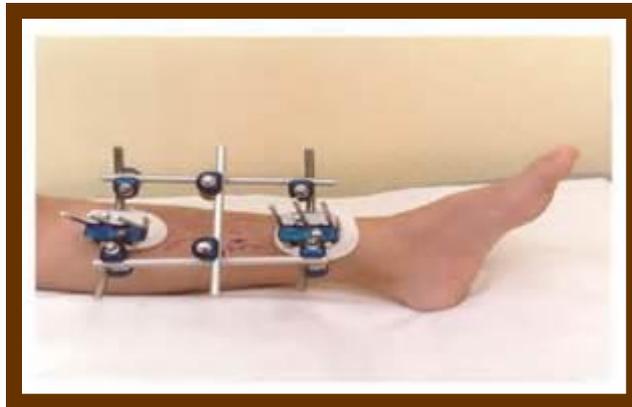
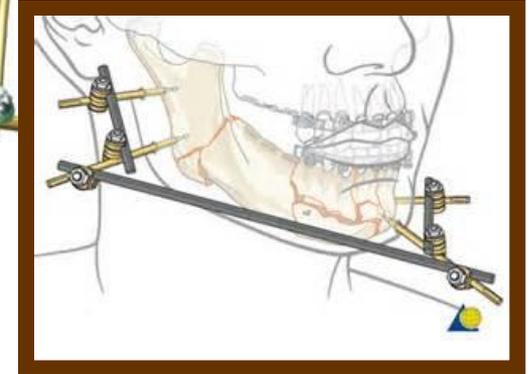




# Reasons for External Fixation Device Placement.....

- a technique of fracture immobilization
- a series of transfixing pins are inserted through the bone and attached to a rigid external metal frame
- method is use mainly in the management of open fractures with severe soft-tissue damage

# Multi-purpose



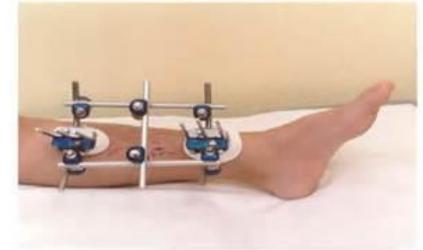
# Types of External Fixation Devices

Vary with the site of placement and type of fracture...

## ■ Unilateral Fixators



- ☞ Also called monolateral frame external fixators
- ☞ Attached to only one side of the limb to which they are fixated
- ☞ Unilateral frames allow the fixated limb to remain functional.



## ■ Taylor Spatial Frame Fixators

- ☞ One of the primary types of ring external fixators.
- ☞ Made up of rings, connecting rods, and struts.
- ☞ This type of external frames have been used primarily to correct deformities
- ☞ Being used increasingly for managing fractures.



# Advantages of External Fixation

- Permits rigid support of:
  - Commuted open fractures
  - Infected nonunions
  - Infected unstable joints
- Facilitates wound care and soft tissue reconstruction
- Allows early function of muscle and joints
- Allows early patient comfort
- Reduces risk of compartment syndrome

**Click here>>>** <https://youtu.be/21pIYYmaxi8>

# Who is responsible for the care?

- Orthopedics Doctors, Physical Therapists and Nurses all share responsibilities in providing care to the patient with an EFD
- The Doctor orders the parameters of mobility and pin site care/dressing changes
- The Physical Therapists trains the patient in initial mobility and use of assistive devices
- Nurses assess for systemic and neurovascular changes, infection, safe mobility practices and insured skin integrity.

**The next slide defines the distinct roles of the RN and Physical Therapist in the acute care setting related to the patient with an external fixation device (EFD).**

## Role of RN/ Nurse

## Role of Physical Therapist

Education of the patient pre- and post-operatively: multiple aspects including safety precautions, device purpose, diet, pain management, follow-up.

Education of the patient pre- and post-operatively: multiple aspects including device type, safety precautions, allowed mobility, assistive devices, follow-up.

Initial assessment for post operative stability and complications following device placement (vs, bleeding...).

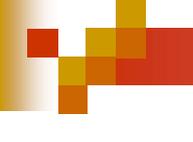
Assessment of fixation device precaution practices.

Positioning/moving/tilting patient to prevent skin breakdown.

Initial training for movement /gait with assistive devices.

Providing pin site care and education for self care post discharge.

Education of the patient : safety precautions, mobility, exercises.



# Device Placement: Preoperative Best Nursing Practices

- Describe the device placement to the patient so the patient is prepared for what to expect postoperatively
- Carefully monitor for signs and symptoms of wound contamination that could lead to infection
- Preoperative pain management/sedation
- Nutrition assessment/preoperative NPO

# Surgical Application

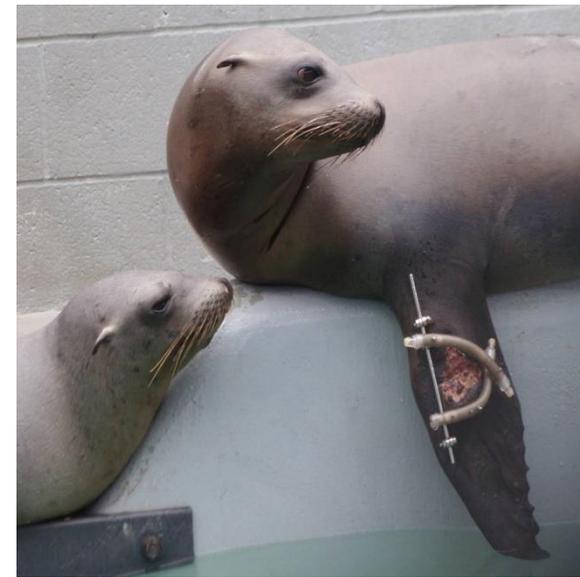


- Transfixing pins are inserted into the bone through small incisions above and below the fracture
- Appliance is stabilized by adjusting and tightening the bars connecting the sets of pins
- Sharp pinheads are covered to protect the other leg and caregivers



# Assessment of the patient with an external fixation device

- Determine patient's understanding of procedure and fixation device
- Evaluate neurovascular status of involved body part
- Inspect pin site
  - redness, drainage,
  - tenderness, pain, loosening pins
- Inspect open wounds
  - healing, infection, devitalized tissue
- Assess functioning of other body systems affected by injury or immobilization



# Examples of Early Pin Site Infection

- Redness



- Crusting,  
with yellow discharge



- Bacterial colonization,  
with poor healing



# Nursing Diagnosis

- Anxiety
  - related to wound or appearance of fixation device (see next slide)
- Peripheral Neurovascular Dysfunction
  - Related to swelling, fixator, and underlying condition
- Infection
  - Related to open wound and skeletal pin insertion
- Impaired Physical Mobility
  - Related to presence of fixator and condition



# Interventions: Anxiety



- Reassure the patient
  - If possible do this before and after surgery. Explain that even though the device may look clumsy, cumbersome or intimidating, it should not hurt once in place.
- Emphasize the positives
  - Inform the patient that greater mobility can be achieved with an external fixation device, thereby minimizing the development of other system problems.
- Encourage patient to verbalize reaction to device
  - Each patient will respond differently. By having the patient verbalize their reactions to the device, nursing staff will better be able to reassure the patient specific to their particular concerns and issues.
- Involve patient in the management and care of the device

# Neurovascular Status

- Assess status frequently
  - Every 15 minutes to 1 hour while swelling is significant
  - After swelling has subsided, every 2 hours for 24 hours
  - Then every 4 hours or as needed for symptoms
- Establish baseline of functioning for comparative monitoring
  - Complex musculoskeletal injuries frequently result in disruption of soft tissue functioning
- Elevate extremity to reduce swelling
- Report any changes status or abnormal findings

# Encourage Mobility



- The external fixator maintains the fracture in a stable position and the extremity can be moved
- To move extremity, grasp the frame and assist the patient to move
- Teach crutch walking without weight-bearing when soft tissue swelling has diminished
  - Encourage weight-bearing only after patient is cleared by doctor or physical therapist, and only as prescribed

# Preventing Infection

- Provide wound care
- Monitor for local and systemic infection
- Provide site and fixator care
  - Clean fixator with clean cloth and water, as needed
  - Clean pins and remove crusts with sterile applicator
    - Crusts formed by serous drainage can prevent fluid from draining and can cause infection
    - A small amount of drainage from the pin sites is normal
  - Report loosened pins
  - Report inflammation, swelling, tenderness, and purulent drainage at pin site
    - Look for and report signs of infection





# FYI....a note on pin placement and handling....

- According to a local orthopedic specialist (Dr. Owen), a properly, securely placed fixation pin will not yield much fluid.
- Loosened or poorly secured fixation pins may cause inflammation of the site and, therefore, discharge.
- Proper aseptic handling during and after surgery will prevent site infection.

# To clean or not to clean....that is the question.....

## *When is it appropriate to do clean the pin sites on an external fixation device?*

- When devices are placed for a short term (eg. a few days) often times orthopedic doctors will not order pin care or will do pin site care themselves when they visit the patient.
- Gauze may be placed at the pin site by the doctor. If the gauze becomes damp, the prudent nurse will replace the damp gauze with dry gauze using aseptic technique.



# Check pin site every day for signs of infection, such as:

- Skin redness
- Skin at the site is warmer
- Swelling or hardening of the skin
- Increased pain at the pin site
- Drainage that is yellow, green, thick, or smelly
- Fever
- Numbness or tingling at the pin site
- Movement or looseness of the pin

**>>>>If you think there is a site infection, call the surgeon right away.**

# Cleaning pin sites:

## Clean pinsite only as MD orders

There are different types of pin-cleaning solutions. The two most common solutions are:

- Sterile water
- A mixture of half normal saline and half hydrogen peroxide

**>>>Use the solution that your surgeon recommends.**

Supplies you will need to clean your pin site include:

- Gloves
- Sterile cup
- Sterile cotton swabs (about 3 swabs for each pin)
- Sterile gauze
- Cleaning solution



Cleaning the pin site

- Clean the pin site twice a day only as ordered by the doctor.
- Do not put lotion or cream on the area unless your surgeon tells you it is OK.

# The basic steps for pin site cleaning are as follows:

1. Check Physician's order.

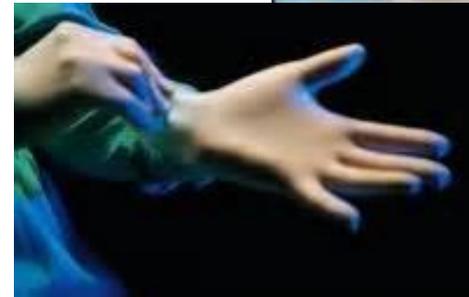
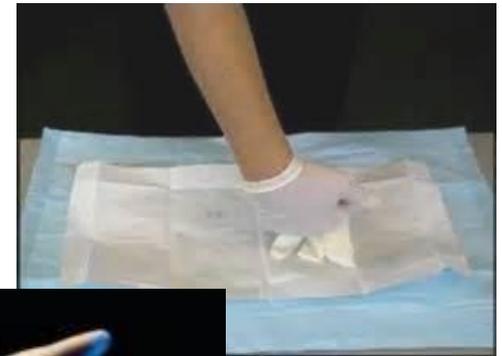
2. Wash and dry your hands.

3. Put on gloves.

4. Pour the cleaning solution into a cup and put half of the swabs in the cup to moisten the cotton ends.

5. Use a clean swab for each pin site. Start at the pin site and clean your skin by moving the swab away from the pin. Move the swab in a circle around the pin, then make the circles around the pin larger as you move away from the pin site.

6. Remove any dried drainage and debris from around the pin site with the gentle movement of the swab.



# The basic steps for pin site cleaning continue:

- 6. Use a new swab or gauze to clean the pin. Start at the pin site and move up the pin, away from the skin.**
- 7. When you are done cleaning, use a dry swab or gauze in the same way to dry the area.**
- 8. For a few days after the pin insertion surgery you may wrap the pin site in dry sterile gauze while it heals. After this time, leave the pin site open to air.**
- 9. If there is an external fixator (a steel bar that may be used for fractures of long bones), clean it with gauze and cotton swabs dipped in your cleaning solution every day.**
- 10. Most patients who have pins can take a shower 10 days after surgery. Ask the surgeon how soon when the patient can shower**

<https://youtu.be/pP0BrZXxBGw>



# Discharge Planning for the Patient with and External Fixation Device

- Precautions related to mobility
  - Specific amount of weight-bearing or non-weight bearing ordered
- Signs and symptoms to call the MD about
  - Increased pain
  - Fever
  - Signs of infection at pin sites
- Pain management plan
  - medications ordered
- Follow-up appointment plan



# The End

## Orthopedic Nursing Part 2: External Fixation Devices Nursing Best Practice