AAPA/ AAOS Musculoskeletal Galaxy

- **Title: Orthopaedic Rehabilitation Techniques**
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LEARNING OBJECTIVES

- Identify appropriate exercises for a patient's home exercise program
- Identify appropriate stretches to help restore a patient's range of motion
- Understand how to develop a post-operative rehabilitation protocol
- Identify rehab exercises that your patients should avoid during physical therapy

DISCLOSURES

- I am a paid speaker for Ferring Pharmaceutical's Euflexxa Injection Workshop for Physician Assistants.

Orthopaedic Rehabilitation Techniques

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Principles of Rehabilitation

- Enhance the recovery of injured tissue while avoiding stresses that may prove detrimental to the healing process
- Promote an environment to facilitate healing
- Decrease Pain and Effusion
- Early PROM to avoid arthrofibrosis

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Principles of Rehabilitation

- Gradual restoration of muscle strength and endurance
- Restore Neuromuscular Control
- Focus on the entire kinetic chain
- There are few things you can do to speed up recovery, but several things you can do to slow it down

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Tissue Healing Process

- **Inflammatory Phase** (lasts up to 2-5 days)
  - Homeostasis
    - Vasoconstriction/ platelet aggregation/ thromboplastin makes clot
  - Inflammation (swelling, pain, heat and redness)
    - Vasodilation/ phagocytosis (engulfing of particles by the cell, i.e. macrophage)
    - Dilation of the blood vessels allows nutrients, white blood cells, antibodies, enzymes and other beneficial elements into the affected area to promote healing and reduce infection

Tissue Healing Process

- **Proliferative Phase** (lasts 2 days to 3 weeks)
  - Granulation
    - Fibroblasts lay bed of collagen
    - Fills defects and produces new capillaries
    - Fibroblasts continue to reorganize and aid in the development of new tissue and accelerate the healing process
  - Contraction
    - Wound edges pull together to reduce effect
  - Epithelialization

Tissue Healing Process

- **Remodeling/ Maturation Phase** (3 weeks to 2 years)
  - 3 New collagen forms which increases tensile strength (scar 80% as strong)
  - Cellular activity declines with time and the number of blood vessels in the affected area decrease and recede

Lower Extremity Rehabilitation

Range of Motion Exercises

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Lower Extremity Rehabilitation

Strengthening Exercises

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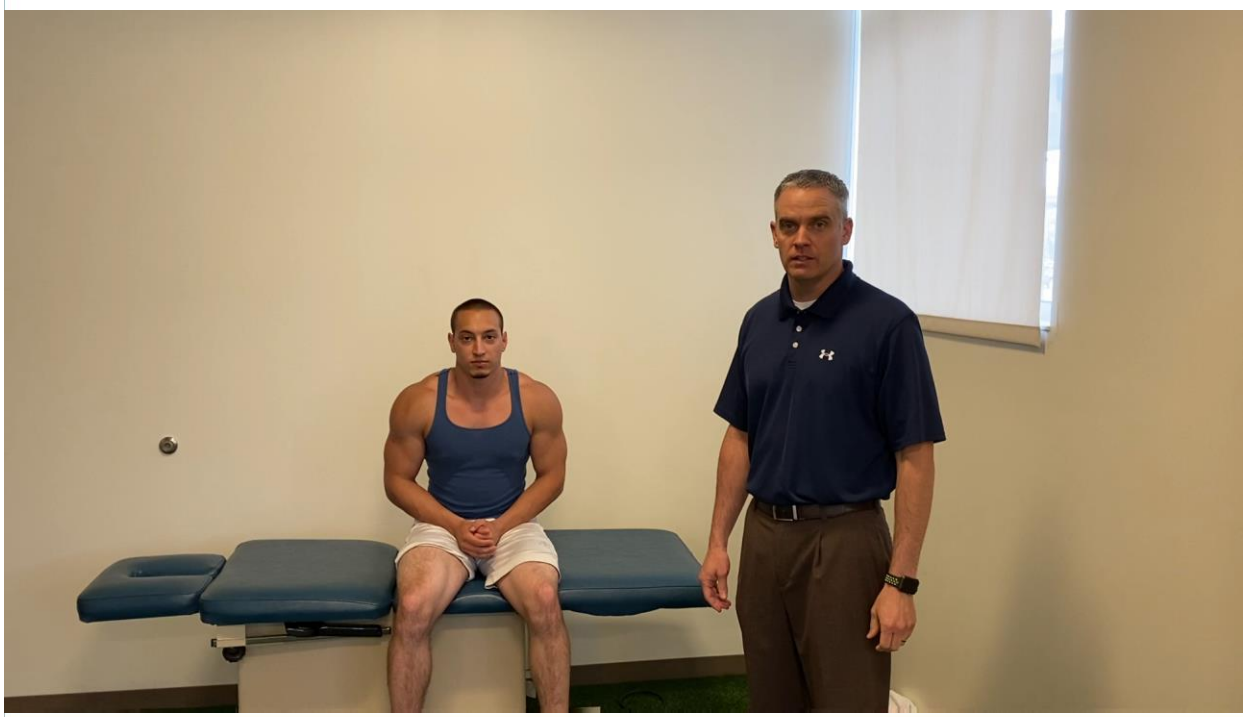

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General LE Rehab Guidelines

Range of Motion

- Knee Extension: heel props/ prone hangs
- Knee Flexion: heel slides/ wall slides
- Stationary Bike: start with seat high and move down as ROM improves
- Ankle: ankle pumps/ drawing the alphabet

Strengthening Exercises

- Quads sets, 4-way Straight Leg Raises (SLR), Short-Arc Quads, Mini-squats, Lunges, Step-ups, Squats, Calf raises, 4-way Ankle
- Balance/ Proprioception:
  - Balance on one leg/ eyes closed/ steamboats

General LE Rehab Guidelines

Meniscus Repair vs Meniscectomy

- Meniscus Repair
  - Post-op knee brace locked in extension and TTWB for 6 weeks
  - ROM: 0 – 90 degrees only; unlock brace as ROM improves
  - D/C brace after patient can perform a SLR
  - Progress to full ROM at 6 weeks

- Meniscectomy
  - Crutches for 2-3 days; gradual progression to WBAT
  - Try to eliminate and avoid activities that may increase swelling

General LE Rehab Guidelines

ACL Rehab Principles

- Crutches and Knee Brace 4-6 weeks (may vary based on graft selection)
- Importance of SLR and achieving full extension early
- Understand graft selection– allograft tissue may require longer immobilization
- Any other repairs? (i.e meniscus, articular cartilage)
- Average 6 – 9-month rehabilitation process
- Isokinetic testing to determine RTP
- Avoid open kinetic chain leg extensions
- Proprioceptive exercise/ Core Stabilization/ Jump Training

General LE Rehab Guidelines

OCD Lesions: OATS vs MACI vs Allograft vs Microfracture

- Post-op knee brace with crutches (NWTB) for the first 6 week
- Immediately started on CPM device the day after surgery for early PROM and utilized up to 3 months; CPM is used for approximately 6-8 hours per day (MANDATORY)
  - Early PROM assists in cellular orientation and prevents adhesions from developing
- Return to sports in 6-9 months; high impact activity may be resumed in 12-18 months
- RTP Criteria: normal gait, full ROM/ strength while pain-free, no recurrent effusions

Upper Extremity Rehabilitation

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Upper Extremity Rehabilitation

Range of Motion Exercises

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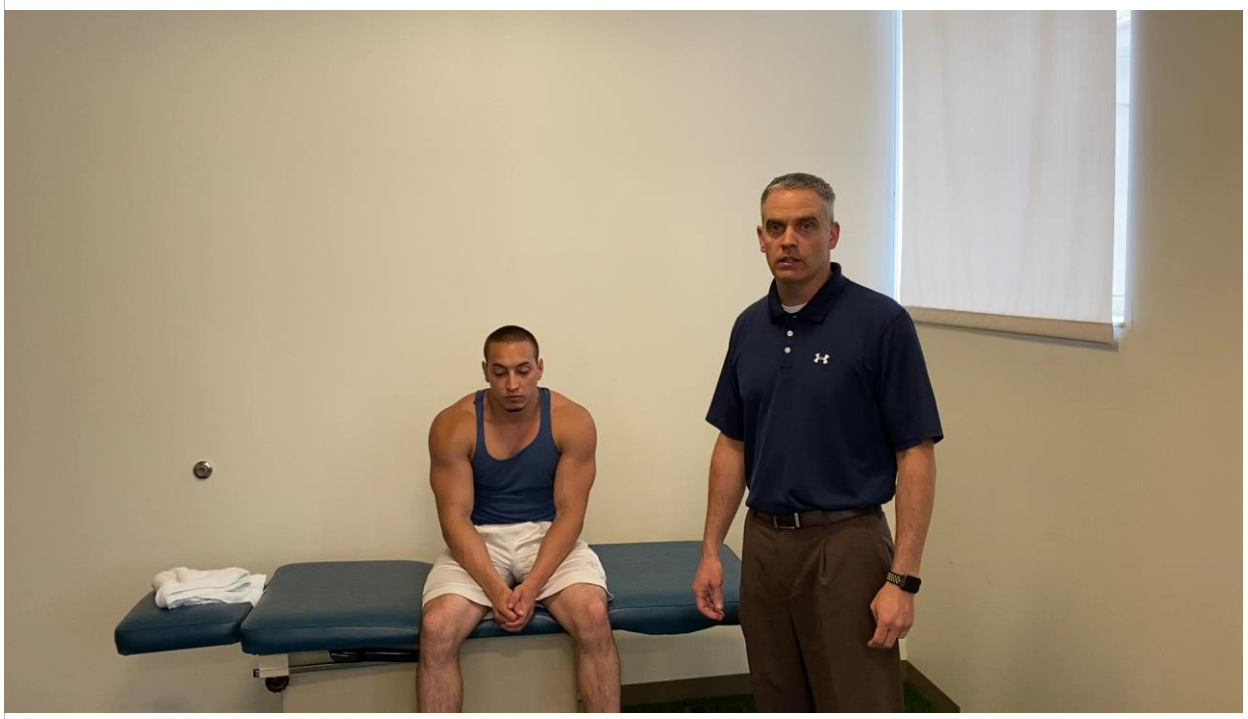

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Upper Extremity Rehabilitation

Strengthening Exercises

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General UE Rehab Guidelines

Range of Motion

- Shoulder: pendulums, wall-walks, table slides, passive assist motion with a cane
- Internal Rotation stretch for Posterior Capsule: Sleeper stretch, cross-body, towel stretch
- Pectoralis/ Anterior: door or corner stretch

Strengthening Exercises

- RTC: resisted internal and external rotation
- Periscapular: rows, “W”, “T”
- Serratus Anterior: serratus punches/ push-up plus
- Deltoid: lateral raises and forward flexion
- Biceps/ Triceps/ Forearm

General UE Rehab Guidelines

Shoulder Rehab Principles for RTC and Labrum

- Shoulder ARC brace for 6 weeks with PROM; Begin AROM and strengthening exercises at 6 weeks
- Strong emphasis on proprioceptive exercises in patients with instability and avoid abducted/ external rotation
- Focus on rotator cuff and scapular stabilization exercises to help with positioning of humeral head
- May start push-up progression with a block around 4 ½ months for anterior labral repairs

Lumbosacral Rehabilitation

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Lumbosacral Rehabilitation

- Posterior Pelvic Tilts
- Knee to chest stretching (glutes/ hamstrings)
- Mad Cats (lumbar/ thoracic vertebral segments)
- Donkey Kicks (glute max)
- Fire Hydrants (glute med)
- Glute Bridges
- Dead Bug
- Planks

Summary

- There are few things you can do to speed up recovery, but several things you can do to slow it down
- Begin early range of motion as soon as possible to avoid arthrofibrosis
- Be careful to avoid exercises/ movements that stress the injured/ repaired tissue
- Don’t forget to include exercises for the entire kinetic chain
- Proper form and technique is just as important as the appropriate exercise

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