Pearls for Foot Injury Rehabilitation & Return to Play

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The presenters named in this presentation certify that they have no relevant financial or nonfinancial relationships existent within the presentation today.
Goal

• Provide pearls of wisdom to optimize rehabilitation and return to play/work for foot and ankle injuries
Objectives

- Recognize the importance of early physical therapy referral for foot/ankle injuries
- Identify the necessity and value of including all parts of the body in foot/ankle rehabilitation
- Formulate return to play/work guidelines and functional testing with specific example of Lisfranc injury including the importance of a healthcare TEAM approach
Why pearls?

- **Pearls = Important information for success of recovery**
  - Recognize often overlooked aspects of rehabilitation
  - Immediate application to your clinical practice

- **Kate**
  - Division 2 collegiate athlete
  - Personal experience of rehab through 2 different ankle surgeries.

- **DeDe**
  - 33 years of professional experience and multiple CEU courses
  - Personal experience of her own Lisfranc injury.
Early Referral

• **Value of Early Referral to Physical Therapy**
  – Gait/Weight bearing (WB) status
  – Preventions of deconditioning
  – Optimize return to function

• **Importance of addressing entire body to improve outcomes**
  – Cardiovascular
  – Core
  – Hip
  – Foot/Ankle
PEARL: Rethink traditional assistive devices and importance of normalizing gait pattern.

- **Weight bearing status**
  - Determined by provider

- **Pros and cons of various assistive devices and gait patterns**
  - Non-weight bearing
  - Kneeling scooter
  - Hands free Assistive device
  - Touch weight bearing
  - CAM boot/Arch support
  - Equal leg length
PEARL: Cardiovascular deconditioning is lost faster than musculoskeletal strength

- **Prevention of Deconditioning**
  - 2 months of CV gains are lost in 1 month of inactivity.
  - One study found endurance athletes with 4 weeks of inactivity = 20% decrease in VO2 max

- **Maintaining and Optimizing for return to play**
  - Pool
  - Upper Body Ergometer
  - Uninvolved limb exercise
  - Bike- if approved by provider for WB restrictions
PEARL: Core is the foundation for distal strength and skill.

• Educating patient on importance of core
  – Stabilization
  – Future injury prevention
  – Importance for return to more skilled movements when appropriate
  – Safety for balance during use of assistive device
**PEARL:** Early intervention for hips is key to recovery.

- **Gluteus max/medius strength**
  - Side-lying Leg Raise - 81% EMG muscle activation
  - Clam Shells - 30-40% EMG muscle activation
  - Progress to functional ex when able

- **Psoas Major stretch**
  - Prone lying
  - Prone on elbows
  - Thomas Stretch
  - Half Kneeling
PEARL: Trying to prevent some atrophy will speed rehab

Focus strengthening on these major muscle groups:
- Soleus/Gastroc (once able)
- Quadriceps
- Hamstrings

• 4 Counter measures:
  - 1) Antioxidants/anti-inflammatory compounds, 2) Nutritional supplements, 3) Physical training and exercise\(^2\) 4) neuromuscular e-stim
  - Exercise is still shown to be the most beneficial

• Slow twitch type 1 are more vulnerable and show more atrophy than type 2\(^2\)
Ankle Mobility & Strength

**PEARL:** Importance of relationship of subtalar to midtarsal joint

- Pronation unlocks mid-tarsal joint; Supination locks mid-tarsal joint
- Measure dorsiflexion functionally in closed chain
- Posterior Talar Glides
  - Alleviate anterior ankle pain and increase dorsiflexion
- Propulsion Exercises
  - Progression of calf strengthening
- Possible use of different taping techniques
PEARL: After limited weight bearing with any LE injury, foot intrinsic muscles need to be addressed

- Intrinsic weakness could be a source of pain and potential cause of re-injury
- Exercise Ideas
  - HEP2GO look under Toe Yoga
  - Recommended 3 second holds progressing up to 40 reps each
    - Second to fourth toe extension (4-toe salute)
    - Toe splaying
    - First Toe Extension
    - Short-foot progression
General Guidelines of Lisfranc Injury

**PEARL: Realistic expectations for recovery (typically prolonged)**

- Grade 1 Lisfranc Injury - less then 2mm diastasis and no arch height loss. Only grade normally managed conservatively with physical therapy
  - Weight bearing status ranges from NWB for 6 weeks to full WB with orthotic
  - Return to sport between 11-18 weeks

- Grade 2-3 Lisfranc Injury - Typically surgical
  - Weight bearing status determined by surgeon (typically NWB).
  - Return to sport with surgery between 12-20 weeks Grade 2 and Grade 3 is season ending typically and much longer recovery
Case Study Lisfranc Injury

Timeline:

• **December Wrestling Injury** – 1 month misdiagnosed due to not having WB radiographs

• **January Surgery Grade 3** (5mm separation)

• **NWB 8 weeks then PWB Crutches with CAM boot 6 more weeks**

• **April Rehabilitation begins at 14 weeks**
  - Lacks push off during gait
  - Compensated Trendelenburg
    - (4/5 side-lying gluteus medius strength with psoas major dominance)
  - Plantar flexor weakness
Case Study: Rehab progression/return to sport

• **Gluteus max/med strength**
• **LE stretching program**
  - Psoas, calf, hamstrings, quadriceps
• **Posterior talar glides were valuable for dorsiflexion (DF) motion**
  - Star excursion test to determine functional DF
• **After pain free heel raise (approximately 3 weeks) progressed to low impact exercise on mini trampoline**
  - Two legged jump
  - Jump with turns
  - Single leg jumps
  - Jog in place
Case Study: Return to Sport/Functional Testing

- Progress toward single leg hopping and agility ladder
  - A/P, M/L, Diagonals
- When one-legged hops on the involved leg were pain free could return to jogging
- Incline treadmill at 10% incline to promote push off
- Jogging forward and backward was pain free added in 45 degree cuts then 90 degree cuts
- Functional Tests
  - Hop tests for return to play
    - SL hop
    - Triple hop
    - 6 meter timed hop
Key Pearls of Wisdom

• Accurate diagnosis
• Early referral to Physical Therapy to prevent deconditioning
• Weight bearing and assistive device options
• Full body approach
• Address foot intrinsic muscles
• Functional testing prior to return to sports


QUESTIONS?