Challenges in Performance and Rehabilitation

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Driving Issue

• How can musculoskeletal function and clinical outcomes be optimized?
  – Patients recovering/living with musculoskeletal injuries
    • Non-operative & post-operative patients
  – Enhance performance of non-pathologic population
Optimize

• For athletics clear, core aspect of competition, but at what cost?

• Injury recovery more complex, interventions for one aspect effect others
  – Therapy exercises
  – Assistive device design

• Understanding the impact of injury or pathology on neuromuscular function & evaluating treatment approaches to address neuromuscular deficits
Quantifying Changes

• To understand these impacts we need to develop methods to quantify changes in function (good and bad) for a given intervention.

  – Variety of tools to accomplish this
    • Direct measure
    • Others require modeling, only as good as the assumptions
Out of Lab/Clinic Compliance

- Increased compliance with rehab plan, better outcomes
  - Develop methods to hold patients interest
  - Minimize complexity of instructions
  - Real time feedback
Take Research Out of Lab Setting

- Inertial Measurement Units, IMU
- Collect motion data out of lab
- Activity recognition
  Walking, running, stairs, incline
- Measure compliance
- Real time feedback of desired movements
- Reminder of undesirable movements
Thank You