Priority Statement Title: Can objective biomechanical and biological measures be translated from the lab to the clinic to improve patient outcomes?

Priority Statement Code: CJ2D

Domain: tissue, cellular, joint, whole body

Priority Statement

Background and Relevance

Many biomechanical research studies aim to identify parameters that are indicators of neuro-muscular-skeletal disease, and to provide guidelines and tools for clinicians to use these measurements for patient diagnosis and treatment. It's unknown if these tools improve the clinician's ability to make early diagnoses or provide patient-specific treatments to enhance outcomes.

If quantitative biomechanical and biological measurements can improve patient care, advances made in the laboratory would positively impact large populations. Reasons for differences between the methodologies used in research and clinical settings are likely to include:

- limited exchange of knowledge between research and clinical settings
- complexity of technology
- difficulty interpreting results
- expenses associated with testing
- need for highly trained laboratory staff to collect and interpret results
- lack of consensus about the superiority of each individual evaluation technique.

This initiative would aim to improve patient function through early detection of neuro-muscular-skeletal diseases by using biomechanical, biological, and clinical measures. By basing patient care decisions on quantitative evaluation methods, better long term health may result.

Objectives

1. Establish the efficacy and cost-effectiveness for utilizing biomechanical, biological, and clinical measure(s) for improving patient outcomes.
2. Improve early detection strategies for specific neuro-muscular-skeletal diseases.
3. Improve patient specific treatment planning.
4. Translate research concepts and methodolgies to guide clinical care

Recommended Actions

1. Request funding for disease specific investigations to determine if biomechanical, biological, and clinical measures improve patient outcomes when compared with current standard of care practices.

2. Evaluate benefit to cost ratio for applying these biomechanical, biological and clinical measures toward improving early detection, treatment planning, and clinical outcomes for each specific disease.
3. Increase the importance of the plan for knowledge transfer of NIH grants that use clinical impact as the motivation for the research:
    a. Presentation at appropriate conferences for dispersal of idea.
    b. Publication in journals with the appropriate clinical audience.
    c. Affiliation with clinical facility for pilot test of idea.