PROPOSAL DEVELOPMENT INFORMATION
GCMAS Research Committee

Objective 2: **Gait/motion analysis is an effective functional outcome measure.**
There is a paucity of quantitative research documenting the advantage of computerized gait analysis over traditional clinical evaluations or questionnaires as a functional outcome assessment tool. Historically, most orthopaedic surgeons and rehabilitation specialists have relied primarily on static examination and observational gait analysis to assess outcomes. Recently, questionnaires have been developed that may overlap with gait analysis assessments. The purpose of this line of research is to demonstrate that gait analysis is an effective functional outcome measure.

Long Term Goal
Demonstrate that gait/motion analysis is an effective functional outcome measure.

Purpose of Proposed Investigation
Determine the relationship between gait/motion analysis measures and physical function as measured by other existing functional outcome measures.

Development Strategy
Strategies
1. Meeting with interested GCMAS members to better define and focus the purpose.
   a. What aspect of "function" does one expect to measure by functional outcomes as it relates to gait? One assumes that "physical function" is of primary interest, but consideration for how this is reflected within level of disablement, and defined by groups involved in outcome measure development (e.g. NIH PROMIS effort has defined physical function).
2. Define 1 or 2 "target" populations to focus the initial development. Outcome measures vary across patient groups/ages/diagnoses.
3. Define population-specific factors related to gait variables and functional outcome measures. Identify their expected changes either by natural history or intervention.
   a. Form workgroups for each population defined above. Groups should be multi-disciplinary.
   b. Identify what functional outcome measures are most pertinent or "gold" standard in the populations. Consider all relevant stakeholders (researchers, clinicians, insurance groups…). In adults, FIM is often considered as a measure for payment. Could consider the newly set of outcome measures made available in NIH PROMIS as these are emerging and may be a new standard in outcome measures.
4. Identify what set of gait variables might best reflect change in the population (if any).
5. Review literature to see if datasets exist to help inform the project. Enough data may exist to inform a power analysis.
6. Consider appropriate research design and statistical analyses.
   a. Given the data set could be complex and large, it would lend itself perhaps to some form of structural equation modeling, or other forms of statistical analysis with latent variables. Such analyses would help account for the interaction between gait variables as well the fact that functional outcome measure scores are not perfect measures of "actual" physical function.
7. Identify funding sources.

Challenges
Current outcome measures may be inadequate to capture change. Trying to define the effectiveness of gait analysis based on inadequate "gold" standard functional outcome measures would not be productive.