

Kimberly Edginton Bigelow, Ph.D.

As a whole body biomechanist, assessment of resulting human movement has the potential to not only quantify functional limitations, but also serve as an indicator of onset of disease/disability and help monitor changes due to deterioration or therapeutic intervention. The importance of this quantification has significant ramifications for medical care and reimbursement, as documentation of evidence becomes increasingly important. Whole body biomechanics may, as such, be the biomechanics discipline with the potential to most directly affect clinical care; however, a **major limitation** in research is that studies do not often consider the feasibility of translating the presented work into a clinical environment.

Therefore, research that promotes **clinical translation** is necessary. I believe this should not solely be a final step in the evolution of research, but should also guide preliminary work and feasibility studies by using the ultimate goal of clinical translation in framing the way researchers approach problems and choose research methodology. In particular, **determining how to combine parameters obtained from biomechanical analyses (particularly balance and gait) and present them in a way most useful to healthcare providers is of utmost importance and should be both a goal of all research, as well as an area of specific research focus.** My own work has focused on improving the clinical utility of posturography for use in screening older adults for risk of falls, with an end result of a logistic regression model and resulting equation that can be used to calculate the percent likelihood of fall history/future falls. I believe that a key to ensuring clinical translation would be further work to advance the development of such algorithms and equations – a significant step to clinical usefulness in comparison to the traditional results of studies that list only a mean value and standard deviation for each parameter.

Associated specific recommendations include:

- 1) Development and dissemination of standardized procedures for data collection, data analysis, and reporting of analysis of movement – with focus on feasibility for diverse clinical settings
- 2) Development and dissemination of normative values and variability of movement parameters according to developed standards – as well as establishment of Minimum Clinically Significant Differences for these parameters

I also believe we must continue to **find ways to overcome the inherent divide that occurs between many biomechanical researchers due to compartmentalized discipline-specific knowledge.** In particular, data analysis can be problematic – especially as the use of non-linear analysis and newer analysis methods grows due to their potential of revealing underlying physiological differences. As more technically-minded researchers move toward this route, researchers with clinical expertise may be left out and/or feel such analyses lack clinical relevance. Research and resources are needed to address this. The further development of web-based consortiums where data analysis programs can be shared and discussed could be particularly useful.

The Biomechanics Priority Conference is an important and significant step in advancing research in the field in coming years, while also offering a forum for discussion on how to best bridge the multiple disciplines comprising biomechanics. I believe that the dialogue begun at the conference will help illuminate additional research needs and discipline-specific conflicts. I foresee conversations including topics as basic as establishing a common vocabulary among researchers. I believe that too often we assume, incorrectly, that a biomechanist has a base-level understanding of the breadth of topics falling within biomechanics. I know, myself that I have used the term “posturography” during American Society of Biomechanics meetings, and been surprised when the term is unfamiliar to colleagues. I look forward to seeing what other such mis-assumptions are acknowledged and overcome during this Conference, and I certainly hope to be a part of this seminal event.