Towards Precision Medicine in Spinal Cord Injury: How should SCI Clinicians and Researchers Design Questions to Best Capitalize on Large SCI Databases in the Age of AI and Big Data?

Course ID 139

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Number of Individuals proposed: 4 Type of Course: Expert Panel Educational Objectives: 1)   Understand the nature of existing large SCI databases, both the opportunities and limits 2)Identify how AI and Big Data approaches to large data sets work 3)Discuss guidance to the field on what questions would best capitalize on the opportunities for precision SCI medicine that are presented by large SCI data sets and AI tools Summary: Precision medicine is an effort to tailor medical interventions based on specific and key patient features. Examination of large sets of such data can be used to determine the best match of clinical profile to prognosis and to therapeutic efficacy. For example, oncology has moved from treating cancers based on tumor size, number of lymph nodes involved, and whether the disease has metastasized, to treating based on the genes and cellular receptors expressed. In SCI medicine, we have a similar opportunity to transition to more precision medicine as we now have several large, growing data sets with which to begin this process. As with other areas of biomedical engineering, data scientists may have the ability to mine these data sets, but knowing which questions to ask requires the insights of SCI clinicians and researchers. Simultaneously, SCI clinicians and scientists may need to formulate their questions better or differently to capitalize on features provided by big data sets. The Engineering Subcommittee of the Research Committee of ASIA controls neither access to the large SCI data sets nor directs large AI and Big Data efforts, but it is uniquely positioned to facilitate communication between those efforts and wants to start the discussion of this connection at the 2024 annual meeting. The proposed product of the session would include a white paper of prioritized questions to take to SCI data sets. The committee's goal would be to vet this white paper with various stakeholders, including the community with lived experience, in order to have a finished product by the 2025 annual meeting. We plan to propose a biomedical engineering pre-course at the 2025 meeting that would include a data "hack-a-thon" where some of these questions could guide how a real data set could be mined in real time. Funding Source: None Draft Agenda: 00 – 08 Course Introduction and Moderation: What are we trying to do here? 08 – 18 What is/are the nature of and the challenges with current large SCI databases 18 – 28 What AI and Big Data approaches can ask of big data sets 28 – 38   What evidence do we have already regarding predictions of recovery or response to therapeutic interventions from current data set analyses 38 – 60 Panel and Audience Discussion to initiate formulation of questions to ask of SCI data sets and outline a white paper towards that end (all faculty, Engineering Committee members, and audience)

Learning Objective 1 Understand the nature of existing large SCI databases, opportunities, and limits

Learning Objective 2 Identify how AI and Big Data approaches to large data sets work

Learning Objective 3 Discuss guidance to the field on what questions would best capitalize on the opportunities for precision SCI medicine that are presented by large SCI data sets and AI tools