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Advancing Workplace Safety Surveillance with Ambulatory Inertial Sensors: A Research to Practice to Research Study

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Abstract: Work-related musculoskeletal disorders (MSDs) are prevalent in the United States and are a major cause of pain, disability, and lost productivity. Occupational health and safety personnel employed in industries that commonly report a high incidence of MSDs, such as manufacturing, are often responsible for evaluating and modifying workspaces to prevent these conditions. The routine use of imprecise and biased self-report and/or observational-based exposure assessment methods, however, often limit such efforts. Wearable ambulatory inertial sensors (AISs) are direct measurement technologies that have recently emerged as a more objective approach for performing assessments of exposure to physical risk factors such as extremes of posture in the working environment. This presentation will focus on a research project supported by the Centers for Disease Control (CDC) / National Institute for Occupational Safety and Health (NIOSH; Grant # K01OH011183) that aims to address three methodological research gaps that currently prevent the broad adoption of AISs among industrial occupational health and safety personnel. In particular, a component of the project involves the development, evaluation, and implementation of a Research to Practice to Research (RtPtR) web application that summarizes direct measurements obtained from AISs to better inform operational decision-making. This web application as well as other findings of the project and their RtPtR implications will be discussed.

Keywords: Wearable Technology, Inertial Sensors, Musculoskeletal Disorders, Physical Activity

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