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Guest Editorial

Ergonomics

How can we best characterize the field of research in ergonomics? What words best describe what we do? And how best can we express our purpose to those who read and learn from our research?

In ergonomics, we believe that the human body is designed to perform motions within its limits of flexibility, range of motion, endurance, speed, and strength. Going beyond its limits, the human body can experience injuries and disorders. Therefore, the role of ergonomics is to assess the person, occupation, and environment and then to change the occupation and environment to meet the person's needs; in addition, the person may need to adapt his or her occupational behaviors to maximize occupational performance.

As health and rehabilitation professionals, our purpose is to evaluate the person, occupation, and environment to identify the risk factors and plan and implement a prevention strategy to eliminate or minimize the risk of injury and disorder. The overall goal of ergonomics is to maximize the health and well being, safety, efficiency and productivity of a person in any environment.

Many believe that ergonomists have an engineering background only. In the contrary, an ergonomist may have a variety of backgrounds including occupational therapy, physical therapy, medicine, psychology, design, and engineering. Therefore, research has to emphasize collaboration between different disciplines and should focus on the person as a whole and include psychosocial, personal behavioral and cultural aspects as well as physical. This services two purposes. The first is to deliver rich ergonomics information to the public, other health and rehabilitation professionals, and students. Therefore, we are interested in investigating useful applications that meet the needs of all. The second purpose is to present learning materials that meet the needs of the person. For example, managers see an increase in productivity, persons with disability feel a sense of efficient performance, and directors find reduction in absenteeism. Overall, the expectation of ergonomics research is to provide beneficial knowledge to support the needs for all.

This special issue of *WORK* offers an array of articles that cover different areas of ergonomics. The first research article authored by Nunes presents an ergonomics analysis tool, which is an area that needs the attention and research by ergonomists. FAST ERGO_X is designed to identify, assess and control the risk factors associated with work-related musculotskeletal disorders (WRMD) in the work environment. Schreuer, Myhill, Aratan-Bergman, Samant and Blanck introduce a paper that goes beyond the person's disability to facilitate effective work accommodation. They believe that ergonomists have the background, skills, training, and knowledge to play a valuable role in implementing a successful accommodation. The selected words in this article reflect the idea of embracing the person as a whole including participation, limitation, performance, mental and independence. Cole, Theberge, Dixon, Rivilis, Neumann and Wells describe participatory ergonomics interventions in different contexts. The use of qualitative approach is much needed in the field of ergonomics in order to best understand the human experience and individualize an intervention plan. Their article presents an excellent example of interventions to reduce musculoskeletal disorders (MSD).

The following set of articles focus on MSDs. Wells, Laing, and Cole examine the impact of a change in intensity on reducing MSD. They construct a relationship between medium to high intensity through reducing mechanical exposure and the rate of MSD, but not between low intensity, which they suggest for future research. Gielo-Perczak and Karwowski focus on the approach that human motor performance is dynamical nonlinear system. They provide a prospective on balance control during standing on a narrow beam with a single-handed load holding task to eliminate falls and in turn, reduce the possibility of MSD. To determine

the advantage of job rotation, Raina and Dickerson investigate the influence of job rotation and task order on muscle fatigue. The benefit is to reduce or eliminate MSD through scheduling and designing work that considers job rotation with two tasks of different muscular demand. To improve performance and eliminate the possibility of MSD, Hignett, Willmott and Clemes explore different types of stretchers that are used by mountain rescuers. They determine the faulty feature of the stretchers and recommend a new design that reduces loads and provides flexibility and adjustability.

Alnaser and Wughalter report on the discomfort level over time between two ergonomic chairs. They determine the important role that time and task can play in the rating of discomfort. The authors give advice on purchasing ergonomic chairs and ways to prevent MSD. In the final article in this section, Corlett suggest an ergonomic chair design that helps in reducing sitting discomfort. Corlett provides sound support for the new design that fits different users, adjusts according with the task, and improves performance.

Finally, the special issue concludes with an interesting article that focuses on psychosocial risk factors. This is an area of research that certainly needs further investigation by ergonomists. Deeney and O'Sullivan discuss the existing evidence based literature on psychosocial risk factors that are associated with MSD. Documenting the theories, risk factors and possible causes, Deeney and O'Sullivan offer researchers an array of opportunities for future research.

As guest editor, I thank everyone who helped make this special issue a reality. Special thanks to Dr. Karen Jacobs for the invitation and unique experience to be a guest editor and many thanks to Victoria Hall for organizing the special issue.

Best Wishes

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