

## **Active breaks, biofeedback, and exercise training as workplace interventions for WRMSD**

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Work-related musculoskeletal disorders (WRMSD) affect millions of people each year, with a subsequent socioeconomic burden due to poor performance at work, presenteeism or absenteeism, and increased demand for health services (Bevan et al., 2015). Pain and impaired physical function, especially in the neck and shoulder regions, are common complaints among employees with WRMSD. Workers who use computers and mobile devices intensively and surgeons performing minimally invasive surgeries are particularly vulnerable to these problems, with an estimated pain prevalence of up to 70% (Hoe et al., 2018).

Among the interventions provided to these workers with WRMSD, active pauses, biofeedback, postural correction, and exercise training are often considered important elements in the long-term management of these disorders. Research studies report that active pauses can be more beneficial by slowing fatigue development, even if the effects are unclear among surgeons. Building on that, biofeedback triggering active pauses has also been shown to decrease the level of activation of the trapezius muscle and redistribute the biomechanical load or to re-educate the weak muscles to improve motor control in office workers. Some research has advocated muscle strengthening or fitness training as effective interventions for WRMSD, although more attention should be given to how to progress when planning these training programmes (Stassen et al., 2022). These interventions report better outcomes when conducted at the workplace (Stassen et al., 2022), with some conflicting evidence.

The speakers in this symposium have been actively involved in researching the effects of biofeedback and strength training interventions for people with WRMSD, with special emphasis on white-collar workers with neck-shoulder problems. They will share their experience on their latest research studies with the participants.

### **About Our Speakers:**

1. Dr. Tessy Luger, Eberhard Karls University and University Hospital of Tübingen, Germany

Head of the Work Physiology Laboratory, Eberhard Karls University and University Hospital of Tübingen, Germany

Dr. Luger received her PhD degree from the VU University in Amsterdam, the Netherlands. She now manages the Work Physiology Laboratory of the Institute of Occupational and Social Medicine and Health Services Research in Tübingen. Her research interests are in biomechanics and work-related musculoskeletal disorders, especially the role of work-related load changes (e.g., short work breaks, task rotation) on the biomechanics of the upper limbs and the back.

2. Prof. Pascal Madeleine, Aalborg University, Denmark

Professor, Sport Sciences – Performance and Technology, Dept. of Health Science and Technology, Aalborg University, Denmark

Professor Madeleine received his PhD and DSc degree from Aalborg University, Denmark. He is currently employed as a Professor in Sports and Ergonomics at the Department of Health Science and Technology at Aalborg University, Denmark. He is vice dean for research and innovation and head of Graduate Doctoral at the Faculty of Medicine at Aalborg University. He has published more than 250 peer reviewed scientific journal publications and book chapters. His main area of research interests are the development and application of novel methods and technologies in Ergonomics and Sport Sciences.

3. Prof. Grace Szeto, Tung Wah College, Hong Kong

Professor and Physiotherapy Programme Leader, School of Medical & Health Sciences, Tung Wah College, Hong Kong

Professor Szeto has been teaching Physiotherapy under-graduate programmes for over 20 years. Her research interest is in work-related musculoskeletal disorders, ergonomics, and biomechanics, especially neck and upper limb disorders in computer & smartphone users. Prof. Szeto has been a Member of the Hong Kong Occupational Safety & Health Council, and chairperson of their research committee since 2017. She is currently serving as Associate Editor for the journal *Musculoskeletal Science & Practice*, and editorial board member for *Applied Ergonomics* and *Ergonomics*.

4. Prof. Alberto Marcos Heredia-Rizo, University of Seville, Spain

Professor and Academic Secretary, Department of Physiotherapy, Faculty of Nursing, Physiotherapy and Podiatry, University of Seville, Spain

Prof. Heredia-Rizo has been teaching Physiotherapy under-graduate and post-graduate programmes for over 15 years. His main research interest is the role of exercise, physical activity, and self-management strategies in people diagnosed with chronic conditions, with

special interest in the study of neck-shoulder musculoskeletal problems in visual display unit users, and the clinical impact of mobile health (mHealth) tools in chronic disorders. Prof. Heredia-Rizo has been awarded a Fulbright scholarship at the University of Iowa, US. He is currently the lead researcher of the Uncertainty, Mindfulness, Self, Spirituality (UMSS) Research Group.