Working Posture Assessment: The TACOS (Time-Based Assessment Computerized Strategy) Method

Post-conference Workshop
September 26, 2023

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Managing all the risk assessment data collected and the relevant risk score calculations can be so complex that "simple tools", i.e., Excel©, have been developed for gathering, managing, and processing the data. These tools (present in different calculation models for biomechanical overload estimation) are employed to implement the strategy we have developed for calculating the risk arising. During the workshop, specific free software will be provided with which exercises will be done. It is mandatory to bring and use a personal laptop during the workshop.

The tool is primarily designed to be used by ergonomists, employers, OSH operators, and trade union representatives. It may also be helpful for occupational medical staff conducting periodical inspections and drafting health surveillance protocols and for supervisory bodies (labour inspectors) conducting inspections in the workplace needing to detect potentially dangerous situations requiring specific preventive interventions rapidly.

MAIN CONTENTS

- Most of the methods proposed and currently used for analysing working postures do a fair job of identifying and describing, for a single task, which postures should be assessed and how to score them. What is still missing is a definite procedure for studying working postures in jobs characterised by turnover on many tasks (multitask) that also considers the variation of time exposition (as present in agriculture, construction, etc..).
- To begin with, it must be stressed that to study biomechanical overload of the upper limbs, it is necessary to apply a method that investigates all the associated risk factors rather than focusing only on awkward postures.
- The OCRA method (Occhipinti, 1998; Colombini and Occhipinti, 2016), for example, does that insofar as awkward postures are one of the risk factors taken into due consideration. In this way, this method can predict the % probability of developing an upper limb Musculoskeletal disease.

- Similarly, the study of biomechanical overload of the lower back during manual handling also requires a multifactorial approach such as the one proposed by the RNLE and its extensions (Colombini et al., 2012).
- However, the postures of the spine remain to be studied, even in the absence of manual handling of loads, as well as the postures of the lower limbs, to which the TACOs method presented here is mainly dedicated.

MAIN CRITERIA

- This entails reconstructing the task(s) performed by an individual or homogeneous group of workers regarding the postures adopted during the work.
- As mentioned earlier, in our real-world experience, while it is not difficult to single out which postures require evaluating, there are often major shortcomings regarding:
    - The criteria for adjusting final scores based on real task duration (full-time, part-time, etc..), and
    - The criteria for evaluating the exposure to many tasks present in a working cycle where their turnover could be longer than one day (monthly or annual cycle, etc.)

THE AIM OF THE METHOD

- The aim of the method proposed here is, therefore, not to decide which postures should be analysed (extensive use is made of methods and procedures already available in the literature and included in current standards), but rather to suggest how they should be used in relation to time (Timing Assessment) even in more complex situations such as multiple task exposure scenarios and work cycles lasting longer than one day.
- The management of all this data and the relevant risk score calculations are so complex that "simple tools", i.e. Excel© spreadsheets(freely downloadable at www.epmresearch.org/free-software-in-english have been developed for gathering, managing and processing the data.

About Our Speakers:

1. Daniela Colombini

MD in Occupational Medicine and Statistics, European Ergonomist. President of Scientific Association Ergonomics of Posture and Movements International Ergonomics School (EPM IES), she has 40 years of experience in risk assessment methods for biomechanical overload prevention. Coauthor of OCRA method, VLI NIOSH ML, TACOs posture. Occupational Medicine Professor at the University of Milan, Florence and Bogotà for many years.Since 20 years active member of CEN and ISO in TC 159 SC3: co-chair of sub-groups in TC MSDs in

International Ergonomics Association. Chair of **ISO TR 23476** ***(agriculture)*** and the new **ISO TR** ***(construction).*** Author of more than 20 books and 200 scientific papers.

2. Enrico Occhipinti

Enrico has a degree in Medicine and Surgery with postgraduate specializations in Occupational Medicine and in Health Statistics at the University of Milano (Italy). He is a Certified European Ergonomist. He is professor at the School of Specialization in Occupational Medicine, University of Milano and has been Director of the Research Unit "Ergonomics of Posture and Movement" (EPM) at Fondazione Don Gnocchi ONLUS - Milano up to 2015. He is the Scientific Director of EPM International Ergonomics School. He has devoted about 40 years on ergonomic issues related to physical ergonomics and the prevention of work-related musculoskeletal disorders and is Author of more than 250 papers and handbooks, in Italian and English, on the matter. He developed and co authored the OCRA method. He is a member and has been coordinator (up to 2012) of the Technical Committee on Prevention of Musculoskeletal Disorders of the International Ergonomics Association (IEA) and represents Italy in international commissions of the European Committee for Normalization (CEN) and the International Organization for Standardization (ISO) dealing with ergonomics and biomechanics. He is member of the Italian Working Group devoted to the Prevention of Occupational Musculoskeletal Diseases in the framework of the National Health Service Plan for Prevention (2021-2025).

3. Matteo Candoli

Graduated in Prevention Techniques in workplaces from the University of Bologna and specialized in Prevention Sciences from the University of Milan, Matteo is a researcher and collaborator at the "Ergonomics of Posture and Movement" - research unit of Milan, since 2021. He has worked as a consultant alongside Marco Cerbai at Safety Work Srl since 2021, where he carries out risk analysis in the field of workplace ergonomics. Specialized in biomechanical overload analysis using OCRA, NIOSH, Snook&Ciriello and TACOS methods. He works with local, national and multinational companies where he analyzes and proposes solutions for improving workstations.