CONFERENCE SESSIONS

ME ERGONOMICS AND PRODUCTIVITY: PROOF THAT THEY ARE NOT MUTUALLY EXCLUSIVE

Durango 1 Room
W. Gary Allread and Alex Aurand, The Ohio State University
Basic/Intermediate level

Manual materials handling continues to be a physically demanding task that ergonomists often struggle to improve. The goal of this study was to evaluate a common lifting activity and measure various aspects of its impact on the worker and the task itself. Ten subjects were asked to load and unload pallets of cases, using traditional means and with an assist device that positions these cases in a more conveniently placed location. These volunteers wore a trunk motion and a heart monitor. They were videotaped as well to record their work patterns. Following each work condition, they also were asked to rate their physical effort subjectively.

Analyses of the data found that, by improving case location, low-back injury risk can be significantly reduced. In addition, this type of work task change can also significantly lower heart rate (a physiological measure) and subjective perceptions of the job's demands. It also greatly improved productivity, in terms of the number of steps subjects needed to perform the task. This study emphasizes both the benefits of ergonomics equipment for MMH and the need to evaluate work using several types of work metrics.

NE DESIGNING-IN SAFETY IN HEALTHCARE FACILITIES: THE SAFETY RISK ASSESSMENT TOOL

Durango 2 Room
Mary Willa Matz, Patient Care Ergonomic Solutions LLC
All levels

The facilitation of healing and the prevention of harm are the ultimate goals of healthcare facility design. Over the years, experts in their fields have determined there are specific design considerations that can be included in the design on healthcare buildings that will provide a safer environment of care for patients and caregivers. This presentation will focus on the reduction of patient handling and fall risks through design using the "Safe Design Roadmap" and the "Safety Risk Assessment."

8 – 9:30 a.m.

M NIOSH'S IMPACT ON INDUSTRIAL ERGONOMICS: PAST, PRESENT AND FUTURE

Baja Room
Steve Hudock, Jessica Ramsey and Jonisha Pollard, NIOSH
Intermediate/Advanced level

This Master Track will take us through a brief historical survey of NIOSH's impact on industrial ergonomics, from the development and validation of the risk assessment tools and practices to the current and future focus on surveillance, intervention evaluation and information dissemination and emerging technologies. Researchers will present the impact NIOSH has had on industrial ergonomics with the NIOSH Lifting Equation, patient and manual material handling and the Health Hazard Evaluation program. Researchers will discuss how the mining industry has presented unique challenges to ergonomic interventions. Researchers will conclude with how surveillance and cost effectiveness can be augmented through the use of workers' compensation data and how NIOSH is addressing emerging technologies, such as mobile application development, wearable sensor technology and the use of exoskeletons in industrial settings.

8:30 – 8:55 a.m.

E TARGET ZERO STRUCTURED IMPROVEMENT ACTIVITIES FOR ERGONOMIC INJURY REDUCTION

Coronado Ballroom M-P
Steven Wish and Anthony Banks, Lockheed Martin Corp.
Basic/Intermediate level

Lockheed Martin has developed and regularly employs focused events to address ergonomic-related risk and potential for injuries in manufacturing facilities and office environments. These events, called Target Zero Structured Improvement Activities (TZ SIA), are designed to fully engage employees and leadership providing them the tools and process to enhance safety and ergonomic performance in key opportunity areas. The events are conducted on-site and are a collaboration between the Business Area and Corporate Energy, Environment, Safety and Health. Results are shared across the enterprise to leverage the solutions, best practices and lessons learned. Currently, Lockheed Martin uses three unique types of SIAs, selected based on the operational risk profile and site-specific data. These include: the Traditional Safety TZ SIA, designed to implement a structured process to evaluate key opportunity areas and develop mitigation plans across the full spectrum of health, safety and organization culture; the ergonomics-focused SIA where cross-functional teams are trained to identify ergonomic risk factors and then given the tools and resources to quickly implement low-cost, high impact solutions; and the Ergonomics Integrated Injury Prevention SIA that encompasses the methodology of the ergonomics-focused event incorporating a holistic approach to health and wellness.

OE HAND-HELD TECHNOLOGY ... THERE'S MORE TO IT THAN TEXTING THUMB

Coronado Ballroom Q-S
Timothy Pottorff, Zurich Services Corp.
All levels

Frequent and extended use of hand-held technology presents many as-yet unrealized and significant risk factors beyond the commonly referred to "texting thumb." These include additional biomechanical and respiratory physiological issues. The costs to society from these risk factors have yet to be fully realized as most people are not aware of the changes occurring in their bodies as they use these devices. This presentation will discuss additional risk factors from the use of hand-held devices, how the issues occur and what people can do to minimize the risk to their bodies.

ME DEVELOPMENT OF ACCEPTABLE HAND IMPACT FORCE LIMITS

Durango 1 Room
Alireza Sedighi, Sunwook Kim, Ehsan Rashedi, Mohammad Iman, Mokhlespour Esfahani and Maury Nussbaum, Virginia Tech
Intermediate level

Upper extremity musculoskeletal disorders, including the hand/wrist, are common in the workplace. Repetitive impacts using the hand may be a risk factor for these disorders and such impacts often occur in the automotive industry (e.g., during final trim assembly, using the "hand as a hammer"). Currently, there is limited evidence regarding acceptable exposures to these impacts or the influences of important task characteristics. We used a psychophysical approach, very similar to an earlier study. Twenty females completed a simulated trim installation task, which captured the typical force profiles required for trim installation. Participants were asked to repetitively strike a load cell with the highest amount of force that would not cause pain, undue discomfort, etc. After

initial practice and familiarization, the task was performed for different strike frequencies and locations/postures and in each participant could adjust the "resistance" required. Several outcomes measures were derived from each impact force profile. Force limits were affected by strike frequency and location/posture and distributions of acceptable forces were compiled for each of the task conditions. These data can be used to develop guidelines for tasks involving repetitive hand impact.

NE ON THE BRINK: A REASSESSMENT OF NURSE ERGONOMICS IN THE EMR ENVIRONMENT

Durango 2 Room
Carrie Schmitz, Ergotron Inc.
Basic/Intermediate level

Do current ergonomic recommendations for healthcare adequately protect nurses from work-related risks? While the American National Standards Institute (ANSI) and the National Institute for Occupational Safety and Health (NIOSH) have published thousands of pages of ergonomic recommendations, it is unclear whether these are still relevant and applicable. For ergonomics to positively impact nurse and, by extension, patient safety, stakeholders must conceive a solution while circumventing the tendency to assign blame. Several stress factors causing burnout among nurses will be identified along with a review of nurse survey results including one conducted by Minnesota-based Ergotron in 2014 where nurses reported that they:

- Are less friendly or engaging with their patients (22%)
- Have to modify or limit their activity/movement on the job (22%)
- Are distracted (17%)
- Need more assistance from other staff (14%)

Based on a hospital case study, participants of this session will be guided through an exercise that assesses which aspects of ergonomics apply to the current healthcare setting; how to initiate and sustain positive change; and establish improvements that mitigate risk and feel comfortable and familiar to nurses for optimal impact.

9 – 9:25 a.m.

E DROWNING IN A SEA OF ERGO TO-DO'S? HOW TO PRIORITIZE, DELEGATE AND SAVE YOUR PROGRAM... AND SANITY!

Coronado Ballroom M-P
Lashawn Nevins and Bobbie Watts, Michelin North America
Basic level

Managing an ergonomics program requires a lot of time and effort – which are limited commodities. With all of the activities involved in sustaining and evolving a successful program, it can be overwhelming. How do you determine which of your ergo to-do's to focus on to drive the most sustainable progress? Ergonomic assessments are a good place to start, but they shouldn't be your only drivers. This presentation will provide best practices to use to help focus your time and attention. In it, we will take a look at the various elements of an ergonomics program and the activities involved and provide guidance on how to effectively utilize your time, effort and resources to strategically build and propel your program.

OE DEVELOPMENT AND VALIDATION OF A SELF-REPORT ERGONOMIC ASSESSMENT TOOL (SEAT)

Coronado Ballroom Q-S
Paul Ritchey, Ranjana Mehta and Camille Peres, Texas A&M University
Basic level

Despite considerable advances in the practice of office ergonomics, office workers are still suffering from musculoskeletal disorders (MSDs). These disorders, like carpal tunnel syndrome, can lead to high medical costs for employers and intense pain and discomfort for employees. It is our hypothesis that the design of the software that office workers use is a contributing factor to their risk of developing MSDs. Presented here are the results of a series of studies focused on the development, improvement and validation of a Self-report Ergonomic Assessment Tool (SEAT) sensitive enough for evaluating ergonomic risks associated with the design of software, or in other words, the way in which users are required to interact with software. Another important design goal for the SEAT is that it should be able to be used quickly and easily during software development processes. Data from several studies were used to validate the SEAT using recorded videos and muscular responses measured through surface electromyography and near infrared spectroscopy.

ME "SECURING" OUR FUTURE: IMPLEMENTING A BUSINESSWIDE POWER TOOLS ERGONOMIC STANDARD ACROSS MULTIPLE MANUFACTURING SITES

Durango 1 Room
Bethany Gardner and Kali Gawinski, Sandalwood Engineering & Ergonomics
Lori Huffman, General Electric Appliances, A Haier Company
All levels

Power hand tools are widely used in manufacturing. Effective power tool and fastening strategies, including company standards, are critical for assembly operations to maximize quality and productivity while minimizing injury risk to employees. GE Appliances, a Haier company, manufactures a wide range of home appliances across nine plants in the United States. Despite the use billions of fasteners per year, secured with thousands of power tools, GE Appliances lacked a business-wide power tool standard and fastening strategy. This presentation will discuss the challenges of implementing a business-wide power tool ergonomic standard, due to high variation in the types of products that are assembled and in the assembly cycle times (from 15 seconds to 20 minutes). We will describe the process to develop the standard, including helpful references and critical stakeholders that were involved, the implementation process including our multi-media communication and training plans, as well as strategies employed to bring current tooling into compliance with the new standard with resource and budget constraints. We will also discuss proposed research to fill the gaps in the existing standard as well as ongoing initiatives to improve power tool and fastening strategies across the business.

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