Are you having trouble selecting the right ergonomic tool for your task analyses? ErgoDATA removes the guess-work and helps you choose the correct tool.

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Applied Ergonomics Conference
March 26-29, 2018
and learn how you can use ErgoDATA for free

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ErgoCenter.NCSU.edu
We are excited to welcome you to another stimulating year of the Applied Ergonomics Conference! You are joined by ergonomics professionals from industry, education, training, research, academia, healthcare and more for four days packed full with the latest insights and best practices from the field. We hope you walk away from AEC with an invigorated perspective, fresh ideas and new friends that will continue to influence your work in the years to come.

Don’t miss these exciting features at the AEC 2018:
• A keynote presentation by David J. Cochran, Ph.D., PE, CPE, of the University of Nebraska-Lincoln.
• AEC Aspire Talks, a new keynote presentation format featuring short-form presentations of compelling messages from some of the brightest minds in ergonomics.
• Twelve tracks of educational sessions, from manufacturing applications to office ergonomics.
• Seven roundtable and master track discussions about some of the most pressing issues in ergonomics.
• Diverse vendors presenting their latest solutions, tools and resources in the Exhibit Hall to solve your organization’s challenges.
• Real-world ergonomics solutions and applications from industry-leading Ergo Cup® competitors.
• Hours of valuable networking opportunities, including Ergo Speed Networking, the AEC Trivia Game and a trip to an off-site escape room.
• Pre-conference workshops designed to give you tangible skills to take back to your organization.
• Dozens of presentations from the experts, sharing their success stories, lessons learned and measurable impact.
• Awards presentation for the Creativeness in Ergonomics Practitioner and Student of the Year.

Thank you for joining us for the 21st Applied Ergonomics Conference – we hope you enjoy your time with us in Atlanta!

Save the date for 2019!
Applied Ergonomics Conference 2019
March 25-28, 2019
Hyatt Regency New Orleans | New Orleans
CONFERENCE COMMITTEE

Meet the 21st Annual Applied Ergonomics Conference Committee.

CONFERENCE CHAIR
Brian Roberts, CNA Insurance

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Julia Abate, SAS Institute Inc.
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ERGO CUP®
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Brock Anderson, ergo-ology
David Balderrama, The Boeing Company
Joe Balderrama, Balderrama Ergonomics & Risk Management (BERMN)
Marisol Barrero, Toyota Motor North America
David Brodie, Cargill
Elise Condie, EORM
Vic Garrison, Liberty Mutual Insurance
Dan Gottesman, The Boeing Company
David Hayes, Tyson Foods Inc.
Winnie Ip, Humantech
Glenn Jimmerson, Sandalwood
Josh Kerst, Focal Upright
William Lenharth, University of New Hampshire
Johnine Mowatt, Think ERGO LLC
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Holly Wick, 3M Center
Kelsie Woods, Newport News Shipbuilding

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Vice-Chair: Brock Anderson, ergo-ology

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Chair: Sandra Sellers, Walt Disney Parks & Resorts
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Chair: Marise Carroll, Ergonomics Consultant
Vice-Chair: Lucy Hart, Global Furniture Group

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Nicolas De Cuadro, ERGIINDUSTRIAL
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Patricia Hope, Superior Ergonomics
Katharine Metters, Posturite
Isabel Nunes, UNIDEMI
Mirtha Perazza, The Ergonomics Center of North Carolina
Rodrigo Marçal Pereira, Ergocenter
Yordán Rodríguez Ruiz, University of Antioquia
Paul Schwab, Texas Instruments
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Vice-Chair: Depeesh Desai, Humantech Inc.

NETWORKING
Chair: Holly Duhamel, FCA – TMP
Vice-Chair: Paul Adams, 3M

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Davana Pilczuk, Cintas

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Vice-Chair: Catherine Rae, Sandalwood

Committee Member
Kim Monroe, KM Ergonomics LLC

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Tim Potterff, QP3 ErgoSystems
Abraham Robledo, Hilpilnix
Carrie Scheel, Concordia University
Sheryl Ulvin, University of Michigan

POSTERS
Chair: Mark Benden, Texas A&M University

Committee Member
Rich Halstead-Nussloch, Kennesaw State University

ROUNDTABLE/ MASTER TRACK
Chair: Nancy Laurie, Wegmans Food Markets Inc.
Vice-Chair: Amanda Kauder, Heatcraft RPD

Committee Member
Dave Wood, Raytheon

SOCIAL MEDIA
Chair: LaShawn Nevins – Michelin North America
Vice-Chair: Johnine Mowatt – Think ERGO LLC

STUDENT/NEW PROFESSIONAL
Chair: Joe Wallace, CNA Insurance
Vice-Chair: David Grieshaber, Illinois State University

WEBINARS
Chair: Carrie Scheel, Concordia University
Vice-Chair: Amy Blueter, Kinetic Technologies

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Teresa Bellingar, Haworth Inc.
Don Greene, IIEE
Doug Long, IISE
Brian Roberts, CNA Insurance
Sandra Woolley, Mayo Clinic
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Brock Anderson, ergo-ology

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Lori Huffman, General Electric

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Hong Kong Ergonomics Society (HKES)
IEDUV
imk automotive
Indian Society of Ergonomics
Japan Ergonomics Society (JES)
Latvian Ergonomics Society (LES)
Human Factors and Ergonomics Society of the Philippines
Polish Ergonomics Society
The Portuguese Ergonomics Association (APERGO)
Asociacion Española de Ergonomia (AEE)/Spanish Ergonomics Society
Portuguese Society of Occupational Safety and Hygiene (SPOSHO)
Inter-Regional (Russian) Ergonomics Association (IREA)
Ergonomics Society of Thailand (EST)
WSH (Workplace Safety and Health Institute) Institute
Tuesday, March 27

DAVID J. COCHRAN, PH.D., PE, CPE
Professor Emeritus
University of Nebraska-Lincoln

After 40 years as professor of industrial engineering at the University of Nebraska-Lincoln, Cochran is now its professor emeritus. He serves on the master’s and Ph.D. committees, is a fellow of both the Human Factors and Ergonomics Society and the American Association of Industrial Hygienists, and is on the Foundation for Professional Ergonomics board. Cochran served on the founding Board of Certification in Professional Ergonomics – certification number 8. He consulted on inspections for OSHA including the groundbreaking meatpacker case, and led an OSHA team that developed the Ergonomics Program Standard – promulgated Nov. 14, 2000, and rescinded 2001. Cochran has a bachelor’s in psychology, a master’s and a doctorate degree in industrial engineering with an emphasis on ergonomics – all from the University of Oklahoma.

Wednesday, March 28

Join us for three presentations from influential leaders in ergonomics at Wednesday’s keynote presentation, AEC Aspire Talks. A new addition to the Applied Ergonomics Conference, AEC Aspire Talks are designed to share learnings, achievements and innovational aspects of ergonomic programs in powerful 20-minute segments. AEC Aspire Talks are inspired by the popular TED Talks, geared toward audiences staying engaged while retaining relevant information. Your presenters are:

MARISOL BARRERO
Project Manager, Ergonomics
Toyota Motor North America

Marisol Barrero has worked for Toyota Motor North America, Georgetown, Kentucky, as an ergonomist in the Production Engineering Division’s Safety Group for 11 years. Currently, she manages the North American manufacturing ergonomics program. She develops and supports tools, standards and procedures for use across Toyota’s 15 North American manufacturing facilities. In addition, she leads ergonomics development for new vehicles produced in North America. Barrero has also worked as an ergonomics consultant with Mitsui Sumitomo Insurance Group and Humantech, as well as a researcher with NIOSH. She received her bachelor’s and master’s degrees from Cornell University. She has been a Certified Professional Ergonomist since 2006.

JARED GLASPELL
Plant Ergonomics Engineer
Honda of America Manufacturing Inc.

As the plant ergonomics engineer at Honda of America Manufacturing Inc. in East Liberty, Ohio, for over a year now, Jared Glaspell provides both ergonomic and safety technical support to 2,300-plus associates in a three-shift, light truck manufacturing facility. Prior to this role, he amassed 16 years of safety and ergonomics professional experience in both automotive research and design, as well as home appliance manufacturing. An alumnus of Wright State University, Dayton, Ohio, Glaspell holds a bachelor’s degree in Human Factors Engineering. He is starting his fifth year serving on the ergonomics committee for the Ohio Bureau of Workers’ Compensation Safety Congress & Expo. Glaspell resides in Columbus, Ohio, with his wife and two children.

CHRIS SHIELDSMITH
Corporate Ergonomics Specialist
Cummins Inc.

A proven corporate ergonomics leader, Chris Shieldssmith leads and implements industry-proven ergonomic and safety solutions and process for Cummins Inc., a Fortune 200 company with operations in more than 190 countries. During his tenure at Cummins, Shieldsmith has played a strategic and critical role in establishing a common and simplified approach to ergonomics throughout the organization, which has led to record low injury rates and enhanced education, knowledge and awareness around health and safety issues. He has also been instrumental in driving a leadership engagement model around ergonomics, making it a part of the culture at Cummins. Shieldsmith holds a master’s degree in ergonomics from Indiana University and is a certified Six Sigma Green Belt.
### SCHEDULE AT-A-GLANCE

#### Monday, March 26
- **7 a.m. – 5 p.m.** Registration Desk Open | 2nd Floor Foyer
- **8 a.m. – 5 p.m.** Pre-Conference Workshops | Various rooms
- **9 – 11 a.m.** Facility Tour: Emory Healthcare J Wing Tower | Departs from Hilton Atlanta lobby
- **9:15 – 11:15 a.m.** Facility Tour: Atlanta Trulite Glass and Aluminum Solutions | Departs from Hilton Atlanta lobby
- **5 – 7:30 p.m.** Welcome Reception in the Exhibit Hall | Exhibit Area – 2nd Floor

#### Tuesday, March 27
- **7 a.m. – 5 p.m.** Registration Desk Open | 2nd Floor Foyer
- **7:15 – 7:30 a.m.** Speaker – Moderator Check-in and Briefing for 8 a.m. Sessions | Room 202
- **7:15 – 7:45 a.m.** First Timer’s Orientation | Grand Ballroom West – 2nd Floor
- **8 – 9:30 a.m.** Concurrent Sessions | Various rooms
- **9:45 – 10:45 a.m.** Keynote Presentation | Grand Ballroom West – 2nd Floor
- **10:45 a.m. – 5 p.m.** Exhibits and Ergo Cup® Competitions | Grand Ballroom, Salon and Foyer
- **11:30 – 11:50 a.m.** ErgoScience – Exhibitor Presentation | AEC Theater – Exhibit Hall
- **Noon – 1 p.m.** International Meet-n-Greet | Grand Ballroom West – 2nd Floor
- **Noon – 1:15 p.m.** Lunch in Exhibit Hall | Exhibit Area – 2nd Floor
- **2 – 2:20 p.m.** International Products – Exhibitor Presentation | AEC Theater – Exhibit Hall
- **2 – 3 p.m.** AEC Trivia Game | Grand Ballroom West – 2nd Floor
- **3 – 5 p.m.** Concurrent Sessions | Various rooms
- **5:15 – 6:15 p.m.** Ergo Speed Networking | Grand Ballroom West – 2nd Floor
- **6:30 – 9 p.m.** Networking Event – Escape Room | Depart from hotel lobby

#### Wednesday, March 28
- **7 a.m. – 5 p.m.** Registration Desk Open | 2nd Floor Foyer
- **7 – 7:30 a.m.** Speaker – Moderator Check-in and Briefing for 8 a.m. Sessions | Room 202
- **8 – 9:30 a.m.** Concurrent Sessions | Various rooms
- **9:45 – 10:45 a.m.** AEC Aspire Talks | Grand Ballroom West – 2nd Floor
- **10:45 a.m. – 1:15 p.m.** AEC Trivia Games in the Exhibit Hall | Grand Ballroom, Salon and Foyer
- **11:30 a.m. – Noon** Speaker – Moderator Check-in and Briefing for 1:30 p.m. Sessions | Room 202
- **11:30 a.m. – Noon** Speaker – Moderator Check-in and Briefing for 3:30 p.m. Sessions | Room 202
- **Noon – 1:15 p.m.** Lunch in Exhibit Hall | Exhibit Area – 2nd Floor
- **1:30 – 5 p.m.** Concurrent Sessions | Various rooms

#### Thursday, March 29
- **7 a.m. – 1:30 p.m.** Registration Desk Open | 2nd Floor Foyer
- **7 – 7:20 a.m.** Speaker – Moderator Check-in and Briefing for 8 a.m. Sessions | Room 202
- **7:30 – 7:50 a.m.** Speaker – Moderator Check-in and Briefing for 10 a.m. Sessions | Room 202
- **8 – 9:30 a.m.** Concurrent Sessions | Various rooms
- **9:30 – 10 a.m.** Break | Grand Ballroom Foyer
- **10 – 11:30 a.m.** Concurrent Sessions | Various rooms
- **11:45 a.m. – 1:30 p.m.** Lunch & Awards Ceremony (advanced ticket/fee required) – Ergo Cup® Competition, Practitioner and Student Awards | Grand Ballroom West – 2nd Floor
# EXHIBITOR & ERGO CUP® SCHEDULE

<table>
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<th><strong>Monday, March 26</strong></th>
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<td>7 a.m. – 5 p.m.</td>
<td>Registration Desk Open</td>
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<td>11 a.m. – 4 p.m.</td>
<td>Exhibitors and Ergo Cup® Set Up</td>
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<td>5 – 7:30 p.m.</td>
<td>Welcome Reception in the Exhibit Hall</td>
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<td>10:45 a.m. – 3 p.m.</td>
<td>Dedicated Exhibit and Ergo Cup® Time</td>
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<tr>
<td>10:45 a.m. – 5 p.m.</td>
<td>Exhibit Hall Open</td>
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<td>Noon – 1:15 p.m.</td>
<td>Lunch in Exhibit Hall</td>
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<td>1:15 – 3 p.m.</td>
<td>Dessert reception in the Exhibit Hall</td>
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<td>Lunch in the Exhibit Hall</td>
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<td>2 – 4 p.m.</td>
<td>Exhibitors and Ergo Cup® Dismantling and Move-out</td>
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## VENDOR PRESENTATIONS

Connect with ideal resources for the latest products and services for your projects. If you've been sourcing vendors for a special project, process improvement, training or new product development be sure to make time to attend.

Also, learn how to expand your career with certification and publishing.

The presentations will provide the opportunity to get all of your questions answered, which will shorten your decision-making process.

Come join us in the AEC Theater to learn about exciting products, solutions and ideas focused on ergonomics.

**Tuesday, March 27**

11:30 – 11:50 a.m.
**Reduce Work-Related Injuries With Pre-Hire Testing**
Deborah Lechner, President, ErgoScience Inc.

2 – 2:20 p.m.
**Ergonomic Influences on the Use and Choice of Assembly Lubricants**
Tom McGuckin, VP of Research, Quality and Safety, International Products Corporation

**Wednesday, March 28**

11 – 11:50 a.m.
**The Process in Becoming a Certified Professional Ergonomist**
Bill Boyd, IISE

12:30 – 1:15 p.m.
**Getting Your Ergonomics Success Stories Told to the Public**
Michael Hughes, managing editor for the Institute of Industrial and Systems Engineers
Maury Nussbaum, HG Prillaman Professor at Virginia Tech in the Department of Industrial and Systems Engineering and editor-in-chief of *IISE Transactions on Occupational Ergonomics and Human Factors*
**NETWORKING EVENTS**

**First Timer’s Orientation**
7:15 – 7:45 a.m.
Grand Ballroom West – 2nd Floor
The First Timer’s Orientation assists conference attendees in navigating the conference program and activities to make the best of their time at the meeting. While it’s geared toward those new to the conference, it is open to all attendees.

**International Meet-n-Greet**
Noon – 1 p.m.
Grand Ballroom West – 2nd Floor
Visit the international table in the ballroom to meet fellow international attendees.

**AEC Trivia Game**
2 – 3 p.m.
Grand Ballroom West – 2nd Floor
The ultimate ergo challenge, teams compete in their knowledge of ergonomic facts, fiction and folklore in this fast-paced quiz game. Open to all attendees to participate or attend, this event draws large crowds.

**Ergo Speed Networking**
5:15 – 6:15 p.m.
Grand Ballroom West – 2nd Floor
In a fast, round-robin style interaction, you will meet representatives from numerous organizations that will broaden your connections, increase your exposure and cultivate new partnerships with top-notch individuals and organizations. Come join us for refreshments and a great time! Advanced signup is required; visit the registration desk on the lower level.

**Networking Event – Escape Room (off-site)**
6:30 – 9 p.m.
Depart from hotel lobby
Sponsored in part by BodyBuilt/ErgoGenesis
This Networking Event is the culmination of the Networking Committee’s efforts to bring conference attendees together. The off-site event for 2018 will be a visit to an escape room, followed by dinner. Transportation will be provided. **Limited space + additional fee required.**

**FACILITY TOURS**

Facility tours offer an in-depth, behind-the-scenes look at ergonomics in action at various facilities in a variety of industries. An additional fee is required for each tour. Facility Tours will depart from the Hilton Atlanta lobby.

**Hospital Tower vs. J Wing Tower**
9 – 11 a.m.
Explore ergonomics solutions at the $400 million state-of-the-art hospital tower at Emory Hospital, serving over 230 patients. The J Wing Tower applies ergonomics practices with patient and employee needs in mind to create an environment combining excellent patient care and workplace efficiency.

**Atlanta Trulite Glass and Aluminum Solutions**
9:15 – 11:15 a.m.
Discover how Atlanta Trulite Glass and Aluminum Solutions eliminated workplace injury in 2017 by implementing effective ergonomics programs that improve the way people and products move across the facility.
FREE

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January/February 2015

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Gas Detection
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Heating Protection

Impact Protection Gloves
The most popular gloves in the ergonomics industry. Now
available in a new material matrix that provides added
protection and comfort.

Hi-Viz FR Vests
Officially approved protectors that are designed to
provide complete hand protection to the employee.

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Now gas detectors alone control under monitoring software
used the new BGI portable gas detector with a high
response time. The gas detectors alone control under
monitoring software used the new BGI portable gas
detector with a high response time.

Ultrasonic Leak Detector
The BC-3000 Deluxe Ultrasonic Leak Detector is
designed to locate leaks in a variety of materials.

Improving the Industry
The BC-3000 Deluxe Leak Detector can be used
in any application where detection of leaks
is critical.

Mercury Vapor at 0.3ppm
The BC-3000 Deluxe Leak Detector can be
used to detect mercury vapor at 0.3ppm.

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8 a.m. – Noon

OSHA RECORDKEEPING REQUIREMENTS AND MUSCULOSKELETAL DISORDERS (MSDS)
Room 204
Gary Orr, OSHA
Billie Kizer, US Department of Labor – OSHA
Glenn Ketcham, OSHA Regional Coordinator Atlanta
Intermediate Level

Since 1971, most employers with establishments in the United States have been required to record work-related injuries and illness on the OSHA log. Musculoskeletal disorders such as back injuries, carpal tunnel and other disorders can be recordable if the incident meets the established criteria. The OSHA log and recordability criteria have changed over the years. The requirements for reporting severe injuries and illnesses have also changed. Most recently, OSHA has required many employers to submit an electronic version of their OSHA records. In this workshop participants will learn about the importance of recording and analyzing incident information. Participants will be able to get answers to questions regarding MSD reporting.

DIY: HOW TO UPGRADE YOUR ERGONOMICS PROGRAM AND INCREASE ITS ORGANIZATIONAL IMPACT
Room 205
Allison Stephens, Fanshawe College
All levels

Have you felt that you could accomplish more with your ergonomics program? Have you plateaued? Then this do-it-yourself approach workshop is for you. How to put the fun back into your ergo teams. Leveraging what your company is doing in other departments and programs to move ergonomics forward. From ergo junk yard wars to nationwide ergonomic marketing, you never know where the ergonomic journey can take you. Six Sigma, lean manufacturing, Material Sequencing and change control all impact ergonomics. Let’s get you ready to build on these initiatives! It’s important to keep abreast of ergonomic research. We will look at new research and discuss new tools and how to roll them out. Such tools as ACGIH – duty cycle/fatigue analysis and cumulative back loading. Are you using the latest tools? Time to look at what data helps make better decisions. Force gauges to Gyro suits – what’s right for you to use. How to leverage your ergonomics community. Let’s not do it alone. Let’s learn from the collaborative ergonomic approach at USCAR, consortia and external funding opportunities. Be ready to add some new tools to your ergonomics toolbox. Let’s rebuild your ergonomics program and have some fun.

DEMYSTIFYING COST JUSTIFICATION FOR ERGONOMIC SOLUTIONS
Room 206
Ben Zavitz, ErgoHP
Intermediate/Advanced Level

Have you been denied money for ergonomic improvements? Has your strategic ergonomic plan been unsupported by upper management? If the answer is “Yes,” you are not talking the language of business, known as Finance or “Show-Me-The-Money!” Knowing how to capture the financial benefits of your ergonomic initiatives and the ability to perform a cost-benefit analysis is essential in today’s business climate to demonstrate how ergonomic solutions affect the bottom line. This workshop will give you the skills to develop a comprehensive cost-benefit analysis using various data sources available within your company. All companies have access to big data and operational metrics. Knowing how to gather this data and analyze it ensures ergonomics moves from a cost of doing business to a cost-saving initiative. Both reactive and proactive costs and benefits and the technical aspects of each will be reviewed. Several real-world case studies will be used to demonstrate the concepts and approach. The workshop will end with teams competing for the CEO dollars for their project. Attendees are encouraged to submit case studies (or contact the instructor) prior to the workshop.

All workshops will be held on Monday, March 26, and require advanced registration.
8 a.m. – 5 p.m.  

**ERGONOMICS CERTIFICATION REVIEW: DETERMINING WHAT YOU DO AND DO NOT KNOW**  
Room 207  
Sheree Gibson, Ergonomics Applications  
Intermediate Level

This workshop is designed for those considering applying for BCPE certification or those who are trying to study for the certification exam. The goal is to assist them by explaining the process including the Core Competencies required. We will cover basic concepts from seven key areas: the ergonomic system, design approaches, human-machine interaction, job design and analysis, product design and user-experience, human-computer interaction and basic statistics. Finally, we will make some recommendations on how to prepare for the exam.

1 – 5 p.m.  

**EXPERIENCE ERGONOMICS: TRAINING DEMONSTRATIONS THAT ILLUSTRATE ERGONOMIC AND SAFETY CONCEPTS**  
Room 204  
Paul Adams, 3M  
Lisa Brooks, ORCHSE Strategies LLC  
All levels

Back by popular demand, this highly rated workshop is guaranteed to be fun and memorable. Ergonomists and safety practitioners are often asked to train supervisors, engineers, workers, safety and ergonomic team members. When properly performed, demonstrations offer trainers a means to engage students in a manner that helps learners understand important concepts, while also making the training experience fun and memorable. In this train-the-trainer workshop, students will learn about what makes a demonstration effective or ineffective, how to use demonstrations to support learning and tips for delivering memorable training. The instructors will demonstrate and provide written instructions for delivering at least 20 different, low-cost, demonstrations. Students are encouraged to bring along any training demonstrations that they have found to be effective and will be given the opportunity to share these with the class as well. Casual dress is recommended.

**CREATING CULTURE CHANGE: HOW TO GAIN BUY-IN AT ANY LEVEL**  
Room 205  
Davana Pilczuk, Cintas  
All levels

Welcome to the course that will teach you how to do the one thing we all complain about: creating culture change. This class addresses the art and science of influencing people, teams and organizations, so they all share the same vision you do. Companies often fail to truly buy in to ergo programs, but you will learn how to change that and how to become a master influencer. Attendees will see how, regardless of their job title, they have a great deal of power and influence to change the current state. They will learn how to leverage key people, sell their ideas better and make the case for ergonomics more effectively. Management, and everyone around you, will certainly listen to you once you’ve completed this entertaining, highly practical, interactive class.

**APPROACH TO DEVELOPMENT AND IMPLEMENTATION OF ERGONOMICS DESIGN STANDARDS**  
Room 206  
Patricia Racco, Ford Motor Company  
All levels

Developing ergonomic standards for engineering is a successful method to ensure consistency and drive ergonomic principles to those making the decisions. The goal of this workshop is to share helpful tips and the process used to develop SAE Manufacturing Ergonomics standards. The workshop will outline the need for standards, gathering data to ensure robustness, the presentation of data (written vs. visual), identifying key stakeholders and how to ensure success by working collaboratively. The workshop will share published examples developed by a collaborative cross-company team. Participants will walk through a step-by-step approach on the selection, development and publication of a standard that will stand up to scrutiny, backed by ergonomic guidelines and assessment tools. There will be an interactive/hands-on portion where participants can “practice” or fine-tune standard writing in small and large group discussion. We encourage all participants to bring in a standard proposal, in any level of development from concept to final editing, to apply the concepts touched on in the workshop and share with the larger group. The objective is for the participants to successfully implement the approach and leave with ability to write for their workplace.
### MONDAY, MARCH 26

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 a.m. – 5 p.m.</td>
<td>Registration Desk Open – 2nd Floor Foyer</td>
</tr>
<tr>
<td>8 a.m. – Noon</td>
<td><strong>OSHA Recordkeeping Requirements and Musculoskeletal Disorders (MSDs)</strong> Billie Kizer and Glenn Ketcham, U.S. Department of Labor - OSHA</td>
</tr>
<tr>
<td>1 – 5 p.m.</td>
<td><strong>DIY: How to Upgrade Your Ergonomics Program and Increase Its Organizational Impact</strong> Allison Stephens, Fanshawe College</td>
</tr>
<tr>
<td>8 a.m. – Noon</td>
<td><strong>Demystifying Cost Justification for Ergonomic Solutions</strong> Ben Zavitz, ErgoHP</td>
</tr>
<tr>
<td>11 a.m. – 4 p.m.</td>
<td>Exhibitors, Ergo Cup® and Poster Presenters Set-up</td>
</tr>
<tr>
<td>5 – 7:30 p.m.</td>
<td>Welcome Reception in the Exhibit Hall</td>
</tr>
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### TUESDAY, MARCH 27

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>7 a.m. – 5 p.m.</td>
<td>Registration Desk Open – 2nd Floor Foyer</td>
</tr>
<tr>
<td>7:15 – 7:45 a.m.</td>
<td>First Time Attendee Orientation</td>
</tr>
<tr>
<td>7 – 7:30 a.m.</td>
<td>Speaker – Moderator Check-in and Briefing for 8 a.m. Sessions</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td><strong>Addressing Employee Well-Being in Risk Reduction Activities</strong> Steven Wish and Traci Arthur-Hartranft, Lockheed Martin Corporation</td>
</tr>
<tr>
<td><strong>Session Coordinator:</strong> Ranjana Mehta</td>
<td><strong>Tools and Technology for Practitioners</strong> Chriss Styles</td>
</tr>
<tr>
<td>9:45 – 10:45 a.m.</td>
<td><strong>Executive Session</strong> Paul Adams, 3M</td>
</tr>
<tr>
<td>10:45 a.m. – 3 p.m.</td>
<td>Exhibits and Ergo Cup in Exhibit Hall – Dedicated Time</td>
</tr>
<tr>
<td>10:45 a.m. – 5 p.m.</td>
<td>Exhibit Hall Open</td>
</tr>
<tr>
<td>11 – 11:30 a.m.</td>
<td>Speaker/Moderator Check-in and Briefing for 3 p.m. Sessions – Room 202</td>
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## TUESDAY, MARCH 27

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>Noon – 1:15 p.m.</td>
<td>Lunch in Exhibit Hall</td>
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<tr>
<td>1:15 – 3 p.m.</td>
<td>Networking Reception in the Exhibit Hall</td>
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<tr>
<td>1 – 2 p.m.</td>
<td>Poster Session – Exhibit Area</td>
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<tr>
<td>2 – 3 p.m.</td>
<td>AEC Trivia Game - Grand Ballroom West – 2nd Floor</td>
</tr>
<tr>
<td>3 – 5 p.m.</td>
<td>Session Coordinator: Tina Minter</td>
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### Ergonomics in the Manufacturing Environment

<table>
<thead>
<tr>
<th>Room</th>
<th>Programs</th>
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</thead>
<tbody>
<tr>
<td>Rooms 208-210</td>
<td>Ergonomics Boot Camp - A Practical Understanding and Application of Ergonomic Concepts With Education and Competition Daniel Callahan, Coca-Cola Refreshments</td>
</tr>
<tr>
<td>Rooms 212-214</td>
<td>But My Numbers Say... Rob Jorden, Blickle USA Wheels and Casters, Inc.</td>
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</tbody>
</table>

### Ergonomics in the Healthcare and Laboratory Environment

<table>
<thead>
<tr>
<th>Room</th>
<th>Programs</th>
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</thead>
<tbody>
<tr>
<td>Rooms 204-205</td>
<td>Assessments of Occupational Exoskeleton Technologies for Overhead Work Maury Nussbaum, Sunwook Kim, Saad Alabdulkarim, Mohammad Iman Mokhlespour Esfahani and Mohammad Mehdi Alemi, Virginia Tech</td>
</tr>
<tr>
<td>Rooms 206-207</td>
<td>But My Numbers Say... Rob Jorden, Blickle USA Wheels and Casters, Inc.</td>
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</tbody>
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### Master Track Discussion

<table>
<thead>
<tr>
<th>Room</th>
<th>Programs</th>
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</thead>
<tbody>
<tr>
<td>Room 211</td>
<td>Ergonomics Issues in Medical Transport Sandra Woolley, Mayo Clinic</td>
</tr>
<tr>
<td></td>
<td>Ergonomics for the Changing Workforce Ranjana Mehta, Texas A&amp;M University, Lora Cavouto, University of Buffalo</td>
</tr>
</tbody>
</table>

### Session Coordinator: Tina Minter

5:15 – 6:15 p.m. | Speed Networking Event (limited space – advance sign-up required) |
6:30 – 9 p.m.    | Off-site Networking Event (limited space – additional fee required) – Depart from Hotel Lobby |
**WEDNESDAY, MARCH 28**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>7 a.m. – 5 p.m.</td>
<td>Registration Desk Open – 2nd Floor Foyer</td>
</tr>
<tr>
<td>7 – 7:30 a.m.</td>
<td>Speaker - Moderator Check-in and Briefing for 8 a.m. Sessions – Room 202</td>
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<thead>
<tr>
<th>Track</th>
<th>Room 208-210</th>
<th>Rooms 212-214</th>
<th>Rooms 204-205</th>
<th>Rooms 206-207</th>
<th>Rooms 211</th>
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<td>Ergonomics Programs</td>
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<tr>
<td>Ergonomics in the</td>
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<td>Tools and</td>
<td>Ergonomics</td>
<td>Master Track</td>
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<tr>
<td>Manufacturing Environment</td>
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<td>Technology</td>
<td>in the Office</td>
<td>Discussion</td>
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<thead>
<tr>
<th>Room</th>
<th>Moderators</th>
<th>Session Coordinator</th>
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<tbody>
<tr>
<td></td>
<td>Keith White</td>
<td>Jim Galante</td>
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<tr>
<td></td>
<td>Peter Kuhlang</td>
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<td></td>
<td>Brent Bowers</td>
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<td>Adam Pickens</td>
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<td></td>
<td>Nancy Laurie</td>
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</tbody>
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8 – 9:30 a.m. (Extended Sessions)

**Session Coordinator:** Jim Galante

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Communicating the Value of Ergonomics to Business Stakeholders Blake</td>
</tr>
<tr>
<td></td>
<td>McGowan, Humantech</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Proactive Ergonomics: Reducing Workplace Injuries and Improving</td>
</tr>
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<td></td>
<td>Productivity Through Proper Caster Selection Wayne Hodgins and Lui</td>
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<td></td>
<td>Dilauro, Darcor Casters, Thomas Albin, High Plains Engineering Services LLC</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Use Management Systems to Strengthen Your Ergonomics Program Paul</td>
</tr>
<tr>
<td></td>
<td>Schwab, Texas Instruments, Inc.</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Think on Your Feet - Evaluation of Cognitive Skills for Three</td>
</tr>
<tr>
<td></td>
<td>Alternative Workstations Josh Kerst, Safco Products Company</td>
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<tr>
<td>8 – 9:30 a.m.</td>
<td>Ergonomics = Human Factors: Preparing for the New World Ranjana Mehta,</td>
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<tr>
<td></td>
<td>Texas A&amp;M University</td>
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<tr>
<td>8 – 9:30 a.m.</td>
<td>Being an Effective Ergonomics Leader Bobbie Watts, Michelin North</td>
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<td>America</td>
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<tr>
<td>8 – 9:30 a.m.</td>
<td>Real World Wheel Ergonomics Dave Lippert, Hamilton Caster &amp; Mfg. Co.</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Fighting Fatigue With Exoskeletons Terry Butler, Lean Steps Consulting</td>
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<td></td>
<td>Inc.; Daniel Wisner, John Deere</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>‘Smart’ Electric Sit-stand Desks: Can Software Prompts be an Effective</td>
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<td></td>
<td>Intervention to Decrease Sedentary Behavior and Improve Office Productivity? Parag Sharma, Texas A&amp;M University; Wayne Owens, Wellnomics, Ltd.</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Keynote Presentation - AEC Aspire Talks - Marisol Barrero, Project</td>
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<tr>
<td></td>
<td>Manager, Ergonomics, Toyota Motor North America; Jared Glaspell, Plant</td>
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<tr>
<td></td>
<td>Ergonomics Engineer, Honda of America Manufacturing Inc.; and Chris</td>
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<td></td>
<td>Shieldsmith, Corporate Ergonomics Specialist, Cummins Inc.</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Exhibits and Ergo Cup® in the Exhibit Hall – Dedicated Time</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Exhibit Hall Open</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Speaker/Moderator Check-in and Briefing for 1:30 pm Sessions – Room 202</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Speaker/Moderator Check-in and Briefing for 3:30 pm Sessions – Room 202</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Poster Session</td>
</tr>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Lunch in the Exhibit Hall</td>
</tr>
</tbody>
</table>

10:45 a.m. – 1:15 p.m. Exibit Hall Open

11 a.m. – 11:30 a.m. Speaker/Moderator Check-in and Briefing for 1:30 pm Sessions – Room 202

11:30 a.m. – 12:30 p.m. Speaker/Moderator Check-in and Briefing for 3:30 pm Sessions – Room 202

11:30 a.m. – 12:30 p.m. Poster Session

Noon – 1:15 p.m. Lunch in the Exhibit Hall
You can view the schedule by downloading the conference app, Applied Ergonomics Conference 2018, at the Google Play Store or at the Apple Store.

### WEDNESDAY, MARCH 28

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<tr>
<th>Track</th>
<th>Room</th>
<th>Rooms 208-210</th>
<th>Rooms 212-214</th>
<th>Rooms 204-205</th>
<th>Rooms 206-207</th>
<th>Rooms 211</th>
<th>Roundtable Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ergonomics Programs</td>
<td>Room</td>
<td>Keith White</td>
<td>Chris Styles</td>
<td>Catherine Rae</td>
<td>Charles Metz</td>
<td>Dave Wood</td>
<td>Roundtable Discussions for Industries With Physically Demanding Jobs Brent Bowers, John Deere, Stephen Jenkins, Cintas; Ben Zavitz, ErgoHP</td>
</tr>
<tr>
<td>Ergonomics in the Office</td>
<td>Ergonomics as a Business Tool Zachery Collins, Bureau Veritas</td>
<td>Positioning for Optimum Benefit: The Worker ... or the Work? James Galante, Southworth Products Corp.</td>
<td>One-handed Carrying in the Workplace: A Systematic Review of the Literature Mohamed Badawy, Mark Schall, Richard Sesek, Sean Gallagher and Jerry Davis, Auburn University</td>
<td></td>
<td>Moderator</td>
<td></td>
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</table>

1:30 – 3 p.m.

Session Coordinator: Greg Garrett

10:45 a.m. – 1:15 p.m. Exhibits and Ergo Cup® in the Exhibit Hall – Dedicated Time

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**DOWNLOAD THE CONFERENCE APP!**

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Any changes will be reflected in the Conference App.
## WEDNESDAY, MARCH 28

<table>
<thead>
<tr>
<th>Track</th>
<th>ME</th>
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<tbody>
<tr>
<td>Room</td>
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<td>Rooms 212-214</td>
<td>Rooms 204-205</td>
<td>Rooms 206-207</td>
</tr>
<tr>
<td>Moderators</td>
<td>Keith White</td>
<td>Catherine Rae</td>
<td>Dave Wood</td>
<td>Thomas Rowell</td>
</tr>
<tr>
<td><strong>Ergonomics Programs</strong></td>
<td><strong>Ergonomics in the Manufacturing Environment</strong></td>
<td><strong>Tools and Technology for Practitioners</strong></td>
<td><strong>Ergonomics in the Office</strong></td>
<td><strong>Roundtable Discussion</strong></td>
</tr>
<tr>
<td>Ergo Leakage</td>
<td>Ergonomic Recovery Model for Cyclical Industrial Work</td>
<td>Understanding the Potential Uses and Barriers to Adoption of Wearable Technology in the Workplace</td>
<td>Managing Office Ergonomics in a Manufacturing Environment</td>
<td>Effective Insurance Carrier Ergonomics Assistance, Tools &amp; Resources</td>
</tr>
<tr>
<td>Gene Kay, VelocityEHS</td>
<td>Gabriele Caragnano, Fondazione Ergo</td>
<td>Lora Cavuoto, University at Buffalo; Mark Schall and Richard Sesek, Auburn University</td>
<td>Thomas Varghese, UTC</td>
<td>Tina Minter, Cindy Callaghan &amp; Greg Griffith; CNA Financial Corp; George Brogmus, Liberty Mutual</td>
</tr>
</tbody>
</table>

### 3:30 – 5 p.m.

#### Session Coordinator:
Abraham Robledo

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Innovative Model of Evidence-Based Occupational Health 20 Years in the Making: From Hire-to-Retire</td>
<td>James Rethaber and Keith Adamson, Fit For Work; Kevin Holguin, H-E-B Grocery</td>
</tr>
<tr>
<td>Ergonomic Bottleneck: Revolutionize the Way You Find Problems</td>
<td>Nicholas Smith, Auburn Engineers</td>
</tr>
<tr>
<td>Featured Speaker</td>
<td>Chris Dockery, BMW Manufacturing Co.</td>
</tr>
<tr>
<td>The Evaluation and Use of Wearable Technology</td>
<td>How to Move 3,000 People in 3 weeks and Almost Live to Tell About It!</td>
</tr>
<tr>
<td>Manual Material Handling Mitigation of Musculoskeletal Injury Risks with Simulation and Ergonomic Principles and Tools</td>
<td>Shanon Wooden, University of Central Florida</td>
</tr>
<tr>
<td>Determining Ergonomics Expertise: Research Findings and Practical Implications</td>
<td>Office Ergonomics With a Curve</td>
</tr>
<tr>
<td>Kristin Streilein and Edwin Irwin, Mercer Engineering Research Center</td>
<td>Marjorie Werrell, ERGOWORKS Consulting, LLC; Debra Lieberman, IMF; Zack Koutsandreas, Novavax</td>
</tr>
<tr>
<td><strong>Featured Speaker</strong></td>
<td><strong>Roundtable Discussion</strong></td>
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**THURSDAY, MARCH 29**

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<tbody>
<tr>
<td>7 a.m. – 1:30 p.m.</td>
<td>Registration Desk Open – 2nd Floor Foyer</td>
</tr>
<tr>
<td>7 – 7:20 a.m.</td>
<td>Speaker – Moderator Check-in and Briefing for 8 a.m. Sessions – Room 202</td>
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<tr>
<td>7:30 – 7:50 a.m.</td>
<td>Speaker – Moderator Check-in and Briefing for 10 a.m. Sessions – Room 202</td>
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<thead>
<tr>
<th>Track</th>
<th>Room</th>
<th>Moderators</th>
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<tbody>
<tr>
<td><strong>E</strong> Ergonomics in Design and Development</td>
<td>Rooms 208-210</td>
<td>Chris Entrekin</td>
</tr>
<tr>
<td><strong>T</strong> Tools and Technology for Practitioners</td>
<td>Rooms 212-214</td>
<td>Chris Styles</td>
</tr>
<tr>
<td><strong>DG</strong> Diverse and Global Workforce</td>
<td>Rooms 204-205</td>
<td>Donna Bartlett</td>
</tr>
<tr>
<td><strong>AR</strong> Applied (Translational) Research</td>
<td>Rooms 206-207</td>
<td>Leigh Brantley</td>
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<tr>
<td><strong>RT</strong> Roundtable Discussion</td>
<td>Rooms 211</td>
<td>Kali Gawinski</td>
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<table>
<thead>
<tr>
<th>Session Coordinator: Gregory Griffith</th>
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<tbody>
<tr>
<td>Ergonomics Guidelines for Cart Design Lori Winnemuller, The Boeing Company</td>
</tr>
<tr>
<td>Force Estimation Technology for More Practical Use of Subjective Force Ratings Murray Gibson, Saturn Ergonomics Consulting; Connor Lusk, Saturn Ergonomics / Auburn University</td>
</tr>
<tr>
<td>Five Things Ergonomists Can Do to Promote Improved Cyber-Security Rich Halstead-Nussloch, Kennesaw State University</td>
</tr>
<tr>
<td>Usability Testing Methods and Metrics for the Screen and Beyond Kristin Streilein, Mercer Engineering Research Center</td>
</tr>
<tr>
<td>The Evolution of Ergonomics Assessments at 3M Holly Wick and Jeffrey Nelson, 3M</td>
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<tr>
<td>Ergo and Daily Living Bobbie Watts, Michelin North America; Marenda Caldwell, UPS</td>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8 – 9:30 a.m.</td>
<td>Session Coordinator: Gregory Griffith</td>
</tr>
<tr>
<td>9:30 – 10 a.m.</td>
<td>Break</td>
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### TRACKS AND ROOM INFORMATION

#### TRACK E
- **Ergonomics in Design and Development**
- **Room:** Rooms 208-210
- **Moderators:** Steve Greely
- **Presentations:**
  - Ergonomic Assessment Involving Development of a Personal Mobility Device
    - Patricia Sullivan, Delia Rosales-Valles, Joel Cazares, Kaela Gudz, Antonio Ortega and Edward Pines, New Mexico State University
  - Design of Roller Coaster Seat From Anthropometry Perspective
    - Jess Li, Mengyi Yu and Yi-Chien Lu, Pennsylvania State University
  - Requirements – Do You Have Your Shopping List Ready?
    - Donald MacDonald and Linda Miller, EWI Works International Inc.
  - Fad vs. Fact: What Ergonomics Solutions Do You Really Need?
    - Jeff Sanford, Humantech

#### TRACK ME
- **Ergonomics in Manufacturing Environments**
- **Room:** Rooms 212-214
- **Moderators:** Julie Thompson
- **Presentations:**
  - Breaking Down Cultural Barriers at La-Z-Boy – A Case Study of Early Ergonomic Involvement in a New Product Launch
    - Dan Mines, Sandalwood Engineering and Ergonomics; Tim McCurry and Dennis Poland, La-Z-Boy, Inc.
  - The 2 Year Leap – Boosting Build Station’s Productivity
    - Chris Knieriem and Trent Phillips, Gulfstream Aerospace
  - Fad vs. Fact: What Ergonomics Solutions Do You Really Need?
    - Jeff Sanford, Humantech
  - Reactive Balance Training as a Workplace Fall Prevention Intervention
    - Michael Madigan and Maury Nussbaum, Virginia Tech

#### TRACK F
- **Fall Prevention**
- **Room:** Rooms 204-205
- **Moderators:** Gary Orr
- **Presentations:**
  - Study of Near-falls in Healthy Adults Under Standing and Walking Conditions
    - Shubo Lyu, Pennsylvania State University; Andris Freivalds, Pennsylvania State University; Ling Rothrock, Pennsylvania State University
  - Preventing Slips Trips and Falls: Is Your Program Truly Multifactorial?
    - Deborah Lechner, ErgoScience, Inc.
  - Reactive Balance Training as a Workplace Fall Prevention Intervention
    - Michael Madigan and Maury Nussbaum, Virginia Tech
  - Evidence Behind Alternative Computer Mouse Designs
    - Ahmed Radwan, Utica College

#### TRACK AR
- **Office – Applied (Translational) Research**
- **Room:** Rooms 206-207
- **Moderators:** William Muira
- **Presentations:**
  - Ergonomic Evaluation of Office Furniture: The Relationship on Range of Adjustability in Chairs and Observed Postural Changes
    - Whitney Mantooth and Ranjana Mehta, Texas A&M University
  - A Cognitive Ergonomic Assessment of Office Chair Design
    - Ashley Shortz, Madeline Franke, Ecem Kilic, Whitney Mantooth and Ranjana Mehta, Texas A&M University
  - Evidence Behind Alternative Computer Mouse Designs
    - Ahmed Radwan, Utica College

#### TRACK M
- **Master Track Discussion**
- **Room:** Rooms 211
- **Moderators:** Chris Entrekin
- **Presentations:**
  - The Role of Ergonomics Champions in Developing and Managing Ergonomics Programs
    - David Alexander, Auburn Engineers Inc.
  - The following organizations have been invited to share their knowledge and experience within this Master Track, and we thank them for their willingness to help others:
    - Gulfstream Aerospace, Navistar, GE Appliances/ Haier, Ergo-ology, Johnson & Johnson, Boeing and Toyota

### SCHEDULE
- **10 – 11:30 a.m.:**
  - **Session Coordinator:** Tim Pottorff
  - **Presentations:**
    - Ergonomic Assessment Involving Development of a Personal Mobility Device
    - Design of Roller Coaster Seat From Anthropometry Perspective
    - Requirements – Do You Have Your Shopping List Ready?
    - Fad vs. Fact: What Ergonomics Solutions Do You Really Need?
    - Reactive Balance Training as a Workplace Fall Prevention Intervention
    - Evidence Behind Alternative Computer Mouse Designs

- **11:45 a.m. – 1:30 p.m.:**
  - Lunch & Awards Ceremony - Ergo Cup® Competition, Practitioner and Student Awards – Grand Ballroom West - (advanced ticket/fee required)
TUESDAY, MARCH 27

8 – 8:40 a.m.

**ADDRESSING EMPLOYEE WELL-BEING IN RISK REDUCTION ACTIVITIES**

Steven Wish and Traci Arthur-Hartranft, Lockheed Martin Corporation
Session: Ergonomics Programs
Room 208 – 210
Basic Level

Lockheed Martin, in a collaborative effort between its Safety & Health and Benefits teams, examined the link between employee well-being and the prevalence of work-related injuries. Eight years of workplace injury data was integrated into the health data collection system and analyzed, identifying those areas of increased odds of workplace injury among employees who suffer from certain health conditions. This session will review these findings and outline the incorporation of employee resilience training, activities and resources into the organizations' ergonomic improvement and injury risk reduction activities.

**WEARABLE ERGONOMICS – USING WEARABLE SENSORS TO EVALUATE EXOSKELETONS IN THE FIELD**

Matthew Marino, Briotix
Session: Ergonomics in the Manufacturing Environment
Matthew Marino, Briotix
Room 212 – 214
Intermediate Level

Every day, workers report to physically and mentally demanding jobs. The estimated direct costs of injuries due to overexertion involving an outside source was $15.1 billion in 2012, representing one-quarter of the total workplace injury direct costs (Liberty Mutual, 2014). These injuries account for about 30% of lost time injuries. Traditional ergonomic methods can be very effective, but they are often time-consuming and fail to capture everything about a worker's job. New technologies can collect many types of data efficiently and accurately for use by ergonomists in the field.

Employees at Costco agreed to participate in trials of wearable sensor systems and exoskeletons. The trials were supervised by a Briotix lead ergonomist. Workers in numerous departments were tested using traditional methods, as well as wearable sensor systems designed to collect physiological, kinematic and ground reaction force data. Exoskeletons designed to mitigate injury risk for the back, neck, shoulders, legs, knees and feet were tested.

Wearable technologies are part of the future of how people will function in the world. This may be true for ergonomists as well. This presentation will report on our effort, data, results, experience and hopes for wearable sensor and exoskeleton use in ergonomics.
**CONFERENCE SESSIONS**

8 – 9:30 a.m.

**RT ROUNDTABLE DISCUSSIONS FOR INDUSTRIES WITH HIGHLY REPEATED JOBS**
Brent Bowers, John Deere; Stephen Jenkins, Cintas
Session: Roundtable
Room 211
Intermediate/Advanced Level

This roundtable session will focus on highly repetitive jobs involving the arms, hands and upper extremities. Applicable industries include jobs similar to electrical wiring, food processing, highly detailed finger work, etc. We will discuss how companies have adapted the available assessment tools to their needs, which tools work best and which ones to avoid. Additionally, we will discuss what the results of the assessments mean and how they can be used to improve the ergonomics of highly repetitive jobs.

8:50 – 9:30 a.m.

**E USING TECHNOLOGY TO EMPOWER EMPLOYEES AND ADVANCE THE ERGONOMICS PROCESS AT LAND O’LAKES**
Daniel Liddell, Land O’Lakes
Session: Ergonomics Programs
Room 208 – 210
Intermediate Level

A successful ergonomics process includes gaining management support and increasing buy-in, involving key members of the business and engaging employees to participate and implement the solutions. The presenter of this session will share the key learnings of the process, the strategies used to target focus areas and how the use of web-based training and an online management system have saved time and resources in a continually growing company. How design standards were used to develop risk mitigation projects and how these projects were deployed at multiple locations will also be shared.

**TT FATIGUE TOOLS FOR HIGH-RISK INDUSTRIAL SETTINGS**
Ranjana Mehta, Texas A&M University
Session: Tools and Technology for Practitioners
Room 212 – 214
All Levels

Worker fatigue is a critical occupational risk that has cost lives, injured workers, disrupted productivity, with economic losses estimated at $18 billion a year. Fatigue, generally defined as a physiological state of reduced mental or physical performance capability resulting from sleep loss, circadian phase, and workload, has been implicated as a serious risk factor in most of the cases affecting worker safety, particularly in the oil and gas extraction (OGE) industry where fatality rates are 7 times higher than all US workers. Both industry and federal agencies have determined that “decreasing fatigue-related injuries and fatalities in the OGE industry” is one of their top strategic research (to practice) priorities. However, one of the major barriers that currently impact the development of effective fatigue mitigation practices in OGE workers is the assessment of fatigue. Fatigue is a complex multidimensional construct, and its definition and assessment differs based on different occupations. Several objective and subjective fatigue assessment methods exist, but none are comprehensive, relevant, and feasible for the OGE workforce. This presents challenges in identifying high-risk workers and developing fatigue management practices that are targeted and effective in reducing fatigue-related incidents in the OGE industry. In this presentation, attendees will be able to identify worker fatigue-related sources (sleep, shift, physical demands, cognitive workload, stress, etc.) in onshore and offshore operations and understand their impacts on worker health and safety and assess worker fatigue using feasible and reliable tools/techniques (subjective, physiological, and performance based).

8:50 – 9:30 a.m.

**EX FEATURED SPEAKER – TILT THE ICEBERG: UNLOCK THE ROI WITH YOUR RISK MANAGEMENT AND ERGONOMIC SOLUTIONS**
Shari Falkenburg, CNA
Session: Executive Session
Room 204 – 205
All Levels

Return on investment (ROI) is a concept by which most business decisions are made. In its most basic form, ROI is the total amount of gain, minus the initial investment, divided by the total investment.

As professionals in ergonomics, healthcare, safety, human resources and risk management, we are often challenged to demonstrate that our risk management/ergonomic solutions are an investment with rewards beyond regulatory compliance or injury reduction. To be a true investment, we need to understand the business language required to promote our solution and to leverage data information that supports good safety/ergonomics. Knowing what is valuable and what should be valued are fundamentals that enhance your ROI.

During this presentation, we will examine the ROI model and enhancements for building your solutions. We’ll look at the risk-return tradeoffs and how your ROI is a cost-savings tool for good employee health and company growth.

**NE MY VEHICLE IS MY OFFICE: A SURVIVAL GUIDE FOR ROAD WARRIORS**
Arnie Neustatter, Pacific Gas and Electric Co.
Session: Ergonomics in the Non-Manufacturing Environment
Room 206 – 207
Basic/Intermediate Level

Today’s mobile worker often is found typing away on tablets, laptops and other devices from the front seat of their vehicle. Paperwork is attended to with a makeshift combination of clipboards and other writing surfaces. Many service jobs access work tickets and other requests on their devices from within their vehicle.

This session will review a proven method to assess the risk of in-vehicle computer use. Many practical solutions will be presented by showcasing case studies from different vehicle types.
Upper-extremity musculoskeletal disorders (MSDs) remain prevalent and costly in several occupational sectors, and work involving prolonged or repetitive arm elevation is associated with work-related MSDs. Occupational exoskeletons are a rapidly emerging technology that can assist and support workers in diverse environments and may help them perform tasks with less physical effort and, hence, reduced MSD risk. Though a new option for the control and prevention of work-related MSDs, there is little empirical evidence to support this potential and limited reports of potential unintended consequences. In the context of simulated overhead work tasks (e.g., light assembly and drilling), we have completed multiple lab-based studies using diverse exoskeleton technologies. A mix of qualitative and quantitative approaches have been developed and applied, addressing diverse outcomes including usability, comfort, performance, balance and biomechanical demands. Results indicate that, in general, there is clear potential for occupational exoskeletons to be an effective approach to reduce physical demands. However, some technologies may be less well suited for some tasks demands. Continuing work is both underway and planned, with long-term goals to generate guidelines and practices to help facilitate the safe and effective adoption of occupational exoskeletons.

**ASSESSMENTS OF OCCUPATIONAL EXOSKELETON TECHNOLOGIES FOR OVERHEAD WORK**

Maury Nussbaum, Sunwook Kim, Saad Alabdulkarim, Mohammad Iman Mokhlespour Esfahani and Mohammad Mehdi Alemi, Virginia Tech
Session: Applied (Translational) Research
Room 204 – 205
Intermediate Level

Upper-extremity musculoskeletal disorders (MSDs) remain prevalent and costly in several occupational sectors, and work involving prolonged or repetitive arm elevation is associated with work-related MSDs. Occupational exoskeletons are a rapidly emerging technology that can assist and support workers in diverse environments and may help them perform tasks with less physical effort and, hence, reduced MSD risk. Though a new option for the control and prevention of work-related MSDs, there is little empirical evidence to support this potential and limited reports of potential unintended consequences. In the context of simulated overhead work tasks (e.g., light assembly and drilling), we have completed multiple lab-based studies using diverse exoskeleton technologies. A mix of qualitative and quantitative approaches have been developed and applied, addressing diverse outcomes including usability, comfort, performance, balance and biomechanical demands. Results indicate that, in general, there is clear potential for occupational exoskeletons to be an effective approach to reduce physical demands. However, some technologies may be less well suited for some tasks demands. Continuing work is both underway and planned, with long-term goals to generate guidelines and practices to help facilitate the safe and effective adoption of occupational exoskeletons.

**ERGONOMICS FOR THE CHANGING WORKFORCE**

Ranjana Mehta, Texas A&M University; Lora Cavuoto, University at Buffalo
Session: Master Track
Room 211
All Levels

This master track session will include presentations on recent changes in worker demographics and characteristics, e.g., age and obesity, that affect the workplace and how ergonomics principles can be used to address these issues to increase worker safety and productivity. Open discussions will follow where you can share and learn from your peers on whether/how work tasks can be assessed for the changing capacities of the workers, and ways in which tasks can be redesigned to ensure safe work practices. Additionally, we will facilitate discussions on how ergonomists can address challenges associated with changing workforce demographics in an effective and sensitive manner.
LEVERAGING PREVENTION THROUGH DESIGN TO IMPROVE ERGONOMICS

Nancy Laurie, Wegmans Food Markets Inc
Session: Ergonomics Programs
Room 208 – 210
All Levels

Following the Hierarchy of Hazard Controls, the most effective way to prevent musculoskeletal disorders is to design out MSD risk factors. Prevention through Design (PtD) methodology is used to anticipate and design out or minimize all hazards to an acceptable level during the design phase of a project. Exposure to hazards is considered for workers in facilities, work methods and operations, processes, equipment, tools, products, new technologies and the organization of work. This approach dovetails nicely with the hazard identification and control section of most ergonomics programs. Wegmans Food Markets Inc., a regional grocery chain, has adopted NIOSH’s Prevention through Design program into its overall Environmental, Health and Safety Management System. This session discusses PtD and demonstrates how workplace ergonomics were improved by the adoption of this approach with an example design project involving a new organic bread line.

UNDERSTANDING AND EXECUTING EFFECTIVE KAIZEN EVENTS

Jeffrey Smagacz, Marsh Risk Consulting
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
All Levels

While many methods are used to implement the concepts of Lean Manufacturing, one of the most popular is the Kaizen event. Kaizen events are focused, continuous improvement workshops using hourly employees and technical staff to drive real-time, low-cost improvements.

Kaizen events provide a tremendous opportunity for improving ergonomics in the workplace. Educating the workshop participants in ergonomics methods can result in a tremendous reduction of motion waste and ergonomic risk factors. Case studies have demonstrated that production efficiency can be increased by 25% to 60% and ergonomic risk can be reduced significantly without large capital expenditures. A financial payback of three to six months is often achieved to deliver immediate business value.

You will learn how to set up, manage and execute an Ergonomics Kaizen Event, as well as understand the five key items that make or break the success of the event. Improvements from a variety of industries will be shared highlighting impacts in productivity, quality, safety enhancement and ergonomic risk reduction.

EMORY HEALTHCARE’S SAFE PATIENT HANDLING PROGRAM

Kathy Norris, Emory Healthcare
Session: Ergonomics in the Healthcare and Laboratory Environment
Room 206 – 207
Basic/Intermediate Level

The Bureau of Labor Statistics lists RNs sixth for at-risk occupations. It is estimated a nurse may manually lift up to 1.8 tons in eight hours. Emory Healthcare launched a Safe Patient Handling Study in 2007. Two ergonomists conducted an evaluation. 24% of the total injuries in our two primary hospitals and 41% in the skilled care facilities were due to patient handling. The estimated annual total direct and indirect workers’ compensation costs were between $1.9 million and $4 million. Lift equipment trials were set up. The staff purchased the Liko Overhead Lifts, which support 440 lbs. The Safe Patient Handling Program was implemented in November 2009. A safe patient handling nurse was designated to oversee the lift installations and staff training. Challenges included maintaining enough lift sheets and consistent staff utilization of the equipment. With significant staff education and administrative support, there was a 12.5% cumulative reduction in injuries in 2014. Emory Healthcare’s overall cost for work-related injuries was reduced from $5 million in 2004 with 20,000 employees to $3.7 million with 39,075 employees in 2015. Cumulative yearly recordable patient handling injuries went from 153 in 2014 to 125 in 2016.

DISTRIBUTED SERVICE WORKFORCE – COMPLEX CHALLENGES REQUIRE UNIQUE SOLUTIONS

Kurtis Salter and Lori Huffman, General Electric Appliances, A Haier Company
Session: Ergonomics Programs
Room 208 – 210
Intermediate Level

The GE Appliances, a Haier Company-Facility Service group, has over 1,000 service technicians and they complete 2.1 million appliance repairs annually with an average tenure and age of 21 and 52 years, respectively. Ergonomic-related injuries represent the majority of all work-related injuries with the highest workers’ compensation cost associated with these injuries. This is our journey…

This presentation explores the unique challenges that face GE Appliances Service Organization as it relates to musculoskeletal injuries related to appliance repairs in homes, retail and construction locations within the United States. An eclectic, comprehensive and unique approach is being taken to identify, reduce and manage work-related injuries related to material handling, product installations and removal, appliance repair, van and inventory management, and general awkward body postures in a distributed workforce.

EMERGENCY AND PRODUCTIVE WORK! RISK EVALUATION OF PHYSICAL WORKLOAD BY ERGONOMIC ASSESSMENT WORKSHEET AND HUMAN WORK DESIGN – AN INTERNATIONAL PERSPECTIVE

Peter Kuhlang, Deutsche MTM-Vereinigung e.V. MTM-Institut
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
Intermediate Level

Today, enabling productive and ergonomic work processes, work methods and work systems plays a significant role, and in the future, it is going to gain even more significance. The “Ergonomic Assessment Worksheet” (EAWS) is a screening tool to evaluate the physical workload on the human body in different workplaces. It was developed for ongoing production and production planning in the automotive industry and similar industries. With EAWS, physical stress can be easily evaluated and the results are very detailed. Aspects of successive stress superposition can be greatly simplified for short-cycle tasks. The results of the evaluation are the basis for the communication between management and workers’ councils. The new process building block
systems Human Work Design (MTM-HWD®) describes motions of people in conjunction with an ergonomic assessment procedure, in this case EAWS, in one step, which allows a direct correlation in designing productive and ergonomic work. This contribution presents principles, practical application cases and the standardized education concept of EAWS and MTM-HWD® in the light of their international application.

**RELATIONSHIP BETWEEN SUBJECTIVE PERCEPTION OF TASK ACCEPTABILITY AND BIOMECHANICAL OBJECTIVE MEASURES; PART II: RESULTS**

Monica Lynn Haumann Jones, University of Michigan; Marty Smets, Ford Motor Company; Allison Stephens, Fanshawe College
Session: Applied (Translational) Research
Room 204 – 205
Intermediate/Advanced Level

Introduction: Biomechanical, physiological and psychophysical approaches have been used to establish guidelines for task acceptability or to make a determination of task demands. In practice, these approaches yield different and often conflicting assessments. It would be useful for the practitioner to know how a population will subjectively respond to tasks that are designed to be objectively acceptable based on traditional ergonomic assessment. Human factor and product design research has demonstrated systematic links between objective measures and subjective ratings. Subjective assessments are critically important to estimate the acceptability of biomechanical stresses given the individual capacity of a worker.

Methods: The effects of varying force and posture task requirements on subjective rating were quantified in a laboratory study of 20 men and women. Multivariate analyses evaluated the quantitative interaction between the task requirements, performance and participant characteristics and the useful relationship with subjective perception.

Impact: Knowledge about the interdependence between objective measures and subjective rating of a task will be used to develop population distribution models of risk assessment, which have clear implications for ergonomic analyses of manual tasks. Results can be integrated into digital human models or exist as a stand-alone tool for use by practitioners.

**BIOMECHANICAL AND PSYCHOPHYSICAL EVALUATIONS OF MANUAL PIPETTING**

Eunsik Kim and Andris Freivalds, Pennsylvania State University; Faisal Aqlan and Courtney Cole, Penn State Behrend
Session: Ergonomics in the Healthcare and Laboratory Environment
Room 206 – 207
Basic Level

Manual pipetting is still the main task laboratory technicians in the areas of chemistry, biology and medicine perform daily, even though electrical pipettes are available in the market. Prolonged manual pipetting may lead to Repetitive Stress Disorders (RSDs), Cumulative Trauma Disorders (CTDs) or other musculoskeletal injuries due to force, repetitive movements and awkward postures of the fingers and wrist. The purpose of this study is to evaluate different types of manual pipettes from biomechanical and psychophysical perspectives. Specifically, thumb-push and finger-push pipettes are compared in several pipetting tasks. Surface electromyography is used to measure muscle activity for the Adductor Pollicis (ADD), Flexor Pollicis Brevis (FPB) and Flexor Pollicis Longus (FPL) in the fingers as well as the Flexor Digitsorum Profundus (FDP) and Flexor Digitsorum Superficialis (FDS) in the hand. Subjective discomforts and preferences are also recorded for each subject with each type of pipette. The results are used to assess the impact of pipette design on finger and hand force and muscle activity. We expect that the application of this study will contribute to the reduction of pain associated with pipetting by improving pipette design guidelines.

**SMALL FACILITY, BIG RESULTS: A STRATEGY AND CASE STUDY**

Mohammad Jeelani, Auburn Engineers; William Spillman and Cathy Majors, ATI Specialty Alloys and Components
Session: Ergonomics Programs
Room 208 – 210
Basic Level

Small facilities face unique challenges when attempting to establish local ergonomics programs, including financial and personnel constraints. An employee-driven approach to outside mentoring and a strategy focusing on preventative actions, corrective actions, medical management and program management have proven to be effective for these types of facilities.

A site of 150 employees that manufactures technologically advanced materials set a goal for establishing a world-class ergonomics program and an ergonomics culture within five years. By adopting an employee-driven approach and a proven program strategy, the team was able to eliminate its project backlog, reduce the number of injuries per year by 92%, increase ergonomics related early reports by 67%, engage 15% of the plant workforce on either the ergonomics team or the newly established ergonomics subcommittee, and increase its ergonomics program audit results from “poor” to “good.” The team also became the model for other teams at the facility and across the company and competed in the Applied Ergonomics Conference Ergo Cup® twice.

This site’s ergonomics journey will be presented in this session. This session will also include a repeatable model for establishing a world-class employee driven ergonomics program at a small facility.

**USING FACTS AND DATA TO IDENTIFY COST-EFFECTIVE SOLUTIONS**

Ben Zavitz, ErgoHP
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
Intermediate/Advanced Level

Knowing what facts and data to use to identify root causes, cost-effective solutions and convince management to support your ergonomic improvements is essential for any ergonomics practitioner. This presentation will reveal several real manufacturing case studies and what facts and data were used to identify cost-effective solutions. Case studies will demonstrate how injury data, injury claim costs, risk assessment results, biomechanical analysis, advanced instrumentation (EMG, pressure/force sensors, vibration, physiological, etc.), productivity analysis and human CAD modeling were used to identify effective solutions and verify implemented solution results in a wide variety of manufacturing environments.
**NEW PUSH-PULL GUIDELINES BASED ON BIOMECHANICAL TOLERANCES**

W. Gary Allread, SRI-Ergonomics, The Ohio State University
Session: Applied (Translational) Research
Room 204 – 205
Intermediate Level

Introduction: Most practitioners use psychophysically based guidelines to assess push-pull tasks in industry. New research advances have allowed for these tasks to be assessed using a biomechanical model, which determines safe limits on actual spine loads and their tolerance limits. Methods: A total of 62 subjects performed (two-handed) pushing and (one- and two-handed) pulling tasks in a laboratory setting, in straight-line and sharp-turn directions. An electromyography assisted model was used to determine spine shear force levels. Results: Spine loads were lowest during straight-line pulls at low handle heights, straight-line pushes at high handle heights, turns at high handle heights and two-handed turns (compared to one-handed pulls). In addition, a comparison of these limits with previously developed psychophysical guidelines found that the latter underestimate low-back injury risk by as much as 30%. Discussion and Significance: These guidelines, based on objectively gathered biomechanical data, appear to produce a more accurate estimate of pushing and pulling limits that will protect the health of those who do manual materials handling.

**ERGONOMICS FOR DENTAL PRACTICES**

Ronald Porter, The Back School
Session: Ergonomics in the Healthcare and Laboratory Environment
Room 206 – 207
Basic Level

Dental professionals today face many unique and challenging ergonomics risks in the practice of dentistry. This presentation will review the specific ergonomics risks and statistics related to musculoskeletal disorders for dental professionals. We will discuss various approaches to improve productivity, reduce fatigue and discomfort and increase the longevity of the dental professional’s career caused by the physical job demands to dentists, dental hygienists and dental assistants. Attendees will learn proven ergonomics interventions that they can begin to use immediately with dental professionals.

**COMMUNICATING THE VALUE OF ERGONOMICS TO BUSINESS STAKEHOLDERS**

Blake McGowan, Humantech
Session: Ergonomics Programs
Room 208 – 210
Advanced Levels

In business terms, value is commonly defined as the importance or worth to the operation. When ergonomics is done right, and human performance is optimized, there are two primary positive outcomes: improved employee well-being and improved business performance.

Traditionally, dependent stakeholders (safety and human resources) appreciate the value of ergonomics. They understand that good ergonomics improve employee well-being, including a reduction in causal absenteeism, first aid cases, modified duty cases, recordable injuries, lost-time cases, workers’ compensation claim costs, among others. However, dominant stakeholders (plant leadership, quality, operations, manufacturing, the board of directors and investors) generally have a limited awareness or understanding of the value of ergonomics. Thus, it is often overlooked and under-exploited.

So, how do we best convey the value of ergonomics to business stakeholders? They need to be educated how ergonomics affect the bottom line. It enhances product quality, increases manufacturing performance, improves employee engagement, boosts stock performance and demonstrates good corporate social responsibility.

**PROACTIVE ERGONOMICS: REDUCING WORKPLACE INJURIES AND IMPROVING PRODUCTIVITY THROUGH PROPER CASTER SELECTION**

Wayne Hodgins and Lui Dilauro, Darcor Casters; Thomas Albin, High Plains Engineering Services LLC
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
Intermediate Level

A carefully selected caster will mitigate immediate risk and manage risk during its life span. With a robust and well-built caster, risk of failure diminishes and workforce protection increases. Dr. Tom Albin will review the ergonomic factors that affect push-pull forces in manual material handling situations. Darcor’s Lui Dilauro, a recognized ergonomic mobility expert, will review case histories where leading companies have seen benefits based on caster selection. He will also identify the risks and benefits associated with different wheel materials and design configurations.
USE MANAGEMENT SYSTEMS TO STRENGTHEN YOUR ERGONOMICS PROGRAM
Paul Schwab, Texas Instruments Inc.
Session: Tools and Technology for Practitioners
Room: 204-205
Intermediate/Advanced Level

Occupational safety and health management systems are used by many organizations to monitor and control safety and health risks. These same systems can also be used to continuously improve ergonomics programs. While an ergonomics management system can function independently, an ergonomics program can be leveraged by integrating it into existing safety and health management systems. This also ensures ergonomics related risks are considered fairly when prioritizing abatement of other risks. In addition to an overview of management systems, a case study will be presented outlining how ergonomics is integrated into existing safety and health management systems at Texas Instruments.

THINK ON YOUR FEET – EVALUATION OF COGNITIVE SKILLS FOR THREE ALTERNATIVE WORKSTATIONS
Josh Kerst, Safco Products Company
Session: Ergonomics in the Office
Room 206 – 207
Intermediate Level

To think on one’s feet is a phrase that means to react to events decisively, effectively and without prior thought or planning. How does your physical workspace and environment support this activity? Gain insight from the latest neurocognitive research for speed and accuracy of decision-making for alternative workstation designs. Attend this session if you are interested in learning how physical working positions influence the way we think and learn.

8 – 9:30 a.m.

ERGONOMICS = HUMAN FACTORS: PREPARING FOR THE NEW WORLD
Ranjana Mehta and Camille Peres, Texas A&M University; Chris Dockery, BMW Manufacturing Co.; Matthew Marino, Briotix
Session: Master Track
Room 211
All Levels

Automation in the workplace, e.g. use of industrial robots, and exoskeletons, now requires workers to apply some level of mental or cognitive effort, in addition to physical demands. Ideally, physical and cognitive demands should be assessed together when examining worker capacity and work demands – but this is rarely done. This master track session will present the importance of both the physical ergonomics and cognitive human factors principles and techniques for assessing ergonomic risks and hazards in industrial settings that introduce varying levels of automation. The limitations of existing ergonomic tools and how ergonomists can address these gaps through design and training will be discussed. Finally, examples of effective human-machine interface designs (manual and software displays and controls) will be shared.

BEING AN EFFECTIVE ERGONOMICS LEADER
Bobbie Watts, Michelin North America
Session: Ergonomics Programs
Room 208 – 210
All Levels

There is sometimes a misconception that as the ergonomic leader you should have all the answers. This is neither right nor it is healthy! An effective leader knows that building strategic relationships is key to mobilizing everyone to work toward common goals and to find the answers, together. This is necessary to build a sustainable ergonomics program. This presentation, presented by a knowledgeable executive leader pulling from proven leadership training and experience, will provide guidance on successful leadership qualities found in every area of business and how to integrate and demonstrate those qualities throughout your ergonomics program. It will delineate the specific steps to take to organize others around shared values and how to make every participant in your ergonomics program an effective leader. The presentation will also provide guidance on how to create and grow a well-rounded network by identifying specific players and their respective roles both within and outside of your organization. The goal of the presentation is to leave each participant with specific to-dos to improve their leadership abilities and propel their ergonomics program forward.

REAL WORLD WHEEL ERGONOMICS
Dave Lippert, Hamilton Caster & Mfg. Co.
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
Basic Level

What is a “safe” ergonomic push or pull force for something on wheels? This session will explore a practical understanding of the Liberty Mutual ergonomic tables for push/pull forces and how the size and type of wheel selected makes all the difference. Session participants will do the actual testing and recording of data from the use of a special cart. The cart, with built-in force measurement, will enable users to accurately determine push and pull forces at a consistent load weight. After charting actual data, the audience will participate in making prudent wheel selections.

FIGHTING FATIGUE WITH EXOSKELETONS
Terry Butler, Lean Steps Consulting Inc.; Daniel Wisner, John Deere; Jason Gillette, Iowa State University
Session: Tools and Technology for Practitioners
Room 204 – 205
All Levels

Improved productivity, improved quality and making workers safer gets almost everyone’s attention in manufacturing and other industries whenever a new technology enters the marketplace. However, like fall protection technology, wearable exoskeleton technology needs to be approached by safety and ergonomic professionals with an analytical and technical eye for detail to ensure the proper training, care, use, fit, function and limitations are communicated to the user.

This presentation will unpack the results from a detailed user test conducted with John Deere employees, at two separate sites, under the supervision of Dr. Jason Gillette from Iowa State University; Terry Butler, president, Lean Steps Consulting; and Dan Wisner, a John Deere ergonomist. Breakthrough test methodology utilizing wireless electromyography sensors on real employees performing real jobs on the shop floor will be presented along with the impressive results.
‘SMART’ ELECTRIC SIT-STAND DESKS: CAN SOFTWARE PROMPTS BE AN EFFECTIVE INTERVENTION TO DECREASE SEDENTARY BEHAVIOR AND IMPROVE OFFICE PRODUCTIVITY?
Parag Sharma, Texas A&M University; Wayne Owens, Wellnomics, Ltd.
Session: Ergonomics in the Office
Room 206 – 207
Intermediate Level

It is estimated that nearly 90% of American adults spend their waking time sedentary, whether in an office environment or in their homes (Straker et al., 2012). Excess sedentary time has been linked to obesity, which in turn has been implicated in higher risks for cardiovascular disease, diabetes and cancer (Tremblay et al., 2010, Katzmarzyk et al., 2009, Dunstan et al., 2012). Sit and stand desks have been shown to increase physical activity in the workplace, but most studies have indicated a reduction in utilization over time. The sustainability of sit and stand desk usage has been a challenge in maintaining physical activity and reduction in sedentary time within occupational settings.

This presentation will review the results from a study in Australia that attempted to decrease sedentary behavior in the workplace and will look at productivity metrics such as keystrokes, backspaces and delete keys. The findings will allow us to see if this intervention can increase productivity and sustain long-term sit-stand behavior by using computer software prompts.

1:30 – 1:55 p.m.

WHY ERGONOMICS INJURY PREVENTION FAILS: THE MISSING LINKS
David Damico, Marsh
Session: Ergonomics Programs
Room 208 – 210
Basic Level

Successful ergonomics initiatives to reduce musculoskeletal stress usually focus on physical components (e.g., chairs, equipment and policies) and education in hopes of seeing a change in worker postures and their work behaviors. However, workers are unlikely to change, and sustain that change, if they are not motivated to do so and if their work environment presents barriers to engaging in that change. This presentation will identify several educational items (e.g., ergonomics is “job-related”) mistakenly presented to workers as ergonomic truths which likely result in barriers to successful musculoskeletal injury prevention. The presentation will also identify how to engage workers in adopting ergonomics practices and how to guide workers to self-sustaining injury prevention behaviors. This presentation is a shallow dive into a deep discussion on how human behavior is affected by information and motivation, and why first building a program to address the cognitive side of ergonomics is essential in achieving and sustaining musculoskeletal injury reductions from the physical side.

UPS AND DOWNS OF ERGONOMIC TELECOMMUTING PROGRAMS
Tina Minter, Chubb Insurance
Session: Ergonomics in the Office
Room 206 – 207
Basic Level

Telecommuting is a new normal for businesses thanks to technology that allows employees to work from home. Telecommuting has its benefits for both workers and companies but there are some disadvantages and challenges with maintaining the ergonomics program from a distance. Some of the challenges include performing training, providing standardized equipment, managing personal equipment and performing ergonomic evaluations of the workstations. The risk of ergonomic injury can also be even higher for teleworkers than those in the office if the appropriate steps are not taken when implementing a telecommuting program. This presentation will discuss these challenges and provide real-life solutions for managing the ergonomic workstations of at-home workers.

WHEN ERGONOMICS LEAD TO DANGER – BRAKING SYSTEMS
Rob Jorden, Blickle USA Wheels and Casters Inc.
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
All Levels

With the ergonomic research in the caster industry, and the drive for forklift-free manufacturing facilities in recent years, heavy loads have become easier and easier to move. Once those loads are in motion, they have to not only be stopped, but held in place to prevent them from becoming dangers themselves. Braking system research in the caster industry has had much less innovation over the past 30 years than features that make loads easier to move and handle. Is this leading to a more hazardous workplace? We’ll talk through case studies and real-world examples of how choosing a braking system can be just as important as the more obvious ergonomic choices.

USE OF GRIP SENSOR TECHNOLOGY TO QUANTIFY THE GRIP FORCE REQUIREMENTS OF WORK
Deborah Lechner, ErgoScience Inc.
Session: Tools and Technology for Practitioners
Room 204 – 205
Intermediate Level

Historically, quantifying the grip strength requirements of work tasks has been subjective at best and technology for direct measurement of the grip force required for work tasks has been lacking. More recently, the TekScan Grip™ system has been developed, which measures and evaluates static and dynamic pressures from grasping objects. The Grip™ system measures interface pressure for human hand and finger gripping applications to assess comfort, design and ergonomics. The system is used to improve design for a more ergonomically sound product, study carpal tunnel and repetitive motion syndrome, or analyze the human hold on various tools. It provides technology for collecting vital information and insight to enhance product design, manufacturing, quality and research. This presentation will describe the technology, its uses and limitations and will provide a case example of its use in job analysis for the purpose of documenting grip requirements of work.

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1:30 – 3 p.m.

**RT ROUNDTABLE DISCUSSIONS FOR INDUSTRIES WITH PHYSICALLY DEMANDING JOBS**

Brent Bowers, John Deere; Stephen Jenkins, Cintas; Ben Zavitz, ErgoHP
Session: Roundtable
Room 211
All Levels

This roundtable session will focus on jobs that require the entire body to be physically involved. Applicable industries include jobs similar to a manual laborer in construction, foundries and shipbuilding. The goal of the discussion will be to better understand which assessment tools work best to assess the ergonomics of a physically demanding job, how these tools might need to be modified and how to select the most appropriate tool for the job.

2 – 2:25 p.m.

**E UNDERSTANDING AND OVERCOMING RESISTANCE TO ERGONOMIC CHANGE**

Murray Gibson, Saturn Ergonomics Consulting; Don Triggs, Rockwell Collins
Session: Ergonomics Programs
Room 208 – 210
Basic/Intermediate Level

The presenters will discuss the emotional and analytical reaction encountered when implementing ergonomic change and provide practical and actionable strategies geared toward overcoming these obstacles. These concepts are based upon the teachings and strategies of well-known industrial psychologists. Multiple examples are provided based upon real-life experiences of the presenters over a combined half a century of work applying ergonomics.

**ME DUMB VS. SMART MATERIAL HANDLING LIFTERS – WHO WINS?**

Volker Schmitz, Schmalz Inc.
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
Basic Level

With the push toward Industry 4.0 and smart devices, you want to reassess when and where to upgrade your technology and where to wait and hold off. Technological advances are coming fast and furious. In our brief overview session, we will look at the overhead lift assist devices that are proven technology with a more than 30-year track record and where they still apply today and where they fall short in meeting today’s needs. Where do Intelligent Lift Assist devices come in? What do they offer today and what applications are they indispensable in? What do the next five years hold in store for us?

**TT SMARTPHONE-BASED ERGONOMIC RISK SCREENING**

SangHyun Lee, University of Michigan
Session: Tools and Technology for Practitioners
Room 204 – 205
Basic/Intermediate Level

Many manual workers in the industries such as manufacturing, retailing, warehousing, healthcare and construction are involved in physically demanding activities. They deal with awkward body postures and repetitive manual handling tasks that result in ergonomic injuries. However, current manual observation-based ergonomic risk assessments are time-consuming, expensive, subjective and error prone. As such, it is challenging to widely apply to many job sites.

To address these issues, a smartphone-based ergonomic risk screening system processes the videos of workers taken via the camera embedded in the phone. In other words, automated ergonomic risk screening is enabled without using any special devices or sensors. This technology can make the current ergonomic risk screening process fast, affordable and objective providing an exciting path for many industries that suffer from ergonomic injuries. Current applications to real manufacturing environments and its accuracy in risk screening will be demonstrated in this discussion.

2 – 2:55 p.m.

**OE FEATURED SPEAKER – STATE OF THE SCIENCE IN SEDENTARY RESEARCH**

Mark Benden, Texas A&M Ergonomics Center
Session: Ergonomics in the Office
Room 206 – 207
Basic/Intermediate Level

The IOY or Internet of YOU is fast becoming a standard in industry for both office and industrial worker data collection. What does that mean? It means that more and more of your equipment like tools, desks and chairs are being connected to data received from monitors you are wearing to one central processing point. This amalgamation of data about you and your environment is full of significant challenges such as privacy, security and ethical issues. In this session, Dr. Benden will break down the currently available products for collecting worker data associated with sedentary behavior and movement while providing practical buying advice with pros/cons for different software, hardware and general approaches. Attendees should come away with a full understanding of the current state of the science for collecting this data and what general conclusions are coming out of the most recent research.

2:30 – 2:55 p.m.

**E ERGONOMICS AS A BUSINESS TOOL**

Zachery Collins, Bureau Veritas
Session: Ergonomics Programs
Room 208 – 210
Intermediate Level

A company’s leadership team may have a different perspective about injury than the health and safety team. This can put the company in a reactive posture regarding injuries. Relying on the lagging indicators of Injury Rates or Lost Work Day Cases leaves employers playing whack-a-mole. This presentation will discuss how to tie safety and ergonomics metrics to other key business indicators such as quality, productivity, morale and financial risk. The discussion will show how to turn business leaders into strong allies by using ergonomics to give a competitive edge. Milestones to converting a company from reactive to proactive and developing a clear path to funding ergonomics solutions will be described. Finally, ergonomists will walk away with some common business language and tactics to demonstrate how an ergonomics program positively impacts a company’s financial position.
Every day in manufacturing, assembly, packaging and shipping operations companies are challenged to meet goals like increased productivity, higher quality, less cost and to do it all safely. Applied ergonomics is not only an integral part of these decisions, it is a must. This presentation examines many of those challenges in some manufacturing and assembly operations and then offers some solutions. Many factors must be considered when positioning the work to the worker. Also, when re-positioning the worker to the work, cost effectiveness, productivity, quality and, of course, ergonomics must be measured. This fast moving, picture-driven presentation offers both the problem and some practical engineering interventions.

Musculoskeletal disorders (MSDs) represent a large proportion of the total number of nonfatal occupational injuries and illnesses involving days away from work. Manual materials handling (MMH) has been associated with the development of MSDs among workers. One-handed carrying can be one of the most strenuous MMH tasks; however, no formal, recommended guidelines exist for one-handed carrying in the workplace. We conducted a systematic review of the published literature since 1966 presented in prominent human factors and occupational safety and health journals to determine the current state-of-the-art pertaining to one-handed carrying. Twenty-nine relevant articles were identified after searching four electronic databases. The articles suggested that one-handed carrying is more physically demanding and fatiguing than other MMH tasks. Physiological responses to carrying a load in one hand were approximately the same as carrying twice the load distributed equally between two hands. Biomechanical studies suggested similar conclusions. In general, the maximum load to be carried in one hand was suggested to be 9-10 kg for males, and 6-7 kg for females, respectively. We will discuss how the relatively limited research in this area may affect occupational health and safety practice as well as recommend areas for future research.

The scope of the research project is any cyclical human work planned and executed in an industrial competitive environment. The most typical cases are within industries where there is the need to define an expected output (products or services) based on the optimization of the trade-off between labor productivity and ergonomics. Estimated world manufacturing population impacted by the procedure: 200 million workers (30 million in EU28, 12.5 million in US, 100 million in China and 60 million in India).

Wearable technologies are emerging as a means to better characterize exposure to risk factors associated with many common occupational health and safety-related problems such as work-related musculoskeletal disorders (MSDs). Inertial measurement units (IMUs) and personal physical activity monitors, in particular, are attractive to many ergonomists and other safety professionals because of their ability to quantify worker postures and behaviors pertinent to workplace injuries. We will present the results of a survey of about 950 safety professionals and ergonomists on the current uses of wearable technologies at work, the perceived benefits of such technologies and barriers faced in further implementation. The survey indicated that over half of respondents would be in favor of using wearable technologies to track occupational health and safety risk factors; however, overcoming the issue of employee privacy and confidentiality of the data would need to be addressed first. Other barriers for implementation included employee compliance, sensor durability, cost, accuracy of the data and workplace safety standards around worn items. We will discuss how some of these concerns can be overcome in different work environments and where wearable technologies may be best used for promoting worker health and safety based on these perspectives.
Ever tried to manage an office ergonomics program when the primary focus is heavy manufacturing? UTC was faced with this exact challenge and developed an online portal that tracks requests for office ergonomic assessments to completion including remote locations. Review how the company ensured all employees received office ergonomics training and scheduled assessments.

3:30 – 5 p.m.

**RT EFFECTIVE INSURANCE CARRIER ERGONOMICS ASSISTANCE, TOOLS & RESOURCES**
Tina Minter and Cynthia Callaghan, Chubb Insurance; Greg Griffith, CNA Financial Corp; George Brogmus, Liberty Mutual
Session: Roundtable
Room 211
All Levels

Many of today’s insurance carriers offer staff trained in ergonomics, ergonomics tools and other resources. The objective of this roundtable session is to provide the participants guidance regarding how to strategically position and utilize their insurance carrier’s ergonomics resources. This session will discuss the pros and cons of an organization working with its insurance carrier on its ergonomics program and initiatives. Best practices will be discussed and shared.

4 – 4:25 p.m.

**OE MANAGING OFFICE ERGONOMICS IN A MANUFACTURING ENVIRONMENT**
Thomas Varghese, UTC
Session: Ergonomics in the Office
Room 206 – 207
Basic/Intermediate Level

This presentation will demonstrate the effectiveness of a comprehensive occupational health program from hire-to-retire for a large grocery retailer with over 100,000 employees. A case study approach will be utilized to describe the types of the occupational health services provided over the 20-year period, as well as the impacts of these services.

H-E-B Grocery continues to be very proactive regarding injury prevention. H-E-B Risk Solutions has partnered with Fit For Work for the past 20 years and has integrated many services within their occupational health programs in their manufacturing, warehousing, transportation and retail environments. The services provided, impacts of the services and pitfalls to avoid are discussed in this presentation.

4 – 5 p.m.

**OE HOW TO MOVE 3,000 PEOPLE IN 3 WEEKS AND ALMOST LIVE TO TELL ABOUT IT!**
Tim Pottorff, QP3 ErgoSystems
Session: Ergonomics in the Office
Room 206 – 207
All Levels

This presentation discusses the efforts undertaken to move 3,000 people to a new headquarters facility a mile down the road. The talk will discuss pre-move planning and logistics, as well as details regarding how 3,000 people were settled from seated workstations into brand new workstations, including new seating and height adjustable desks. The talk explains what worked, what did not work, changes made during the process and numerous humorous anecdotes acquired along the way.

**ME THE ERGONOMICS BOTTLENECK: REVOLUTIONIZE THE WAY YOU FIND PROBLEMS**
Nick Smith, Auburn Engineers Inc.
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
Intermediate/Advanced Level

When ergo evaluators prioritize which jobs need solutions, it’s common to use whole-body risk assessments to compare total risk scores. Jobs with many “at-risk” work elements get attention first. Often, jobs with a few extreme work elements get hidden until pain or an injury surface. Such jobs are “bottlenecks” of the production line, as the expected throughput is much higher than the workers’ musculoskeletal limit. These jobs are commonly associated with high rates of off-quality, worker selection and turnover.

A new method, the Ergonomics Bottleneck, allows evaluators to instead prioritize jobs that fatigue workers quickly in their work shift. In practice, this method discovers the acceptable number of cycles for each job, revealing which jobs are burdening operators quickly into their shifts. This also aids in scheduling job rotation and job allocation.

In this presentation, multiple assessment tools will be demonstrated using the Ergonomics Bottleneck to tackle some tricky case studies. Attendees will also learn how this can benefit their job allocation and rotation schedules. Finally, attendees will see how solutions for these jobs can be much easier to garner management support.

**TT FEATURED SPEAKER – THE EVALUATION AND USE OF WEARABLE TECHNOLOGY**
Chris Dockery, BMW Manufacturing Co.
Session: Tools and Technology for Practitioners
Room 204 – 205
Intermediate Level

Wearable devices to aid human performance in the work environment are burgeoning. They range from small, clip-on devices to full-body devices and clothing. The field and technology are evolving rapidly. There are many implications for ergonomics regarding effectiveness, comfort, usability and human factors issues. A range of types of wearable devices is discussed along with various factors that affect their success or failure in intended uses. Some factors are obvious and some are not. Issues such as donning and doffing, vision, IT concerns and comfort are discussed.
While it would be ideal if everyone calling themselves an ergonomist was an expert in the field, the reality is that without mandatory certification there is no guarantee the consultant pitching his/her services is truly an expert. This presentation will look at definitions of expertise and the current theoretical models of expertise development. We will then consider how researchers measure expertise in ergonomics and human factors. We will finish by discussing the practical implications of this research for determining the expertise of ergonomic consultants and the appropriate level of expertise required for typical applications.

Manual material handling (MMH) professionals are subject to ergonomic stressors while performing work tasks. The cumulative effect of repetitive motions, awkward body postures, excessive use of force and static muscle loads increases the risk of musculoskeletal repetitive strain disorders. This case study considers multiple MMH specialists in a shipping department to simulate major tasks and analyze postures, lifting and workplace design. Individual technique and productivity data was captured using observations, participant surveys and interviews. JACK, a 3-D simulation tool, was used to model the work environment and risk to lower back spinal forces. Posture analysis was also performed using Rapid Upper Limb Assessment (RULA). Most tasks observed involved awkward postures and high forces in the lower back. Furthermore, 67% of the participants with over two years of experience reported at least one injury. The results support the importance of recognizing the risks of MMH and implementing ergonomic strategies that reduce the risk of injury and increase efficiency. This presentation will explore the process employed to delineate risks and discuss administrative (staffing, breaks, training) and engineering controls (equipment, layout, redesigning tasks) that can aid in reducing the identified risks.

This fast-paced session assumes a basic knowledge of office ergonomic risk factors and solutions. It uses specific case studies and examples to demonstrate practical in-the-field solutions for special cases that are seen in today’s workforce. The focus will be how to address the non-traditional employee. What specific factors need to be considered for a pregnant employee, ADA employee or telecommuter? New trends in sit-stand workstations will also be addressed including their pros and cons. Group interaction and discussion will be utilized. Attendees will be able to return to the workplace with new solutions for some of the more challenging assessments they may encounter.

**SESSIONS**

**THURSDAY, MARCH 29**

**Dd** **DISTRIBUTION & MATERIAL HANDLING SOLUTIONS FOR THE PRACTICAL ERGONOMIST**
Charles Scalise, CNA Insurance
Session: Ergonomics in Design and Development
Room 208 – 210
All Levels

Learn how critical bottlenecks were identified and practical solutions were implemented in three different industries (Packaging/Distribution, Plastics Blow Molding, Electronic Goods Recycling). Some of the key highlighted solutions include: a) Pivoting tables, b) End of line carousels and c) Feed to center re-configuration. A greater than 50% efficiency improvement was achieved in each case. Combined savings from reduced injuries exceed $1 million annually.

**Oe** **OFFICE ERGONOMICS WITH A CURVE**
Marjorie Werrell, ERGOWORKS Consulting LLC; Debra Lieberman, Zack Koutsandreas, Novavax
Session: Ergonomics in the Office
Room 206 – 207
Intermediate

This fast-paced session assumes a basic knowledge of office ergonomic risk factors and solutions. It uses specific case studies and examples to demonstrate practical in-the-field solutions for special cases that are seen in today’s workforce. The focus will be how to address the non-traditional employee. What specific factors need to be considered for a pregnant employee, ADA employee or telecommuter? New trends in sit-stand workstations will also be addressed including their pros and cons. Group interaction and discussion will be utilized. Attendees will be able to return to the workplace with new solutions for some of the more challenging assessments they may encounter.

**E** **DETERMINING ERGONOMICS EXPERTISE: RESEARCH FINDINGS AND PRACTICAL IMPLICATIONS**
Kristin Streilein and Edwin Irwin, Mercer Engineering Research Center
Session: Ergonomics Programs
Room 208 – 210
All Levels

While it would be ideal if everyone calling themselves an ergonomist was an expert in the field, the reality is that without mandatory certification there is no guarantee the consultant pitching his/her services is truly an expert. This presentation will look at definitions of expertise and the current theoretical models of expertise development. We will then consider how researchers measure expertise in ergonomics and human factors. We will finish by discussing the practical implications of this research for determining the expertise of ergonomic consultants and the appropriate level of expertise required for typical applications.

**ME** **MANUAL MATERIAL HANDLING MITIGATION OF MUSCULOSKELETAL INJURY RISKS WITH SIMULATION AND ERGONOMIC PRINCIPLES AND TOOLS**
Shanon Wooden, University of Central Florida
Session: Ergonomics in the Manufacturing Environment
Room 212 – 214
All Levels

Ergonomic risk assessment is most frequently performed using observational methods/tools, such as REBA on prescribed elements of a job. While generally low-cost and valid for many applications, such techniques can be of limited use in mitigating risk on jobs having a wider scope of effort, variation in frequency of action, environmental or structural constraints to solution, or inaccessibility to observation.

The author will present three case studies illustrating the use of digital human simulation of work or the analysis of body-worn sensor data to enhance or replace observational methods of ergonomic risk assessment. The benefits each advanced method offered will be highlighted, relative to the customers’ expected outcomes. Finally, the cost implications will be discussed, both for the tools themselves and for the level of expertise required to utilize them.

Such advanced tools and methods provide ergonomists the ability to quantify risks with sufficient accuracy and granularity to customize risk management strategies to meet the needs of both workers and management.

**Tt** **BEYOND REBA: HOW ADVANCED TOOLS CAN ENHANCE ERGONOMIC RISK MANAGEMENT**
Edwin Irwin and Kristin Streilein, Mercer Engineering Research Center
Session: Tools and Technology for Practitioners
Room 212 – 214
Intermediate/Advanced Level

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Intermediate/Advanced Level

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**Dg** **TRAINING GENERATION Z: INSIGHTS FOR OUR YOUNGEST STUDENTS AND EMPLOYEES**
Richard Sesek, Robert Thomas, Menekse Salar, M. Fehmi Capanoglu, Ashley Garner, Tom Devall and Xuanxuan Zhang, Auburn University
Session: Diverse and Global Workforce
Room 204 – 205
Basic/Intermediate Level

Ergonomics professionals in academia and industry are currently faced with a common challenge. Specifically, communication with younger students and employees born after 1995 and referred to by demographers as “Generation Z.” They adopt different learning strategies than their millennial predecessors. Traditional instruction approaches must, accordingly, be modified to optimize their learning experiences. An introductory (3 credit hour) course has been taught for 17 years to all sophomore students majoring in Industrial and
Systems Engineering at Auburn University. In 2013, faculty were encouraged by the university's Biggio Center for Enhancement of Teaching and Learning to begin modifying instruction in anticipation of Generation Z students. A variety of interactive instructional approaches were developed and implemented for four consecutive years (2014 – 2017). Class evaluations indicate these instructional methods have been both effective and well received, but there remains room for improvement. Communication with industry partners suggests that they also recognize the need to modify ergonomics training to effectively communicate with Generation Z employees. These employees may benefit from these instructional experiences at Auburn University. We present a sampling of activities that we find effective in the classroom along with suggestions for applying them in the workplace.

**AR ‘STAND UP FOR YOUR HEALTH’ - CREATION OF A TOOL TO REDUCE SEDENTARY BEHAVIOR IN OFFICE ENVIRONMENTS**

Thomas Heilskov-Hansen, Novo Nordisk
Session: Applied (Translational) Research
Room 206 – 207
Intermediate Level

The health-related risk factors associated with sedentary work are becoming more evident and scientifically well established. This emphasizes the need to address this issue in large global companies with many office workers.

Behavioral scientists assisted in the development of a practical toolbox aimed at reducing sedentary work. The initiative was evaluated using both an objective (accelerometers) and subjective (questionnaire) approach.

Musculoskeletal disorders and lifestyle related diseases have been linked to long periods of sedentary behavior. Even though most office workers in Scandinavian countries are equipped with sit-to-stand desks, most rarely use the standing functionality. This emphasizes a need for a method or tool that can help change this behavior going forward. The impact on physical well being and health will be substantial if succeeded.

Based on existing knowledge and behavioral science a tool has been developed aimed at helping office-based employees reduce their long periods of sedentary work in a global pharmaceutical company with 42,000 employees.

**TT FORCE ESTIMATION TECHNOLOGY FOR MORE PRACTICAL USE OF SUBJECTIVE FORCE RATINGS**

Murray Gibson, Saturn Ergonomics Consulting; Connor Lusk, Saturn Ergonomics/Auburn University
Session: Tools and Technology for Practitioners
Room 212 – 214
Intermediate/Advanced Level

Many times, ergonomics practitioners use employee subjective (1-10) force ratings to estimate force levels when it’s difficult to measure the force directly with a force gauge, or when the appropriate force measurement equipment is unavailable (example: facility does not have a torque gauge). This can be problematic because individual strength differences impact the “meaning” of the subjective force ratings (i.e., your “3” rating may be my “5” rating due to differences in individual strength capability). The authors present a practical, evidence-based model to more accurately translate individual subjective force ratings into actual force values (expressed in pounds-force). The model is calibrated to the user (“rater”) with inputs of select measured individual strength capabilities (max grip strength, pinch strength, etc.), or by estimating individual strength capabilities with predictive equations and models. The predictive equation route utilizes readily obtainable user/rater inputs (characteristics such as gender, age, height, etc.). This Force Estimation Technology model serves as a practical tool for the ergonomics practitioner to more accurately determine force values in the field using subjective ratings.
FIVE THINGS ERGONOMISTS CAN DO TO PROMOTE IMPROVED CYBER-SECURITY
Rich Halstead-Nussloch, Kennesaw State University
Session: Diverse and Global Workforce
Room 204 – 205
Basic/Intermediate Level

Writing for Forbes.com, Steve Morgan estimates the cost of cyber-crime will top 2 trillion dollars in 2019. Although much of cyber-crime is committed only through machines, some of the more pernicious and sophisticated rely on users to act human, such as spear phishing where a personalized email convinces a user to provide sensitive information, e.g., passwords. The approach taken is to survey the data and findings about cyber-security breaches to identify the major cyber-security crimes requiring human action and leverage the perpetrators’ knowledge and application of human factors; then point out ergonomics countermeasures to mitigate the risk of these cyber-crimes. Through understanding the cognitive ergonomics of cyber-security and what countermeasures are available, practicing ergonomists will increase their capability, scope and value to serve their facilities, by knowing the major links between cognitive ergonomics and cyber-security; utilizing best-practice countermeasures to ergonomics-based cyber-crimes and promoting effective cyber-security through good ergonomics practices.

FEATURED SPEAKER – ADJUSTING TO THE REALITY OF OBESITY IN THE WORKPLACE: STRATEGIES FOR INJURY PREVENTION AND HEALTH PROMOTION
Lora Cavuoto, University at Buffalo
Session: Applied (Translational) Research
Room 206 – 207
Intermediate/Advanced Level

Obesity now affects over 600 million adults worldwide and has a 30% prevalence in the U.S. workforce. Higher levels of obesity are correlated with higher injury rates. Compensation claims related to lifting and exertions and injuries of the back, wrist/hand and neck/shoulder are all more common with a higher BMI. Obesity is associated with a decrease in general physical function and cognitive abilities. As such, the effects of obesity on work performance, physical capacity and cognitive function is important to ergonomists, safety professionals and occupational health experts. This presentation will highlight the specific effects of obesity on work-related outcomes including balance, falls risk, strength and materials handling ability, including a discussion of areas where the obesity effect has been shown to be minimal and a consideration of the limitations and gaps in the current knowledge of obesity-related effects. Strategies for risk assessment and job design will be discussed, emphasizing strategies that move beyond accommodation and consider the new normal of working population demographics. As the effects of obesity are accentuated by lack of exercise, general poor health and co-morbidities, this presentation will discuss opportunities for implementation of a total worker health approach.

USABILITY TESTING METHODS AND METRICS FOR THE SCREEN AND BEYOND
Kristin Streilein, Mercer Engineering Research Center
Session: Tools and Technology for Practitioners
Room 212 – 214
Intermediate Level

Every device designed for people to use has a user interface, yet most often the design of this interface is given limited thought with poor results. This presentation is intended as an overview of usability testing for the screen and beyond. Starting from the ISO definition of usability, various methods of usability testing will be discussed. The types of measurements that can be obtained by these methods and specific metrics for comparison will be examined in the context of answering specific usability questions of concern to designers and users. Practical examples for both screens and physical objects will be used to illustrate these concepts.

THE EVOLUTION OF ERGONOMICS ASSESSMENTS AT 3M
Holly Wick and Jeffrey Nelson, 3M
Session: Tools and Technology for Practitioners
Room 208 – 210
Intermediate Level

Three stages of the use of an ergonomics assessment tool at a global corporation will be discussed: selection methods, original implementation and design of modified version for efficiency and increased usage as the corporation grew. Selection methods will be discussed relative to user population characteristics. The original implementation involving preparation, training development and support required will be reviewed. Drivers for tool modification and redesign, and the basics of the new design will be presented. Finally, a comparison of original versus current states of use will highlight best practices and lessons learned in each situation.

ERGO AND DAILY LIVING
Bobbie Watts, Michelin North America; Marenda Caldwell, UPS
Session: Diverse and Global Workforce
Room 204 – 205
All Levels

Most of the time, our efforts and resources for improving ergonomics are centered around physical changes and behaviors within the workplace. However, we have to take into consideration what our employees are exposed to outside of work on a daily basis. Additionally, we have to consider personal characteristics that everyone brings – whether at work or at play. This presentation will focus on challenges many face outside of work (such as taking part in common hobbies and the daily functions of those with debilitating conditions) where good solid ergonomic principles would be beneficial and applicable. This presentation will also provide examples and foster discussion on how best practices used outside of work can be used as a source of innovative ideas to reincorporate into the workplace – and vice versa. We all have one body and we take it everywhere we go. Therefore, we need to make sure ergonomics is a way of life – not just a way of work.
ERGONOMIC ASSESSMENT INVOLVING DEVELOPMENT OF A PERSONAL MOBILITY DEVICE
Antonio Ortega, Patricia Sullivan, Delia Rosales-Valles, Joel Cazares, Kaela Gudz and Edward Pines, NMSU College of Engineering
Session: Ergonomics in Design and Development
Room 208-210
Intermediate/Advanced Level

This investigation helps propose a new approach for the ergonomic assessment in the design of mobility devices targeted toward a specific percentage of the population living in a metropolitan area. The results of the investigation deliver the optimal ergonomic specifications that aid in the elimination of injury, provide maximum comfort and reduce fatigue among the mobility device’s users. The analysis, which establishes the appropriate measurements of the Baby Boomer population in Washington, D.C., within the 5th and 95th percentile, is done simultaneously alongside the design process. The measurements are then tested using Tecnomatix Jack 8.3 and are further evaluated through the production of a prototype. External factors, such as road conditions, are also considered in the final model, as they could also increase the risk of ergonomic nonconformity. The final results show that the device conforms to the ergonomic measurements and meets the necessary expectations in comfort, feasibility, fatigue and injury. This approach has been effective in designing the mobility device, thus eliminating the need for further engineering design revisions.

BREAKING DOWN CULTURAL BARRIERS AT LA-Z-BOY – A CASE STUDY OF EARLY ERGONOMIC INVOLVEMENT IN A NEW PRODUCT LAUNCH
Dan Mines, Sandalwood Engineering and Ergonomics; Tim McCurry and Dennis Poland, La-Z-Boy Inc.
Session: Ergonomics in Manufacturing Environments
Room 212 – 214
Intermediate Level

La-Z-Boy is a major manufacturer of high quality furniture, with plants located throughout the United States. The processes employed in producing these products place extreme ergonomic demands on the workers. High rates of production, prolific use of hand tools, heavy end items and work practices place demands on employees that result in high rates of employee turnover, absenteeism and work-related MSDs. For the first time at La-Z-Boy, ergonomic engineering principles and tools were implemented early in the timeline of a new product launch. This presentation will describe the benefits of moving ergonomic principles more up front in a product launch timeline, challenges of overcoming cultural structures and describe how bottlenecks on manufacturing plant floors can be removed through early identification and mitigation of ergonomic risks.

STUDY OF NEAR-FALLS IN HEALTHY ADULTS UNDER STANDING AND WALKING CONDITIONS
Shubo Lyu, Andris Freivalds and Ling Rothrock, Pennsylvania State University
Session: Fall Prevention
Room 204 – 205
Basic Level

Human body balance has been studied, and unbalanced conditions and falls, especially in the elderly, can be detrimental. Most findings in existing research focused on post-fall conditions, but few studied near-fall conditions for preventing and detecting falls. In this research, near-fall conditions in standing and walking will be stimulated. In standing: 1) standing on the level floor for 30 seconds; and 2) standing on a balance for 30 seconds. In the walking condition test, there are three conditions: 1) walk on level floor for 10 meters, turn around and walk back; 2) walk on balance hemisphere for 10 meters (which are put in a straight line), turn around and walk back; and 3) walk on balance beam for 10 meters, turn around and walk back. Body acceleration and angular velocity on the head, sternum and waist will be measured, as well as galvanic skin response and blood pressure. Then machine learning algorithms like support vector machine can be implemented for predicting falls. This research focuses on near-falls under standing and walking conditions, which is beneficial to build algorithms for detecting falls. Also, with multiple parameters change it could help improve the algorithm accuracy.
The Role of Ergonomics Champions in Developing and Managing Ergonomics Programs

David Alexander, Auburn Engineers, Inc.
Session: Master Track
Room: 211
Intermediate/Advanced Level

The following organizations have been invited to share their knowledge and experience within this Master Track, and we thank them for their willingness to help others.

Gulfstream Aerospace, Navistar, GE Appliances/Haier, Ergo-ology, Johnson & Johnson, Boeing and Toyota.

There are many variations of ergonomics programs, yet one thing most have in common is the lack of an “Ergonomics Champion.” The concept of a champion is widely used in many quality management programs and lean initiatives. The champion is there to support the program and assist with resources. Yet, for many ergonomics programs, there is no Ergonomics Champion. If there is one, he or she rarely interacts with the ergonomics team. The Ergonomics Champion rarely has a playbook for guidance, and little is done to train, educate and mentor the Champion for this role. Few Ergonomics Champion have ever met or benchmarked with other Ergonomics Champions from sister sites or nearby industries. This Master Track Presentation is designed to let several pairs of Corporate Ergonomists and their Ergonomics Champions explain their roles, their interactions, their partnerships, their successes and their learnings in a no-holds-barred discussion and questions and answer session in front of a live audience.

Design of Roller Coaster Seat from Anthropometry Perspective

Jess Li, Mengyi Yu and Yi-Chien Lu, Pennsylvania State University
Session: Ergonomics in Design and Development
Room 208-210
All levels

During the roller coaster ride, riders are secured within the seat by the U shape harness. However, more than half of the riders reported concerns of not being fastened tightly based on our survey. This work proposed a redesign approach for roller coaster seat including the U shape harness. Anthropometry data was pulled from ANSUR (military population) and NHANES (general population), including hip breadth, buttock-popliteal length, sitting height, head breadth, chest breadth, abdominal extension depth (sitting). Seat size, like seat width, seat depth and seat backrest height as well as the U-shaped harness internal width, are determined by the 90th percentile values of the corresponding anthropometry data. To design the shape of the harness, we tested two types of curve: Elipse and Quadratic Bezier’s curve. In order to find the parameters for each curve type, we ran an optimization analysis through Solver in Excel 2013. The objective function is the total percent accommodation, i.e., when the harness touches the shoulder, it shall also touch the abdomen. In the end, it was found that Elipse can accommodate more people compared with Bezier’s curve. The methodology can be extended to different curves to find the best-fit shape.
A COGNITIVE ERGONOMIC ASSESSMENT OF OFFICE CHAIR DESIGN
Ashley Shortz, Madeline Franke, Ecem Kilic, Whitney Mantooth; Ranjana Mehta, Texas A&M University
Session: Office – Applied (Translational) Research
Room 206 – 207
All Levels

The office environment has changed greatly over the past decade, specifically with respect to office chair design. Traditional seating evaluations have typically emphasized outcomes associated with long-term sitting, like low back disorders. However, the effects of chair design (i.e., static or highly adjustable) on cognitive performance has been limited. The present study was a cognitive ergonomic assessment of chair design on cognitive performance and cardiovascular responses. This study consisted of 41 participants that attended three experimental sessions. The cognitive test battery included three tasks that examined various cognitive functions including working memory, cognitive flexibility and inhibition response. The results from this study will be used to determine the potential cognitive benefits of chair design.

11 – 11:25 a.m.

REQUIREMENTS – DO YOU HAVE YOUR SHOPPING LIST READY?
Donald MacDonald and Linda Miller, EWI Works International Inc.
Session: Ergonomics in Design and Development
Room 208 – 210
Basic/Intermediate Level

Ergonomists are always keen to be involved in the procurement of equipment so that ergonomics is considered in the acquisition. We always say that ergonomics would not be viewed as “too expensive” if we had just been asked before a new piece of equipment was purchased. To best show our value, we need to differentiate wants from needs, and we need to provide a prioritized shopping list with the needs at the top of the list. The shopping list can be called a list of requirements. By writing a list of testable requirements, getting the correct product with appropriate features increases significantly.

Standards such as ANSI HFES 100 and BIFMA G1 2013 provide invaluable information for ergonomists; however, they might be overwhelming for non-ergonomists to apply. A requirement that needs extensive analysis is more likely to be ignored or misinterpreted by readers. The presentation will provide examples related to office equipment procurement with both well-written and poorly written requirements. More technical doesn’t necessarily mean better. Creating testable requirements that can be understood by your clients and the vendors you are working with will assist in the procurement of the equipment that meets your client’s needs.

FAD VS. FACT: WHAT ERGONOMICS SOLUTIONS DO YOU REALLY NEED?
Jeff Sanford, Humantech
Session: Ergonomics in Manufacturing Environments
Room 212 – 214
Basic Level

When workplace ergonomics is done right, everyone is on board. Selecting the proper solutions, getting management support to fund it and making sure employees are involved during the implementation process will not only reduce injury and illness rates, but will improve productivity and employee morale. This session will uncover the most important elements needed to implement and manage a sustainable ergonomics process and will share readily available solutions for the office, manufacturing, processing and warehouse environments. Passing fads will be exposed, and best practices from Fortune 1000 companies will be shared.

REACTIVE BALANCE TRAINING AS A WORKPLACE FALL PREVENTION INTERVENTION
Michael Madigan and Maury Nussbaum, Virginia Tech
Session: Fall Prevention
Room 204 – 205
All Levels

Slips, trips and falls remain a major contributor to occupational injuries and lost work time. A fairly new approach to reducing the number of falls is to improve the reactive balance response to a slip or trip through training. This so-called reactive balance training is based on well-established motor learning principles and involves repeatedly exposing individuals to slip and trip-like perturbations in a safe, controlled manner. We will present multiple studies from our group that support the potential of this approach to reduce fall rates after laboratory-induced slips and trips. This training is thought to have strong potential for application in the workplace.

EVIDENCE BEHIND ALTERNATIVE COMPUTER MOUSE DESIGNS
Ahmed Radwan, Utica College
Session: Office – Applied (Translational) Research
Room 206 – 207
Intermediate Level

Previous research has shown that the prolonged use of a standard computer mouse is associated with musculoskeletal symptoms. Many alternative designs may reduce this risk by optimizing posture, decreasing undesirable muscle activity and improving subjective response. However, the evidence behind their efficacy has not been well established yet. Multiple databases were searched by independent researchers to identify high quality-controlled trials that evaluated the use of alternative and standard computer mouse designs. This search identified 17 studies within that last decade that met the inclusion criteria for data extraction and analysis. Methodological quality of included studies was assessed by two independent raters utilizing the PEDro scale and the Cochrane Risk of Biase scale. Alternative computer mouse designs such as biofeedback, roller-bar, slanted and vertical mice were effective in reducing muscle activity in comparison with the standard mouse; however, the level of evidence that support their use has been deemed mild to moderate. It is also clear that ergonomic education will enhance the benefits of using alternative mouse designs. Authors conclude that mouse selection should be an individualized process that is preceded by careful analysis of everyone’s needs and occupational demands rather than the desire to change.
POSTER SESSIONS

Posters will be on display in Grand Ballroom West - 2nd Floor

Information on a variety of topics will be displayed in a poster format in the exhibit hall foyer through the duration of the conference. Presenters from the poster sessions will provide attendees with an overview of their topic in a one-on-one conversation. Attendees can walk to each poster presentation on their schedule. Authors will be at their posters the following times to answer your questions:

Tuesday, March 27 from 1 – 2 p.m.
Wednesday, March 28 from 11:30 a.m. – 12:30 p.m.

Poster # 2154
Proactive Approach for Enhancing Ergonomics Awareness
Jerry Cline, Honda Transmission Mfg.

Poster # 2155
Ski/Snowboard Tech Shop Ergonomics
Shaheen Ahmed and Jaxon Antolak, Minnesota State University, Mankato
Peter Paulson, KEB America, Inc.

Poster # 2156
Ergonomics Versus Traditional Squat Bar: A Pilot Study
Shaheen Ahmed, Bryan Caffin, Caleb Goettl and Kristen Konkol, Minnesota State University, Mankato
Melissa Ryan, AGCO Jackson Operations

Poster # 2157
Anthropometric Evaluation of the Formula SAE Car: A Pilot Study
Shaheen Ahmed and Heejin Soh, Minnesota State University, Mankato

Poster # 2159
What’s Up? A Review of Changes Within an Animal Care Organization Practicing Ergonomic Safety Risk Assessment Auditing
Carol Oteham, Purdue University

Poster # 2160
Hit Ergo Home Runs With a Baseball-Themed Competition
Kevin Barefield and Claudia Sanchez, Gulfstream Aerospace Corporation

Poster # 2162
The Influence of Lean Manufacturing on the Improvement of Working Conditions in a Mining Industry Sector
Rodrigo Pereira, Flavia Rossi Vale and Ximena Valis, Ergo Center
Enilene Lovatte, Marisa Coser, Melina Peixoto and Alexandre Machado, Instituto Federal do Espirito Santo

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ERGO CUP® COMPETITION

The internationally recognized Ergo Cup® competition, sponsored by the Ergonomics Center of North Carolina and Edward P. Fitts Department of Industrial and Systems Engineering at North Carolina State University and presented by IISE, provides an exciting opportunity for companies to highlight their successful ergonomic solutions. The general theme across all Ergo Cup® categories is innovation.

Each year, organizations are asked to submit their solutions or ergonomics initiatives to one of three categories. Any organization that has created an effective solution or initiative within the previous 24-months is eligible to compete. After submitting their entry, teams arrive at AEC and present their entry to a panel of expert judges who will select five winners. Then, once winners have been selected by the judges, attendees vote on five Excellence Awards that cover the five major judging criteria.

The five Ergo Cup® categories are:
- Team-driven workplace solutions
- Team-driven workplace solutions for companies with internal competitions
- Engineering/Ergonomist-driven workplace solutions
- Engineering/Ergonomist-driven workplace solutions with internal competitions
- Ergonomic Program Improvement Initiatives

The five Ergo Excellence awards are:
- Innovation
- Simplicity
- Cost savings
- Ergonomic risk
- Presentation quality

2018 ERGO CUP® FINALISTS

Energizing Ergonomics: The Comprehensive Ergonomics Solution
Cummins Power Systems, Fridley, Minnesota
Category: Ergonomics Program Improvement Initiatives
Ergo Cup® Booth: 224

The presentation will show the comprehensive process that the Cummins Power Systems site in Fridley, Minnesota revamped and implemented in a 12-month period. The presentation will highlight the preventive and reactive processes, the engineering approaches and the innovative measurement process that has shifted focus from lagging measures to leading indicators that led to more than a 40% reduction in recordable-level incidents.

Postural Education on Filling and Folding process
Ethicon, Neuchâtel, Switzerland
Category: Ergonomics Program Improvement Initiatives
Ergo Cup® Booth: 225

This presentation will show a postural education program for sitting workstations composed of visual indicators with graduation on all adjustable part of each station, training and annual refresh, individual memory card with personal parameters, good save behavior program.

“TALK the TALK – ERGO Moments”
Johnson & Johnson Vision Care, Jacksonville, Florida
Category: Ergonomics Program Improvement Initiatives
Ergo Cup® Booth: 226

Ergonomic injuries and OSHA recordables continued to occur, although Ergonomic Job Analyzers were performed to keep operators at a low risk. Due to some operators being unfamiliar with ergonomics and not following their safe job procedures ergonomic injuries were occurring to operator's shoulders, lower back, elbows, forearms, wrists and hands, due to overreaching, twisting and overexertion. Implementing ERGO Moments helped operators understand the importance of following their safe job procedures. Operators are now identifying ergonomic risks within their job task and are engaged in the processes. ERGO Moments has helped lower our overall ergonomic injuries and OSHA recordable.

ERGO LOGIC – New Model Packaging Process
Honda of Canada Mfg., Alliston, Ontario, Canada
Category: Ergonomics Program Improvement Initiatives
Ergo Cup® Booth: 227

Honda of Canada Mfg. (HCM) works with suppliers to design packaging for parts shipping. Previously focus was on maximizing efficiency of packaging in trailers. The New Model logistics team adjusted the process to focus on ergonomic impact and benefits directly related to proper part presentation. HCM logistics group implemented 812 packages for CRV and 642 packs for Civic over a two-year period with this approach. The HCM & supplier production processes are repetitive. Part loading and part removal will directly affect the users’ posture, repetitive motion, force exertion, morale and quality of work. ROI = 5.6; Payback 79wks.

Propulsion Ergo Program Improvement Initiative
GE Transportation, Erie, Pennsylvania
Category: Ergonomics Program Improvement Initiatives
Ergo Cup® Booth: 228

The Propulsion division of GE Transportation, Erie, Pennsylvania, launched its ergonomics program in late 2013. This project describes the program improvement journey from 2013 to 2017.

Fountain Gun Clamp
Coca-Cola, Philadelphia, Pennsylvania
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 200

The Fountain Gun Clamp is a simple solution that allows an employee to bleed syrup flavor soda lines without having to hold down each button on a Fountain Gun (what you would see a bartender hold down to serve drinks). It’s made from a c-clamp and has a flat piece of sheet metal welded to the tip of the clamp.
2018 ERGO CUP® FINALISTS

**Conveyor Cleaner**
Coca-Cola, Tempe, Arizona
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 201

Using recycled parts, a tool was fabricated ($220, in-house) that sprays water, brushes the conveyor and squeegees excess debris from the surface of a conveyor. To use, the operator clamps the unit to a water hose, which also acts as the main power source to engage both the scrub and squeegee operations. The conveyor cleaner can be attached to any conveyor line and eliminates any manual cleaning.

**Cryovac Juice Extractor**
Dunedin Juice Plant, Dunedin, Florida
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 202

For specific customers (such as McDonald’s), Coke is required to perform large quantity quality checks on the syrup being delivered to external customers. To complete the task, random syrup samples must be taken, and barrels must be filled to ship to the quality check lab. Each test requires a 50-gallon drum to be filled. Product filling the barrels can be out of plastic bags (about 15 gallons each). Syrup is very expensive and was difficult to completely get out of each bag and into a testing barrel.

**Sandblasting Our Way to Better Ergonomics**
Cummins Fuel Systems, Columbus, Indiana
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 203

The presentation will describe the innovative modifications to a sandblast cabinet by a cross functional team of employees at Cummins Fuel Systems. The innovative yet simple modifications greatly reduced the ergonomic risks associated with the re-work of parts used in High Horsepower injectors for diesel engines producing up to 4200 hp. Visitors to our booth will have the opportunity to experience a simulation of the awkward posture and other ergonomic risks this project reduced by 95% while spending less than $300.

**The Clampettes**
Honda of America MFG. Inc., Anna, Ohio
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 204

Production associates manually set over 26,000 hose clamps per day using needle nose pliers and similar tools, resulting in high grip forces, awkward wrist positions and high frequencies of motions and exertions. After analyzing all aspects of the job process and reviewing studies that showed differences in hand sizes, grip strengths and grip spans, the team designed and fabricated a clamp setting mechanism that eliminated all ergonomics and safety risks. This mechanism also improved quality by eliminating scratches to the clamp coating (prevents premature rust) and enhanced productivity by reducing adjustments due to inconsistent depth of the hose clamp setting.

**Battery Seal Press**
Honda of America MFG. Inc., Marysville, Ohio
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 205

During the assembly of the Integrated Power Unit on hybrid-electric powered vehicles, production associates repetitively turn a wheel on a press to lower 160 pounds of weight on top of the first battery to seal the seat, repeat this process to set the seal between the first and second batteries, and install other components on the IPU. The frequent turning of this press wheel at a raised height creates ergonomics risks in terms of posture and repetition. The team developed a new system to lower and raise the weights on the press using a system of pull pins and levers.

**Mission Accomplished**
Honda Transmission Mfg., Russells Point, Ohio
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 206

During the production repair process, production associates remove taper bearings from the torque converter or mission cases, averaging 85 taper bearings per month over the last two years. Production associates used a slide hammer type of device with a heat gun. The pounding motions caused physical stress on the hands, arms, shoulders and back. This very time-consuming method could also damage the cases. The team developed a new device to pull out the taper bearings using a two-handed ratchet motion. This new device eliminated the ergonomic stress, and greatly reduced the quality risk for damage and the time to complete repair.

**Foam Removal Tool**
Honda Manufacturing of Alabama, Lincoln, Alabama
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 207

Production associates need to install the sunroof drain tube through the structural steel between the front windshield and the driver-side window before the application of acoustic foam inside this A-Pillar. If newly hired production associates inadvertently skip this step, they go through an eight-hour repair process, exposing them to ergonomics risks such as overhead work, heavy manual lifting and awkward postures to be able to install the drain tube. The team fabricated an auger-type tool to remove just enough of the foam, allowing them to insert this drain tube, eliminating the ergonomics risks and making the repair significantly simpler.

**Thermally Initiated Venting System Station**
Lockheed Martin Missiles and Fire Control, Camden, Arkansas
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 208

An integrated set of tooling was designed, prototyped, built and introduced into the Thermally Initiated Venting System (TIVS) manufacturing process to eliminate significant awkward manual manipulation (pushing/pulling) and sustained and repetitive application of high force in awkward postures throughout the TIVS installation process. Incorporation of the fixture also significantly reduced awkward postures, which were previously necessary to access hard-to-reach components and fasteners. Engineering and process changes were implemented, which reduced the need for some strenuous activities while reducing the touch time and personnel required to perform the task.

**U2 Canopy Lift Tool Project**
Lockheed Martin Aeronautics, Palmdale, California
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 209

A Canopy Lift Tool was designed, fabricated and incorporated into the MMRO operations of the U2 “Dragon Lady” aircraft. Incorporation of this tooling eliminated the frequently encountered bending, twisting and extended and overhead reaching required to manually lift, lower and carry the aircraft canopy throughout the process. Implementation of the tooling also increased productivity, reducing the number of mechanics required to perform the task from six to three, freeing up the remaining mechanics to focus on value-added tasks.
Safe and Ergonomic Handling of Roller Platforms and Trolleys
Delphi Powertrain, Chihuahua, Mexico
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 210

Many pallets and containers with different types of bases need to be loaded and unloaded from various locations every shift. In order for this work to be performed safely, a risk reduction project was undertaken. Health and safety, ergonomic and productivity issues are all addressed with the solution to standardize the stop devices used to prevent pallets or containers from rolling off platforms.

Smart & Safe Sampler
PPG Coatings (Tianjin) Co. Ltd., Tianjin, P.R. China
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 211

Operators are required to obtain samples for QC testing from 50-gallon drums. The sampling process required a lot of manual work using a drum cart with much lifting, pulling and pushing forces on arms, wrists and trunk. The new liquid sampler, optimized by the team, eliminates moving the drum and allows the operator to obtain a sample through a small opening which only takes about 30 seconds.

Hands Down
Toyota Motor Manufacturing Indiana, Princeton, Indiana
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 214

The Toyota Indiana West Assembly Plant builds the Highlanders and Sequoias. Team members on Engine line were having to over reach to pick up the manifold on the production side and on the conveyance side (every 58 seconds). This process resulted in several early WMSD discomfort report, as well as injuries. This process also contributed to quality issues and additional costs because team members had to pick up manifold with one hand while setting it on the hook and it resulted in several dropped manifolds. Production team members designed and fabricated internally a solution to reduce vertical reach, while improving quality, cost and productivity.

MFU Battery Install
Raytheon, Louisville, Kentucky
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 215

During new production start-up of MFU, one task required employees to lift, turn and install seven batteries weighing 119 pounds each. This required two employees and took approximately two hours to complete. This task was not ergonomically correct and could lead to significant risk and potential injury to their backs, shoulders, hands and feet. Employees also must kneel and use awkward postures during the install. There was also a risk of damaging the battery and injury, if one of the batteries were dropped. Hourly employees recognized and discussed the risks involved and brainstormed ideas for a solution – a modified lift cart and extension.

The Amazing Demolding Station
Bibby-Ste-Croix, Quebec, Canada
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 216

Bibby-Ste-Croix is a foundry producing cast iron pipe and fittings. Our molten iron is transported with ladles lined with a refractory material which frequently needs to be removed and replaced. An 18-pound jackhammer was used for this task. The Ergo Project Team, with a progression of different ideas and evolving designs, developed and built a simple and efficient demolding station. The necessary ladle modifications were then incorporated into the project. The result was our new Amazing Demolding Station which eliminated significant ergonomic risks, reduced silica and noise exposures and greatly improved the efficiency of removing the refractory lining from the ladles.

Drill Powered FOD Cap Socket
GE Aviation, Cincinnati, Ohio
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 217

Ergonomic solution to improve the process of removing assembly FOD caps.

Over Easy
The Timken Company – Rail Bearing, Mascot, Tennessee
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 218

Timken’s Mascot, Tennessee, facility serves the rail industry by providing new and reconditioned rail bearing assemblies for passenger, freight and locomotive applications. The labor-intensive process of assembling rail bearings requires the bearings to be manually flipped in order to install all the necessary components. The average weight for each bearing at the point it is flipped is 80 pounds, with production volume reaching up to 450 bearings per eight-hour shift. The combination of these factors yields repetitive, awkward postures and high forces. After qualitative and quantitative ergonomic review along with associate input, the Mascot team designed, built and installed a mechanical bearing flipper that eliminated the need to flip over 7.5 million pounds of bearings each year manually.

EGO (Ergonomics-on-the Go)
Cintas, Greensboro, North Carolina
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 220

At Cintas, we deliver uniforms, mats, bundled aprons and boxed products. We improved our cart for transporting these items from our delivery van to our customer locations. The cart has better casters for easier handling and pushing across all types of surfaces. We can hang uniforms on the new cart, which maintains their quality and finish. We included a handle, work surface, hanger rack holder and spring-loaded bottom to reduce manual handling risks. It reduces lifting and carrying of product. We also developed a pulley system to take the 44-pound cart safely off and on the van.

Clem Cage
Coca-Cola, Maspeth, New York
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 221

Using the concept of a PEZ candy dispenser, the Clem Cage was designed (in-house) so that Order Builders can retrieve pallets without having to manually handle from the top of a pallet stack.

Wunderstand 2.0
Gulfstream-Appleton, Appleton, Wisconsin
Category: Workplace Solutions I (Team-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 222

To make airplane furniture, we use large aluminum honeycomb panels (weighing up to 35 pounds). Cabinetmakers use one hand to hold the panels while simultaneously using the other hand for highly intricate work such as adding wood trims, edge filling and performing a multitude of processes needed to complete each piece. This puts the worker in awkward postures and creates undue neck, shoulder and back stress. The furniture employees designed a new holding fixture that reduces the ergonomic impact of muscle fatigue when holding the panel and performing multiple tasks at the same time. The new device is so revolutionary to the furniture world that it recently received a patent for its unique design and process improvement.
The ROV Drive Shaft sub-assembly process used an Ergo Cup® Booth: 234 Workplace Solutions (Team-Driven categories). When bead blasting aircraft wheel assemblies, the operator is required to hold the bead blaster spray nozzle in one hand and physically lift and rotate the 50# assembly with the other hand to remove paint and corrosion before the painting process. This high-risk task causes hand, wrist, arm, and back fatigue and requires the mechanic to take multiple breaks during the operation.

“Mix” It Safer
The Estée Lauder Companies, Melville, New York Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 231

The Estée Lauder Companies’ manufacturing facility in Melville, New York, makes cosmetic products in large production vessels ranging from 25 to 1,000 gallons. To create a finished product, the raw materials are mixed together using a five-foot-long solid stainless-steel mixing shaft with an attached propeller. These mixing shafts can weigh up to 65 pounds and were known to cause musculoskeletal injuries when employees manually attached them to the motor. Technical Services employees working with the Engineering and EHS departments developed an in-house solution to modify the existing equipment to reduce the ergonomic risks.

The “Quint-Essential” Lifting Tool
The Estée Lauder Companies, Oevel, Belgium Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 232

The Estée Lauder Companies’ manufacturing facility in Oevel, Belgium, produces cosmetic products for many brands within the company. Employees identified a need for a tool to avoid the ergonomic risks of the improper lifting of heavy rolls of paper used as packing material. After reviewing possible vendor solutions and not finding a suitable option, the employees proposed modifying an adjustable lifting tool for multiple heavy and awkward lifting tasks throughout the facility.

Jurassic Press

The ROV Drive Shaft sub-assembly process used an arbor press to press in the bearings. The equipment limited who could operate the station to only 29% of the workforce. The press had a high ergonomic risk for the shoulders and elbows, requiring extended reach and high force to operate and repeating the operation 3-5 times per piece. It also had the potential to strike operators working or walking behind the press.

The team retrofitted an old hydraulic press to replace the arbor press. By designing and building it in-house, they were able to save money, reduce the process time by 22% and change the operation to a LOW ergonomic risk. Now 100% of the workforce can operate this equipment. The changes saved an estimated $67,690 through avoided injuries and reduced process time.

Bushing Rodding Tool
Owens Corning, Newark, Ohio Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 235

The new and old tool will be compared to demonstrate the improvement in ergonomics. We will also include a video of the task being performed with the use of both tools to provide a clear picture of the tools used in the plant. A training simulator will be set up at the booth for hands-on experience for conference attendees and judges.

The Need to Rotate
Mueller Company, Albertville, Alabama Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 236

The completed hydrant was loaded to a pallet, on a conveyor and manually rotated. The hydrant was rotated to allow clearance for hydrant washer, before painting. On the new assembly line, the hydrant is loaded to a pallet that is automatically rotated to the correct orientation that would allow it to move through the rest of the line.

J.E.D. Clamp-It (Justifying Ergonomic Design)
DePuy Synthes, Horseheads, New York Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 237

As part of our machining process in the Solids cell, fixtures are utilized in the machining process. These fixtures are used to hold our raw materials during manufacturing. The fixtures were repeatedly moved in and out of the equipment to load and unload parts at varying intervals based on equipment cycle times. To secure the fixtures to the equipment, a ratcheting torque wrench and a hex key socket were used.

It is important that machine operators ensure that the fixtures are properly secured to ensure the product is within specifications.

Robot Bell Cup Push Tool
Volkswagen Group of America, Chattanooga, Tennessee Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 238

The idea to improve the manual assembly and disassembly of robot bell cups came from the team who completed the process daily and understood the ergonomic, safety and quality issues with the process. A tool was designed and 3D-printed to replace the robot manufacturer tool and improve the process. The tool created a process that was more ergonomically friendly by reducing pressure points on the palm and improved quality by reducing the potential to damage the bell cups. The tool improved the process time by controlling the location of the bell and eliminating the fatigue on the hands from compressing the bell cup during assembly and disassembly.

Baffle Installation Lever
Volkswagen Group of America, Chattanooga, Tennessee Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 239

The installation of a lever to install baffles onto parts was the idea of a team member who had sore thumbs and hands. The baffles have two clips that must be pressed into holes on a metal part. The baffle clips required high push force to install while the team member held the metal part. The process was changed by adding a stand to hold the part and a lever arm to press the baffle clips into the metal part. This resulted in a 40% reduction in force to install the clips and improved quality by reducing the amount of unseated baffles. In addition, productivity was improved 50% by creating a repeatable process.

Drive Shaft Delivery Method
Volkswagen Group of America, Chattanooga, Tennessee Category: Workplace Solutions I (Team-Driven Workplace Solutions) Ergo Cup® Booth: 240

The development of a new delivery method for drive shafts was born from team member ergonomic complaints and quality issues. The team re-designed the delivery racks by reorienting the parts from a
Ergo Cup® Booth: 243
Workplace Solutions
Category: Workplace Solutions I (Team-Driven)

At Honda of South Carolina, we have a process that poses a challenge to associates. The process requires the associate to torque a hub castle nut on a free spinning hub assembly. A locking device was implemented to retain the wheel studs to prevent the hub from spinning while torque is being applied. The locking tool is used 960 times per day in a normal 1:07 process time.

The Knuckle Sandwich
Honda Manufacturing of Indiana LLC, Greensburg, Indiana
Category: Workplace Solutions I (Team-Driven Workplace Solutions)
Ergo Cup® Booth: 244

Do you want a knuckle sandwich? How about a knuckle to the chest? Honda Manufacturing of Indiana takes its first swing in the Ergo Cup® with the Knuckle Sandwich team.

During the design review of the 2016 Civic model, production associates would have struggled in holding the 37-48 pound rear knuckle. With both hands tempering bolts, the chest would keep the knuckle assembly upright. This condition resulted in high risk for injury, increased downtime and poor associate morale. Knuckle Sandwich is proactive approach providing a fixture that supports the rear knuckle during installation, thereby eliminating all these potential inefficiencies.

Mig Masters
Honda of South Carolina, Timmonsville South Carolina
Category: Workplace Solutions I (Team-Driven Workplace Solutions)
Ergo Cup® Booth: 245

In the Weld Department at Honda of South Carolina, the process known as stageout requires an associate to lift a frame off of the primary fixture and carry the frame by hand to a staging table 6’ away. The second associate would lift the part from the staging table, exposing associates to parts with hot welds and sharp edges and then carry an additional six feet to the secondary fixture. Frames often fell during loading and unloading. Higher fatigue levels were attributed to excessive walking and material handling.

Lever for Door Adjustment
Ford Motor Company, Hermosillo, Mexico
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 62

Since 1987, our door adjustment process consisted of moving the door hinges by hitting them with a hammer and chisel. This process is critical to set the door correctly aligned to the vehicle. The idea to change that process came from our Ford Production System with a process called Workstation Stability and Continuous Improvement Mapping where we had four stations evaluated as RED in Safety, Quality and Delivery targets. These results were related to accidents, medical treatments, defects caused in these stations and downtime. A supplier manufactured the prototype lever with the initial design made by our engineering team. After the tryouts, our team made several iterations to improve the design. This design eliminated the ergonomic issues, decreasing the risk of accidents caused by handling the hammer and chisel; improved our vehicles quality by eliminating the marks produced by the impact of the chisel; and provided a cost reduction by decreasing hammer and chisel usage.

Coil Swage Process Change and Equipment Design
ATI Specialty Alloys and Components, Huntsville, Alabama
Category: Workplace Solutions I (Team-Driven Workplace Solutions)
Ergo Cup® Booth: 242

An employee-led ergonomics team was presented with a challenging problem with a swaging process for metal alloy coils. The facility was experiencing indicators for musculoskeletal disorders due to high vibration as well as lost sales revenue due to manufacturing inconsistencies. This employee-led team turned to process and equipment design changes to yield extreme results.

The project resulted in an 89% reduction in ergonomics risk factor score. Annual lost sales revenue of $28,620 was recovered with an annual injury cost avoidance of $60,000. The total annual ROI for the project was 4564% and the payback period was less than eight days.

Knuckle Buster
Honda of South Carolina, Timmonsville, South Carolina
Category: Workplace Solutions I (Team-Driven Workplace Solutions)
Ergo Cup® Booth: 243

Removing and replacing a 100+ pound main landing gear shock strut, and/or a side brace, for periodic maintenance requires two mechanics to manually lift and carry the component(s) from cart level to above shoulder height. Two mechanics are required to handle the component while another mechanic removes/replaces the holding pins that secure the unit to the aircraft. The process consumes three mechanics and poses significant risk for upper body and back injury. By adapting an existing lift device with an attachment that will latch on to the strut or side brace, the manual lifting and carrying requirement is eliminated and the labor and durations times are significantly reduced.

G650 Shock Strut & Side Brace Tool
Gulfstream – Appleton, Appleton, Wisconsin
Category: Workplace Solutions I (Team-Driven Workplace Solutions)
Ergo Cup® Booth: 241

Do you want a knuckle sandwich? How about a knuckle to the chest? Honda Manufacturing of Indiana takes its first swing in the Ergo Cup® with the Knuckle Sandwich team.

Final Assembly Door Panel Installation Fixture
Ford Motor Company, Hermosillo, Mexico
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 63

In Ford Motor Company’s Hermosillo Stamping and Assembly Plant, launching a new model is always a challenge given new specifications, options, upgrades, etc. We build the Ford Fusion and Lincoln MKZ models in our production lines. For Model Year 2017, there were some overall improvements to the vehicle. One of those was the additional speakers in models such as Lincoln MKZ. In simple terms, additional speakers equate to additional weight to the door panel.

Die Setter Laser Light Marker
Toyota Motor Manufacturing, TX Inc., San Antonio, Texas
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions)
Ergo Cup® Booth: 80

Die Setter Laser Light Marker
Toyota Motor Manufacturing, TX Inc. (TMMTX) Press/Stamping shop established a highly visible laser into the process to help with the current ergonomic standards within the production process. The implementation of the laser has created a highly functional visual solution that will prevent repetitive neck flexion, extension and rotation needed to safely lift and fly a four-ton press die with crane.

Applied Ergonomics Conference 2018 43
New CRV Tailgate Install Methodology
Honda of Canada Mfg., Alliston, Ontario, Canada
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 82

Honda of Canada Mfg. (HCM) engineers developed a new method to install CRV tailgates. With the new vehicle design and the old method of install, only associates greater than 6’0” would be able to perform the process. With the use of the tools developed to allow perfect fit and alignment of the tailgate, the hinges can now be installed before the placement of the tailgate, reducing the extreme reaches and awkward postures. This allows accessibility of all associates to the process. HCM associates have provided positive feedback, significantly improving zone morale. Injury avoidance = 4/year. ROI = 2.76, payback, 15 weeks.

Automatic Transmission Shift Lever
Honda of America Manufacturing, Marysville, Ohio
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 83

Transmission transfer units are mounted on the floor of the production line. The transmission lever is too high and the team members are forced to bend over and lift 50 pounds to complete the job. This results in an awkward position which can lead to back injuries. The team created a 3D printed lever with a switchable magnet that will assist in installation. The production team members have provided positive feedback on the fixture.

Snubber Die Cut Solution
GE Power, Charlottesville, VA
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 101

In 2016 a new product was introduced to our Charlottesville facility which was transferred internally from Kidsgrove, UK. This high-volume product (10,000/year) required material application to the top surface of the components to secure a series of 16 large capacitors from shock and vibration. Initial ergonomics risk evaluation indicated that there were 21 risks to mostly upper extremities that need to be addressed in the process to prevent any injuries in future.

Self Turning Tool
Toyota Motor Manufacturing, TX Inc., San Antonio, Texas
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 102

Toyota Motor Manufacturing, TX Inc. (TMMTX) at home to the Toyota Tundra and Toyota Tacoma. Over 110,000 Toyota Tacoma trucks are built each year and 80% of them 4X4 powered drivetrain. To complete a 4X4 Tacoma, the team members must rotate the Prop Shaft by hand six times to install the bolts to the Transmission Transfer unit. The constant rotation of the prop shaft has caused wrist and hand discomfort due to the awkward hand positioning. Team members worked alongside engineers to look for ways to improve the process. Their collaborative solution is a tool that helps self-rotate the prop shaft. The resulting solution not only improved ergonomic conditions for the production team members but also has improved production time savings to the production line.

Right off the Bat
Bridgestone Warren County, Morrison, Tennessee
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 103

We use a conveyor on each side of the creel stand to convey 80-pound spools of wire to the pins on the creel stand. Each reel is supported between two plastic bats that are attached across two chains that convey the spools about 40 feet along the creel stand. We modified the conveyor belts by splitting them into two parts. This modification allows us to change just the top half of the bat that gets worn from the spools. Three screws that are easily accessible allow us to replace the top of the bat rather than having to remove the entire bat from the conveyor.

Switchable Magnet
Large-Scale 3D-Printed Fixture with
Charlottesville facility which was transferred internally from Kidsgrove, UK. This high-volume production of new models was needed to optimize layout. The new ergonomic workstation was designed to replace two workstations by saving space and keeping the ability of processing two different harnesses using a rotating mechanism. We can alternate the setup to make two different products without sacrificing space and keeping ergonomic key points always active.

331 & 332 Routing Process on Same Table
Gulfstream Aerospace, Mexico City, Mexico
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 120

Looking for space reduction to support ramp-up production, Gulfstream Aerospace in Mexico City designed and implemented an innovative workstation that improved the ergonomics of the workstation by 26% and improved the productivity by 18%.

D614 Engine Strap Dolly
Gulfstream Aerospace, Savannah, Georgia
Category: Workplace Solutions II (Engineering/ Ergonomist-Driven Workplace Solutions with internal competitions)
Ergo Cup® Booth: 121

The presentation describes how a dolly used for the construction of an aircraft engine strap frame underwent numerous modifications to compensate for issues arising from a move from one building to another. What started as a simple change turned into a project which resulted in cycling over different parts of the dolly numerous times, resulting in continuous ergonomic improvements. Special emphasis is given to the integration of hinges that were manufactured as a single component using a new additive manufacturing process. This project won first place at the Gulfstream internal Ergo competition.
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EXHIBITOR BOOTH & ERGO CUP® LISTING

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Atlas Injury Prevention Solutions | Booth #108
Atlas Injury Prevention Solutions prevents injuries and reduces cost through various strategies including physical demands analysis; post-offer pre-employment and return-to-work physical function screens; ergonomics software, services, and training; on-site early intervention and physical therapy; and stretching for manufacturing, transportation, warehouses, offices, and healthcare. Best of all we support over 15,000 U.S. cities.

Barefoot Ergonomic Flooring by Beagle I Inc. | Booth #128
Barefoot Ergonomic Flooring by Beagle I Inc. is the manufacturer of Barefoot mats. GoodToGo and OnTheRun. Barefoot mats are ergonomic, anti-fatigue floor mats that use high quality rubber. Barefoot mats are highly effective safety mats that provide exceptional comfort for people who spend for long periods of time. Barefoot OnTheRun is a comfortable anti-fatigue footwear. It is worn over the shoe secured by adjustable strapping. It is intended for use in all dry areas where ergonomic flooring is impractical. GoodToGo is a warehousing traffic safety and warning system. It is a dual purpose lighted floor strip with microwave sensors that slows traffic and warns pedestrians and drivers that they are entering blind intersections.

BodyBilt by ErgoGenesis | Booth #37
BodyBilt ergonomic seating and accessories by ErgoGenesis is dedicated to building ergonomic workplace solutions that provide comfort resulting in increased productivity. The company’s national sales force markets BodyBilt products to companies of all sizes, government entities, educational institutions, healthcare facilities, emergency call centers and individuals throughout the U.S.

Caster Connection | Booth #70
Caster Connection – manufacturer and distributor of casters and wheels – serves as a trusted partner invested in the success of our clients by providing mobility solutions that offer measurable value. Since our founding in 1987, we have been dedicated to developing the most innovative and optimal solutions to deliver enhanced ergonomics, safety and efficiency for every partner.
**Contour Design Inc. | Booth #51**
Contour Design has been the leading manufacturer of workplace ergonomic solutions for over 20 years. Our unique RollerMouse line of products includes an updated version of our popular Pro series, and our newly updated wireless Contour Mouse is available in five sizes.

**Contour Design Inc.**
10 Industrial Drive
Windham, NH 03087
P: (603) 893-4556 | F: (603) 893-4558
www.contourdesign.com

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**Darcor Casters and Wheels | Booth #110**
Darcor Casters and Wheels provides ergonomic solutions that mitigate risk to injury, increase efficiency and promote a healthier workplace. We accomplish this through the use of proprietary wheel technology that exceeds ergonomic mobility standards.

**Darcor Casters and Wheels**
7 Staffordshire Place
Toronto, ON, Canada M8W 1T1
P: (416) 255-8563 | F: (416) 251-6117
www.darcor.com

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**Ekso Bionics | Booth #97**
Visit the Ekso Bionics booth to see our latest industrial products designed to improve worker safety including the new EksoVest which assists workers with repetitive overhead tasks and the EksoZeroG which makes heavy construction tools up to 35 lb. feel weightless. Learn how to work safer and smarter with Ekso Bionics.

**Ekso Bionics**
1414 Harbour Ways, Suite 1201
Richmond, CA 94804
P: (510) 984-1761
www.eksoworks.com

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**Enviance | Booth #93**
As a leader in cloud-based environmental, health and safety software, Enviance’s Office Ergonomic Software (OES) and RSIGuard are designed to protect your employees from common health risks while improving your company’s bottom-line performance through a comprehensive health monitoring and management program.

**Enviance**
5780 Fleet Street, Suite 200
Carlsbad, CA 92008
P: (866) 368-4262
www.Enviance.com

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**Ergo Advantage | Booth #111**
Ergo Advantage is a manufacturer of modular anti fatigue matting specializing in anti-slip, ESD and 5 and 6S initiatives with the best warranty on the market. The underside allows for cord and wire management, and the different color and lighting options greatly improve the work area.

**Ergo Advantage**
630 Glengary Cres.
Fergus, ON, Canada N1M 3E2
P: (519) 791-4989 | F: (519) 843-1982
www.advantagemats.com

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**Ergo Desktop | Booth #112**
Ergo Desktop is the manufacturer of the Kangaroo adjustable height desktop. We offer many options from our entry level Wallaby Junior, to one of our newest additions the Electric Kangaroo Pro. Our goal is to improve your employee’s overall health, comfort level, and finding ways to impact productivity using correct ergonomics.

**Ergo Desktop**
2116 Eaglebrooke Parkway
Celina, OH 45822
P: (567) 890-3746 | F: (866) 232-7988
www.ergodesktop.com

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**ergoCentric Seating Systems | Booth #86**
At ergoCentric Seating Systems, our sole mission is to design and manufacture the best ergonomic chairs in the world and we are recognized as North America’s premier manufacturer of high-quality ergonomic seating for office, specialty and healthcare environments.

**ergoCentric Seating Systems**
275 Superior Blvd.
Mississauga, ON L5T 2L6
P: (905) 696-6800 | F: (905) 696-0899
www.ergocentric.com

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**ERGOMAT | Booth #132**
ERGOMAT is a premier supplier of ergonomic and safety products, providing innovative economical solutions for challenges faced in an evolving workplace. From pioneering development of the ergonomic bubble mat, through introducing durable peel and stick floor striping and signage and more recently employing LED and kinetics into matting and signage products, we continue to supply the industrial marketplace with products responsive to immediate needs.

**ERGOMAT**
7469 Industrial Parkway
Lorain, OH 44053
P: (877) 374-6628
http://en.ergomat.com/en
EXHIBITORS

Ergonomic Assist Systems & Equipment (EASE Council of MHI) | Booth #48
The Ergonomic Assist Systems & Equipment (EASE Council of MHI) is made up of material handling equipment manufacturers focused on providing effective ergonomic solutions for the manufacturing, assembly, warehousing, distribution and other industries in the supply chain. Our goal is to help find quality (sound) ergonomic solutions that improve the work experience and productivity.

Ergonomic Assist Systems & Equipment (EASE Council of MHI)
8720 Red Oak Blvd., Suite 201
Charlotte, NC 28217
P: (704) 714-8760 | F: (704) 676-1199
www.mhi.org/EASE

The Ergonomics Center of North Carolina | Booth #113
The Ergonomics Center of North Carolina is a membership-based organization housed in the College of Engineering at North Carolina State University. The Center’s highly experienced, board-certified ergonomists provide the highest quality ergonomics consulting, training programs and research for companies throughout the world. Our services include onsite training, job and task analysis, program development, engineering design guidelines, and cost-saving solutions for both industrial and office ergonomics.

The Ergonomics Center of North Carolina
3701 Neil Street
Raleigh, NC 27607
P: (919) 515-2052 | F: (919) 515-8156
www.ErgoCenter.NCSU.edu

ErgoScience Inc. | Booth #126
ErgoScience provides hire to retire injury prevention services. Our pre-hire/post-offer Physical Abilities Testing helps you hire employees who can perform the physical requirements of the job. Our post-hire services help employees work optimally providing ergonomic assessment and training, worksite Early Intervention programs, pre-transfer and periodic Fitness for Duty Testing.

ErgoScience Inc.
201 Office Park Dr., Suite 150
Birmingham, AL 35223
P: (205) 879-6447 | F: (205) 879-6397
www.ergoscience.com/

Ergotron | Booth #52
Ergotron is on a mission to transform sedentary work environments into places of movement and health, with products grounded in ergonomics. Ergotron is helping computer workers around the globe adopt active sit-stand workstyles that improve comfort, health and mood states, in turn impacting productivity and vitality.

Ergotron
1181 Trapp Road
St. Paul, MN 55121
P: (800) 888-8458
www.ergotron.com

Ergotronix Inc. | Booth #41
Ergotronix Inc. is a leading designer and manufacturer of ergonomic material handling equipment based in Sarasota, Florida. We provide the best quality work positioners, transporters, lifters and conveyor rollers making manufacturing environments safer and more efficient all while boosting productivity. Remember, “Good Ergonomics = Good Economics.”

Ergotronix Inc.
6408 Parkland Drive
Sarasota, FL 34243
P: (877) SEE-ERGO
www.ergotronix.com

Eureka Ergonomic | Booth #122
Eureka Ergonomic will be showcasing their signature products from a unique collection. This includes an advanced-patented gas strut technology available in all their sit-stand desktops with multiple colors, electric height-adjustable standing desks, the Eureka executive swing chair, and other innovative office accessories.

Eureka Ergonomic
632 Fritz Drive, Suite 105
Coppell, TX 75019
P: (469) 294-8999 | F: (469) 294-8807
www.eurekaergonomic.com/

Feel Good Inc. | Booth #68
Feel Good Inc. provides portable TENS (transcutaneous electrical nerve stimulation) units offering a wide variety of benefits including alleviating back, nerve, post-op, diabetic pain and migraines. Our units also improve circulation and sleep patterns to decrease the use of pain relievers that causes negative side effects.

Feel Good Inc.
1460 Gemini Blvd. #8
Orlando, FL 32837
P: (407) 986-3351
www.feelgoodinc.org

Fanshawe College | Booth #116
Fanshawe College in London, Ontario, Canada, features a first-of-its-kind Post Graduate Certificate Program in Ergonomics. Attracting international students, offering unpaid field placement opportunities to United States companies. Learn about our program and graduates. Highlight ergonomic analysis tools, Jack digital human model, Handpak software, force gauge use.

Fanshawe College
1001 Fanshawe College Blvd.
London, ON, Canada N5Y 5R6
https://www.fanshawec.ca
**Flexpipe | Booth #125**

At Flexpipe, we certainly know about the importance of having the best equipment to maximize a production floor’s efficiency and ensuring employees are working in a safe, ergonomic manner. Modular materials handling systems will help you implement lean manufacturing and continuous improvement principles. Flexpipe – it’s tubes, joints and your creativity.

**Flexpipe**
1975 Latham Street
Memphis, TN 38109
P: (855) 406-0253 | F: (866) 516-1183
www.flexpipeinc.com/us_en/

**Goldtouch | Booth #94**

Goldtouch is the industry-leading creator of custom comfort ergonomic technology products, including keyboards, mice, and accessories for your computer. Our ergonomic computer peripherals benefit both individual and business needs by reducing the pain and discomfort so commonly associated with repetitive stress injuries (RSIs). Unlike other ergonomic companies, we build products that adjust to each unique individual, allowing every person to find their own personal solution. Find your perfect Goldtouch solution today.

**Goldtouch**
1320 Arrow Point Drive
Bldg. 1, Suite 101
Cedar Park, TX 78613
P: (512) 259-5688
www.goldtouch.com

**Grand Stands Inc. | Booth #89**

Electric sit-stand table bases with a variety of features and ergonomic accessories including new sit-stand monitor arm.

**Grand Stands Inc.**
1946 S. Myrtle Ave.
Monrovia, CA 91016
P: (626) 294-1777 | F: (626) 774-5756
www.grandstands.com

**Hamilton Caster & Mfg. Co. | Booth #95**

Hamilton Caster manufactures ergonomic-friendly casters, wheels, carts and trailers for industrial applications. Extensive push-pull and swivelability testing capabilities enable us to provide you the optimal solution for your application. Many Hamilton solutions are stocked for same-day/next-day PRONTO® shipment. Custom solutions are also available.

**Hamilton Caster & Mfg. Co.**
1637 Dixie Highway
Hamilton, OH 45011
P: (513) 863-3300 | F: (513) 863-5508
www.hamiltoncaster.com

**HealthPostures | Booth #46**

HealthPostures products transform existing office spaces into truly ergonomic sit-stand environments that provide health and wellness benefits that extend far beyond the office. Health Postures is a pioneer in the ergonomic sit-stand industry and is among the few suppliers that manufacture and assemble their products in the USA.

**HealthPostures**
16801 Industrial Circle SE
Prior Lake, MN 55372
P: (952) 873-3266
www.healthpostures.com

**Humantech | Booth #38**

For nearly 40 years, global companies have relied on Humantech for workplace improvements. By combining experienced, board-certified ergonomists with our proprietary assessment tools and comprehensive software, we deliver integrated solutions that impact safety, quality and productivity. At Humantech, we help companies do ergonomics right.

**Humantech**
1161 Oak Valley Drive
Ann Arbor, MI 48108
P: (734) 663-6707 | F: (734) 663-7747
www.humantech.com

**Impacto Protective Products Inc. | Booth #92**

Impacto Protective Products Inc. is a manufacturer and distributor of specialized ergonomic products aimed to provide worker protection from impact, vibration, cumulative trauma and repetitive strain injuries. Our line of Anti-Vibration Air Gloves® features certified protection from hand/arm vibration. Additional body protections include products such as Kneepads, Body Pads, Anti-Fatigue Insoles, Anti-Vibration Cushions and many more ergonomic PPE solutions.

**Impacto Protective Products Inc.**
40 Dussek Street, P.O. Box 524
Belleville, ON, Canada K8N 5B2
P: (613) 966-0062 | F: (613) 966-0067
www.impacto.ca

**Industrial Hygiene News | Booth #115**

Industrial Hygiene News features products and services that help keep employees safe and the company OSHA compliant. IHN informs and educates occupational safety and health professionals dealing with workplace safety, emergency response, indoor air quality as well as ergonomic issues.

**Industrial Hygiene News**
8650 Babcock Boulevard
Pittsburgh, PA 15237
P: (412) 364-5366 | F: (800) 245-3182
www.IndustrialHygieneNews.com
International MODAPTS® Association | Booth #88
MODAPTS® The Language of Work provides fast, consistent method of determining a “fair day’s work” in manufacturing, processing, office, distribution and rehabilitation centers. MODAPTS is a measurable tool for ergonomic initiatives and is applied in over 40 countries worldwide.

International MODAPTS® Association
5119 Kara Drive
Jonesboro, AR 72401
P: (870) 277-0870 | F: (870) 277-0074
www.modapts.org

Kinetic Technologies | #42
K-Tec engineers and manufactures material handling carts, equipment and solutions focused on ergonomics and safety. Ensuring that your employees are operating within company ergo zone and safety guidelines, from push-pull limits to lifting, rotating and elevating, K-Tec has a solution for you.

Kinetic Technologies
1350 Rockefeller Road
Wickliffe, OH 44092
P: (440) 943-4111 | F: (440) 943-4777
www.ktecinc.com

Levitate Technologies Inc. | Booth #64
Levitate Technologies Inc., introduces the AIRFRAME™, a lightweight wearable technology engineered to support the arms of professionals and skilled trade workers who are exposed to repetitive arm motion and/or static elevation of the arms. The company is dedicated to improving the lives of active professionals and skilled trade workers.

Levitate Technologies Inc.
9540 Waples Street, Suite F
San Diego, CA 92121
P: (858) 688-5381 | F: (858) 408-3566
www.levitatetech.com

Mark-10 Force Corp. | Booth #130
Mark-10 is a manufacturer of digital force measurement gauges and testing systems for job task analysis, industrial ergonomics, strength measurement, and other push/pull applications. Mark-10 is co-exhibiting with our distributor NexGen Ergonomics, a specialist in ergonomics instrumentation.

Mark-10 Force Corp.
11 Dixon Ave.
Copiague, NY 11726
P: (631) 842-9200 | F: (631) 842-9201
www.mark-10.com

International Products Corporation | Booth #96
Improve worker safety and ease assembly operations. P-80® Temporary Rubber Assembly Lubricants significantly reduce the force required to assemble rubber and plastic parts. Six different unique water-based formulas are truly temporary – once dry the lubrication is gone.

International Products Corporation
201 Connecticut Drive
Burlington, NJ 08016
P: (609) 386-8770 | F: (609) 386-8438
www.ipcol.com

Loctek Ergonomic | Booth #76
At Loctek, we believe that active movement is the next step in the sit-stand movement, and we’re passionate about bringing healthy sit-stand-move solutions to the workplace and home. That’s why we’ve developed our award-winning V9 Deskcise desk bike. Visit our website to learn more!

Loctek Ergonomic
6475 Las Positas Road, Suite A
Livermore, CA 94551
P: (855) 421-2808
www.loctek.us

MEGAComfort Inc. | Booth #50
MEGAComfort is an innovative work-life wellness solutions company for the workplace. They provide clinically proven and field-tested footwear accessories including patented ergonomic anti-fatigue insoles and orthotics to proactively combat pain and fatigue, while increasing wearer comfort and productivity.

MEGAComfort Inc.
14351 Myford Road, Suite F-220
Tustin, CA 92780
P: (877) 634-2266, ext. 321 | F: (844) 634-2990
www.megacomfort.com

Lean Factory America | Booth #36
Our products aid in the elimination of waste, a cornerstone of lean manufacturing. Some of these products include Movexx compact push/pull assists, tote/dolly lifters and height adjustable workstations. The result is increased health and safety, manufacturing efficiency and profitability for the customer.

Lean Factory America
816 East Third Street
Buchanan, MI 49107
P: (888) 674-2839
www.leanfactoryamerica.com

Mark-10 Force Corp. | Booth #130
Mark-10 is a manufacturer of digital force measurement gauges and testing systems for job task analysis, industrial ergonomics, strength measurement, and other push/pull applications. Mark-10 is co-exhibiting with our distributor NexGen Ergonomics, a specialist in ergonomics instrumentation.

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MEGAComfort Inc.
14351 Myford Road, Suite F-220
Tustin, CA 92780
P: (877) 634-2266, ext. 321 | F: (844) 634-2990
www.megacomfort.com
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**Modjoul Inc. | Booth #114**
Modjoul is a data invention company creating wearable technology to keep employees safe. Modjoul’s product, the Modjoul SmartBelt, is equipped with sensors and GPS to track employee safety and help prevent workplace injuries. Learn more by visiting our website.

Modjoul Inc.
105-2 Sloan Street
Clemson, SC 29631
P: (864) 722-9760
https://www.modjoul.com/

**O’Mara Sprung Floors | Booth #40**
O’Mara Sprung Floors has been manufacturing ergonomic flooring for 20 years. With a 70% shock absorption rating, our floors help thousands of people avoid injury associated with working on hard floors and worn-out anti-fatigue mats. Our patented system allows for easy installation and reconfiguration. We offer standard and custom configurations.

O’Mara Sprung Floors
3116 Eugene Street
Burton, MI 48519
P: (810) 743-8281 | F: (810) 743-2303
www.antifatiguefloors.com

**SRI-Ergonomics, The Ohio State University | Booth #117**
SRI-Ergonomics, part of OSU’s Spine Research Institute, offers a wide range of ergonomics technical support services to companies and organizations nationwide. These include quantitative evaluations of work activities, training courses by our ergonomics experts (at the university and on site) and applied research on many ergonomics issues of concern to practitioners.

SRI-Ergonomics, The Ohio State University
1971 Neil Avenue, 210 Baker Systems
Columbus, OH 43210
P: (614) 292-4565 | F: (614) 292-7852
https://ergonomics.osu.edu/

**Posture Depot | Booth #66**
Unique ergonomic solutions that help employers reduce injuries and absenteeism while increasing employee productivity, satisfaction and retention. The economical DeskRite 100 instantly converts any surface into a sit-stand workstation. No other workstation packs the features and ergonomic benefits! Specializing in ergonomic assessments, consulting and the best brands in ergonomics.

Posture Depot
179 Gasoline Alley, #211
Mooresville, NC 28117
P: (704) 999-0809
www.PostureDepot.com

**PHS West Inc. | Booth #58**
Ergo-Express® motorized carts and tugs are a safe and efficient solution for moving heavy materials, equipment and supplies. With any of our motorized products, one staff member can safely perform the same task that may currently take multiple trips or multiple staff.

PHS West Inc.
6704 Bleck Drive
Rockford, MN 55373
P: (763) 498-7576 | F: (763) 498-8128
www.phswest.com

**Prestige International | Booth #90**
Prestige International is the exclusive U.S. Distributor of top ergonomic manufacturers of input devices and workstation accessories from Evoluent, Hippus Handshoe, Bakker Elkhuizen, Penclic and many more.

Prestige International
333 W. Merrick Road
Valley Stream, NY 11580
P: (516) 872-1250 | F: (516) 960-7798
www.team-prestige.com

**Roemheld USA | Booth #85**
Roemheld provides products to create ergonomic workstations for light/medium duty assembly. Our products are used as building blocks to create a customized workstation capable of lifting, tilting, rotating and moving your work-piece during the assembly process. By optimizing the part position, human effort is minimized and part quality is optimized.

Roemheld USA
927 Horan Drive
Fenton, MO 63026
P: (636) 386-8022 | F: (636) 386-8034
www.roemheld-usa.com

**Saturn Ergonomics Consulting | Booth #54**
Saturn Ergonomics provides innovative technology solutions and practical consulting services. Onsite ergonomics training is complimented by a web-based technology platform, ergoUNIVERSE™. ergoUNIVERSE™ provides apps, videos, and remote consulting support. Empower more employees in your organization to successfully apply ergonomics! Visit Booth #54 to experience these user-friendly ergonomics solutions.

Saturn Ergonomics Consulting
311 N. College Street
Auburn, AL 36830
P: (334) 502-3562
www.saturnergonomics.com

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**O’Mara Sprung Floors**
www.antifatiguefloors.com

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**SRI-Ergonomics**
https://ergonomics.osu.edu/

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**Saturn Ergonomics**
www.saturnergonomics.com

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**Posture Depot**
www.PostureDepot.com
EXHIBITORS

Spenco®/Implus LLC | Booth #35
Spenco is an innovative healthcare company whose mission is to help people everywhere achieve more comfortably. While Spenco’s core business revolves around producing high quality insole and footcare products, Spenco also provides the most advanced sports medicine and first-aid products.

Spenco®/Implus LLC
2001 T.W. Alexander Drive
Durham, NC 27709
P: (844) 827-0439
https://www.spencofootwear.com/

University of Michigan Center for Ergonomics | Booth #106
Ergonomic job analysis and design software developed by the University of Michigan Center for Ergonomics will be explained and demonstrated. Information will be available about continuing education and academic training opportunities in ergonomics and other occupational health and safety sciences.

University of Michigan Center for Ergonomics
1205 Beal Avenue
Ann Arbor, MI 48109
P: (734) 763-2243 | F: (734) 764-3451
www.centerforergonomics.org

VelocityEHS | Booth #73
VelocityEHS Ergonomics software is the fastest and easiest way to right-fit jobs to your workers. We deliver expert-designed training to all employees for a fraction of the cost of traditional ergonomics consultation. Employees perform self-assessments and web-based training to identify and resolve their unique ergonomic risks, with advanced remote or onsite consultations available as needed.

VelocityEHS
222 Merchandise Mart Plaza
Suite 1750
Chicago, IL 60654
P: (888) 362-2007
www.ehs.com

Vision Engineering | Booth #105
With 60 years of manufacturing excellence, Vision Engineering’s patented ergonomic technology has revolutionized stereo microscopes and non-contact measuring systems. As pioneers in designing eyepiece-less microscopes, our ergonomics offers unrivalled operator comfort and increased productivity. Visit our booth to see the eyepiece-less stereo microscopes, Mantis and Lynx EVO.

Vision Engineering
570 Danbury Road
New Milford, CT 06776
P: (860) 355-3776
www.visioneng.us/about/ergonomics

Working Concepts | Booth #91
We design and manufacture ergonomic knee protection and standing mats. Our products are Soft Knees no strap knee pads, Ergokneel Kneeling Mats and Extreme Standing Mats for standing with our pain.

Working Concepts
P. O. Box 1345
Gresham, OR 97030
P: (503) 663-3374 | F: (503) 663-1437
www.softknees.com

Xsens | Booth #107
Xsens provides full-body motion capture solutions for ergonomics and human factors applications. Our product uses inertial sensors and is based on biomechanical models and advanced sensor fusion algorithms. Xsens is easy to use, short setup time and instant validated data output. Xsens can be used anywhere.

Xsens
10557 Jefferson Blvd., Suite C
Culver City, CA 90232
P: (310) 481-1800
www.xsens.com
See you in The Big Easy!

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March 25-28, 2019
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Increased Energy. Improved Bottom Line.

O’Mara ergonomic sprung floors eliminate the discomfort, pain, and long-term injury associated with working on improper flooring. Made with resilient wood panels and cushioning foam blocks, our floors are crafted to far surpass and outlast the performance and lifespan of your typical anti-fatigue mat.

Improve your employees’ health, wellness, vitality and safety while experiencing a long-term return on your investment.

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