

Exoskeleton Advisory Committee

February 21, 2018 phone meeting minutes

In attendance:

Sarah Martin, Occupational Therapy Supervisor, Insurance Services, Washington State Labor & Industries

Jim Lin, Ergonomist, SHARP, Washington State Labor & Industries

Stephen Bao, Senior Epidemiologist, SHARP, Washington State Labor & Industries

Rick Goggins, Ergonomist, DOSH, Washington State Labor & Industries

June Spector, Associate Professor, Env. and Occ. Health Sciences, University of Washington

Matt Marino, Physical Therapist, Ergonomist, Briotix

Chris Reid, Human Factors and Ergonomics Engineer, Boeing

Catherine Trask, Associate Professor, Canadian Centre for Health and Safety in Agriculture, University of Saskatchewan

Ornwipa (Fah) Thamsuwan, Postdoctoral Fellow, Ergonomics Lab Manager, University of Saskatchewan

Keith Osborne, Ergonomist, Seattle City Light

Delia Treaster, Ergonomist, Ohio Bureau of Workers Compensation

Absent:

Pete Johnson, Professor, Env. and Occ. Health Sciences, University of Washington

Rich Gardner, Lead Ergonomist, Boeing

Agenda

- Introductions
- Project scope – Suggestion: Initially focus on answering the questions, “Are current exoskeletons appropriate for return to work? If yes, what guidelines should be followed? If not yet, what more do we need to know?”
- Next steps – how do we want to collaborate?

Discussion

(Note: I grouped these under topic headings rather than just typing them up in chronological order.)

Definitions

Return to Work – At Boeing, only testing exoskeletons with workers who have no current restrictions. For BWC, injured workers with claims, not yet at full capacity. For L&I, transitional work post-injury, working toward full-time return to work. In Canada, graduated return to regular job duties.

Rehab vs. Industrial Exoskeletons – is there a clear separation? Yes, rehab exoskeletons mostly for neurological conditions, help with walking. Industrial applications mostly postural support, offloading weight of tools, manual materials handling. Industrial may not be as protective as rehab exoskeletons.

Process

What type of professional should oversee using exoskeletons for return to work? Team approach, physician involvement and buy-in, match technology to diagnosis, physical therapist/rehab professional support, company management, ergonomist, and user (injured worker) involvement. Training important, making sure worker accepting of technology. Not a long-term device, wear during rehab and then wean off.

Need a good job analysis and data on what exoskeletons can accomplish in order to educate physicians so they can make an informed decision. Help physicians become familiar with the technology, have one available for physicians to try on.

Test exoskeleton first with healthy worker doing the same job as the return to work candidate to make sure technology appropriate for the job tasks. Then move to fitting the exoskeleton to the injured worker and giving them the training on how to use it.

Possibly test exoskeleton with worker during work hardening phase.

Look at task requirements for job, limit exoskeleton use to those jobs where automation, engineering and administrative controls not feasible.

If physicians involved, they would prescribe the exoskeleton to be used; would be considered a medical device, not PPE.

Current state of knowledge

Industrial exoskeletons have potential for return to work, but we're not sure if they're good or bad yet. There are no regulations for their use in light duty work.

Best to have randomized controlled trials on exoskeleton effectiveness. Also develop clinical practice guidelines with diagnostic criteria. Who is a good candidate for exoskeleton? Which exoskeleton would work best for a specific condition?

Will be easier at present to develop best practices guidelines in the return to work and occupational safety and health arena. Not enough information yet for clinical practice guidelines.

Data on effectiveness of exoskeletons not available for all of them. Most data focus on EMG, fatigue measurements (VO₂), movement quality. Not enough information for physicians to sign off on them yet. Technology is still developing rapidly from one version to the next, very little information in the literature.

SuitX example, 50-70% reduction in erector spinae EMG, may not equate to being able to lift 50% more weight.

ASTM creating standard for evaluating exoskeletons using standardized criteria.

Do we know enough now to recommend exoskeletons for return to work?

Generally, not yet. But if someone does choose to use them for this purpose, the process needs to be carefully managed.

Next steps and collaboration options

Share list of committee members and e-mail addresses (with permission) to allow connecting and collaborating.

If sharing information through e-mail, Sharepoint, etc., need to have deadlines and expectations to keep project moving forward.

All are welcome to join the ASTM Subcommittee F48.02 on Human Factors and Ergonomics for Exoskeletons and Exosuits: <https://www.astm.org/COMMITTEE/F48.htm>

At least one month out when scheduling the next phone meeting.