Participatory Ergonomics: Key Aspects for a Successful Program

Dwayne Van Eerd & Kiera Keown

ESAO Conference, May 2009

Toronto, Ontario

Presentation outline

Background

- Institute for Work & Health
- Systematic review program

The latest research on participatory ergonomics

- Are participatory interventions effective?
- How can you implement a participatory ergonomic intervention?

A participatory ergonomics tool for workplaces

- ‘Reducing MSD Hazards’

The Institute for Work & Health

- The IWH is an independent not for profit research organization
- Our mission is to conduct and share research that protects and improves the health of working people and is valued by policy-makers, workers and workplaces, clinicians, and health & safety professionals

The Institute for Work & Health

Our research is driven by two broad goals:

- to protect healthy workers by studying the prevention of work-related injury and illness. This type of research includes studies of workplace programs, prevention policies and the health of workers at a population level

- to improve the health and recovery of injured workers. We conduct research on treatment, return to work, disability prevention and management, and compensation policies

Our Stakeholders

Workplace Safety and Insurance Board
Provincial Health & Safety Associations
Ministry of Labour
Employers
Injured Workers
Labour
Clinicians
Health and Safety professionals
Researchers

IWH Systematic Review Program

2004 - 4 year pilot program funded by the WSIB

2005 - Research Program in Systematic Reviews established at IWH

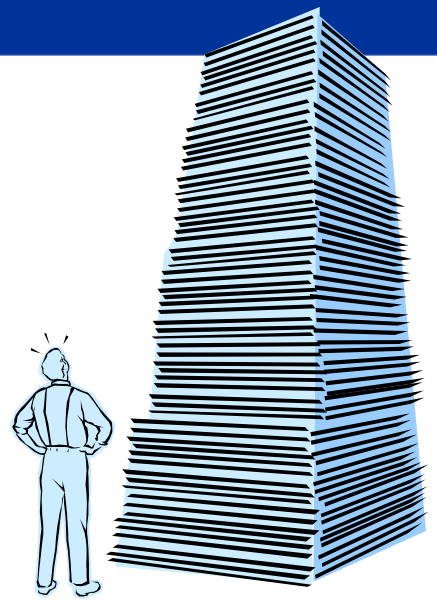
Accomplishments:

- 13 Reviews
- 8 Scoping reviews
- 1 Narrative review
- 1 Methods paper

Over 100,000 articles served!

- 61 reviewers, 4 countries, 27 stakeholder consultations

It is impossible for any individual to keep up-to-date with the literature therefore…



What is a Systematic Review?

A research project that focuses on answering questions about the current evidence on a topic by:

- **identifying**,
- **appraising**, and
- **summarizing** the results of primary research

Minimize bias by using **replicable**, **scientific** and **transparent** approaches

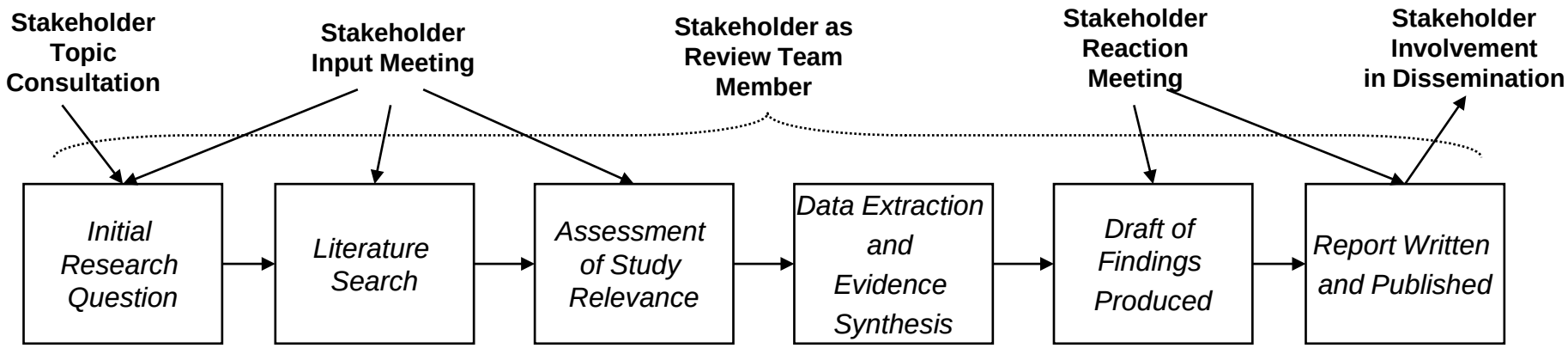
Inform decision makers, e.g., clinicians, researchers, consumers, and policy makers.

Steps of a Systematic Review

1. Develop question
   - Researchers, stakeholders, key literature; provide input
2. Conduct literature search
   - Researchers, stakeholders, library experts; provide input
3. Identify relevant publications
   - Criteria based on answering question
4. Quality appraisal
   - Adapting existing criteria, developing new when necessary
5. Data extraction
   - The data necessary to answer question
6. Evidence synthesis
   - Stakeholders input about potential messages

Level of Evidence	Minimum Quality	Minimum Quantity	Consistency
Strong	High	3 studies	All high quality studies converge on the same findings.
Moderate	Medium	3 studies	Majority of medium and better quality studies converge on the same findings.
Limited	Medium	2 studies	Majority of medium and better quality studies converge on the same findings.
Mixed	Medium	2 studies	If there are two studies, they do not agree. If more than two, relatively equal numbers of studies support and do not support effectiveness.
Insufficient	The above criteria are not met.		

Stakeholder Involvement



Systematic Review Steps

Participatory Ergonomics Effectiveness review:

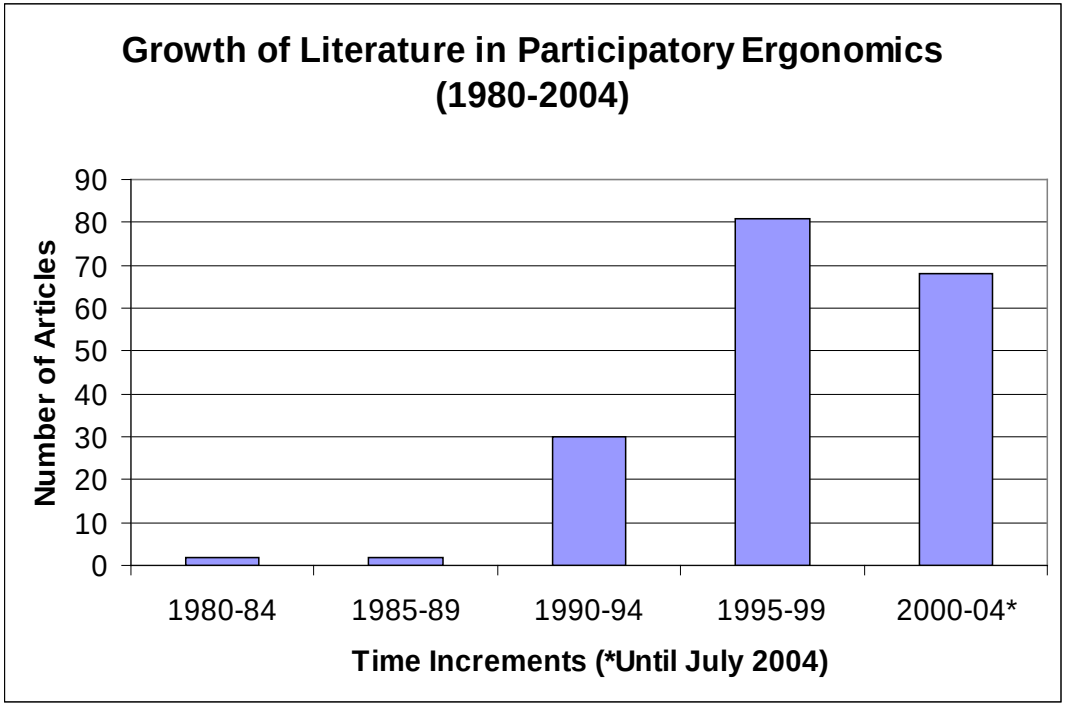
Title: Effectiveness of Participatory Ergonomic Interventions: A Systematic Review.

Review Team: Donald Cole, Irina Rivilis, Dwayne Van Eerd, Kim Cullen, Emma Irvin, Jonathan Tyson, Dee Kramer, Quenby Mahood

Considerations

Growth in PE literature

First systematic review of PE interventions



Research Question

Are participatory ergonomic (PE) interventions effective with respect to improving health outcomes?

Definition of participatory ergonomics:

Kuorinka, 1997 “practical ergonomics with participation of the necessary actors in problem solving”

Our interpretation was to be inclusive but we felt that “workers” should be involved to be truly participatory

Stakeholder Involvement

Stakeholders prioritized PE as one of first SR program topics

Stakeholder as review team member

Knowledge Transfer Associate as team member

Stakeholder feedback sought prior to final report

Literature Search

6 electronic databases searched

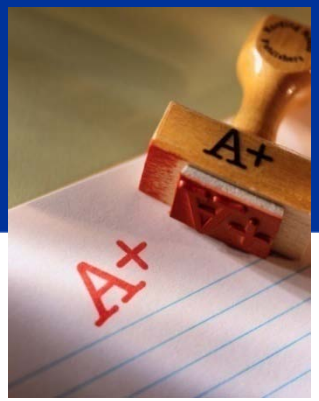
Content experts

- International

Reference lists

Stakeholders

442 documents found



Relevance and Quality

Relevance: did the document evaluate a participatory ergonomics intervention or program

- Not “how to” but describe an actual or attempted intervention
- **23** documents were relevant

Quality: developed criteria based on previous work

- Effectiveness studies
- **12** documents had methodological quality required to answer our question

Characteristics of Studies

Author, Year	Jurisdiction	Industry / Sector
Ketola, 2002	Finland	Office / Municipal govt.
Morken, 2002	Norway	Aluminum
Evanoff, 1999	Missouri, USA	Healthcare
Carrivick, 2001	Australia	Healthcare
Laitinen, 1997	Finland	Transportation / Steel
Wickströem, 1993	Finland	Metal
Halpern, 1997	Colorado, USA	Auto accessories/ Manufacturing
Lanoie, 1996	Quebec, Canada	Food distribution (alcohol)
Bohr, 2000	Missouri, USA	Office / Transportation
Moore, 1998	Mid-west USA	Food (meat packing)
Reynolds, 1994	Pennsylvania, USA	Apparel / Manufacturing
Herbert, 2001	New York, USA	Apparel / Manufacturing

Findings

Current studies provide

- **moderate** evidence that PE interventions can have a **positive impact** in **reducing musculoskeletal symptoms**.

- **limited** evidence that PE interventions can have a **positive impact** in **reducing injuries and workers' compensation claims**.

- **limited** evidence that PE interventions can have a **positive impact** in **lost days from work or sickness absence**.

Stakeholder feedback

Overall very positive

Wondered about grey literature

Pleased to have some evidence for PE effectiveness

BUT

Wanted to know what the literature said about “how to implement or carry out” a PE intervention!

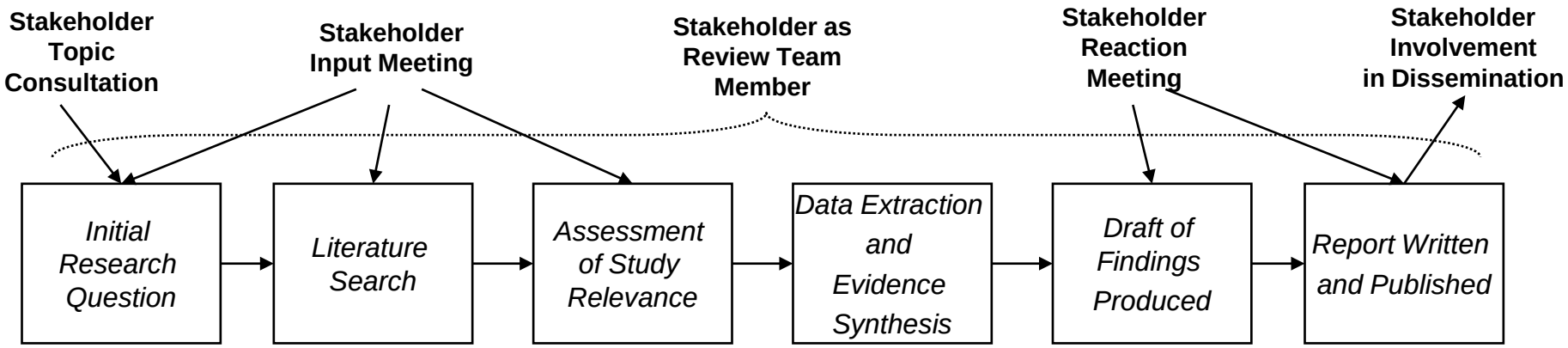
Participatory Ergonomics Process and Implementation Review

Title: Participatory ergonomics interventions: implementation and process, a systematic review.

Review Team: Dwayne Van Eerd, Donald Cole, Judy Village, Nancy Theberge, Marie St. Vincent, Kiera Keown, Judy Clarke, Quenby Mahood, Emma Irvin, Kim Cullen

Research Question: What is the evidence regarding context, barriers and facilitators to the implementation of participatory ergonomic interventions in workplaces?

Stakeholder Involvement



Systematic Review Steps

(Keown, Van Eerd & Irvin, 2008)

PLUS meetings in British Columbia and Manitoba and additional meeting in Ontario (with funding from WorkSafeBC and Manitoba WCB

Literature Search

17 electronic databases searched
- Including grey literature

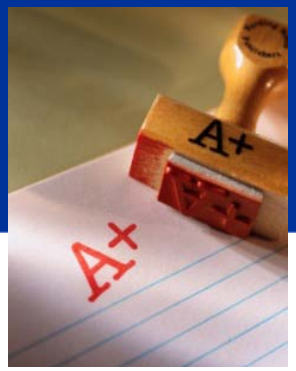
Conference proceedings
- Hand-searched

Content experts
- International

Reference lists

Stakeholders

Over 2100 documents found



Relevance, Quality, and Content

Relevance: did the document describe a participatory ergonomics intervention or program

- Not “how to” but describe an actual or attempted intervention
- 256 documents were relevant

Quality and content: developed criteria based on previous work

- Not able to use effectiveness criteria
- Needed details in the documents to answer questions about PE process, facilitators and barriers
- 52 documents had content and quality to answer our question
  - Described PE from many different countries and industries

Teams and Training

A **team** was described in all of the documents:

- Department/work group (53.8%)
- Steering committee (46.2%)
- Change team (across dept)(40.4%)

Training provided by

- Ergonomist (39.5%)
- Researcher (28.9%)
- Other (29.0%)
- Not reported (34.2%)

Who got training

- Workers (52.6%)
- Change teams (39.5%)
- Supervisors (23.7%)
- Senior management (7.9%)
- Other (18.4%)
- Unclear (18.4%)

Involvement and Responsibilities

- Worker/Operator (100%)
- Line mgr/supervisor (78.8%)
- External advisor (65.4%)
- Internal specialist (61.5%)
- Senior manager (44.2%)
- Union representative (19.2%)
- Supplier/purchaser (3.8%)
- Cross-industry org (0%)
- Set-up/structure (30.8%)
- Monitor/oversee (40.4%)
- Problem Identification (98.1%)
- Solution development (98.1%)
- Implementation (88.5%)

Decision making and Focus

- Group consultation (84.6%)*
- Group delegation (9.6%)
- Individual consultation (5.8%)
- Tools/equipment (84.6%)
- Work processes (63.5%)
- Workplace Organization (13.5%)

*The PE team is encouraged to make their views known on work-related matters but management retains the right to take action or not

What are the Facilitators / Barriers to PE process and implementation

Other facilitator/barrier categories less reported include:

- resistance to change, production requirements, research issues, personnel turnover, awareness of PE, nature of work, intervention history

Facilitator/Barrier	%
Support of PE program	75
Resources	69
Ergonomics training	69
Create appropriate team	56
Communication	52
Organizational training	40
Follow detailed plan	35
PE facilitator/champion	31
Working relations	29
Easy changes first	23
Climate of workplace	21

Recommendations from the review

Create PE teams with appropriate members

- including workers, supervisors and advisors

Involve the right people in the PE process

Provide ergonomic training

Involve a PE champion/ ergonomics specialist

Define participants' responsibilities

- problem-solving, developing solutions and implementing change

Make decisions using group consultation

Facilitators/Barriers from the review

…most often reported in the literature:

- Support of PE intervention
- Resources
- Ergonomic training/knowledge
- Creation of an appropriate team
- Communication
- Organizational training/knowledge

Stakeholder feedback

Very positive and enthusiastic (Ontario, British Columbia, Manitoba)

Pleased that we reviewed grey literature, but suggested that it be presented together with peer-reviewed

Suggested that we develop and disseminate a tool from the review findings (consistent across stakeholder groups and provinces...)

Target audience of tool = practitioners and workplace decision makers

Tool Development

Stakeholder feedback obtained for tool development

Format ideas: CD-ROM, website, handbook, summary of evidence, training materials...

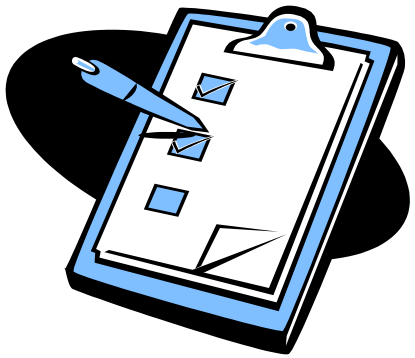
Most often wanted “how to” implement PE with a focus on facilitators and barriers (overcoming barriers)

We explored existing tools:

PE blueprint – awareness low outside of Ontario

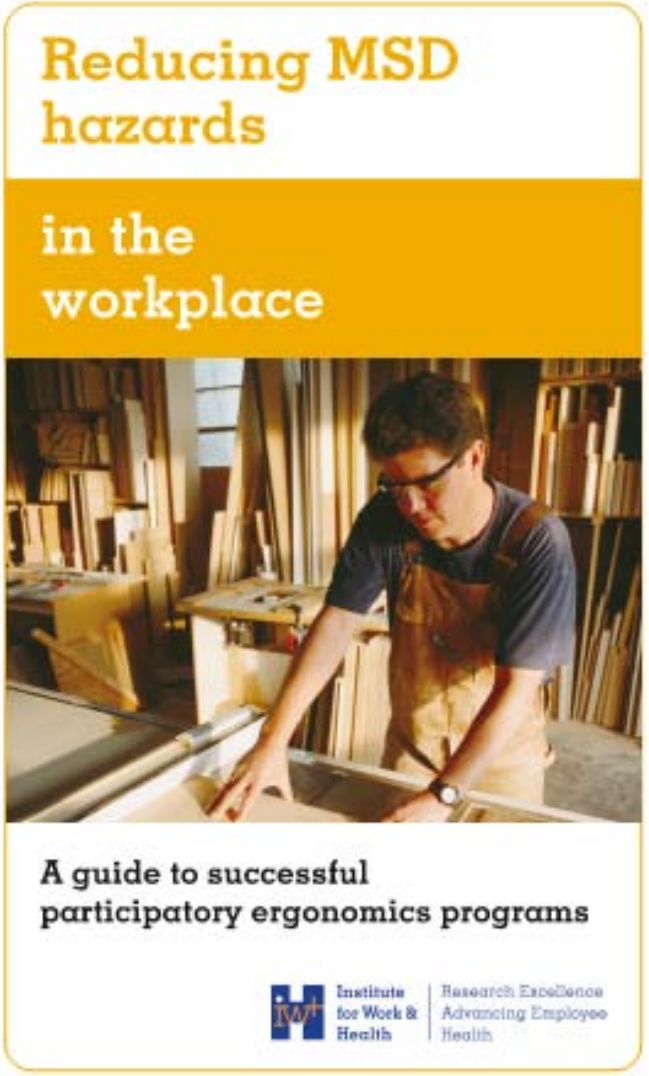
MSD guidelines – just becoming available

Focus was to design tool to compliment these...



The PE aid

- Evidence based information
- "Vignettes" added to illustrate messages
- Stakeholders involved in development
- Easy to read
- Applicable to practice
- Electronic format – printable



What is participatory ergonomics?

Participatory ergonomics (PE) is the process of involving key personnel, such as workers, in the process of identifying and solving problems with work-related hazards. A PE intervention or program is an effective approach to reducing hazards that can lead to injuries. Studies have shown that PE programs can reduce musculoskeletal injuries, workers' compensation claims and lost days from work or sick leave.

Musculoskeletal disorders (MSDs) are injuries and disorders of the musculoskeletal system and are a major cause of work-related injury in Canada, accounting for approximately 40 per cent of workers' compensation claims. Examples of MSDs include carpal tunnel syndrome, tendonitis and low-back pain.

A PE program encourages workers to help to identify the hazards or risk factors in their workplace, such as working in awkward positions, doing repetitive work and having to apply force, which can cause or aggravate MSDs.

Improved ergonomics can lead to increased productivity. PE programs can be implemented as a part of an organization's continual improvement process, and should be budgeted for and evaluated.

How can you implement PE?

In the following pages are some tips to help you get started. These recommendations come from scientific evidence examining workplaces that have implemented PE interventions/programs. But remember that since you are involving your workplace and workers, your specific process will be – and should be – unique.

*This evidence was summarised in a systematic review by a team of researchers and ergonomists. For the full list of references, please refer to page 8.

The evidence:
create PE teams with appropriate members (workers, supervisors,

The vignette: *In a manufacturing setting, an ECT was formed that did not include representatives from the skilled trades. With the assistance of an ergonomic consultant, the ECT members were adept at identifying hazards and devising solutions…*

Provide "real life" examples
Bring evidence to life
From qualitative studies

A PE team should include representation from the workers and supervisors who will be directly affected by the intervention. The team would also benefit from having someone with expertise in ergonomics. Additional membership from management could help mobilize the resources necessary to implement changes. As well, it would show management support.

Participants usually include:
- workers
- supervisors
- advisors
- technical specialists (maintenance personnel, engineers, skilled trades people)

CASE STUDY

In a manufacturing setting, an ergonomic change team (ECT) was formed that did not include representatives from the skilled trades. With the help of an ergonomic consultant, team members became adept at identifying hazards and devising solutions. However, the solutions were often difficult to implement because the workplace's production equipment was complex. The team's difficulties in designing solutions led to delays in making changes, and team members grew frustrated. After several months, the team enlisted the assistance of skilled trades people to help them design workable solutions. Over time, this approach enabled the team to design solutions that could be adapted to the workplace and addressed hazards.

4

Make decisions using group consultation

Allow your ergonomic team to make decisions together and then present the team's suggestions to management for approval.

A team is empowered when it is involved in the decision-making around the PE program. Teams should be encouraged to make decisions about which problems to focus on and which solutions to implement. Management may then become involved when financial resources are required.

CASE STUDY

At a long-term care centre, managers initially did all decision-making about health and safety. At first, team members had to provide management with general suggestions about interventions and implementation to consider. The centre's management soon noticed that the team was becoming less engaged in the process. They began letting the team work together to decide which interventions to address and which solutions they felt were most appropriate. Team members only needed to gain management approval for interventions that cost more than $100. As a result, the team members became much more involved with the PE program.

Resources:

Participative Ergonomic Blueprint:
http://www.iwh.on.ca/products/blueprint.php

Other ergonomic resources include:
Occupational Health and Safety Council of Ontario (OHSCO) MSD Prevention Guideline:
http://www.iwh.on.ca/assets/pdf/MSDPrevention_Guide.pdf

Occupational Health Clinics for Ontario Workers (OHCOW) PE manual:
http://www.ohcow.on.ca/resources/handbooks/TI_automotive/ergonomichandbook2.pdf

References:

Rivilis I, Van Eerd D, Cullen K, Cole DC, Irvin E, Tyson J, et al. Effectiveness of participatory ergonomic interventions on health outcomes: A systematic review. Appl Ergon 2008 May; 39(3):342-58.

Cole D, Rivilis I, Van Eerd D, Cullen K, Irvin E, Kramer D. Effectiveness of Participatory Ergonomic Interventions: A Systematic Review. Toronto: Institute for Work & Health; 2005. http://www.iwh.on.ca/sr/wi_part_ergo.php

Van Eerd D, Village J, Clarke J, Cole D, Cullen K, Irvin E, Keown K, Mahood Q, St-Vincent M, Theberge N. Participatory ergonomics interventions: implementation and process, a systematic review. Toronto: Institute for Work & Health; December 2007. http://www.iwh.on.ca/sys-reviews/process-and-implementation-of-participatory-ergonomics-interventions-a-systematic-review

Dissemination plan

Stakeholder networks:

- Ontario – Review stakeholders, Prevention partners
- Nationally – British Columbia & Manitoba stakeholders, Quebec review team member, Nova Scotia WCB, Newfoundland and Labrador ongoing PE/KTE projects

Then more broadly…

Website, e-mail distribution, print versions

Questions??

Institute for Work & Health

Research Excellence
Advancing Employee Health

www.iwh.on.ca