Combining Ergonomics and Wellness for Total Worker Health

Nicholas Warren, ScD
Associate Professor of Medicine
University of Connecticut Health Center
Center for Promotion of Health in the New England Workplace

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Agenda for Today

- Deeper exploration of ergonomic risk factors and interventions (OSH)
- Deeper exploration of risk factors for poor health choices (WHP)
- The case for integration
- A toolkit for integration and improving employee health
CPH-NEW’s goals include
(From NIOSH Total Worker Health™ Mission)

www.cdc.gov/niosh/twh

1. Implement and evaluate models for improving worker health by combining:
   - Worksite health promotion (WHP)
   - Workplace safety & health (OSH)

2. To promote participatory approaches that engage all levels of an organization in the design of effective, sustainable workplace interventions.
Workplace OSH: Ergonomics

Ergonomists design to support human capabilities and limitations

- **Occupational Health**: reduce **MSDs** & “accidents”
- **Human Factors**: increase system efficiency, e.g., improve the usability of a software system

“Fitting the job to the person” requires attention to multiple organizational levels

- Physical risk factors (job level)
- Psychosocial risk factors (job and org.)
- Work organization risk factors (org.)
Ergonomics (1): Physical Factors

Job-level physical attributes (exposures) ...

... and ...

[Diagram of ergonomic considerations]
Ergonomics (2): Psychosocial Factors

- Low control
  - Low skill utilization, no learning opportunities
  - Monotonous work

- High job demands
  - Rapid work pace
  - Time pressure
  - Few rest break opportunities

- Low social support from coworkers and/or supervisor
  - No help to get the job done
  - Low emotional/personal support
Ergonomics (2): Psychosocial Factors

- Low rewards, relative to the effort required
- Perceived fairness
  - Discrimination
  - Harassment
- “Emotional labor” (having to mask true feelings to perform job duties)
- Work schedule incompatible with family or personal needs
- Job insecurity
Ergonomics (3): Work Organization

Work Organization:
How work is organized, supervised, and carried out

Physical Factors:
Load, postures, repetition, etc

Psychosocial Factors:
Subjective perceptions of the job characteristics
This is Ergonomics: Fitting the work to the worker

- Work Organization
- Physical load (E.g., frequency and duration of lifting)
- Psychosocial stressors (E.g., low control & support, monotony)
- Health effects (e.g., musculo-skeletal disorders)
Can we attribute MSD risk to “psychosocial” vs. “physical” strain?
The Workplace as a System

Company Level
(Structure, culture, organizational practices, technology)

Division/Department
(Resources; relation to other departments)

Job Level
(Work pace, supervision, work flow, decision-making opportunities)

Physical
Exposures
Psychosocial
Exposures

Other workplace exposures:
- Safety hazards
- Chemical, dust, biological, etc.
- Noise, temperature, radiation, etc.

Company Environment

Organizational
Outcomes:
- Productivity
- Quality
- Customer satisf.
- Health care costs
- Workers’ comp.
- Absenteeism
- Turnover

Worker
Outcomes:
- Health
- Job satisfaction
- Lifestyle
- Productivity
Workplace Health Promotion (WHP) in this System Context: TWH approach

Fostering healthy decision-making

Traditional focus on the individual’s behavior
- Stop smoking, healthier diet, cope with stress

System focus “Social health promotion”
- activities at the community or societal level [WHO]
- Environmental conditions that foster healthy behaviors
- Positive human relations at work that foster decision-making and self-efficacy
Why Integration?

Traditional HP behavioral targets: Exercise, diet, smoking, obesity, etc.

- Risk factors for chronic disease: e.g. CVD, diabetes
- These are also risk factors musculoskeletal disorders (MSDs)

Both ergonomic risk factors and these so-called “personal” or “lifestyle” risk factors are affected by physical, psychosocial, and work organization features of work.
Individual Health and MSD risk (1)

- **Obesity**: positive association
  - Biomechanical loading (back, hip, knee)

- **Exercise, sports**: mixed effects
  - Risk of injury/over-use
  - Conditioning

- **Smoking**: mostly consistent *but weak* association (LBP, neck, shoulder MSDs)
  - Reduced circulation, tissue repair
  - Metabolic changes
Individual Health and MSD risk (2)

Cardiovascular disease risk factors

- Serum C-reactive protein (inflammatory marker)
  - Higher risk of sciatica & poorer recovery [Shiri 2007]
  - Frozen shoulder [Bulgen 1982]

- Serum triglycerides; blood pressure
  - Predicted later sciatica pain [Leino-Arjas 2006a,b]

- Atherosclerosis: obstruction of lumbar and sacral arteries
  - Disc degeneration; history of chronic low back pain [review by Kauppila 2009]
These “Individual characteristics” are also work-related....
Work environment factors and physical inactivity in men [Wemme et al. 2005]

<table>
<thead>
<tr>
<th>Job Feature</th>
<th>Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent overtime</td>
<td>1.3 (1.1 – 1.6)</td>
</tr>
<tr>
<td>No influence on overtime</td>
<td>1.3 (1.0 – 1.7)</td>
</tr>
<tr>
<td>“Passive” (low demands, low control)</td>
<td>1.7 (1.2 – 2.4)</td>
</tr>
<tr>
<td>“High strain” (high demands, low control)</td>
<td>1.4 (1.0 – 2.0)</td>
</tr>
</tbody>
</table>
To address a SYSTEM problem, \textit{process} is as important as its \textit{content}.

\textbf{TWH Basic Tenets:}
\begin{enumerate}
  \item Integration of OSH and WHP (content)
  \item Participatory Approach (process)
\end{enumerate}
Benefits of a (facilitated) participatory workplace process

Employee health self-efficacy

- Increased decision latitude
- Increased confidence to change unhealthy conditions
- Increased program sustainability
- Increased social support

Insights derived from workers’ perspective

- Find (other) root causes of physical & psychosocial stressors
- Find (other) root causes of unhealthy behaviors
- Reflect own experiences, needs and language of the intended program participants
Other Benefits of Integrated OHS and HP Worksite Programs

- **Employee Involvement and Participation**
  - Greater buy-in from all levels
  - Better integration of programs with workplace culture, needs of employees in different subgroups
  - Avoid unforeseen obstacles

- Sharing resources across departments and functions: cost-efficient, less duplication in program offering
- Common set of metrics can be used by all programs
- Reduced competition for senior management attention and scarce resources
- Health care costs decrease
- Reduces disability and sickness absence
- Improve productivity
- Affects employee recruitment/retention (employer of choice)?
Implementing a CPH-NEW participatory program
Healthy Worksite TOOLKIT

 бюро

Participatory program start up guides
- Establish Design Team and Steering Committee
- Gather data (surveys, interviews, focus groups)
- Identify workplace problems (OSH and WHP)
- Develop solutions/interventions
- Assess and adjust interventions

IDEAS intervention planning tool for integrated health protection/health promotion
- Intervention, Design, and Analysis Scorecard

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Roles of Steering Committee (SC) & Design Team (DT)

**Steering Committee**
- Forms DT & provides necessary resources
- Invites DT to develop and propose interventions
- Selects most feasible/desirable interventions
- Develops or extends interventions for middle management & supervisors & staff (with help from DT)
- Helps promote & evaluate all interventions

**Design Team**
- Identifies & prioritizes employee health issues
- Comes up with ideas for workplace interventions
- Proposes best intervention ideas to SC
- Helps promote & evaluate all interventions
- Helps refine interventions, as needed
Reflection

What are some factors at play in your workplace?
Step 1: Identify Health & Safety Problem/Issue and Contributing Factors

General Health & Safety Problem/Issue:
High rate of back, neck, shoulder pain in office workers
Case: A social services agency employs 50 women, 50% over 40, 40% overweight

Sub-Issue:

Poorly fitting furniture and poor set up of equipment create discomfort and muscle strain

Contributing Factors:
Desks and office furniture not sized for employees. Some furniture adjustable, some not adjustable.
Employees don't know how to adjust furniture and equipment for best fit.
No ergonomics expertise in-house.

Job requires constant use of computer
Few rest breaks
Constantly sitting and typing

Contributing Factors:
Workload recently increased due to staff layoffs.
No formal break schedule.
Culture of working through lunch.
Email is primary communication tool; it increases time keyboarding.

Lack of personal fitness

Contributing Factors:
Many employees overweight.
Job duties are sedentary.
Fatigue and stress from job gets in the way of healthy eating and exercise.
Culture of working through lunch.

www.uml.edu/centers/CPH-NEW
Step 2: Set Measureable Objectives & Brainstorm Solution Activities

Health & Safety Goal/Objective
Reduce the rate of neck, shoulder, and back pain in office workers.

Solution #1
Improve office workers' comfort and "fit" with their work stations

Specific activities/components of Solution #1
- Replace non-adjustable furniture; reassign furniture
- Provide workstation ergo training to all employees
- Hire ergonomist to assess current environment and design an ergonomics policy/program
- Lack of access to occupational physician to treat and manage pain from computer overuse

Solution #2
Establish rest breaks and routines to vary posture throughout the work day to minimize strain from heavy computer use.

Specific activities/components of Solution #2
- Establish new norms for lunch and other breaks to step away from desks
- Place printers away from desks to encourage walking and movement
- Pilot test a shared treadmill workstation to encourage movement during work
- Supervisor training on workload coaching and supportive communication with direct reports

Solution #3
Improve personal fitness and resilience

Specific activities/components of Solution #3
- Offer core and upper body strength training
- Break room with mats for stretching, yoga DVDs for stretching and stress reduction, treadmill for cardio warm up, moderate free weights
- Encourage flex time for fitness routines
- Incentives for participation in fitness activities
### Step 3: Set Selection Criteria for Evaluating Solution Activities and Interventions

<table>
<thead>
<tr>
<th>Scope/Impact</th>
<th>Benefits/Effectiveness</th>
<th>Resources/Costs</th>
<th>Obstacles/Barriers</th>
</tr>
</thead>
</table>
| Must offer preventive benefit for all personnel who are heavy computer users | Employees with low comfort will report improved comfort  
Employees with pain will not progress to disability  
Employees will be aware of good ergo principles and the basics of good workstation set up  
Employees will know where to go for reliable information and problem solving  
Most employees will report high organizational support for health/safety | Will increase expenses for supplies by no more than 20%  
Will use existing space  
Health/wellness activities will be supported by existing budget/personnel  
External consultant fees will not exceed $10,000 | Strength and other fitness training may be limited to what insurer can provide  
May have to re-purpose space for fitness break area  
Ergo improvements may not be supported if they are not perceived to be important  
Improving supportive culture for fitness, breaks and movement may take time |
Step 4: Apply Selection Criteria to Solution Activities & Create 3 Intervention Alternatives

<table>
<thead>
<tr>
<th>Solution Activities</th>
<th>Scope/Impact:</th>
<th>Benefits/Outcomes:</th>
<th>Resources:</th>
<th>Obstacles:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace or reassign non-adjustable furniture</td>
<td>6 employees with pain get furniture upgrades. Over time, adjustable equip phased in for all employees</td>
<td>Prevent disability and lost time for 6 employees w/pain Prevent injuries for others if swap mis-fitting furniture</td>
<td>$500 x 6 people = $3000 Estimate 20% increase in workstation supply expenses/year</td>
<td>Exceeds current budget</td>
</tr>
<tr>
<td>Provide workstation ergo training to all employees</td>
<td>100 employees</td>
<td>Employees will be aware of good ergo principles and will maximize comfort of their existing furniture, equipment</td>
<td>FREE online self study or FREE training from workers comp insurer</td>
<td>No significant obstacles</td>
</tr>
<tr>
<td>Hire ergonomist to assess office and design ergo policy/program</td>
<td>100 employees</td>
<td>Identify hazards, prioritize needs, develop a strategy to address hazards in long term</td>
<td>FREE policy consultation from workers comp insurer Might need consultant for walk-through and report</td>
<td>Possible cost if need to hire ergonomist</td>
</tr>
<tr>
<td>Ergonomist and occ. doctor available to advise/treat MS pain</td>
<td>6 employees with pain referred for treatment and accommodation</td>
<td>Employees with pain get treated and receive accommodations; prevent disability and lost time</td>
<td>Workers comp insurer</td>
<td>Risk of prompting more claims</td>
</tr>
</tbody>
</table>

*Use multiple worksheets to review solution activities, then combine solution activities into intervention alternatives.*
### Step 4: Apply Selection Criteria to Solution Activities & Create 3 Intervention Alternatives

| Intervention B: Increase movement and breaks to minimize computing strain |
|---|---|---|---|
| **Solution Activities:** | **Scope/Impact:** | **Benefits/Outcomes:** | **Obstacles:** |
| Establish new norms for lunch and other breaks to step away from desks | All 50 employees | Feel less stressed, happier Feel less pain More social connections? | Minimal/no cost Takes time to reinforce new habits Need execs to lead |
| Place printers away from desks to encourage walking and movement | All 50 employees | More movement Feel less pain, more energy More social connections? | Minimal: Cost of new cables if needed No significant barriers Time to move equipment |
| Pilot test a shared treadmill workstation to encourage movement during work | 25 estimated volunteers to use the equipment | More movement Feel less pain | $2,000 Space Exceeds budget Time to test Liability |
| Supervisor training on workload coaching and supportive communication | 15-20 executives, directors, managers, supervisors | Managers support and model new norms for breaks and movement Better employee morale | $500+ Identifying a trainer |

*Use multiple worksheets to review solution activities, then combine solution activities into intervention alternatives.*
### Step 4: Apply Selection Criteria to Solution Activities & Create 3 Intervention Alternatives

**Intervention C: Improve personal fitness and resilience**

<table>
<thead>
<tr>
<th>Solution Activities</th>
<th>Scope/Impact</th>
<th>Benefits/Outcomes</th>
<th>Resources</th>
<th>Obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentives for participation in fitness and strength training</td>
<td>Estimate 20 will participate</td>
<td>Feel stronger, less pain, feel more energetic</td>
<td>Day off for completing 6 weeks of twice weekly sessions</td>
<td>Minor: Tracking and documentation</td>
</tr>
<tr>
<td>Break space, equip to stretch, exercise</td>
<td>Estimate 20 will use space and equipment</td>
<td>Feel less stress, less pain, more social connections?</td>
<td>Mats, rollers stretching $100, Yoga/stretching/strength DVDs $50, Moderate free weights $200, Treadmill $600</td>
<td>No budget available, might have to gather donated items, participation depends on breaks, norms</td>
</tr>
<tr>
<td>Encourage flex time for fitness routines</td>
<td>100 employees</td>
<td>Feel happier, feel more support for health</td>
<td>Extra time scheduling?</td>
<td>No formal flex time policy; need to balance flex time with client needs</td>
</tr>
</tbody>
</table>

*Use multiple worksheets to review solution activities, then combine solution activities into intervention alternatives.*
### Step 5A: Rate Intervention(s)

<table>
<thead>
<tr>
<th>Intervention A</th>
<th>Intervention B</th>
<th>Intervention C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title: Improve workstation fit</td>
<td>Title: Increase breaks and movement during workday</td>
<td>Title: Improve fitness and resilience</td>
</tr>
<tr>
<td>Anticipated scope/impact (L/M/H)</td>
<td>M (Only some benefit)</td>
<td>H (Everyone benefits)</td>
</tr>
<tr>
<td>Anticipated benefits (L/M/H)</td>
<td>H</td>
<td>H (Movement is key)</td>
</tr>
<tr>
<td>Resources needed (L/M/H)</td>
<td>Use existing resources</td>
<td>Use existing resources</td>
</tr>
<tr>
<td>Anticipated obstacles (L/M/H)</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

Priority rankings of interventions (optional):

Intervention B is priority—employees need support from management to move more. Intervention A has some options that can be done using existing resources. Option C is last priority because lifestyle changes take time, are difficult. Low chance of success.

**Additional notes to the Steering Committees (optional):**

Dear Steering Committee, the Design Team would like to propose implementing at least some elements from ALL of these interventions. We recognize some elements may need time to gather budget to support higher priced items.
### Step 5B: Rate & Select Intervention(s)

<table>
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<tr>
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<th>Intervention B</th>
<th>Intervention C</th>
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<tr>
<td><strong>Title:</strong></td>
<td><strong>Title:</strong></td>
<td><strong>Title:</strong></td>
</tr>
<tr>
<td>Improve workstation fit</td>
<td>Increase breaks and movement during workday</td>
<td>Improve fitness and resilience</td>
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<tr>
<th>Anticipated scope/impact (L/M/H)</th>
<th>Anticipated benefits (L/M/H)</th>
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<th>Anticipated obstacles (L/M/H)</th>
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</table>

**Topics to discuss with Design Team regarding proposed interventions:**

- [ ]
- [ ]
- [ ]

**Intervention(s) selected for implementation:**

- [ ]
CPH-NEW Resources

- Website [www.uml.edu/cphnew](http://www.uml.edu/cphnew)
  - Mailing list
  - Quarterly Newsletter
  - CPH-NEWs and Views—fact sheets

- Speakers Bureau

- Pilot grants

- Healthy Worksite Program Toolkit
  - Launch scheduled for September 2013
Center for the Promotion of Health in the New England Workplace

Assoc. Prof. Manuel Gifuentes of the Work Environment Department at UMass Lowell is testing the use of treadmills and sit-to-stand electric desks as promising solutions to help people stay healthy, and avoid a sedentary lifestyle that can cause cardiovascular disease, diabetes, obesity, depression and more. Learn more.

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Thomas Wilson, ’89

Research & Innovation

Emerging Topics

- Differences among Nursing Homes in the Outcomes of a Safe Resident Handling Program
- Reducing Prolonged Sitting in the Workplace: Developing Best Practice
- Training at the Workplace Improves Cleaners’ Internal Resources for Handling Demanding Work

News & Events

- Sept. 17, Westford, MA - Transforming Worksite Wellness Beyond ROI Conference
- Sept. 24 - Webinar: Learn Winning Strategies for CPH-NEW Pilot Grants
- Oct. 17, University of Connecticut - The Health, Workplace, and Environment: Cultivating Connections Conference
- 2013 Q2 CPH-NEW Newsletter
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Contacts and Acknowledgements

University of Massachusetts
Lowell
Ms. Sandy Sun
Email: CPHNEW@uml.edu
Tel: 978-934-3268

CPH-NEW main website:
www.uml.edu/Research/centers/CPH-NEW

University of Connecticut
Dr. Jeff Dussetschleger
Email: JDussetschleger@uchc.edu
Tel: 860-679-1393

Nick Warren: warren@nso.uchc.edu

CPH-NEW website at Univ. Conn.:
http://www.oehc.uchc.edu/healthywork/index.asp