Role of Occupational Health Services in Prevention of Work-related Cardiovascular Disorders

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The goals of occupational health services

- To prevent: All the conditions and factors in work, work environment, and work organization, which may be hazardous to health
- To promote:
  - healthy and safe work environment
  - well-functioning work community
  - the prevention of work-related illnesses
  - the maintenance and promotion of the employees' ability to work (OHS Act 2001, Finland)
- Rehabilitation and RTW
- Optional: curative services

Tasks of Occupational Health Services in view of CVDs

- Recognition of employees with risk of CVD
  - Medical treatment/guidance to treatment and rehabilitation
  - Sick leave, part time sick leave, support in return to work
- Recognition of work-related risks – recommendations to diminish them
  - chemical and physical exposure
  - work time: shift work, long working hours/weeks
  - psycho-social exposure
  - stress factors related to unsecurity of the employment, threat of unemployment
- Life style
- Intervention program at the work place
  - collaboration with primary health care
  - BOHS – combines both

Proportion of mortality related to occupational factors in Finland


**Work** attributable fraction

- **Ischemic heart disease**: 9% for women, 19% for men
- **Stroke**: 8% for women, 12% for men
- Fatalities in traffic accidents ~391/yr and 38% reduction 1999-2010!
- WRD fatalities 1800/yr (6-fold)

Work stress and Cardiovascular diseases

Meta-analysis by Kivimäki et al. 2006, Scand J Work Environ Health: 83 000 employees, 14 studies

<table>
<thead>
<tr>
<th>Exposure</th>
<th>RR, OR</th>
<th>Adjusted (age, sex etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High work load</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Imbalance between inputs to work and rewards</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Injustice/unfairness in the organization</td>
<td>1.6</td>
<td>1.5</td>
</tr>
<tr>
<td>(Väänänen et al. 2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low predictability at work (clarity of goals, foreseeing problems, work awareness etc.)</td>
<td>Hazard ratio, HR 1.24 among workers aged 45-54 years</td>
<td></td>
</tr>
</tbody>
</table>
Working hours and shift work  
(Härmä 2006)

<table>
<thead>
<tr>
<th>Working times</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 11 h/d</td>
<td>3-fold risk to cardiac infarction</td>
</tr>
<tr>
<td></td>
<td>4-fold risk for diabetes mellitus 2</td>
</tr>
<tr>
<td>&gt; 60 h/week</td>
<td>3.7-fold risk for pension</td>
</tr>
<tr>
<td></td>
<td>because of health reason</td>
</tr>
<tr>
<td>Night shifts in work</td>
<td>1.6-fold risk for coronary disease</td>
</tr>
<tr>
<td></td>
<td>1.5-fold risk for breast cancer</td>
</tr>
</tbody>
</table>

Shift work (2- or 3-shift) associated with higher carotid intima media thickness and 2.2-fold odds for carotid plaque in young men 24-39 years of age  
(Acceleration of atherosclerotic process  
(Puttonen et al., Atherosclerosis. 2009 Aug;205(2):608-13)

Psychosocial agents

- Justice at work diminished CVD deaths 45%  
(Kivimäki ym., Psychosom Res, 06;61:271-4)  
and mortality 35%  
(Kivimäki ym., Arch Intern Med; 165:2245-51)

- Burnout increases CVD in men (OR 1.35);  
muskuloskeletal diseases in women (OR 1.22)  
(Honkonen ym. Psychosom Res 2006;61:59-66)

Disappearance of health promotion need during a 3-year follow-up  

<table>
<thead>
<tr>
<th>Physical activity</th>
<th>Group A (%)</th>
<th>Group B (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>Musculoskeletal symptoms</td>
<td>55</td>
<td>56</td>
</tr>
<tr>
<td>Dietary habits</td>
<td>44</td>
<td>40</td>
</tr>
<tr>
<td>Obesity</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Smoking</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Serum lipids</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>Quality of sleep</td>
<td>24</td>
<td>33</td>
</tr>
<tr>
<td>Mental well-being</td>
<td>50</td>
<td>54</td>
</tr>
</tbody>
</table>

Levels of WHP (MoSAH)

<table>
<thead>
<tr>
<th></th>
<th>Level 1: Healthy workers</th>
<th>Level 2: Threat of decreased work ability</th>
<th>Level 3: Workers with disability to work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All workers</td>
<td>Workers with symptoms, ill health</td>
<td>Workers with diseases, workers who come off bad</td>
</tr>
<tr>
<td>Measures</td>
<td>Prevention:</td>
<td>Finding out the reasons and influencing them:</td>
<td>Treatment of the diseases and rehabilitation.</td>
</tr>
<tr>
<td></td>
<td>- healthy working conditions</td>
<td>- exposure - life style - lacking rehabilitation etc. - unsecurity of the work.</td>
<td>- Improvements of the work environment.</td>
</tr>
<tr>
<td></td>
<td>- healthy life style - good work atmosphere</td>
<td>Secondary prevention</td>
<td>- Improvement of the work society, work contracts etc.</td>
</tr>
<tr>
<td></td>
<td>- “decent work and work contracts”</td>
<td>Tertiary prevention</td>
<td></td>
</tr>
</tbody>
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Actions of occupational health services for Work Ability, PMWA

(Individual & Group approach  
(Source: Rantanen 2011)

- Basic check  
- Age groups >45  
- WH, LLL, HE  
- PMWA

- Early DG  
- WRD  
- Early intervention  
- Good care  
- PMWA

- Good care  
- 2nd & 3rd Prevention  
- Early rehab.  
- PMWA

- Basic check  
- Age groups >45  
- WH, LLL, HE  
- PMWA

- Regular risk monitoring & assessment  
- Structural prevention  
- Primary prevention

- Job placement  
- Job adjustment  
- Work practices

- Regular risk monitoring & assessment  
- Structural prevention  
- Primary prevention

- Job and work environment adjustment  
- Lightened work  
- part-time work

Diseases, able to work 15%

<table>
<thead>
<tr>
<th></th>
<th>Long-term healthy</th>
<th>Excellent work ability</th>
<th>28% ?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healthy, Good work ability</td>
<td>42%</td>
<td></td>
</tr>
</tbody>
</table>

Significant loss of health 55 to 60 work ability 15%

Determinants of long work life expectancy  
(Source : Ilmarinen 2006)

<table>
<thead>
<tr>
<th></th>
<th>R² 0.14</th>
<th>R² 0.14</th>
<th>R² 0.13</th>
<th>R² 0.39</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Family</td>
<td>Neighbourhood Community</td>
<td>OHS</td>
<td>Work skills</td>
</tr>
<tr>
<td></td>
<td>Values, attitudes, motivation</td>
<td>Competence and skill</td>
<td>Health and functional capacity</td>
<td></td>
</tr>
</tbody>
</table>

R² = Explanatory power
The OHS Cycle

CVD, Cancer and Chronic Respiratory Diseases Risk Factors (Puska 2010)

What to screen?
- Screening of conventional risk factors
- Conventional ECG & Ergometric screening
- Ultrasonic screening for carotid intima media thickness of men in shift work to prevent acceleration of atherosclerotic process? (V. s. Puttonen et al. work)
  - Screening not (yet?) recommended by U.S. Stroke Association
  - More feasible method for OHS: measurement of central artery stiffness, in screening use in Japan
- Young employees at risky jobs or employees with high risk?
  - The research institutes should develop feasible methods and programs for screening at OHS

Need for new tools at OHS

Traditional prevention methods:
- For identification: criteria, scores
  - the traditional risk factors
  - screening tools for early recognition
- Methods for early interventions
  - Individual factors
  - Systems factors

New approaches:
- Using new ICT tools for communication, monitoring and feedback
- Need for "organisational diagnosis" for CVD risk environments and conditions
- Using socialmedia and networking
- Effective use of TV and other mass media

New types of motivation for life style?
- Health promotion is in competition of the time and interest with other information and entertainment
  - Behavioural theories
  - Collaboration with media?
- E.g. TV program "Life at stake" with internet risk calculator
  - Fashionable: Personal / special group trainers in physical activities, healthy cooking courses etc.?
  - We should OHS utilise consults/advertising experts to make the health promotion campaigns "fancy"?
  - For employers: cost-benefit estimations of the effects of downsizing, outsourcing and sacking?
  - Return of the investments to healthy work place an to health promotion?

Challenges for Prevention of CVDs by the OHS

- Preventive means exist for control of chemical and physical exposure, work time, workplace psycho-social agents
  - OHS activities in collaboration with workplaces
- Lack of preventive means against work insecurity, downsizing, global economical crisis etc.
  -Governments: actions for more secure work contracts
  - ILO, EU principles for "decent work life"
  - WHO: ICD 11 work - Occupational diseases more visible?
  - Workers' and Employers' Associations?
- Benefits from prevention:
  - Decrease of occupational and non-occupational diseases, decreased costs, improved health and work ability
  - Recognition of ODs and WRDs - kick-off for prevention!
Occupational health as an investment

- In a Finnish enterprise (Lassila & Tikanoja) OH is developed and followed up as any other business activity
- Results: Sick leaves diminished, retiring age rose up to 62 years
- Regular meetings with the OHP and the management of the enterprise
- Participatory OHS as a goal
- **OHS needs skills** to communicate with the workplace counterparts

Wider – national and global - approach needed

- OHS has no preventive means against work insecurity, downsizing, global economical crisis etc.
  - Governments: actions for more secure work contracts
  - ILO, EU principles for “decent work life”
  - WHO: ICD 11 work - Occupational diseases more visible?
  - Workers’ and Employers’ Associations?

Hearts and minds at work in Europe

- From individual level intervention to (pan-) national action plans – Recommendations to policy makers:
  - to develop or influence policies and practices at an international, national, regional, local or company level
  - **workplaces are powerful settings for health promotion and prevention**
  - workplace health interventions are available and effective
  - workplace health issues apply to non-working life as well
  - workplace health is an essential part of public health – BOHS