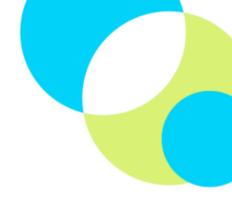
## Well-being through work



6.3.2014 Lindholm Harri 1



Experiences in Physiological Stress Assessment Studies of the Finnish Institute of Occupational Health (FIOH)

Harri Lindholm, MD, PhD, FIOH





- First measurements in laboratory in the nineteen eighties
- First recordings of physical and mental work strain with Holter devices in the nineteen eighties
- First measurements of physical and mental work strain with pulse recorders in real-life settings in the year 1990
- Co-operation with Firstbeat from the year 2004



# Examples of evaluated occupations

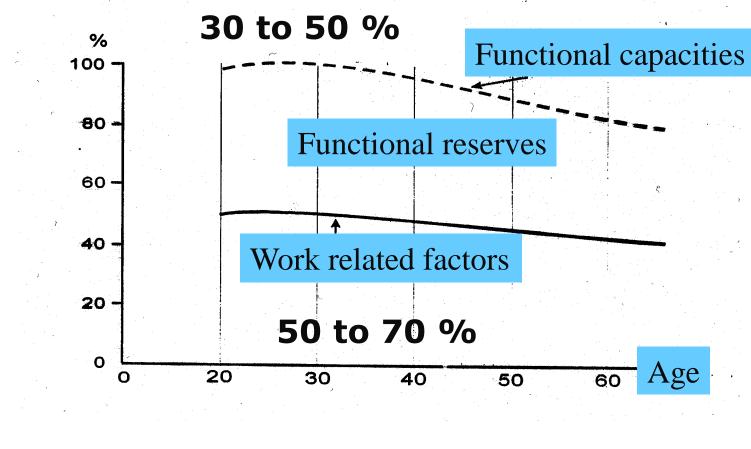
- ICT workers, media workers, civil servants, professional players in electronic sports and games
- Nurses, social workers, physicians
- Pole workers,, workers in traffic (railway, bus, truck drivers, seafarers), forestry workers, cleaning work
- Industrial workers: shipyards, papermills, workers in food production
- Safety workers: firefighters, police officers, soldiers, peacekeepers
- Artists: musicians (from classic to rock), actors, writers
- Top leaders in public and private sector

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Children (school, preschool)



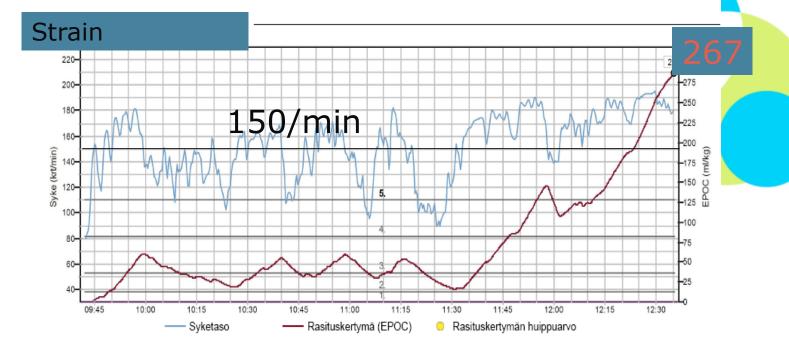
Management of work demands or increase in functional capacity or both?

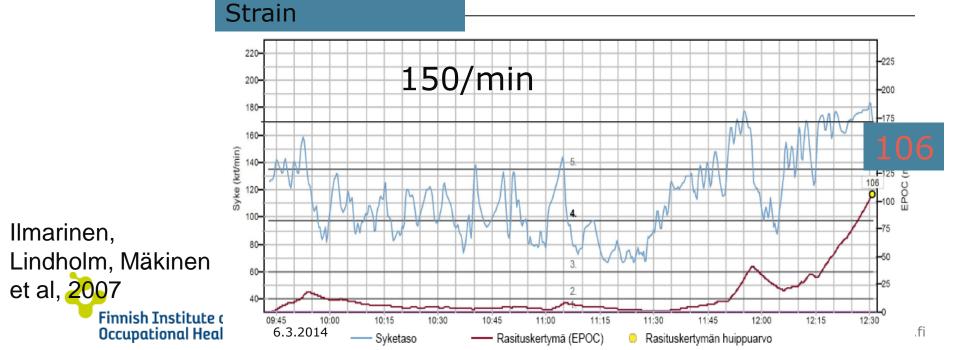


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Finnish Institute of Occupational Health

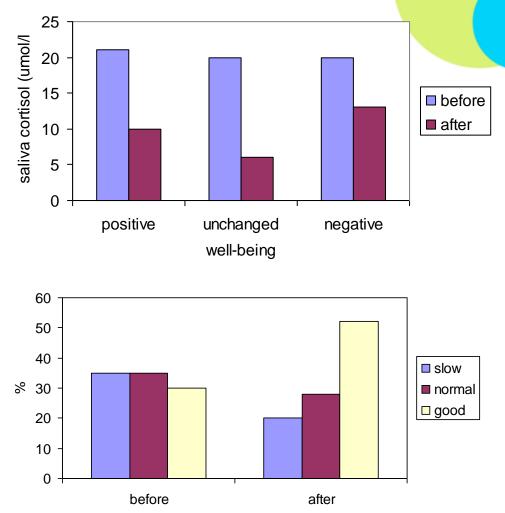
6in3d12011m1 Harri





### Effect of work shift change among the nurses

Change (µmol/I) of saliva cortisol morning response before and after intervention (one year follow-up) in employees experiencing the change in well-being positive, unchanged, or negative.



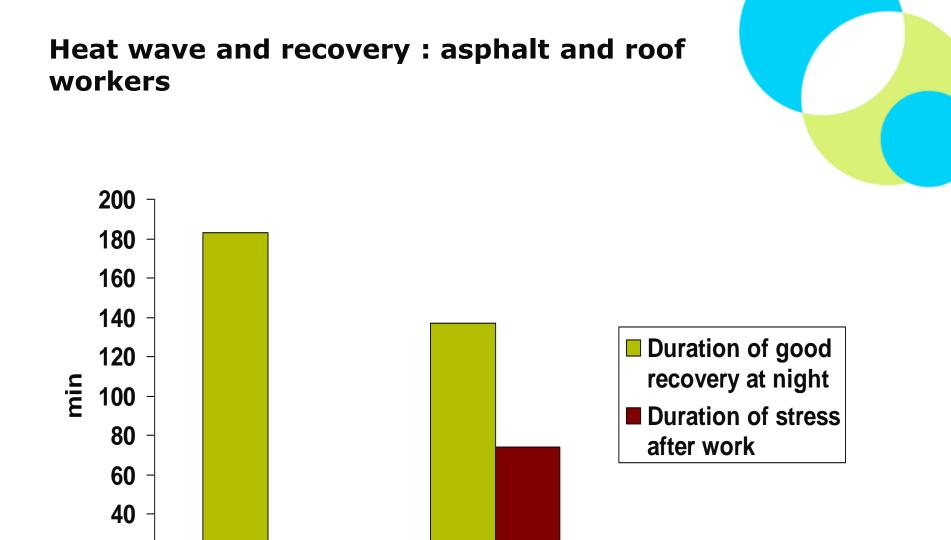
Recovery of the autonomous nervous system after working days both before and after changes to working hours (% of participants).

**Finnish Institute of** 

**Occupational Health** 

Lindholm, Hakola, Pohjonen et al 2008

intervention



Heat

Lindholm Harri 8

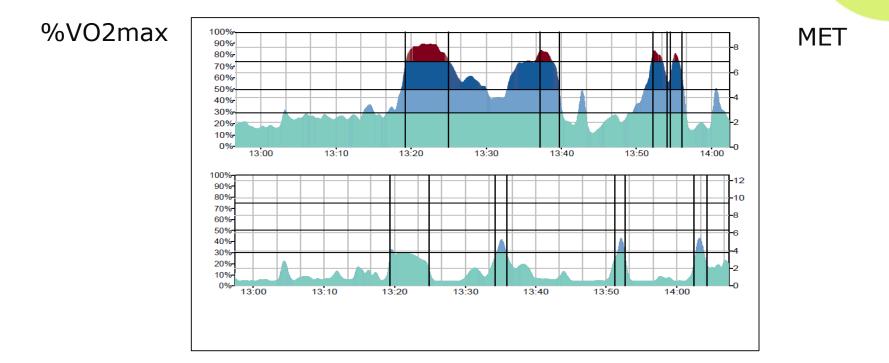
20

0

**Occupational Health** 

**Normal** 

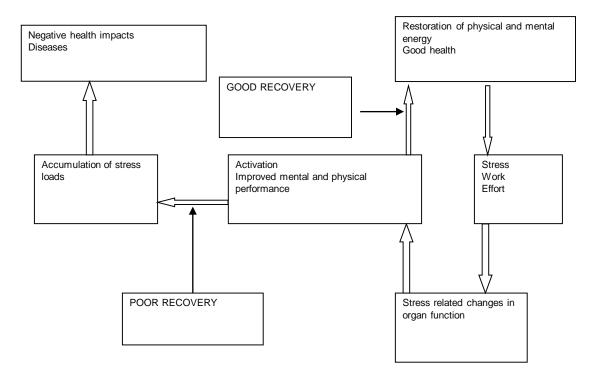
## Seafarers and emergency situations



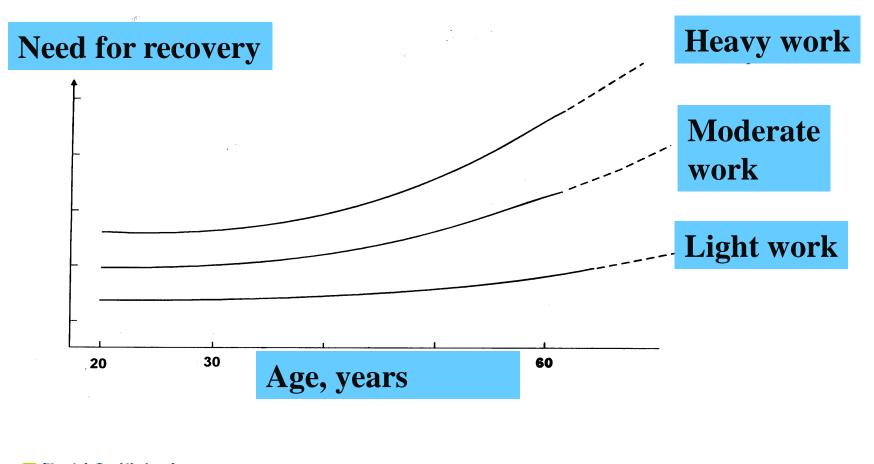
Swimming in rough sea 100 m, climbing to a lif raft from water, turning an upturned life raft, climbing ladders up back to ship

#### Miilunpalo et al, 2013

#### Recovery

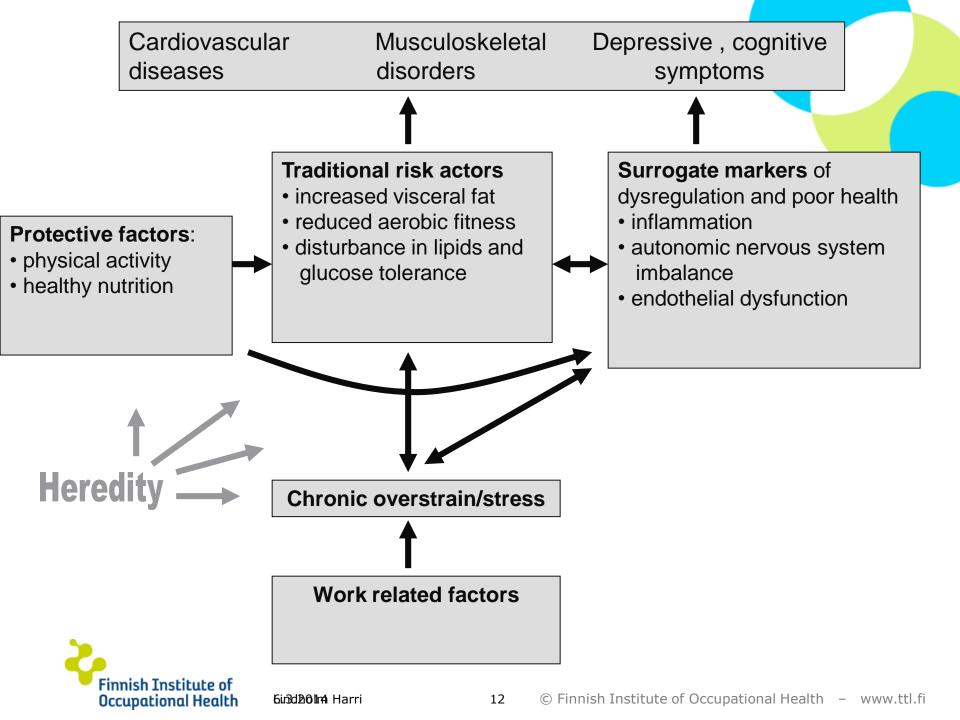






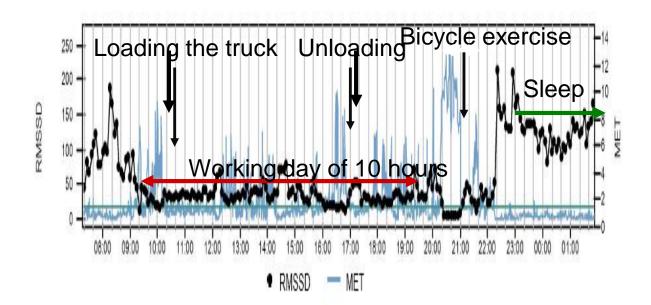
 Finnish Institute of Occupational Health

6in3d2001m4 Harri



### Physical exercise improves recovery, 40 years old truck driver





Black line: the vagal activity assessed by heart rate variability, high is good Blue line: energetic strain in MET's



6in3d12011n4 Harri

## Forestry workers: recovery, well-being, vascular health

Lindholm et al, 2014

Vascular age based on stiffness measurement Salivary metabolic and stress hormones (FIOH)

#### One year

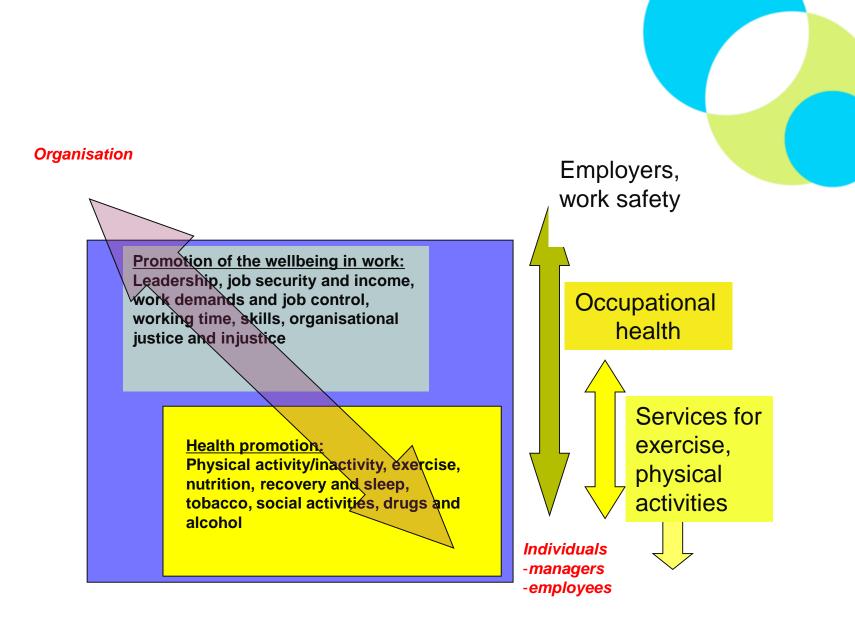
Results: Some changes in lifestyle at individual level. Significantly improved perceived recovery and sleep also at group level, decreased levels of stress hormones, vascular age decreased from 53 years to 48 years Forestry workers, N= 150

Selection with standardized questionnaire by commercial well being company (CWC) in cooperation with OH of the company, N=40, mean age 53 years

Lifestyle oriented personal training (CWC)

HRV based (Firstbeat) evaluation of work strain and recovery. Good recovery oriented health promotion by OH of the company







6in3d2001mA Harri

#### Health and work stress

**Work related factors:** job control, job insecurity, time pressure, information overflow, cognitive pressure, injustice in work organisation, bullying, physical overstrain, physical inactivity, shift work, working times, environmental factors

Job strain, unhealthy physical working environment, insufficient recovery during and after work

Genetics, epigenetics in early childhood, stress reactivity Lifestyle factors: tobacco smoking, alcohol consumption, recreational drugs, poor physical fitness and low physical activity, overweight

**Regulation and early signs**: Autonomic nervous system, hypothalamic- pituitary-adrenal axis, catecholamines, inflammation, brain-body interaction

#### Diseases

Cardiovascular diseases, cognitive disorders, depression, chronic musculoskeletal complaints, metabolic dysfunction

