



Finnish Institute of
Occupational Health

Cochrane Systematic Reviews of Occupational Health Interventions

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In this workshop..

-you will learn....
 - what the Cochrane Collaboration is
 - how a Cochrane Systematic Review is produced
 - what a Cochrane Systematic Review is
 - what framework is used
 - what the methods used are
 - what the problems are in implementing the results of Cochrane Systematic Reviews

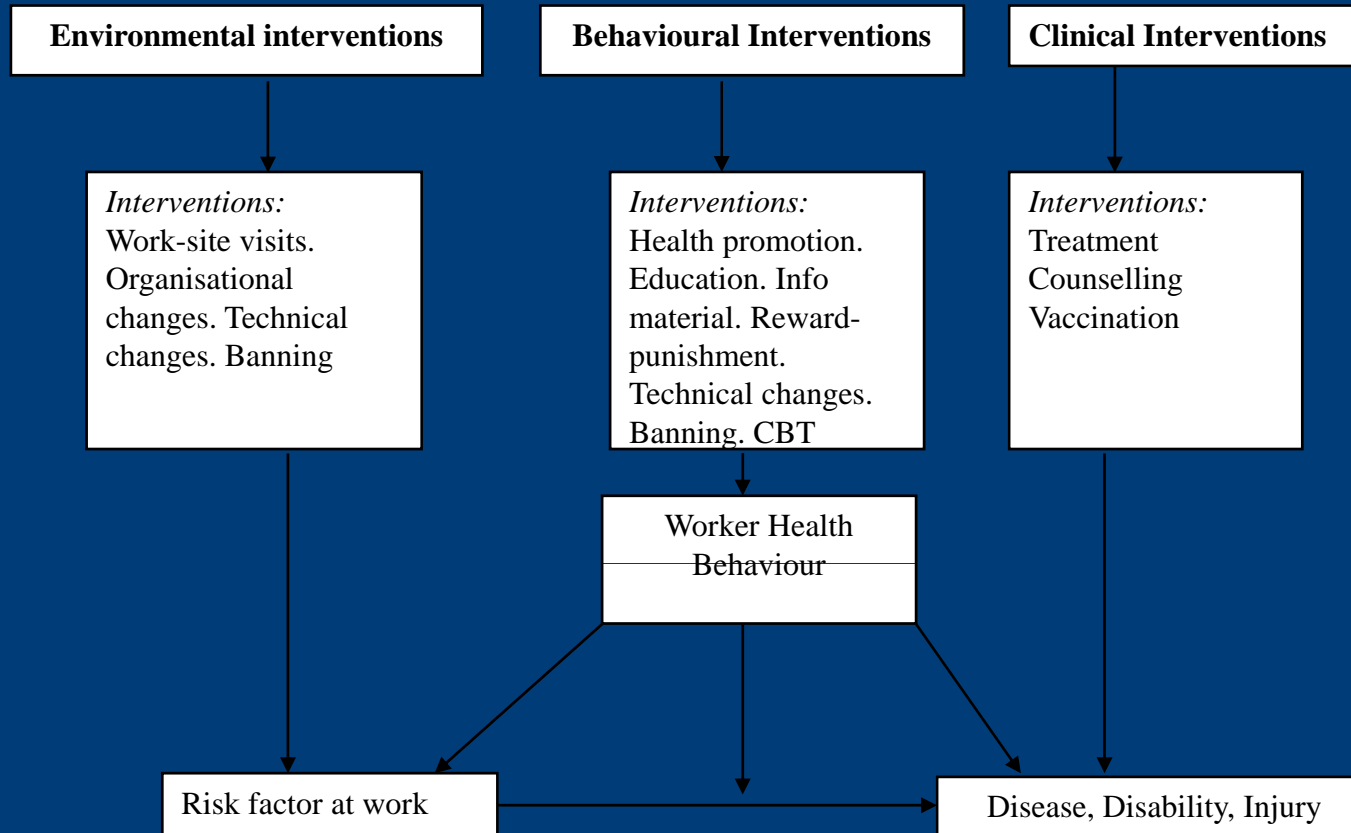
Cochrane Collaboration

- Mission
 - to provide up to date evidence on the effects of health care
- Products
 - systematic reviews of healthcare interventions
 - in Cochrane Library: www.thecochranelibrary.org
 - according to quality handbook
- Name
 - after Archie Cochrane, British epidemiologist
- Organisation
 - network of 50 review groups that produce systematic reviews supported by fields and centres
 - involves 10.000 persons on voluntary basis and small professional staff
- Web address
 - www.cochrane.org

Cochrane Occupational Health Field

- FIOH started Occupational Health Field in the Cochrane Collaboration
 - funding from FIOH, Ministry of Health, FinOHTA, Dutch Ministry of Social Affairs, NIOSH Australia
- Cochrane Occupational Health Field (COHF)
 - coordinator, information specialist, researchers
 - jos verbeek, merja jauhiainen, jani ruotsalainen, marika lehtola, irja laamanen, riitta sauni, iris pasternack, maritta kinunen, juha liira
 - over 50 authors involved from all over the world
 - officially registered with CC in May 2004

Occupational Health Interventions



Verbeek, Scand J WEH 2004

Tasks Occupational Health Field

- To maintain database of occupational health intervention studies
 - gather trials by hand searching journals
 - database at www.cohf.fi
- To stimulate the conducting of Cochrane Occupational Health Reviews
 - We.....
 - organise funding
 - write ourselves
 - organise reviewers
 - gather topics etc.
 - Reviews are located with Cochrane Review Groups
 - formally not with a field
 - Field has no formal power
 - mediate between reviewers and Cochrane review groups

Cochrane Review Production Process

- Title registration with a review group
 - avoids duplication
- Protocol
 - background, search, methods
 - peer-reviewed
 - publication in Cochrane Library
- Review
 - peer-reviewed (editors and external experts)
 - according to Cochrane Handbook
 - published in Cochrane Library
 - possibly published as a journal article

Cochrane Review Production Process

- Time line

- protocol: six months
- review
 - search selection: three months
 - data extraction: three months
 - data analysis: three months
 - writing: three months
- peer-review: six months
- time to publication: two years

- Updating

- every two years

Contents of a Cochrane Review

- Title
- Inclusion criteria
- Search
- Data Analysis
 - comparisons
 - outcome data
 - pooling
 - forest plot
- Conclusions
 - implications for practice
 - implications for research

Titles of Cochrane Reviews

- Titles for Cochrane reviews have a set format
 - P I C O
 - *intervention **for** health problem*
 - *intervention **for** health problem A **versus** intervention B*
 - *intervention A **versus** intervention B **for** health problem **in** participant group/location*

Title

- Formulate a title according to the PICO acronym


Title

- For occupational health reviews
 - 'intervention' for the prevention and treatment of **occupational outcome**
 - noise induced hearing loss, back pain, disability as a result of back pain, work-related stress, occupational injuries
 - **work-directed interventions for occupational outcome**
 - workplace adjustments, work reorganisation
 - intervention' for 'health problem' in **workers exposed to workplace health hazard**
 - hearing loss prevention programme
 - workplace smoking cessation programmes (?)

Inclusion criteria

- S PICO
 - study-design
 - participants
 - intervention
 - control
 - outcome
- To be used in study/article selection
 - be as concrete as possible!

Inclusion criteria: study designs

- Evaluation research in OH
 - often more difficult to perform because
 - employers, employees not interested
 - rapid changes in working populations and firms
 - unpredictable changes in organisations
 - interventions often carried out at group level
 - work accommodations
 - needs evidence other than RCTs
 - cluster randomised trials
 - cohort studies
 - interrupted time series
 - case-control studies
 - before-after studies
- 

Inclusion Criteria: Study Designs

- the lower the methodological quality...
 - the lower the power to change believes
 - the more work it is to locate studies
 - the more difficult it is to agree about study designs
 - the more difficult it is to draw conclusions

Inclusion Criteria: Study Designs In Cochrane Reviews

- Randomised Controlled Trials
 - cluster randomised, cross-over trials
- Controlled Before After Studies
- Interrupted Time Series

Inclusion Criteria: Randomised Controlled Trial



Inclusion Criteria: Controlled Before-After Study



Inclusion Criteria: Interrupted Time Series



Inclusion Criteria

- Ergonomic shift scheduling to prevent cardiovascular disease in shift workers
- Formulate Inclusion Criteria: S PICO

Inclusion Criteria

- Intervention in shift scheduling and changes in biomarkers of heart disease in hospital wards. Henrik Bøggild, Hans Jeppe Jeppesen Scand J Work Environ Health 2001;27(2):87—96
- **Objectives** The effect of introducing regularity, few consecutive night shifts, more weekends off, and only 2 different types of shifts (day-evening or day-night) into shift scheduling on biomarkers of heart disease was studied.
- **Methods** Ergonomic shift criteria were introduced in a quasi-experimental controlled intervention in 4 hospital wards. Six wards participated as controls. Altogether 101 nurses and nurses' aides were followed for 6 months with measurements of cholesterol and triglycerides. The intervention led to more regular schedules and more staff having 2 shifts in 2 of the intervention wards 1 year after the intervention. The schedules among the controls became less regular and less predictable. The number of consecutive night shifts remained unchanged.
- **Results** After 6 months the HDL cholesterol level had increased in the intervention group, and the total cholesterol and LDL cholesterol levels and the total:HDL cholesterol ratio had decreased. Regardless of the intervention, changes in regularity were associated with the triglyceride and HDL cholesterol levels and also with the total:HDL cholesterol ratio. More ergonomic changes were associated with lower LDL cholesterol levels, a lower total:HDL cholesterol ratio, and higher HDL cholesterol levels.
- **Conclusions** Increased ergonomic scheduling was possible. Lipids and lipoproteins changed as predicted, both when the changes were assessed in respect to the changes in schedules that resulted from the intervention and the changes that occurred regardless of the intervention. The study suggests that scheduling based on ergonomic criteria is a possible means for reducing the risk of heart disease among shift workers.

Search and study selection

- Based on S PICO
- Usually combination of search terms for
 - study-type
 - randomised controlled trial search string
 - intervention
 - outcome
 - work
- Sensitive search yields
 - 1000 to 8000 references
 - most sensitive is 15 million references
- Article selection
 - Article meeting inclusion criteria?
 - In duplicate because unreliable

Data Synthesis

- What to combine?
 - similar
 - S PICO
 - follow-up time
 - setting
 - arbitrary judgement
- Example

Data synthesis

- Make sensible comparisons:
 1. Ear muffs reduce noise levels with 20 dB(A)
 2. EAR plugs reduce hearing loss with 10 dB
 3. Legislation reduces noise levels with 5 dB(A)
 4. Worker training in plug use reduces hearing loss with 15 dB
 5. Subsidies for employers reduce noise levels with 10 dB(A)
 6. Information campaign for workers reduces hearing loss with 10 dB
 7. Magnesium for noise-exposed workers reduces hearing loss with 5 dB

Data-synthesis: comparisons

- Hearing protection vs no protection
 - hearing loss (plugs)
 - noise reduction (muffs)
- Employer incentives vs no incentives
 - noise reduction (legislation, subsidy)
- Worker behaviour change vs no intervention
 - hearing loss (information, training)
- Magnesium vs no intervention
 - hearing loss

Data synthesis: outcomes

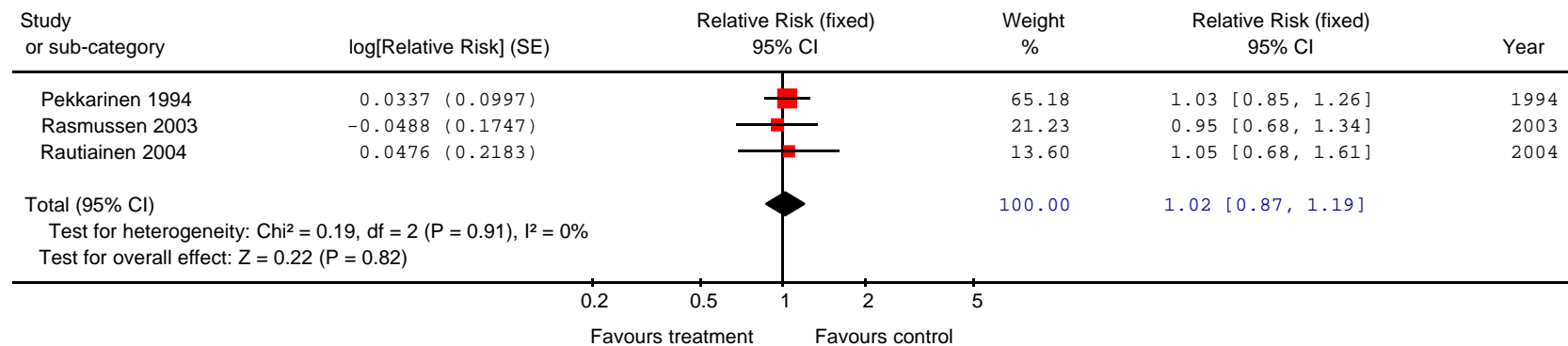
- Worker training to prevent injuries
- Outcome
 - Study 1:
 - intervention: 12 injuries / 45 workers
 - control: 18 injuries / 37 workers
 - author's conclusions:
 - RR 0.46 (95% CI 0.1 to 1.9)
 - no significant outcome
 - Study 2:
 - intervention: 16 injuries / 201.000 working hours
 - control: 26 injuries / 193.000 working hours
 - author's conclusions:
 - RR 0.59 (95% CI 0.29 to 1.12)
 - no significant outcome
- No quantitative analysis possible we combined studies qualitatively:
 - conclusion: based on two studies with a non-significant outcome we found no evidence of effectiveness

Data synthesis: outcomes

- Recalculate all outcomes on similar scale
 - 2000 working hours = 1 working year (US)
- Combine in meta-analysis
 - Pooled:
 - RR 0.59 (95% CI 0.41 to 0.93)
- Review Conclusion:
 - the intervention reduces injuries with 40%





Data analysis: forest plot

Review: Interventions for preventing injuries in the agricultural industry (1007007)
 Comparison: 01 Educational intervention versus no intervention
 Outcome: 01 All injuries adults



Conclusions

- Cochrane Review Section:
 - Implications for practice
 - Implications for Research

Action based on balance between benefit and harm	Numbers	Letters	Traffic lights	Thumbs	Arrows
Do	1	A			
Probably do	2	B			
Probably don't do	3	C			
Don't do	4	D			

- How active should we be in implementation?
- Implementation process:
 - What is current practice?
 - Is there a need for change?
 - How can we best contribute to the change?
 - Can we measure a change?

Lifting Advice to prevent back pain

- Results review
 - 6 RCTs and 5 Cohort Studies: no positive outcome
 - For preventing back pain or back pain related disability
 - MMH advice not more effective than
 - no advice (3 RCTs)
 - very brief advice (1 RCT)
 - physical exercise (1 RCT)
 - back belt use (2 RCTs)
 - MMH advice and assistive devices not more effective than
 - MMH advice alone (1 RCT)
 - no advice (1 RCT)
 - Cohort studies reported the same results

Lifting Advice to prevent back pain

- Review Implications for practice
 - This review does not provide evidence that training and advice by themselves prevent back pain
 - (Mandatory training should be reconsidered)
- Practice
 - Wide spread practice of advice (ergonomy)
 - Mandatory training according to EU regulation
 - EU subsidies for training
 - Strong belief among OH practitioners

Ecosh: Economic Dimension of OSH

- Implementation facilitators
 - Economic evaluation, business case, incentives for uptake of OSH-interventions
- FP-7 EU subsidized workshops
- Helsinki 23-24.1.2009
 - productivity and OSH interventions
- Amsterdam 8-9.5.2009
 - economic evaluation from company's perspective
- Lodz 28-29.11.2009
 - economic incentives for OSH uptake
- **WWW.ECOSH.EU**

Conclusions

- Cochrane methodology can be very well applied to a wide variety of OH topics
- More research designs than RCTs should count as evidence
- Evidence from non-randomised studies poses sometimes problems that are not surmountable
- Implementation calls for more knowledge
 - of current practice
 - powers involved in changing current practice