Liberty Mutual Research Institute for Safety

What predicts long term disability or early return to work?
A review of the evidence

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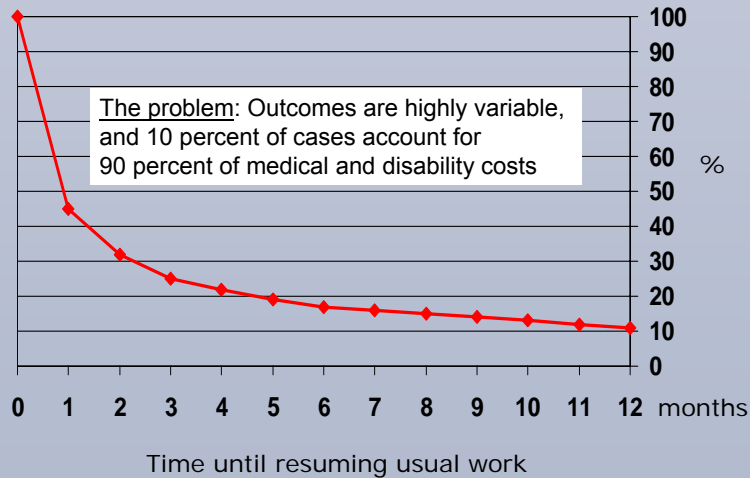Örebro University, Örebro, Sweden

- 10th Journées annuelles de santé publique
  (JASP), Montréal (Qc) Canada, Oct 23-27, 2006

Objectives

- Summarize factors associated with RTW outcomes in prospective MSD studies.

- Discuss methodology and interpretation.

- Present options for integrating prognostic factors into RTW interventions.

RTW for musculoskeletal disorders

The problem: Outcomes are highly variable, and 10 percent of cases account for 90 percent of medical and disability costs

%

0 1 2 3 4 5 6 7 8 9 10 11 12 months

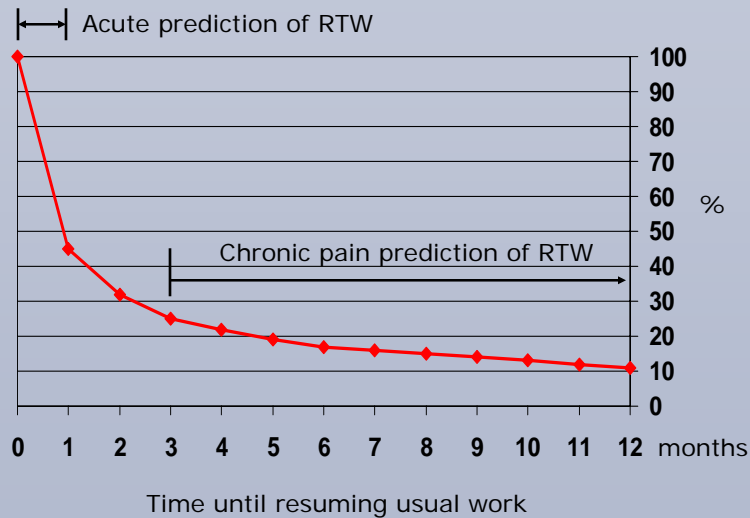Time until resuming usual work

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Public health models for risk reduction: The example of cardiovascular disease

- **Demographic (non-modifiable)**
  - age, gender, heredity
- **Lifestyle**
  - smoking, diet, physical inactivity, stress, alcohol
- **Medical diagnostics**
  - high blood cholesterol, high blood pressure, obesity/overweight, diabetes mellitus

American Heart Association, 2006

LBP prognosis for RTW – who and when to screen?

Acute prediction of RTW

Chronic pain prediction of RTW

%

Time until resuming usual work

(x-axis: 0 1 2 3 4 5 6 7 8 9 10 11 12 months; y-axis: 0 10 20 30 40 50 60 70 80 90 100)

Predictors of MSD disability: Study designs

- Types of studies
  - Prospective cohort study
- Study populations
  - Workers filing workers' compensation claims
  - Primary care/ occupational medicine cohorts
  - Referrals to specialty clinics
- Data collection
  - Repeated survey of longitudinal outcomes
  - Administrative database
- Types of analysis
  - Logistic regression predicting RTW
  - Cox proportional hazards modeling

Methodology

- Consult recent literature reviews (2000-2005)
- Compile all factors with at least "moderate support" concluded in one or more review.
- Eliminate redundancy
- Create categories of risk
- (Analyze concordance of risk factors with experimental RTW interventions)

Nine published reviews (2000-2005)

- Crook et al., J Occup Rehab 2002.
- Hartvigsen et al., Occup Environ Med 2004.
- Hoogendorn et al., Spine 2000.
- Linton, J Occup Rehabil 2001.
- Linton (in Nachemson & Jonsson, ed.), 2000.
- Pincus et al., Spine 2002.
- Shaw et al., Disabil Rehabil 2001.
- Steenstra et al., Occup Environ Med, 2005.
- Waddell, The Back Pain Revolution, 2004.

Factor groupings

- Demographic (administrative)
- Biomedical (diagnosis, test results)
- Workplace (job tasks & environment)
- Personal (psychosocial)
- (Treatment, insurance/delivery system)

Demographic factors

- Older age
- Female gender
- Higher socioeconomic status

Biomedical factors (after red flags)

- History of LBP with work absence
- Time lapse before pursuing treatment
- Radicular findings
- "Specific" vs. "non-specific" diagnosis

Workplace factors (1)

- Physical demands
  - fast work pace (self-report)
  - Heavier physical demands (self-report)
  - Type of occupation (construction, warehousing)
- Social/managerial
  - Lack of social support (validated scales)
  - Lack of control (validated scales)
  - Less job tenure (years with employer)
  - Lack of modified duty options (yes/no)
  - Delayed report of injury (days)

Workplace factors (2)

- Worker perceptions about work
  - Job dissatisfaction (validated scales)
  - Monotonous work (validated scales)
  - Job stress (validated scales)
  - Belief work is dangerous (yes/no)
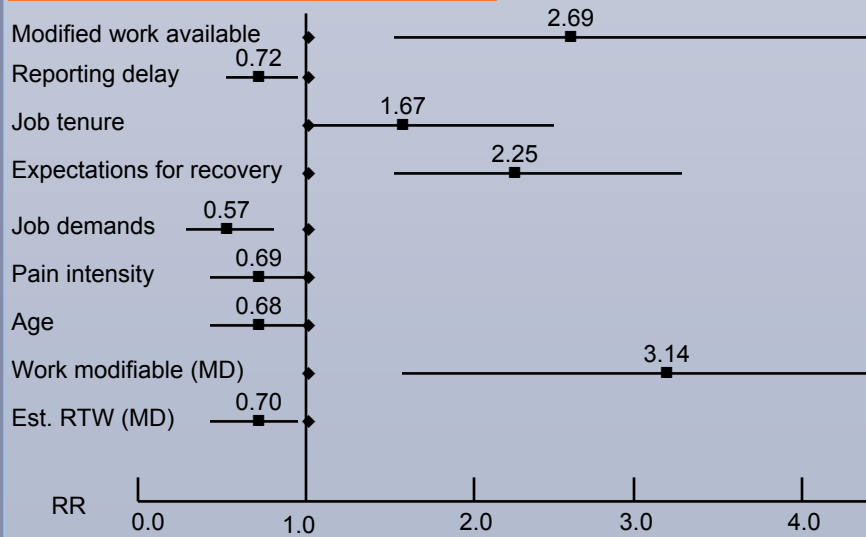 - Emotional effort of work (single rating)

Personal factors (1)

- Behavioral
  - Perceived functional limitation (validated scales)
  - Fear avoidant beliefs (validated scales)
  - Pain behavior (validated scales)
- Cognitive
  - Pain intensity (0-10 rating)
  - Somatization (validated scales)
  - Pain catastrophizing (validated scales)
  - Poor expectations for recovery (single item)
  - Poor rating of general health (single item)

Personal factors (2)

- **Emotional** (abbreviated scales)
  - Distress
  - Depressed mood
  - Anxious mood

# Example: Relative risk (RR) for RTW at one month after LBP (N = 291)*

Factor	RR
Modified work available	2.69
Reporting delay	0.72
Job tenure	1.67
Expectations for recovery	2.25
Job demands	0.57
Pain intensity	0.69
Age	0.68
Work modifiable (MD)	3.14
Est. RTW (MD)	0.70

RR scale: 0.0 1.0 2.0 3.0 4.0

*Shaw et al., SPINE, 30(5), 572-580.

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Interpreting risk factor results?

- Overlap among risk factors
- Poor predictive accuracy
- Modifiable vs. non-modifiable
- "Risk factors" vs. "risk indicators"
- When to screen for early intervention
- How should risk factors inform treatment?
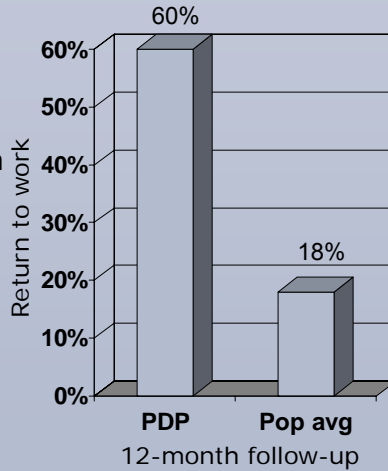
Option A:
Intervene for high risk patients only

- <10 weeks low back pain, unable to resume work
- 70 of 700 (10% high risk)
- Groups:
  - 22 high risk with intervention (HR-I)
  - 48 high risk with no intervention (HR-NI)
- Multidisciplinary functional restoration

Bar chart: % Return to work at 12-month follow-up — HR-I: 91%, HR-NI: 69%, LR: 87%
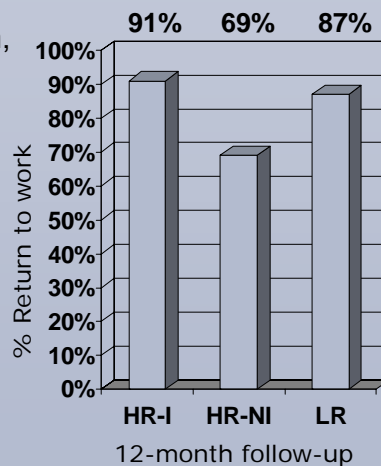
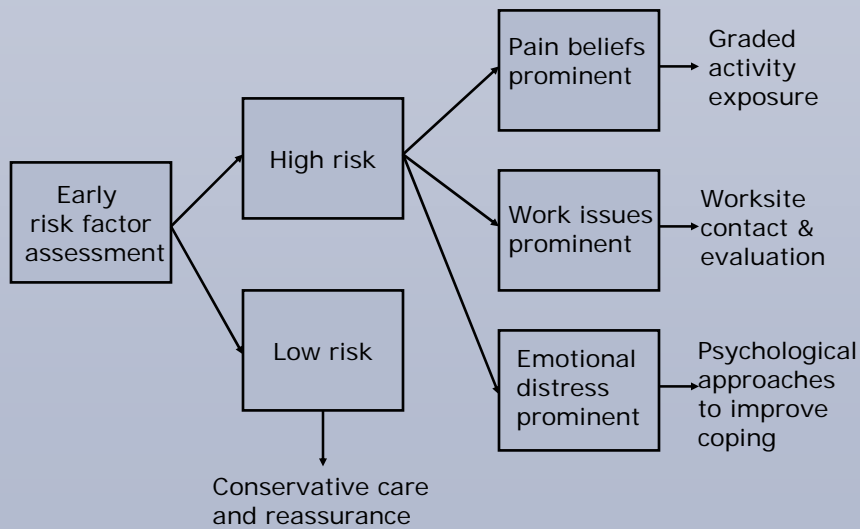Gatchel, Polatin, Noe et al., J Occup Rehabil 2003.

Option B:
Intervene on a single risk factor

- Work-related musculoskeletal disorders
- <2 years work absence
- 10-week Pain Disability Prevention (PDP) program focusing on:
  - pain catastrophizing
  - fear of movement/re-injury
  - perceived disability
  - depression
- Administered by specially trained psychologists in community settings.

Sullivan, Ward, Tripp et al., J Occup Rehabil 2005.

Option C:
Identify patient sub-groups?

Early risk factor assessment → High risk → Pain beliefs prominent → Graded activity exposure

High risk → Work issues prominent → Worksite contact & evaluation

High risk → Emotional distress prominent → Psychological approaches to improve coping

Early risk factor assessment → Low risk → Conservative care and reassurance

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Summary

- Many prospective studies of RTW
- Psychosocial & workplace factors are key
- No evidence of clear consensus
- Predictive accuracy could be better
- Clear opportunities for intervention

Questions?

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