Pain and recovery after musculoskeletal injury

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Rehabilitation and Recovery after Injury
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Pain and recovery after injury: standard beliefs

- Pain is often caused by injury (direct relationship)
- And, most expect as injury resolves, so does pain

Example:

“for 90% low back pain resolves within 6 weeks”

Refs.

Henschke et al. BMJ (2008) (Sydney Primary Care Study)

- Inception cohort study of 973 patients presenting to primary care with LBP < 2 weeks duration

- Follow up at 6 weeks, 3 months, and 12 months (< 3% dropout)

- Sampled three dimensions of recovery: return to work, interference with function due to pain, and pain status
Three pictures of recovery from LBP

- Normal work status
- No disability
- Pain-free

Close to 30% still reporting pain 1 yr later

To understand health, work and disability in NSW CTP Scheme participants

Recruited from NSW Motor Accidents Authority Personal Injury Register (PIR) database

NSW CTP insurers contribute claims data to MAA

Claims can be ‘minor’ (Accident Notification Forms) or full claims
Design and Methods

- Telephone interviews at baseline, 12 and 24 months

- Inclusion criterion - compensable injury in motor vehicle crash within the past 3 months

- Exclusion criteria - age < 18 years; Severe brain injury, spinal cord injury, injury requiring hospitalisation for more than 7 days; inability to complete questionnaires by telephone in English.

- Standardised health and other outcome measures
MVA Pain outcomes (Gopinath et al. unpublished)

N = 417, 327, and 291 (at 3 measurement phases)

Proportion of participants experiencing moderate/severe pain during the 24 months as assessed by the EQ-5D ‘pain/discomfort’ scale

60-70% report pain persisting at long-term = chronic pain

* NSW Pop. Prevalence ~ 20% (Blyth, et al., 2001)
Pain following injury persists >1 year in 30-70%

Why?

Many proposed mechanisms (e.g. CNS changes)

But these don’t happen for many cases

Typically, considered in terms of risk factors or predictors
Common risk factors for poor outcomes with MSK pain *(Mallen et al, Br J Gen Pract 2007)*

- Pain severity
- Anxiety and/or depression
- Higher somatic perceptions/distress
- Adverse coping strategies
- Higher disability
- Greater movement restriction
- Longer duration
- Multiple sites
- Previous episodes
- Low social support
- Older age

Some modifiable
Other not modifiable

Reflect past history and features of current episode

Influence of pain history shows importance of primary prevention
**Context**  Low back pain is extremely common. Early identification of patients more likely to develop persistent disabling symptoms could help guide decisions regarding follow-up and management.

**Objective**  To systematically review the usefulness of individual risk factors or risk prediction instruments for identifying patients more likely to develop persistent disabling low back pain.

**Data Sources**  Electronic searches of MEDLINE (1966-January 2010) and EMBASE (1974-February 2010) and review of the bibliographies of retrieved articles.

**Study Selection**  Prospective studies of patients with fewer than 8 weeks of low back pain from which likelihood ratios (LRs) were calculated for prediction of persistent disabling low back pain for findings attainable during the clinical evaluation.

**Conclusion**  The most helpful components for predicting persistent disabling low back pain were maladaptive pain coping behaviors, nonorganic signs, functional impairment, general health status, and presence of psychiatric comorbidities.
## Increased risk for poor RTW after injury

<table>
<thead>
<tr>
<th>Biological</th>
<th>Red flags</th>
<th>Orange flags</th>
<th>Yellow flags</th>
<th>Blue flags</th>
<th>Black flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal and environmental Factors (Psychosocial)</td>
<td></td>
<td>• Depression</td>
<td>• Unhelpful (eg. avoidant) coping strategies (eg. resting)</td>
<td>• Perceived low social support at wk; Perceived unpleasant work</td>
<td>• Legislative criteria for compensation</td>
</tr>
<tr>
<td>Environmental (systemic) (Main et al., 2008)</td>
<td></td>
<td>• PTSD</td>
<td>• Emotional distress</td>
<td>• Low job satisfaction</td>
<td>• Nature of workplace (eg. heavy work)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Emotional distress</td>
<td>• Perception of excessive demands</td>
<td>• Threats to financial security</td>
</tr>
</tbody>
</table>
Summary of Yellow Flag Concepts and Evidence

Early Identification and Management of Psychological Risk Factors ("Yellow Flags") in Patients With Low Back Pain: A Reappraisal

Michael K. Nicholas, Steven J. Linton, Paul J. Watson, Chris J. Main, the "Decade of the Flags" Working Group

Originally the term "yellow flags" was used to describe psychosocial prognostic factors for the development of disability following the onset of musculoskeletal pain. The identification of yellow flags through early screening was expected to prompt the application of intervention guidelines to achieve secondary prevention. In recent conceptualizations of yellow flags, it has been suggested that their range of applicability should be confined primarily to psychological risk factors to differentiate them from other risk factors, such as social and environmental variables. This article addresses 2 specific questions that arise from this development: (1) Can yellow flags influence outcomes in people with acute or subacute low back pain? and (2) Can yellow flags be targeted in interventions to produce better outcomes? Consistent evidence has been found to support the role of various psychological factors in prognosis, although questions remain about which factors are the most important, both individually and in combination, and how they affect outcomes. Published early interventions have reported mixed results, but, overall, the evidence suggests that targeting yellow flags, particularly when they are at high levels, does seem to lead to more consistently positive results than either ignoring them or providing standard interventions to people regardless of psychological risk factors. Psychological risk factors for poor prognosis can be identified clinically and addressed within interventions, but questions remain in relation to issues such as timing, necessary skills, content of treatments, and context. In addition, there is still a need to elucidate mechanisms of change and better integrate this understanding into the broader context of secondary prevention of chronic pain and disability.
Risk factors examined by Henschke et al. (included some yellow flags)

- Older age
- More intense pain
- Longer duration of low back pain
- More days of reduced activity
- Patient reports feeling depressed
- Patient believes pain is likely to persist
- Compensable low back pain
The more of these risk factors present, the more likely recovery will be delayed.
### Table I

**Table I. The items selected for the short version of the ÖMPSQ.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Concept area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How long have you had your current pain problem?</td>
<td>Pain</td>
</tr>
<tr>
<td>2. How would you rate the pain that you have had during the past week?</td>
<td>Pain</td>
</tr>
<tr>
<td>3. Please circle the one number which best describes your current ability to participate in each of these activities</td>
<td>Self-perceived function</td>
</tr>
<tr>
<td>I can do light work for an hour.</td>
<td></td>
</tr>
<tr>
<td>4. Please circle the one number which best describes your current ability to participate in each of these activities</td>
<td>Self-perceived function</td>
</tr>
<tr>
<td>I can sleep at night.</td>
<td></td>
</tr>
<tr>
<td>5. How tense or anxious have you felt in the past week?</td>
<td>Distress</td>
</tr>
<tr>
<td>6. How much have you been bothered by feeling depressed in the past week?</td>
<td>Distress</td>
</tr>
<tr>
<td>7. In your view, how large is the risk that your current pain may become persistent?</td>
<td>Return to work expectancy</td>
</tr>
<tr>
<td>8. In your estimation, what are the chances you will be working your normal duties in 3 months</td>
<td>Return to work expectancy</td>
</tr>
<tr>
<td>9. An increase in pain is an indication that I should stop what I'm doing until the pain decreases.</td>
<td>Fear avoidance beliefs</td>
</tr>
<tr>
<td>10. I should not do my normal work with my present pain</td>
<td>Fear avoidance beliefs</td>
</tr>
</tbody>
</table>
Score Distribution in a Workers Compensation Cohort in NSW (1-5 days of notification of injury)

Histogram

Mean = 51.00
Std. Dev. = 16.361
N = 217

With permission
Costs by 6 months as scores on initial OMPQ-SF rise

OMPQ-SF scores at baseline
In MVA (MAA) study

Prognostic indicators of social outcomes in persons who sustained an injury in a road traffic crash

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Key findings

› **Injury severity not a prognostic indicator** of work disability over the 24 mths

  [Note: Hepp et al (BMC Psychiatr 2011;11:53): injury severity did not predict the number of days off work at 3 years]

› **SF-12 MCS scores** (an indicator of mental well-being) independently predicted RTW and sustained RTW over 24 months

› **OMPSQ scores** were associated with RTW after 12 months, Those with scores \( \leq 50 \) = **more likely to RTW**
## Selecting high psychosocial risk patients vs no selection (RCTs from 2000) (Nicholas et al., Physical Therapy 2011)

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention &amp; Outcomes (bold)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linton &amp; Andersson, 2000</td>
<td>6 x 2-hr grp sessions with Clin. Psychologist + Rehab &gt; Information + Rehab (on lost time from work)</td>
<td>+</td>
</tr>
<tr>
<td>Loisel et al., 2002</td>
<td>All interventions achieved gains, but comprehensive ‘Sherbrooke’ model (combined occupational and clinical interventions) had fewer days on benefits. (RTW)</td>
<td>+</td>
</tr>
<tr>
<td>Van den Hout et al., 2003</td>
<td>Graded activities (behavioural principles) + problem-solving training &gt; Graded activities + education (on longer-term work status)</td>
<td>+</td>
</tr>
<tr>
<td>Linton et al., 2005</td>
<td>CBT grp = CBT + exercise grp &gt;&gt; minimal tmt grp (examination, reassurance, advice on activities). (lost time)</td>
<td>+</td>
</tr>
<tr>
<td>Schiltenwolf et al., 2005</td>
<td>The addition of the behavioural therapy for dealing with stress and problems generally seems to have added significantly to exercise/activity program. (Lost time)</td>
<td>+</td>
</tr>
<tr>
<td>Verbeek et al., 2002</td>
<td>Many similarities in content of control grp and treatment grp. No difference between grps on disability &amp; RTW outcome (both improved).</td>
<td>(-) Low distress in initially</td>
</tr>
<tr>
<td>Jelema et al., 2005</td>
<td>Psychosocial intervention = standard care (both by GP only) (on disability)</td>
<td>(-) Low level of risk factors initially</td>
</tr>
<tr>
<td>Hay et al., 2005</td>
<td>CBT (pain management) and manual therapy (+ home exercise) achieved similar results (disability)</td>
<td>(-) Low distress initially</td>
</tr>
<tr>
<td>Sullivan et al., 2006</td>
<td>Psychosocial risk factors reduced in both groups (Physio + CBT vs Physio only), but catastrophizing reduced more in combined group. Combined group had better RTW 4-wks after end of treatment.</td>
<td>+ Reduced catastrophizing associated with better outcomes</td>
</tr>
</tbody>
</table>
When psychosocial risk/prognostic factors low, usual care is sufficient

(Usual care seems effective in “uncomplicated cases of LBP” – Jallema et al. Pain 2006)

But, when psychosocial risk/prognostic factors high, interventions targeting these aspects more effective than usual care

So, you don’t have to intervene early in most cases

Just those in higher risk category
Management Implications: Claims

- **Screen** for demographic characteristics (age, sex, education, work status, pre-injury health, etc.)
  - **Action**: monitor (can’t change, but can factor into management/treatment planning)

- **Screen** for psychosocial factors (depression, pain, beliefs – could use OMPSQ-SF & SF-12)
  - **Action**: if +ve arrange psychological assessment to clarify picture and consider options after that

- **Monitor** interactions between Claims team and injured person
  - **Action**: if problems (conflict/disputes) found, intervene
Outcomes:
1. Cost of workers compensation claims
2. Sustained RTW in the 12 month follow-up
- It is not the injury, it is the person (for mild to moderate injuries)
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Investigators

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