

### **The Challenge with Soft Tissue Injuries**

WorkSafeNB (WSNB) has observed that: *Some injured workers with little or no physical impairment have more chronic pain disability than those with greater levels of impairment.* This is not unique to New Brunswick (NB).

For shoulder fractures, median claim duration in NB was 23 weeks compared to expected disability duration (DDG) of 21 weeks in general population. For soft-tissue injuries (STIs), median claim duration was 20 weeks compared to expected DDG of 4-6 weeks. Median claim duration for partial rotator cuff tear (RCT) was 80 weeks compared to 48 weeks for full RCT.

55% of claimants with STI had yellow flags. Non-surgical shoulder STI claimants who proceed to surgery have more yellow flags than claimants who stay in active rehab. Yellow flags are indicative of psychosocial barriers to early return-to-work (RTW) (Kendall, Linton et al. 1997; Waddell, Burton et al. 2003; Gozna 2004; Waddell 2004; Gozna 2005; Gozna 2007; ACOEM (American College of Occupational and Environmental Medicine) 2008 Revision; Kendall, Burton et al. 2009). An audit of shoulder, back and knee surgery suggested that 57% of surgery was for “soft indications” – predominantly to alleviate pain. Median claim duration for firm indications was 55 weeks (68% RTW; 8% open at 2 years for medical treatment) compared to 79 weeks for soft indications (57% RTW; 19% open at 2 years for medical treatment).

Research finds that workers’ compensation (WC) patients prefer surgical over non-surgical treatment (Atlas, Tosteson et al. 2007). However, workers’ compensation patients are four times more likely to have a poor surgical outcome compared to non-WC patients (Harris, Mulford et al. 2005). It would appear that surgeons are operating on conditions in workers’ compensation patients that they would generally not operate on in non-WC patients.

#### **(a) Occupational Disconnect Can Be Harmful to One’s Health**

Worklessness can be harmful to health – higher mortality, greater morbidity (poorer general health, poorer mental health), higher use of medical services, and greater consumption of medications (Talmage and Melhorn 2005; Waddell and Burton 2006; Black 2010).

Increased time off work is associated with an increasing risk of worklessness (Waddell 1987; Alyward and Sawney 2007). If one is off work for 4-6 weeks, one has a 20% probability of long-term disability. By 12 weeks, there is a 55% probability of no RTW within 6 months. By 6 months, there is a 50% probability of no RTW within the next year. If a worker is off work 1-2 years or has lost their job, it is unlikely that they will RTW at all (Waddell 2004). Occupational disconnect can be harmful to one’s health (Gozna 2005).

#### **(b) What is the predominant disabling condition?**

Research shows that from the subacute injury phase onward, psychosocial factors play a greater roll in long-term absence and chronic pain disability than biomedical factors (Hogg-Johnson, Frank et al. 1994; Gatchel, Polatin et al. 1995; Shaw, Pransky et al. 2005; Waddell and Burton 2006; Shaw, Pransky et al. 2007). Research points to pain catastrophizing and fear avoidance as significant psychosocial risk factors for prolonged chronic pain disability (Crombez, Vlaeyen et al. 1999; Vlaeyen and Linton 2000; Severeijns, Vlaeyen et al. 2001; Buer and Linton 2002; Denison, Asenlof et al. 2004;

## Shoulder Injury Management Program Overview: The Challenge

Waddell 2004; Boersma and Linton 2005; Swinkels-Meewisse, Roelofs et al. 2006; Jensen, Nielsen et al. 2010). Linton and Boersma developed a screening tool for psychosocial risk factors for prolonged disability – the Örebro Musculoskeletal Pain Questionnaire (ÖMPQ) (Linton and Boersma 2003; Boersma and Linton 2005; Hockings, McAuley et al. 2008). The questionnaire has been validated in the workers' compensation context (Dunstan, Covic et al. 2005; Margison and French 2007).

### *(c) Pain Catastrophizing Predicts*

Greater chronic pain and disability (Turner, Jensen et al. 2000; Buer and Linton 2002; Picavet, Vlaeyen et al. 2002; Turner, Jensen et al. 2002; Shaw, Pransky et al. 2007; Demmelmaier, Lindberg et al. 2008; Campbell and Edwards 2009). Submaximal performance on muscle testing (Verbunt, Seelen et al. 2005). Higher analgesic intake in general (Jacobsen and Butler 1996; Severeijns, Vlaeyen et al. 2004) and opioid specifically (Jensen, Thomsen et al. 2006). Poorer response to radiofrequency and injection treatment (van Wijk, Geurts et al. 2008). Greater activity intolerance (Buer and Linton 2002; Sullivan, Rodgers et al. 2002). Poorer general health (Severeijns, van den Hout et al. 2002; Severeijns, Vlaeyen et al. 2004). Higher health care utilization (Severeijns, Vlaeyen et al. 2004; Jensen, Thomsen et al. 2006).

### *(d) Fear Avoidance Predicts*

Submaximal performance on muscle testing (Verbunt, Seelen et al. 2005). Greater chronic pain and disability (Crombez, Vlaeyen et al. 1999; Buer and Linton 2002; Picavet, Vlaeyen et al. 2002; Denison, Asenlof et al. 2004; Grotle, Vollestad et al. 2004; Boersma and Linton 2005; Cedraschi and Allaz 2005; Coudeyre, Tubach et al. 2007; Jensen, Nielsen et al. 2010). More functional / ADL disability (Buer and Linton 2002; Swinkels-Meewisse, Roelofs et al. 2003; Gheldof, Vinck et al. 2006; Swinkels-Meewisse, Roelofs et al. 2006; Swinkels-Meewisse, Roelofs et al. 2006b). Greater social disability (Swinkels-Meewisse, Roelofs et al. 2003; Gheldof, Vinck et al. 2006; Swinkels-Meewisse, Roelofs et al. 2006; Swinkels-Meewisse, Roelofs et al. 2006b). More prolonged work restrictions / work absence (Cicccone and Just 2001; Fritz, George et al. 2001; Fritz and George 2002; Storheim, Ivar Brox et al. 2005; Lotters, Franche et al. 2006; Turner, Franklin et al. 2006; Shaw, Pransky et al. 2007).

### *(e) WSNB's Experience*

WSNB screens claimants for high risk of prolonged disability using a modified version of the ÖMPQ – the Pain and Activity (P&A) Questionnaire. Scores below 99 are associated with a “predominantly biomedical / anatomical” pain generator (low risk). Scores above 139 are associated with a “predominantly psychosocial” pain generator (high risk). Background analysis of claims for WSNB's 2008-2009 pilot program to manage “high risk” claims showed that high-risk STI claimants off work beyond 26 weeks had more imaging, more opioids, more nerve blocks, and more surgery than low risk STI claimants off work beyond 26 weeks. Since the main difference is a higher portion of psychosocial / yellow flags in the former, biomedical treatment for psychosocial factors is going to be ineffective. If the physician is trapped in the biomedical model, failed biomedical-based treatment leads to more biomedical-based treatment.

WSNB's experience is that the highest opioid use is in claimants with a predominantly psychosocial pain generator. Research finds that higher opioid use is associated with

## Shoulder Injury Management Program Overview: The Challenge

poorer functional outcomes and longer disability duration in persons with musculoskeletal (MSK) injuries (Webster, Verma et al. 2007; Kidner 2009).

WSNB initiated the High Risk 2008-2009 pilot in an attempt to reduce the harm to injured workers from unnecessary prolonged duration off work. WSNB screened STI claimants at 4 weeks with the P&A questionnaire. Case management used a biopsychosocial approach in claimants at high risk for prolonged disability to identify what the real issues were. Intervention included use of cognitive-behavioural techniques by case managers and more formal cognitive-behavioural therapy (CBT). 76% of high-risk and 62% of very high-risk claimants were off benefits at 26 weeks compared to 33% for historical controls, thereby avoiding unnecessary medical interventions.

### **References:**

- ACOEM (American College of Occupational and Environmental Medicine) (2008 Revision). Occupational Medicine Practice Guidelines. 2nd Edition ed., Edited by K. T. Hegmann and L. S. Glass. Massachusetts, OEM Press.
- Alyward, M. and P. E. Sawney (2007). *Chapter 4: Support and rehabilitation (restoring fitness for work)*. In Chap. 4, *Fitness for Work: The Medical Aspects*. 4th ed. K. T. Palmer, R. A. F. Cox and I. Brown, Eds. Oxford, Oxford University Press: 69-79.
- Atlas, S. J., T. D. Tosteson, et al. (2007). "What is different about workers' compensation patients? Socioeconomic predictors of baseline disability status among patients with lumbar radiculopathy." Spine (Phila Pa 1976) **32**(18): 2019-26.
- Black, D. C. (2010). Maximising the Health & Well-Being of the Working-Age Population. International Forum on Disability Management, Los Angeles, USA.
- Boersma, K. and S. J. Linton (2005). "Expectancy, fear and pain in the prediction of chronic pain and disability: A prospective analysis." Eur J Pain.
- Boersma, K. and S. J. Linton (2005). "Screening to identify patients at risk: profiles of psychological risk factors for early intervention." Clin J Pain **21**(1): 38-43; discussion 69-72.
- Buer, N. and S. J. Linton (2002). "Fear-avoidance beliefs and catastrophizing: occurrence and risk factor in back pain and ADL in the general population." Pain **99**(3): 485-91.
- Campbell, C. M. and R. R. Edwards (2009). "Mind-body interactions in pain: the neurophysiology of anxious and catastrophic pain-related thoughts." Transl Res **153**(3): 97-101.
- Cedraschi, C. and A. F. Allaz (2005). "How to identify patients with a poor prognosis in daily clinical practice." Best Pract Res Clin Rheumatol **19**(4): 577-91.
- Ciccone, D. S. and N. Just (2001). "Pain expectancy and work disability in patients with acute and chronic pain: a test of the fear avoidance hypothesis." J Pain **2**(3): 181-94.
- Coudeyre, E., F. Tubach, et al. (2007). "Fear-avoidance beliefs about back pain in patients with acute LBP." Clin J Pain **23**(8): 720-5.

## Shoulder Injury Management Program Overview: The Challenge

- Crombez, G., J. W. Vlaeyen, et al. (1999). "Pain-related fear is more disabling than pain itself: evidence on the role of pain-related fear in chronic back pain disability." Pain **80**(1-2): 329-39.
- Demmelmaier, I., P. Lindberg, et al. (2008). "The associations between pain intensity, psychosocial variables, and pain duration/recurrence in a large sample of persons with nonspecific spinal pain." Clin J Pain **24**(7): 611-9.
- Denison, E., P. Asenlof, et al. (2004). "Self-efficacy, fear avoidance, and pain intensity as predictors of disability in subacute and chronic musculoskeletal pain patients in primary health care." Pain **111**(3): 245-52.
- Dunstan, D. A., T. Covic, et al. (2005). "Does the Orebro Musculoskeletal Pain Questionnaire predict outcomes following a work-related compensable injury?" Int J Rehabil Res **28**(4): 369-70.
- Fritz, J. M. and S. Z. George (2002). "Identifying psychosocial variables in patients with acute work-related low back pain: the importance of fear-avoidance beliefs." Phys Ther **82**(10): 973-83.
- Fritz, J. M., S. Z. George, et al. (2001). "The role of fear-avoidance beliefs in acute low back pain: relationships with current and future disability and work status." Pain **94**(1): 7-15.
- Gatchel, R. J., P. B. Polatin, et al. (1995). "The dominant role of psychosocial risk factors in the development of chronic low back pain disability." Spine **20**(24): 2702-9.
- Gheldof, E. L., J. Vinck, et al. (2006). "Pain and pain-related fear are associated with functional and social disability in an occupational setting: evidence of mediation by pain-related fear." Eur J Pain **10**(6): 513-25.
- Gozna, E. (2004). "Back to Basics: An Algorithmic Approach to Low Back Pain." Web-based training on assessment, treatment, rehabilitation and disability management of occupational injuries and diseases Retrieved January 2, 2008, from <http://www.grandroundsnow.com/courses/jpage/1/p/Home/content.do>.
- Gozna, E. (2005). "3rd Party Medicine." Web-based training on assessment, treatment, rehabilitation and disability management of occupational injuries and diseases Retrieved January 2, 2008, from <http://www.grandroundsnow.com/courses/jpage/1/p/Home/content.do>.
- Gozna, E. (2007). "SUCCESSFUL RTW." Web-based training on assessment, treatment, rehabilitation and disability management of occupational injuries and diseases Retrieved January 2, 2008, from <http://www.grandroundsnow.com/courses/jpage/1/p/Home/content.do>.
- Grotle, M., N. K. Vollestad, et al. (2004). "Fear-avoidance beliefs and distress in relation to disability in acute and chronic low back pain." Pain **112**(3): 343-52.
- Harris, I., J. Mulford, et al. (2005). "Association between compensation status and outcome after surgery: a meta-analysis." JAMA **293**(13): 1644-52.
- Hockings, R. L., J. H. McAuley, et al. (2008). "A systematic review of the predictive ability of the Orebro Musculoskeletal Pain Questionnaire." Spine **33**(15): E494-500.
- Hogg-Johnson, S., J. Frank, et al. (1994). Prognostic Risk Factor Models for Low Back Pain: Why they have failed and a new hypothesis. Toronto, Institute for Work & Health.

## Shoulder Injury Management Program Overview: The Challenge

- Jacobsen, P. B. and R. W. Butler (1996). "Relation of cognitive coping and catastrophizing to acute pain and analgesic use following breast cancer surgery." J Behav Med **19**(1): 17-29.
- Jensen, M. K., A. B. Thomsen, et al. (2006). "10-year follow-up of chronic non-malignant pain patients: opioid use, health related quality of life and health care utilization." Eur J Pain **10**(5): 423-33.
- Jensen, O. K., C. V. Nielsen, et al. (2010). "One-year prognosis in sick-listed low back pain patients with and without radiculopathy. Prognostic factors influencing pain and disability." Spine J.
- Kendall, N. A. S., A. K. Burton, et al. (2009). Tackling Musculoskeletal Problems – A guide for clinic and workplace: identifying obstacles using the psychosocial flags framework. London, UK, The Stationery Office.
- Kendall, N. A. S., S. J. Linton, et al. (1997). Guide to Assessing Psychosocial Yellow Flags in Acute Low Back Pain: Risk Factors for Long-Term Disability and Work Loss. Wellington, NZ, Accident and Rehabilitation and Compensation Insurance Corporation of New Zealand and National Health Committee.
- Kidner, C. L. (2009). "Higher opioid doses predict poorer functional outcome in patients with chronic disabling occupational musculoskeletal disorders." The Journal of bone and joint surgery **91**(4): 919-27.
- Linton, S. J. and K. Boersma (2003). "Early identification of patients at risk of developing a persistent back problem: the predictive validity of the Orebro Musculoskeletal Pain Questionnaire." Clin J Pain **19**(2): 80-6.
- Lotters, F., R. L. Franche, et al. (2006). "The prognostic value of depressive symptoms, fear-avoidance, and self-efficacy for duration of lost-time benefits in workers with musculoskeletal disorders." Occup Environ Med.
- Margison, D. A. and D. J. French (2007). "Predicting treatment failure in the subacute injury phase using the Orebro Musculoskeletal Pain Questionnaire: an observational prospective study in a workers' compensation system." J Occup Environ Med **49**(1): 59-67.
- Picavet, H. S., J. W. Vlaeyen, et al. (2002). "Pain catastrophizing and kinesiophobia: predictors of chronic low back pain." Am J Epidemiol **156**(11): 1028-34.
- Severeijns, R., M. A. van den Hout, et al. (2002). "Pain catastrophizing and general health status in a large Dutch community sample." Pain **99**(1-2): 367-76.
- Severeijns, R., J. W. Vlaeyen, et al. (2004). "Pain catastrophizing is associated with health indices in musculoskeletal pain: a cross-sectional study in the Dutch community." Health Psychol **23**(1): 49-57.
- Severeijns, R., J. W. Vlaeyen, et al. (2001). "Pain catastrophizing predicts pain intensity, disability, and psychological distress independent of the level of physical impairment." Clin J Pain **17**(2): 165-72.
- Shaw, W. S., G. Pransky, et al. (2007). "Patient clusters in acute, work-related back pain based on patterns of disability risk factors." J Occup Environ Med **49**(2): 185-93.
- Shaw, W. S., G. Pransky, et al. (2005). "Early disability risk factors for low back pain assessed at outpatient occupational health clinics." Spine **30**(5): 572-80.
- Storheim, K., J. Ivar Brox, et al. (2005). "Predictors of return to work in patients sick listed for sub-acute low back pain: a 12-month follow-up study." J Rehabil Med **37**(6): 365-71.

## Shoulder Injury Management Program Overview: The Challenge

- Sullivan, M. J., W. M. Rodgers, et al. (2002). "An experimental investigation of the relation between catastrophizing and activity intolerance." Pain **100**(1-2): 47-53.
- Swinkels-Meewisse, I. E., J. Roelofs, et al. (2006). "Acute low back pain: pain-related fear and pain catastrophizing influence physical performance and perceived disability." Pain **120**(1-2): 36-43.
- Swinkels-Meewisse, I. E., J. Roelofs, et al. (2003). "Fear of movement/(re)injury, disability and participation in acute low back pain." Pain **105**(1-2): 371-9.
- Swinkels-Meewisse, I. E., J. Roelofs, et al. (2006b). "Fear-avoidance beliefs, disability, and participation in workers and non-workers with acute low back pain." Clin J Pain **22**(1): 45-54.
- Talmage, J. B. and J. M. Melhorn (2005). *Chapter 1: Why Staying at Work or Returning to Work is in the Patient's Best Interest*. In Chap. 1, *A Physician's Guide to Return-to-Work*. J. B. Talmage and J. M. Mehorn, Eds. Washington, DC, AMA Press: 1-6.
- Turner, J. A., G. Franklin, et al. (2006). "Worker recovery expectations and fear-avoidance predict work disability in a population-based workers' compensation back pain sample." Spine **31**(6): 682-9.
- Turner, J. A., M. P. Jensen, et al. (2000). "Do beliefs, coping, and catastrophizing independently predict functioning in patients with chronic pain?" Pain **85**(1-2): 115-25.
- Turner, J. A., M. P. Jensen, et al. (2002). "Catastrophizing is associated with pain intensity, psychological distress, and pain-related disability among individuals with chronic pain after spinal cord injury." Pain **98**(1-2): 127-34.
- van Wijk, R. M., J. W. Geurts, et al. (2008). "Psychological predictors of substantial pain reduction after minimally invasive radiofrequency and injection treatments for chronic low back pain." Pain Med **9**(2): 212-21.
- Verbunt, J. A., H. A. Seelen, et al. (2005). "Pain-related factors contributing to muscle inhibition in patients with chronic low back pain: an experimental investigation based on superimposed electrical stimulation." Clin J Pain **21**(3): 232-40.
- Vlaeyen, J. W. and S. J. Linton (2000). "Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art." Pain **85**(3): 317-32.
- Waddell, G. (1987). "1987 Volvo award in clinical sciences. A new clinical model for the treatment of low-back pain." Spine (Phila Pa 1976) **12**(7): 632-44.
- Waddell, G. (2004). The Back Pain Revolution. 2nd ed. Edinburgh, Churchill Livingstone.
- Waddell, G. and A. K. Burton (2006). Is Work Good for You. London, England, The Stationary Office.
- Waddell, G., A. K. Burton, et al. (2003). Screening to Identify People at Risk of Long-Term Incapacity for Work: A Conceptual and Scientific Review. London, UK, Royal Society of Medicine Press Ltd.
- Webster, B. S., S. K. Verma, et al. (2007). "Relationship between early opioid prescribing for acute occupational low back pain and disability duration, medical costs, subsequent surgery and late opioid use." Spine (Phila Pa 1976) **32**(19): 2127-32.