

Evidence base for *Explain Pain Second Edition*

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Introduction

Everyone, when injured or in pain wants to know what is wrong, how long the problem will last and what can be done about it. It is self-evident that patients who get appropriate answers will be more satisfied, feel less threatened and cope better.

The education models in *Explain Pain* are novel in that they take neuroscience education about the whole body, including the nervous system, to people in trouble in a language they can understand. There is a particular focus on the brain and it, therefore, involves education about the role of thoughts, attitudes, perceptions and superstitions, as well as tissue damage and healing. These education models are based firmly within the biopsychosocial approach (Waddell, 2004). Pain is seen as not necessarily a sign of damage but more an individual response to threat, real or perceived. Psychological factors have long been known as strong predictors of long term disability and chronic pain (eg. Burton et al.1995; Fritz et al. 2001; Chou and Shekelle 2010). *Explain Pain* education gives a biological base to the psychological factors.

Modern views of evidence based medicine pay attention to basic sciences and controlled trials (Sackett et al. 1996).

Basic sciences

Using novel paradigms such as the neuromatrix (Melzack, 1999), in association with rapid developments in brain imaging techniques such as functional MRI (e.g. Flor, 2000; Verne, Robinson, & Price, 2004) and an understanding of stress biology, allow the predictions that altering the threat value of an injury, procedure or pain state will have a beneficial influence on brain plastic changes and biological coping and healing systems such as the immune, endocrine, sympathetic, motor, respiratory, pain and other systems (eg. Butler, 2000; Butler & Moseley, 2003; Moseley 2005; Janig et al 2006; Melzack, 1999; Wand et al. 2011).

Controlled trials

There are a number of studies on the effects of education on pain and disability. Most are biomechanically based i.e., structure based education programmes with reported benefits ranging from excellent (Udermann et al., 2004) to very little (Gross et al. 2000).

Therapeutic neurophysiology education often includes the structural issue, if relevant, but goes into depth on the neuroscience and in particular, plastic changes in the nervous system. The approach was initially reported by Moseley (2003a) and for the public, in the patient directed book *Explain Pain* (Butler & Moseley, 2003)

A randomised controlled trial has shown that one-to-one education sessions about the neurophysiology of pain will result in significant changes in pain beliefs and attitudes (Moseley, 2002). Another RCT has demonstrated that pain neurophysiology education (and not structure specific education) will alter pain cognitions and physical performance (Moseley et al. 2004). In addition, changes in pain cognitions after a one to one pain physiology education programme are also associated with changes in physical performance. Pain thresholds can be increased during physical tasks (Moseley, 2004.)

Pain neurophysiology education will improve the outcome of other therapeutic approaches such as various exercise strategies (Moseley, 2003b).

Many therapists initially believe that patients are unable to take on information about pain neurophysiology. However, Moseley (2003) showed that patients and therapists can understand the neurophysiology of pain, but professionals usually underestimate the ability of patients to understand.

More recent studies (eg. Meeus et al 2010; Nijs et al 2011, Kol et al. 2013) have supported the initial Moseley et al. findings with the increased number of studies now allowing initial systematic reviews which support the use of *Explain Pain* type education, in particular, to decrease pain ratings, perceived disability and catastrophisation, and developing healthy attitudes and beliefs about pain (Louw et al. 2011; Clarke et al. 2011).

References

- Burton, K. A., Tillotson, K. M., Main, C. J., & Hollis, S. (1995). "Psychological predictors of outcome in acute and subchronic low back trouble." *Spine*, 20, 722-728.
- Butler, D. S. (2000). *The Sensitive Nervous System*. Adelaide: Noigroup Publications.
- Clarke, C. L., C. G. Ryan, et al. (2011). "Pain neurophysiology education for the management of individuals with chronic low back pain: systematic review and meta-analysis." *Manual therapy* 16(6): 544-549.
- Flor, H. (2000). "The functional organization of the brain in chronic pain." In J. Sandkühler, B. Bromm & G. F. Gebhart (Eds.), *Progress in brain research*, vol 129. Amsterdam: Elsevier.
- Fritz, J. M., George, S. J., & Delitto, A. (2001). "The role of fear-avoidance beliefs in acute low back pain: Relationships with current and future disability and work status." *Pain*, 94, 7-15.
- Gross, A. R., Aker, P. D., Goldsmith, C. H., & Peloso, P. (2000). "Patient education for mechanical neck disorders." *Cochrane Database Systematic Review*, CD000962.
- Johansson, K., et al., "Preoperative education for orthopaedic patients: systematic review." *J Adv Nurs*, 2005. 50p. 212-23
- Kol, E, Alpar S.E., Erdoğan A, "Preoperative Education and Use of Analgesic Before Onset of Pain Routinely for Post-thoracotomy Pain Control Can Reduce Pain Effect and Total Amount of Analgesics Administered Postoperatively." *Pain Manag Nurs*. 2013 Feb 26. pii: S1524-9042(12)00182-8. doi: 10.1016/j.pmn.2012.11.001.
- Louw, A., I. Diener, et al. (2011). "The Effect of Neuroscience Education on Pain, Disability, Anxiety, and Stress in Chronic Musculoskeletal Pain." *Archives of Physical Medicine and Rehabilitation* 92(12): 2041-2056.
- Meeus, M., J. Nijs, et al. (2010). "Pain physiology education improves pain beliefs in patients with chronic fatigue syndrome compared with pacing and self-management education: a double-blind randomized controlled trial." *Arch Phys Med Rehabil* 91(8): 1153-1159.
- Melzack, R. (1999). "From the gate to the neuromatrix." *Pain, Suppl 6*, S121-S126.
- Melzack, R. (1999). "Pain and stress: A new perspective." In R. J. Gatchel & D. C. Turk (Eds.), *Psychosocial factors in pain*. New York: Guildford Press.
- Moseley, G. L. (2002). "Combined physiotherapy and education is effective for chronic low back pain. A randomised controlled trial." *Australian Journal of Physiotherapy*, 48, 297-302.
- Moseley, G. L. (2003b). "Joining forces - combining cognition-targeted motor control training with group or individual pain physiology education: A successful treatment for chronic low back pain." *Journal of Manual and Manipulative Therapeutics*, 11, 88-94.

- Moseley, G. L. (2003a). "A pain neuromatrix approach to rehabilitation of chronic pain patients." *Man Ther*, 8, 130-140.
- Moseley, G. L. (2003). "Unravelling the barriers to reconceptualisation of the problem in chronic pain: The actual and perceived ability of patients and health professionals to understand the neurophysiology." *J Pain*, 4(4), 184-189.
- Moseley, G. L. (2004). "Evidence for a direct relationship between cognitive and physical change during an education intervention in people with chronic low back pain." *European Journal of Pain*, 39-45.
- Moseley, G. L. (2005). "Widespread brain activity during an abdominal task markedly reduced after pain physiology education: Fmri evaluation of a single patient with chronic low back pain." *Australian Journal of Physiotherapy*, 51, 49-52.
- Moseley, G. L., Hodges, P. W., & Nicholas, M. K. (2004). "A randomized controlled trial of intensive neurophysiology education in chronic low back pain." *Clinical Journal of Pain*, 20, 324-330.
- Moseley, G. L. (2007). "Reconceptualising pain according to its underlying biology." *Physical Therapy Reviews* 12: 169-178.
- Moseley, G. L. and H. Flor (2012). "Targeting Cortical Representations in the Treatment of Chronic Pain: A Review." *Neurorehabilitation and Neural Repair* 26(6): 646 - 652.
- Nijs, J., J. Van Oosterwijck, et al. (2011). "Pain neurophysiology education improves cognitions, pain thresholds, and movement performance in people with chronic whiplash: A pilot study." *Journal of Rehabilitation Research and Development* 48(1): 43-57.
- Sackett, D. L., Rosenberg, W. M. C., Muir, J. A., & al., e. (1996). "Evidence based medicine: What it is and what it isn't." *British Medical Journal*, 312, 71-72.
- Udermann, B. E., Spratt, K. F., Donelson, R. G., Mayer, J., Graves, J. E., & Tillotson, J. (2004). "Can a patient educational book change behavior and reduce pain in chronic low back pain patients?" *Spine Journal*, 4, 425-435.
- Verne, G. N., Robinson, M. E., & Price, D. D. (2004). "Representations of pain in the brain." *Current Rheumatology Reports*, 6, 261-265.
- Waddell, G. (2004). *The Back Pain Revolution* (2nd ed.). Edinburgh: Churchill Livingstone.
- Wand, B. M., L. Parkitny, et al. (2011). "Cortical changes in chronic low back pain: Current state of the art and implications for clinical practice." *Manual Therapy* 16(1): 15-20.