

## Evidence base for *Explain Pain Second Edition*

Authors Dr David Butler and Prof Lorimer Moseley, ISBN 978-0-9873426-6-9

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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).

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