

## EDITORIAL

# Striving for better outcomes of treating chronic pain: integrating behavioural change strategies before, during, and after modern pain science education

The first and previous contributions to this Comprehensive Pain Management editorial series introduced the role of lifestyle factors such as physical (in)activity, sedentary behaviour, stress, poor sleep, and unhealthy diet as perpetuating factors of chronic pain.<sup>1</sup> Engaging in a lifestyle approach implies a behavioural change from the patient. Hence, identifying and addressing the patient's barriers to engaging in behavioural change is required for pursuing a healthy lifestyle. Common barriers to an adaptive lifestyle change can be pure biomedical beliefs,<sup>2</sup> fear of movement,<sup>3</sup> catastrophizing,<sup>4</sup> hypervigilance,<sup>5</sup> low self-compassion,<sup>6</sup> and poor acceptance.<sup>7</sup> Pain Science Education aims to shift some of these barriers through reconceptualization of 'how pain works'.<sup>8</sup>

In this fifth contribution of the *Comprehensive Pain Management Editorial Series*, we focus on the potential role of pain science education to facilitate a better lifestyle approach in the management of chronic pain. We will provide a brief update on the state of the field of patient pain education and discuss the importance of promoting two-way communication, for example via motivational interviewing techniques, to promote behaviour change before, during, and after pain education.

## Revolution in pain neuroscience led to a transformation in pain education

'Pain Science' refers to the broad body of biological and psychological sciences that have made significant contributions to our understanding of 'how pain works'. In the last century, substantial advances in our understanding of the neurophysiology of pain<sup>9-11</sup> and the profound implications of those advances for managing chronic pain led to a new approach to pain education, originally called 'Intensive Neurophysiology Education'.<sup>12</sup> As clinical trials interrogating this approach, and the key text,<sup>13</sup> were published, the educational approach became

known as 'Explaining pain', or 'Pain Neuroscience Education' (PNE). Since then, over 78 randomized controlled trials (RCTs) have evaluated the impact of PNE on chronic pain-related outcomes. The content and educational objectives in the vast majority of those RCTs have remained true to the original work. The key learning objectives include: (1) that pain is constructed and modulated by the brain, (2) that pain offers a dynamic protective buffer, and (3) that the sensitivity of the pain system changes in the presence of inflammation, and gradually over time.<sup>14,15</sup> The proposed mechanisms of this kind of education are both direct - a reduction in 'pain system sensitivity' through a reduction in the threat value of pain, and indirect - enablement and empowerment to participate in active self-management strategies - a 'lifestyle approach'.<sup>14,15</sup> Broadly speaking, PNE aimed to provide the biological justification for adopting a biopsychosocial approach to managing and overcoming chronic pain. PNE has consistently demonstrated small to medium effects on pain, disability, and psychosocial outcomes across diverse languages and diagnoses, including fibromyalgia, chronic spinal pain, chronic jaw pain, chronic fatigue syndrome, and post-surgical pain.<sup>16,17</sup>

## The establishment of PETAL and the transition of pain neuroscience education to pain science education

The content and strategies of PNE have evolved over time, with the most substantial changes triggered by the discovery that, when PNE achieved its learning objectives, pain and disability outcomes appeared to be excellent.<sup>18</sup> However, PNE did not achieve its learning objectives often enough.<sup>18</sup> Research also showed that PNE is difficult to deliver and difficult to receive – patients usually don't want it and clinicians often don't want to deliver it.<sup>19-23</sup> These discoveries led to the establishment of the international, interdisciplinary Pain

Education Team to Advance Learning (PETAL) collaboration ([petalcollaboration.org](http://petalcollaboration.org)). A first action of PETAL was to recognise the changes in educational content – a broader consideration of relevant pain sciences (*e.g.*, immunology, psychology, endocrinology) rather than focussing mainly on the neurophysiology of pain,<sup>24</sup> and extensive research into consumer perspectives on what content is most important,<sup>25-29</sup> integration of a range of educational and conceptual change strategies, guidance by contemporary learning theories,<sup>8</sup> and development of clinical tools and guides for health clinicians.<sup>15,30-34</sup> Through iterative consensus, PETAL proposed to shift the term PNE to ‘pain science education’ (PSE).<sup>8</sup>

## Pain science education involves two-way communication, not just ‘giving the pain talk’

Ultimately, the aim of PSE is two-fold – (1) to reduce the threat value of pain and (2) to enable and empower people toward behavioural change. To be effective, PSE aims at deep learning. Theoretical frameworks around deep learning, and strategies by which to achieve it, have been covered in detail elsewhere,<sup>8,30</sup> but a consistent theme across the strategies is two-way communication. This contrasts with PNE, which is primarily a didactic presentation of information. Techniques such as motivational interviewing (MI), cognitive therapy, and cognitive functional therapy, might all be useful methods to promote a two-way approach to PSE. They might be expected to promote both deep learning and the identification of behaviours by which to operationalize the concepts being targeted in PSE. In this editorial, we will limit the discussion to the potential use of MI within PSE.

MI is seen as the language of change.<sup>35</sup> MI is a directive, collaborative, patient-centred communication strategy for enhancing and eliciting motivation for behaviour change, by helping clients resolve dissonance, ambivalence, and uncertainty.<sup>36</sup> MI is a communication process in which the healthcare professional is supportive, empathetic, positive, and hopeful. We have described the practical aspects of integrating MI within the context of PNE in detail elsewhere.<sup>33</sup> MI might be used before, during, and after PSE by focusing on engaging in behavioural change,<sup>37</sup> reducing the risk of resistance in a patient, and improving the therapeutic alliance.<sup>38</sup> MI for behavioural change might consider the Behaviour Stage of Change model<sup>39</sup> – is the patient ready to change their beliefs about pain management strategies and the wisdom or otherwise of movement and loading of a painful body part?<sup>40</sup> The Stages of Change model includes five stages that a patient may go through during behavioural change: (1) precontemplation (*i.e.*, the patient is not (yet) considering changing), (2) contemplation (*i.e.*, the patient is willing to change), (3) preparation (*i.e.*, the patient wants to change but does not know how), (4) action (*i.e.*, the patient is actively taking steps into behavioural change without a stable state), and (5) maintenance stage (*i.e.*, the patient has achieved and can sustain the goals).<sup>39</sup> Consideration of these stages of change may facilitate better engagement or lead us to present different goals towards engagement.

Change talk or sustain talk questions may help to guide someone through the stages of change.<sup>35</sup> Change talk questions aim to facilitate patients to talk about their own

reasons for, and potential pathways to, change.<sup>41</sup> That is, to elicit reasons and needs for adapting their behaviour or lifestyle that are important to them personally, rather than simply adhering to advice or instruction from their clinician.<sup>41</sup> “*Can you tell me why you want to make this change?*” – Change talk questions contrast with ‘providing advice’ and veer the conversation around recovery toward ‘participating’ in or ‘driving’ one’s recovery instead of ‘adhering’ to, or ‘complying’ with care.<sup>41</sup> Change talk can also provide a non-confrontational way to address discrepancies between two contrasting views held by the patient, or inconsistencies between their beliefs and behaviours.<sup>41</sup>

An important aspect of the evolution of PNE to PSE is that these principles of MI that have been applied to promote behavioural change around PNE,<sup>33</sup> can equally be applied to promote participation in PSE – eliciting for example “*Learning more about how pain works might help me understand why despite all the treatments I have had on my back, it still hurts*”. To promote behavioural change within PSE, change talk might relate to learning-focussed behaviour, for example, linked to shared values or activities – “*My partner and I could complete this workbook together because we enjoy doing things together and my partner doesn’t understand what’s going on with my pain*”. To promote the understanding of generic concepts such as ‘pain protects us and promotes healing’, a concept identified by recovered consumers as a key learning for recovery<sup>25-29</sup> – “*Learning how pain actually promotes healing would help my daughter when she is sore after a match*”. These change statements are all examples of how a MI-skilled therapist might seek to promote participation in, and learning within, PSE.

## Does integrating MI into PSE improve outcomes?

Whether or not integrating MI, cognitive therapy, or cognitive functional therapy, into PSE improves learning, behaviour change, pain, disability, or quality of life outcomes remains to be seen. Considering that a robust clinical trial to answer this question would incur substantial costs and take several years, it may be challenging to convince funders of its value. It seems reasonable to suggest that any strategy to improve deep learning and promote sustainable changes in behaviour is worth integrating into all our therapeutic engagements. Based on the results mentioned earlier – if learning objectives are met, truly excellent outcomes appear possible – one might predict that improving PSE through the integration of behavioural change strategies such as MI, will reasonably lead to improved and sustained outcomes.

This proposal brings us to two key considerations when we are aiming to shift someone’s understanding of their problem of pain, through PSE. First, when PNE was first developed more than 20 years ago, it was conceptualised as something a clinician would ‘do to’, or ‘give’, a patient. As a result, we have observed that ‘delivering PNE’ or ‘doing pain science’ has become the objective of intervention, which contrasts with PNE’s initial intent – in which learning was the objective. PNE has been widely taught, and adopted, from within this ‘delivery’ framework, rather than a ‘learning’ framework; we are among those to blame for this mistake. That ‘delivering PNE’ has consistently produced small to medium effects is probably good fortune

more than good planning. We hope that the arrival of PSE, through the collaborative, consumer-guided research, and consensus of the PETAL collaboration, refocuses the field on the objective to ‘learn about pain’, rather than to ‘deliver the pain talk’. Second, according to evidence-based clinical guidelines internationally, the best treatments we have for chronic pain tend to stipulate that education is the ‘first thing we should do’, and active self-management strategies the second,<sup>42-44</sup> yet commonly held misconceptions about ‘how pain works’ still tend to undermine the wisdom of this approach. This presents a ‘catch-22’ whereby education is required to change minds, but changed minds are required to engage in education. This is where MI may prove to be a critical mechanism by which to begin the process of conceptual change before, during, and after PSE: helping patients identify values-based motivation for learning how their pain system works and the best ways of reducing it, and its impact on their lives.

### Conflicts of interest

All authors are involved in interventions for patients with chronic pain including the use and development of educational and communication strategies. Eva Roose and Jo Nijs hold grants from Stand Up to Cancer (Kom op tegen Kanker, the biggest Belgian cancer charity) paid to the Vrije Universiteit Brussel. Jo Nijs and the Vrije Universiteit Brussel received lecturing/teaching fees from various professional associations and educational organizations. Jo Nijs authored a Dutch book on pain science education, but the royalties are collected by the Vrije Universiteit Brussel. G. Lorimer Moseley has received support from: Reality Health (a virtual-reality pain education platform), ConnectHealth UK, Institutes of Health California, AIA Australia, Workers’ Compensation Boards, and professional sporting organisations in Australia, Europe, and South and North America. Professional and scientific bodies have reimbursed him for travel costs related to presentation of research on pain and pain education at scientific conferences/symposia. He has received speaker fees for lectures on pain, pain education, and rehabilitation. He receives royalties for books on pain and pain education. He established and is a non-paid CEO of the non-profit Pain Revolution, an unpaid Director of Pain Australia, and an unpaid Director of the Australian Pain Solutions Research Alliance.

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