

## REVIEW

# A review of physiotherapy pain management strategies in the management of patients with chronic pelvic pain

**K. Petersen**

*Pain Management Department, The National Hospital for Neurology and Neurosurgery, University College London Hospitals NHS Foundation Trust, London, UK*

---

### Abstract

This article describes physiotherapy approaches to the management of patients with chronic pelvic pain (CPP) as a part of the multidisciplinary team. Once treatable medical causes have been excluded, the focus is on utilizing the evidence base for chronic pain, and using the biopsychosocial framework to establish the individual needs of the patient, including support from the pain management team to address medical needs, medication issues and psychological impact. Specific musculoskeletal diagnosis and treatments have been extensively explored in the literature, but physiotherapy treatments of the sensitized nervous system in CPP have been less well documented. There is a recognized need for clinicians managing patients with this diagnosis to be skilled and knowledgeable about the principles of pain management, and the author has drawn on experience, expert opinion and the limited literature available. Explanations about pain mechanisms may be more challenging because these include visceral pain, inflammatory conditions and functional issues unique to the pelvic area. Descriptions of physiotherapy pain management techniques such as desensitization, stretches and exercises focus on commonly observed problems for people with CPP, including poor sitting tolerance, bladder issues and allodynia. The emphasis of the paper is on supporting the patient to develop self-management techniques, and it includes a brief overview of the data collected from Link, the first pelvic pain management programme developed in the UK.

*Keywords:* chronic pain, chronic pelvic pain, pain management, physiotherapy.

### Introduction

Chronic pelvic pain (CPP) is a complex heterogeneous condition that is characterized by lower abdominal and/or pelvic pain, and it often has a poorly understood underlying pathophysiology (McGowan *et al.* 2010). Chronic pelvic pain has been reported to affect 38 in 1000 women in the UK annually, which is comparable to the rate of asthma (37 in 1000) (Donaldson 2009). The prevalence of male CPP syndrome is estimated to be 8.2%, although these figures vary between 2.2% and 9.7%. This is partly because of inconsistencies in the classification of the condition, as well as the form of data collection employed,

which is primarily done in primary care and, therefore, risks excluding patients who do not report their symptoms to their general practitioner (Baranowski *et al.* 2014).

In the UK, the Map of Medicine website (<http://mapofmedicine.com/>) has been an important development that highlights the prevalence of CPP, and provides guidance for clinicians dealing with the complexity of its symptoms. It supports specialist multidisciplinary pain management approaches once obvious medical causes for the pain have been excluded (MoM 2015).

The aim of the present article is to describe the pain management role of physiotherapy within the multidisciplinary team managing patients diagnosed with CPP according to the European Association of Urology (EAU) guidelines (Engeler *et al.* 2014). The information and rationale may help clinicians who work in settings such as women's health and pelvic pain

*Correspondence:* Katrine Petersen, ESP Physiotherapy Specialist in Chronic Abdomino-pelvic Pain Management, University College London Hospitals NHS Trust, Pain Management Department, The National Hospital for Neurology and Neurosurgery at Cleveland Street, 25 Cleveland Street, London W1T 4AJ, UK (e-mail: [Katrine.Petersen@uclh.nhs.uk](mailto:Katrine.Petersen@uclh.nhs.uk)).

clinics, and support healthcare professionals who are already competent in core pain management principles to utilize and adapt those skills for patients with CPP.

### Definition

As defined by the EAU guidelines:

“Chronic pelvic pain is chronic or persistent pain perceived in structures related to the pelvis of either men or women. It is often associated with negative cognitive, behavioural, sexual and emotional consequences as well as with symptoms suggestive of lower urinary tract, sexual, bowel, pelvic floor or gynaecological dysfunction.” (Engeler *et al.* 2014, p. 18)

The authors of the guidelines felt that it was inappropriate to use terminology such as chronic prostatitis or interstitial cystitis when there is no proven infection, and therefore, classified CPP with “pain syndromes” such as prostate, bladder, vulvar, pelvic floor, endometriosis and pudendal pain syndromes.

Chronic pelvic pain can also occur alongside one or more underlying pathologies, and this must be considered when discussing a care pathway. The interactions between the pain mechanisms and underlying pathologies mean that it is necessary for multidisciplinary teams to work closely together, often in an interdisciplinary manner, in order to provide consistent messages and joint care. This involves close collaboration with services such as urology, gynaecology, gastroenterology, neurology and endometriosis clinics.

As with other pain conditions, CPP is often associated with a higher occurrence of other persistent pain conditions such as fibromyalgia, back pain, fatigue and anxiety (Ahangari 2014).

### Pelvic pain physiotherapy

There are an emerging number of physiotherapists who offer musculoskeletal assessment and treatments for CPP. Physiotherapists, who are trained in managing the musculoskeletal component of CPP, are well placed to offer advice, education and reassurance, and address functional difficulties. Dry needling and manual therapies, such as myofascial release, massage, and the much-debated internal and external trigger point release techniques (Quintner *et al.* 2015), can provide symptomatic relief (FitzGerald *et al.* 2012). Empirical evidence of the efficacy of these forms of treatment has yet to be

established, and these modalities are difficult to access via the National Health Service (NHS), particularly outside the area of women’s health physiotherapy. There are a number of self-help books that can aid successful self-management (Stein 2009; Wise & Anderson 2010; Parks 2011).

Manual therapy is thought to reduce nociceptive input by stimulating brainstem descending inhibitory pathways (Zusman 2011). It has also been proposed that passive stimulation of the tissues can interrupt the viscerosomatic reflex in the short term, and that this can be a powerful tool for producing pain relief (Hilton & Vandyken 2011). However, neuroimaging research suggests that patients living with chronic pain show marked maladaptive neuroplasticity. Tracey (2010) examined a number of studies confirming a dysfunction in the normal descending inhibitory pathways in patients with chronic pain, who were compared to healthy volunteers. Associated low mood, hypervigilance and fear may also suppress this anti-nociceptive mechanism (Moseley 2006). Therefore, consideration must be given to the patient’s presentation, perception of his or her pain problem, and underlying pain mechanisms in order to ensure that manual therapy is explained and applied in the most appropriate framework for the individual patient.

From clinical experience in specialist pelvic pain management services, a smaller number of people with CPP have developed highly complex multifactorial mechanisms by which the pain is maintained (Hilton & Vandyken 2011). These patients can present with more-constant pain, are often prescribed with a broad range of pain-relieving medications (including opioids, neuropathic medication and antidepressants), are highly distressed and disabled, and are often unable to work, exercise or socialize. They report failed relationships and feelings of being isolated, and attend a high number of medical appointments, including ones at accident and emergency departments. McGowan *et al.* (2010) reviewed the literature on the impact that CPP has on women’s lives, and found that confusing diagnoses and failed treatments can result in dissatisfaction and disengagement from healthcare. Men with CPP also report that they are more reticent about disclosing their problems, and find it inadequate and frustrating to be given incompatible explanations for their pain (Showghi & Williams 2012). This group of patients may benefit from a better understanding of the current CPP models, which avoid the compartmentalization of pain brought

about by focusing on a single system (e.g. musculoskeletal, bacterial, neurological or psychological). Physiotherapists are in an ideal position to explain “allodynia” and “neural tolerance” (instead of “trigger points” and “tight muscles”), which may help patients to understand the choices that they have with regard to managing their own nervous system with a wide range of pain management strategies, while acknowledging the complexity of the pain experience.

It is paramount to use the extensive research that highlights predictive factors for chronicity so that these can be addressed at an early stage. One study of 84 women with CPP found that those with higher expectations of personal control over their pain felt less depressed and in better physical health when they were followed up after 3 years (Weijenborg *et al.* 2009). Catastrophizing, i.e. assuming the worst possible outcome, has also been well researched in CPP. It has been found to be associated with greater disability, urinary symptoms and pain, but these factors can be addressed with the right skills and strategies to support the patient in reducing the impact of CPP (Tripp *et al.* 2006).

### Neurophysiological pain explanations for chronic pelvic pain

Butler & Moseley’s (2003) *Explain Pain* has been widely used to support the development of patient pain education. Pain education has been adapted in the management of CPP (Curran 2015) to help patients understand their condition, and gain knowledge that can facilitate better self-management in terms of both day-to-day coping skills as well as patient choice when it comes to treatment options.

In a study of the population with CPP in New Zealand, Grace & Zondervan (2004) found that 30% of these individuals were particularly concerned about the cause of their pain, which was reported as more troubling than the pain itself. Another study of healthy volunteers responding to information about the threat of a cold compressor found significantly less coping strategies when participants were misinformed about the threat of pain and tissue damage (Jackson *et al.* 2005).

Physiotherapists are well placed to discuss the pelvic anatomy and functional physiology, and relate these to the science of pain, which can help to reduce fear avoidance and catastrophic thoughts (Robinson *et al.* 2013). For example, patients might experience a flare-up in their

symptoms, and believe that they have an infection or a structural problem, which they have no control over. Explaining pain mechanisms can help patients to understand that the symptoms are not necessarily a sign of tissue damage, and that they can develop a range of coping strategies, rather than seeking unnecessary medical attention.

Research has shown that patients from all educational backgrounds can understand complex neuroscience (Moseley *et al.* 2004), and the benefits can stretch to immediate changes in their perception of pain and their physical function (Moseley *et al.* 2004).

It has been proposed that CPP may pose more challenges to the nervous system because of the issues related to urinary, bowel and sexual function unique to the visceral structures of the pelvis (Hilton & Vandyken 2011).

Visceral pain is reported by patients to be more diffuse, which may be explained by the pelvic organ’s primary afferent cell bodies spanning from the mid-thoracic to lower sacral sites (Ness & Gebhart 2000). It has also been demonstrated that a visceral afferent C-fibre can branch and form weak synapses in up to 10 segments (Ness & Gebhart 1988). Under normal circumstances, it can be difficult to locate the structures in the pelvis, and the weak and diffuse sensations mean that a more significant form of excitation would be needed to alert us to changes in the pelvis (e.g. urinary urgency). However, CPP can lead to sensations and symptoms in a variety of areas of the pelvis, and increase the patient’s concern that there is a need for further investigations.

Patients with a diagnosis of bladder pain syndrome often describe it as “interstitial cystitis” because they believe that an underlying infection is causing the symptoms. The International Association for the Study of Pain classifies bladder pain syndrome as: “the occurrence of persistent or recurrent pain perceived in the urinary bladder region, accompanied by at least one other symptom, such as pain worsening with bladder filling and daytime and/or night-time urinary frequency” (IASP 2012). Only a minority of these patients have clear evidence of a pathology, and the diagnosis is primarily based on exclusion (Hanno *et al.* 2011).

Currently, there is no universally accepted aetiology for CPP, but the influence of the interactions between the autonomic, immune, peripheral and central nervous systems reflects the heterogeneity of this population (Theoharides *et al.* 2008). Several authors have reviewed the literature

investigating the role of neuro-inflammation using data from both human studies and murine models. They have proposed more-complex models involving peptides (including substance P) and mast cells released from the efferent nerve endings, which further amplifies the nociceptive barrage, as well as increasing the likelihood of inflammatory mediator findings (Baranowski 2008; Hoffman 2011; Murphy *et al.* 2014). This is also thought to cause persistent activation in the spinal cord, and ultimately, long-term central nervous system (CNS) changes that maintain the inflammatory cycle and the involvement of the immune system.

Thus, chronic inflammatory changes may be found long after the initial bacterial cause has been eliminated. This has been proposed as an explanation for several chronic inflammatory conditions, including bladder and prostate pain syndromes (Murphy *et al.* 2014), and it has been demonstrated that T-cells can mediate CPP in the absence of a persistent bacterial infection (Quick *et al.* 2013). Explaining these mechanisms can help patients to understand why antibiotics are not recommended for long-standing CPP, and also support the rationale for desensitization and tolerance through neuronal plasticity. This fits with *Explain Pain* (Butler & Moseley 2003), in which links are made between the pain experience and the threat perceived by the brain. Neurogenic inflammation could be explained to the patient as a response by the CNS to a perceived threat in the tissues that activates the immune system and initiates a healing process, i.e. the release of inflammatory markers. This also helps to explain psychological influences on neurophysiology; for example, stress has been found to increase the symptoms of bladder pain (Baranowski 2008).

Muscle tension in response to pain has been demonstrated in CPP (Labatt 2008), and the function of the pelvic floor can be affected by this. Patients complaining of urgency, but having difficulties urinating once they get to the toilet, may benefit from advice about muscle tension and relaxation, as well as the influence of pain and stress on these mechanisms (Hilton & Vandyken 2011). Strengthening the pelvic floor may initially exacerbate the symptoms of CPP. Therefore, pain management physiotherapy must focus on enhancing the patient's understanding of normal pelvic function, including relaxation, depending on her dysfunction and goals (e.g. defecation, urination and sexual activity), through education and advice. This type of work shifts the focus from a medical diagnosis and pain resolution to

self-management so as to reduce fear and avoidance in spite of persistent symptoms.

It is recognized that it is difficult to demonstrate the impact or effectiveness of this type of patient education in isolation. However, as suggested by Blyth *et al.* (2005), patients are empowered when they have the knowledge, skills, attitude and self-awareness that they need to influence their health behaviours and situations. The above authors also demonstrated that self-management in patients with chronic disease can have an impact on all aspects of life. Supplying information about the condition in isolation, i.e. without offering education about the skills and self-care strategies needed to manage the complexities of CPP, may not provide life-enhancing outcomes for the patient.

Therefore, it is not a matter of simply supplying patients with information and advice; instead, supporting them to implement a range of strategies (e.g. pacing, stretching, exercises, desensitization and goal-setting) in a manner that gives individuals choices, and enhances their skills and resources for managing CPP is preferable.

### **Movement and stretch**

Fear and avoidance of movement is a normal response to pain, but this can become unhelpful in cases of chronic pain (Vlaeyen & Linton 2000). The importance of addressing this issue has been highlighted, and has been recommended as a key part of the physiotherapy role in managing chronic pain (BPS 2013). Stretching has traditionally been used to describe a movement sustained at the end of range that aims to increase range of movement (ROM) by mechanically lengthening the soft tissues. However, this mechanical theory has been challenged by Konrad & Tilp (2014), who designed a trial to investigate mechanical adaptations to regular sustained stretching of the gastrocnemius muscle. They reported a significant increase in ROM after 6 weeks, but no evidence of a change in muscle tendon or fascicle length, as measured by ultrasound. Konrad & Tilp (2014) concluded that the improvement in ROM was more likely to be a result of increased stretch tolerance and adaptations in the nerve endings. A growing body of evidence suggests that the increase in flexibility is caused by modification of the subject's sensory response (Weppeler & Magnusson 2010), and this may be a more useful model for people with CPP since it highlights the fact that decreased ROM may be a maladaptation of the

nervous system rather than a structural problem in the muscle.

Research into flexibility training in patients with chronic pain came to the same conclusion, and also showed that the improvement in ROM is specific to the movement practised (Law *et al.* 2009). The physiotherapist is in an ideal position to help individuals to identify activities that are limited as a result of fear and decreased tolerance to the movements involved. For example, patients may have difficulty tying their shoelaces, but through pain education and support, they can adopt a gradual approach to moving and restoring their tolerance to bending their back and hips without fear of tissue damage. It may be helpful to approach moving “mindfully”, a method that encourages patients to pay attention to their own neural tolerance or “sensory end point” (Wepler & Magnusson 2010). There may be a variety of non-specific benefits to this approach, including a relaxation component, increased confidence in exercising, and a way of decreasing sensitivity to movement without the patient having to push the range and potentially exacerbate the pain.

Stretches can also be successfully implemented as a pacing strategy when activities such as sitting have become difficult. The patient may set a timer on her computer, and get up and stretch, utilizing relaxation strategies, such as frequently focusing on her breathing, in order to manage her working day. It can also be a useful strategy for flare-ups of pain and certain individually relieving stretches may be a part of a patient’s non-medical flare-up plan.

Some authors (Stein 2009; Wise & Anderson 2011) recommend carrying out a stretching programme for CPP up to four times a day, but there is no specific research supporting a set amount of repetitions or frequency, and most patients need to consider their own individual circumstances and routine.

### **Desensitization**

This strategy focuses on the individual’s goal; for example, a return to sexual function, a reduction of urinary urgency and frequency, an increase in sitting tolerance, or wearing trousers. There is a lack of research in this area, but desensitization is based on current knowledge of how pain mechanisms in CPP influence such sensations as the urge to void, rectal fullness and abnormal reactions to normal stimuli (Collett 2008), as well as the consequences of

responding to those sensations, including avoidance behaviour and fear, which increases the excitability of the motor cortex (Zanette *et al.* 2004). A desensitization approach is often used in other chronic pain conditions, such as complex regional pain syndrome (CRPS), for which current guidelines recommend the strategy as a way to gradually normalize the response to a painful movement or stimulus (Turner-Stokes *et al.* 2011). Some urology studies indicate that there are physiological similarities between CPP and CRPS in terms of inflammatory neuro-mediator release and autonomic changes (Janicki 2003; Baranowski 2008).

The key to this strategy involves pain education to assist patients to see that they have a choice in their response to the sensation, and that the nervous system is capable of adaptation. Individuals may be aware that their bladder is not full, but the urge and increased pain mean that they do not feel that they have any control over it. Some sensations may be more tolerable if the patient knows that these are not a signal of harm and do not necessarily worsen. A study by Moseley *et al.* (2004) found that patients who had attended an information session explaining that pain does not equal harm, demonstrated a better tolerance to movement after the session.

Strategies such as stretch, breathing, visualization and distractions can increase the time between toilet visits/increase tolerance to sensations of stretch and touch, and individuals may retrain their nervous system to respond in a more helpful way. This can significantly improve their quality of life as they gain confidence in sexual activity, sitting, going out without increased anxiety about needing the toilet, and wearing clothing previously thought to be impossible. Intimate relationships and sexual activity are often issues that are best addressed alongside psychological support, the development of strategies such as communication and “myth-busting” to challenge unhelpful expectations about sex. The physiotherapy input can then focus on desensitization, pacing and flare-up planning, as with any other activity, but in the context of sex and relationships.

Examples of this approach working include the “Re-Connect” model developed at University College London Hospitals, which uses pain management psychology and physiotherapy to support patients with CPP who are returning to sexual activity. A review of the programme showed that it increased clinicians’ confidence in addressing these issues, and was also effective

in reducing sexual anxiety in patients with CPP (Edwards *et al.* 2015).

### General exercise

There should be no need to reiterate the multiple general health benefits of exercise. Exercise has been found to have a moderate beneficial effect in chronic pain, but the underlying mechanism and which exercises are most beneficial remain unclear (Hayden *et al.* 2005). The updated Scottish guidelines for management of chronic pain suggest that patients should decide what type of exercise they would like to do, and are most likely to adhere to this if they adopt a graduated approach (SIGN 2014). Exercise has been linked with better outcomes in those with mild to moderate depression, which is a common comorbid factor in chronic pain (Arnow *et al.* 2006; Rimer *et al.* 2012), and epidemiological studies have strongly suggested that functional disability is inversely related to physical activity levels in various domains (Singh 2002).

As a therapeutic tool, the emphasis is on gaining the health benefits of exercise, and providing a self-management strategy that empowers patients so that they feel in control of their physical health and function (Mattson *et al.* 2000). Gondoh *et al.* (2009) also showed that aerobic exercise may increase the production of brain-derived neurotrophic factor, which stimulates neuroplasticity. Combined with helpful pain management education, these neuroanatomical and physiological changes may explain why exercise has been found to be effective in treating conditions such as fibromyalgia (Busch *et al.* 2007); however, further studies are needed to establish a link with CPP.

### Pain management programmes

Pain management programmes (PMPs) are well established as interventions that improve quality of life for patients with chronic pain conditions (BPS 2013), and are effective in reducing healthcare utilization (Lamb *et al.* 2010; Clare *et al.* 2013). These programmes can involve physiotherapists, nurses and psychologists utilizing cognitive behavioural therapy (CBT) approaches. It has been demonstrated that CBT is effective in the management of chronic pain (Williams *et al.* 2012), and further information on physiotherapists employing the principles of CBT in the management of CPP has been described by McLoughlin *et al.* (2015).

Bowel and bladder problems, and also the sexual impact of CPP, are often viewed as taboo subjects associated with embarrassment and shame, and patients describe issues with fertility and identity specific to the area of pain (Rhodin 2013). Thus, specific PMPs for individuals with CPP have been developed, and the data from Link, a gender-specific management programme for pelvic pain, support the effectiveness of a PMP for CPP (Edwards *et al.* 2013). These data show that it is effective in reducing pain intensity, disability and unhelpful thinking about pain, and in improving mood and pain-related self-efficacy. These changes hold for both men and women, and meet or exceed the treatment benchmark for PMPs for general pain (Morley *et al.* 2008).

### Conclusions

The present article has provided an overview of some of the pain management skills used by physiotherapists treating patients with chronic pain, and demonstrated how these can be adapted for patients with CPP. Good-quality trials of chronic pelvic pain management are lacking (Cheong *et al.* 2014; Engeler *et al.* 2014), but current research into treatments for chronic pain and CPP strongly supports a multidisciplinary approach (Engeler *et al.* 2014; MoM 2015). Physiotherapists are well placed to provide patient-centred interventions. While a number of pelvic pain patients can be well managed in the community with reassurance, simple pain relief and advice, it is important to consider the skills needed to deal with the complexities of CPP in the context of a multidisciplinary team, including medical issues and the psychosocial impact, as well as the difficulties that patients encounter in terms of adequate explanations of pain, disability and support.

The present article has described some of the self-management strategies that the patient can adapt to improve function in spite of living with CPP. It is hoped that CPP research can help to develop more predictive models in the future (e.g. to assist in identifying the patient populations who can be managed cost-effectively by physiotherapists with advice and musculoskeletal treatments) since there is currently an insufficient evidence base. Individuals with very complex needs must be identified appropriately so that they receive a much more comprehensive and multidisciplinary package of care. The focus is on addressing the multiple factors that can maintain the experience of CPP, as well as the issues that make it more difficult for the patient

to cope and self-manage. In all cases, individuals who present with CPP must be assessed using a biopsychosocial approach that goes beyond the peripheral tissues.

## References

- Ahangari A. (2014) Prevalence of chronic pelvic pain among women: an updated review. *Pain Physician* **17** (2), E141–E147.
- Arnou B. A., Hunkeler E. M., Blasey C. M., *et al.* (2006) Comorbid depression, chronic pain, and disability in primary care. *Psychosomatic Medicine* **68** (2), 262–268.
- Baranowski A. (2008) Defining the urological chronic pelvic pain syndromes. *Review in Pain* **2** (1), 29–31.
- Baranowski A. P., Lee J., Price C. & Hughes J. (2014) Pelvic pain: a pathway for care developed for both men and women by the British Pain Society. *British Journal of Anaesthesia* **112** (3), 452–459.
- Blyth F. M., March L. M., Nicholas M. K. & Cousins M. J. (2005) Self-management of chronic pain: a population-based study. *Pain* **113** (3), 285–292.
- British Pain Society (BPS) (2013) *Guidelines for Pain Management Programmes for Adults: An Evidence-Based Review Prepared on Behalf of the British Pain Society*. [WWW document.] URL [https://www.britishpainsociety.org/static/uploads/resources/files/pmp2013\\_main\\_FINAL\\_v6.pdf](https://www.britishpainsociety.org/static/uploads/resources/files/pmp2013_main_FINAL_v6.pdf)
- Busch A. J., Barber K. A. R., Overend T. J., Peloso P. M. J. & Schachter C. L. (2007) Exercise for treating fibromyalgia syndrome. *The Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD003786. DOI: 10.1002/14651858.CD003786.pub2.
- Butler D. & Moseley G. L. (2003) *Explain Pain*. Noigroup Publications, Adelaide.
- Cheong Y. C., Smotra G. & Williams A. C. de C. (2014) Non-surgical interventions for the management of chronic pelvic pain. *The Cochrane Database of Systematic Reviews*, Issue 3. Art. No.: CD008797. DOI: 10.1002/14651858.CD008797.pub2.
- Clare A., Andiappan M., MacNeil S., Bunton T. & Jarrett S. (2013) Can a pain management programme approach reduce healthcare use? Stopping the revolving door. *British Journal of Pain* **7** (3), 124–129.
- Collett B. (2008) Chronic pelvic and vulvar pain in women. *Reviews in Pain* **2** (2), 8–14.
- Curran N. C. (2015) Commentary on the influence of gender on the management of chronic pelvic pain. *BJOG: An International Journal of Obstetrics and Gynaecology* **122** (6), 766–768.
- Donaldson L. (2009) *150 Years of the Annual Report of the Chief Medical Officer: On the State of Public Health 2008*. [WWW document.] URL [http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_096231.pdf](http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_096231.pdf)
- Edwards S., Williams A., Brezitski M., *et al.* (2013) The effectiveness of specialised pain management programmes: benchmarking against published outcomes for general pain management programmes. Poster presented at the British Pain Society Annual Scientific Meeting, Bournemouth, UK, 16–19 April 2013.
- Edwards S., Mandeville A., Petersen K. *et al.* (2015) “Re-Connect”: A Model for Working with Persistent Pain Patients on Returning to Sexual Activity. [WWW document.] URL <http://www.rcoa.ac.uk/system/files/FPM-Reconnect-Model.pdf>
- Engeler J., Baranowski A. P., Borovicka J., *et al.* (2014) *Guidelines on Chronic Pelvic Pain*. [WWW document.] URL [http://uroweb.org/wp-content/uploads/26-Chronic-Pelvic-Pain\\_LR.pdf](http://uroweb.org/wp-content/uploads/26-Chronic-Pelvic-Pain_LR.pdf)
- FitzGerald M. P., Payne C. K., Lukacz E. S., *et al.* (2012) Randomized multicentre clinical trial of myofascial physical therapy in women with interstitial cystitis/painful bladder syndrome and pelvic floor tenderness. *The Journal of Urology* **187** (6), 2113–2118.
- Gondoh Y., Sensui H., Kinomura S., *et al.* (2009) Effect of aerobic exercise training on brain structure and psychological well-being in young adults. *The Journal of Sports and Medicine in Physical Fitness* **49** (2), 129–135.
- Grace V. M. & Zondervan K. T. (2004) Chronic pelvic pain in New Zealand: prevalence, pain severity, diagnoses and use of the health services. *Australian and New Zealand Journal of Public Health* **28** (4), 369–375.
- Hanno P. M., Burks D. A., Clemens J. Q., *et al.* (2011) AUA guideline for the diagnosis and treatment of interstitial cystitis/bladder pain syndrome. *The Journal of Urology* **185** (6), 2162–2170.
- Hayden J., Van Tulder M. W., Malvivaara A. & Koes B. W. (2005) Exercise therapy for treatment of non-specific low back pain. *The Cochrane Database of Systematic Reviews*, Issue 3. Art. No.: CD000335. DOI: 10.1002/14651858.CD000335.pub2.
- Hilton S. & Vandyken C. (2011) The puzzle of pelvic pain – a rehabilitation framework for balancing tissue dysfunction and central sensitization, I: pain physiology and evaluation for the physical therapist. *Journal of Women's Health Physical Therapy* **35** (3), 103–113.
- Hoffman D. (2011) Understanding multisystem presentations in chronic pelvic pain: the inter-relationships between the viscera and myofascial pelvic floor dysfunction. *Current Pain and Headache Reports* **15** (5), 343–346.
- International Association for the Study of Pain (IASP) (2012) *Bladder Pain Syndrome (XXIII-2)*. [WWW document.] URL [http://www.iasp-pain.org/files/Content/ContentFolders/Publications2/ClassificationofChronicPain/Part\\_II-F.pdf](http://www.iasp-pain.org/files/Content/ContentFolders/Publications2/ClassificationofChronicPain/Part_II-F.pdf)
- Jackson T., Pope L., Nagasaka T., *et al.* (2005) The impact of threatening information about pain on coping and pain tolerance. *British Journal of Health Psychology* **10** (3), 441–451.
- Janicki T. I. (2003) Chronic pelvic pain as a form of complex regional pain syndrome. *Clinical Obstetrics and Gynecology* **46** (4), 797–803.
- Konrad A. & Tilp M. (2014) Increased range of motion after static stretching is not due to change in muscle and tendon structure. *Clinical Biomechanics* **29** (6), 636–642.
- Labatt J.-J. (2008) Pudendal neuralgia: clinical signs and diagnosis. In: *Urogenital Pain in Clinical Practice* (eds A. P. Baranowski, P. Abrams & M. Fall), pp. 361–371. Informa Healthcare, New York, NY.
- Lamb S. E., Hansen Z., Lall R., *et al.* (2010) Group cognitive behavioural treatment for low-back pain in primary care: a randomised controlled trial and cost-effectiveness analysis. *The Lancet* **375** (9718), 916–923.
- Law R. Y. W., Harvey L. A., Nicholas M. K., *et al.* (2009) Stretch exercises increase tolerance to stretch in patients

- with chronic musculoskeletal pain: a randomized controlled trial. *Physical Therapy* **89** (10), 1016–1026.
- McGowan L., Escott D., Luker K., Creed F. & Chew-Graham C. (2010) Is chronic pelvic pain a comfortable diagnosis for primary care practitioners: a qualitative study. *BMC Family Practice* **11**: 7. DOI: 10.1186/1471-2296-11-7.
- McLoughlin R., Petersen K. & Brook S. (2015) Physiotherapy in assessment and management of pain. In: *Abdominal and Pelvic Pain: From Definition to Best Practice* (eds B. Messelink, A. Baranowski & J. Hughes), pp. 227–236. Wolters Kluwer, Philadelphia, PA.
- Map of Medicine (MoM) (2015) *Discover How Our Work with The British Pain Society Is Creating Better Management of Chronic Pain*. [WWW document.] URL <http://mapofmedicine.com/our-work-with-the-british-pain-society/>
- Mattsson M., Wikman M., Dahlgren L. & Mattsson B. (2000) Physiotherapy as empowerment – treating women with chronic pelvic pain. *Advances in Physiotherapy* **2** (3), 125–143.
- Morley S., Williams A. & Hussain S. (2008) Estimating the clinical effectiveness of cognitive behavioural therapy in the clinic: evaluation of a CBT informed pain management programme. *Pain* **137** (3), 670–680.
- Moseley G. L., Nicholas M. K. & Hodges P. W. (2004) A randomized controlled trial of intensive neurophysiology education in chronic low back pain. *The Clinical Journal of Pain* **20** (5), 324–330.
- Moseley L. (2006) Making sense of “S1 mania” – are things really that simple? In: *Topical Issues in Pain*, Vol. 5 (ed. L. Gifford), pp. 321–340. CNS Press, Falmouth.
- Murphy S. F., Schaeffer A. J. & Thumbikat P. (2014) Immune mediators of chronic pelvic pain syndrome. *Nature Reviews Urology* **11** (5), 259–269.
- Ness T. J. & Gebhart G. F. (1988) Characterization of neurons responsive to noxious colorectal distension in the T13–L2 spinal cord of the rat. *Journal of Neurophysiology* **60** (4), 1419–1438.
- Ness T. J. & Gebhart G. F. (2000) Acute inflammation differentially alters the activity of two classes of rat spinal visceral nociceptive neurons. *Neuroscience Letters* **281** (2–3), 131–134.
- Parks T. (2011) *Teach Us to Sit Still: A Sceptic’s Search for Health and Healing*. Rodale, New York, NY.
- Quick M. L., Wong L., Mukherjee S., et al. (2013) Th1-Th17 cells contribute to the development of uropathogenic *Escherichia coli*-induced chronic pelvic pain. *PLoS One* **8** (4): e60987. DOI: 10.1371/journal.pone.0060987.
- Quintner J. L., Bove G. M. & Cohen M. L. (2015) A critical evaluation of the trigger point phenomenon. *Rheumatology* **54** (3), 392–399.
- Rhodin A. (2013) Successful management of chronic pelvic pain. *Journal of Pain and Palliative Pharmacotherapy* **27** (3), 289–291.
- Rimer J., Dwan K., Lawlor D. A., et al. (2012) Exercise for depression. *The Cochrane Database of Systematic Reviews*, Issue 7. Art. No.: CD004366. DOI: 10.1002/14651858.CD004366.pub5.
- Robinson V., King R. & Ryan C. G. (2013) “Pain neurophysiology education” as part of a pain management service decreases fear avoidance and improves patient’s understanding of the neurophysiology of chronic pain at four months follow up. *Pain and Rehabilitation – Journal of the Physiotherapy Pain Association* **34** (Winter), 30–33.
- Showghi N. N. & Williams C. de C. A. (2012) Information about male chronic pelvic and urogenital pain on the Internet: an evaluation of Internet resources. *Pain Medicine* **13** (10), 1275–1283.
- Scottish Intercollegiate Guidelines Network (SIGN) (2014) *SIGN 136: Management of Chronic Pain*. [WWW document.] URL <http://sign.ac.uk/guidelines/fulltext/136/index.html>
- Singh M. A. (2002) Exercise to prevent and treat functional disability. *Clinics in Geriatric Medicine* **18** (3), 431–462.
- Stein A. (2009) *Heal Pelvic Pain: The Proven Stretching, Strengthening, and Nutrition Program for Relieving Pain, Incontinence, IBS, and Other Symptoms Without Surgery*. McGraw-Hill, New York, NY.
- Theoharides T. C., Whitmore K., Stanford E., Moldwin R. & O’Leary M. P. (2008) Interstitial cystitis: bladder pain and beyond. *Pharmacotherapy* **9** (17), 2979–2994.
- Tracey I. (2010) Getting the placebo pain you expect: mechanisms of placebo, nocebo and reappraisal effects in humans. *Nature Medicine* **16** (11), 1277–1283.
- Tripp D. A., Nickel J. C., Wang Y., et al. (2006) Catastrophizing and pain-contingent rest predict patient adjustment in men with chronic prostatitis/chronic pelvic pain syndrome. *The Journal of Pain* **7** (10), 697–708.
- Turner-Stokes L. & Goebel A. (2011) Complex regional pain syndrome in adults: concise guidance. *Clinical Medicine* **11** (6), 596–600.
- Vlaeyen J. W. S. & Linton S. J. (2000) Fear-avoidance and its consequence in chronic musculoskeletal pain: a state of the art. *Pain* **85** (3), 317–332.
- Weijnenborg P. Th. M., Le Kuile M. M., Gopie J. P. & Spinhoven P. (2009) Predictors of outcome in a cohort of women with chronic pelvic pain – a follow-up study. *European Journal of Pain* **13** (7), 769–775.
- Weppeler C. H. & Magnusson S. P. (2010) Increasing muscle extensibility: a matter of increasing length or modifying sensation? *Physical Therapy* **90** (3), 438–449.
- Williams A. C. de C., Eccleston C. & Morley S. (2012) Psychological therapies for the management of chronic pain (excluding headache) in adults. *The Cochrane Database of Systematic Reviews*, Issue 11. Art. No.: CD007407. DOI: 10.1002/14651858.CD007407.pub3.
- Wise D. & Anderson R. U. (2010) *A Headache in the Pelvis: A New Understanding and Treatment for Chronic Pelvic Pain Syndromes*, 6<sup>th</sup> edn. National Centre for Pelvic Research, Occidental, CA.
- Zanette G., Manganotti P., Fiaschi A. & Tamburin S. (2004) Modulation of motor cortex excitability after upper limb immobilization. *Clinical Neurophysiology* **115** (6), 1264–1275.
- Zusman M. (2011) The modernisation of manipulative therapy. *International Journal of Clinical Medicine* **2** (5), 644–649.

*Katrine Petersen is an ESP physiotherapist specialist in chronic abdominopelvic pain management who works in the Pain Management Department of the National Hospital for Neurology and Neurosurgery.*

*This article is reprinted with permission from Pain and Rehabilitation – Journal of the Physiotherapy Pain Association, Vol. 2015, No. 39, pp. 22–29 (Summer 2015).*