



## Systems Interventions to Improve the Management of Chronic Musculoskeletal Pain: Topic Brief

PATIENT-CENTERED OUTCOMES RESEARCH INSTITUTE

June 9, 2015

---

### High-Level Research Questions

What is the comparative effectiveness of multidisciplinary pain management programs versus the use of different tools, modules, and technology for educating and supporting primary care practitioners in managing patients with chronic musculoskeletal pain, and on reduction of pain, achievement of patient goals, and improvement of functioning?

What is the comparative effectiveness of alternative models of coordinated pain management—such as specialized, integrated pain centers, coordinated care models that emphasize cross-provider data- and communication-sharing, or those that include risk triage systems with care coordination—for treatment of chronic musculoskeletal pain?

What is the comparative effectiveness of shared decision making about chronic musculoskeletal pain management in a primary care setting versus usual care on achievement of patient goals, quality of life, and functioning?

### Assignment for Workgroup Participants

- Based on your perspective (patient, clinician, payer, etc.), what are two to three of the most relevant comparative effectiveness research questions focusing on improving the management of chronic musculoskeletal pain that warrant further research to address current gaps in knowledge?

Submitted questions will be used to generate the agenda for the workgroup meeting.

*This document was prepared for informational purposes only and should not be construed as medical advice or used for clinical decision making.*

## Opportunity Snapshot

As part of PCORI's efforts to fund high-impact and useful research on critical patient-centered health and healthcare issues, PCORI is hosting a multi-stakeholder workgroup to discuss high-priority topics that focus on improving the management of chronic low back pain. One of the topic briefs you will receive addresses clinical interventions for chronic low back pain; this brief addresses systems interventions to improve care management for chronic musculoskeletal pain. PCORI will use feedback from the workgroup to conduct further gap analyses and develop a funding announcement. The objective of the workgroup is to create a set of comparative research questions whose findings could improve patient-centered outcomes.

### Introduction

Approximately 100 million adults in the United States suffer from chronic pain—more than those with heart disease, cancer, and diabetes combined.<sup>1</sup> The estimated total costs in healthcare expenses and lost productivity exceed \$600 billion each year, with half a million workdays lost annually.<sup>2</sup> Pain not only has economic costs but also affects a patient's everyday life, impairing physical and mental functioning, quality of life, and productivity.<sup>1</sup> As a result, severe chronic pain imposes a significant burden on affected individuals, their families, employers, friends, communities, and the nation as a whole. As the most common cause of long-term disability in middle-aged people, chronic pain presents a national challenge, with both the Institute of Medicine (IOM) and the Agency for Healthcare Research and Quality (AHRQ) calling for “a cultural transformation in the way pain is perceived and managed on both the personal and societal levels.<sup>3</sup>

Chronic musculoskeletal pain is the most common single type of chronic pain, with most patients suffering from multisite pain.<sup>1, 2</sup> The elderly and veterans are often the most vulnerable; both groups suffer from high rates of chronic musculoskeletal pain.<sup>1</sup>

Chronic musculoskeletal pain is not only influenced by biomedical factors but also by psychological and social factors; as such, multiple providers (behavioral, physical therapy, pharmacists) are often involved in treatment. Most people who experience chronic pain are treated by primary care providers, who may have limited knowledge of effective models of pain management. Some of these patients may eventually be referred to specialized pain centers for multidisciplinary pain programs. Fragmentation of care in the United States affects patients' ability to seek and receive appropriate treatment. The scope of services offered to a patient presenting with pain may depend on where he or she seeks treatment, or it may depend on the provider's specialty, as the physician may have a restricted view of treatment options.<sup>1</sup> Fee-for-service reimbursement and fragmentation of care also encourage the overuse of low-value diagnostic or medical procedures. For these reasons, systems interventions to equip primary care physicians with better tools for managing their chronic pain patients, or comprehensive or multidisciplinary approaches, may be best for patients to manage their chronic pain; however, in the United States, several barriers in the healthcare structure make it difficult for patients to receive this type of care.

## Terminology and Definitions

Chronic musculoskeletal pain is a musculoskeletal pain condition that has no identifiable underlying serious or specific disorder, and that has not resolved in less than three to six months.<sup>44</sup>

## Patient-Centered Outcomes

- Pain is a universal experience, but pain is also unique and subjective, requiring management to be tailored to each individual patient's needs.<sup>4</sup>
- Patients play a large role in the treatment and management of their chronic pain, and the effectiveness of treatment is largely dependent on the patient's level of involvement.<sup>1</sup>
- Outcomes of major importance to patients include decreasing pain; achieving functional goals; improving quality of life; reducing suffering, depression, anxiety, and stress; returning to work; reducing sick leave; and reducing adverse events from harmful care. According to the American Chronic Pain Association, quality of life and function are better indicators of the impact of pain than measures of pain alone for patients with chronic musculoskeletal.
- Systems-level interventions can also reduce the time to achievement of functional goals, improve the efficiency of care (e.g., reduce the use of redundant, inappropriate, or harmful procedures), and improve patient satisfaction with care.<sup>3, 5</sup>

## Current Research and Evidence Base

Chronic musculoskeletal pain guidelines, which encompass the management of chronic low back pain, identify two levels of management.<sup>5</sup> Level I occurs in the primary care setting and includes active involvement of the patient in developing a care plan and functional goals, an exercise program, physical therapy, behavioral management, and pharmacologic therapy. Notably, opioids are rarely needed for Level I management. In Level II, referral to a multidisciplinary team with a pain specialist or a specialized pain center may be recommended for pain that cannot be managed at Level I. This brief addresses gaps in the evidence for systems-level interventions within each of these two broad areas.

### ***EVIDENCE GAPS FOR LEVEL I MANAGEMENT: Primary Care Setting***

### ***EVIDENCE GAPS FOR SUPPORTED SELF-MANAGEMENT:***

Considerable evidence has established that the active engagement of patients in their own treatment helps improve pain outcomes, but much of the evidence is methodologically of low quality. A 2012 white paper published by the Center for Excellence in Self-Management Research at Case Western Reserve University and funded by the National Institute of Health identified the following evidence gaps in the self-management of chronic musculoskeletal pain<sup>6</sup>:

- There is a need to determine which self-management programs work for which patients and how they can best be implemented. Sixteen systematic reviews looked at the influence of patient self-management education interventions and exercise regimens on the well-being of patients with knee osteoarthritis. Self-management programs significantly improved psychological outcomes as compared with control groups, but there were no other differences. Because the interventions varied in terms of number of episodes, duration of sessions, and duration of program, the authors pointed out that they could not tell whether the interventions themselves, the methods of implementation, or methodological limitations were responsible for the modest effects observed.
- Of the seven systematic reviews focused on self-management interventions in musculoskeletal pain, some have shown improvement in pain, functioning, physical health, self-efficacy, disability, and safety, but results have been inconsistent across the reviews. One review found that self-management programs improved psychological outcomes but not physical outcomes. Self-management interventions in another review improved outcomes for arthritis but not chronic low back pain.
- While Internet-based interventions seem promising for patients suffering from chronic pain, more evidence is needed. Six reviews focused on Internet-based interventions and chronic conditions/chronic pain. Outcomes that showed improvements included adherence, levels of knowledge, social support, clinical outcomes, some behavioral outcomes, symptom control, pain, activity, and costs. Attrition was a problem in several studies. There was noted marked variation in intervention formats and control groups. The benefits of online peer support were particularly unclear.

#### *EVIDENCE GAPS FOR PATIENT INTERACTION WITH PRIMARY CARE PHYSICIANS:*

While most patients suffering from chronic pain are treated in the primary care context, few high-quality studies examine the effectiveness of various interventions to facilitate shared decision making in this setting; studies that take place in the United States are especially sparse. Guidelines published in 2013 by the Institute for Clinical Systems Improvement and the Scottish Intercollegiate Guidelines Network identified the following evidence needs:<sup>4,5</sup>

- There is a great need for more research about the discussion between a healthcare provider and patient regarding shared decision making in pain management.
- There is no high-quality evidence directly linking the nature of the interaction between primary care physicians and patients to outcomes in chronic pain management. Current evidence comes from nonanalytic studies, such as case reports and case series.
- Specific training of clinicians in adopting effective approaches might improve such outcomes as patient satisfaction, anxiety reduction, and pain reduction. More high-quality research is needed before widespread adoption. Current evidence comes from high-quality systematic reviews of case control or cohort studies.
- There is a significant lack of data regarding interventions to improve chronic musculoskeletal pain in racial and ethnic minorities.<sup>7,8,9</sup> It appears that the underreporting of pain intensity by minority pop-

ulations is one of the major contributions to the disparities in chronic pain management.<sup>8</sup> Some believe that physicians contribute to this disparity by their limited awareness, as well as stereotypes regarding pain and minority individuals.<sup>8</sup> Research is needed that looks at empowering patients to accurately report their pain intensity, which could be achieved through using culturally sensitive assessments and culturally comfortable care.<sup>8</sup>

#### **EVIDENCE GAPS FOR REHABILITATION PROGRAMS:**

Although evidence exists that such interventions as supervised or individualized exercise and self-management techniques may improve exercise adherence, high-quality, long-term follow-up randomized controlled trials (RCTs) are needed.<sup>5</sup>

- A systematic review by Jordan et al. (2010)<sup>10</sup> assessed the effects of interventions to improve adherence to exercise and physical activity for adults with chronic musculoskeletal pain. The 42 RCTs and quasi-experimental studies showed that such interventions as supervised or individualized exercise therapy and self-management techniques may enhance exercise adherence. Of eight trials studying self-management programs, six improved adherence measures; however, the authors concluded that more high-quality RCTs with longer follow-up periods were needed, as well as a standard validated measure of exercise adherence.

#### **EVIDENCE GAPS FOR LEVEL II MANAGEMENT: *Interdisciplinary Approach***

A multidisciplinary pain program (MPP) is defined as a treatment program of four components: medical therapy, behavioral therapy, physical reconditioning, and education. A partial MPP includes only two or three of the components.<sup>3,4</sup> A 2011 AHRQ systematic review found the quality of evidence on the effectiveness of multidisciplinary pain programs to be low, with the majority of studies lacking a comparator treatment and comparison population, and large numbers of participants lost to follow-up. There are also relatively few RCTs, and almost all RCTs are based in Europe.<sup>3</sup> The review, along with 2013 guidelines by the Scottish Intercollegiate Guidelines Network<sup>4</sup> and a 1999 Cochrane review<sup>11</sup> and a 2008 updated systematic review<sup>12</sup>, identified the following evidence needs:

- There is little scientific evidence for the effectiveness of multidisciplinary rehabilitation for fibromyalgia or widespread musculoskeletal disease in working-age adults.<sup>11</sup>
- There are inconsistent findings about whether interdisciplinary programs of pain management are effective in reducing the intensity of pain or other patient outcomes. Inconsistencies stem from differences in the definition, composition, intensity of treatment, and heterogeneity of patient populations.<sup>3</sup>
- There is little known about the effects of various components within a multidisciplinary model on pain outcomes.<sup>4</sup>
- There is also a lack of evidence of the effectiveness of programs for different pain diagnoses.<sup>3,4</sup>
- There is a lack of long-term studies to monitor wellness and self-management of pain after patients



leave a multidisciplinary pain program.<sup>4</sup>

Multidisciplinary pain programs differ in their structure, services offered, and types of professionals associated. They can be embedded in a primary care setting, be standalone pain centers, and can be delivered in either the inpatient or outpatient settings.<sup>11</sup> Although there has been a trend toward outpatient models as a means to decrease cost,<sup>3</sup> preliminary evidence indicates that inpatient programs may demonstrate better long-term effects (quality of evidence low).<sup>4</sup>

### **ONGOING RESEARCH**

Ongoing Studies from clinicaltrials.gov:

- Karolinska Institutet. Nationwide Evaluation of Multimodal Rehabilitation in Patients with Chronic Musculoskeletal Pain. Widespread Chronic Pain. Observational Study. Recruiting. 6,000 patients. Completion date 2016.
- Maastricht University Medical Center. Outpatient Rehabilitation for Adolescents with Chronic Pain. Multimodal Rehabilitation Program|Behavioral: Care as Usual. Double-Blind RCT. Recruiting. 124 patients. Completion date 2016.
- Norwegian University of Science and Technology. Coordinating Teams in Primary Health Care. Musculoskeletal Disease. RCT. Recruiting. 880 patients. Completion date 2018.
- Luleå Tekniska Universitet. Individually Tailored Web-Based Multimodal Pain Rehabilitation in Primary Health Care. RCT. Recruiting. 200 patients. Completion date 2016.
- Kaiser Foundation Research Institute. Pain Program for Active Training and Coping. Cluster RCT. Chronic Non-malignant Pain. Behavioral Health, Nurse Case Management, Physical Therapy, and Pharmacy Embedded in Primary Care. Recruiting. 1,200 patients and 500 primary care practices. Completion date 2018.

All but one of the studies identified in clinicaltrials.gov on multidisciplinary pain are being conducted in Europe. The one U.S. trial is part of the National Institute of Health's (NIH's) Health Systems Collaboratory. It takes place wholly in an integrated healthcare system, and the outcomes are not very patient-centered, compared with those recommended by the American Chronic Pain Association (primary outcome is reduction in pain; secondary outcomes are healthcare utilization, costs, and patient satisfaction).<sup>13</sup>

### **Likelihood of Implementation of Research Results in Practice**

Would implementation of the results of a comparative study on this topic be feasible in a practice setting? Could study results on this topic be important enough to create momentum to change practice guidelines

and practice measures?

- The adoption of evidence-based protocols for management of chronic pain by primary care practitioners has been low.<sup>1</sup>
- A tightening of accreditation standards by the Commission on Accreditation of Rehabilitation Facilities has led to a reduction in the number of accredited pain centers. Multidisciplinary pain programs have been declining over the years.<sup>3</sup> Jeffrey et al., authors of a recent AHRQ systematic review on multidisciplinary pain care, note the collaborative model *“runs counter to the prevailing architecture of American healthcare financing and provision.”*
- With the growth of patient-centered medical homes and accountable care organizations, and increased financial incentives for care coordination, findings that demonstrate which treatments and multidisciplinary models are most effective for which kinds of patients suffering from chronic musculoskeletal pain—particularly if they involve more efficient mechanisms to promote collaboration across providers—could be widely adopted.

## Durability of Information

Would new information on this topic remain current for several years, or would it be rendered obsolete quickly by new technologies or subsequent studies?

Despite a lack of high-quality evidence, systems interventions for pain management (as mentioned above) have been in long-term use, and while some of the techniques used by the various practitioners are evolving, the basic approach to multidisciplinary pain management is changing modestly. As a result, it is likely that findings would be highly durable.

## Research Areas of Interest

### Level I

- What is the comparative effectiveness of shared decision making about chronic musculoskeletal pain management in a primary care setting versus usual care on achievement of patient goals, quality of life, and functioning?

### Level II

- What is the comparative effectiveness of multidisciplinary pain management programs versus the use of different tools, modules, and technology for educating and supporting primary care practitioners in managing patients with chronic musculoskeletal pain on reduction of pain, achievement of patient goals, and improvement of functioning?
- What is the comparative effectiveness of alternative models of coordinated pain management—such

as specialized, integrated pain centers; coordinated care models that emphasize cross-provider data- and communication-sharing; or those that include risk triage systems with care coordination—for treatment of chronic musculoskeletal pain?

## Conclusions

Chronic musculoskeletal pain requires a comprehensive care plan for each patient that addresses personal goals and the physical and psychosocial factors associated with pain. Current guidelines highlight the importance of shared decision making and active involvement of the patient, especially at the primary care level, and a multimodal approach to Level II management. Fragmentation of health care in the United States prevents effective coordination across the diverse providers involved in pain management, and the patient may suffer as a result. While numerous studies have examined multidisciplinary team approaches, most of them have been outside of the United States. Future studies should focus on improving shared decision making and facilitating self-management in the primary care context and on identifying the differential effects of treatment components and the subgroups that would benefit most from multidisciplinary pain programs.<sup>3</sup>

---

## References

<sup>1</sup> Institute of Medicine. Relieving pain in America: a blueprint for transforming prevention, care, education, and research. Washington (DC): National Academies Press; 2011.

<sup>2</sup> Gaskin DJ, Richard P. The economic costs of pain in the United States. *J Pain*. 2012;13(8):715. DOI: 10.1016/j.jpain.2012.03.009.

<sup>3</sup> Jeffery MM, Butler M, Stark A, Kane RL. Multidisciplinary pain programs for chronic noncancer pain. Technical Brief No. 8. (Prepared by Minnesota Evidence-based Practice Center under Contract No. 290-07-10064-I.) Rockville (MD): Agency for Healthcare Research and Quality; September 2011.

<sup>4</sup> Scottish Intercollegiate Guidelines Network (SIGN). Management of chronic pain. Edinburgh (Scotland): SIGN; 2013 (SIGN publication no. 136). [December 2013]. Available at: [http://www.sign.ac.uk/Publication\\_No.11-EHC064-EF](http://www.sign.ac.uk/Publication_No.11-EHC064-EF).

<sup>5</sup> Institute for Clinical Systems Improvement. Health care guideline: assessment and management of chronic pain. 2013.

<sup>6</sup> Jone KR, Daly BJ, Higgins P, Madigan E, Moore SM. The evidence base for self management. White Paper. Cleveland (OH): Case Western Reserve University. March 2012. Available at: [http://fpb.case.edu/SMARTCenter/docs/The\\_Evidence\\_Base\\_for\\_Self-Management.pdf](http://fpb.case.edu/SMARTCenter/docs/The_Evidence_Base_for_Self-Management.pdf)

<sup>7</sup> Gagnon CM, Matsuura JT, Smith CC, Stanos SP. Ethnicity and interdisciplinary pain treatment. *Pain Pract*. 2014;14:532–40.

<sup>8</sup> Mossey JM. Defining racial and ethnic disparities in pain management. *Clin Orthop Relat Res*. 2011;469:1,859–70.

<sup>9</sup> Narayan MC. Culture's effects on pain assessment and management. *Am J Nurs*. 2010;110:38–47; quiz 48–9.

---

<sup>10</sup> Jordan JL, Holden MA, Mason EE, Foster NE. Interventions to improve adherence to exercise for chronic musculoskeletal pain in adults. *Cochrane Database Sys Rev*. 2010 Jan 20(1):CD005956. Doi: 10.1002/12651858.CD005956.pub2.

<sup>11</sup> Karjalainen K, Malmivaara A, Tulder M, Roine R, Jauhainen M, Hurri H, Koes B. Multidisciplinary rehabilitation for fibromyalgia and musculoskeletal pain in working age adults. *Cochrane Library*. July 1999.

<sup>12</sup> Scasighini L, Toma V, Dober-Spielmann S, Sprott H. Multi-disciplinary treatment for chronic pain: a systematic review of interventions and outcomes. *Rheumatology*. 2008;47:670–78

<sup>13</sup> Kaiser Foundation Research Institute. Pain Program for Active Training and Coping. Cluster RCT. Chronic Non-malignant Pain. Behavioral health, Nurse Case Management, Physical Therapy, and Pharmacy Embedded in Primary Care. Recruiting. 1,200 patients and 500 primary care practices. Completion date 2018.