



**MANAGING PAIN AND TREATING MUSCULOSKELETAL CONDITIONS:**  
A PCORI-Sponsored Conference on the  
Use of Patient-Centered Evidence and Best  
Practices at Worksite Health Centers

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**The Center for Workforce Health and Performance (CWHP)** is an independent, non-profit organization dedicated to developing and disseminating the evidence base for public and private investments in a healthy, high-performing workforce. The Center conducts research and educational activities that help business leaders, communities, and policy makers understand how unmet health needs harm household incomes, business performance and national prosperity, and to recognize the competitive advantages of policies that promote healthier, longer, and more fulfilling working lives.

[tcwhp.org](http://tcwhp.org)

**NAWHC** is a non-profit trade organization, focused on assisting public and private employers, unions and other plan sponsors in getting the greatest return from their onsite, near-site, shared, mobile and virtual health centers, pharmacies, worksite fitness and wellness centers. Our mission is to become the premier source of education, information, networking and resources for employers and others who wish to integrate or develop worksite clinics into their health care and benefit strategies.

[nawhc.org](http://nawhc.org)

## **ACKNOWLEDGEMENT**

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The Patient-Centered Outcomes Research Institute® (PCORI®) is an independent, nonprofit organization authorized by Congress in 2010. Its mission is to fund research that will provide patients, their caregivers, and clinicians with the evidence-based information needed to make better-informed healthcare decisions. PCORI is committed to continually seeking input from a broad range of stakeholders to guide its work.

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# Background

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The Patient-Centered Outcomes Research Institute® (PCORI®) granted the Center for Workforce Health and Performance (CWHP), a 501(c)(3) nonprofit organization, and its partner organization the National Association of Worksite Health Centers (NAWHC), a 501(c)(3) nonprofit organization, a Eugene Washington PCORI Engagement Award (EAIN-00102) to develop a conference for employers and other organizations that manage on-site and near-site health centers. The conference would promote a better understanding of how worksite health centers identify, use, and apply evidence to improve employees' health. The conference focused on best practices in pain management and treating musculoskeletal (MSK) conditions at worksite health centers.

MSK conditions were selected as a substantive area for several reasons.

Surveys of the NAWHC members and vendor partners who manage their worksite health centers demonstrated unmet needs around the treatment of MSK conditions, which are highly prevalent in most working populations, regardless of industry or location. MSK conditions are often among the top three cost areas for employers due to their high medical and prescription drug expenses and the resulting absenteeism and lost productivity. In discussions with employer-sponsors and vendors of worksite health centers, NAWHC and CWHP found that most employers were unaware of PCORI's sponsored MSK research and that there were pockets of innovative practices aimed at preventing MSK injuries and pain that could be replicated by others.

As part of the conference program, CWHP would present a summary of the evidence base produced by PCORI-funded studies focused on populations with MSK conditions and/or chronic or traumatic pain. The findings would serve as introductory material to substantive sessions that discussed other research and best practices developed by employers to prevent MSK surgery and avoid the use of opioids to address pain. The sessions would also include discussions of how presented materials could be applied in an on-site health clinic setting and what additional research could improve the evidence base relevant



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to workforce pain management and patient-centered outcomes.

A preliminary review of the study topics was shared with NAWHC's Medical Director Committee on January 16, 2020, which then advised on the conference program topics

and potential speakers. An in-person conference was originally scheduled for Dallas, Texas, on May 15, 2020.

Because of safety considerations due to the COVID-19 pandemic, the meeting was held as a virtual symposium on December 9, 2020.

# The PCORI Research Review

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A search of PCORI's research database was conducted in January 2020 by Kimberly Jinnett, PhD, then president of CWHP. The search included all studies tagged with the keywords *musculoskeletal*, *pain*, *opioid*, and/or *chiropractor*. Fifteen studies with final or preliminary results were identified. A summary review of the studies was conducted by current CWHP President Brian Gifford, PhD, and Erin Peterson, MPH, researcher for the Integrated Benefits Institute (IBI), a 501(c)(6) partner organization of CWHP.

Dissemination of the review's findings served as discussion points and organizing principles for the CWHP-NAWHC virtual symposium on best practices in treating MSK disorder and back pain patients at worksite health centers (see the December 9, 2020, meeting agenda attached as an Appendix). The evidence table at the end of this report provides summary information for each of the identified studies, including a link to the original

research on PCORI's website. We make note of studies that focus on the health of vulnerable populations, such as low-income patients and patients from racial/ethnic minorities who are often underrepresented in clinical research.

Readers are strongly encouraged to consult the original studies for detailed information about the research design, study population, timeframe, analyses, findings, and limitations.

## **SYMPOSIUM DESCRIPTION**

The CWHP-NAWHC virtual symposium on best practices in treating MSK disorder and back pain patients at worksite health centers was held on the Zoom platform on December 9, 2020. NAWHC invited employers, unions, healthcare providers, third-party clinic vendor suppliers, payers, and others associated with or interested in MSK and worksite health centers to participate in the program. The event drew 40 attendees, primarily from NAWHC's member organizations.

The meeting began with an introduction to PCORI and its support of prior efforts by CWHP and partner organizations to understand where employers get their evidence for health interventions and how they use that information to make benefits decisions.<sup>1,2</sup> Attendees were introduced to the concept of patient-centered outcomes as “consideration of patient’s perspectives, values, and preferences when making treatment decisions.”<sup>3</sup> This definition differentiates research on patient-centered outcomes from comparative effectiveness research and considers what patients want from treatments, whether they understand the implications of their options, and how they balance values against affordability and access.<sup>4</sup> A summary of findings from the current project (described in the next section) was presented to set the stage for the symposium discussion and to introduce the specific sessions. A summary of the materials covered in each session by invited speakers is provided below. Detailed notes on the sessions are appended to the meeting agenda in the Appendix.

### **Session 1: Preventing Pain and MSK Conditions**

- Addressing needs for different generations of workers
- Back pain and back care education for employees
- Evidence that matching employees to job tasks can reduce associated costs

### **Session 2: The Research on Managing and Treating Pain**

- Multiphased and multidisciplinary (medical, acupuncture, chiropractic, massage, physical therapy, and yoga) approaches to pain management, including delivery, engagement, functional ability, and well-being
- Nonpharmaceutical options
- Removing barriers to pain management

### **Session 3: Integrating Providers for Treatment and Management of Pain**

- An integrated, collaborative delivery model (including physicians, chiropractors, physical therapists, and massage therapists)
- Comparisons of chiropractic and non-chiropractic outcomes

## **SUMMARY OF PCORI-SPONSORED STUDIES PRESENTED TO SYMPOSIUM ATTENDEES**

Three themes emerged from the review of the PCORI-sponsored studies.

### **1. Interventions went beyond clinical and pharmaceutical treatments.**

Therapeutic approaches such as physical therapy and interventions targeting mental health/psychosocial outcomes were well represented, as were patient educational interventions and provider-focused interventions (note that the categories of interventions are conceptual and not meant to be exclusive or exhaustive).

## Interventions in PCORI-funded studies went beyond clinical and pharmaceutical treatments



### Clinical

- Usual care (lidocaine) versus plus steroid
- Opioid monitoring, dose lowering
- Prescription pain medicine and antidepressants



### Therapeutic

- Physical therapy, chiropractic, exercise training
- Cognitive behavioral therapy
- Mind-body focus



### Educational

- Post-surgery information
- Developing pain coping skills, patient activation
- Online guidance
- Decision aids, pamphlets
- Post-trauma guidance



### Provider Interventions

- Surveys of patient preferences
- Collaborative care models
- Clinic-based prescribing policies
- Computer-assisted programs to identify treatment options

### 2. Pain management was only one of several outcomes studied.

Seven studies focused on pain reduction or pain management as a primary outcome, and three focused on pain as a secondary outcome. Taking primary and secondary outcomes together, it was more common for studies to focus on the quality of life of patients living with chronic pain, their mental health, their ability to perform physical activities, and the safe use of prescription opioid medications.

### 3. Patients' perspectives were represented in the study designs.

Several studies incorporated patients' perspectives and expectations in the care delivery process, including the use of patient surveys that were shared with providers as part of the care planning process. This was most pronounced in the study of a collaborative care model that integrated the patient into the team of interdisciplinary specialists. Studies also addressed the specific needs of racial and ethnic minorities and the value of culturally aware educational materials.

# Evidence for Effectiveness

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Studies that addressed pain management or reduction reported several effective interventions. Chiropractic care, physical therapy, and coping skills therapy were shown to improve pain outcomes, as was pain coping skills training. Sharing patients' survey responses about health problems and activity impairments with doctors (if not with physical therapists) helped improve pain outcomes. This suggests a role for considering patients' perceptions and expectations in care delivery. The success of the collaborative care model for multiple sclerosis (MS) patients—in which the patient develops self-manage skills that allow them to operate as an integral part of the collaborative team—provides further emphasis to this point.

The variety of outcomes included in the studies precludes a simple summary of findings. Among the PCORI-sponsored studies, specific examples that represent groups of intervention types (i.e., *clinical, therapeutic, educational, and provider*) were found to be effective for outcomes that fell within broad categories; these outcome categories are labeled *care delivery, patient engagement, functional ability, and well-being* (as with intervention categories, categories of outcomes are conceptual and not meant to be exclusive or exhaustive). These relationships are illustrated in the schematic below.

Only one study found an association between a clinical intervention and any outcomes: specifically, a clinic-based program of phased opioid dose reduction and risk-stratified monitoring lowered overdose rates without increasing patients' pain severity.

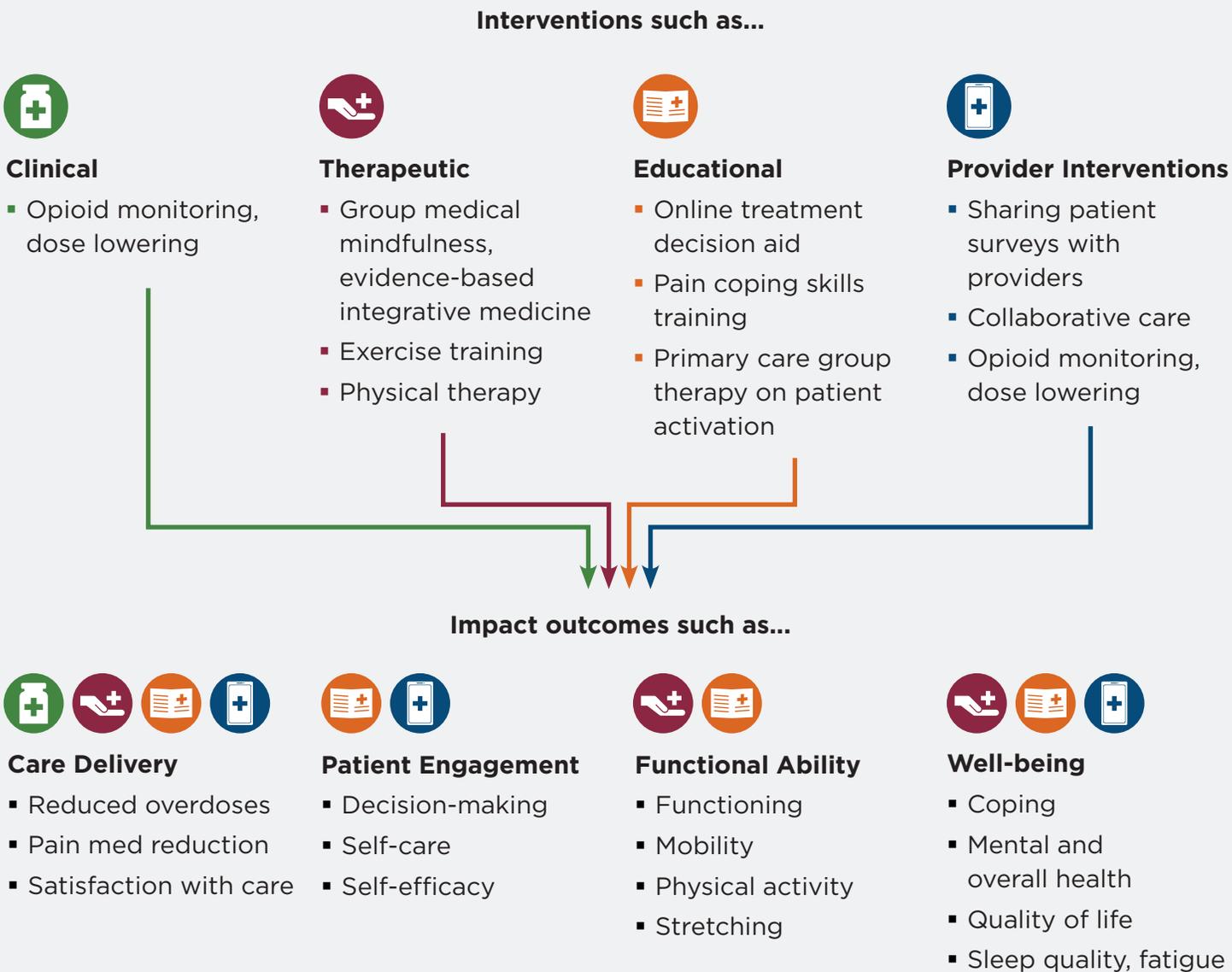
Examples were found indicating that therapeutic interventions can have an impact on care delivery and patients' functional ability and well-being; educational interventions can have an impact on care delivery, patient engagement, functional ability, and well-being; and provider interventions can have an impact on care delivery, patient engagement, functional ability, and well-being.

## **A SPECIFIC FOCUS ON PROVIDER INTERVENTIONS**

Considering that the audience of the CWHP-NAWHC symposium was composed primarily of worksite health center practitioners, special attention was paid to the findings from studies of provider interventions. The discussion emphasized four findings with particular relevance for practice.

First, patients whose doctors received their responses to survey questions about problems and care goals reported more self-care, better quality of life, and higher satisfaction with care at five months into the intervention.

## Schematic of the impact of intervention types on categories of patient outcomes



These patients were also less bothered by pain and had better sleep at 10 months. It was noted that a study in which survey results were shared with physical therapists found no association with pain relief but that

reviewing survey responses increased agreement between patients' desired outcomes and therapists' treatment foci and was associated with patients' improvements toward their mobility goals. Both studies suggest a clinical

role for patients' perspectives and participation to help prioritize patients' goals and improve treatment decisions.

Second, a collaborative care model involving the patient, a designated care manager, and an interdisciplinary team of specialty and care providers had multiple benefits for MS patients, including improved pain control and mental health and less fatigue, both at the end of treatment and for six months afterward. Collaborative models for patients with other types of complex conditions (including multiple comorbidities) may prove advantageous for patient-centered outcomes.

Third, a study of clinics that used a program of phased opioid dose

reduction and risk-stratified opioid monitoring found no evidence that the program reduced overdoses, pain severity, or patient injuries or accidents when compared with clinics without the program.<sup>5</sup> Nonetheless, clinics with the program achieved significant year-over-year reductions in overdoses without increasing patient's pain severity. This suggests that similar programs represent viable interventions for medically managing pain.

Finally, patients at clinics selected to implement a computer-assisted program to help providers identify treatment options had no better outcomes than patients at control clinics.<sup>6</sup>

## Guidance for Future PCORI-Sponsored Studies

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The symposium sessions included discussions with participants and attendees, with specific attention to how audience members could apply presented materials in their own workplaces or health centers and what other evidence they would be interested in seeing PCORI pursue. Attendees' comments indicated that they found the presented information helpful, and many believed that

they could apply or would consider the best practices described. It was acknowledged that plan coverage influences patients' treatment choices, emphasizing the need to develop an MSK and pain management evidence base directed toward insurance carriers and other third-party payers.

It was noted that while PCORI-sponsored studies touched on such

issues as the prevention of disease progression and health crises, they had less to say about prevention of disease onset and injuries.

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There was also a general sense among symposium presenters that future PCORI studies would be most useful if they focused specifically on outcomes relevant to employers. For example, outcomes such as employees' ability to work, avoid illness-related absences and disability

leaves, return to work after episodes of illness and injury, and function on the job could serve as indicators of an intervention's effectiveness. At the same time, patient-centered considerations were deemed valuable and warrant continued inclusion. Future topics could include psychosocial issues related to MSK conditions, employee engagement in workplace interventions, and recognizing factors associated with preferences for different types of care.

It was also recommended that studies focus on specific work contexts. This could include different types of workplaces (for example, businesses such as utilities or hospitals that have less capacity for work-from-home as an accommodation or with safety-sensitive considerations) and examinations of worksite health centers as patient-centered "medical homes" relative to other types of provider arrangements.

Presenters also noted that several of the studies found evidence for the therapeutic value of integrative and complementary approaches, such as chiropractic and mind-body practices, but that employees' health insurance benefits often do not cover these treatments and that their practitioners are often not included in provider networks. Patients' low awareness of their uses and availability may also limit their impact on employees' health and productivity. Presenters specifically mentioned examinations

of interventions that help employees overcome such barriers to care.

Finally, symposium participants noted that the ongoing COVID-19 pandemic has disrupted the model of on-site health centers to the extent that workplaces closed or operate below pre-pandemic capacity. This raises

the question of the effectiveness of telephonic delivery of physical therapy and pain management, as well as the long-term implications for patients who may have forgone or postponed care for painful conditions or comorbidities that complicate disease management strategies.



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# Evidence Table

## Summary of PCORI-sponsored studies of pain and musculoskeletal conditions

Intervention	Control/ Usual Care	Population	Primary Outcomes	Secondary Outcomes	Evidence for Effectiveness
<b>Boston Medical Center, 2020<sup>7</sup></b>					
<ul style="list-style-type: none"> <li>Group medical visit</li> <li>Mindfulness</li> <li>Evidence-based integrative medicine</li> </ul>	Individual primary care provider visit	<ul style="list-style-type: none"> <li>Patients with chronic pain and depression</li> <li>Low-income, predominantly African American or Hispanic</li> </ul>	<ul style="list-style-type: none"> <li>Pain reduction</li> <li>Reduced depressive symptoms</li> </ul>	<ul style="list-style-type: none"> <li>Pain medication use</li> <li>Pain self-efficacy</li> <li>Mental health quality of life</li> <li>Emergency Department visits</li> <li>Patient satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>Reduced use of pain medication</li> <li>Improved mental health quality of life</li> </ul>
<b>Kaiser Foundation Health Plan of Washington, 2018<sup>6</sup></b>					
Primary care clinic-based computer-assisted treatment decision tool	No decision tool	Patients with low back pain	<ul style="list-style-type: none"> <li>Back-related physical function</li> <li>Pain intensity</li> </ul>	<ul style="list-style-type: none"> <li>Healthcare utilization</li> <li>Physician and physical therapy visits</li> <li>Imaging studies</li> <li>Opioid prescriptions</li> </ul>	None
<b>Kaiser Foundation Health Plan of Washington, 2019<sup>5</sup></b>					
Clinic-based program for: <ul style="list-style-type: none"> <li>Lowering opioid doses</li> <li>Monitoring patients taking opioids long-term</li> <li>Creating care plans</li> <li>Refilling opioid prescriptions</li> </ul>	No program	Patients who used opioids long-term	Adverse events: <ul style="list-style-type: none"> <li>Opioid overdose</li> <li>Medically attended injuries</li> <li>Motor vehicle crashes</li> </ul>	<ul style="list-style-type: none"> <li>Pain severity</li> <li>Pain-related interference with activities</li> <li>Ratings of opioid helpfulness</li> <li>Prevalence of prescription opioid use disorder</li> </ul>	<ul style="list-style-type: none"> <li>Reduced year-over-year overdose rates in intervention group during the dose lowering phase</li> <li>No significant improvement compared with control</li> </ul>

Intervention	Control/ Usual Care	Population	Primary Outcomes	Secondary Outcomes	Evidence for Effectiveness
<b>Kaiser Foundation Research Institute, 2019<sup>8</sup></b>					
Primary care clinic-based group therapy focused on: <ul style="list-style-type: none"> <li>▪ Patient activation, empowerment</li> <li>▪ Opioid risks</li> <li>▪ Pain self-management strategies</li> <li>▪ Care navigation</li> </ul>	No program	Patients prescribed opioids for chronic pain	<ul style="list-style-type: none"> <li>▪ 13-item patient activation instrument</li> <li>▪ Beliefs, knowledge, and confidence in managing health-related tasks</li> </ul>	<ul style="list-style-type: none"> <li>▪ Depression</li> <li>▪ Quality of life</li> <li>▪ Overall health</li> <li>▪ Pain intensity</li> <li>▪ Functional status</li> <li>▪ Satisfaction with care</li> <li>▪ Opioid misuse</li> <li>▪ Pain coping</li> <li>▪ Self-efficacy (expectations)</li> <li>▪ Patient/provider communication</li> <li>▪ Healthcare utilization</li> <li>▪ Substance use</li> <li>▪ Pain management strategies</li> <li>▪ Chronic pain</li> <li>▪ Opioid use goals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improved overall health at six months</li> <li>▪ Reduced depression, improved function and quality of life, and more use of self-care services and self-management (e.g., meditation exercise) at 12 months</li> <li>▪ Improved self-coping at six and 12 months</li> </ul>
<b>Kaiser Foundation Research Institute, 2015<sup>9</sup></b>					
Results of patient survey, administered before primary care visit, shared with doctor <ul style="list-style-type: none"> <li>▪ Health problems</li> <li>▪ Activity impairments</li> </ul>	No previsit survey	Patients prescribed medications for complex conditions such as mood disorder, widespread pain, or fibromyalgia	Changes in patient-prioritized functional outcomes	<ul style="list-style-type: none"> <li>▪ Pain</li> <li>▪ Symptoms and functioning</li> <li>▪ Satisfaction with care</li> <li>▪ Self-care activities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Patients and providers reported that the tool met their expectations and improved healthcare encounters</li> <li>▪ Improved self-care activities, health-related quality of life, and satisfaction with care in the first five months</li> <li>▪ Improved pain and sleep quality in the first 10 months</li> </ul>

Intervention	Control/ Usual Care	Population	Primary Outcomes	Secondary Outcomes	Evidence for Effectiveness
<b>San Francisco State University, 2014<sup>10</sup></b>					
<ul style="list-style-type: none"> <li>▪ Patient survey results shared with physical therapists</li> <li>▪ Mobility at time of survey</li> <li>▪ Desired level of mobility</li> </ul>	Results not shared with physical therapists	<ul style="list-style-type: none"> <li>▪ Patients in an outpatient, physical therapy wellness center</li> <li>▪ 84% with musculoskeletal diagnoses</li> </ul>	<ul style="list-style-type: none"> <li>▪ Agreement between gaps in patients' stated current and desired mobility and therapists' foci of care</li> <li>▪ Patients' mobility at the end of physical therapy</li> </ul>		<ul style="list-style-type: none"> <li>▪ Reviewing survey responses increased agreement between patients' desired outcomes and therapists' foci</li> <li>▪ Patients whose therapists saw their survey results experienced greater improvements toward mobility goals</li> </ul>
<b>University of Alabama, Birmingham, 2019<sup>11</sup></b>					
An online treatment decision aid provided information about benefits and side effects of immune-blocking medications used to treat lupus nephritis	A pamphlet on lupus nephritis (American College of Rheumatology)	<ul style="list-style-type: none"> <li>▪ Women with lupus nephritis</li> <li>▪ Predominantly African American or Hispanic</li> </ul>	<ul style="list-style-type: none"> <li>▪ Decisional conflict about immunosuppressive drugs</li> <li>▪ Value and knowledge regarding immunosuppressive drugs, informed choices</li> </ul>	<ul style="list-style-type: none"> <li>▪ Patient/physician communication</li> <li>▪ Patient control over decision-making</li> <li>▪ Acceptability and feasibility of the decision aid</li> <li>▪ Patient-centered communication</li> </ul>	<ul style="list-style-type: none"> <li>▪ African American and white women who used the decision aid had lower decisional conflict</li> <li>▪ Women who used the decision aid were more likely to describe information as easy to use and quality as excellent</li> </ul>
<b>University of Iowa, 2020<sup>12</sup></b>					
Video training to teach parents skills to facilitate supportive conversations with their children following a child's serious injury	Trauma education booklet	Parents of children who experienced a serious injury	Child's post-traumatic stress disorder and depressive symptoms	<ul style="list-style-type: none"> <li>▪ Child's quality of life</li> <li>▪ Emotional problems</li> <li>▪ Conduct problems</li> <li>▪ Behavior around peers</li> <li>▪ Hyperactivity/inattention</li> <li>▪ Prosocial behavior</li> </ul>	<ul style="list-style-type: none"> <li>▪ At six months after injury, children of parents who underwent video training had better conduct and peer behaviors</li> </ul>

Intervention	Control/ Usual Care	Population	Primary Outcomes	Secondary Outcomes	Evidence for Effectiveness
<b>University of North Carolina at Chapel Hill, 2019<sup>13</sup></b>					
Pain coping skills training plus usual care	Usual osteoarthritis care	African American adults with hip or knee osteoarthritis	Pain severity	<ul style="list-style-type: none"> <li>▪ Physical function</li> <li>▪ Pain interference</li> <li>▪ Mental and physical health</li> <li>▪ Pain coping attempts</li> <li>▪ Pain catastrophizing</li> <li>▪ Depressive symptoms</li> <li>▪ Arthritis self-efficacy</li> <li>▪ Physical activity</li> <li>▪ Patient impressions of osteoarthritis symptoms</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improvement in arthritis self-efficacy and patient impressions of arthritis symptoms</li> <li>▪ Reduction in pain catastrophizing</li> <li>▪ Increases in pain coping attempts</li> </ul>
<b>University of Washington, 2019<sup>14</sup></b>					
Epidural injection of a corticosteroid plus lidocaine	Epidural injection of lidocaine alone	Patients age 50 and older with moderate to severe leg pain caused by central lumbar spinal stenosis	At 12 months after treatment: <ul style="list-style-type: none"> <li>▪ Functional ability</li> <li>▪ Pain</li> </ul>	At 12 months after treatment: <ul style="list-style-type: none"> <li>▪ Moderate or substantial clinically meaningful improvement</li> <li>▪ Back pain</li> <li>▪ Depression and anxiety symptoms</li> <li>▪ Use of opioids, physical therapy, or spine surgery</li> </ul>	None at 12 months; both groups experienced similar reductions in pain and disability and used opioids, physical therapy, and surgery at similar rates

Intervention	Control/ Usual Care	Population	Primary Outcomes	Secondary Outcomes	Evidence for Effectiveness
<b>University of North Carolina at Chapel Hill, 2019<sup>15</sup></b>					
<ul style="list-style-type: none"> <li>▪ Physical therapy</li> <li>▪ Internet-based exercise training (IBET)</li> </ul>	No intervention	Patients with knee osteoarthritis	Lower-extremity pain, stiffness, and function	<ul style="list-style-type: none"> <li>▪ Physical activity</li> <li>▪ Exercise</li> <li>▪ Satisfaction with physical function</li> <li>▪ Sleep disturbance</li> <li>▪ Fatigue</li> <li>▪ Knee symptom change</li> <li>▪ Depressive symptoms</li> <li>▪ Social support for exercise</li> <li>▪ Self-efficacy for exercise</li> <li>▪ Fear of movement</li> <li>▪ Physical ability tests</li> </ul>	<p>Physical therapy compared with control:</p> <ul style="list-style-type: none"> <li>▪ More physical activity and stretching</li> <li>▪ Better physical ability</li> <li>▪ Higher satisfaction with function</li> <li>▪ Fewer sleep problems and less fatigue</li> <li>▪ Higher ratings of improvement</li> </ul> <p>IBET compared with control:</p> <ul style="list-style-type: none"> <li>▪ More stretching</li> <li>▪ Higher ratings of improvement</li> </ul>
<b>University of Pittsburgh, 2019<sup>16</sup></b>					
<ul style="list-style-type: none"> <li>▪ Prescription pain medicine and antidepressants</li> <li>▪ Community-based group exercise classes</li> <li>▪ Clinic-based chiropractic and physical therapy combined with rehabilitative exercises</li> </ul>	None (compared across interventions)	Adults with lumbar spinal stenosis age 60 and above who experience difficulty walking	<ul style="list-style-type: none"> <li>▪ Pain and physical function</li> <li>▪ Walking ability</li> </ul>	Daily physical activity	<ul style="list-style-type: none"> <li>▪ Chiropractic and physical therapy group had the most improvement in pain two months after study</li> <li>▪ Exercise group had more daily activity than medication group at six months but not at one year</li> </ul>

Intervention	Control/ Usual Care	Population	Primary Outcomes	Secondary Outcomes	Evidence for Effectiveness
<b>University of Pittsburgh, 2020<sup>17</sup></b>					
<ul style="list-style-type: none"> <li>Physical therapy and unsupervised exercise</li> <li>Community-based group exercise classes</li> </ul>	No intervention	Arthritis patients age 60 or older, two to four months postoperative from total knee replacement surgery experiencing moderate functional limitations	Patient-reported physical function	<ul style="list-style-type: none"> <li>Performance-assessed function</li> <li>Patient-reported health</li> <li>Patient-identified physical activity levels</li> </ul>	<ul style="list-style-type: none"> <li>Compared with control, both treatment groups reported improved performance in physical activity and satisfaction</li> <li>Physical therapy group had the best-performance assessed function, followed by the community exercise group</li> </ul>
<b>University of Washington, 2019<sup>18</sup></b>					
Collaborative multiple sclerosis care program involving the patient, a designated care manager, and an interdisciplinary team of specialty and care providers	Usual MS care, including neurology and rehabilitation medicine	Adults with MS who suffered from chronic pain or a major depressive disorder	<ul style="list-style-type: none"> <li>Controlled pain intensity</li> <li>Pain reduction</li> <li>Reduced depression severity</li> </ul>	<ul style="list-style-type: none"> <li>Pain intensity</li> <li>Pain interference</li> <li>Depression severity</li> <li>Disability</li> <li>Fatigue</li> <li>Self-efficacy for managing MS</li> <li>Patient satisfaction</li> <li>Healthcare utilization</li> </ul>	<p>At end of 16-week treatment:</p> <ul style="list-style-type: none"> <li>Less pain intensity and interference</li> <li>Less severe depression, disability, and fatigue</li> <li>Higher satisfaction and pain improvement</li> </ul> <p>Six months after treatment:</p> <ul style="list-style-type: none"> <li>Improved pain and depression control at six months</li> <li>Less pain interference, disability, and fatigue</li> <li>Fewer depression diagnoses</li> </ul>
<b>Vanderbilt University Medical Center, 2020<sup>19</sup></b>					
<ul style="list-style-type: none"> <li>Telephonic cognitive behavioral physical therapy</li> <li>Telephonic educational program taught by physical therapist</li> </ul>	None (compared across interventions)	Adult patients with recent spine surgery	<ul style="list-style-type: none"> <li>Disability</li> <li>Pain</li> <li>Physical and mental health</li> </ul>	<ul style="list-style-type: none"> <li>Physical activity</li> <li>Physical function</li> </ul>	None after one year; participants in both groups reported similar improvements in disability, pain, physical health, mental health, physical activity, and physical function

**APPENDIX:**

# Final Symposium Agenda and Session Summaries

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## **BEST PRACTICES IN TREATING MSK AND BACK PAIN PATIENTS IN YOUR WORKSITE HEALTH CENTER AND PROGRAMS**

**10:00 A.M. CT**  
**WELCOME AND**  
**PURPOSE OF PROGRAM**

**Purpose and Formal Description of the Day**

- Larry Boress, Executive Director, National Association of Worksite Health Centers

**Patient-Centered Outcomes Research Institute (PCORI), the Patient-Centered Perspective on Health and Productivity Outcomes, and Why MSK Matters to Employers**

- Brian Gifford, President-Elect, Center for Workforce Health and Performance

**Session summary**

The opening session introduced the two sponsoring organizations and outlined the problems surrounding the cost, lost productivity, and concerns about unnecessary surgery and the use of opioids to manage and treat MSK injuries and other pain conditions. Attendees were introduced to the concept of patient-centered outcomes as “consideration of patient’s perspectives, values, and preferences when making treatment decisions.” This definition differentiates research on patient-centered outcomes from comparative effectiveness research and considers what patients want from treatments, whether they understand the implications of their options, and how they balance values against access and affordability. The program format was described, with participants encouraged to engage with the information presented, ask questions, share experiences, and make recommendations for further PCORI research.

**10:15 A.M. CT**  
**PREVENTING PAIN**  
**AND MSK CONDITIONS**

**Summary of PCORI Findings**

- Brian Gifford, President-Elect, Center for Workforce Health and Performance

**Today's Workers and On-Site PT Services: What They Want. What They Use.**

- Kevin Schmidt, Chief Executive Officer, Worksite Well

**Back Classes and Other Key Approaches to Prevention**

- Daniel Lord, DC, Director of Physical Health, Crossover Health, LinkedIn, Facebook
- Okon Antia, Crossover Health

**Putting the Right People in the Right Job: Injury Prevention and Workers' Compensation Cost Containment Through Functional Testing**

- Penny Gilbert, LAT, ATC, Specialist, Purchasing, Textron, Inc.

**All-Attendee Roundtable Discussion: Larry Boress, Facilitator**

- Can you apply this information to your workplace clinic programs/services?
- What else about prevention would you want PCORI to research?

**Session summary**

Brian Gifford provided an overview of themes that emerged from PCORI-sponsored research on MSK conditions. Interventions included in PCORI-sponsored studies went beyond clinical and pharmaceutical areas and included therapeutic services, patient input and education, and provider integration. Pain management studies included physical functioning, quality of life, mental/emotional health, coping, and, when needed, opioid use management. And patients' perspectives were represented in the study designs.

Kevin Schmidt described the importance of recognizing how workers of different generations viewed their need to prevent and address injuries and their preference for on-site physical therapy services. An effective prevention program is both personalized and convenient to access.

Daniel Lord and Okon Antia discussed back classes as a preventive approach, as well as helping workers recognize when and how injuries occur and how to address different tasks.

Penny Gilbert described how Textron, an airline manufacturer, was successful in preventing MSK injuries by matching workers of certain abilities to the physical and mental tasks most appropriate to the individual.

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**11:25 A.M. CT  
BREAK**

**11:30 A.M. CT  
THE RESEARCH ON  
MANAGING AND  
TREATING PAIN**

**Summary of PCORI Findings**

- Brian Gifford, President-Elect, Center for Workforce Health and Performance

**Non-surgical Treatments for MSK and Pain**

- Sherry McAllister, MS (Ed.), DC, President, Foundation For Chiropractic Progress

**All-Attendee Roundtable Discussion: Larry Boress, Facilitator**

- Can you apply this information to your workplace clinic programs/services?

**Session summary**

Brian Gifford summarized the findings of PCORI-sponsored research showing effective pain management, including sharing with providers patients' perspectives on their pain and impairment and the need to set realistic outcome expectations; the value of adding pain coping skills; and the success of collaborative care with integrating various providers, including chiropractors and physical therapists.

Sherry McAllister presented findings describing the effectiveness of a multiphased approach to pain management, including not only the delivery of care but also patient engagement, addressing patients' functional ability and well-being. The value of non-pharmacological options to manage pain—including acupuncture, chiropractic, massage, physical therapy, and yoga—was also described, as were costs and structural barriers to pain management.

**12:15 P.M. CT  
BREAK**

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**12:20 P.M. CT**  
**INTEGRATING**  
**PROVIDERS FOR**  
**TREATMENT AND**  
**MANAGEMENT OF PAIN**

**Summary of PCORI Findings**

- Brian Gifford, President-Elect, Center for Workforce Health and Performance

**MSK Treatment, Management, and Payment: The Cisco Experience**

- Katelyn Johnson, Director of Benefits, Cisco
- William Updyke, DC, Leader, Physical and Complimentary Medicine, Cisco

**All-Attendee Roundtable Discussion: Larry Boress, Facilitator**

- Can you apply this information to your workplace clinic programs/services?
- What else about treatment and management would you want to PCORI to research?

**Session summary**

Brian Gifford summarized the findings of PCORI-sponsored studies in which interventions were directed at provider practices. Effective provider interventions included using survey information about patients' needs and perspectives and establishing collaborative care models involving the patient, a designated care manager, and an interdisciplinary team of specialty and care providers. Phased opioid reduction showed the potential to reduce overdoses without increasing patients' pain severity.

Katelyn Johnson and William Updyke focused on Cisco's experience integrating physicians, chiropractors, physical therapists, and massage therapists in a collaborative practice. They described how the program resulted in improved health outcomes, higher productivity, lower costs, and increased patient satisfaction among employees with MSK conditions.

**1:20 P.M. CT**  
**ENDING COMMENTS**

**Brian Gifford, CWHP, and Larry Boress, NAWHC**

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