

Pain and Function in Chronic Musculoskeletal Pain —Treating the Whole Person

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Abstract: Chronic pain is often associated with functional limitations that have a huge impact on patients' lives. However, despite being relatively common, chronic musculoskeletal pain is still viewed by some as a symptom of another disease rather than its own condition, and is therefore poorly addressed. This is compounded by other challenges in the field, including education gaps for both healthcare professionals and patients, a lack of universal and comprehensive assessment tools, poor societal perceptions of chronic pain, and the current stigma around the use of opioids. Here, we review the current chronic musculoskeletal pain management landscape in the United States and offer professional insight into emerging methods that can be used to improve patient outcomes, in particular, the achievement of meaningful functional goals. This perspective incorporates our combined multidisciplinary (psychiatry, psychology, nursing, physical therapy, and general medicine) experience and insights. We believe that chronic pain is a multifactorial experience and treatment requires an integrated, multidisciplinary approach from a range of healthcare providers. For the best patient outcomes, this team should work together to assess and treat the patient as a whole, addressing their pain and also providing education, empowerment, and support to enable patients to set and achieve meaningful functional goals that will provide real improvement in their quality of life. We believe that the healthcare community should elevate the conversation around chronic musculoskeletal pain management beyond that of just pain, to encompass the meaningful benefits that improvement in functional outcomes brings to patients.

Keywords: patient participation, delivery of healthcare, physical functional performance, United States, interdisciplinary team

Introduction

Chronic pain is a significant medical problem affecting many people's lives on a daily basis. The 2016 National Health Interview Survey (N = 33,028; age ≥18 years; response rate: 54.3%) by the Centers for Disease Control and Prevention (CDC) estimated 20.4% (ie, 50 million) of the United States (US) adult population is afflicted with chronic pain.¹ It is therefore undeniable that chronic pain is a significant medical problem affecting many people's lives on a daily basis and it is at an epidemic level.¹ Despite attempts to quantify and treat chronic pain, its continued and substantial prevalence suggests that there is more work to be done. This paper reviews the current landscape of chronic musculoskeletal pain treatment and shares our considerable multidisciplinary (psychiatry, psychology, nursing, physical therapy, and general medicine) experience and insights. We discuss chronic pain in the US: working definitions, current assessment tools, and

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management. Using our own clinical experience, we provide suggestions on incorporating assessment tools into clinical practice within a multidisciplinary team, highlighting the importance of inter-professional and patient communication, education for all, patient empowerment, and functional goal setting. We aim to elevate the clinical conversation beyond that of just pain, to re-focus clinical practice on gaining meaningful functional outcomes for patients.

Chronic Pain

Working Definitions

There is no single definition of chronic pain. In general, chronic pain would ideally be defined as that which persists beyond that of the normal healing time;² however, this definition is not applicable to many conditions. The International Association for the Study of Pain support a flexible working definition of chronic pain depending on the clinical situation but call for a criterion of ≥ 6 months for research purposes.³ In clinical practice, many consider persistent or recurrent pain for ≥ 3 months to be a useful definition.⁴ According to the American Chronic Pain Association, chronic pain is defined as both ongoing and recurrent pain that lasts beyond the usual course of acute illness or injury healing (ie, >3 –6 months) and adversely affects an individual's well-being.⁵ The National Pain Strategy similarly defines chronic pain as that occurring on at least half of days for ≥ 6 months.⁶ In an effort to aid research efforts aimed at identifying the impact of pain on people's lives, the National Pain Strategy also introduced the term "high-impact chronic pain"; ie, chronic pain "associated with substantial restriction of participation in work, social, and self-care activities for ≥ 6 months".⁶ As a result, the chronic pain field is now equipped with an additional definition that is more encompassing of the functional impact of pain. This is imperative considering that the 2016 National Health Interview Survey estimated 8% (ie, 19.6 million) of the US adult population to experience high-impact chronic pain.¹

Pain as the 5th Vital Sign

Given the detrimental and persistent nature of chronic pain, it is unsurprising that efforts have been made to improve pain management for individuals coping with this condition. Initiatives from multiple groups have led to pain being recognized as the "5th vital sign".

The American Pain Society was the first to promote the phrase "pain as the 5th vital sign" to increase awareness of

pain treatment among healthcare providers (HCPs).⁷ The US Department of Veterans Affairs' Veterans Health Administration (VHA) and Joint Commission were consistent with this position, and also with the need for systematic assessments and quantitative measures of pain (eg, using an 11-point scale to measure pain) to improve pain management.^{8,9} In the case of the VHA (which led an initiative called "Pain as the 5th vital sign"), there was a push for HCPs to implement the Numeric Rating Scale (NRS; 0 = no pain to 10 = worst possible pain) to evaluate patient-reported pain levels during outpatient clinical visits.⁸ It was expected "that a pain score of 4 or higher would trigger a comprehensive pain assessment and prompt intervention". Following a retrospective cross-sectional review of 600 medical records at a Veterans Affairs medical center ($n = 300$ for the pre-implementation group and $n = 300$ for the post-implementation group), it was found that the quality of pain care was unchanged between visits before and after the initiative ($p > 0.05$ for all comparisons).⁸ Unfortunately, this focus on pain as the "5th vital sign" did not improve the quality of pain management.

More recently, the US Department of Health and Human Services in conjunction with the US Department of Veterans Affairs with the Office of National Drug Control Policy convened a Pain Management Best Practices Inter-Agency Task Force to address chronic pain.¹⁰ This group placed an emphasis on there being an individualized, patient-centered approach for the diagnosis and treatment of pain with established measurable outcomes focused on improvements, including to quality of life, functionality, and activities of daily living.¹⁰ As part of the clinical best practices, two critical steps were identified: 1) a thorough initial evaluation which entails an assessment of probable factors that cause or contribute to the pain condition, and 2) the development of a treatment plan that addresses the cause of the pain and manages pain that persists despite treatment. The task force report recommends using a biopsychosocial model of care which comprises a multidisciplinary approach spanning various disciplines (using one or more treatment modalities) if there is clinical evidence to support improved outcomes. Treatments to be considered include complementary and integrative health (eg, acupuncture, massage, yoga, tai-chi, and spirituality), restorative therapies (eg, physiotherapy, therapeutic exercise, and other movement modalities), behavioral approaches (eg, psychological, cognitive, emotional, behavioral, and social aspects of

pain), interventional approaches (eg, trigger point injections, radiofrequency ablation, cryoneuroablation, and neuromodulation), and medications (including non-opioids and opioids).

Pain Perception and Treatment

From a historical perspective, there have been meaningful shifts in how pain is thought to be perceived. The biopsychosocial model is now a widely accepted conceptual approach that replaces the biomedical reductionist model.¹¹ What makes the biopsychosocial model unique is that it accounts for the complex multifactorial nature of pain. It acknowledges the dynamic interaction between physiological, psychological, and social factors, and the influence they have on one another.¹¹ Of the different elements that make up this complex biopsychosocial model, the psychological aspect is one of the hardest to overcome, underlining the importance of addressing both the sensory and psychological factors driving chronic pain.^{12–14} Patients may experience satisfactory improvement in their pain and functional abilities, but still feel depressed and think they will never fully recover from chronic pain (ie, never be completely pain free or restored to their pre-injury level of function). Psychological factors such as fatigue, emotional distress, resistance, and catastrophizing, can increase the level of pain and suffering in those with chronic pain.^{15–17} Furthermore, it has been proposed that executive function is impaired in patients with chronic pain.¹⁸ Having a pain model that values the physiological, psychological, and social components of pain highlights the necessity for an integrated treatment approach for patients with chronic pain.

Guidelines broadly aimed at the treatment of patients with chronic pain are lacking in the US, with recommendations generally being condition specific, or focused on the use of opioids.^{19–21} In today's world, combining non-pharmacologic and pharmacologic therapeutics is known to enhance relief in patients with chronic pain,^{22,23} and as mentioned earlier, the Pain Management Best Practices Task Force Report¹⁰ does recommend implementing multi-treatment modalities for these patients. In our experience, using a combination of non-pharmacologic and pharmacologic therapies is common in the majority of chronic pain cases. When choosing a therapy for a patient, a number of factors must be considered, including the type of pain, comorbidities, patient access, adherence to therapy, and cost of therapy. Importantly, patient-specific factors also affect how well patients respond to a particular therapy.

For instance, in the case of pharmacologic therapies, side effects are large determinants of whether a patient will skip doses or stop the medication altogether. Speaking directly with patients about the medication side effects and advising them to contact their prescriber to talk about these effects can help improve patient adherence. Other factors are important for non-pharmacologic therapies. It is imperative that patients build a good relationship with their prescribing doctor along with any other HCPs who provide treatment of any kind. Patients who have a good experience are more likely to have confidence in the therapy and continue with it. Most prescribers also recommend physical therapy, aerobic exercise, strength training, massage, yoga, and meditation as non-pharmacologic therapeutic interventions for patients with chronic musculoskeletal pain. However, one of the main barriers is the patient's mindset. Patients overwhelmingly tend to be "pathoanatomically focused", for example, if their diagnosis is a bulging disc, all of their focus is on that location and they find it difficult to comprehend how certain exercises could be relevant for it. Another barrier is the pain patients experience when performing certain types of activities. Many patients with chronic musculoskeletal pain exhibit fear of and avoidance behaviors toward movement/activity. Movement is an important path toward improving function, so an understanding and acceptance of pain is a major factor in a patient's success. Time should be dedicated to enhancing this mindset and a pain psychologist can be invaluable to this process.

Treatment Challenges

The current chronic pain treatment environment is rife with other challenges. Educational gaps about chronic pain (as its own condition) and its management, societal perceptions of chronic pain, and the current opioid climate all impede patients' ability to satisfactorily manage their chronic pain.

Educational gaps exist on many levels, spanning patients, society, and non-comprehensive pain management providers.^{24–28} An unwillingness to acknowledge and address pain with a patient, particularly in the primary care setting, can play a large role in the educational gaps that exist. Primary care physicians often see chronic pain as Pandora's Box, which could consume the course of their already short office visit time. This is worsened by the fact that physicians receive little formal education on chronic pain management and can be exposed to limited areas of emerging research.^{25–30} As a result, patients' chronic pain needs are often left unmet.

Substantial stigma is associated with chronic pain and its treatment. Much of this is due to a lack of education and awareness of the condition, and a lack of empathy for the patients afflicted with it.³¹ Society as a whole still largely perceives chronic pain as a symptom of a condition, as opposed to a disorder itself, even though chronic pain is in fact a disease state of the nervous system not functioning properly.³² Further compounding this is the complexity of opioid use in chronic pain management. Opioid use has become controversial for non-malignant chronic pain due in large part to the epidemic of drug overdoses and deaths, particularly in the US.²⁹ Furthermore, long-term opioid use (>3 months) has been shown to increase the risk of addiction in some individuals.^{33,34} Analysis of HealthCore Database claims data (2000–2005) for patients with non-cancer chronic pain (n = 568,640) show the adjusted odds ratio for opioid use disorder to be as follows:³⁴

- Chronic opioid use (low, medium, and high dose): ≥ 14.92
- Chronic opioid use (high dose only): 122.45
- Acute opioid use (low, medium, and high dose): ≤ 3.1

It is factors such as these that have contributed to the reproach patients treated with opioids encounter. In response to the heightened scrutiny and potential legal repercussions that now exist surrounding opioid use, some HCPs have come to regard the CDC Guideline for Prescribing Opioids for Chronic Pain³⁵ as more than just a guideline, although prescribers typically handle the opioid issue in slightly different ways. Some try to decrease or eliminate opioid use, partly for patient benefit, and partly because of resourcing issues (ie, to avoid the burden associated with authorizations and documentation, as well as the need to monitor for opioid abuse/misuse). Others continue to use long-term opioid treatment when appropriate, but may opt for an alternative medication delivery system, such as an intrathecal infusion pump as opposed to oral. Treatment with oral opioids is typically managed with a multidisciplinary healthcare team and is done with careful screening and in combination with other physical and psychological therapies. There is a risk that non-comprehensive pain management providers may see patients with a history of opioids as only that—patients who have used opioids—even if other significant signs or symptoms of pain or disease have warranted opioid treatment. Unfortunately, our current chronic pain environment

is filled with a culturally inaccurate perception of back-alley dealings and drug-seeking patients who either do not really have pain or who just need to “get over it”. This stigma is driven heavily by the media and negatively impacts patients and also pain management providers, manifesting as decreased access to care and poor treatment coverage. There is a great need for basic education on chronic pain pathophysiology, pain assessment, and pain management to help advance understanding of the condition and the patients who suffer from it.

Assessment Tools for Chronic Pain and Function

Patient-Reported Outcome Measures

A patient-reported outcome measure (PROM) is defined by the US Food and Drug Administration (FDA) as “any report of the status of a patient’s health condition that comes directly from the patient, without interpretation of the patient’s response by a clinician or anyone else”.³⁶ PROMs are commonly implemented when a given treatment approach is designed to ameliorate symptoms, facilitate functioning, or improve quality of life.³⁷ When filling out a PROM, patients are asked to indicate their perceived level of functioning during daily activities, as described in standardized questions.³⁸ PROMs fall into two categories: generic and disease state-specific.³⁹ Unlike a generic PROM that assesses general aspects of a patient’s health (such as self-care), a disease-specific PROM is tailored to the symptoms and impact on function of a specific condition.³⁹ Examples of disease-specific PROMs that are commonly relevant for patients with chronic musculoskeletal pain include the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)⁴⁰ and Oswestry Disability Index (ODI).⁴¹

PROMs are intended to capture a patient’s experience and are therefore well suited to evaluate the patient’s perspective.³⁶ Within the clinical trial setting, PROMs are often used to support a claim in medical product labeling when being submitted to the FDA.³⁶ Multiple factors are considered during FDA review, including the conceptual framework (used to define and provide a description of the measured concepts and the scores used by a given PROM), the psychometric measurement properties (ie, content validity, reliability, construct validity, and responsiveness) of the PROM instrument, the patient population enrolled in the trial, and the trial objectives and design.³⁶ Through the FDA’s lens, a PROM is

not credible without evidence of its usefulness from the intended target patient population, and that requires documented support indicating patient input during development of the PROM and its performance in the specific application for which it is being used.³⁶ Outside the clinical trial setting, PROMs are increasingly being used by individual clinicians and hospitals.³⁹ When used as a clinical tool, the intent is that a PROM will provide individualized insight to better inform and direct clinical decision making, enhancing patients' experience of care.⁴² Although the use of PROMs is increasing, there is still a significant lag in their use by health systems in all but a few countries (ie, England, Sweden, and parts of the US).³⁹ The difference in adoption is likely due, in part, to the influential effects of the government and medical communities.³⁹ In England, the government relies on PROMs to inform it on an HCP's performance, whereas in Sweden and parts of the US, the push for their usage resides within the healthcare community itself and with its goal of improving clinical care for individual patients based on key learnings from these measures.³⁹

Studies have investigated the use of PROMs in clinical trials and clinical practice for chronic pain conditions, reporting on those most frequently used. For example, a systematic review of randomized controlled trial (RCT) data from patients with non-specific low back pain published between 1980 and 2012 (N = 401) reported that the Visual Analog Scale (VAS; n = 119), Roland Morris Disability Questionnaire (RMDQ; n = 58), ODI (n = 36), NRS (n = 37), and patient-rated global assessment (n = 10) instruments were the most commonly used back-specific PROMs to assess pain intensity and disability.⁴³ That review did not differentiate between acute and chronic pain. A different systematic review of RCTs (N = 354) found that the ODI (n = 168), RMDQ (n = 132), and range of motion (n = 71) assessments were the most commonly used functional outcomes for chronic low back pain and that the NRS (n = 13), Brief Pain Inventory (BPI; n = 10), Pain Disability Index (n = 10), McGill Pain Questionnaire (n = 10), and VAS (n = 9) were the most commonly used pain outcome measures.⁴⁴ Some of these findings have been reflected in the clinical practice setting. A United Kingdom survey of 232 general practitioners showed that of the few who did use patient-assessment tools (n = 41; 18%) for their patients with osteoarthritis, the most commonly used was the NRS (n = 24; 58%), followed by general questioning about pain (n = 17; 42%).⁴⁵ Findings from the studies suggest multiple PROMs are

implemented in the research setting, but considerably fewer are used in clinical practice, with the NRS being commonly used within both fields.

Performance-Based Measures

Physical function is a multidimensional concept that involves a number of different constructs, including physical fitness, physical activity, functional capacity, and subjective disability.⁴⁶ Within the same sphere as the PROMs are performance-based measures (PBMs), which are specific physical tasks evaluated in an objective and standardized manner using predetermined criteria.⁴⁷ Similar to PROMs, both clinicians and researchers use PBMs to assess patient outcomes—specifically physical function.³⁸ It is generally recognized that PROMs and PBMs provide different but complementary information.⁴⁸ Numerous performance-based methods are available to measure physical function, including the 30-Second Chair Stand Test, Timed Up and Go (TUG) test, 6-minute walking test (6MWT), Self-Paced Walk Test, sock test, gait analysis, and wearable physical activity trackers. Most of those assess the time it takes a patient to perform the requested activity.³⁸ The Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT) and Outcome Measures in Rheumatology (OMERACT) groups recently convened to discuss and deliberate on vital measurement considerations for physical functioning and activity in the research setting for chronic pain.⁴⁸ It was recommended that investigators consider using the TUG, 6MWT, and Short Physical Performance Battery as performance measures of physical function, and to also consider actigraphy, depending on context.⁴⁸ The IMMPACT/OMERACT recommendations acknowledge that performance measures might be more relevant for a specific clinical trial or have better measurement properties for a specific population; therefore, such factors should be considered when deciding on the use of a PBM.⁴⁸

Incorporating Assessment Tools in Clinical Practice

Pain

Having a validated tool to assess and track a patient's pain is valuable because it speaks not just to the judgment on which an HCP can base a treatment plan, but also translates across disciplines. Numerous validated pain assessment tools exist, with varying applications, ease of use, outcome granularity and reliability.^{49–51} Many pain

assessment tools test specific aspects of pain. For example, quantitative sensory testing is a long-standing but largely research-based method to assess neural function and identify altered pain sensitivity in patients with chronic pain, particularly those with musculoskeletal pain.^{52–55} It is suggested that this type of testing could allow better prediction of treatment outcomes, allowing more guided care.^{52,56}

In our experience, we have found the BPI/BPI-Short Form⁵⁰ is the most commonly used assessment tool, likely because it is short, easy to use, validated, familiar, and assesses multiple dimensions, including pain, mood, interference, sleep, and function. This tool can be used for both pain and functional assessments. The revised Short-Form McGill Pain Questionnaire⁵¹ is less common, but provides a short, succinct assessment for both neuropathic and non-neuropathic pain. The Low Back Pain Impact Questionnaire⁵⁷ is also used because it allows gauging of how much chronic low back pain affects a patient's life.

Other tools that are commonly used to assess pain level in the clinic are the NRS and VAS; with the NRS simply a segmented numeric version of the VAS.⁴⁹ These are fairly quick to implement and patients are typically able to complete them with relative ease. It is important to note that, considering its shortcomings, we do not generally believe that VAS should be used in isolation. It has value primarily for documentation and communication purposes, to get a rough sense of a patient's pain level, and to easily communicate these findings within the broader multidisciplinary team. The VAS can also reveal useful information in specific patient cases. For example, if a patient scores a 6 out of 10 and remains there after three interventions but expresses a particular medication made them feel better, this indicates that the score is not a holistic representation of how the patient is doing. In our opinion, the VAS is not universally used because of its shortcomings. We find that patients can manipulate the process; ie, continue to report higher pain levels due to fear that their treatment will be discontinued if they report lower scores. Additionally, this tool provides limited information, insufficient to make a good clinical decision, is prone to recency/recall effect, and is subjective (ie, a specific score for one patient means something different to another).

Function

There are a number of tools for the functional assessment and management of patients with chronic musculoskeletal

pain. Here are some that we commonly see used in clinical practice, and the reasons why:

- Patient-Specific Functional Scale:⁵⁸ Used because it is short, simple to use, and helpful for tracking small functional improvements.
- Functional Independence Measure:⁵⁹ Although long, it is useful for patients with perceived significant disability.
- STarT Back Screening Tool:⁶⁰ This provides the opportunity to place patients in different categories (low, moderate, or high risk) to better assess the need for interventional assistance from other multidisciplinary team members.
- Opioid Risk Tool:⁶¹ For screenings and assessments to identify risk level for opioid misuse.
- Pain Catastrophizing Scale:⁶² This is good for initial pain evaluations, as elevated pain catastrophizing has been found to have a significant negative impact on ability to perceive benefit from treatment.
- Minnesota Multiphasic Personality Inventory-2 (MMPI-2),⁶³ Personal Assessment Inventory,⁶⁴ or Beck Depression Inventory-II (BDI-II).⁶⁵ These are used for presurgical evaluations. The BDI-II is also employed in initial screening evaluations to assess the level of depression symptoms.

Additional tools in use include the BPI⁵⁰ (which also measures pain), WOMAC,⁴⁰ Oswestry Low Back Pain Disability Questionnaire,⁴¹ Lower Extremity Functional Scale,⁶⁶ QuickDASH (Quick Disabilities of the Arm, Shoulder, and Hand),⁶⁷ Neck Disability Index,⁶⁸ Global Rating of Change scale,⁶⁹ McGill Pain Questionnaire,⁵¹ Hospital Anxiety and Depression Scale,⁷⁰ and PROMIS® (Patient-Reported Outcome Measurement Information System).⁷¹

Phone/mobile apps are increasingly available to support patients with chronic pain.^{72–77} A number of these allow HCPs involvement and collaborative development should continue.^{72,75} From an education perspective, these apps can help patients to learn and navigate information at their own pace, provide reminders to complete treatment, and often involve daily symptom trackers.^{72–77} Although not a formal assessment tool, journaling (ie, using a daily diary to track pain or function) is a form of documentation that can be useful in developing management care plans. This type of activity should have a positive or motivational framework with a specific goal-oriented component,

decreasing the likelihood of patient perseveration (repetition of a particular response) and negativism. Exercise may be associated with small to moderate improvements in pain and function for patients with chronic pain.⁷⁸ We find that incorporating exercise logs into the management plan can be beneficial. This documentation serves not only to log a patient's progression in performing an activity (eg, number of steps taken per day and associated pain level), but it also allows the patient to use their prior results as a benchmark to either push themselves further or decrease their activity, depending on how their body responded. Tracking activity also allows the practitioner to gauge compliance, patient buy-in, and accountability.

Our Thoughts on the Shortcomings and Opportunities in Current Assessment Tools

It is evident that a wide array of assessment tools is currently used to evaluate pain and function in patients with chronic musculoskeletal pain. Each HCP will have their own preferred “toolbox” for a number of different reasons, ranging from simplicity to appropriateness for specific evaluations and ability to effectively assess functional outcomes. Although there are numerous tools available, each has its own shortcomings.

Assessment tools, as a whole, do not incorporate meaningful function-specific questions with a goal-oriented plan for the patients, and modification of existing tools to suit individual needs and patients is common. It is also vitally important to ask functionally relevant questions to tease out nuances that cannot be gleaned from tools such as the VAS and BPI, to get a more personal and specific understanding of function from a broader emotional and social context. Examples of questions would be “How long can you be on your feet until you must sit down?”, “Which body part makes you have to sit down?”, and “In which room of the house do you spend the majority of your time?”

Current assessment tools are also too often lengthy. On any one visit to their HCP, patients can be given several pages of assessments to fill out. This can be burdensome and lead to “form fatigue”, where patients complete the questionnaires in a less than thoughtful and accurate manner (eg, if rating a set of different terms, they may simply put all 10s). Patients in general do not appear to understand why specific tools are used in their care plan. To make matters worse, HCPs seldom review the assessment findings with patients, leading them to feel frustrated and disengaged from the process. To combat

this, HCPs need to help their patients feel they, and their answers, are crucial parts of the process. A simple act of providing one-on-one review of the assessment and its findings is beneficial—patients are typically more engaged when they feel the information they provide in the assessment is used constructively in their treatment plan.

The documentation process can be another problem with assessment tools and their communication. It is not uncommon for patients to fill out assessments electronically from home, and that information is automatically uploaded. As such, it can get overlooked, as the system typically spits out a score based on the data. When combined with the multitude of other documents we need to review, information can get lost or forgotten. Using physical outcome measures, which are important to the patient and can be retested later, is one way to circumvent this problem.

One of the main hurdles facing comprehensive pain management providers is the lack of a single comprehensive tool to simply and effectively assess both pain and function—no tools apply to all patients. If we had the power to formally modify existing tools or create a tool to better meet the needs of patients with chronic musculoskeletal pain, we would first bring more focus to meaningful functional components. Some ideas we have are as follows:

1. Incorporate a section where the patient can set a personally meaningful functional goal.
2. Develop an app-based assessment to record a patient's real-time pain level, emotional state, and activity level.
3. Incorporate a section to inquire about more personal and granular functional activities, such as how long one can stand and sit (“What limits you in standing/sitting?”, “Where do you spend most of your time?”, and “What are you doing?”).
4. Develop an interactive patient-specific “smart tool” to assist with patient engagement and compliance.

The Multidisciplinary Team Using Assessment Tools Within a Multidisciplinary Team

It would be ideal for the chronic pain field to have a single comprehensive method to inform clinicians about the tools available, how to adapt them to their clinical setting, and how to make sense of the information gathered from the tools to translate it into clinical practice. Multidisciplinary care for patients with chronic pain would benefit greatly

from this because it would allow different treatment team members to track a particular patient with the same tool over visits and share data across the team, to better determine the next best step in the patient's treatment plan. Having a single, validated, easy-to-implement assessment tool focused on meaningful functional outcomes would be most valuable to the chronic pain field, to advance comprehensive management for patients with chronic musculoskeletal pain.

In addition to having the right assessment tool, one must be able to effectively communicate information pertaining to the assessment. In a multidisciplinary team environment, it is essential to detail only the key findings and recommendations from the assessment tools, as the totality of information can be too granular to share with all team members. Providing a high-level synopsis (such as a two- or three-sentence paragraph) works nicely for a couple of reasons. The first is time; providers simply do not have time to review all the lengthy specifics from an assessment tool another team member has used. Second, HCPs from different disciplines typically have specific items they are interested in regarding their patient, as opposed to just the pain or function assessment scores; eg, a patient's risk level and whether opioids could be used in their treatment plan; whether a patient has misused medications; or a patient's mood, impulsivity, and trustworthiness. These assessment forms/tools/questionnaires can be shared in paper or electronic formats. Electronic formats include email, tablet, and CHOIR (Collaborative Health Outcomes Information Registry). CHOIR is "an open source, open platform health outcomes registry and learning health system".⁷⁹ Advantages of CHOIR include that it is customizable (can be modified for different medical disciplines), can be pre-templated in the electronic medical records (EMR) system, and can be completed by the patient at home. The one downside is that it can be laborious. To be effective, using assessment tools within a multidisciplinary treatment approach demands team members to communicate pertinent patient information in a succinct manner using the available resources.

Make-Up of a Multidisciplinary Team

Multidisciplinary treatment teams encompass a diversity of HCPs, and their make-up should be specific to the needs of the patient. Common roles within a comprehensive pain management team include a pain psychologist, psychiatrist, nutritionist, pain physician, pain nurse, physiatrist, physical therapist, interventional pain management physician, and

a primary care physician. Inter-team communication typically relies heavily on face-to-face interactions, phone calls, email, or use of the EMR system to relay information pertaining to patient care. The value of communication and documentation cannot be overstated. Good communication ensures that the team is on the same page regarding a patient's treatment plan and progress; outside of that, it helps build patient trust when they hear consistent information from different clinicians regarding their care. Having a key person serve as a coordinator can also be helpful to ensure smooth and consistent workings of multidisciplinary care.

Patients are generally understanding of the need to have a multidisciplinary team and are receptive to having different treatment team members working together on their care. In fact, using a multidisciplinary approach often provides patients with a feeling of safety. Patients tend to gravitate toward at least one treatment team member with whom they most strongly connect and who can help them view the system and their care more holistically. Importantly, although patients are typically receptive to this approach, HCPs do need to educate them on what it means to have a multidisciplinary team and why this approach is being used, particularly when involving disciplines such as psychology/psychiatry.

Outside of the many benefits of a multidisciplinary team approach for patients with chronic musculoskeletal pain, there are a few challenges. Within a multidisciplinary practice, it may take months to get each of the team members' evaluations completed, which can be frustrating/tiring for a patient who has likely previously been through multiple clinician visits for their pain condition. Misalignment on a patient's treatment plan among treatment team members can also be a challenge. This can place the patient in the position of hearing different explanations about their care plan and having to figure out who is the "right" clinician to listen to. With a patient-centered communication approach, we are confident a multidisciplinary treatment team is of the utmost value for our patients, as it ensures the patient is getting an integrated treatment plan that considers the many facets of the chronic pain experience.

Patient Empowerment and Education

Healthcare providers need to ensure that patients feel important and that they are the most essential part of the team. Patient self-management involves active participation in the management of their own chronic condition.⁸⁰ But what does this look like? It can mean getting patients to be more independent. To accomplish this, patients

require education on how to progress treatment independently. It also means getting patients to understand their options and the information provided to them, so they can make informed choices about their care, as well as simply getting them to be honest. A critical component of achieving self-management is letting patients tell their own story in their own words. Healthcare providers need to ensure that patients are heard, and that they believe their provider is listening and empathizes with what they are going through. The provider–patient relationship is a collaborative one, and providers should serve as collaborators, guides, and coaches. In so doing, our main purpose is to educate the patient on their condition and how to manage it, and to get the patient to take ownership of their own care. Such actions will empower the patient to be more confident in making decisions related to their health. An optimal provider–patient relationship is not intended to be lifelong, but ideally one in which the provider sees the patient for only a handful of visits over the course of some months.

Patient education plays a critical role in chronic pain management. A systematic literature review conducted between mid-2017 and August 2019 found that when part of a multidisciplinary intervention, patient education is likely to improve self-management and self-efficacy in individuals with chronic musculoskeletal pain.⁸¹ Unfortunately, few physicians are formally trained to effectively manage and educate on chronic pain.²⁹ Patient education is an essential component of the overall management plan. It occurs over the patient's chronic pain journey and involves activities such as setting/managing expectations, explaining test results (eg, imaging), and educating on therapies (what, how, when, etc.) and their possible side effects. In addition, patient education is also needed from a psychological perspective. There is commonly a disconnect between a patient's understanding of how psychological components (eg, feelings, mood, anxiety, and sleep) relate to chronic pain; and as such, patients tend to view pain as a problem only in their body—not also in their mind. Education to close this knowledge gap and prevent the patient from questioning the need for psychological evaluation is typically invaluable. It is critical that patients understand that the focus of treatment is on improving their function and quality of life—not on complete eradication of pain, which is often impossible. Another important educational component is helping patients see the negative side of avoidance (eg, avoidance

of physical activity) and how it constricts them instead of protecting them—letting patients know that taking healthy risks is an important part of the process. While getting patients to be true partners in their own care is a critical theme in patient success stories, getting them to a place where they can truly be self-sufficient and advocate for themselves is difficult, time-consuming, and takes a diligent and communicative multidisciplinary team. In teams who adopt patient education, a range of different resources are used, such as pre-printed resources (eg, booklets, pamphlets), EMR-generated print resources, or specific Internet sites. Some teams also create their own educational materials. The amount of education required may be different for each patient and approached on a case-by-case basis. Patients often benefit most from education provided one-on-one with a visual aid, such as an anatomical model or an imaging film/scan. We strongly believe there is a need within the healthcare community to increase the amount of formal training that HCPs receive on chronic pain management and how the relevant topics can be communicated to patients. There is a general lack of patient education incorporated into treatment plans and materials to support its inclusion. Healthcare professionals need to be in a position where they are adequately equipped with the information necessary to educate their patients, and in so doing will be able to empower their patients to better manage their chronic pain.

Relationship building is as much a part of patient education as anything else and is foundational for patients to trust the provided information. The length of time each multidisciplinary team member gets to spend with each patient is highly variable and is influenced not just by discipline, but also by practice and the complexity of the patient's problem(s). As such, patient time can range anywhere between ~20 mins to ~1.5 h. Patients are often eager to visit their HCP; therefore, splitting management into multiple visits for practices without specialized multidisciplinary care can be beneficial. Office visits can additionally be used as an opportunity to address items not covered in the initial consult or treatment-based visits. Another part in the equation of relationship building is letting patients know that their provider is not abandoning them when the time comes for them to transition out of their care. Being mindful of how patient transitioning is handled is important and the process needs to convey to patients that they are doing well, and that is why they are being transitioned, but that the door always remains open.

Importance of Goal Setting

Chronic pain has the ability to mask an individual's true functional capacity, making it imperative for the healthcare community to advance the conversation on chronic pain assessment and management, and to discuss the importance of functional outcomes. A 2006 study by Terwee et al³⁸ showed that self-reported measures of physical function are more influenced by pain, as opposed to PBMs of physical function. In this study, conducted in patients with knee osteoarthritis (N = 163), there was a greater correlation between the WOMAC and 36-Item Short Form Health Survey (SF-36) physical function subscales and the WOMAC pain and SF-36 pain subscales ($r = 0.57$ – 0.74) compared with the performance-based DynaPort[®] Knee Test (DPKT) KneeScore2 and the WOMAC ($r = 0.20$) and SF-36 pain subscales ($r = 0.26$).³⁸ These findings highlight the necessity for a more integrated approach when evaluating chronic pain conditions and the value of having a full understanding of how pain affects a patient's overall physical function.

Research has indicated that setting goals elevates physical functioning. A Cochrane systematic review of RCTs (N = 39) including patients with musculoskeletal disorders and chronic pain found evidence that goal setting improved health-related quality of life and self-reported emotional status (n = 8 studies; 446 participants) in adult rehabilitation compared with no goal setting.⁸² Similar findings were reported in a 2010 study by Christiansen et al.⁸³ This study examined the relationship between improved functional outcomes and goal-setting strategies by combining the use of mental contrasting, implementations, and cognitive behavioral therapy as a means to evaluate their effectiveness in improving disability compared with a control group. At a high level, patients were asked to list positive aspects associated with “exercising more” (ie, increasing their physical capacity) and four negative aspects (ie, obstacles) that would need to be confronted to achieve this goal. They were then asked to identify how these aspects would affect them, the beneficial behaviors that would counteract the obstacles, and to formulate implementation intentions to help them achieve their goal. Findings indicated that intervention resulted in significantly greater improvements in physical capacity, as measured by the Hanover Activities of Daily Living Questionnaire, compared with usual treatment ($p < 0.05$).⁸³ Lastly, a small pilot study conducted in patients with chronic back pain (N = 10) found that participants who used a mobile application called MyBehaviorCBP—which

automatically generates physical activity recommendations based on a person's past behaviors using sensor-based machine learning data and self-reported physical activity data logs—walked for 4.9 minutes/day more compared with the control phase ($p = 0.02$) and exercised for 9.5 minutes more (ie, non-walking exercise; $p = 0.31$).⁷⁶ It is therefore evident that incorporating goal setting has a positive impact on a patient's physical capabilities/activity levels.

We strongly believe that incorporating goal setting into the management plan for patients with chronic musculoskeletal pain is an invaluable element to help them improve their function. Goal setting is an important element to get patients focused on achieving a functional outcome that is meaningful in their life, and has been proven to be an effective approach to increasing physical function in patients with chronic musculoskeletal pain. Patient goals should reflect a given patient's personal priorities; they should be task- and value-based and span different periods of time (ie, short-, intermediate-, and long-term). To be effective, goal setting must be patient-driven. Goals can be as simple as achieving a certain number of steps per day or as ambitious as getting back to a job that requires extensive travel. In the current landscape there are few tools available to measure patient-set goals, but being able to measure progress toward these types of meaningful functional goals is important and can often be achieved as a custom add-on feature to an existing assessment tool. However, considering that there are shared human commonalities among patients (eg, a desire to be accepted and loved; to fulfill important life roles [such as parent, spouse, or worker], and to experience self-fulfillment), and that goals tend to be based around activities people use to gauge how they are doing (eg, ability to get and stay out of bed, being with family, working outside the house, being physically active), it is plausible that a tool to assess both psychological and physical wellness could be developed and individualized to incorporate patient goal setting.

Conclusions

We believe that the healthcare community needs to elevate the conversation around chronic musculoskeletal pain management beyond that of just pain, to encompass the meaningful benefits that improvement in functional outcomes brings to patients. Improved function is the second most highly rated expectation of treatment in patients with chronic pain (with the first being pain control), highlighting the value that patients place on this factor.⁸⁴ When conducting clinical assessments, HCPs need to learn to be creative and

incorporate more functionally relevant elements. In particular, data indicate that goal-setting strategies have the potential to improve functional outcomes. It is also important to work toward empowering patients to become advocates of their own care, so that they can be at the center of their treatment plan, and not just bystanders. With chronic pain being a multifactorial experience, it requires an integrated, multi-disciplinary treatment approach. It is vital for the healthcare community to continue to work toward placing a higher value on helping patients achieving improvements in functional outcomes that will be of significance in their day-to-day life.

Abbreviations

6MWT, 6-minute walking test; BDI-II, Beck Depression Inventory-II; BPI, Brief Pain Inventory; CHOIR, Collaborative Health Outcomes Information Registry; EMR, electronic medical records; HCP, healthcare provider; MMPI-2, Minnesota Multiphasic Personality Inventory-2; ODI, Oswestry Disability Index; PBM, performance-based measured; PROM, patient-reported outcome measure; PROMIS[®], Patient-Reported Outcome Measurement Information System; RCT, randomized controlled trial; RMDQ, Roland Morris Disability Questionnaire; TUG, Timed Up and Go; VAS, Visual Analog Scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index.

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