Shared decision making (SDM) is a key component of patient-centered care where clinical evidence and the patient’s preference and values are considered. Physical activity and weight loss are often recommendations in the treatment plan, especially in mild to moderate stage of osteoarthritis (OA). Movement is Life™ created an innovative SDM tool providing a framework for patient-centered discussions. The tool leverages an underlying Markov Model and represents the likely pain, activity levels, and lost productivity at three future time points. Comparing the patient’s likely progression depending on treatment choices to doing nothing, the patient has an illustration of their future state. The tool provides a consistent communication pathway and may reduce disparities by addressing unconscious bias. Orthopaedic nurses can be a catalyst for change in the clinic setting by providing education, counseling, and health coaching to promote physical activity and weight management as a recommended treatment option for early OA symptom management.

OA Burden

Millions of Americans are affected by joint pain due to arthritis and other related rheumatic conditions. The most prevalent and progressive form of joint pain and joint damage is OA. The estimate of prevalence varies by the definition of OA: self-report of presence of pain, aching, or stiffness identified as symptomatic; by radiographic findings; or radiographic findings with symptoms (USBJI, 2020). More than 32.5 million adults in the United States reported OA from 2008 to 2014, which represents one in seven persons (USBJI, 2020).

Age, gender, and race capture the segments of the population who are impacted disproportionately. Adults aged 46–64 years represent 14.8 million patients with OA whereas adults 65 years of age or older represent 13.8 million patients (USBJI, 2020). Females represent 51% of the general U.S. population but have the lion’s share at 78% of adults with OA (USBJI, 2020). African American and Hispanic populations have a higher share in the middle-aged groups reporting OA.

The economic burden of musculoskeletal disorders continues to increase (USBJI, 2020). The annual incremental direct medical cost for OA totals $65.5 billion with average per person cost of $2,018.00 (USBJI, 2020). The direct cost is associated with treatments provided within the healthcare system and prescribed medications (USBJI, 2020). The indirect cost is associated with estimated lost wages from missed work days and lower earnings in adults aged 18–64 years with musculoskeletal disorders (USBJI, 2020).

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**OA Nonoperative Management**

Although there is no cure for OA, a broad range of nonoperative treatment options are available (DeRogatis et al., 2019). The treatment goals of OA include slowing disease progression, pain relief, reducing inflammation, maintaining, or improving mobility, improving function, and improving health-related quality of life (AHRQ, 2016b). With all nonoperative treatment options, there are risks and benefits to the patient and some require lifestyle modification. The combination of treatment options, both pharmacologic and nonpharmacologic, is highly recommended (Bruyère et al., 2014). Patient education on OA disease progression and self-management is considered a standard of care (Bannuru et al., 2019). The following nonoperative approaches will be discussed: weight loss and movement, physical therapy, nonsteroidal anti-inflammatory drugs (NSAIDs), intra-articular injections, and bracing using the American Academy of Orthopaedic Surgeons (AAOS) and the updated Osteoarthritis Research Society International (OARSI) guidelines. Core Treatments in the OARSI guidelines are considered suitable for use by the majority of patients in almost any situation and considered safe for use in combination with other treatments (Bannuru et al., 2019).

**WEIGHT LOSS AND MOVEMENT**

Obesity is a modifiable risk factor for the progression and incidence of OA (Flego et al., 2016). The World Health Organization (WHO, 2013), defines obesity as a body mass index (BMI) of or equal to 30 kg/m². Joint pain has been shown to perpetuate the likelihood of the individual to limit mobility and decrease physical activity leading to weight gain (Flego et al., 2016). The main component of OA prevention efforts is weight loss through a balanced diet and the adoption of regular physical activity (Duclos, 2016). Findings suggest that fat mass is associated with early onset through last-stage OA indicating a link to metabolic-driven inflammatory processes, reinforcing the importance of preventing obesity to prevent joint damage (Cicuttini & Wluka, 2016).

Although weight loss is a safe and effective treatment for OA, it requires lifestyle modifications with adherence to a low-calorie diet and increased physical activity (DeRogatis et al., 2019). Diet in combination with exercise is effective and safe for all patients with symptomatic OA (Bannuru et al., 2019). According to the evidence-based guidelines for the treatment of OA, weight loss is a moderate strength recommendation for patients with symptomatic OA and a BMI of 25 or greater (AAOS, 2013). The BMI classifies subjects into categories by weight with 25 or greater deemed as overweight (Müller et al., 2016). If overweight, at least 10% weight loss is necessary to attain symptom benefit (Messier et al., 2013).

Physical mobility is essential to the health and wellbeing of the aging population. Physical activity can be defined as all movement creating energy use (Colberg et al., 2016). Exercise, a planned physical activity, is recommended as an integral part of weight loss programs. Strengthening and low-impact aerobic exercise and physical activity consistent with national guidelines are strongly recommended for patients with symptomatic OA (AAOS, 2013).

Core Treatments for weight loss and movement suitable for all patients with knee OA include structured land-based exercise programs, combination dietary weight management with exercise, and tai chi and yoga, which are considered mind–body exercises (Bannuru et al., 2019). Although aquatic-based exercise can improve physical function in knee OA, there are no relevant guidelines available (Dong et al., 2018).

**BRACING**

Although bracing as a treatment option is a common practice in clinical orthopaedics for OA, the evidence in the literature is inconclusive regarding the effectiveness of knee bracing (AAOS, 2013; Bannuru et al., 2019). Currently, the provider must document medical necessity for private payers and the Centers for Medicare & Medicaid Services (CMS) for claim reimbursement. A brace can be rigid or semirigid used to provide support, restrict, or eliminate movement of a diseased or injured body part (CMS, 2019). As a biomechanical intervention, joint instability and the level of degree of objective knee laxity must be present in the documentation for claim submissions to prevent a denial.

**PHARMACOLOGIC INTERVENTIONS**

**Nonsteroidal Anti-inflammatory Drugs**

Nonsteroidal anti-inflammatory drugs both oral and topical or tramadol is strongly recommended for knee OA (AAOS, 2013). Topical NSAIDs are strongly recommended for the treatment in all individuals with knee OA (Bannuru et al., 2019). For oral NSAID agents, risk mitigation is suggested in patients with gastrointestinal diagnosis. It is recommended to use the lowest possible dose and shortest duration for treatment in combination with a protein pump inhibitor (Bannuru et al., 2019). For patients with cardiovascular risk or frailty, NSAID of any classification (selective or nonselective) is not a recommended treatment option (Bannuru et al., 2019).

**Intra-articular Injections**

There is a lack of consensus on OA treatment using intra-articular therapies within the orthopaedic community (Jones et al., 2019). Intra-articular injections with corticosteroids (IACS) and hyaluronic acid are conditionally recommended treatments for knee OA (Bannuru et al., 2019). These two treatments are the most widely used intra-articular therapies in patients who do not respond to nonpharmacologic treatment, NSAIDs, or analgesia (Jones et al., 2019). In the AAOS guidelines (2013), the evidence to support IACS was inconclusive and the guidelines were unable to recommend using IAHC. In the updated OARSI guidelines for knee pain, acute in nature, IACS is a short-term treatment option for relief (Bannuru et al., 2019). For longer term symptom management, IAHC is a treatment option for knee OA (Bannuru et al., 2019). Pharmacologic intervention recommendations are shown in Table 1.
TABLE 1. Knee Osteoarthritis Pharmacologic Interventions\(^a\)

| Procedure                                      | AAOS (2013)            | OARSI (Bannuru et al., 2019) |
|------------------------------------------------|-------------------------|------------------------------|
| NSIADS (oral and topical)                      | Strongly recommended    | Strongly recommended         |
| Acetaminophen                                   | Inconclusive            | Conditionally not recommended|
| Opioids, or pain patches                        | Inconclusive            | Strongly recommended against |
| Corticosteroids                                  | Inconclusive            | Conditional                  |
| Hyaluronic acid/viscosupplementation             | Cannot recommend        | Conditional                  |

Note. AAOS = American Academy of Orthopaedic Surgeons; OARSI = Osteoarthritis Research Society International.
\(^a\)Published guidelines.

Shared Decision Making

Shared decision making is the process by which clinicians and patients work together to make decisions about treatment options based on clinical evidence and the patient’s preferences and values. It determines what is most important to the patient regarding their healthcare based on their lived experiences. It is a meaningful dialogue between the provider and patient, which can improve the patient’s experience of care and the patient’s adherence to treatment recommendations (AHRQ, 2016a). There are three components to SDM: unbiased, clear, and accurate medical evidence on reasonable treatment alternatives including no treatment; clinical expertise in communicating the evidence to the patient; and the patient’s values, preferences based on the information, goals, concerns, and treatment burdens (National Quality Forum, 2017). The objective of SDM is patients’ empowerment, active partners in decisions related to their health (Mincer et al., 2017). Shared decision making is an integral building block in patient-centered care (PCC) models (Smith, 2016).

Patient-Centered Care

Emerging as the model for quality healthcare, PCC fosters effective communication between the provider and the patient (Ruben et al., 2020). In 1987, an eighth principle was added to the Picker Principles of Patient-Centered Care: (1) respect for patients’ values, preferences, and expressed needs; (2) coordination and integration of care; (3) information, communication, and education; (4) physical comfort; (5) emotional support and alleviation of fear and anxiety; (6) involvement of family and friends; (7) continuity and transition; and (8) access to care (National Center for Interprofessional Practice and Education, 2015).

Communication skills are essential in the SDM model to allow for exploration of the patient’s values and preferences. Healthcare providers (nurses, therapists, physician assistants, and physicians) can use the “ask-tell-ask” approach to elicit a response (Hashim, 2017). This approach uses small amounts of data in repeated cycles (Hashim, 2017). The use of open-ended questions, active listening, and not interrupting the patient is the way to gain understanding of the patient’s ideas, feelings, concerns, and experience regarding the diagnosis and allows the health care provider to express empathy (Hashim, 2017).

Poor communication can represent a patient safety risk (AHRQ, 2017). In 2010, National Quality Forum Consensus Report, the safe practice of “teach back,” was identified as part of communication with informed consent. Informed consent can be misunderstood as a shared decision between the provider and the patient. Providers may view informed consent as a regulatory or legal standard requiring a patient to be informed of any risk prior to a treatment and may hinder patient centeredness (Sinaiko et al., 2019). In a high-value and patient-centric process, informed consent would be clear, inclusive, and free from bias using written information to aid in decision making (Spatz et al., 2016).

The care team should have education on the use of SDM tools as well as communication skills (Sinaiko et al., 2019). Barriers to the implementation of SDM in clinical orthopaedic practice include the adoption of decision aids, belief that SDM is already occurring, the increase in time spent with the patient, and ingrained clinical procedures (Mincer et al., 2017). Decision aids can provide information about evidence-based treatment options to enhance the informed decision and consent process (Spatz et al., 2016). The communication between a trusted provider and the patient is irreplaceable when it is free from bias, transparent, and comprehensive (Spatz et al., 2016).

Movement is Life Shared Decision-Making Tool

Movement is Life™ is a multidisciplinary coalition of stakeholders focused on the elimination of musculoskeletal disparities by promoting physical mobility among women, African Americans, and Hispanics. The group is committed to be the catalyst for change to include behavior change. Movement is Life™ (MIL) created an innovative SDM tool to provide a personalized framework for patient-centered discussions regarding treatment options for knee OA.

The tool leverages an underlying Markov model and represents the likely pain, activity levels, and lost productivity at three future time points (1, 3, and 6 years). Markov models are typically used for cost analysis but for the framework on the Movement is Life™ shared decision-making (MILSDM) tool, they were used to quantify the cost of disparities in treatment utilization across populations (Karmarkar et al., 2017).
The MILSDM tool personalizes the output page using input data of gender, age, race, ethnicity, height, weight, comorbidities of hypertension and diabetes, living arrangements, marital status, highest education level achieved, and insurance type. The height and weight calculate the patients’ BMI. The insurance input addresses private payer, governmental payer, and uninsured. The patient is asked to self-report pain and activity levels using Likert scales (1–10), with 1 is no pain/no limitation and 10 is extreme pain/extreme limitation. The scales also use illustrations that coincide with the number to allow the patients to choose the best illustration of pain and activity level they are experiencing.

Treatment options selected for the MILSDM tool used review of literature, content experts, and feedback from five primary care physicians. Further refinement on the frequency and variety of treatment options for knee OA used information obtained from the Truven Health MarketScan Research Databases (IBM Watson; Truven Health Analytics, Ann Arbor, MI). The MILSDM tool personalizes the projected impact of alternative strategies on the patient’s likely level of pain, activity, and economic productivity based on the treatment choices selected with “doing nothing” as a defaulted selection. The eight treatment pathways are divided by early- and later-stage OA (see Table 2).

| Treatment Pathway For OA | OA Level |
|--------------------------|----------|
| Increase activity, weight loss, OTC medication | Early OA |
| Increase activity, unloader brace, prescription pain medication | Early OA |
| Physical therapy, unloader brace, prescription pain medication | Early OA |
| Corticosteroid injections, unloader brace, prescription pain medication | Early OA |
| Physical therapy, corticosteroid injections, NSAIDs | Early OA |
| Corticosteroid injections, physical therapy, prescription pain medication, TKA at 2 years | Later-stage OA |
| Corticosteroid injections, physical therapy, prescription pain medication, TKA at 4 years | Later-stage OA |
| Physical therapy, corticosteroid injections or hyaluronic acid injections, NSAIDs | Later-stage OA |

Note. NSAIDs = nonsteroidal anti-inflammatory drugs; OA = osteoarthritis; OTC = over-the-counter; TKA = total knee arthroplasty.

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Evidence indicates that biases are likely to influence treatment decision and diagnosis (FitzGerald & Hurst, 2017). Unconscious bias may influence how a person’s information is processed creating unintended disparities in patient care (Marcelin et al., 2019). Decisional conflict may be reduced using the tool as the framework provides comparative best practice treatment pathways centered on the patient’s disease progression, personal health information, and self-report of pain and activity producing a visual representation of the predictive outcomes based on similar patients.

The MILSDM tool is available to licensed and nonlicensed members of the healthcare team (doctors, nurses, therapists, physician assistants, and medical assistants) to facilitate and create the structure for critical conversations using the web application: http://apps-movementslifecaucus.com/pe/Account/Welcome. The user completes a one-time registration attesting to the terms of use. Once completed, the user is provided access to the interactive tool using a unique URL. Each user is provided links to the training video and user guide.

Use in Practice

Patients may seek medical treatment for arthritis-related knee pain in primary care and orthopaedic care clinic settings. In clinical practice, the provider determines treatment options for OA-related knee pain following a review of the patient history, a physical examination, and a review of the diagnostic radiographs. Communication is a critical skill during the encounter. The provider should actively listen to the patient's concerns, goals, and questions during the encounter to bring attention to the emotional dimension of the experience (Yahanda & Mozersky, 2020).

Based on the findings from the patient encounter for OA-related knee pain, treatment options can be offered to the patient. With the objective to improve function and reduce pain and other symptoms, the management of OA becomes a multidisciplinary approach where pharmacotherapy, physical and occupational therapy, and psychology play a role (Alshami, 2014). Conservative treatment also includes self-management strategies that may involve lifestyle modifications to incorporate pacing activities and weight reduction to reduce pain (Ali et al., 2018; Alshami, 2014). Because these conversations
can become complex, time becomes a valuable and limited resource (Yahanda & Mozersky, 2020). Efficiency can be achieved in SDM by using decision aids (Yahanda & Mozersky, 2020).

The MILSDM tool was developed to provide a personalized and interactive educational encounter using treatment pathways for OA to compare outcomes of pain, function, and work productivity impacting the patient's quality of life (Gaskin et al., 2019; Karmarkar et al., 2017). In preparation for using the MILSDM tool during the encounter, the provider selects two options based on the patient's stage of OA. If the patient is in an early stage of OA and overweight or obese, the provider should select the first treatment pathway option (increase activity, weight loss, and over-the-counter medication). The option to "do nothing" is always the third pathway as a comparator for the two provider-recommended paths. By having three pathways, the patients can better understand the treatment options available and that their choices or preference to treatment will have an impact on their health outcomes.

The MILSDM tool requires demographic and biometric input parameters (gender, age, height, weight, race, ethnicity, presence of hypertension and diabetes, living arrangements, marital status, highest achieved educational level, insurance type, self-reported pain level, and self-reported activity level) to produce the predictive output page. Because time may be a concern for the provider, the SDM discussion on lifestyle modification identified in the first treatment path may be delegated to a nurse using the personalized and interactive tool. The predictive output page can be printed and added to the electronic health record and given to the patient.

Catalyst for Change

Orthopaedic nurses can become catalyst for change. Nurses can be involved during the discussion phase of SDM providing counseling and health coaching (Smith, 2016). The use of decision aids can assist in educating and informing the patient (Smith, 2016).

Understanding barriers and facilitators to physical activity and healthy eating can guide discussions (Pellegrini et al., 2018). Assessing the social determinants of health explores the patients' economic stability, education, environment, health literacy, and access to providers, which impact their ability to self-manage (Bruner, 2020). Promoting healthy weight as a treatment option should be approached using respect and empathy (Reims & Ernst, 2016). For many, achieving and maintaining a healthy weight is a challenge (Reims & Ernst, 2016).

Motivational interviewing is an approach the nurse can use to explore the patient's commitment to, as well as interest in, a behavior change (Elwyn et al., 2014). Allow the patients to share their story by asking open-ended questions and ask permission to explore the topic in more depth to address and reframe expectations (Reims & Ernst, 2016).

Nurses can help the patient set realistic and achievable goals to decrease the weight-bearing effect on the knee joint. Clinically important benefits are gained with increased weight loss of 5% or greater for OA symptom management, and benefits are further enhanced with concurrent use of exercise (Kolasinski et al., 2020). Helping the patients visualize themselves in a future state can be a catalyst to the behavior change needed for self-management. The positive patient outcomes associated with SDM include autonomy, disease self-management, confidence, knowledge, and satisfaction with healthcare choices (Skelly et al., 2020).

Conclusion

When SDM is used, the focus of clinical treatment decisions moves from a provider-driven plan based solely on guidelines to a patient-centric plan incorporating the patient's values and preferences. The MILSDM tool is available for use in clinical practice in primary care and orthopaedic settings to include outpatient rehabilitative practices. After the provider has identified the patient's condition and appropriate treatment options for OA, nurses working in the clinic setting can facilitate an SDM conversation using the tool to incorporate the patient's values and preferences. The patient may be better able to understand the effectiveness of knee OA treatment or management options based on outcomes for similar patients and better able to communicate their desires and preferences. The tool provides a consistent communication pathway, which may reduce decisional conflict and disparities by addressing unconscious bias.

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