NCPD
2.0
ANCC
Contact
Hours
OPEN

A Personalized Shared Decision-Making Tool for Osteoarthritis Management of the Knee

Charla B. Johnson

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.

Shared decision making (SDM) is a key component of patient-centered healthcare. It 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. The mainstay of knee osteoarthritis (OA) management is total knee arthroplasty for severe disease. The goal for patients with mild to moderate disease is effective nonoperative management to prevent or delay disease progression. Provider–patient conversations about treatment options for knee pain related to mild to moderate OA can be influenced by unconscious bias and lead to decisional conflict. Using a personalized SDM tool for OA may decrease musculoskeletal health disparities by providing the patient with an illustration of a future state of likely pain, activity levels, and lost productivity as a result of treatment adherence. Understanding the patient's values and preferences as well as the social determinants impacting the patient's ability to adhere to treatment options is key to SDM and patient-centered outcomes. The purpose of this article is to bring awareness to the SDM tools available for OA and the nurse's role across settings.

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).

Charla B. Johnson, DNP, RN-BC, ONC, Franciscan Missionaries of Our Lady Health System, Baton Rouge, LA; and Movement is Life™ Executive Steering Committee, Warsaw, Indiana.

The author has disclosed no conflicts of interest.

Correspondence: Charla B. Johnson, DNP, RN-BC, ONC (Charla.johnson@fmolhs.org).

DOI: 10.1097/NOR.0000000000000739

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/m^2. 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 well-being 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]

	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 preference 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, therapist, 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).

Table 2. Treatment Pathway For OA[a]

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.
[a]*Movement is Life* Shared Decision-Making Tool User Guide.

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 payor, 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).

The MILSDM tool projects the patients' future state based on the input data and the treatment choices selected. The progression of knee OA left untreated is demonstrated in a visual handout to show the impact on the patients' level of pain, their ability to perform activities of daily living, and assumed financial burden. The financial burden involves measuring the impact of disability, unemployment, and out-of-pocket cost of healthcare, nonmedical needs, and loss of potential earnings (Centers for Disease Control and Prevention, 2020; Dolan et al., 2013; Fernandes et al., 2013). The patients can see the outcomes associated with the selected treatment options and the cost of doing nothing to their health-related quality of life. The tool provides the patient with information illustrating the impact of lifestyle management as an option to choose. This information can emotionally connect them to the desired behavior change of increased physical activity and weight loss if appropriate. Shared decision making encourages and empowers the patient to think about the pros and cons associated with each treatment option, including no treatment (Hashim, 2017).

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://appsmovementislifecaucus.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.

References

AHRQ. (2016a). *The SHARE approach: A model for shared decision making*. https://www.ahrq.gov/sites/default/files/publications/files/share-approach_factsheet.pdf

AHRQ. (2016b). *Treatment of osteoarthritis of the knee: An update*. https://effectivehealthcare.ahrq.gov/products/osteoarthritis-knee-update/research-protocol

AHRQ. (2017). *Advances in patient safety and medical liability*. https://www.ahrq.gov/sites/default/files/publications/files/advances-complete_3.pdf

Ali, S., Walsh, K., & Kloseck, M. (2018). Patient perspectives on improving osteoarthritis management in urban and rural communities. *Journal of Pain Research*, *11*, 417–425. https://doi.org/10.2147/JPR.S150578

Alshami, A. (2014). Knee osteoarthritis related pain: A narrative review of diagnosis and treatment. *International Journal of Health Sciences*, *8*(1), 85–104. https://doi.org/10.12816/0006075

American Academy of Orthopaedic Surgeons (AAOS). (2013). *Treatment of osteoarthritis of the knee. Evidence-based guideline* (2nd ed.). https://www.aaos.org/globalassets/quality-and-practice-resources/osteoarthritis-of-the-knee/osteoarthritis-of-the-knee-2nd-editiion-clinical-practice-guideline.pdf

Bannuru, R., Osani, M., Vayshot, E., Arden, N., Bennell, K., Bierma-Zeinstra, S. M. A., Kraus, V. B., Lohmander, L. S., Abbott, J. H., Bhandari, M., Blanco, F. J., Espinosa, R., Haugen, I. K., Lin, J., Mandl, L. A., Moilanen, E., Nakamura, N., Snyder-Mackler, L., Trojian, T., … McAlindon, T. E. (2019). OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. *Osteoarthritis Cartilage*, *27*(11), 1578–1589. https://doi.org/10.1016/j.joca.2019.06.011

Bruner, E. (2020). Social determinants of health: The zip code is the most important number on the patient's chart! *Virginia Nurses Today*, *28*(1), 12–13.

Bruyère, O., Cooper, C., Pelletier, J., Branco, J., Luisa Brandi, M., Guillemin, F., Hochberg, M., Kanis, J., Kvien, T., Martel-Pelletier, J., Rizzoli, R., Silverman, S., & Reginster, J. (2014). An algorithm recommendation for the management of knee osteoarthritis in Europe and internationally: A report from a task force of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). *Seminars in Arthritis and Rheumatism*, *44*(3), 253–263. https://doi.org/10.1016/j.semarthrit.2014.05.014

Centers for Disease Control and Prevention (CDC). (2020, February 27). *The cost of arthritis in US adults*. https://www.cdc.gov/arthritis/data_statistics/cost.htm

Centers for Medicare & Medicaid Services. (2019). *Medicare benefit policy manual*. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/bp102c15.pdf

Cicuttini, F., & Wluka, A. (2016). *Not just loading and age: The dynamics of osteoarthritis, obesity, and inflammation*. https://www.mja.com.au/system/files/issues/204_02/10.5694mja15.01069.pdff

Colberg, S. R., Sigal, R. J., Yardley, J. E., Riddell, M. C., Dunstan, D. W., Dempsey, P. C., Horton, E. S., Castorino, K., & Tate, D. F. (2016). Physical activity/exercise and diabetes: A position statement of the American Diabetes Association. *Diabetes Care*, *39*(11), 2065–2079. https://doi.org/10.2337/dc16-1728

DeRogatis, M., Anis, H., Sodhi, N., Ehiorobo, J., Chuhatai, M., Bhave, A., & Mont, M. (2019). Non-operative treatment options for knee osteoarthritis. *Annals of Translational Medicine*, *7*(7), S245. http://dx.doi.org/10.21037/atm.2019.06.68

Dolan, J., Veazie, R., & Russ, A. (2013). Development and initial evaluation of a treatment decision dashboard. *BMC Medical Informatics and Decision Making*, *13*(1), 51. http://dx.doi.org/10.1186/1472-6947-13-51

Dong, R., Wu, Y., Xu, S., Zhang, L., Ying, J., Jin, H., Wang, P., Xiao, L., & Tong, P. (2018). Is aquatic exercise more effective than land-based exercise for knee osteoarthritis? *Medicine*, 97(52), e13823. https://doi.org/10.1097/MD.0000000000013823

Duclos, M. (2016). Osteoarthritis, obesity, and type 2 diabetes: The weight of waist circumference. *Annals of Physical and Rehabilitation Medicine*, *59*(3), 157–160. https://doi.org/10.1016/j.rehab.2016.04.002

Elwyn, G., Dehlendorf, C., Epstein, R., Marrin, K., White, J., & Frosch, D. (2014). Shared decision making and motivational interviewing: Achieving patient-centered care across the spectrum of health care problems. *Annals of Family Medicine*, *12*(3), 270–275. https://doi.org/10.1370/afm.1615

Fernandes, L., Hagen, K., Bijlsma, J., Andreassen, O., Christensen, P., Conaghan, P. G., Doherty, M., Geenen, R., Hammond, A., Kjeken, I., Lohmander, L. S., Lund, H., Mallen, C. D., Nava, T., Oliver, S., Pavelka, K., Pitsillidou, I., da Silva, J. A., de la Torre, J., … Vliet Vlieland, T. P.; European League Against Rheumatism (EULAR). (2013). EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis. *Annals of the Rheumatic Diseases*, *72*(7), 1125–1135. https://doi.org/10.1136/annrheumdis-2012-202745

FitzGerald, C., & Hurst, S. (2017). Implicit bias in healthcare professionals: A systematic review. *BMC Medical Ethics*, *18*(1), 19. https://doi.org/10.1186/s12910-017-0179-8

Flego, A., Dowsey, M. M., Choong, P., & Moodie, M. (2016). Addressing obesity in the management of knee and hip osteoarthritis—weighing in from an economic perspective. *BMC Musculoskelet Disord*, *17*, 233. https://doi.org/10.1186/s12891-016-1087-7

Gaskin, D., Karmarkar, T., Maurer, A., Bucay-Harari, L., Castillas, G., Gittens, A., Jones, L., Thorpe, R., Tolbert, E., & Wood, J. (2019). The potential role of cost and quality of life in treatment decision for arthritis-related knee pain in African American and Latina women. *Arthritis Care & Research (Hoboken)*, *72*(5), 692–698. https://doi.org/10.01002/acr.23903

Hashim, M. (2017). Patient-centered communication: Basic skills. *American Family Physician*, *95*(1), 29–34.

Jones, I., Togashi, R., Wilson, M., Heckmann, N., & Vangsness, C. Jr. (2019). Intra-articular treatment options for knee osteoarthritis. *Nature Reviews Rheumatology*, *15*(2), 77–90. https://doi.org/10.1038/s41584-018-0123-4

Karmarkar, T., Maurer, A., Parks, M., Mason, T., Bejinez-Eastman, A., Harrington, M., Morgan, R., O'Connor, M., Wood, J., & Gaskin, D. (2017). A fresh perspective on a familiar problem: Examining disparities in knee osteoarthritis using a Markov Model. *Medical Care*, *55*(12), 993–1000. https://doi.org/10.1097/MLR.0000000000000816

Kolasinski, S., Neogi, T., Hochberg, M., Oatis, C., Guyatt, G., Block, J., Callahan, L., Copenaver, C., Dodge, C., Felson, D., Gellar, K., Harvey, W. F., Hawker, G., Herzig, E., Kwoh, C. K., Nelson, A. E., Samuels, J., Scanzello, C., White, D., … Reston, J. (2020). 2019 American college of rheumatology/arthritis foundation guideline for the management of osteoarthritis of the hand, hip, and knee. *Arthritis Care & Research (Hoboken)*, *72*(2), 149–162.

Marcelin, J., Siraj, D., Victor, R., Kotadia, S., & Maldonado, Y. (2019). The impact of unconscious bias in healthcare: How to recognize and mitigate it. *The Journal of Infectious Diseases*, *222*(220 Suppl. 2), S62–S73. https://doi.org/10.1093/infdis/jiz214

Messier, S., Mihalko, S., Legault, C., Miller, G., Nicklas, B., DeVita, P., Beavers, D. P., Hunter, D. J., Lyles, M. F., Eckstein, F., Williamson, J. D., Carr, J. J., Guermazi, A., & Loeser, R. F. (2013). Effects of intensive diet and exercise on knee joint loads, inflammation, and clinical outcomes among overweight and obese adults with knee osteoarthritis: The IDEA randomized clinical trial. *Journal of American Medicine Association*, *310*(12), 1263–1273. https://doi.org/10.1001/jama.2013.277669

Mincer, S., Lee, M., Bransford, R., Adeogba, S., & Posner, K. (2017). Implementing shared decision-making: Barriers and solution—An orthopedic case study. In J. Battles, I. Azam, K. Reback, et al. (Eds.), *Advances in patient safety and medical liability* [Internet]. Agency for Healthcare Research and Quality. https://www.ncbi.nlm.nih.gov/books/NBK508083/

Müller, M., Braun, W., Enderle, J., & Bosy-Westphal, A. (2016). Beyond BMI: Conceptual issues related to overweight and obese patients. *Obesity Facts*, *9*(3), 193–205. https://doi.org/10.1159/000445380

National Center for Interprofessional Practice and Education. (2015, April 15). *Pickers Institute's eight principles of patient-centered care*. https://nexusipe.org/informing/resource-center/picker-institute%E2%80%99s-eight-principles-patient-centered-care

National Quality Forum. (2010). *Safe practices for better healthcare-2010 update*. https://www.qualityforum.org/Publications/2010/04/Safe_Practices_for_Better_Healthcare_%E2%80%93_2010_Update.aspx

National Quality Forum. (2017). *Shared decision making: A standard of care for all patients*. http://www.qualityforum.org/Publications/2017/10/NQP_Shared_Decision_Making_Action_Brief.aspx

Pellegrini, C., Ledford, G., Chang, R., & Cameron, K. (2018). Understanding barriers and facilitators to healthy eating and physical activity from patients either before and after knee arthroplasty. *Disability and Rehabilitation*, *40*(17), 2004–2010. https://doi.org/10.1080/09638288.2017.1323026

Reims, K., & Ernst, D. (2016). Using motivational interviewing to promote healthy weight. *Family Practice Management*, *23*(5), 32–38.

Ruben, M., Blanch-Hartigan, D., & Hall, J. (2020). Patients in treatment. In *The Wiley Blackwell handbook of treatment engagement: Theory, research and clinical practice* (p. 274). Wiley Blackwell.

Sinaiko, A., Szumigalski, K., Eastman, D., & Chien, A. (2019). *Delivery of patient centered care in the U.S. health care system: What is standing in its way?* Academy Health. https://www.academyhealth.org/sites/default/files/deliverypatientcenteredcare_august2019.pdf

Skelly, C., Hall, C., & Risher, C. (2020). Shared decision making and patient-centered care. *American Nurse Journal*, *15*(2), 45–47.

Smith, M. (2016). The role of shared decision making in patient-centered care and orthopaedics. *Orthopaedic Nursing*, *35*(3), 144-149. https://doi.org/10.1097/NOR.0000000000000243

Spatz, E., Krumholz, H., & Moulton, B. (2016). The new era of informed consent: Getting to a reasonable-patient standard through shared decision making. *Journal of American Medicine Association*, *315*(19), 2063–2064. https://doi.org/10.1001/jama.2016.3070

United States Bone and Joint Initiative (USBJI). (2020). *The burden of musculoskeletal diseases in the United States (BMUS)*. (4th ed). http://www.boneandjointburden.org

World Health Organization [WHO]. (2013). *Obesity and overweight fact sheet no. 311 updated March 2013*. World Health Organization.

Yahanda, A., & Mozersky, J. (2020). What's the role of time in shared decision making? *American Medical Association Journal of Ethics*, *22*(5), E416–E422. https://doi.org/10.1001/amajethics.2020.416

For additional nursing continuing professional development activities on orthopaedic nursing topics, go to nursingcenter.com/ce.