EXECUTIVE SUMMARY

The State of the Science in the Prevention and Management of Osteoarthritis

Experts Recommend Ways to Increase Nurses' Awareness and Knowledge of Osteoarthritis

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Overview: In July 2011 a symposium on osteoarthritis convened experts in many areas—nursing, epidemiology, rheumatology, public policy, geriatrics, pharmacotherapy, physical therapy, and complementary modalities—to discuss the importance of nurses in reducing the disability caused by osteoarthritis. The planning committee included representatives from *AJN*, the National Association of Orthopaedic Nurses, and the Hospital for Special Surgery. Symposium attendees recommended ways in which nurses could take on greater leadership roles in research, policy, education, and clinical practice for the early diagnosis and management of this prevalent condition.

The Centers for Disease Control and Prevention (CDC) reported in 2006 that arthritis affects 46 million adults in the United States and is our nation's most common cause of disability.¹ While there are more than 100 different forms of arthritis, rheumatoid arthritis and osteoarthritis (OA) are the two most common forms that affect adults. Rheumatoid arthritis is an autoimmune

disease resulting in inflammation of the joints, which leads to pain and destruction of joints and organs. OA is characterized by a breakdown of cartilage, the cushion between the ends of bones, and can also damage ligaments, menisci, and muscles.

OA is the most common form of arthritis; it represents an enormous public health burden in terms of health care costs, disability, lost earnings, and reduced quality of life. In 2005 the National Arthritis Data Workgroup estimated that 27 million U.S. adults—more than 10% of the adult population—had OA,² and it has also been estimated that by 2030, 67 million U.S. adults will have arthritis.³ In 2009 almost 1 million people were hospitalized for OA; it is also the main underlying cause of joint replacement, for which the 2009 costs were \$42.3 billion.⁴ In 2003 arthritis and other rheumatoid conditions resulted in \$128 billion in total medical costs and lost earnings.⁵

In 2010 the CDC and the Arthritis Foundation published *A National Public Health Agenda for Osteoarthritis* (www.cdc.gov/arthritis/docs/oaagenda.pdf), a major call to action. It lays out how successfully employing novel approaches to the prevention, early detection, and treatment of OA can affect the financial, societal, and personal burden of this chronic disease. Though this groundbreaking report placed a spotlight on many clinical and advocacy groups, the largest group of health care providers—nurses—was notably absent. Nurses have ranked at the top of Gallup's annual "honesty and ethical standards" poll for many years,⁶ and as educators nurses can have great influence on public perceptions of disease processes and care. In the primary care setting, studies have shown, nurses' assessment and coordination of care, as well as their education of patients about disease processes and prevention of complications, are invaluable.^{7–9}

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Symposium planning committee, left to right: Maureen Shawn Kennedy, Patricia Quinlan, Marjorie G. Kulesa, Laura Robbins, Basia Belza, and Elizabeth Schlenk. Photo courtesy of the Hospital for Special Surgery.

Although articles about OA have been published in nursing journals, we question whether nurses are missing opportunities to teach patients about screening, prevention, complementary therapies, and pain management, perhaps because of the misperception that OA is part of the aging process and less important to treat than diabetes or cardiovascular disease.

This question led us to other questions. Are enough nurses being trained in OA management? Are assessment tools for monitoring both disease progression and complications widely available in all primary and acute care settings, physicians' offices, clinics, and community health care centers? Do assessment and monitoring tools pay adequate attention to patients' level of health literacy, language, age, gender, race, culture, ethnicity, and socioeconomic factors?

To answer these questions and determine the level of awareness and knowledge of OA among nurses, *AJN*, the Hospital for Special Surgery, and the National Association of Orthopaedic Nurses developed a collaborative project—the State of the Science in the Prevention and Management of Osteoarthritis. The objectives were to

- identify gaps in the science and barriers to the early identification of OA and the implementation of interventions that promote mobility, decrease pain, and slow progression.
- describe the state of the science of current interventions for preventing immobility and managing the effects of OA.
- achieve consensus on the priorities for developing the best nursing practices—in the clinical, educational, research, and policy arenas—in order to meet the needs of diverse populations with OA in a variety of settings.
- disseminate the analysis and recommendations to clinicians, nurse leaders, educators, researchers, specialty nursing organizations, other health care professionals, policymakers, consumer advocacy groups, and the general public.

The Symposium

The collaborators convened a symposium at the Hospital for Special Surgery in New York City in July 2011. The symposium brought together more than 40 leaders in nursing, physical therapy, medicine, complementary and alternative medicine, public health, pharmaceutical research, and others. All were practicing, teaching, and/or conducting research related to OA or were involved in OA advocacy initiatives. Organizations represented included the American Academy of Nurse Practitioners, the American Society for Pain Management Nursing, the Arthritis Foundation, the Association of Rehabilitation Nurses, the Association of Rheumatology Health Professionals, the CDC, the Rheumatology Nurses Society, and the U.S. Bone and Joint Initiative. Partial funding for the symposium was provided by the Division of Education and Academic Affairs at the Hospital for Special Surgery. Unrestricted educational grants were also received from Genzyme and Zimmer.

The program started with participants hearing from a person living with OA, Kathy Geller. Her description of this debilitating disease and its treatments set the stage for the conference. Speakers then presented highlights of their papers on the current knowledge of OA, national initiatives, the nurse's role in assessing risk and progression, interventions to relieve symptoms and minimize progression and disability, and strategies for promoting self-management. Each presentation was followed by a question-and-answer period. A panel of three orthopedic nurses identified issues that typically arise when caring for adult patients with OA.

Presentations were followed by small-group discussion and identification by consensus of the top barriers and strategies. The groups identified strategies for addressing both barriers to early assessment and treatment and barriers in practice, education, and policy that prevent the implementation of best practices, as well as future research priorities. The small groups then presented their ideas to the entire group so that consensus could be achieved (see Tables 1, 2, and 3).

Main Themes

Theme 1: What we know about the burden of OA. The disability caused by OA results in enormous costs in lost earnings and care and hospitalization (many for joint replacement). Each year nearly 1 million years of human potential are lost because of OA disability. Comorbidities, which increase these burdens, are significant, and research shows that those with OA are more likely to develop metabolic syndrome; diabetes; and cardiovascular disease risk factors.^{10, 11}

OA causes changes in joint structure, including osteophyte formation and joint capsule thickening, that lead to stiffness, aching, and pain. Pain increases with age and is greater among African Americans and women.¹² Primary risk factors include genetic propensity, female sex, and older age; obesity, injury, and occupations that produce repetitive stress are the three greatest secondary risk factors.

Table 1 Top Barriers to and Strategies for Improving Early Assessment and Treatment of OA

Attendees in several small groups were asked to discuss what prevents people with OA from getting early treatment and what can be done to change that. Their responses are listed in descending order according to the number of votes each received.

Barrier 1. Nurses and other primary health care providers lack knowledge and have inaccurate or inappropriate beliefs about OA and its burden.

Strategies:

- Develop content about OA in multiple formats (print, online, self-learning modules) and disseminate it to undergraduate and graduate nursing and continuing education programs.
- Increase knowledge sharing among health care professionals (including nurses, medical and surgical practitioners, and physical therapy providers) by developing joint education programs, clinical trainings, and research and treatment guidelines.
- Reach out to schools of nursing, university accreditation agencies, and professional associations to include OA and the impact of OA on other health conditions in their curricula.

Barrier 2. OA treatment generally is not considered a priority by patients or providers because other comorbid conditions, such as diabetes or heart disease, are of higher priority.

Strategies:

- Nurses should encourage patients to inform their primary care providers of their OA symptoms and the impact pain and stiffness have on their mobility and activities of daily living.
- Increase nurses' awareness of and access to patient education materials about OA.
- Promote the use of an electronic medical record that includes cues to assess for OA to facilitate early diagnosis.
- Increase both patients' and providers' knowledge about the disease and the need for early intervention.
- Promote the use of an OA screening tool in routine health assessments.

Barrier 3. There are too few evidence-based assessment tools for monitoring and tracking OA progression.

Strategies:

- Develop and disseminate a practical, sensitive, evidence-based, OA-specific assessment tool for use in a clinical setting.
- Make these tools available to all primary and acute care facilities, provider offices, clinics, and community settings.

Barrier 4. There is a lack of coordinated, integrated, multidisciplinary care planning and delivery at all levels.

Strategies:

- Make use of an OA nurse educator or navigator (similar to a certified diabetes or asthma educator) to assess, educate, and monitor patients, troubleshoot problems, and coordinate care.
- Implement care coordination systems (such as the chronic disease model or medical home model) to facilitate ongoing management and follow-up.
- Increase the understanding of interprofessional roles to enable multidisciplinary care that results in the right provider offering the right intervention at the right time.
- Increase collaboration among the professions (the nursing, medical and surgical, and physical therapy disciplines, for example) to promote an interdisciplinary, coordinated approach to OA care.

Barrier 5. Uninformed beliefs and attitudes, such as that OA is an inevitable part of aging and no treatment for it exists, are prevalent among the public.

Strategies:

- Create public service announcements and advertisements to correct misconceptions (for example, that OA is the same as rheumatoid arthritis).
- Develop a community-outreach tool kit for nurses.
- Share patients' "disease journeys."

Barrier 6. Many people with OA lack access to care because of inadequate insurance, distrust of the health care system, unavailability of local care, environmental barriers (lack of transportation), and other external factors.

Strategies:

- Engage community leaders and partner with others—the Y, local hospitals, churches, food pantries—to set up community screenings.
- Provide reimbursement for chronic disease management (for example, using the medical home model, which provides coordinated care and patient education) that includes maintenance care and episodic care.
- Address providers' biases based on race, culture, ethnicity, age, or gender that can result in inappropriate or absent referrals.
- Involve patients in designing realistic, achievable treatment plans that take place within the patients' environment and use available resources.
- Develop Web-based patient education programs to promote self-care, especially in rural areas where access to providers and programs may be limited.
- Educate primary care providers about existing OA education programs in the community and on the Web and using smartphone technology.

Barrier 7. There is a lack of emphasis on health promotion.**Strategies:**

- Engage community leaders to undertake outreach and education efforts.
- Forge partnerships with established groups—the Y, local hospitals, churches, food pantries—for community screenings.

Barrier 8. There is a lack of access to safe physical activity programs.**Strategies:**

- Develop a Web site with state-by-state and local directories of programs.
- Increase dissemination of evidence-based programs to health care providers and to hospital and other wellness programs (such as those at senior centers or the Y) and of self-management programs to patients.
- Prepare evidence-based “return on investment” arguments supporting exercise programs to present to third-party payers, funding agencies, legislators, and primary care providers who may be in a position to implement or sponsor such programs.

Barrier 9. There is a lack of knowledge among patients about OA and the importance of early intervention.**Strategies:**

- Provide information and tools that improve provider–patient interaction concerning OA and treatment options.
- Develop and distribute multimodal, multilingual, and culturally appropriate educational materials and self-management tools at multiple literacy levels.
- Develop and provide patient education resources to health care providers and to providers of community wellness programs.
- Create public service announcements and advertisements to correct misconceptions.
- Develop peer-support programs (similar, for example, to the Reach to Recovery breast cancer programs).

Barrier 10. The nurse’s role in OA care management is unclear.**Strategies:**

- Develop a position paper on the role of the nurse in prevention and management of OA.
- Increase OA education and early-screening messages for community-based RNs.
- Increase nursing’s participation in public education and OA screening.

Theme 2: OA national initiatives can help raise awareness.

In the past 35 years the public health and policy activities of the Arthritis Foundation (www.arthritis.org) and its collaborators have centered on the 1975 National Arthritis Act, the National Arthritis Action Plan, the 2003 arthritis-related Health Plan Employer Data and Information Set, the creation in 2010 of the National Public Health Agenda for OA, data from an evidence-based knee osteoarthritis risk assessment questionnaire for the public, increasing funding for a Department of Defense research program on OA, and the OA Action Alliance in 2011. In 2000, the U.S. Bone and Joint Decade was launched with the aim of drawing attention to the burden of musculoskeletal disease. It was designed as a collaborative effort among the public, patients, and organizations to improve bone and joint health by gathering and assessing data, encouraging good musculoskeletal care, establishing interdisciplinary education programs, and increasing awareness and advocacy. In order to extend this important work past the decade, in 2010 it became the U.S. Bone and Joint Initiative (www.usbjd.org).

Other groups that have developed initiatives are the CDC, the American College of Rheumatology (ACR), and the National Committee for Quality Assurance. This increased attention to the burdens of OA represents a movement, one that has been sparked by such coalitions’ policymakers and public health advocates.

Theme 3: We can assess for risk and progression of OA.

The ACR and other groups have developed criteria for the radiologic diagnosis of OA,¹³ but X-ray findings and clinical

symptoms don’t always correlate. Although magnetic resonance imaging and computed tomography may be better at showing cartilage and bony changes, criteria for diagnosis using these methods have not been established. The presence of radiographically verifiable OA increases with age in all joints.

A number of screening tools have been developed for OA, one of which is the evidence-based Risk Assessment Tool for those with knee pain (available at www.fightarthritispain.org). The primary goal is to identify those at risk in order to prevent disease onset, and the secondary aim is to prevent progression. If the degree of risk is determined to be high, the person can choose to have a comprehensive evaluation early in the disease process in order to learn how to prevent OA or slow disease progression.

Theme 4: There are interventions that relieve symptoms and minimize disease progression. A variety of approaches can be taken to manage OA.

Rehabilitation interventions aim to decrease pain and disability and improve function. They include exercise, physical techniques (such as applying heat, ice, and ultrasonography), manual mobilization and manipulation, assistive devices, gait training, and self-management education. Most of the primary professional orthopedic groups have publicly recognized the value of exercise and rehabilitation, and many of them have issued rehabilitation guidelines (for example, the ACR).¹⁴ Studies evaluating rehabilitation (summarized in two recent Cochrane reviews^{15, 16}) have focused mainly on land-based exercise for knee OA and have shown small to moderate benefits for pain and function.

Table 2 Strategies to Overcome the Top Practice, Education, and Policy Barriers to Implementing Best OA Practices**PRACTICE BARRIERS****Barrier 1. Late presentation at time of diagnosis, resulting in treatment initiation after significant disease progression****Strategies:**

- Develop a widespread public health marketing campaign to raise awareness of OA (for example, secure a celebrity spokesperson, produce multimedia public service ads) and to encourage people to seek treatment at the first symptoms.
- Provide educational materials for all health care providers about early recognition and intervention.

Barrier 2. Lack of consensus on the best practices for managing OA**Strategies:**

- Conduct interdisciplinary research, including clinical trials of interventions, meta-analyses, and systematic reviews of the literature, to help define best practices, treatment guidelines, and protocols.
- Hold summits and focus groups to gain consensus on best practices for weight management, exercise dosing, injury prevention (for example, physical education in schools), and pain management (pharmacologic and nonpharmacologic interventions).

Barrier 3. Lack of provider time to address OA during patient interactions because other comorbidities (diabetes, heart disease) take precedence**Strategies:**

- Use telephone contact or other telehealth and e-technology methods to screen patients before office visits to get information about history, symptoms, and success or problems in adhering to treatment plan.
- Conduct group patient education sessions in provider offices.

Barrier 4. Lack of a holistic approach to patient care**Strategies:**

- Include nurse navigators or chronic disease navigators in health care teams to facilitate collaboration and coordination among providers for comprehensive care and follow-up.
- Collaborate with pain management experts to identify holistic pain management practices and work with organizations to disseminate them to providers and patients.
- Make wellness the incentive instead of symptom management; work with patients, insurance companies, and health benefits companies to emphasize and incentivize wellness activities.

Barrier 5. Lack of patient education materials in the practice setting limits the promotion of prevention and self-management practices**Strategies:**

- Develop culturally appropriate materials at all levels of health literacy, in many languages, and for diverse patient groups (including gender, ethnicity).
- Develop more visual or audio tools as alternatives to written teaching tools, including interactive technologies and Web-based programs.
- Promote prevention at the elementary education level (in pediatric offices) to imprint good health habits early in life.

EDUCATION BARRIERS**Barrier 1. Lack of knowledge among nurse faculty and clinicians about OA best practices****Strategies:**

- Incorporate the curriculum from the U.S. Bone and Joint Initiative into nursing education programs.
- Reach out to nursing faculty organizations about the need to include content on OA in the discussion of chronic disease management and the interaction between OA and other chronic conditions.
- Encourage the development of OA specialty certification in nursing.
- Collaborate with other disciplines to develop a core curriculum for OA and employ a “train the trainer” model such as the one used in the End-of-Life Nursing Education Consortium curriculum.

Barrier 2. Lack of knowledge on how to promote disease self-management**Strategies:**

- Identify competencies and skills nurses need to support patient self-management.
- Incorporate into OA education the American Association of Colleges of Nursing’s patient self-management theory and competencies specific to chronic diseases.

Barrier 3. Lack of funding for educational programs on OA**Strategies:**

- “Piggyback” OA education programs onto other continuing education programs.
- Engage OA community stakeholders, private foundations, and academic institutions to support education.

Barrier 4. Lack of knowledge about evidence-based practice in general

Strategies:

- Encourage partnerships between academic institutions and health care organizations and other entities to teach RNs about evidence-based practice.
- Include content on evidence-based practice in undergraduate nursing education programs.
- Develop and disseminate continuing education programs on evidence-based practice to nurses.

POLICY BARRIERS

Barrier 1. Too few nurses in many point-of-care settings

Strategies:

- Convince policymakers to recognize nurses' value in various care settings and include them in new models of care such as medical homes.
- Share quality indicators (time, cost, patient satisfaction) on when nurses manage chronic disease with health care providers, health system management teams, and third-party payers.
- Increase salaries of outpatient and primary care nurses to attract qualified and experienced nurses, especially in rural areas.
- Secure financial assistance for scholarships to increase the potential for a culturally diverse workforce.

Barrier 2. No reimbursement for OA chronic disease model

Strategy:

- Start an interdisciplinary grassroots effort to develop a chronic disease model for OA.

Barrier 3. Lack of financing for nursing intervention and nurse-managed care

Strategies:

- Allow billing and reimbursement for patient education, prevention modalities, and nurse-led models of OA care.
- Lobby for adequate reimbursement fee schedules for delivery of care.
- Support activities by nursing organizations to lobby Washington legislators for finance reform that will include reimbursement for nursing services and encourage local, grassroots outreach to representatives.

Barrier 4. Limited health care access because of patients' inadequate financial resources or health insurance or a lack of providers

Strategies:

- Support health care reforms that increase access to primary care services.
- Support funding to create and provide OA education for health care providers.

Barrier 5. Lack of commitment by health care leadership to consider OA a priority for care

Strategies:

- Develop a strong voice in the OA Action Alliance and the U.S. Bone and Joint Initiative.
- Complete a cost-benefit study on nursing prevention and management of OA to get the attention of health care leaders.

Table 3 Research Priorities

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- Does increased education in OA change the way nurses care for people with OA?
 - Does improving nurses' knowledge and understanding of OA improve patient outcomes?
 - Does changing the roles of nurses lower the cost of health care for patients with OA?
 - How does body image influence willingness to engage in weight reduction by people with OA?
 - In the outpatient setting, what is the difference in patient outcomes (pain, mobility, satisfaction with care) when a nurse provides patient education?
 - What is the effect of a nurse-managed and nurse-delivered education program on selected outcomes for patients with OA?
 - What is being taught about OA and musculoskeletal disease in undergraduate and graduate curricula at accredited nursing schools?
 - Does the use of the U.S. Bone and Joint Initiative curriculum have an effect on the nurse's role as it relates to OA?
 - How effective is a culturally specific, multidisciplinary patient-education tool kit in helping patients with self-management and adhering to treatment?
 - What is the cost-effectiveness and impact of a nurse-navigator model on clinical outcomes for people with OA?
 - What are the primary concerns and preferences about self-care held by people with OA?
 - For a descriptive study: who is receiving care, how effective are the treatments, and what are the adverse effects?
 - What are age-appropriate, evidence-based pain management strategies for people with OA?
 - What are the effective strategies for managing pain in patients with OA who also have comorbidities that restrict the use of nonsteroidal antiinflammatory drugs?
 - What is the most reliable and valid tool for assessing OA in all settings?

- What pharmacologic and nonpharmacologic interventions are effective for older adults of diverse races and ethnicities who have OA and comorbid conditions?
- What are the most effective evidence-based exercise therapies for the prevention and management of OA?
- What is the role of depression in patients with OA?
- What are the effects of opioid analgesics on activities of daily living in older adults with OA?
- What are the effects of adaptive devices, such as orthotics, in promoting activity and mobility in adults with OA?
- What prevents patients from engaging in OA treatment and how can nurses overcome those barriers?
- How can nurses more effectively deliver cognitive and behavioral therapies to improve outcomes in patients with OA?

A Cochrane analysis of six short-term studies of moderate or low quality found that aquatic exercise provided small to moderate improvements in function and only minor pain relief.¹⁷ Physical modalities are numerous and include thermotherapy, electrotherapy, light therapy, and pressure. Another analysis of three moderate-to-low-quality randomized clinical trials involving a total of 179 patients with knee OA showed that thermotherapy (heat or cold) improved range of motion, knee muscle strength, and function.¹⁸ Cold did not seem to affect pain but did reduce swelling.

Further study is needed on the appropriate dose of exercise, as are rigorous, longer-term studies on other interventions.

Pharmacologic agents are a primary form of treatment for OA because there are no approved disease-modifying therapies. Nonpharmacologic methods—patient education, weight loss, exercise, and physical therapy—are underused.¹⁴ Pain is the most often cited disability-causing symptom among women in later life and can be so severe that it threatens cognition, mobility, and independence.¹⁹

Only a few studies have attempted to explore pain management in OA in different populations (grouped by race, culture, ethnicity, age, or gender). Most of the pharmacologic agents have been shown to decrease pain mildly to moderately, with relief being moderate for acetaminophen and better for opioids and hyaluronan. Oral acetaminophen (used with caution) and topical agents have the best safety profiles. Adverse effects can be serious and include hepatotoxicity caused by acetaminophen overdose and the gastrointestinal, renal, or cardiovascular toxicity caused by nonsteroidal antiinflammatory drugs. Opioids are associated with serious adverse events and are usually used as a last resort.

Complementary and alternative medicine (CAM) is often used by patients to relieve symptoms and by many others to prevent OA. Traditional Chinese medicine and Ayurveda have been used for centuries, and thousands of other therapies and products are available. The National Center for Complementary and Alternative Medicine, part of the National Institutes of Health, has described CAM therapies at <http://nccam.nih.gov/health/whatisacam>. Unfortunately, because of limited funding (most CAM agents are not patentable), few large randomized, controlled trials have been conducted. However, numerous smaller trials have indicated that some CAM therapies are useful, particularly yoga, t'ai chi ch'uan, acupuncture, glucosamine sulfate supplementation, and others.

Middle-aged, well-educated white women as well as those with chronic illness and troublesome symptoms use

CAM the most,²⁰ and patients with all types of arthritis (data for OA alone are not available) use CAM significantly more than others do.²¹ Estimates of use by arthritis patients range from 59% to 90%.²²

Theme 5: Self-management support is an important aspect of OA treatment. In this era of health care reform, more attention is being focused on the self-management of OA, and it is one of the four goals of the U.S. Department of Health and Human Services' strategic framework for dealing with chronic conditions.²³ The ACR's OA guideline identifies self-management education, physical activity, and weight loss as key management strategies.¹⁴ There is consensus on what specific self-management activities patients should undertake, but less agreement on how health care professionals and others can support these activities. Nurses in particular have a role to play in education as well as support, including referral, progress assessment, goal setting, and problem solving.²⁴

Behavior-changing and skill-building interventions work toward exercise performance and weight loss. Physical activity interventions can be delivered in a number of ways—in the home or in health care, community, or workplace settings. No single format has been found to be superior, but programs of longer duration (12 or more supervised sessions) give better results.¹⁵ A recent meta-analysis of exercise delivered in a community setting found clinically significant improvements in pain and function.²⁵ There are few weight loss programs targeted specifically at OA.

Ideally, the provider should recommend educational or behavioral-change programs: arthritis patients whose physicians recommended a program were 18 times more likely to attend.²⁶ Practitioners should be trained to build collaborative relationships with their patients in order to best support them. Other needed system changes include group health care visits and links to community services.

Nurses are in a unique position to inform and support their patients' self-management, and there are many strategies that can help them better encourage it. Multimodal, multilingual, and racially and culturally appropriate patient education materials can be developed at multiple literacy levels, as can online programs, especially for use in rural areas. Peer-to-peer support programs can be developed for patients and summits can be held to gain consensus on the best weight management

practices. Patient and community tool kits can be developed, and community leaders can be encouraged to participate in OA education.

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