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A public health approach to osteoarthritis in the United States

Kirsten R. Ambrose*,

Osteoarthritis Action Alliance, Thurston Arthritis Research Center, School of Medicine, University of North Carolina, Chapel Hill, NC, USA

Katie F. Huffman,

Osteoarthritis Action Alliance, Thurston Arthritis Research Center, School of Medicine, University of North Carolina, Chapel Hill, NC, USA

Erica L. Odom,

Division of Population Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

Anika L. Foster,

Division of Population Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

Nick Turkas,

Arthritis Foundation, Atlanta, GA, USA

Leigh F. Callahan

Osteoarthritis Action Alliance, Thurston Arthritis Research Center, School of Medicine, University of North Carolina, Chapel Hill, NC, USA

A National Public Health Agenda for Osteoarthritis: 2020 Update (OA Agenda) states, “We envision a nation in which adults with osteoarthritis (OA) are able to live full lives with less pain, stiffness, and disability; greater mobility; and preserved function and independence.”¹ OA affects more than 528 million or 7% of people worldwide, and 32.5 million or 1 in 7 adults in the United States (US).^{1,2} Countries with established market economies, older adult populations, and populations with high rates of obesity may have higher prevalence.²

Individuals with OA experience substantial pain and disability, which reduces the quality of life and leads to enormous economic costs.² The *OA Agenda* aims to increase awareness about OA in the US, and defines strategies for prevention and management through overarching objectives focused on the following: 1) expanding evidence-based interventions; 2) supportive policies and communication initiatives; and 3) research, evaluation, and surveillance to better understand OA burden and risk factors, identify interventions, and improve outcomes (Fig. 1).¹

*Correspondence to: Thurston Arthritis Research Center, University of North Carolina, 3300 Thurston Building, CB 7280, Chapel Hill, NC 27599-7280, USA, kambrose@unc.edu (K.R. Ambrose).

Conflicts of interest

The authors have no conflicts of interest to disclose.

These objectives are similar to those put forward years earlier by Osteoarthritis Research Society International (OARSI), which was established to improve global understanding and treatment of OA. When *Osteoarthritis and Cartilage* was founded 30 years ago, it was during a period in the US when arthritis was increasingly being recognized as a significant driver of chronic pain and disability, leading to multiple efforts to improve understanding, awareness, and management.^{3,4} In the years since, progress in elevating this most common form of arthritis has lagged behind other rheumatic conditions, partially due to its specious distinction as an “inevitable” degenerative joint disease.⁵ OARSI continues to lead international efforts to establish OA as a serious, but treatable, disease and improve education and recognition among international healthcare providers and policymakers.⁵ While OA impacts adults worldwide, this commentary serves to highlight ongoing efforts to pursue public health action to mitigate the burden of OA in the US.

The role of public health in the US: A National Public Health Agenda for OA and the OA Action Alliance

The *OA Agenda* was developed in 2010 by the Centers for Disease Control and Prevention (CDC), the Arthritis Foundation, and more than 70 interested stakeholders. It served as a blueprint for the US to address OA burden through proven public health strategies, including physical activity, weight management, injury prevention, and self-management education.⁶ The OA Action Alliance (OAAA) was subsequently created to operationalize the *OA Agenda*. Ten years later, the OAAA led the development of the *OA Agenda: 2020 Update*, which incorporated an iterative and evaluative process to refocus efforts on three key priorities to help reduce OA burden:

- Pursue research to understand OA burden, risk factors, and prevention and intervention strategies.
- Expand and disseminate innovative, evidence-based solutions.
- Establish targeted communications and strategic alliances and partnerships.

These priorities further delineated nine ongoing and new public health strategies for addressing OA, based on accomplishments from the previous decade and an evolving public health, technological, and geopolitical landscape^{1,7} (Fig. 1). The OAAA, CDC, and Arthritis Foundation work collectively and with external partners to address the *OA Agenda's* priorities, evaluate progress, and regularly update the *OA Agenda*. Recent accomplishments and progress toward addressing *OA Agenda* objectives are highlighted in Table I.

Pursue research to better understand OA burden, risk factors, and effective strategies for prevention and intervention

For decades, the CDC has surveilled the growing, aging, and increasingly diverse US population using comprehensive surveys to monitor and track health conditions and outcomes, risk factors, health promotion behaviors, and use of preventive services.^{8,9} These surveys have quantified the rising arthritis prevalence that has tracked the aging US population. Moreover, these findings have highlighted a disproportionate OA burden

among persons from racial/ethnic minority groups and persons who live in rural areas, underscoring the importance of addressing healthcare disparities in OA prevention and management.^{8,9} Population surveillance studies have shown associations between OA and chronic comorbid conditions, such as cardiovascular disease, diabetes, and obesity.¹⁰ Both OA and these chronic conditions benefit from physical activity and weight management. Although these conditions share self-management strategies, OA can make these conditions difficult to manage, highlighting the importance of addressing OA in order to manage these key contributors to mortality.¹⁰

Despite the value of these insights, challenges exist for surveillance systems. Persistent needs to reduce or limit survey lengths and public burden can inadvertently compromise how often and what types of arthritis data are collected. This may signal a need for more comprehensive and routine data collection to effectively monitor trends in arthritis burden and impacts over time (e.g. more states collecting data on arthritis measures and with greater frequency).

Expand and disseminate arthritis-appropriate, evidence-based interventions to address prevention and management

The CDC spearheaded a formal assessment process to identify and recognize proven arthritis management interventions, following successful early efforts to disseminate three community-based interventions. This process was initiated to standardize practices for identifying evidence-based interventions and to increase the number of available programs. It created a threshold of scientific rigor for programs that, today, are recognized as arthritis-appropriate, evidence-based interventions (AAEBIs).¹¹

Several factors have highlighted a burgeoning need to further expand the menu of AAEBIs. These include: 1) access to and engagement with healthcare delivery technology, spurred by the COVID-19 pandemic; 2) elevated attention on social and structural conditions that result in health disparities; and 3) evolving healthcare engagement and information-seeking preferences among adults with arthritis. In 2021, the OAAA became the lead organization to formally evaluate new interventions for AAEBI recognition.¹¹ OAAA hosts a competitive application process for new programs. While most programs are US-developed, AAEBIs now include international programs for evaluation — an opportunity facilitated through partnerships with OARSI researchers. To date, the list of programs has quadrupled to include more content variety, with a majority that can be delivered remotely/virtually and in numerous languages to meet the needs and interests of diverse people with arthritis.¹²

The CDC Arthritis Management and Wellbeing Program provides grant funding to support national organizations, including the OAAA, Arthritis Foundation, National Association of Chronic Disease Directors (NACDD), National Recreation and Park Association, and YMCA of the USA. State-based organizations are also supported, such as departments of health and Area Agencies on Aging.¹³ This funding builds capacity to advance the public health strategies outlined in the *OA Agenda*. While the work of each CDC-funded organization is unique and extensive, all share common interests in promoting arthritis education and self-management behaviors, and expanding delivery of AAEBIs to improve

the quality of life for adults with arthritis. For example, the CDC-funded Arthritis Foundation Helpline provides personalized information and educational resources, including referrals to AAEBIs, via phone, email, and chat.

Establish supportive policies, communication initiatives, and strategic alliances for OA prevention and management

Coordinated communication initiatives ensure that arthritis research, including burden, impact and outcomes data, and public-health recommendations not only reach the intended audiences but also catalyze action. The Arthritis Foundation, CDC, and OAAA actively disseminate health messaging to leverage and extend reach and engagement among organizations, healthcare providers, and people with arthritis. These campaigns address arthritis concerns and barriers, and present the benefits of self-management interventions, such as AAEBIs, in ways that appeal to a variety of users, including via culturally relevant imagery, media formats, and languages. They also build trust through credible, high-quality content. Campaigns garner the greatest interest, including social media that result in exposure to millions of people, when jointly disseminated by multiple organizations during annual health observances such as Arthritis Awareness Month in the US (May) and World Arthritis Day internationally (October 12), and strategically during national and international conference proceedings. Campaigns are also successful when messages are rooted in personal or cultural experience.

Strategic alliances effectively bridge public health action and healthcare policy. Studies have shown that when healthcare providers recommend self-management education or physical activity, individuals with arthritis are more likely to engage with these strategies; however, few receive this counseling.^{14,15} NACDD and OAAA are pursuing objectives to improve healthcare provider referral of adults with OA to AAEBIs and physical activity opportunities within the arthritis continuum of care. Strategic partnerships – with organizations across public health and healthcare at national, state, community, and health-system levels – could help to establish and implement a model of care to increase awareness among healthcare providers about AAEBIs, and to promote physical activity screening, counseling, and referral of patients to programs.

Communication initiatives and strategic alliances support efforts among independent nonprofit and professional organizations, such as the Arthritis Foundation, American College of Rheumatology, OARSI, and key partners in the pharmaceutical industry. These initiatives serve to educate policymakers about the burden of arthritis and the importance of arthritis prevention and control.

Conclusion

Over the last 30 years, advances in scientific discovery, coupled with public health action, have expanded arthritis education and increased access to evidence-based interventions. However, trends in aging, chronic comorbid diseases, and health disparities signal the need to address the toll of arthritis among working-age and older adults and provide equitable opportunities for individuals and communities. Future efforts to increase awareness,

education, and equitable access to proven interventions may build on past successes, strategic partnerships, and collective vision across the US and internationally. The OAAA, CDC, and Arthritis Foundation will continue the work outlined in the *OA Agenda: 2020 Update* in pursuit of a world in which all adults with OA are able to live full lives with less pain.

Acknowledgments

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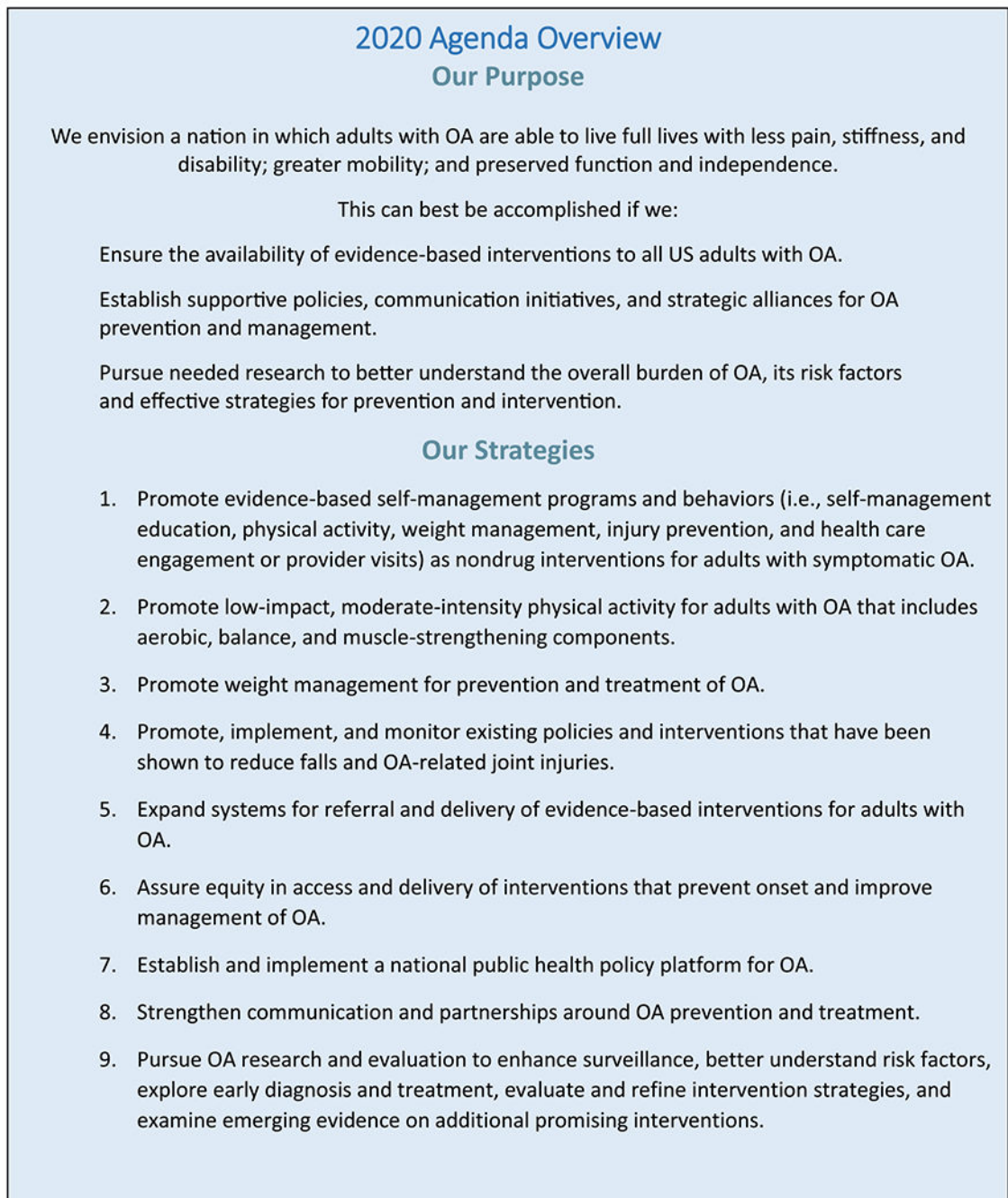


Fig. 1.
OA Agenda: 2020 Update purpose, objectives, and nine public health strategies.

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Accomplishments of the nine strategies outlined in the OA Agenda: 2020 Update.

OA Agenda strategy	Accomplishments
1. Promote evidence-based interventions	<ul style="list-style-type: none"> • AAEBI recognition – 21 interventions (12 physical activity, nine self-management education programs) https://oaaction.unc.edu/aaebi/ and Lifestyle Management Programs for Arthritis CDC • State and national partner expansion of AAEBI access and reach. Using CDC funds, AAEBIs have been offered in all 50 states, the District of Columbia, Puerto Rico, and American Samoa (CDC-Funded Arthritis Programs Reach CDC) • Creation of CDC-funded <i>Arthritis Foundation Helpline</i>, providing personalized referral to AAEBIs
2. Promote low-impact, moderate-intensity physical activity	<ul style="list-style-type: none"> • <i>Walk With Ease/Camine Con Gusto</i> online participant portals; engaging nearly 20 partner organizations (reaching all 50 states and Puerto Rico through the OAAA’s portals, plus concentrated reach in 17 states with CDC-funded portal partners) <i>Walk With Ease - WWE</i> (startwalkwithease.org) • OAAA and American College of Sports Medicine coproduced an infographic: Physical activity reduces risk for osteoarthritis for those with obesity • CDC-funded state and national partners are working to increase healthcare provider-led patient assessment, counseling, and referrals to AAEBIs, and physical activity opportunities for arthritis management • Collective promotion of communication initiatives and other strategies to increase awareness about the benefits of physical activity for arthritis and meeting the <i>Physical Activity Guidelines for Americans, 2nd Edition</i> • <i>Your Exercise Solution</i>, an Arthritis Foundation and American Physical Therapy Association joint-safe video library • Arthritis Foundation Physical Activity Podcast and Webinar Library
3. Promote weight management	<ul style="list-style-type: none"> • Obesity and OA, physical activity, and related Continuing Medical Education activities • Publications on nutrition and diet for OA: <ul style="list-style-type: none"> ○ Nutrition survey among adults with OA and healthcare providers: Buck AN, Shultz SP, Huffman KF, Vincent HK, Batsis JA, Newman CB, et al. <i>Mind the gap: exploring nutritional health compared with weight management interests of individuals with osteoarthritis</i>. <i>Curr Dev Nutr</i> 2022;6(6):nzac084. doi: 10.1093/cdn/nzac084 ○ Umbrella review of nutrition and diet information for OA (Mediterranean Diet resource in development): Buck AN, Vincent HK, Newman CB, Batsis JA, Abbate LM, Huffman KF, et al. Evidence-based dietary practices to improve osteoarthritis symptoms: an umbrella review. <i>Nutrients</i> 2023;15(13):3050. doi: 10.3390/nu15133050 • Promotions: <ul style="list-style-type: none"> ○ Five key public-health strategies for addressing arthritis, including achieving or maintaining a healthy weight (5 Ways to Manage Arthritis CDC) ○ Other Self-management Interventions (OSMIs) through funded partners, including proven weight management interventions
4. Promote policies and interventions to reduce falls and OA-related joint injuries	<ul style="list-style-type: none"> • OAAA’s <i>RemainInTheGame.org</i> online toolkit and mobile app to promote injury prevention among youth athletes • OAAA Injury Prevention Task Group Publications: <ul style="list-style-type: none"> ○ Osteoarthritis Action Alliance, Secondary Prevention Task Group; Driban JB, Vincent HK, Trojjan TH, Ambrose KR, Baez S, et al. Evidence review for preventing osteoarthritis after an anterior cruciate ligament injury: an Osteoarthritis Action Alliance consensus statement. <i>J Athl Train</i> 2023;58(3):198–219. doi: 10.4085/1062-6050-0504.22 ○ Driban JB, Vincent HK, Trojjan TH, Ambrose KR, Baez S, Beresic N, et al. Preventing osteoarthritis after an anterior cruciate ligament injury: an Osteoarthritis Action Alliance consensus statement. <i>J Athl Train</i> 2023;58(3):193–197. doi: 10.4085/1062-6050-0255.22 ○ Minnig MC, Hawkinson L, Root HJ, Driban J, DiStefano LJ, Callahan LF, et al. Barriers and facilitators to the adoption and implementation of evidence-based injury prevention training programmes: a narrative review. <i>BMJ Open Sport Exerc Med</i> 2022;8(3):e001374. doi: 10.1136/bmjsem-2022-001374 • Promotions: <ul style="list-style-type: none"> ○ Five key public-health strategies for addressing arthritis, including avoiding joint injuries (5 Ways to Manage Arthritis CDC) ○ Strength and balance exercises via the <i>Physical Activity Guidelines for Americans, 2nd Edition</i> sections for older adults and those at risk for falls ○ OSMIs through funded partners, including relevant, effective injury prevention interventions
5. Expand systems for referral and delivery of evidence-based interventions	<ul style="list-style-type: none"> • <i>Walk With Ease</i> online portal infrastructure tool in English and Spanish http://startwalkwithease.org • Promote OAAA’s <i>OACareTools</i> toolkit, including nine educational modules and 21 shareable resources for healthcare providers at all levels of care, employers, and adults with OA http://oacaretools.org. • Fund state and national organizations to implement strategies focused on sustainably scaling up AAEBI dissemination, delivery, and access (e.g. via coverage or reimbursement for AAEBIs by insurers, including those serving communities that are disproportionately affected and underserved, major employers, etc.; integrating prompts for AAEBI referrals in clinical electronic health record systems) • Provide tools to support community-based organizations in the delivery of AAEBIs https://oaaction.unc.edu/resource-library/for-community-partners/
6. Assure equity in access and delivery of interventions	<ul style="list-style-type: none"> • Convene community advisory board of individuals and professionals in the Hispanic community to assess needs, gaps, and cultural preferences • Conduct structured interviews to understand and meet the needs of individuals in diverse communities • Develop culturally relevant tools and resources to reach and engage diverse adults with arthritis http://articulacionessanas.org

OA Agenda strategy	Accomplishments
	<ul style="list-style-type: none"> • Expand delivery modes and content of AAEBIs to provide virtual and multilingual options – http://oaaction.unc.edu/aaebi and Remote Delivery of Evidence-Based Programs for Chronic Disease (cdc.gov) • Fund state and national partners to address arthritis-related disparities and inequities, and equitably deliver and expand access to AAEBIs • Conduct research and publish manuscripts about inequities in arthritis burden that can be used to inform policy and practices for increasing equitable dissemination and distribution of AAEBIs • Spanish-language website and resources https://espanol.arthritis.org/; Arthritis CDC • <i>Arthritis Foundation Helpline</i> staff include bilingual persons (English and Spanish) plus translation service for 100+ languages • <i>OA Agenda</i> (2010) – full report text https://www.cdc.gov/arthritis/docs/oaagenda.pdf • <i>OA Agenda: 2020 Update</i> – report text plus sector-specific Action Briefs https://oaaction.unc.edu/oa-agenda/
7. Establish and implement a national policy platform	<ul style="list-style-type: none"> • Webinars and live conference sessions addressing arthritis education and AAEBI promotion delivered by CDC arthritis grantees (national and state) to relevant audiences via OAAA members and partners, and others) • OAAA series of four articles on OA information for the National Council on Aging website http://ncoa.org • Communication resources that can be used by public health professionals and others to increase awareness about burden, proven OA management strategies and behaviors, and AAEBIs (e.g. campaigns, infographics, podcasts, newsletters, social media (Arthritis Communications Center CDC)) • AAEBIs listed in <i>Supplemental Nutrition Assistance Program Education</i> toolkit https://snapedtoolkit.org/interventions/programs/walk-with-ease/ • Inclusion of AAEBIs in United States Administration on Community Living/Title III-D funding https://acl.gov/news-and-events/announcements/older-americans-act-oaa-title-iii-d-list-feedback • Inclusion of AAEBIs in the <i>Physical Activity Guidelines for Americans Midcourse Report: Implementation Strategies for Older Adults</i> https://health.gov/our-work/nutrition-physical-activity/physical-activity-guidelines/current-guidelines/midcourse-report
9. Pursue OA research and evaluation	<ul style="list-style-type: none"> • Collaboration across federal and non-federal partners to fund research aimed at preventing OA among adults at greatest risk for arthritis • Funding of Prevention Research Centers and other partners to conduct research aimed at preventing OA and improving arthritis management and outcomes • Support to surveillance systems and state partners to include and/or collect population-based, arthritis burden data (e.g. Behavioral Risk Factor Surveillance System, National Health Interview Survey), and disseminate findings • Arthritis Foundation's Clinical Trial Network https://www.arthritis.org/science/oa-clinical-trial-network • Arthritis Foundation workshop with United States Food and Drug Administration to develop new treatment for OA (2021) https://www.arthritis.org/science/impact/drugs-for-oa • Arthritis Foundation patient-centered outcomes <i>INSIGHTS</i> report https://www.arthritis.org/liveyes/insights