Building a Model for Osteoarthritis (OA) Care

Summary of Discussions and Presentations at the Chronic Osteoarthritis Management Initiative (COAMI) Management Conference

September 22-24, 2013

Rosemont, IL
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Executive Summary

The conversation between patient and doctor was rushed but efficient, following a familiar pattern. After all, the pair had been meeting in 20-minute intervals for years, gradually bringing the patient’s diabetes under control — a success story.

But in all those visits over all those years, the otherwise astute doctor had never asked about her patient’s joint pain, nor had her team of medical assistants, nurses, and physician assistants. No member of the care team had ever asked; nor had the patient ever volunteered the crucial information that he couldn’t fathom following the doctor’s instructions to be more physically active to keep his weight under control.

The reason was worsening pain in first one knee, then both. The patient had not mentioned his increasingly painful knees for a number of reasons. First, he saw his diabetes — and other problems, such as a family history of heart disease — as far more immediate threats to his health. Diabetes and heart disease were the health problems that could potentially be fixed or at least controlled by his doctor, he thought. But his painful knees? That was just part of aging, wasn’t it? Eventually, he’d probably have to have a knee replaced, or maybe both, like many people he knew. But what was the hurry? The surgery and convalescence sounded painful — more painful than struggling across a room, or out of a chair. Sure, he wasn’t moving around very well. But what could anyone really do about it?

The Burden of Osteoarthritis and Common Co-Occurring Conditions

This scenario and the assumptions of both patients and providers are all too common. Instead of routine screening that provides early alerts to patients and physicians about the possible presence of osteoarthritis (OA), followed by a systematic exploration of strategies to reduce pain and preserve or increase function, patients and providers often have their first conversations about joint pain when the joint is damaged enough to require surgical replacement. Indeed, the number of annual knee replacements has doubled over the last decade, but the rate has increased even more among younger patients under the age of 65. OA is the leading cause of knee replacement surgery, but also affects other joints and is the most common form of arthritis, affecting as many as 27 million Americans in 2008.
Fueled by common risk factors that include obesity, occupational and sports injuries, sex, and family history, OA and other forms of arthritis lead the top 10 causes of disability, outpacing back or spine problems, heart trouble, lung and respiratory problems, and diabetes. Yet OA and arthritis are not only a cause of disability in their own right. They also amplify the impact of limitations caused by other chronic diseases, with which they so often co-occur. Eighty-eight percent of those who report arthritis have at least one other physical or mental co-morbidity — most commonly obesity, heart disease, and/or diabetes.

The prevalence of co-morbidities has many important implications for how and where OA is screened, diagnosed, and treated. For example, a quarter of primary care visits are related to OA, and most OA patients (whether they have been diagnosed with OA or not) are seen in primary care settings.

Another consequence of co-morbidities is that OA can complicate the prevention and treatment of other chronic diseases. For example, the pain and loss of function from OA can undermine many patients’ ability to follow lifestyle recommendations regarding physical activity that would help address both OA symptoms and risk factors for diabetes and heart disease. Patients thus find themselves in a spiral in which pain and joint degradation reduce their physical activity, leading to weight gain and increased risks for heart disease and diabetes; weight gain and decreased activity also lead to further joint pain, resulting in further loss of function and mobility.

The Chronic Osteoarthritis Management Initiative (COAMI)

In 2012, the Chronic Osteoarthritis Management Initiative (COAMI) issued a Call to Action to begin exploring a more coordinated and proactive approach to preventing and treating OA, intervening earlier and more effectively — and in closer alignment with the approach to preventing and managing other chronic conditions. With that goal in mind, a September 2013 meeting convened both founding and new COAMI members to identify the elements of a model of care for OA. COAMI members include representatives of a variety of health care disciplines and patients. As they deliberated over how to accomplish the above goal, participants were asked to consider disparities in sex/gender, race and ethnic origin.
Assessing OA Guidelines, Recommendations, and Outcomes

Joanne Jordan, MD, MPH, Professor of Medicine and Orthopaedics at the University of North Carolina’s Thurston Arthritis Research Center and COAMI Chair, worked with colleagues to prepare for the USBJI/COAMI an annotated bibliography of guidelines and recommendations on the management of OA. An extensive literature review and rigorous screening process yielded several areas where current recommendations and guidelines offer general consensus: education and self-management, exercise and weight loss, use of assistive devices,

Summary Recommendations from a Systematic Review of Recommendations and Guidelines for the Management of OA

- Provide or refer patients to self-management programs.
- Provide education, regular contact to promote self-care, joint protection strategies, and individualized treatment plans.
- Advise patients to engage in low-impact aerobic exercise and, if overweight, to lose weight.
- Consider range of motion, flexibility, endurance, and strengthening exercises, exercise combined with manual therapy, and PT/OT referral.
- Recommend walking aids and assistive devices to improve Activities of Daily Living (ADLs).
- Discuss thermal modalities for hand, knee and hip OA.
- Joint replacement is recommended for appropriate patients.
- Arthroscopy with debridement is not indicated for symptomatic OA.
- For pharmacologic management of OA:
  - First line: acetaminophen/paracetamol
  - Second line: topical capsaicin, and topical or oral NSAIDs (with appropriate risk stratification)
  - Refractory symptoms: consider tramadol, opioids, or possibly duloxetine
- Intra-articular therapy
  - Use IA corticosteroids for hip or knee OA
  - Consider IA hyaluronans for knee OA in select patients

The Annotated Bibliography of OA Guidelines and Recommendations team included: Joanne Jordan, MD, MPH; Amanda E. Nelson, MD, MSCR; Kelli D. Allen, PhD; Yvonne M. Golightly, PT, MS, PhD; and Adam P. Goode, PT, DPT, PhD.
alternative/complementary approaches, surgical interventions, and pharmacologic interventions. Despite the consensus revealed by the review, few of these recommendations are implemented in any systematic way, rendering them largely ineffective. Dr. Jordan noted that future research should focus on dissemination and implementation of the consensus guidelines. COAMI meeting participants also offered suggestions for making the existing recommendations and guidelines more useful and specific.

Dr. Jordan also shared findings from a similar review of patient-centered clinical outcome measures for OA management that is still in draft form. The team in this case sought out measures that would be useful in primary care settings (in which over half of patients with OA are seen), as well as with specialists who are likely to see patients with OA due to common co-morbidities. These include endocrinologists, cardiologists, and oncologists.

Criteria for inclusion in this review included assessing whether the measures were both feasible to implement in these settings (e.g., free or low-cost, low burden for patients and clinicians) and meaningful in terms of assessing OA management outcomes (i.e., outcomes relevant to patients and with adequate psychometric properties for measuring constructs consistently and accurately — and in populations with OA, arthritis, or applicable across chronic diseases). Twenty-eight measures that made it through the feasibility/meaningful litmus test were then ranked into three tiers, ranging from least burdensome to more burdensome but yielding more detailed and potentially useful information for clinicians. Dr. Jordan emphasized that the shorter list is not a recommendation, but rather a culled set of options from which clinicians and care teams can choose those which might be best suited to their practices and patients as they seek to coordinate and improve care for patients with OA.

**Learning from Other Chronic Care Guidelines, Coalitions, and Models**

Participants heard from presenters who described relevant elements of other Chronic Care Models and approaches. These presentations and discussions are presented in more detail in a full summary of the September 2013 COAMI meeting and included: an overview of the Chronic Care Model, Lessons for OA from Diabetes, Lessons from the Canadian Framework to Improve Arthritis Prevention and Care, Managing OA in Primary Care Settings, and Building and Sustaining a Strong OA Coalition.

**The Chronic Care Model.** Darren DeWalt, MD, MPH, Associate Professor in the Division of General Internal Medicine at the University of North Carolina at Chapel Hill, explained the elements of the Chronic Care Model, based on the work of Ed Wagner, MD, MPH.
and his colleagues. The model specifies the elements that yield improved outcomes for patients by matching an informed, activated patient with a prepared, proactive practice team.

Productive interactions between patients and their care teams — the source of value in our health system — occur when the following pieces are in place: self-management support for patients (beyond handing a patient a flyer or a one-sentence instruction to exercise more); delivery system design that delineates how roles and tasks are distributed among care team members; decision support that embeds evidence-based guidelines into daily practice (and shares them with patients), and clinical information systems that provide useful data, prompts, reminders, and support for monitoring and quality improvement. In addition to these features of interactions between patients and providers, the Chronic Care Model also calls for improvements in the broader health care system that surrounds and influences clinical care, as well as the community resources and policies that influence the health of individual patients and of entire populations.

Dr. DeWalt noted how Chronic Care Model elements have been applied to heart failure management, depression, and hypertension, in each case demonstrating better functional and clinical outcomes. Reflecting on aspects of the model that make it particularly relevant for OA, Dr. DeWalt noted that physicians cannot — and should not — do everything, and need to move from a “sage on the stage” perch to being more of a coach or “guide on the side.” Care needs to be standardized, Dr. DeWalt added, before it can be optimized — and OA care is far from standardized. Multiple chronic illnesses are the rule, not the exception, making coordinated care according to the Chronic Care Model even more imperative. Finally, he concluded, guidelines are essential, but not sufficient. Learning models that give care teams a mechanism for making changes in practice and adjusting their implementation until they achieve a reliable level of consistency are key.

Lessons for OA from Diabetes. M. Sue Kirkman, MD, Professor of Medicine in the Division of Endocrinology and Metabolism at the University of North Carolina, drew on her prior experience at the American Diabetes Association, where she oversaw the Association’s development of clinical practice recommendations and consensus reports.

Diabetes, like OA, is common, costly, and causes a significant amount of disability. Dr. Kirkman explained how guidelines for managing diabetes have evolved over time and in response to a changing evidence base. Some features of diabetes care, such as the fact that it is largely self-managed by patients and requires multi-disciplinary teams, made it more naturally aligned with elements of the Chronic Care Model than some other diseases. Still, the evolution of a more patient-centered approach was gradual.
Gradually, diabetes guidelines have become far more nuanced, shifting from specific targets for the “ABCs” of diabetes care (A1C under 7 percent, Blood pressure under 130/80, and LDL Cholesterol under 100 mg/dl) to a conversation between providers and patients. Current recommendations, Dr. Kirkman said, are more consistent with the Chronic Care Model and patient-centered approaches, calling on providers and patients to decide together on A1C, blood pressure, and cholesterol goals and how best to reach them.

Dr. Kirkman summarized several similarities and differences between OA and diabetes, such as an increase in prevalence linked to age and obesity, the common occurrence of co-morbidities (particularly between these two chronic conditions), and a “Rodney Dangerfield” syndrome in which both diseases share a certain lack of respect and are not viewed as serious diseases by the public at large.

As they considered care guidelines and recommendations tied to a model of care, Dr. Kirkman cautioned COAMI participants to stay aligned with the available evidence and not move too far ahead of it.

**Lessons from the Canadian Framework to Improve Arthritis Prevention and Care.**

Gillian Hawker, MD, MSc, Professor of Medicine and Rheumatology at the University of Toronto and Physician-in-Chief of Medicine at Women’s College Hospital, shared with COAMI members the Canadian experience developing a strong national alliance and framework to improve arthritis prevention and care.

Since its formation in 2002, the Arthritis Alliance of Canada has issued a series of landmark reports promoting awareness of arthritis, detailing its economic and societal burden, making the business case for greater investments in prevention and treatment, outlining a research agenda to address gaps, and setting forth a comprehensive model of care and toolkit for its implementation across Canada.

At every juncture, the Alliance has sought out the participation and voices of patients with arthritis, which has been influential in setting the tone and language of discussions, as well as in setting priorities. One example is greater attention to pain management as a neglected area of research and practice.

The Canadian OA model of care has several key elements relevant to U.S. efforts to develop a similarly comprehensive approach, despite differences in the two health systems. These include:

- incorporating OA prevention into primary care by identifying risk factors (such as weight and prior injury) earlier in the disease process;
• routinely identifying patients with musculoskeletal or joint complaints and noting the degree to which OA has affected their daily lives and activities;
• providing OA educational materials that are accessible and appealing to patients and match their needs;
• customizing approaches to therapy;
• assessing symptoms more accurately and systematically (including pain, fatigue, anxiety, and depression as well as function);
• using stepped decision aids; and
• monitoring response to therapy (especially regarding the symptoms of pain, fatigue, sleep quality, mood, and functional performance).

The tools to implement these elements are not fully developed, but are works in progress — and sources of optimism for Dr. Hawker that the Alliance’s achievements will continue.

Managing OA in Primary Care Settings. Kelli Allen, PhD, Associate Research Professor in the Department of Medicine at the Duke University Medical Center and Research Health Scientist at the Durham Veteran Administration (VA) Medical Center, is both a health services researcher and exercise physiologist. She summarized preliminary data from the ongoing Patient and Provider Interventions for Managing Osteoarthritis in Primary Care (PRIMO) studies in North Carolina, which are examining OA management in two settings: the VA Medical Center and Duke primary care clinics.

Dr. Allen noted that clinical practice often does not match recommendations — especially for the use of conservative, non-pharmacological strategies such as exercise, weight loss, addressing functional issues, or helping patients use assistive devices. A 2009 study found that among patients with symptomatic OA, only 11 percent had seen a physical therapist in the prior year — and the rates were even lower for minority patients and/or those with public or no insurance. Likewise, studies show low overall rates of weight loss counseling, physical activity counseling, and formal arthritis education by clinicians across all age groups of patients with OA, representing missed opportunities for secondary prevention.

The PRIMO studies are designed to assess whether patient and provider interventions for managing OA in primary care settings yield changes in outcomes — primarily pain, stiffness, and joint function, but also physical function, depressive symptoms, physical activity, diet, BMI,
coping with pain, fatigue, sleep, and health care use and referrals. These are measured at baseline, and thereafter via brief telephone interviews at 6- and 12-month intervals in the VA studies, and also at 18- and 24-month intervals in the Duke clinics.

The patient intervention consists of telephone calls, materials, and self-management support focused on physical activity, weight management, and cognitive behavioral pain management skills. The provider intervention involves patient-specific treatment recommendations, issued at the point of care (via EMR). These could range from physical therapy and knee braces to medications or surgical referrals, generated by an algorithm.

Although the study results are not complete, the research team is finding some intriguing differences between the two settings (VA and Duke primary care clinics). Of particular concern is a sharp drop-off between treatment recommendations issued to VA providers, and completed consults — especially for physical therapy recommendations (among the 47 percent who received a recommendation, only 14 percent received a consult). Exploring these discrepancies in greater detail is a next step in the analysis.

**Building and Sustaining a Strong OA Coalition.** Patience White, MD, MA, is Vice President of Public Health Policy and Advocacy at the Arthritis Foundation, and also a pediatrician and Professor of Medicine at the George Washington University School of Medicine and Health Sciences. She gave COAMI participants an overview of the OA Action Alliance (OAAA), which was launched in 2011 to focus on the public health and “community resources and policies” segment of the Chronic Care Model, strengthening linkages between community resources and clinical settings.

With support from the Centers for Disease Control and Prevention (CDC) and the Arthritis Foundation, OAAA collaborated with over 70 stakeholders to create the National Public Health Agenda for OA. The Agenda sets forth four key intervention strategies for OA — physical activity, weight management, self-management education, and injury prevention — and 10 specific recommendations designed to promote evidence-based interventions, form and strengthen strategic alliances, and initiate research leading to a better understanding of OA. In addition to the National Agenda, OAAA has worked with the Ad Council to communicate messages about opportunities for changing the course of arthritis — especially among Baby Boomers. The group also supports the development of medical decision-making and risk assessment tools.

More recently, OAAA has worked to recruit new members and to strengthen and sustain the coalition. As COAMI continues its complementary initiatives, Dr. White noted that these types of partnerships work best when they mobilize assets, respond to common opportunities,
and develop integrated strategies. Encouraging COAMI members to continue to recruit and engage active organizations, diversify funding sources, and keep a tight focus on outcomes, Dr. White quoted Henry Ford: “Coming together is a beginning; keeping together is progress; working together is success.”

**Obstacles and Opportunities**

In small groups, COAMI meeting participants explored obstacles to a more coordinated approach to OA, as well as opportunities for addressing or circumventing these challenges. These challenges, while multiple and varied, could yield to a coordinated effort, many participants noted. COAMI could help identify, select, and endorse specific tools, some suggested, and offer CME-type modules (to be circulated through professional societies) that would improve skill sets of care team members likely to encounter patients with OA or at risk. The movements towards patient-centered medical homes and use of quality improvement metrics are seen as significant opportunities, as are linking with other partners — in areas such as obesity prevention, pain management, and injury prevention, and with pediatric and adolescent care providers and advocates — who could help reinforce messages about prevention and debunk myths about the inevitability of OA.

In response to the Chronic Care Model and its application to other chronic conditions, participants saw many commonalities that could be usefully applied to OA management. These included:

- Using algorithms and visit planners to elevate OA in discussions of symptoms.
- Making the case that better OA management (using a full team) frees up practice time.
- Using all members of a care team, not just physicians, to strengthen OA management; delineating individual roles to play to each team member’s strengths and benefit the patient.
- Linking to public health, health educators, and other community resources.
- Integrating common interventions (such as physical activity and weight management) that address multiple co-morbidities.
- Standardizing care but allowing for customization.
- Starting with non-pharmaceutical interventions (as in Canada).
- Developing better tools for informed decision-making.
• Boosting patient engagement and investing in training for care teams geared to patient engagement.

Towards an OA Model of Care
Building on these insights and suggestions, COAMI participants identified core components of an OA model of care, which is provided in draft form below. Many of the elements described are “placeholders” and require more detail and work, but the outlines of a model of care for OA — and the tools and resources that could move providers, patients, communities and health systems closer to a more effective ideal — received support from COAMI participants.

Draft — Core Components of an OA Model of Care
(Based on Discussions at the September 2013 COAMI OA Management Conference)

COMMUNITY — Resources and Policies
• Community Resources and Links to Them

HEALTH SYSTEM — Health Care Organization
• Reimbursement that Supports OA Prevention and Management
• Affordable and Accessible Care
• Referral Networks/Resources; Continuum of Care

SELF-MANAGEMENT SUPPORT
• Behavioral interventions (e.g., physical activity, weight management)
• Patient education
• Shared/collaborative decision-making
• Matched patient/provider goals and care
• Patient engagement and involvement

DELIVERY SYSTEM DESIGN
• Physician education
• Early diagnosis
• Integrated (vs. isolated) decision-making and treatment
• Point person for follow-up
• Referrals to rheumatologists, orthopedic surgeons, psychologists, sleep specialists, PT/OT, etc.
• Continuum of care
• Affordability/accessibility for patient
• Models tailored to health systems and settings

DECISION SUPPORT
• Visit planner (including co-morbidities)
• Risk assessment tools (e.g., FRAX for OA)
• Pain assessment
• Patient-centered functional assessment
• Behavioral interventions
• Point-of-care decision support
• Forum for discussing relative utility of treatment options (links to shared decision-making and delivery system design)
• Tiered approach to match severity

CLINICAL INFORMATION SYSTEMS
• Data to track impact on other chronic conditions
• Performance measures
• Iterative evaluation

Next steps for COAMI members will include continuing to refine the consensus guidelines and recommendations summarized by Dr. Jordan and her colleagues, reviewing currently available risk assessment tools, developing new tools (such as a visit planner template for OA, in the context of common co-morbidities such as diabetes and heart disease), reviewing and recommending obesity guidelines appropriate for OA, reviewing pharmacologic treatment
guidelines, developing a related CME activity, proposing a variety of training modules to disseminate current guidelines and a more complete version of the OA model of care, and identifying best practices and recommendations related to linking clinical settings to community resources.

As progress continues in each of these areas, we can envision a far different encounter between our hypothetical patient and physician. Long before he had given up many daily activities because of knee pain, the patient would have been asked about prior injuries, family history of joint conditions, and joint pain as part of a routine visit, prompted by a visit planner or other tool in use at his primary care or endocrinologist’s office. Just as with his stellar diabetes care, his care team would work with him and others — such as physical therapists — to craft a course of action that addressed symptoms early, avoided further joint degeneration, and addressed risk factors such as weight gain using proven, effective methods, including accessible community resources and a full range of care team members.

Neither the patient nor his care team would assume that his OA — or anyone else’s — is inevitable. The death and replacement of his knee joints could, in all likelihood, be prevented — along with the pain, fatigue, resignation, and distress that accompanied the progression from health and well-being to disability.

This latter scenario is not only possible, but probable for millions of patients — and can be accelerated if an OA model of care becomes routine instead of rare.
Overview of Meeting Goals

Arthritis is the most common cause of disability in the United States and of the various forms of arthritis, osteoarthritis (OA) is the most common, already affecting 27 million Americans by 2008. Given trends in risk factors for OA — particularly an aging population and little progress against obesity trends — OA is likely to continue to take a toll on millions of people in the United States. Beyond the pain and disability caused by OA, there is increasing concern about the health system’s capacity to respond on the scale that will be required if these trends continue.

OA and arthritis also often occur in conjunction with other chronic diseases, with 88 percent of those who report arthritis also having at least one other physical or mental co-morbidity. The prevalence of co-morbidities has many important implications for how and where OA is screened, diagnosed, and treated. For example, a quarter of primary care visits are related to OA, and most OA patients (whether they have been diagnosed with OA or not) are seen in primary care settings.

Another consequence of co-morbidities is that OA can complicate the prevention and treatment of other chronic diseases. For example, the pain and loss of function from OA can undermine many patients’ ability to follow lifestyle recommendations regarding physical activity that would help address both OA symptoms and risk factors for diabetes and heart disease. Patients thus find themselves in a spiral in which pain and joint degradation reduce their physical activity, leading to weight gain and increased risks for heart disease and diabetes, as well as progressive pain and disability.

COAMI’s Launch and Call to Action

Joint pain and loss of function are all too often accepted as inevitable by patients and providers alike. To address these views and shift the management of OA in a more proactive direction, the Chronic Osteoarthritis Management Initiative (COAMI) was convened by the U.S. Bone and Joint Initiative in Rosemont, Illinois for its first meeting in May 2012. The group’s Call to Action called for changing the approach to managing OA from its current form — generally an episodic, reactive approach that attempts to intervene relatively late in the disease process, long after joints are causing significant pain and loss of function — to one more consistent with the coordinated, multi-disciplinary, early, and proactive care now reflected in the approach to
managing other chronic diseases. (To download a copy of COAMI's Call to Action, please visit www.usbjd.org/projects/files/06a.COA MI%20CTA%20Final.pdf.)

The COAMI Call to Action endorsed the idea of a more patient-centered and effective approach to achieving the shared goals of prevention (for those at risk for OA) and earlier diagnosis, pain relief, increased function, and decreased disability (for those diagnosed with OA). However, the specific elements and contours of an OA-specific model of care were not delineated. With that goal in mind, a second COAMI meeting was convened in September 2013, bringing together many of those who had attended the first meeting in 2012, as well as new researchers and representatives of professional associations of those involved in caring for patients with OA. COAMI members include representatives of a variety of health care disciplines and patients. As they deliberated over how to accomplish the above goal, participants were asked to consider disparities in sex/gender, race and ethnic origin. (A list of participants is provided in Appendix A.)

The September 2013 meeting began with a review of findings from an annotated bibliography of well-validated guidelines and recommendations on the management of OA. This helped establish a basic framework for commonalities and convergence across guidelines already in place, areas of difference to be explored, and research needs that could lead to greater consensus in the future.

Next, the group heard from presenters who described relevant elements of other Chronic Care Models, including other chronic diseases (diabetes), the experience of other countries (Canada), and primary care clinical trials for managing OA in different health care settings. With these examples as a backdrop, the group considered key elements of an OA model of care, including opportunities for moving closer to an ideal model of care, criteria for selecting priorities among the various opportunities, and next steps for moving forward. Throughout the discussions, COAMI members focused particularly on models of care for OA with a realistic chance of success in busy primary care settings, with the potential to affect specialty areas as well.

Summaries of the presentations and highlights from the group discussions, along with a preliminary model of OA care for discussion purposes, are provided in this report.
Findings of the Annotated Bibliography of Guidelines/Recommendations on the Management of Osteoarthritis

Joanne M. Jordan, MD, MPH

To provide context for the group’s discussions about models of care for managing OA more effectively, Dr. Jordan reviewed work she and her colleagues recently completed to create an annotated bibliography of existing OA guidelines. Their effort was motivated by the observation that the problem with OA management is not a dearth of guidelines, but rather awareness and uptake of existing guidelines and recommendations. OA is not unique in this regard, but the gap between guidelines and their uptake represents a significant opportunity for progress.

Methods for Identifying and Scoring Relevant Guidelines and Recommendations

To help close the gap between recommendations and their dissemination and implementation, Dr. Jordan and her colleagues conducted a thorough MEDLINE search in April 2013 to identify English-language OA guidelines and recommendations published in the last decade. The team relied on a review process for extracting data and analyzing and categorizing recommendations. In weekly review meetings over several months, the team completed full text reviews of 24 articles (from an initial MEDLINE yield of 148 articles, plus 30 Agency for Healthcare Research and Quality [AHRQ] documents), extracting data for a final synthesis from 16 of these. (The others were found to not meet inclusion criteria after more extensive reviews.)

For the articles that met inclusion criteria (English-language OA recommendations published in the last decade), team members independently assessed guideline quality using the Appraisal of Guidelines for Research and Evaluation (AGREE) second edition instrument, scoring 23 items in each of 6 domains — scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence — and overall.

Two team members scored the items in terms of the degree to which the domain was fully satisfied (e.g., 0 percent meant not at all satisfied and 100 percent meant full satisfaction of the domain), and a third scored the items in the 6 domains to yield a standardized total. Dr.

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1 Amanda E. Nelson, MD, MSCR; Kelli D. Allen, PhD; Yvonne M. Golightly, PT, MS, PhD; and Adam P. Goode, PT, DPT, PhD.
Jordan pointed out that each set of guidelines invoked different methods to assess the strength of recommendations, yet the AGREE scoring method suggested that the Osteoarthritis Research Society International (OARSI), American Academy of Orthopaedic Surgeons (AAOS) and American College of Rheumatology (ACR) guidelines fared well.

**Where are the Commonalities Across Guidelines?**

Next, the team looked for commonalities across all the guidelines and recommendations in the following areas:

- education and self-management;
- exercise and weight loss;
- assistive devices;
- alternative/complementary approaches;
- surgical interventions; and
- pharmacologic interventions.

Dr. Jordan pointed out that despite the consensus evident across many of these areas, in practice many recommendations either do not occur or are rendered ineffective because they are poorly implemented. For example, “Provide or refer patients to self-management programs is agreed on by all,” she said, “but almost never happens.” Similarly, advising a patient to lose weight, without providing support or specific guidance, is an approach “doomed to failure.”

The box on the next page summarizes the common recommendations that emerged from the review of existing guidelines.

**Getting from Guidelines to Practice: Dissemination and Implementation**

Commenting on the implications of this work, Dr. Jordan noted that future research should focus on dissemination and implementation and identification of barriers to implementation, so that existing recommendations can be operationalized. With the support of COAMI members and other clinicians, patients, administrative and policy experts, she is optimistic that a set of OA consensus guidelines can gain traction in the future in a variety of settings, but especially in the busy primary care settings in which so many opportunities to diagnose and manage OA more effectively are currently missed.

Questions and comments following Dr. Jordan’s presentation centered on balancing evidence-based guidelines with practical tools and guidance that would be appropriate in busy clinical settings (e.g., algorithms or stepped care guidelines), how to address disagreements between different organizations, the lack of early objective measures of disease risk and onset,
the lack of effective disease-modifying treatments that could be offered, and the potential of Electronic Medical Records (EMRs) or other information systems as possible prompts.

Meeting participants with experience from other guideline consensus processes noted how complex, lengthy, and confusing such work (and its products) can be. Another important issue raised in response to the guidelines presentation was how best to incorporate patient preferences into any recommendations, guidelines, or suggestions for clinical practice. All of these comments previewed longer discussions that took place throughout the meeting.

### Summary Recommendations from a Systematic Review of Recommendations and Guidelines for the Management of OA

- Provide or refer patients to **self-management programs**.
- Provide education, regular contact to promote self-care, joint protection strategies, and individualized treatment plans.
- Advise patients to engage in **low-impact aerobic exercise** and, if overweight, to **lose weight**.
- Consider **range of motion, flexibility, endurance, and strengthening exercises**, exercise combined with manual therapy, and Physical Therapy (PT)/ Occupational Therapy (OT) referral.
- Recommend **walking aids and assistive devices** to improve Activities of Daily Living (ADLs).
- Discuss thermal modalities for hand, knee and hip OA.
- **Joint replacement** is recommended for appropriate patients.
- **Arthroscopy with debridement** is not indicated for symptomatic OA unassociated with mechanical symptoms.
- For pharmacologic management of OA:
  - First line: acetaminophen/paracetamol
  - Second line: topical capsaicin, and topical or oral NSAIDs (with appropriate risk stratification, especially for older patients)
  - Refractory symptoms: consider tramadol, opioids, or duloxetine
- **Intra-articular therapy** for select patients
  - Use IA corticosteroids for hip or knee OA
  - Consider IA hyaluronans for knee OA in select patients
Organizing Care for Patients with Chronic Diseases

Darren A. DeWalt, MD, MPH

To explain the Chronic Care Model, Dr. DeWalt began with an image of a small plane. Living with a chronic illness, he explained, is similar to piloting a small plane. Small-plane pilots need some basic flight instruction, preventive maintenance to keep the plane operational, a safe flight plan that gets them to their destination, and air traffic control to warn of dangers and manage traffic. Likewise, the patient navigating one or more chronic illnesses needs self-management support (the analog to flight instruction), effective clinical management (the body’s “preventive maintenance”), a treatment plan instead of a flight plan, and close follow-up similar to what air traffic control offers to pilots.

If your plane/body is about to crash, Dr. DeWalt observed, the current health care system does fairly well, because it’s designed for just such acute situations. “When someone has appendicitis, we know how to take it out,” he said, “and with end-stage joint disease, we can take it out and replace it.” Indeed, as Dr. Jordan had observed earlier, this is reflected in the projected increase in total knee replacements by 637 percent between 2005 and 2030, expected to reach 3.5 million procedures per year in the United States by 2030.

Instead of focusing on heroic and dramatic interventions to avoid a crash (worthwhile and appropriate as these may be in truly acute situations), the Chronic Care Model focuses on piloting the plane day in and day out, avoiding crashes and near-misses as much as possible. The model forms the basis for Patient-Centered Medical Home (PCMH) approaches and is based on the work of Ed Wagner, MD, MPH and his colleagues at the MacColl Center for Health Care Innovation in Seattle and its Improving Chronic Illness Care (ICIC) initiative.

Productive Interactions: What They’re Made of and What They Look Like

Dr. Wagner and his colleagues have suggested that productive interactions between an informed, activated patient and a prepared practice team are the source of all value in our health care system. As Dr. DeWalt explained, a prepared practice team is one that is ready for the patient. At the time of the visit, the team has everything needed to make the visit as effective as possible: all the patient information, decision supports, people, equipment, and time required to deliver evidence-based clinical management and self-management support.

The prepared team is only part of the equation. The other part is an informed, activated patient — one who understands the disease process and views him or herself as the daily self
The patient in this scenario also has engaged family and caregivers in supporting his or her self-management, and views the health care provider as a “guide on the side,” rather than a “sage on the stage.” In our health system and culture, Dr. DeWalt noted, physicians are accustomed to the “sage on the stage” role. Yet if patients are to be able to fly their own planes, both patients and physicians will have to learn how providers can be more effective as “guides on the side.”

When an informed, activated patient is matched with a prepared practice team, productive interactions are the result. This means that in addition to assessing a patient’s clinical and functional status, the provider and his or her team also have assessed the patient’s self-management skills and confidence, as well as family, cultural, and other influences — e.g., whether a patient will be able to follow through with physical therapy or a physical activity program. Clinical management is tailored to the patient’s needs, preferences, and values with a stepped protocol; the practice team and patient are engaged in collaborative goal-setting and problem-solving, which in turn yields a shared care plan in which both parties are invested. Instead of saying good-bye at the door of the exam room, the practice team is involved in active, sustained follow-up, pursuing an ongoing relationship that will help the patient continue to safely fly his or her plane.

The Chronic Care Model: A Continuum of Care

To achieve these productive interactions, Dr. DeWalt explained, patients and providers need four elements to be in place: self-management support, delivery system design, decision support, and clinical information systems. The model also recognizes that these clinical interactions occur within a broader framework that includes the surrounding geographic community and its resources and policies, as well as a national, state, and local health systems.

Dr. DeWalt described each of these elements before turning to specific examples of how they apply to different chronic conditions.

- **Self-management support** emphasizes the patient’s central role in managing his or her own illness (or illnesses, as is often the case). Effective self-management support strategies include assessment, goal-setting, action planning, problem-solving, and follow-up — far beyond handing a patient a flyer or instructing patients to exercise. Within the health system and surrounding community, resources must be organized to provide support; much of what falls in this category is likely to occur outside the clinic walls.
- **Delivery system design** refers to how roles are defined and tasks distributed among team members. Ideally, team members use planned interactions to support evidence-based care that is culturally appropriate and tailored to meet individual patients’ needs. For those patients who are struggling, the delivery system would provide clinical case management services that provide an additional level of support by assessing disease control, adherence, and self-management status; adjusting treatment quickly if such adjustments are needed; providing additional self-management support and more intensive follow-up, and helping patients navigate the complex health care process and landscape. For all patients, whether they need more intensive case management or not, the delivery system ensures regular follow-up and provides care that is understood by patients and is consistent with their cultures.

- **Decision support** embeds evidence-based guidelines into daily clinical practice. It integrates specialist with primary care expertise, using proven provider education methods. Patients, too, need decision support; sharing guidelines and information with them is an important aspect of the Chronic Care Model.
Dr. DeWalt noted that guidelines alone, while critical, are insufficient to change the way care is delivered. In Dr. DeWalt’s own practice, a visit planner helps organize and prioritize different aspects of a patient’s visit; the information in the planner is drawn from the patient’s EMR and prompts every care team member from the front desk staff to nurses, medical assistants, and physicians with reminders. Before the physician sees the patient, various screening items have been checked and the planner has been populated with data from prior visits, so every single member of the care team knows the patient’s prior issues and concerns, helping to direct the conversation. Many EMR/EHR systems have this type of decision support built in, yet it is an under-used feature, Dr. DeWalt noted. Even with the EHR as a tool, he said, it took over 5 years to get physicians in the practice to use the visit planner in this way.

- **Clinical information systems** are also part of the Chronic Care Model, providing reminders for providers as well as for patients. These systems identify the relevant subpopulations that would benefit from more proactive care (such as intensive case management) and generally facilitate individual patient care planning. The systems share information with providers and patients, but also support quality improvement goals by allowing monitoring of team and system performance.

These four elements — self-management support, delivery system design, decision support, and clinical information systems — all relate to the areas where a patient comes into contact most directly with the health care system and individual providers. Yet the two other elements in the model — health care organization and community resources and policies — also influence patient outcomes.

- **Health care organization** refers to the broader system in which individual practices are operating. This element supports improvement at all levels and generally promotes improvement strategies that lead to more comprehensive system change — change that is driven by policies that are designed to improve individual practice and health outcomes. Health care organization that supports effective Chronic Care Models should encourage the open and systematic handling of problems and provide incentives based on the quality of care, using patient-centered, rather than surrogate, measures of outcomes, along with agreements that promote and facilitate care coordination.

- **Community resources and policies** can play a significant role in encouraging patients to participate in effective programs. For individual providers, this includes
acquainting themselves with local resources as well as forming new partnerships with community organizations to support or develop programs, as well as advocating for policies to improve care. Dr. DeWalt pointed to Walk With Ease, a program for seniors evaluated and promulgated by COAMI member Leigh Callahan, PhD, as one example. Beyond individual programs, Dr. DeWalt noted that advocacy for walking paths and safe areas to exercise are also examples of how community resources and policies are linked to effective Chronic Care Models.

Dr. DeWalt reviewed how Chronic Care Models have been applied to heart failure management, depression, and hypertension. In each case, approaches that focus on productive interactions between informed, activated patients and prepared, proactive practice teams have demonstrated better functional and clinical outcomes. However, the changes did not come easily. Just as was the case in his own practice, Dr. DeWalt noted, the practice changes he described took years to become routine and established, and required much more effort than disseminating guidelines and journal articles.

**Observations Relevant to an Emerging OA Model of Care**

Reflecting on aspects of the Chronic Care Model that seem particularly appropriate for managing OA, Dr. DeWalt offered several observations.

**Physicians can’t — and shouldn’t — do everything.** Physicians are part of a team and should delegate some areas of care to others in the team with differing areas of expertise. For example, pharmacists can be more successful in managing hypertension than are cardiologists, by helping patients monitor their blood pressure. Providers need to accept these different divisions of labor, Dr. DeWalt noted, but so do patients, many of whom expect their physicians to deliver edicts from their “sage on the stage” perch. This doesn’t mean that patients shouldn’t have valued relationships with their physicians, but they, too, have to recognize that they are a part of a team and rely on members of the entire team.

**We can’t optimize care until we’ve standardized care,** Dr. DeWalt continued, sharing the story of Brent James, MD, a surgeon at Intermountain Health Care. Dr. James wanted to reduce ventilator-associated pneumonia in the Intensive Care Unit (ICU), quickly finding that every pulmonologists managed the ventilator differently. He developed protocols and disseminated them with a provocative message: “It’s more important to do it the same way than the way you think is best.” As Dr. DeWalt observed, “We all think our way is best . . . we think we’re God’s gift to ventilators, injecting or replacing a knee joint . . . but as long as we have
variation in care, we can’t learn to improve.” Dr. DeWalt emphasized that standardizing care and protocols does not mean that care teams and patients no longer have options to customize care. Rather, once a level of standardization is achieved, then adjustments can be made.

Multiple chronic illnesses are the rule, not the exception. Dr. DeWalt shared data on patients with diabetes, 45 percent of whom have additional diagnoses and half of whom experience functional limits. Among patients with diabetes, arthritis is the most common additional diagnosis, affecting at least 34 percent of these patients and outpacing obesity, hypertension, cardiovascular disease, and pulmonary disease. Among Medicare beneficiaries, over 60 percent have two or more diagnosed conditions. In Dr. DeWalt’s own practice, common co-morbidities in patients with diabetes include heart failure, depression, and arthritis.

Guidelines are essential, but not sufficient. Ideally, guidelines are both a catalogue of the best available evidence and helpful in practice. “You can’t design a chronic care illness model unless you’ve agreed on how to behave as a care team,” Dr. DeWalt said. “But even the most helpful guideline doesn’t change how care is delivered.” For that, he suggested, we need a recipe for improving outcomes, through fitting together all of the elements of a Chronic Care Model. In addition, we need to define how a larger system assesses performance, gives feedback, and prompts constant brainstorming about ways to deliver this continuum of care for every patient, every time.

A Recipe for Improving Outcomes

The ingredients for improved patient-centered outcomes include evidence-based clinical change concepts (i.e., the necessary but insufficient guidelines), system change concepts (such as the Chronic Care Model), strategies for systems change (such as Plan-Do-Study-Act cycles), and a learning model that allows physicians and teams to practice and learn ways to improve care in an ongoing way. It is the learning model, Dr. DeWalt explained, that gives teams a mechanism for making changes in practice, sharing their ideas, and adjusting their implementation until they achieve a reliable level of consistency, delivering the right care to every patient, every time.

A number of drivers can accelerate this process. Even after a Chronic Care Model is developed for OA, for example, changes will be needed in the ambient environment in which care teams practice. Accountable leadership at the health systems level will be needed, along with partnerships that promote quality of care. For OA, these are likely to include specialty societies, boards, health departments, and community agencies — among others — willing to work together to promote the quality of care for OA patients. In addition, patients and society at
large will need to understand the significance of OA and the need to participate in treatment or prevention measures.

Other drivers could include pay-for-performance (PFP) and Patient-Centered Medical Home (PCMH) incentives, transparent performance reporting (e.g., National Committee on Quality Assurance, NCQA), organized quality improvement through collaboratives and other mechanisms; and consumer engagement and involvement to design better delivery systems (e.g., through groups such as Patients Like Me or the Arthritis Foundation).

Dr. DeWalt concluded by noting that the Chronic Care Model identified key aspects of how care could be provided in the future. In places where it is already underway, the model has improved outcomes across a variety of conditions, but systems changes are required. Although achieving these changes takes hard work and years of persistence, a variety of levers — from incentive systems to transparent reporting and consumer involvement — can influence both the pace and the success of large-scale system transformation, for OA and for many other chronic conditions as well.

Questions for Dr. DeWalt included strategies for reimbursing other care team members (e.g., some Medicaid and ACO models), balancing algorithms with personalized medicine (using them to organize thinking, rather than to dictate what each patient receives), incorporating patient preferences (e.g., valuing pain relief and mobility over mortality risks), unintended consequences of pay-for-performance systems (e.g., cherry-picking patients), and prioritizing among multiple conditions (e.g., by asking patients which three things they want to discuss, although this tends to drop prevention discussions perpetually lower on the priority list).

Diabetes as a Model for Chronic Care: Successes and Ongoing Challenges

M. Sue Kirkman, MD

Diabetes, like OA, is common, costly, and causes a significant amount of disability. Dr. Kirkman provided an overview of what OA models of care can learn from decades of efforts to develop models of care for diabetes, including both successes and ongoing challenges.

After reviewing the burden of diabetes in the United States — the seventh leading cause of death, affecting 25.8 million people (11.3 percent of adults) and consuming 1 in 5 health care dollars — Dr. Kirkman explained the evolution of diabetes evidence and guidelines. The early 1990s, she noted, marked a turning point. Between 1922, when insulin was discovered, and the
early 1990s, the clinical focus of diabetes care was Type 1 diabetes and keeping these patients alive and as healthy as possible.

As the disease shifted to an epidemic of Type 2 diabetes in the early 1990s, the clinical focus shifted to glucose control, preventing complications (to the eyes and kidneys), and managing patients’ blood pressure and cardiovascular risks. In addition, preventing or at least delaying the onset of Type 2 diabetes in those at risk became a major emphasis, reflected in many randomized control trials (RCTs). More recently, Dr. Kirkman noted, research has gone beyond RCTs to comparative effectiveness trials and other research efforts that incorporate real-world evidence.

The Evolution of Diabetes Guidelines

The American Diabetes Association (ADA) was the first to produce comprehensive diabetes guidelines, publishing Standards of Medical Care for Patients with Diabetes Mellitus in 1989. This 4-page document included 10 references to other ADA guidelines, but no references to studies or trials because there weren’t any at that point. In contrast, the January 2013 edition is 56 pages long and includes 528 references, many to systematic reviews and RCTs. The two documents bracket significant changes in the past 25 years in terms of the evidence base for treating diabetes — and also show how guidelines both evolve and adapt to changes in the evidence base.

The evolution of guidelines for HbA1C goals illustrates the relationship between changing evidence and corresponding guidelines. Three trials — the DCCT trial of Type 1 diabetes (1993), the Kumamoto trial of Type 2 diabetes (1995) and UKPDS trial of Type 2 diabetes (1998) — appeared to show that microvascular disease was either prevented or ameliorated with better glycemic control. The HbA1C cut-off, Dr. Kirkman noted, was somewhat arbitrarily chosen at 7 percent, but could have been within a small range on either side of that. In any case, between 1993 and 2009, diabetes guidelines were relatively simple and focused on the “ABCs” of diabetes care: A1C under 7 percent, Blood Pressure under 130/80, and LDL Cholesterol under 100 mg/dl. These simple guidelines had some advantages, but also disadvantages because they lacked nuances and did not specify for which patients (e.g., all adults? most?) they were most appropriate.

Following the 1990s DCCT, Kumamoto, and UKPDS trials, benefits continued to be noted during long-term follow-up, with glycemic control more tightly controlled over periods ranging from 4 to 10 years. But new questions emerged about patients with cardiovascular disease (CVD) — the main cause of complications and deaths — and patients who were more
typical of patients with diabetes overall, than those studied in the trials with early diagnosis and follow-up. In 2008 and 2009, three large additional RCTs — ACCORD, ADVANCE, and VADT — were conducted to study older patients with longer histories of diabetes and CVD (or risk factors). All three trials explored whether intensive glucose lowering reduced CVD in patients with Type 2 diabetes.

The ACCORD trial’s intensive therapy arm was stopped early when patients under intensive glycemic control appeared to be more likely to die than those in the conventional arm under standard therapy. How could and should guidelines respond to this finding, in which more intensive glucose control appeared to improve microvascular complications and not make much difference for CVD, yet one trial (ACCORD) showed increased mortality? Exploring subgroups and ancillary studies only made the picture more complicated.

**Shifting the Conversation to Take Nuances Into Account**

In response, ADA made an effort to develop more nuanced recommendations, taking into account a number of factors unique to each patient (such as the patient’s attitude, risks, disease duration, life expectancy, co-morbidities, vascular complications, and support system) to help guide decisions about the stringency of the A1C goal.²

Like other patient-centered care approaches, a more nuanced approach shifts from a physician telling a patient, “Your ABCs should be <7 percent for A1C, <130/80 for Blood pressure, and <100 for LDL Cholesterol” to a conversation

more along the lines of “Let’s work together to figure out your A1C goal and how to get there, and decide together where we want your blood pressure to be, and talk about improving your cholesterol.” This may yield longer-lasting, improved, and customized outcomes, but it is far more difficult to operationalize and measure than the original ABC targets. It also leaves out a number of other important considerations — such as routine use of aspirin (another area where evidence evolved, Dr. Kirkman noted), weight management, eye exams, and evaluation of joint pain and depression. For typical patients with co-morbidities alongside their diabetes, these are difficult conversations to have in short primary care visits.

**Measuring Performance**

Dr. Kirkman explained the evolution of performance measures for diabetes, beginning in the late 1990s and tied to (but not the same as) the development of guidelines. An early example was the voluntary Diabetes Provider Recognition program, which generated certificates for participants based on chart review criteria. Publicly reported Healthcare Effectiveness Data and Information Set (HEDIS) measures, which are mandatory for health plans and are based on administrative data, were a next iteration and included many diabetes-related measures — both process (HbA1c testing) and control (e.g., ABC targets).

Do performance measures work? A Translating Research Into Action for Diabetes (TRIAD) research group comparison of commercial managed care plans with the Veterans Administration (VA), where performance measures have been in place for a long time, found that the VA outperformed managed care plans on all process measures and two-thirds of intermediate outcomes.

**Diabetes and the Chronic Care Model: Successes and Ongoing Challenges**

Dr. Kirkman noted that diabetes care had to respond to some features of the disease; these responses aligned diabetes care with elements of the Chronic Care Model relatively early. For example, diabetes care is largely self-managed by patients and requires multiple decisions from them on a daily basis. The adoption and maintenance of healthy (or healthier) behaviors that diabetes management requires is not usually a result of education solely from physicians,
but from multi-disciplinary teams, as demonstrated in successful RCTs. Collectively, these changes in diabetes care have made a difference, influencing risk factors as well as outcomes (e.g., amputations, end-stage renal disease, and hyperglycemic deaths). Patients with both Type 1 and Type 2 diabetes are living longer, with an age-adjusted risk of death down by 23 percent between 1997 and 2004. In addition, implementation of these guidelines has affected reimbursement for self-management education and even HEDIS measures. However, this evolution was gradual and at least 10 to 15 years in the making.

Diabetes does illustrate many features of the Chronic Care Model that Dr. DeWalt had described earlier: quality improvement incentives are built into the health system, self-management education and support is a cornerstone of standard care, a variety of decision supports are in place (such as reminders embedded in EHRs, meter downloads, and point-of-care testing), and the delivery system is designed to have non-physicians provide components of care in collaboration with physicians. Registries, report cards, and reminders are standard features of diabetes care clinical information systems. Community resources and policies remain a weak link — at least in comparison to other elements of the model — but here, too, diabetes care has made progress through lay health workers and peer support models.

Although these successes are gratifying, many challenges remain. Among these are the obesity epidemic and failures of prevention overall, which are heavily influenced by societal factors and are not strictly in the purview of the medical system. Reimbursement systems still do not adequately support activities that would make a difference, such as cognitive work, reimbursement for non-physician providers, or self-management support between visits, though patient-centered medical homes and Accountable Care Organizations may change that. The respective roles of primary care providers and specialists — especially for those with Type 2 diabetes — are not well-defined, and shortages and reimbursement issues plague both primary care providers and endocrinologists.

Echoing the concerns of other speakers and participants, Dr. Kirkman noted the tension between individualized and systematic care, especially in terms of accountability measures. “How do we balance individualization, complex decisions, and shared decision-making with systematic, efficient care, helpful guidelines, and practical performance guidelines,” she asked, “especially when individualization applies to multiple things beyond glycemic control?”

Finally, Dr. Kirkman urged, “Watch out for unintended consequences.” If guidelines and performance measures are either too rigid or used simply because they are measureable and attainable (but don’t correlate with improvements in outcomes), they may end up undermining or displacing quality care instead of promoting it.
Implications for OA

In closing, Dr. Kirkman noted several similarities and differences between diabetes and OA. Both share an increase in prevalence, in part because they are linked to age and obesity. Patients often have co-morbidities (in fact, often diabetes and OA in particular). The interactions between primary care providers and specialists are poorly defined, yet both conditions demand multi-disciplinary care to improve patients’ outcomes. And both diseases suffer from what Dr. Kirkman called the “Rodney Dangerfield” syndrome: they get no respect and are not viewed as serious diseases by the public at large.

OA and diabetes may differ in terms of how symptomatic they are, although this may not be true in earlier stages. OA outcomes are more difficult to define and track—but perhaps also more important to patients, since whether or not patients experience pain is more salient to them than whether their HbA1c is under control.

The diabetes guidelines experience offers many lessons for COAMI members and others. First and foremost, guidelines, performance measures, and changes in systems of care clearly can make a difference. A cautionary note, however, is to stay aligned with the available evidence and not move too far ahead of it (and then be forced to shift gears when evidence changes). Continuous re-evaluation is required of the evidence, its implications, and how best to measure meaningful outcomes. Similarly, a balance needs to be found between individualized and guideline-driven care.

Development and Implementation of the Canadian Framework to Improve Arthritis Prevention and Care in Canada

Gillian Hawker, MD, MSc

Dr. Hawker gave COAMI participants a brief tour of the history of the Arthritis Alliance of Canada and its development and implementation of a framework to improve arthritis prevention and care across the border.

The Arthritis Alliance of Canada first formed in 2002 (then called the Alliance for the Canadian Arthritis Program) to identify areas where a broad group of stakeholders might be able to accomplish things that no single organization could do alone. These included identifying
critical research gaps, promoting best practices for prevention, and enhancing awareness of and knowledge about arthritis.

Although the Alliance was not OA-specific, it has helped balance attention to different forms of arthritis and has highlighted prevention and specific risk factors (such as obesity). It also stimulated funding for grants to multidisciplinary teams across research disciplines, many addressing previously neglected areas of research (such as management of OA pain).

From its earliest meetings, the Alliance has encouraged and sought out the participation of people with various forms of arthritis. This has been influential in the tone and language of discussions as well as in setting priorities — for example, highlighting the importance of pain management as a neglected area of research and practice and directing new research funding to this topic.

**Standards for Arthritis Prevention and Care**

By 2005, within a few years of its initial meeting, the Alliance began issuing a series of landmark reports, based on intensive literature reviews and work from several task forces. The 12 standards for arthritis prevention and care that emerged from this process are grouped into three main categories: awareness, prevention, and management. Dr. Hawker noted those most relevant to OA (listed in the box on the following page), noting that although these were perhaps a bit generic, “motherhood and apple pie” types of standards, they really did galvanize the community and served as aspirational goals for the group.

Based on evidence at the time, the group also set forth provisional standards requiring additional research. These included:

- To prevent arthritis, every Canadian must understand and implement prevention strategies to reduce sport and recreation injuries.

- Every Canadian with arthritis must have timely access to appropriate integrated health care, appropriate to their age and disease stage.

A turning point in research funding allocation decisions came when the Alliance commissioned a review of funding for different types of arthritis, publishing and disseminating the results. For the first time, Dr. Hawker said, her colleagues in rheumatology realized that OA and rheumatoid arthritis (RA) received similar investments, both in amount of research funding and numbers of grants — yet OA affects many more people, making it under-researched by comparison.
Making the Business Case

Responding to feedback from government stakeholders, the Alliance next turned to building a solid case for changing the approach to both preventing and managing different types of arthritis. Working with an applied risk management firm, RiskAnalytica, the Alliance commissioned a study to answer two key questions:

- What is the estimated burden of OA and RA in Canada over a 30-year period (2010-2040)?
- What are the cost and other implications of specific “what if” scenarios, compared to current care — including total joint replacements for OA, 50 percent reductions in obesity

Selected Standards from the Canadian Standards for Arthritis Prevention and Care — of Particular Relevance to OA

- Every Canadian must be aware of arthritis.
- Every Canadian with arthritis must have access to accurate information and education on arthritis that meet a defined set of criteria and are appropriate to their age and stage of disease.
- Participation in social, leisure, education, community and work activities must be an integral measure used to evaluate outcomes by health professionals, educators, policy makers and researchers.
- Every Canadian must be informed about the importance of achieving and maintaining a healthy body weight, and actively encouraged to engage in physical activity to prevent the onset and worsening of arthritis.
- All relevant health professionals must be able to perform a valid, standardized, age appropriate musculoskeletal screening assessment.
- Health care professionals must recognize osteoarthritis as a significant health issue and treat it according to current treatment guidelines.
- To prevent arthritis, every Canadian must understand and implement prevention strategies to reduce sport and recreation injuries.
- Every Canadian with arthritis must have timely access to appropriate integrated health care, appropriate to their age and disease stage.
(as measured by BMI >30), adequate pain management for OA, and early diagnosis and access to Disease-Modifying Anti-Rheumatic Drug (DMARD) therapy for RA?

Between October 2008 and September 2011, a series of workshops was convened to identify data sources and key interventions, review the risk modeling results, and prepare a final report — all involving a variety of stakeholders (Alliance members, patients, experts, scientists, funding and government agencies) across Canada.

The risk modeling step involved simulations of OA and RA in the Canadian population, taking into account incidence, prevalence, mortality, and risk factors. The results were presented as continuum of care maps that showed the progression of disease (for both OA and RA), associated levels of disability, and economic burden — as well as the simulated impact of various interventions on economic burden, disease progression, and disability.

The results were dramatic. In 2010, it was estimated that 1 in 8 Canadians was living with OA and 1 in 136 with RA. Three decades later, by 2040, the prevalence of these would increase to 1 in 3 Canadians with OA and 1 in 68 with RA. Unchecked, these trends would amplify the $12.6 billion spent in 2010 for both OA and RA. This is in addition to the significant productivity losses, calculated as a percentage of Canada’s GDP: 1.05 of the country’s GDP from $17.3 billion in OA productivity losses in 2010, and 0.2 percent ($3.3 billion) related to RA.

The report’s most important conclusion was that the burden of OA and RA — the most costly arthritic diseases — could be addressed with effective interventions, but that more research was needed to improve strategies for preventing and treating obesity and for managing pain. To coordinate these efforts, the next step was to develop a national framework for arthritis care to achieve the Alliance’s vision of improved knowledge, awareness, prevention and management through collaborative action. The group was able to secure a motion from the Canadian Medical Association advocating that “governments invest in a pan-Canadian approach to evaluate and implement a national framework for innovation and interdisciplinary models of care for arthritis and other musculoskeletal conditions.”

**Developing a Comprehensive Model of Care**

Among the top priorities was to champion improvements in models of care, so that the focus could shift to prevention, early diagnosis, and early intervention to prevent the need for acute care. A Models of Care Committee explored different definitions and
elements of models of care, adopting the Australian definition (see box).

The Alliance developed a toolkit to help practices develop and evaluate their own models of care, available from the Alliance’s website (www.arthritisalliance.ca). The toolkit includes worksheets that can be used to identify opportunities for improvement or expansion, at local, provincial, or national levels; it recognizes that one size does not fit all in a country as large and diverse as Canada.

Dr. Hawker noted some advantages that Canadian practices have in adopting a model of care approach, including a built-in team-based primary care medical home model. However, physical therapists are not typically included in these teams; this is an omission that the model of care approach is starting to rectify.

Several other challenges — many shared with counterparts in the United States and elsewhere — persist. Chief among these are the societal attitudes and beliefs about OA that persist not only among patients and the public, but among health care professionals as well. Examples include the idea that it’s “just” OA — part of the normal (and inevitable) process of aging. These beliefs are accompanied by related misconceptions: that OA is non-inflammatory and degenerative, that there are no effective treatments, and that OA is less important than conditions such as diabetes or heart disease.

As a result, OA is not on patients’ or physicians’ radar as a common chronic condition, so risk factors are not routinely assessed or addressed in primary care settings, nor are lifestyle modifications recommended as often as they are for other chronic conditions. In general, physicians and other providers are not as knowledgeable or aware as they should be about risk factors for OA, nor about early assessment and interventions for symptomatic OA. In addition, when other co-morbidities are present (as is often the case), some therapies might be contraindicated. Finally, attitudes and beliefs about pain medications — particularly fear of addiction — may prevent people with OA pain from obtaining relief.

What is a Model of Care?

“An overarching design for the provision of a particular type of health care service that is shaped by a theoretical basis, Evidence-based Practice, and defined standards. It consists of defined core elements and principles and has a framework that provides the structure for the implementation and subsequent evaluation of care.”

Dr. Hawker explained how the Canadian approach addresses these challenges by establishing core elements of a comprehensive OA model of care:

- **Incorporating OA prevention into primary care** by identifying risk factors (weight, prior injury); researchers are currently working on predictive models that could help patients determine their risk of developing OA, similar to how the FRAX tool helps predict fracture risk.

- **Identifying patients with MSK/joint complaints**, especially if these are perceived as routine “aches and pains” associated with aging (and thus not volunteered as symptoms); recognizing how much patients accommodate by modifying their activity levels and perhaps not recognizing the degree to which OA has affected their daily lives and activities.

- **Screening routinely for OA** by asking which joints have been troublesome (i.e., painful, swollen, stiff, or aching) on most days the previous week or month, whether there is a family history of OA, or a previous joint injury.

- **Providing OA educational materials that are accessible and available in multiple formats**, covering the core elements of arthritis self-management, treatment objectives (e.g., exercise, pacing activities, weight reduction), and that match patients’ needs, preferred language, and level of health literacy.

- **Promoting and requiring a set of practice skills among team members.** “We don’t need more ‘ologists,’” Dr. Hawker commented. “We need skill sets.” The mix of skills and team members, she added, might look quite different in downtown Toronto than in a more remote small town. In general, though, the skills sets would include: the ability to conduct a musculoskeletal exam with the ability to diagnose OA diagnosis, the ability to aspirate and inject a knee (and rule out sepsis/crystal arthropathy, as well as deliver intra-articular therapies), prescribe and monitor exercise and other therapies, assess biomechanical factors (by PT/OT) so that patient-specific recommendations regarding
the use of aids and devices can be made, and monitor changes in patients’ pain and functional levels.

- **Customizing approaches to therapy**, targeted to etiology (biomechanical factors and systemic/inflammation) and symptoms (pain, disability, sleep/fatigue, depressed mood). Understanding the different pathways to joint destruction — inflammation, and altered joint loading — is important in determining treatment that addresses one or both. Most of OA care doesn’t require a physician, Dr. Hawker noted, until the patient requires systemic therapies. The progression, she suggested, should be to start with non-drug therapies, and then move to local/topical treatments before systemic ones. One reason that local therapies aren’t used more often is that many providers don’t know how to inject properly; in Canada, they are using a visiting specialist model in which the “injector” is on site for half a day each month.

- **Assessing symptoms.** Therapy cannot be targeted unless symptoms are accurately assessed, but this doesn’t occur systematically. Dr. Hawker noted that a focus on pain alone may be missing important causes and symptoms: for example, pain can cause fatigue via sleep disruption, which in turn can lead to further fatigue, and depressed mood. Physical activity, Dr. Hawker pointed out, affects all of these — but there are also strategies for addressing pain, sleep disorders, and anxiety. “Sometimes,” she noted, “the simple stuff works.” A symptom checklist, with 10-point Likert scales for assessing pain, fatigue, function, mood, and sleep, would be ideal.

- **Using stepped decision aids.** Dr. Hawker shared a stepped decision aid, noting that the volume of treatment information for patients (and providers, too) makes the information confusing and difficult to operationalize. This is a work in progress; in part, it is a challenge because there’s no single decision point and the evidence is in flux.

- **Monitoring response to therapy.** Tools also are needed to assess how a patient’s symptoms have responded to therapy, along the same dimensions of pain, fatigue, sleep quality, mood, and functional performance.

**Status of Canadian Model of Care Efforts**

Dr. Hawker is very pleased that a primary care champion is now on board to test and refine the model in a resource-rich province (Alberta) with a strong health system to match. In addition, the Alliance is developing tools that meet some of the needs outlined above, such as
an online version of a stepped decision aid, OA risk prediction tools, and decision support tools
to help patients determine whether or not they are appropriate candidates for TKA. All of these
will be evaluated and modified, as needed. In addition, the group is preparing a policy on injury
prevention in sports. Most of all, Dr. Hawker is proud of the Alliance’s growing and extensive
membership, including recent additions of the Canadian Obesity Network and Pain Society,
which are critical to have as part of the team. The experience in Canada can be used as a
framework to guide COAMI discussions and model of care plans.

**Patient and Provider Interventions for Managing Osteoarthritis in Primary Care Clinical Trials in Different Health Care Settings**

*Kelli Allen, PhD*

Dr. Allen described the design and preliminary data from ongoing Patient and Provider
Interventions for Managing Osteoarthritis in Primary Care (PRIMO) studies in North Carolina.
Several aspects of OA treatment prompted the closer look at how OA is managed in different
settings — in this case, at the Durham, NC VA Medical Center and at 10 Duke University
Medical Center primary care clinics.

Numerous prior studies, Dr. Allen said, have indicated that clinical practice does not
match recommendations, with overall quality indicator pass rates between 22 and 57 percent.
In particular, studies have found extremely low use of conservative, non-pharmacological
strategies such as exercise, weight loss, addressing functional issues, or helping patients use
assistive devices. According to a 2009 Medical Expenditures Panel Survey, among patients
with symptomatic OA, only 11 percent had seen a PT in the prior year, and the rates were even
lower for African American and Hispanic patients, and/or those with public or no insurance.
National Health Interview Survey (NHIS) data show low overall rates of clinician weight
counseling, physical activity counseling, and formal arthritis education across all age groups of
patients with OA, representing many missed opportunities for secondary prevention.

Studies of provider interventions in Canada and France have showed improvements in
patient self-management, physician prescribing practices, patient outcomes, pain relief,
perceptions of treatment, and Western Ontario and McMaster Universities Arthritis Index
(WOMAC) measures. However, these types of provider interventions have not been deployed
or studied so far in the United States, and they are likely too time-intensive for providers to be
practically implemented in many health care settings. The goal of the PRIMO studies is to assess patient and provider interventions for managing OA in primary care settings.

The PRIMO Studies

The PRIMO VA study includes two-arms, comparing a patient and provider intervention with usual care at the Durham VA Medical Center. This involves 30 primary care providers and 300 patients. The patient cohort is half white, half non-white from each practice, with hip and/or knee OA who also have BMI ≥25 and are physically inactive. The PRIMO Duke study is more complex and compares four arms: interventions for patient only, provider only, patient and provider, and usual care. There are 10 primary care clinics and 560 patients in the Duke study; the patients are similar to those in the VA study. The clinics and patients are randomized to one of the four intervention arms.

In both settings (VA and Duke), the researchers are collecting data at baseline and via brief telephone interviews at 6- and 12-month intervals; the Duke study includes follow-up at 18- and 24-month intervals as well. The primary outcomes being tracked are those measured via WOMAC questionnaires: pain, stiffness, and physical function. In addition, the studies track objective physical function, depressive symptoms, physical activity, diet, BMI, coping with pain, fatigue, sleep, and health care use and referrals. Finally, a cost effectiveness analysis will be conducted. The VA study has completed enrollment and will have a first follow-up occurring in December 2013; the Duke study will complete enrollment by the end of 2013 as well.

PRIMO’s Patient Intervention

For the first 6 months of the intervention, patients receive bi-weekly telephone calls, followed by monthly calls for the next 6 months. The length of the calls varies, with some more involved and others simple check-in calls. Based on a literature review and meta-analysis, the intervention materials and self-management support focus on physical activity, weight management, and cognitive behavioral pain management skills. Patients choose whether they want to focus first on physical activity or weight management, but the cognitive behavioral skills are emphasized throughout the intervention, along with goal-setting and action plans to decrease barriers to behavior change and increase patients’ confidence and self-efficacy. A
guide for patients — written in an accessible patient voice — provides encouragement and basic information.

**PRIMO’s Provider Intervention**

The primary care provider intervention includes receiving patient-specific treatment recommendations, issued at the point of care. The recommendations are delivered via EHR, typically within 2 to 3 days of a non-acute care visit, and are based on treatment guidelines, the patient’s clinical status, and preferences articulated during the baseline assessment. They range from PT and knee braces to referrals for weight management and physical activity programs, to joint injections, topical NSAIDs/capsaicin (adding gastroprotective agents or discontinuing NSAIDs, as indicated), trying new pain medications, or referring patients to orthopedic surgeons to discuss surgical options.

The referral recommendations were generated by algorithms based on evidence and research-based assessments available to the study team at the time the study was designed; Dr. Allen noted that these algorithms could be considered as a starting point but are not necessarily the only or optimal approach for generating patient-specific treatment recommendations. She explained that the objective was to see whether elevating the delivery of recommendations in primary care settings would stimulate more referrals and use of evidence-based treatment strategies. The next question is how realistic this approach might be in other primary care settings and whether the results can be reliably tracked, measured, and are significant.

For the Duke patients, paper-based documents listing physical activity and weight management resources are offered that are customized to each geographic area; the listed resources are generally either free or low cost, to reduce barriers to access. For VA patients, some of these resources are available within the health care system, including to physical activity and weight management programs, thanks to programs such as MOVE!®.³

In the VA system, which has relied on EHRs for far longer than most practices, the IT system is set up in a way that providers co-sign progress notes, so the study team can confirm that they have seen the recommendations during the visit. Because of the EMR system at the Duke clinics, the provider co-sign is not an option.

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³ For more information about the MOVE!® Program, visit http://www.move.va.gov/default.asp.
Since enrollment is not complete yet for the Duke arms, participant data are only available for the 300 VA participants. Their mean age is 62, largely male (91 percent), and half are white and half non-white (by design). Mean BMI is 34 kg/m\(^2\); 21 percent have hip OA and 89 percent knee OA, with a mean duration of arthritis symptoms of 14 years and WOMAC scores of 48.4. In addition to OA symptoms and obesity, participants were experiencing other difficulties, as reflected in high mean insomnia severity index scores, sleep apnea (66 percent of them), fatigue, and depressive symptoms. Seventy-seven percent were taking some type of medication (prescription or over-the-counter) to manage their arthritis; 30 percent were taking more than one medication, with opioid use close to 30 percent as well.

When asked how well these medications were controlling their arthritis pain, on a scale from 0 (not at all) to 10 (very well), the mean score was 5, similar to results noted in other studies. A translation of this might be that the medications help, but the pain is not gone, so the medications don’t do the trick completely. Not surprisingly, the majority (78 percent yes; 14 percent maybe) said they would be interested in talking to a provider about trying a different medication for their arthritis pain (or, for those not taking any medication, trying one).

Just over half (55 percent) had had injections into a knee; 18 percent had had injections into a hip. Again, most (60 percent yes; 22 percent maybe) would be interested in trying a knee or hip joint injection if their provider thought it would be appropriate. Eight-one percent had used a knee brace for knee OA, but half of these were elastic sleeves only; 92 percent were either interested in trying a brace or trying a different kind of brace. Sixty-nine percent had used a topical cream to treat their arthritis; 96 percent were interested in trying one if recommended by a provider.

Almost half (47 percent) of those with knee OA had ever been evaluated by a physical therapist; only 31 percent of those with hip OA had done so. This was particularly disappointing, Dr. Allen noted, since these patients reported having OA symptoms for over 10 years, on average. If recommended, VA patients reported high levels of interest in trying or discussing a physical therapy referral (80 percent yes and 10 percent maybe among patients with knee OA; 68 percent yes and 16 percent maybe among patients with hip OA).

Treatment Recommendations and Consults

One concern about the study design was missing patient-provider interactions if they didn’t occur during the year-long study period. This was less of a concern with the VA cohort,
since these patients tend to be in poorer health and thus see their providers more frequently. In the PRIMO VA study, 85 percent of patients had a non-acute visit with a study-enrolled provider during the study period, and 7 percent had non-acute visits with other providers (who were not enrolled in the study). These providers still received the recommendations, if they agreed, even if they weren’t formally enrolled in the study. Seventy percent of the VA patients had a non-acute visit within 2 weeks of the treatment recommendation being issued.

In the VA arms, 122 treatment recommendations were issued; 112 were issued in the two completed study clinics in the Duke arms of the study. The differences between the two raised some interesting issues. For example, knee brace treatment recommendations were issued for 39 percent of VA patients, but 78 percent of Duke patients — possibly more because the VA patients already had braces. PT evaluation and exercise recommendations were issued for 47 percent of patients at the VA setting and 63 percent at the Duke settings. Weight management treatment recommendations were high among both groups: 84 percent at VA clinics and 95 percent at Duke. Joint injection recommendations were similar (23 percent and 25 percent, respectively), but topical NSAID/capsaicin recommendations were higher at Duke (74 percent) than the VA (53 percent). Recommendations to discuss new or alternative pain medications were high: 84 percent and 83 percent.

Next, the team examined the correlation between treatment recommendations issued to providers and resulting consults. The drop-off was particularly sharp for PT referrals, with only 14 percent of those receiving a recommendation actually issuing a consult. This may be due to a perceived lack of PT resources within the VA system. Other potential reasons might include patients’ lack of interest or perceived barriers. Exploring these discrepancies in greater detail will be a next step for the research team. Future results on the impact of patient and clinician education on OA outcomes will help inform the developing COAMI model of care.
Dr. White gave the COAMI participants an overview of the OA Action Alliance’s (OAAA’s) history and focus, explaining how it complements and reinforces the work of COAMI. In terms of the Chronic Care Model that had been the focus of prior presentations and discussions, Dr. White noted, the OAAA focuses on a public health approach and on the “community resources and policies” part of the model, seeking to strengthen the linkages between community resources and clinical settings.

People with arthritis and their advocates want their pain relieved, their quality of life improved, and both the general public and policymakers to recognize arthritis as a central public health issue. Until this recognition materializes, it will be difficult to increase funding, improve treatment, and find a cure. Recognition of arthritis as a major public health issue also can help focus attention on what people at risk for or with arthritis can do to improve their quality of life and, ideally, prevent OA and its progression, as well as resulting disability.

Dr. White reiterated the challenges noted by other presenters and COAMI participants: the lack of understanding (and misunderstanding) of arthritis among the public, health care providers, and policymakers; a lack of urgency linked to the combination of high morbidity but low mortality; overshadowing of arthritis by common co-morbidities (so that patients minimize arthritis compared to other, seemingly more immediate threats to their health); and common myths that arthritis is not serious and is an inevitable part of aging that simply must be endured, rather than ameliorated or prevented.

The public health community joins others in finding this status quo unacceptable. Dr. White shared the Health Impact Pyramid (see following page) often used by the Director of the Centers for Disease Control and Prevention (CDC), Dr. Thomas Frieden, to show where public health could increase its impact on population health.

The largest impact on population health outcomes, Dr. White noted, comes from focusing on the socioeconomic and contextual factors at the bottom of the pyramid. Yet too often, our health system is exclusively focused on the more intensive and individualized services at the top of the pyramid, which may have benefits for individuals, yet are less likely to shift the health profiles and outcomes for entire populations or groups.

Although COAMI, the OAAA, and the Arthritis Foundation are unlikely to change socioeconomic factors such as poverty, education, housing, and overall inequality, these and
other groups can help change the next rung in the pyramid: the context in which individuals make decisions that affect their health. This is how success eventually was achieved in changing the prevalence of smoking, Dr. White observed.

The public health approach to doing so is to conduct surveillance that defines both the problem and opportunities for addressing it, identify risk and protective factors, develop and evaluate interventions that reveal what works (and for whom), and implementing effective policies and programs so that more people can benefit from them.

To apply the public health approach to OA, CDC and the Arthritis Foundation collaborated with 70 stakeholders to create the National Public Health Agenda for OA. The agenda was based on a thorough evidence review and identified four key intervention strategies: physical activity, weight management, self-management education, and injury prevention. The Agenda set forth 10 specific recommendations designed to promote evidence-based interventions, form and strengthen strategic alliances, and initiate research that leads to a better understanding of OA, its risk factors, and effective strategies for prevention. An Institute of Medicine report, Living Well with Chronic Disease, was released in 2012 and helped focus attention on the morbidity from arthritis and how it could be lessened. This message also was the focus of an Ad Council campaign designed to create a greater sense of urgency and compel
Baby Boomers with arthritis to realize they could change the course of arthritis. The campaign became one of the top 10 Ad Council campaigns in 2010, generating $50 million in donated media and support and drawing 8.6 million unique visitors to the Arthritis Foundation’s website.

Parallel efforts involve developing medical decision-making and risk assessment tools, such as a DVD and booklet to guide patients in making an informed decision about whether or not to have knee surgery, and a knee OA risk assessment tool that was completed by 5,000 individuals during the Ad Council campaign.

The Arthritis Foundation and CDC launched the OAAA in 2011 as the need for a

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### A National Public Health Agenda for Osteoarthritis: 10 Recommendations

1. Self-management education should be expanded as a community-based intervention for people with symptomatic OA.

2. Low impact, moderate intensity aerobic physical activity and muscle strengthening exercise should be promoted widely as a public health intervention for adults with OA of the hip and/or knee.

3. Existing policies and interventions that have been shown to reduce OA-related joint injuries should be promoted, implemented and enforced.

4. Weight management should be promoted for the prevention and treatment of OA, and national nutrition and dietary guidelines for the general population should be followed by adults with OA so they select a quality diet while staying within their calorie requirements.

5. A national policy platform for OA should be established to improve the nation’s health through evidence-based clinical and community prevention and disease control activities, including core public health infrastructure improvement activities.

6. Systems to deliver evidence-based interventions should be expanded.

7. Quality of and equal access to evidence-based interventions for OA should be assured.

8. Workplace environments should be improved by adopting policies and interventions that prevent onset and progression of OA.

9. A well-designed communication strategy should be initiated and sustained to enhance understanding and change attitudes and behavior among consumers, health care providers, policymakers, employers and the business community, and community organizations.

10. Research and evaluation should be pursued to enhance surveillance, better understand risk factors, refine recommended intervention strategies, evaluate workplace interventions, and examine emerging evidence on additional promising interventions.

Source: Centers for Disease Control and Prevention.
stronger coalition became evident and to expand their capacity and engage a broader range of partners.

With CDC funding and support, the OAAA was officially launched in 2011 with a set of key documents (e.g., vision and mission statements), an online presence, recruitment of partners, and an inaugural meeting that laid the groundwork for action-oriented work groups to divide the work. The work groups focus on physical activity, weight management, injury prevention, and self-management — each with a chair or co-chairs, specific goals, and activities to reach those goals. For example, the physical activity workgroup is co-chaired by the National Parks and Recreation Association, which has become an enthusiastic and valuable partner. The weight management group is co-chaired by Shape Up America!, the injury prevention group by the National Athletic Trainers’ Association, and the self-management group by the American Chronic Pain Association. Each group also has been able to develop materials to share with its own professional networks and directly with the public; many of these are available on the OAAA website (www.oaaction.org).

Reflecting on the OAAA experiences to date and what they may offer as COAMI launches similar efforts, Dr. White had several helpful observations. She noted that partnerships like OAAA and COAMI work best when they mobilize assets, respond to common opportunities, and develop integrated strategies. Yet sustaining partnerships is much harder than forming them. She advised continuing to recruit and engage active organizations, diversify funding, and keep a tight focus on short- and long-term outcomes to keep individuals and organizations engaged.

In closing, Dr. White quoted Henry Ford:

“Coming together is a beginning; keeping together is progress; working together is success.”

Findings of the Annotated Bibliography of Clinical Outcomes on the Management of Osteoarthritis

Joanne M. Jordan, MD, MPH

Dr. Jordan presented the initial results of a review of outcome measures for OA management in clinical practice that she and her colleagues at the Thurston Arthritis Research Center at the University of Carolina at Chapel Hill and Duke University conducted. The review

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4 In addition to Dr. Jordan, the team included Kirsten Nyrop, PhD; Amanda Nelson, MD, MSCR; Yvonne Golightly, PT, MS, PhD; Kelli Allen, PhD; and Leigh Callahan, PhD.
was conducted as a first step towards COAMI-endorsed recommended outcome measures and to generate discussion, but is not yet at the stage of being released as a final product.

Since over half of patients with OA (physician-diagnosed or not) are seen in primary care settings, primary care providers and settings were one focus of the outcome measures review. Another area of focus was specialty providers who are likely to see patients with OA due to common co-morbidities, including endocrinologists, cardiologists, and oncologists. In the initial review, Dr. Jordan and her colleagues sought out measures that could initiate a physician-patient dialogue about joint symptoms that would allow monitoring of outcomes from OA interventions targeted to these settings.

To narrow the focus, the team examined outcome measures in four domains that are both relevant to patients with OA (or at risk for OA) and likely to be addressed in primary care and specific specialty practices: pain, function, fatigue, and sleep. They also limited the review to patient-reported outcomes, since clinician-assessed outcome measures require specific training, equipment, or resources and are more likely to have been assessed elsewhere.

Measures for each of the four domains — sleep, fatigue, pain, and function — were identified via a literature review, generated from a special supplement of *Arthritis Care and Research* (Patient Outcomes in Rheumatology, 2011: A Review of Measures), the NIH Patient Reported Outcomes Measurement Information System (PROMIS), and broader PubMed searches. Some articles were eliminated (e.g., if the full article was not accessible or the measure was not clearly defined or cited). Of the 87 measures that initially met the criteria, 9 were later eliminated, leaving 78.

To develop a tiered list of recommended patient-reported outcomes, the team followed the literature review with an assessment of how meaningful the final list of measures would be in assessing OA management outcomes. This meant that the measures had been tested and had adequate psychometric properties for measuring constructs consistently and accurately (i.e., reliability and validity), with such testing including OA or arthritis populations or at least tested in ways that apply to a variety of chronic diseases. Measures also had to be sensitive enough to detect changes in disease progression or treatment effectiveness.

The measures also were rated in terms of feasibility, since they would have to be implemented in primary care or specialty settings whose primary focus is not OA. Standards for feasibility included accessibility (i.e., in the public domain; free); low burden for patients/responders (i.e., accessible language/literacy, clear formatting, brief questions/instruments); and low burden for clinicians and administrators (easy to administer, score, and interpret).
Based on these criteria to assess “meaningfulness” and feasibility, an additional 50 measures were not recommended upon further review. Of the remaining 28, once the measures were found to meet criteria for being both meaningful and feasible, they were ranked into tiers, as follows:

- **Tier 1:** Least burdensome; open dialogue about joint symptoms; recommended for first use in a clinical setting, especially among patients at high risk for OA but not seeing the primary care provider or specialist for joint symptoms (and not yet definitely diagnosed with OA). Tier 1 measures included 8 for sleep, 7 for fatigue, 6 for pain, and 7 for function.

- **Tier 2:** High content validity, deeper exploration of joint pain, but brief enough to incorporate into primary/specialty practices (and useful for follow-up of issues uncovered by Tier 1 measures). Tier 2 measures included 3 (plus 1 alternative) for sleep, 2 (plus 1 alternative) for fatigue, 2 (plus 1 alternative) for pain, and 4 for function.

- **Tier 3:** Generate the most detailed information for clinicians, but require more time and a comprehensive exploration of OA and related outcomes. Tier 3 measures included 3 for sleep, 2 for fatigue, 2 for pain, and 2 for function.

Dr. Jordan emphasized that this winnowed list does not represent a recommendation; some may be more appropriate than others, depending on the purpose and setting, as well as time available. The measures also can be listed by the number of items, how long they take to administer and score, or other features.

In response to Dr. Jordan’s presentation, COAMI participants reviewed the initial list of outcome measures in more detail and provided feedback to the team. In particular, participants are interested in obtaining feedback from clinicians who may be using these or other tools, to augment the research lens and possibly discover some useful and promising validated tools that did not surface during the search for measures already described and tested in the literature to date.

The draft tables with details on outcome measures for each domain will be circulated to COAMI participants for review and feedback, with subsequent iterations — and consensus on a set to recommend to clinicians — forthcoming.
Obstacles and Opportunities

Small Group Discussions

In small groups, COAMI participants shared their own perspectives and ideas to examine in more detail the gaps between the current and ideal systems of care for OA, as well as current obstacles and opportunities for addressing them.

In their reports to the larger group, representatives of each small group itemized a variety of missed opportunities in areas such as 1) educating patients and providers to counteract common myths, 2) training care teams, 3) integrating care across providers, 4) accessing surrounding community resources, 5) communicating more effectively, and 6) helping those at risk for OA to prevent further joint deterioration. In addition, disparities in OA incidence and outcome have been identified based on sex/gender, as well as race/ethnicity. However, there is little high-quality evidence that addresses differences in response to early intervention or non-surgical treatments. Several also pointed to system-wide issues that serve as obstacles to earlier and more integrated care, such as reimbursement that provides disincentives rather than incentives for coordinated and preventive care, and clinical information systems that fail to connect the dots for patients and providers. The lack of standardized screening tools and tools for early diagnosis was a common theme, as well.

These challenges, while multiple and varied, could yield to a coordinated effort, many participants noted. COAMI could help identify, select, and endorse specific tools, and offer CME-type modules (through professional societies and health professions schools) that would improve skill sets of care team members likely to encounter patients with OA or at risk. The movements towards patient-centered medical homes and use of quality improvement metrics are seen as significant opportunities, as are linking with other partners — e.g., obesity prevention, pain management, injury prevention, pediatric and adolescent care providers and advocates — who could help reinforce messages about prevention and debunk myths about the inevitability of OA. The USBJI, along with some of its participating organizations, could encourage further research into sex/gender and race/ethnicity differences in accessibility and response to early intervention and non-surgical treatment of OA.
In discussion of the response to the Chronic Care Model and its application to other chronic conditions, participants saw many areas that could be usefully applied to OA management. These included:

- Using algorithms and visit planners to elevate the prominence of OA in discussions of symptoms that are affecting the patient;
- Making the case that better OA management (using a full team) frees up practice time;
- Using all members of a care team, not just physicians, to strengthen OA management; delineating individual roles to play to each team member’s strengths;
- Linking to public health, health educators, and other community resources;
- Integrating common interventions (such as physical activity and weight management) that address multiple co-morbidities;
- Standardizing care but allowing for customization;
- Starting with non-pharmaceutical interventions (as in Canada);
- Developing better tools for informed decision-making; and
- Boosting patient engagement and investing in training for care teams geared to patient engagement.
Building a Model of OA Care

Panel and Group Discussion

Building on these insights and suggestions, COAMI participants identified core components of an OA model of care, which is provided in draft form below. Many of the elements described are “placeholders” and require more detail and work, but the outlines of a model of care for OA — and the tools and resources that could move providers, patients, communities and system closer to a more effective ideal — received support from COAMI participants. This group should continue to engage the spectrum of the health care professional and patient communities. Health care professionals should also be encouraged to reach out to communities that may not typically access the health care system for pain issues and to tailor the model to accommodate individual patient concerns.

Draft — Core Components of an OA Model of Care

(Based on Discussions at the September 2013 COAMI OA Management Conference)

| COMMUNITY — Resources and Policies |
| • Community Resources and Links to Them |

| HEALTH SYSTEM — Health Care Organization |
| • Reimbursement that Supports OA Prevention and Management |
| • Affordable and Accessible Care |
| • Referral Networks/Resources; Continuum of Care |

| SELF-MANAGEMENT SUPPORT |
| • Behavioral interventions (e.g., physical activity, weight management) |
| • Patient education |
| • Shared/collaborative decision-making |
| • Matched patient/provider goals and care |
| • Patient engagement and involvement |

| DELIVERY SYSTEM DESIGN |
| • Physician education |
| • Early diagnosis |
| • Integrated (vs. isolated) decision-making and treatment |
| • Point person for follow-up |
| • Referrals to rheumatologists, orthopedic surgeons, psychiatrists, sleep specialists, PT/OT, etc.) |
| • Continuum of care |
| • Affordability/accessibility for patient |
| • Models tailored to health systems and settings |

| DECISION SUPPORT |
| • Visit planner (including co-morbidities) |
| • Risk assessment tools (e.g., FRAX for OA) |
| • Pain assessment |
| • Patient-centered functional assessment |
| • Behavioral interventions |
| • Point-of-care decision support |
| • Forum for discussing relative utility of treatment options (links to shared decision-making and delivery system design) |
| • Tiered approach to match severity |

| CLINICAL INFORMATION SYSTEMS |
| • Data to track impact on other chronic conditions |
| • Performance measures |
| • Iterative evaluation |
Next Steps

The group discussed ways to move forward with the suggestions and specific action steps, especially in the short term (within the next 6 months to 1 year) and looking ahead as well to the future.

An early action step would be to continue discussions during the meeting about refining the language and possibly combining some of the specific guidelines identified by Dr. Jordan and her colleagues in their review of summary recommendations. For example, some participants suggested splitting exercise and weight management recommendations into two separate ones. In the recommendation on providing education and regular contact to promote self-care, some suggested that the mention of “joint protection strategies” more properly belongs with the referral to PT/OT (now included in “consider range of motion, flexibility, endurance, and strengthening exercises”). Some would prefer that range of motion and other exercises be “advised” by the provider, and PT/OT referrals “considered” (due to reimbursement implications).

Moving forward, the plan is for small groups of COAMI participants to tackle the language of specific recommendations and provide a rationale for changes, and then present these back to the larger group for e-mail and/or conference call discussions to generate a new list.

On the following page is a list of action steps identified by the group, as well as the names of those who graciously volunteered to work on these actions. Others are free to join these groups. The agreement was to convene an initial conference call or e-mail contact, break the broad action into smaller steps or a mini-action plan, and then report back to the Steering Committee about progress, as well as any additional resources/information needed to move ahead in the time frame envisioned at the September 2013 COAMI meeting.
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<thead>
<tr>
<th>Action</th>
<th>COAMI Volunteers</th>
<th>Timeline</th>
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<tbody>
<tr>
<td>Review/revise <strong>summary recommendations/guidelines language:</strong></td>
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<td>By 3/14</td>
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<tr>
<td>- Combine patient self management and support recommendations</td>
<td>Mari Brick</td>
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<tr>
<td>- PT/OT recommendations (including exercise, modalities)</td>
<td>Carmen Kirkness</td>
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<td>Anita Bemis-Dougherty</td>
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<td>Marjorie Delo</td>
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<td>Review available <strong>risk assessment tools</strong></td>
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<td>Constance Chu</td>
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<td>Kelli Allen</td>
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<td>Maura Iversen</td>
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<td>Ken Caldwell</td>
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<tr>
<td>Develop <strong>visit planner template</strong> for OA (with co-morbidities)</td>
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<td>Within 6 months</td>
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<td>Kelli Allen</td>
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<td>Darren DeWalt</td>
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<td>Simon Piller</td>
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<td>Review/recommend <strong>obesity guidelines</strong> appropriate for OA</td>
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<td>By 3/14</td>
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<td>Sharon Bout-Tabaku</td>
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<td>Sue Kirkman</td>
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<td>Simon Piller</td>
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<td>Review <strong>pharmacologic treatment guidelines</strong> and develop CME activity (possibly with ACSM)**</td>
<td>Arthur De Luigi</td>
<td>3/14 for review; later for CME activity</td>
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<td>William Dexter</td>
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<td>Dan Swagerty</td>
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<td>Develop <strong>inter-disciplinary CME</strong> (engage organizations, develop train-the-trainer activity for ideal diagnostic methods, dissemination of guidelines, implementation)**</td>
<td>Kim Templeton</td>
<td>After model of care and other components are finalized (late 2014?)</td>
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<td>Janet Wyatt</td>
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<td>Scot Rheinecker</td>
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<td>Alexe Page</td>
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<td>Develop <strong>Fellowship Education/Training</strong> (to approach AAFP/Residency programs)**</td>
<td>Marjorie Delo</td>
<td>After model of care and other components are finalized (late 2014?)</td>
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<td>Alexe Page</td>
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<td>Arthur De Luigi</td>
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<tr>
<td>Review <strong>diagnostic criteria</strong> and use of imaging</td>
<td>Ken Caldwell</td>
<td>TBD; additional team members welcome!</td>
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<td>Identify best practices/recommendations for <strong>linking to community resources</strong>; basic inventory of typical resources available in many communities**</td>
<td>Patience White</td>
<td>By 3/14</td>
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<td>John Robitscher</td>
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<td>William Dexter</td>
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In addition to these relatively short-term actions, the group identified a number of more ambitious actions that could be tackled as time and resources permit, and as progress is made on the initial tasks the group has set for itself. These include:

- Considering how/when to include Medicaid and other payers in COAMI discussions
- Integrating OA models of care into other chronic illness models and implementation/design work (to address co-morbidities and take advantage of PCMH/QI initiatives)
- Developing marketing and dissemination campaigns to disseminate models, including conferences (e.g., APHA medical care section and policy endorsements), journals, government affairs offices, listservs, letters of support, other organizations involved in primary care redesign, nurse practitioners, consumer groups (e.g., Patients Like Me)
- Identifying and developing exemplars of OA care as a COAMI model of care pilot/model for the field
- Developing a sustainability model
- Establishing an OA National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS) measure
- Monitoring emerging technology and how it can support an OA model of care.

If these short- and longer-term actions unfold as planned within the next several years, it is hoped by COAMI’s steering committee and participants that OA can soon join other chronic diseases in offering a model of care that is far closer to the coordinated, proactive ideal than what is currently in place, taking advantage of the momentum created by other Chronic Care Models and changes underway in local, regional, and national health systems. In addition, the efforts of COAMI can help to overcome the view of patients, the public, and many health care professionals that OA is inevitable and that joint pain and related disability should be tolerated. Hopefully, the impact of OA on the management of other chronic health conditions will be recognized and addressed, to improve the care of all.
Appendix A: COAMI Management Conference Participants

Chair
Osteoarthritis Research Society International
Joanne M. Jordan, MD, MPH
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University of North Carolina at Chapel Hill
School of Medicine
Chapel Hill, NC

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Kaiser Permanente
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Department of Rehabilitation Medicine
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Director, Master of Science in Nursing Program
Lead Faculty, Orthopedic NP Concentration
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Maine Medical Center Family Medicine Center
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American Geriatrics Society
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Maura Daly Iversen, PT, DPT, SD, MPH
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American Public Health Association
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Detroit MRC Coordinator
Detroit Medical Reserve Corps.
Detroit, MI

American Public Health Association
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Cook County Health in Hospitals System
Chicago, IL

Institute of Pediatric Nursing
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Institute of Pediatric Nursing
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Movement is Life/Operation Change
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Movement is Life/Operation Change
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National Association of Chronic Disease Directors
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National Association of Chronic Disease Directors
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Worcester, MA

National Hispanic Medical Association
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Chairwoman, National Hispanic Medical Association
Director, UCSF-Fresno Latino Center for Medical Education and Research
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National Medical Association
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Susan Koshy
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William W. Dexter, MD, FACSM
Director of Sports Medicine
Maine Medical Center Family Medicine Center
Portland, ME

Joanne M. Jordan, MD, MPH (Chair)
Professor, Medicine & Orthopaedics
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