

# Musculoskeletal Health: Addressing the Leading Causes of Disability

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**Musculoskeletal conditions are not only the most common group of chronic health problems in our country, but they have a profound impact on critical domains of health including pain, disability, work participation, mental health, and potentially mortality. There are challenges to the treatment of common musculoskeletal conditions, including the current epidemic of opioid misuse and abuse. However, there are also evidence-based therapies that can be more effectively incorporated into care models for these conditions. This issue of the NCMJ describes the impact of common musculoskeletal conditions, gaps in care, and strategies for improving both prevention and management of these conditions.**

**T**he individual and societal impacts of musculoskeletal (MSK) conditions are striking, but they are often underestimated and underappreciated. These conditions, including arthritis, back and neck pain, and osteoporosis, affect one-half of all adults in the United States and three-quarters of those aged 65 and older, making these conditions more common than hypertension, diabetes, and cardiovascular disease [1]. Rates of MSK conditions are also rising substantially in the United States due to an aging population, high rates of obesity (including children), and increasing rates of joint injuries.

At the individual level, MSK conditions can have a truly profound impact. They lead to more activity limitations than any other health condition and are key culprits in the chronic pain epidemic [1]. In addition to these well-known consequences of MSK conditions, there is a growing appreciation that MSK conditions substantially impact many other aspects of daily life including mental health, sleep, and work participation. Recent research by Cleveland and Callahan, summarized in this issue, also indicates that symptomatic osteoarthritis in particular may impact mortality risk [2]. This is indeed a paradigm shift, as most MSK conditions have traditionally been thought to have little, if any, impact on lifespan. Although the mechanisms by which osteoarthritis may lead to earlier mortality are not fully understood, one intriguing and plausible pathway is through inactivity and functional limitations. Several interesting studies of US data have shown that arthritis is a critical barrier to physical activity among adults who are obese and those with

diabetes and cardiovascular disease [3-5]. Based on these emerging studies, MSK conditions are increasingly recognized as serious illnesses [6].

At the societal level, MSK conditions are associated with lost work days and significant health care costs; together these costs are estimated to be about \$874 billion per year and this amount is rising [1]. For health care systems in the United States, the volume of services delivered for MSK conditions is a tremendous burden and challenge. These conditions drive about 13% of health care visits [1], and they are a component of treatment in far more. A “supply side crisis” has been projected for joint replacement surgeries due to increasing demand and an inadequate number of orthopedic surgeons to accommodate this need [7].

MSK conditions are ubiquitous, affecting individuals across the lifespan. However, certain demographic subgroups bear a disproportionate risk. Older adults are at particular risk for disabling back pain and osteoarthritis, as well as osteoporosis and associated fractures. In this issue, Platts-Mills highlights recovery from an acute MSK injury as an under-recognized challenge for older adults [8]. The high risk for post-injury functional decline—and related negative outcomes—among older adults necessitates a comprehensive management approach that optimizes pain control, physical rehabilitation, and monitoring of psychological responses; this can be a particular challenge in fragmented health care environments. On the other end of the age spectrum, there has also been an increase in chronic MSK conditions among younger adults—particularly post-traumatic osteoarthritis—as a result of joint injuries [9, 10]. As summarized by Pietrosimone, military personnel are at particularly high risk for post-traumatic osteoarthritis [9], and this should be a priority concern in North Carolina given our large populations of military personnel and veterans. For both military personnel and athletes who suffer from anterior cruciate ligament and other injuries, adequate initial

Electronically published September 22, 2017.

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rehabilitation combined with ongoing education, monitoring, weight management, and appropriate movement patterns and activity can go a long way to optimizing joint health. As with a number of other chronic health conditions, racial and ethnic minority individuals bear a disproportionate burden of MSK conditions [11]. For example, a seminal North Carolina-based study, the Johnston County Osteoarthritis project, has documented greater prevalence and severity of osteoarthritis among African Americans compared with Caucasians [12, 13]. There are ongoing endeavors to mitigate racial and ethnic disparities in the prevalence, impact, and treatment of MSK conditions [14, 15], and as Campbell describes in this issue [11], critical components of these efforts involve enhancing access and cultural appropriateness of interventions.

### **Challenges in Management of MSK Conditions**

Several articles in this issue highlight key challenges facing providers, health systems, and patients in the quest to adequately manage common MSK conditions. Perhaps the most critical issue, and certainly the most highly publicized, surrounds the epidemic of opioid misuse, abuse, and related adverse outcomes, summarized by Chidgey and Murphy [16]. There are many ongoing policy, guideline, and research efforts aimed at reducing inappropriate opioid use. However, opioid reduction at the individual patient level is challenging not only because of the potentially addictive nature of these medications, but also due to the limited number of other effective and lower risk treatment options and/or access to other treatments. Raveendran and Nelson summarize treatment guidelines for osteoarthritis, a condition for which there are currently no disease-modifying therapies, and available symptom-reducing therapies produce modest effects [17]. However, a combination of these therapies—with weight management and physical activity at the core—can produce meaningful improvements in pain and function of individuals with osteoarthritis [18, 19]. Yet, multiple studies show that in our health care systems we are failing to adequately implement osteoarthritis treatment guidelines, including low use of nonpharmacological therapies such as physical therapy [20, 21]. Carvalho, Bettger, and Goode describe a number of specific barriers to rehabilitation and other therapies for patients with MSK conditions [22]. These include co-payments that make care unaffordable for some patients, annual visit limits that do not consider specific diagnoses or severity, and lack of access to rehabilitation providers (particularly in rural areas). These barriers have a very real impact on receipt of services, and therefore MSK outcomes, particularly among the most vulnerable patients. Changes in the health care environment, including shifts to value-based payments and bundled care (eg, total joint replacement care including rehabilitation), may affect these patterns. However, effects of these changes are largely unknown. There is a critical need to develop and implement sustainable care models that ensure patients

with MSK conditions receive guideline-based care, including recommended nonpharmacological therapies. Telehealth and mobile health based interventions have the potential to bridge these gaps, but larger effectiveness and implementation type studies are needed.

Treatment of rheumatoid arthritis differs from many other MSK conditions due to the availability of disease-modifying therapies. However, the availability of effective therapies does not eliminate treatment challenges. As summarized by Pisetsky in this issue [23], there are at least 2 key challenges to optimal management of rheumatoid arthritis. The first has to do with high medication costs, which result in payer requirements that can delay provision of what a rheumatologist believes will be the best initial therapy, and which also add significant administrative burden. The second is related to prompt diagnosis and treatment, which is critical for improving rheumatoid arthritis outcomes. Often due to inadequate training of health care providers in MSK care and a shortage of rheumatologists nationwide, misdiagnoses and delayed diagnoses of rheumatoid arthritis are common. Pisetsky notes that better systems are needed to improve the process of early diagnosis and treatment of rheumatoid arthritis [23]. Models such as early arthritis clinics have been successfully utilized in Europe and could be adapted for implementation within health care system structures in the United States.

### **The Path Forward: Reducing Risk and Improving Care for MSK Conditions**

A multifactorial approach is needed to reduce the burden of MSK conditions in the United States. First, there is an urgent need for preventive efforts. One obvious and critical area is reducing rates of obesity, as this is a key risk factor in many common MSK conditions, including osteoarthritis and low back pain, as described by Shultz and Ambrose in this issue [24]. Given the association of obesity with many other chronic health conditions, this is a priority area for the Centers for Disease Control and Prevention and other public health organizations. Reduction of risk for chronic MSK conditions should be included in messaging regarding the importance of maintaining a healthy weight. Another critical aspect of preventing chronic MSK conditions is reducing joint injury risk. Studies have shown that neuromuscular training programs can reduce injuries in both youth and adults, but a greater commitment to implementation is needed across populations at risk [25].

A second area of need is for innovative, integrated care models that promote evidence-based treatment of MSK conditions in an efficient manner. There is a particular need to improve utilization and access to rehabilitative and exercise-based therapies that are known to improve outcomes for many chronic MSK conditions. This is an area where linkage between clinical care and community-based services and programs is important. There are many free or inexpensive exercise and self-management programs available

in communities [24]. Clinician referral to these programs could help to boost patients' engagement in these activities. In addition, as described by George [26], care models for MSK conditions need to consider the multifactorial nature of pain, giving attention to interactions between physiological and psychological factors. One practical step toward this approach is the training of health care providers in "psychologically informed pain management." An example, which has been a focus of recent research, is training physical therapists to incorporate cognitive behavioral therapy into their treatment of patients with MSK conditions [27, 28].

A third area of need is for augmented research support to build the evidence base for treatment of MSK conditions. Research is needed not only to identify more effective therapies, but to study best practices for implementing evidence-based treatment components in a cost-effective and patient-centered manner. Unfortunately, funding for MSK conditions is quite limited, accounting for less than 2% of the National Institutes of Health budget since 2000 [1]. Given the tremendous and growing burden of MSK conditions in the United States, a greater investment in research to reduce and better treat these conditions is warranted [1].

## Conclusion

MSK conditions have truly reached epidemic proportions in the United States, fueled by a "perfect storm" of demographic trends: an aging population, health behaviors, obesity, physical inactivity, and joint injuries. Articles in this issue highlight a number of gaps in care for these conditions. However, there are also very real and feasible opportunities for improvements in preventive efforts and care quality. The heightened attention to opioid risks and misuse has also increased awareness of the need to promote nonpharmacological pain therapies, and there is a commensurate trend toward greater prioritization of funding for studies in this area. Although there are many unanswered questions regarding optimal management of many MSK conditions, evidence is clear that for many of these conditions, basic behavioral strategies (exercise, weight management, cognitive behavioral approaches) improve outcomes. These behaviors are not always easy for patients to adopt or maintain. However, health care providers should be encouraged to refer patients to available programs that support these behaviors. *NCMJ*

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## Acknowledgments

Potential conflicts of interest. K.D.A. has no relevant conflicts of interest.

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