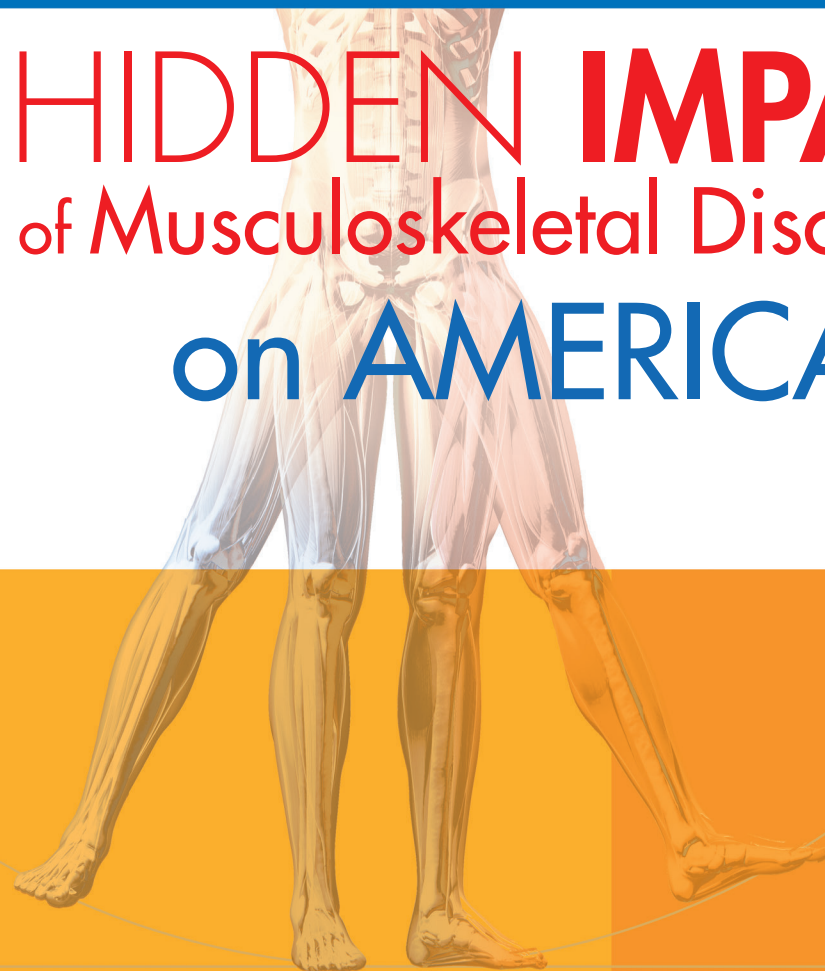




THE HIDDEN IMPACT

of Musculoskeletal Disorders

on AMERICANS



Bone
and Joint
Initiative
USA

www.boneandjointburden.org



THE HIDDEN IMPACT

of Musculoskeletal Disorders on Americans

At every stage of life, our bones and joints—and the muscles, tendons, cartilage, and ligaments that help move them—are vulnerable to injury and disease. With so many moving parts, it's not surprising that over the course of a lifetime, one or more elements of the intricate **musculoskeletal system** that supports our bodies and allows us to move freely can become damaged.

Examples surround us.

- Perhaps you have a parent or friend with arthritic joints, who has trouble opening jars or walking a short distance without wincing.
- Maybe it's your running buddy, contemplating (or perhaps recovering from) a knee replacement.
- It could be your daughter or son whose sports injury took him or her off the soccer field, or whose training injury took him or her off the battlefield.
- Maybe a senior in your life fell and broke his or her hip, and no longer lives independently.
- Or perhaps you yourself have visited a doctor, Emergency Department, or physical therapist at some point to seek relief for an aching neck or back, a swollen and tender joint, or a sprain, strain, or fracture.

Chances are high that these examples will conjure someone (or, more likely, several people) close to you, as they would for most Americans. **Musculoskeletal disorders** rob millions of people of their ability to live productively, independently, and free from pain, but are largely hidden in health and cost discussions. Already common today, they will become much more common—and costly—as the population ages.

However, **this common scenario is not inevitable.**

We already know a great deal about how to prevent and treat these problems, but our knowledge is still incomplete, and what we do know is not optimally shared with the public and providers. We can learn more through ongoing and new research.

The current situation can and must change. With targeted, strategic investments in scientific research and better practices in delivering care, we will continue to improve screening, diagnosis, and treatment, and to lower escalating costs within our healthcare system. At the same time, we can do more to prevent many of these disorders in the first place, or at least decrease their severity and impact on daily life.

This summary presents some highlights of the most currently available scientific and economic data about the impact of musculoskeletal disorders on healthcare costs, lost workdays, and activities of daily living—an impact that is often obscured by attention and investments in other conditions. It presents constructive ideas about how we can reverse these trends.

Many more details are available
at www.boneandjointburden.org.



What are Musculoskeletal Disorders?

- **Arthritis** and other rheumatic conditions that affect joints and connective tissues – such as osteoarthritis, rheumatoid arthritis, gout, and lupus
- Disorders and conditions of the spine – such as **low back and neck pain**
- **Spinal deformity** – such as scoliosis, which causes side-to-side curvature
- **Osteoporosis**, a condition caused by bones that weaken over a lifetime with greater risk of breaking
- **Cancers** of bone and connective tissue – such as bone and joint cancers and myeloma, a malignant primary tumor of the bone marrow
- **Injuries** to the neck, spine, pelvis, joints, and extremities, including fractures, sprains and strains

The IMPACT of Musculoskeletal Disorders at a Glance

Musculoskeletal Disorders:

- Are common and costly
- Affect all age groups
- Contribute significantly to **disability**, undermining the ability to work, overall **quality of life** and contributing to a loss of **independence**
- Are often **paired with other conditions** and diseases (co-morbidities), affecting health overall
- Warrant **more research and practice investments**, commensurate with their heavy toll on health, costs, and well-being; and
- **Can be prevented and treated** more effectively—often with knowledge and practices that already exist

Musculoskeletal Disorders are COMMON

More than 1 in 2 adults—124 million Americans over 18—reported a musculoskeletal medical condition. That exceeds the next two most common health conditions: circulatory conditions (such as heart disease, stroke, and hypertension) and respiratory conditions (such as emphysema and chronic asthma).

Number of Americans over 18 who reported a musculoskeletal medical condition in 2015:

124 MILLION



More adults reported musculoskeletal conditions than any other self-reported medical conditions.

50.1 per 100

Source: National Health Interview Survey (NHIS). Adult sample, 2015.
<http://www.cdc.gov/nchs/nhis/data-questionnaires-documentation.htm>. July 23, 2016

Musculoskeletal Disorders are COSTLY

The economic impact of musculoskeletal disorders can be measured in several ways.

DIRECT COSTS

are the costs within the healthcare system, such as **treatments** provided in clinics and hospitals, including emergency departments, and the cost of prescription **medications**.

INDIRECT COSTS

represent estimates of **lost wages**, since **adults of working age** (in the 18-64 age range) with musculoskeletal disorders miss work more and may earn less.

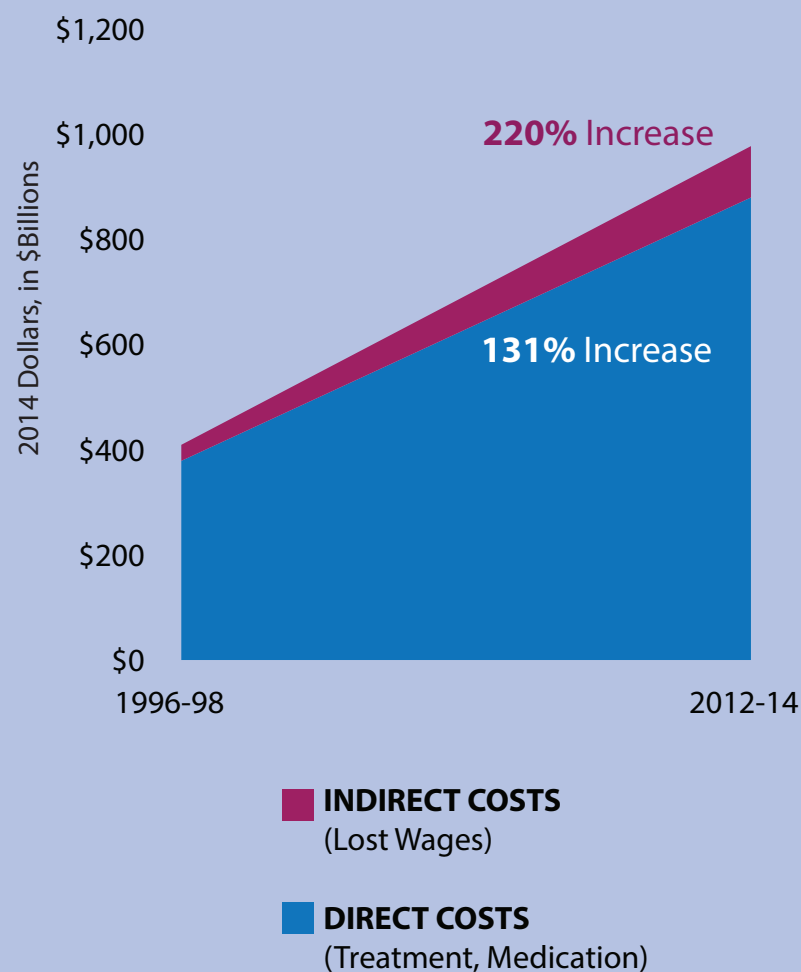
Both types of costs have jumped significantly—so much so that they constitute a significant proportion of the US Gross Domestic Product (GDP). GDP is a standard measure of an entire economy—the total value of all the goods and services provided in a year.

Between 1996 and 2014, the costs of musculoskeletal disorders represented increasing shares of GDP, from 3.44% of GDP in 1996 to **5.76% of GDP** in 2014, **exceeding defense spending** for that year.

In all of these categories—direct costs, indirect costs, and share of GDP—the **economic impact** of musculoskeletal disorders is increasing.

The combination of a growing and aging population guarantees that these costs will increase, unless current trends are reversed.

Jumps in TREATMENT COSTS and LOST WAGES because of MUSCULOSKELETAL DISORDERS, 1996-98 – 2012-14 (2014 dollars), in \$Billions



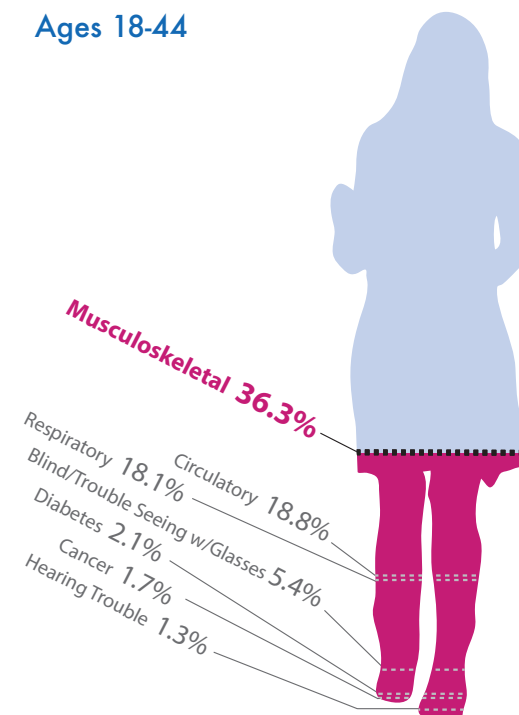
Musculoskeletal Disorders AFFECT ALL AGE GROUPS

Not surprisingly, as people age, conditions such as hearing and vision problems, cancer, and heart disease become more common. Still, across all adult age categories, musculoskeletal conditions are either the **most commonly reported** medical conditions (among those under 65) or **second most commonly reported** (among those 65 and older).

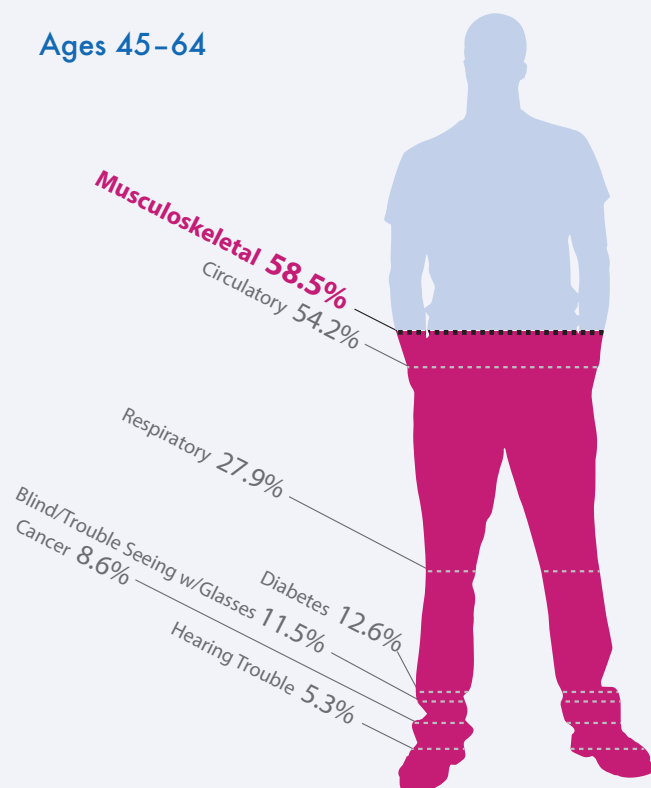
Because of musculoskeletal conditions, millions of people are living with pain, having trouble moving around, or finding it difficult to complete tasks of daily life, often for years and even decades.

Musculoskeletal disorders can make other conditions even more difficult to live with, multiplying their impact. For example, back or knee pain may make it more difficult for people to get the daily physical activity that would help prevent the progression of other chronic conditions such as diabetes or heart disease.

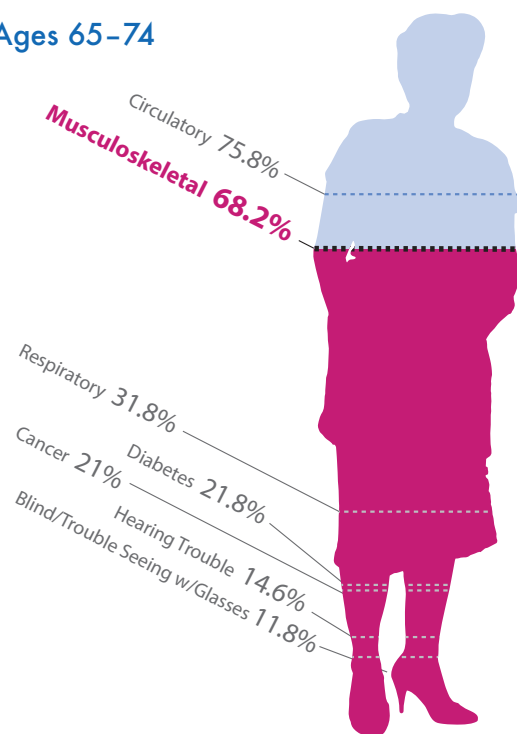
Ages 18-44



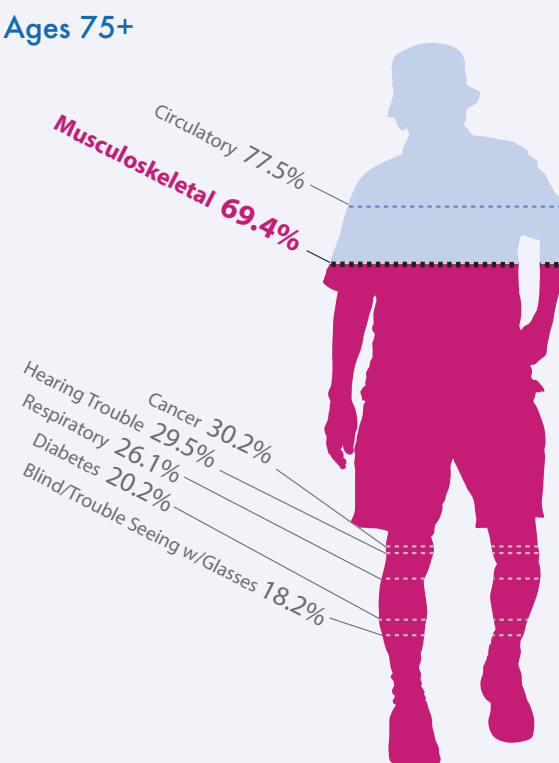
Ages 45-64



Ages 65-74



Ages 75+



Musculoskeletal Disorders Contribute Significantly to DISABILITY, LOWER QUALITY OF LIFE, and Inability to Work

Daily routines require activities such as bathing, grooming, getting dressed and undressed, preparing meals, walking back and forth, and being able to use the bathroom without assistance. When these activities are truly routine, they are barely noticeable. But when disorders such as back or neck pain, arthritis, or rheumatism interfere with the ability to perform these tasks, they can become extremely limiting.

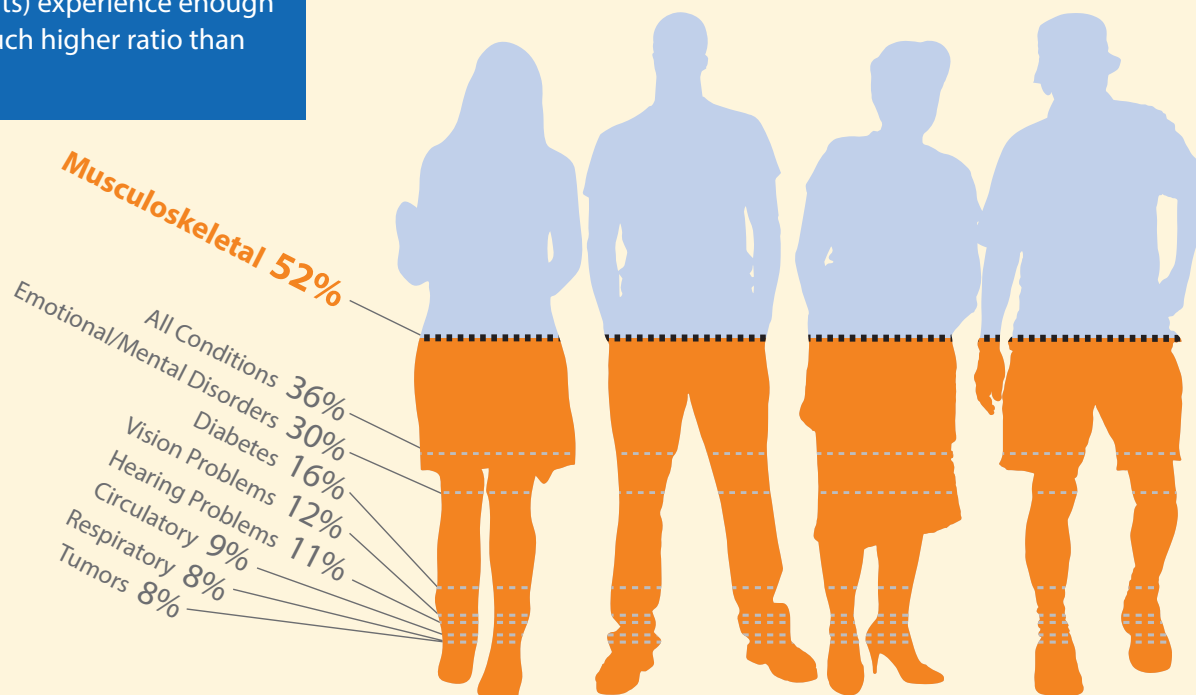
The National Health Interview Survey asks respondents about whether or not they experience limitations in performing normal **activities of daily living (ADL)** due to a medical condition. In 2015, more than 82 million adults—36% of the adult population—said that they experienced difficulties performing routine ADL without help, due to a medical condition. Of those adults reporting ADL limitations, **64 million had a musculoskeletal condition**. This means that about half of those with a musculoskeletal condition (124 million adults) experience enough impairment that it interferes with their ADL—a much higher ratio than for other medical conditions.

Musculoskeletal disorders interfere with an important activity of daily living for adults: **work**. Back pain alone accounted for more than **264 million** lost work days in one year. Arthritis, the leading cause of disability in the United States, limits the type or amount of work that at least 1 out of every 4 working age adults with arthritis can perform—if they are able to work at all.

For workers with musculoskeletal conditions (including back and neck pain, arthritis, as well as others), these days add up quickly: **an average of 10 days per worker every year**. That's a double or triple hit on costs: treatment, medications, and lost productivity, which includes lost wages.

Percentage of people with a medical condition who report it interferes with activities of daily living:
Musculoskeletal conditions exceed all others

Not surprisingly, musculoskeletal conditions outrank other conditions as a cause of lost work days, with many implications for productivity.



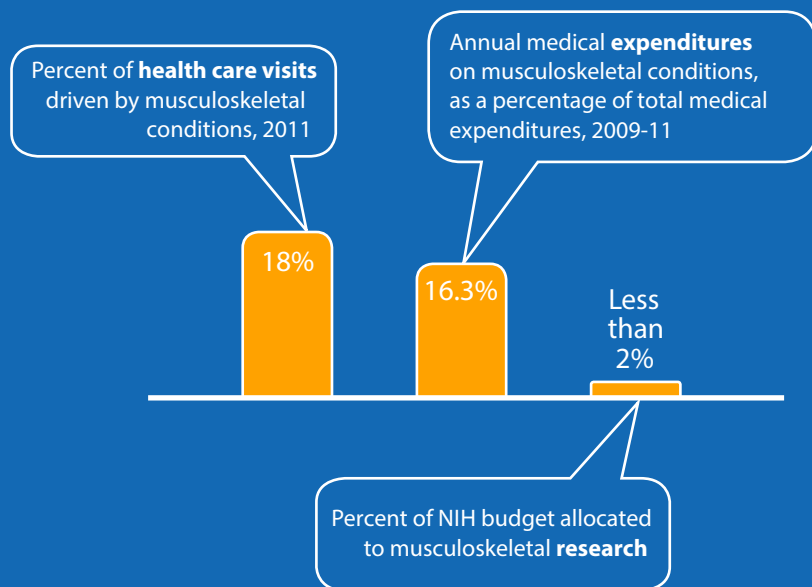
Musculoskeletal Disorders Warrant GREATER INVESTMENTS in RESEARCH and CLINICAL PRACTICE

Low back and neck pain are among the top five causes of disability, according to the *Global Burden of Disease*, and osteoarthritis is in the top 20. Despite the significant economic and health impact, affecting such a large proportion of the population, these disorders receive far less research investment than other conditions.

Within the National Institutes of Health (NIH) budget, for example, the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) received its lowest funding to date in 2016, when it received just 1.68% of the total NIH budget (from a high of 2.34% in 1991, soon after NIAMS was formed). Between 2012 and 2016, NIH funding for musculoskeletal conditions was \$7.9 billion, compared to \$42.1 billion for cancers and \$23.1 for heart and circulatory disorders.

Addressing this imbalance in funding has the potential to affect the true burden of disease by reducing disability rates.

NIH Research Investments, 2012-16: Musculoskeletal Conditions Lag Behind Other Conditions



CAN BE PREVENTED and/or Treated More EFFECTIVELY

If research, education and other funding for musculoskeletal conditions were more aligned with its impact on health, costs, and quality of life, where should we focus our attention?

Each type of musculoskeletal disorder raises its own set of unanswered questions. Addressing even a portion of them would contribute to more informed responses to current challenges and unmet needs, with potential to change the future trajectory of increased costs, pain, and disability.

In addition to pursuing new [research](#), we can improve outcomes by implementing changes in [awareness](#) and [practice](#) based on existing research results. Gaps in basic knowledge among the public and some practitioners mean that these conditions may not be diagnosed or treated with the most up-to-date or clinically effective methods. Dramatically improved treatments for inflammatory conditions (such as rheumatoid arthritis) and osteoarthritis (through physical activity and total joint replacements) show that treatment advances are possible, but they will not occur without adequate funding and a health system organized to deliver care effectively.

Below are selected recommendations from experts in the field, demonstrating that greater investments could be put to immediate use. (For a more comprehensive and detailed compendium, please see [The Burden of Musculoskeletal Diseases in the United States](#).)

OVERALL

Preparing the Healthcare Workforce to Respond to Patients' Needs

A key contributor to rising costs is the [aging of the US population](#). With musculoskeletal conditions and other chronic diseases more prevalent and more severe as people age, the demands on the healthcare system will increase. Unfortunately, the growth of the [healthcare workforce](#) is not keeping pace. New physicians are not entering some medical specialties of particular importance to this population, such as rheumatology and geriatrics.

Across the spectrum of musculoskeletal conditions, changes are required in recruiting and training healthcare professionals, as well as providing incentives and support for inter-disciplinary teams that are more responsive to the needs of patients. [Many primary care practitioners](#)—where patients are most likely to turn for help before consulting a specialist—do not receive up-to-date training in musculoskeletal disorders in medical school or continuing education and are often not informed about the potential for earlier interventions, treatment options, and when to refer to specialists. Medical schools in the US must teach state-of-the-art knowledge, skills and attitudes regarding the musculoskeletal system and its disorders.

Measuring the Burden in Younger Populations

An important overall research gap is [measuring the burden of musculoskeletal conditions in young and active patients and pediatric populations](#), comparable to the measures of lost wages and workdays for adults and caregivers. As pediatric patients transition through adolescence into adulthood, they are often lost to follow-up, making it difficult to understand adult manifestations of pediatric musculoskeletal conditions. Better long-term follow-up data on pediatric musculoskeletal conditions would address this knowledge gap.

Low Back and Neck Pain:

Understanding Current Treatments While Developing New Ones

As noted above, back pain was the cause of at least *264 million* lost work days—enough to account for more than 2 lost work days for every full-time worker in the country. Research funding for care and prevention is needed to [compare the effectiveness of treatment alternatives](#), develop [new treatments](#), and evaluate [prevention approaches](#). Research could help answer questions such as:

- What is the [influence of hip and spine disorders](#) on the outcomes of treatment for low back pain?
- Why do some people with [degenerative disc disease](#) experience [pain](#), while others do not?
- What is the [most effective treatment for back pain](#)?
- When are [non-surgical interventions](#) (such as injections) most effective? When is surgery needed?
- How can better diagnoses and treatments be offered in [primary care settings](#) to improve access, while coordinating with other providers (e.g., physical therapists, chiropractors, alternative care providers)?

Another important gap is the [lack of comprehensive, reliable outcomes data](#) for all treatment settings and types, since no databases fully cover outpatient procedures like injections or treatments by athletic trainers, physical therapists, chiropractors, and other providers from whom many patients seek treatment.

With all these uncertainties, many of those suffering from neck or back pain may inadvertently do exactly the opposite of what is recommended. Educating the public *and* providers about effective responses can alleviate pain and suffering, and may help some avoid costly and/or painful surgeries that do not necessarily yield better outcomes.

Arthritis:

Improving Access to Care and Engaging Patients

Arthritis includes the most common type of arthritis (osteoarthritis, or OA) as well as the various forms of inflammatory arthritis, which include rheumatoid arthritis (RA), gout, and spondyloarthritis, connective tissue disease (including lupus), fibromyalgia (FM), psoriatic arthritis, and other conditions. More than 1 in 4 adults has doctor-diagnosed arthritis; by 2040, an estimated 78 million Americans will have doctor-diagnosed arthritis if current trends continue.

Across the different types of arthritis, common challenges include [access to care](#), patients' [adherence to treatment regimens](#) (such as taking medication regularly or making difficult and lasting lifestyle changes), and attention among both patients and providers to the role of [evidence-based non-pharmacological interventions such as exercise and behavior modification](#). In part, this is due to [reimbursement models](#) that create incentives for short-term treatment at the expense of ongoing, long-term management of chronic diseases.

Promising areas for research include the following:

- What is most effective for pre- and post-operative [pain management](#) (especially [non-opiate](#) forms)?
- Are there more effective ways to [engage patients](#) in treatments that are proven to effectively decrease OA morbidity, such as exercise and weight loss?
- What is the [role of systemic inflammation](#) in the development of arthritis?
- How can [co-morbidities](#) that often accompany arthritis be addressed and linked (e.g., weight loss, physical activity, nutrition counseling, behavioral health)?
- What [prehabilitation lifestyle/exercise regimen](#) is best, prior to a joint replacement?

- What is the [best timing for joint replacements](#)?
- What are the causes of joint replacement failure and how do we best treat/prevent them?
- What are the best [settings for post-operative rehabilitation](#) (e.g., acute care inpatient rehabilitation facility, skilled nursing facility, physical therapy at home or as an outpatient)?
- What causes the majority of people with [ACL injuries](#) to progress to OA, while some do not?
- What is the best time to intervene among people with ACL injuries to prevent or alter the risk of OA following injury?

Injuries:

Building on Progress in Preventing Specific Types of Injuries

- Musculoskeletal injuries among [workers](#) have declined, but still account for over half of all worker nonfatal injury cases that involve days away from work.
 - What are effective strategies for understanding, preventing, and treating this common and costly type of injury?
- Studies using National Collegiate Athletic Association data suggest that college [athletes](#) who have sustained an injury during their college years have lower health-related quality of life scores that are likely to worsen over time. This is especially true for those who experienced a joint-related health issue or long-term, major chronic injuries. This can affect overall quality of life as well as the ability to address other chronic disease risk factors (e.g., maintaining physical activity levels later in life).
 - Which factors contribute to the poorer health-related quality of life outcomes for college athletes?
 - What are the implications for recreational and scholastic athletes?
- Building on prior research and progress, what can be learned and applied to decrease the considerable toll of injuries in the [US military](#) (e.g., in basic training activities, sports, falls, and motor vehicle crashes), which are the primary factors impacting military readiness?
 - What are modifiable causes, risk factors, and effective prevention strategies? Effective injury prevention would make a significant contribution to the health and productivity of active and veteran military personnel.

Neuromuscular Diseases:

Identifying Models and Training Providers

- What are [cost-effective healthcare model systems](#) for patients with neuromuscular disease?
- How can physicians and allied health professionals receive better training in the [management of chronic neuromuscular disease](#), including training on how to prevent complications (such as falls prevention) or cost-effective treatment options (such as telemedicine for patients at home)?
- How can [primary care providers](#) better manage patients with neuromuscular disease in community settings?
- How can [interdisciplinary teams](#) collaborate more effectively?

Osteoporosis:

Fixing A Fractured Approach

The number of people with osteoporosis—low bone mass and strength that can increase the risk of fracture—is expected to increase from an estimated 10.2 million people in 2010 to 13.6 million in 2030. The estimated number of people with low bone mass—a potential precursor to osteoporosis—suggests steady increases as well, growing from 43.4 million in 2010 to 57.8 million over the same time frame.

Fractures are significantly associated with subsequent fractures. As the saying goes, “[Fractures beget fractures](#).” Although the burden of osteoporosis is growing, testing and treatment are not keeping pace; even after a fracture, many healthcare providers do not discuss osteoporosis and fracture risk with their patients.

Research needs include [new drugs and therapies](#) to treat the condition, heal faster, and prevent additional fractures; changes to [treatment care approaches](#); and funding to test the effectiveness of [new therapies and treatments](#). One treatment care example is the Fracture Liaison Service (FLS) model for coordinated care among primary care, orthopaedic, emergency department providers, and other specialists, which tracks patients through a registry and allows for more consistent post-fracture assessments and follow-ups.

The IMPACT of GREATER INVESTMENTS in PREVENTION, DIAGNOSIS, and TREATMENT: IMPROVED OUTCOMES and LOWER COSTS

Continuing with the current *status quo* means accepting a steadily increasing toll of musculoskeletal disorders as the population grows and ages—a toll measured in healthcare costs, pain, disability, and lost productivity.

Instead, investments across the spectrum of musculoskeletal diseases would pay off for all of these disorders and conditions, and could offer benefits for addressing other chronic conditions as well.

IN THE NEAR FUTURE, what if ...

- The parent with arthritic joints, or you yourself, could enjoy being mobile and active far longer into the natural lifespan, living relatively pain-free and more independent than would otherwise be the case?
- Your running buddy hadn't needed a knee replacement, even though it worked out well for her?
- Your colleague's back or neck pain either never materialized in the first place, or was resolved quickly and thoroughly?
- Your teenager with a sports injury avoided the ACL tear that could have followed her into adulthood?
- Your older neighbor didn't fall at home or at the assisted living place, and avoided a spiral of decline (*affecting one of two seniors over 75 who fall*)?

These scenarios, multiplied by thousands and millions of people, are the compelling vision of the specialists in orthopaedic surgery, rheumatology, physical medicine and rehabilitation, and other musculoskeletal specialties who contributed to *The Burden of Musculoskeletal Diseases in the United States*. It is a vision that is within reach, but only if investments in musculoskeletal diseases match their burdensome impact on America.

The Burden of Musculoskeletal Diseases in the United States: Prevalence, Societal and Economic Cost (4th Edition), published by the United States Bone and Joint Initiative, NFP (USBJI), is a joint project of the organizations listed below.

This summary has been developed from the full publication, which can be viewed at www.boneandjointburden.org.

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Radius Health

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Scoliosis Research Society

Zimmer Biomet

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The material presented in *The Burden of Musculoskeletal Diseases in America: Prevalence, Societal and Economic Cost* is made available for informational purposes only. This material is not intended to suggest procedures or course of treatment, only to provide an interpretation of available data on the incidence and prevalence of most major musculoskeletal conditions.

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Global Alliance for Musculoskeletal Health

The Global Alliance is an international collaborative movement sanctioned by the United Nations/World Health Organization working to improve the quality of life for people with musculoskeletal conditions and to advance the understanding, prevention and treatment of these conditions.



United States Bone and Joint Initiative, NFP

The United States Bone and Joint Initiative (USBJI), publisher of *The Burden of Musculoskeletal Diseases in the United States: Prevalence, Societal and Economic Cost*, is the U.S. National Alliance of the Global Alliance. The USBJI advocates and promotes multidisciplinary, coordinated, and patient-centered care to improve the prevention, diagnosis, and treatment of musculoskeletal conditions



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The Burden of Musculoskeletal Diseases in the United States: Prevalence, Societal and Economic Cost

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*Arthritis, Low back and neck pain, Spinal deformity, Osteoporosis, Cancers of bone and connective tissue, Injuries, Neuromuscular conditions

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**INVEST IN
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