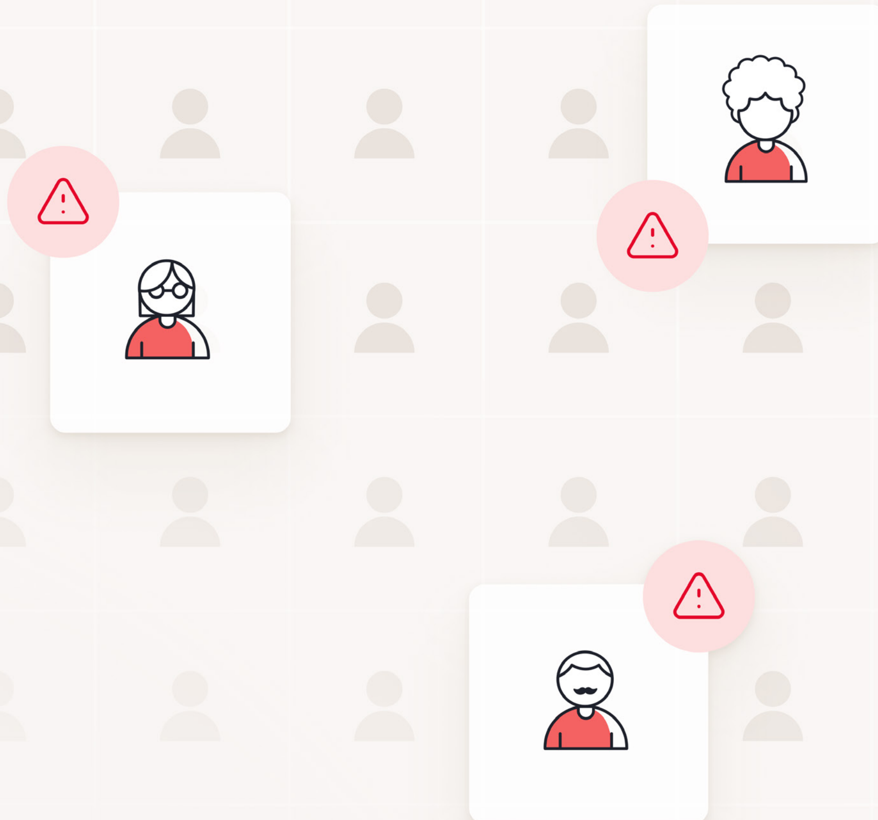


sword

The MSK Money Pit: $10 Million Wasted Every Hour on Low-Value Musculoskeletal Care in the U.S.

Index

Introduction

Wasteful spending in musculoskeletal (MSK) care is both entrenched and ubiquitous.

But it doesn't need to be this way. New analysis by Sword Health of claims data from tens of thousands of patient cases reveals one key area to address to drastically reduce medical spend and optimize precious clinical resources: low-value care.

Our analysis shows that nearly **36% of all MSK surgeries are not evidenced-based, not necessary, and could be prevented**—part of a systemic pattern of low-value care that's costing patients, their employers, and health plans as much as $90 billion per year.[1]

Low-value care refers to medical interventions that do not offer real benefit to patients in managing their conditions, compared to their costs, and may even be at odds with clinical guidelines.[2,3]

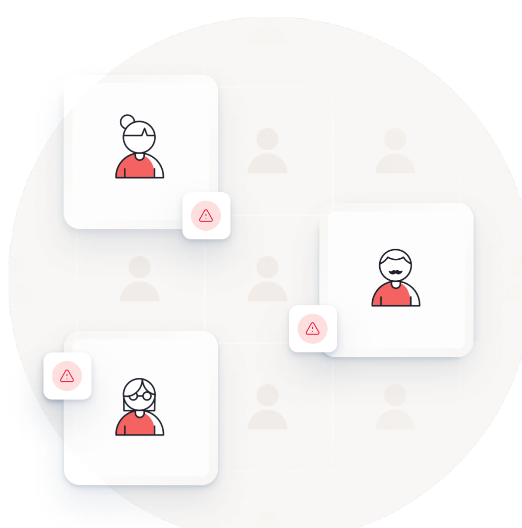
To arrive at our findings, we analyzed nearly 170,000 cases involving people eligible for MSK treatment. Here's what we found:

- Low-value care accounted for 18% of all MSK-related costs in these cases, a staggering figure when applied to the total amount spent on MSK care in the U.S. annually

Nearly **36%** of MSK-related surgeries performed were not necessary and a wasteful use of medical resources

- 80% of the cost of low-value care came from surgeries that were performed without first attempting physical therapy, a proven and much more affordable intervention for MSK pain
- Another 14% of costs came from surgeries where the condition was not resolved within six months, leaving patients in the same or even worse shape than if they attempted no surgery at all
- Just a fraction of the population was responsible for the majority of the overall costs associated with low-value care
- The most wasteful surgeries are also some of the most popular elective surgeries in the U.S., including total knee replacement, hip replacement, and spinal surgery

With $505 billion spent on MSK conditions each year in the U.S., our analysis suggests that low-value care for the treatment of muscle and joint pain amounts to at least $90.9 billion in unnecessary medical spend annually.[1] This amounts to approximately $10.3 million wasted every hour of every day on care that is doing little to improve people's lives.



Given these findings, **steering patients away from low-value interventions and toward physical therapy** as a first intervention provides the biggest opportunity to drastically cut MSK spend, and most importantly, **improve health outcomes for everyone**.

By bringing together data, artificial intelligence, and proven, low-cost interventions, Sword is taking the leadership position in solving the epidemic of unnecessary surgery and the persistent problem of low-value care. Read on to learn more about the impact of low-value care on patient outcomes and costs, and how Sword is developing the first artificial-intelligence engine to predict and prevent unnecessary surgery.

Why do patients so often receive low-value care?

The U.S. healthcare system is one that is characterized by fragmented, disjointed, and disparate care.

The patient experience is typically siloed from practice to practice. Not everyone receives the same standard of care. This is especially true if the patient is in an underserved population. There is a systematic overuse of healthcare resources.[4,5,6]

Another reason is that clinical practice seems to lag about 15 years behind clinical recommendations.[7] Although these guidelines reflect best practices developed from quality evidence and clinical thought leaders, they are inconsistently applied because of factors that include:

- Practitioner specialty and past experience[8]
- Practice setting and technological capabilities[9]
- Fee-for-service model and other financial incentives[9]
- Health illiteracy and health disparities[11,9]
- Insufficient practitioner communication skills[12]
- Defensive medicine considerations[13]
- Incentives towards patient satisfaction and self-referral[10]

Once these delivery patterns are established, they are slow to change, especially if they require substantial investments in technology and infrastructure, and generate substantial revenue.[9]

Another key driver of low-value care includes patient preference, especially for options that appear to be more convenient than going to physical therapy for weeks or months. In-person PT requires patients to schedule appointments, take time off work, and commute to and from a clinic—perhaps for months at a time.

For these reasons, many patients fail to adhere to their program, leading some to pursue alternative treatments such as injections or surgery.

However, what many patients don't realize is that surgery can come with a host of complications, including risk of hospital readmissions, painful recovery, even greater disability, and increased odds for a second surgery. Plus, recovery after surgery is hard, long, and usually involves physical therapy—so there is really no point trying to avoid it in the first place.

What are the consequences of low-value care on patients?

Almost everyone loses when it comes to low-value care—and the impact extends far beyond wasted money and time.

The major negative consequences of low-value care for patients include:

- Poor health outcomes
- Higher risk for side effects and need for additional care
- Inappropriate care escalation
- Higher patient psychological distress and suffering
- Higher healthcare-associated costs (impacting both patients and society)
- Increased productivity losses (healthcare-related absenteeism)

Additionally, low-value care is one of the main drivers of inequalities in healthcare, since patients in minority racial and ethnic groups are more likely to receive low-value care than their white counterparts.

This is due to a variety of socioeconomic factors, including lack of provider access, cost, lack of insurance, and lack of access to linguistically and culturally appropriate care.[9]

What happens when we replace low-value care with better interventions?

There is a wealth of evidence that suggests non-invasive care should be the first line intervention in MSK conditions, with education and exercise as the mainstay of care. In addition, most guidelines recommend against using imaging too early and also against utilizing injections and other invasive interventions until the benefit of physical therapy has been clearly ruled out.[14-20-18]

The early delivery of well-designed physical therapy has been associated with:

- ↓ Lower costs[5]
- ↓ Less consumption of opioids[21,23]
- ↓ Less escalation towards invasive procedures, such as injections[23]
- ≈ Similar long-term outcomes as surgical interventions[24-27]

Unfortunately, physical therapy is not typically presented as the first line of defense. In fact, quite the opposite is true: Currently, musculoskeletal care is plagued with an overuse of advanced imaging techniques.[28] This is driven in part by insufficient health literacy and by the practice of defensive medicine. Additionally, there is a popular misconception that surgery leads to fast recovery, even though the effectiveness of most surgical interventions over physical therapy remains highly debatable.[13]

Taken together, these factors help explain why patients with MSK pain conditions often receive treatments that are neither standardized nor evidence-based.[1,3,9]

A deeper look into low-value care in treating MSK

> In fact, early MRI has been associated with an eight-fold increased risk of surgery in patients with acute low back pain (LBP).[37]

Imaging

We have witnessed an explosion of clinical MRI use and expenditure over the past two decades, by as much as 30% annually. However, this has not resulted in better treatment decisions or outcomes for people with MSK pain, and has led to worse outcomes in some cases.[29-31]

Despite the lack of reliable outcomes, it is estimated that 20% to 50% of patients undergo low-added value imaging—often on their very first visit with their consulting physician.[32,33] Part of the problem is due to insufficient health literacy. Research shows that patients feel more satisfied if they receive advanced imaging for their MSK condition —even if it's unnecessary and not helpful for their condition.[10,11]

Early imaging, however, frequently triggers additional medical care (e.g. additional testing, specialist referral[19], surgery, and invasive procedures)[28,34] and increases the risk of adverse outcomes and also absence from work.[35,36]

In addition to these risks, clinically irrelevant imaging findings (which are frequent even in children and asymptomatic adults) causes patients to worry more, focus excessively on minor symptoms, or avoid exercise or other recommended activities due to fears of further injury.[16,38,39]

Besides these potentially serious clinical and human consequences, there is also the economic burden. In a study involving 2.5 million privately insured adults with newly diagnosed LBP, imaging alone without further interventions accounted for nearly 20% of the overall nonsurgical healthcare spend—adding up to more than half a billion dollars annually.[4]

By contrast, by following guidelines for the care of LBP, patients, their employers and/or health plans could have saved $362 million each year.

Opioids and Injections

The use of opioids should be the last-resort treatment option for most patients. There is little evidence of their effectiveness against chronic MSK pain.[40]

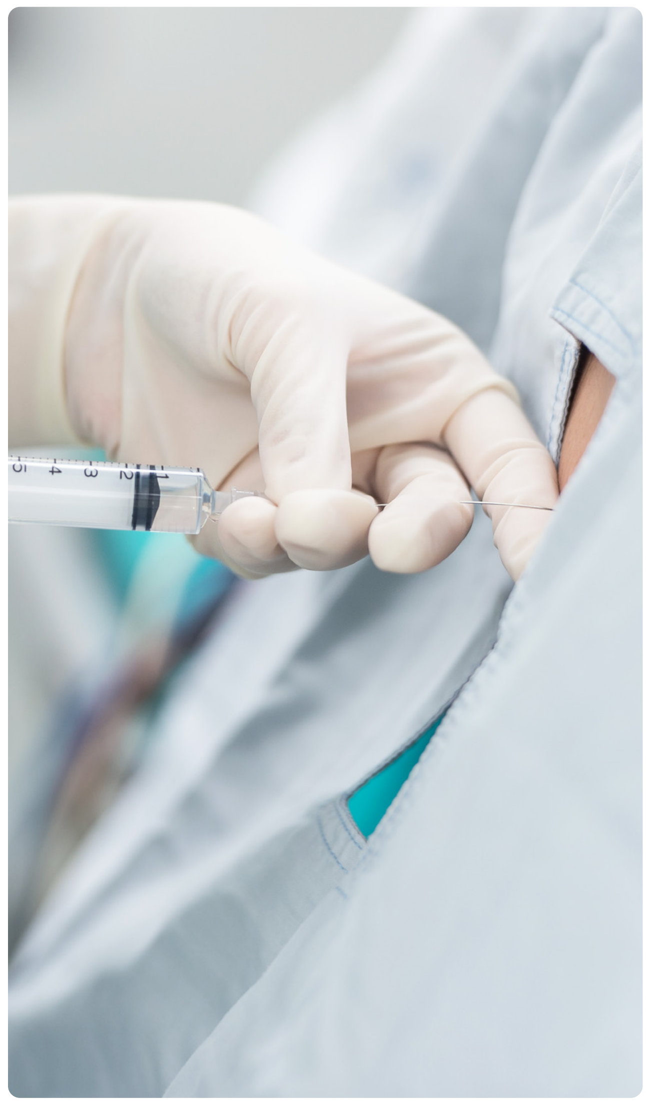
> **In 2017, the CDC reported that more than one-third of the 47,600 opioid overdose deaths in the United States involved prescription opioids.[41]**
>
> **Nevertheless, up to 40% of patients with LBP receive opiates within the first year of diagnosis.[42]**

The United States and Canada have a seven-fold higher rate of opioid prescriptions filled in the immediate postoperative period compared with Sweden.[43]

Opioids can severely impact an individual's quality of life, leading to unnecessary costs and addictive behavior, and possibly fatal overdoses. It's not just patients with prescriptions who are harmed —a majority of people misusing opioids say they get them from friends or family with legitimate prescriptions.[44] Unfortunately, opioid prescription rates have been reported to be twice as high as physical therapy referral.[45]

Epidural injections can provide short-term pain relief, usually lasting less than four weeks. However, they do not seem to provide long-term relief or reduce the long-term risk of surgery,[36,46] and have been tied to rare but serious adverse events, including loss of vision, stroke, paralysis, and death.[47,48]

Yet, lumbosacral epidural injections have increased approximately 609% from 2000 to 2014 among Medicare beneficiaries.[47] Intra-articular injections are also commonly used to provide short-term pain relief for osteoarthritis;[48] however further cartilage loss may still occur.[51,52]



Surgery

Surgery should be the final step in care escalation. However, the odds of a successful MSK-related surgery are much lower than most patients probably realize.

> For example, **there is an alarming lack of clinical trials that compare the effectiveness of surgical procedures to no surgery at all.[53]**

This is the reflection of a number of factors: lack of incentives to perform such trials, insufficient infrastructure and expertise in trial research, or even the perception that some procedures are so effective that they are likened to the “parachute analogy.”[53]

Moreover, the majority of the existing trials that do make that comparison are mostly not in favor of surgery when analyzing long-term outcomes. This is true for a number of areas, including spinal surgery (spinal stenosis, vertebroplasty), knee surgery (partial meniscectomy, anterior cruciate ligament), hip surgery (debridement), and shoulder surgery (surgical repairment of incomplete or small rotator cuff tears).[24,54-62]

We know that non-guideline care decreases the chances of success. This, paired with misconceptions and lack of evidence around some surgical procedures, results in potentially unnecessary surgeries.[63,64]

In 2020 alone, it was estimated that 13,541 spinal fusions for low back pain were unnecessary[65]. In fact, research has shown that having a second opinion for surgery can decrease surgical pathway by 58% when analyzed by a multidisciplinary team.[66]

There is also no guarantee of a successful outcome from surgery. Several studies show that up to 46% of the patients with spinal surgery do not become pain-free, regardless of the applied surgical technique.[67-69]

Plus, having one spine surgery increases the probability of getting another spine surgery.[70] This is also a common scenario in other conditions, such as rotator cuff tears where recurrent tears after large or massive repairs remain a problem, ranging from 13% to 94%.[71]

Less discussed is the impact of the damage that the surgery itself can induce.[72] The reality is that the post-surgical recovery process is often long, painful, and necessarily involves lengthy physical therapy programs. In some cases, such as with shoulder tendon repair surgeries, the rehabilitation process can often last 3-6 months, and the patient is expected to experience pain and discomfort throughout this period.

How much is low-value care costing patients, employers and health plans?

So far, we have been mainly discussing the clinical impact of low-value care. But this is only part of the problem. The other major component is the unnecessary costs associated with healthcare that is not appropriate, not necessary, nor effective.

To estimate the economic impact of low-value care, analysts at Sword Health looked at claims data from 169,400 eligible members receiving care in 2022.

Within this group, 24% of members had at least one medical procedure for MSK-related treatment, culminating in a total cost of $200,998,551 ($4,844.51 per eligible member).

Our analysis found that low-value care made up 18% of the total cost of services, or just over $37 million. Only a fraction of the eligible members accounted for the entirety of this cost, highlighting the opportunity to dramatically reduce costs by targeting the few patients who are most prone to low-value care.

We determined that the nature of the low-value care fell into three distinct categories:

Tier 1

Services that went against accepted medical guidelines.

Cost

$1,638,433

or **4%** of total low-value care

Tier 2

Surgeries that were performed without attempting conservative care first (physical therapy or chiropractic care).

Cost

$30,254,017

or **80%** of total low-value care

Tier 3

Surgeries that did not benefit the member because the condition was not resolved six months later.

Cost

$5,134,187

or **14%** of total low-value care

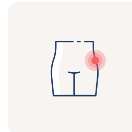
In Tier 1, the unnecessary services that went against clinically accepted guidelines included:

- Meniscectomy in patients with degenerative joint disease of the knee (total cost: $1,515,320)
- MRI for lumbar spine pain without first trying conservative care (total cost: $122,762)

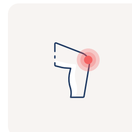
The surgeries performed in Tier 2 and 3 are deemed not necessary and could have been prevented altogether if the patient had been offered and attempted alternative, less invasive treatments before resorting to surgical intervention.

In all, we found that up to 36% of MSK-related surgeries were wasteful—a staggering statistic when you consider how many surgeries are performed each year.

These avoidable surgeries included some of the most popular elective procedures for the treatment of MSK pain, such as:



Hip arthroplasty for hip osteoarthritis
total cost: $4,550,693



Knee arthroplasty for knee osteoarthritis
total cost: $12,047,316

Shoulder arthroscopy or open distal clavicle resection for impingement/arthritis
total cost: $3,443,407

Spinal surgery for lumbar herniated disc
total cost: $4,002,171

Spinal surgery for lumbar spinal stenosis
total cost: $3,107,576

The fact that 80% of the total cost of low-value care in this population occurred because physical therapy was not presented as a first intervention should be alarming to patients, employers and health plans alike.

This analysis by Sword reveals that significant cost reductions can be accomplished by preventing just a tiny percentage of patients from receiving low-value care. Additionally, this study reinforces previous research showing that when physical therapy is ignored in favor of more invasive, more costly procedures like surgery, medical expenditures rise exponentially.

How can we solve the problem of low-value care?

The data that we have shown clearly illustrates one fact: The issue of low-value care, specifically as it relates to the treatment of musculoskeletal conditions, is an entrenched phenomenon that is hurting patients, leading to poor outcomes and wasteful healthcare spending.

But what if there was a way to identify people who are most prone to receive low-value MSK care before they start down a path that inevitably leads to unnecessary and invasive interventions?

At Sword, we are creating this future with the launch of Predict, the world's first AI engine using advanced machine learning to identify members who are up to 40x more likely to have surgery, more than six months before a decision has been made to operate, to help them avoid unnecessary and costly hip, knee, and back surgeries.

With Predict, Sword leverages a wide range of healthcare and demographic data to identify, engage, and treat members who are most at-risk for surgery with digital physical therapy, which is proven to reduce surgery intent by as much as 60%.

Predict will dramatically empower health plans, employers and labor unions to not only avoid costly surgeries and other issues, such as reduced productivity and absenteeism, but also enable people to live healthy, pain-free lives without resorting to highly invasive procedures or becoming addicted to opioid medication.

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