

Finding and redirecting MSK members to doctor-led care with predictive analytics

THE CHALLENGE

The current standard of musculoskeletal (MSK) care is limited by a critical lack of foresight in the patient journey. As a result, MSK clinicians remain in a perpetual state of reactive care that amounts to little more than damage control. Without preventive or proactive strategies that reach patients at important inflection points in their care journeys, thousands of individuals will continue to receive costly, inappropriate care that often fails to eliminate pain and improve outcomes.

Characterizing the MSK patient journey

For many MSK patients, the standard course of treatment results in steep medical bills and growing frustration with the lack of symptom improvement. The MSK specialty is notorious for excessive spending due to rampant use of imaging, medications, and surgeries—all top contributors to the $380 billion annual MSK care bill (Dieleman, 2020). However, numerous studies show that these invasive interventions often fail to move the needle on outcomes. A recent meta-analysis evaluating data from over 12,000 patients with 28 MSK conditions found no statistically significant differences in clinical outcomes between surgical and non-surgical treatment (Skou, 2022). Another study highlighted in the *Harvard Business Review* demonstrated that more than half of high-volume spine surgeries recommended for low back pain were inappropriate (HBR, 2017). In addition, these costly interventions also put patients at risk for continued suffering: The prevalence of Failed Back Surgery Syndrome—a recognized medical condition in which patients continue to experience back pain years after their procedures—nears 40 percent (Orhurhu, 2022).



Despite the large body of evidence demonstrating the inability of surgery to deliver lasting relief for so many, countless clinicians nationwide continue to send patients to the operating room. One study analyzing data from 7.1 million cases from the largest United States inpatient health-care database showed a continuously upward trend for spinal fusion procedures with an increase of 118 percent from 1998 to 2014 (Reisener, 2020). While there are distinct clinical indications for beneficial and effective surgery (e.g. the sudden loss of muscle strength due to pressure on a nerve), it is clear that MSK surgery is overutilized, leaving many patients with long recovery times and ongoing or worsening pain.

Reactive intervention has become obsolete

To help curb the use of unnecessary procedures, health plans and employers attempt to identify at-risk patients before they resort to surgery. Historically, pinpointing high utilizers of MSK care involved manually combing through mountains of claims data. This tedious and time-consuming process significantly delays time to contact, as claims analysis typically requires weeks to complete. Despite best efforts, this retroactive method of data analysis is highly ineffective, as many members have likely already moved to the most costly step in the cycle of care: surgery.

THE SOLUTION

As the healthcare industry transforms into a more data-driven landscape offering greater accountability and shared decision-making, predictive health analytics emerges as the tool of choice for employers and health plans looking to improve care and lower costs. By expanding the scope and quality of data needed to support more effective care, predictive analytics opens the door to new ways of reaching members at critical decision points in their MSK journey. Employers and health plans can leverage this wealth of data to find members further upstream and intervene with more appropriate, non-surgical medical care.

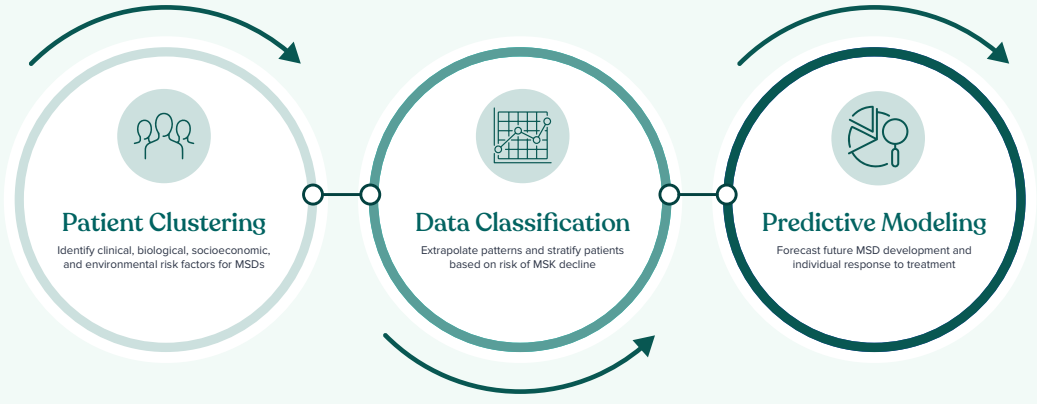
Harnessing the power of predictive analytics

Artificial intelligence (AI) empowers the MSK decision-making process by overcoming the limitations of the traditional reactive care pathways. With advanced machine learning (ML) methods, insurers and employers gain access to powerful predictive models that instantly identify warning signs for MSK decline (for example, a recent visit to an orthopedic specialist by an individual who has also been taking a prescription pain medication for a period of time). Machine learning gives healthcare providers the upper hand in the care process, as these models are continuously updated with new information regarding all patient variables.

Assessing the validity of predictive analytics

The distinct advantage of big data analytics is the opportunity to compare member health trends with the historical view of tens of millions of members over multiple years. These Monte Carlo simulations examine clinically relevant implications to predict outcomes with and without intervention, helping clinicians pinpoint the best windows of opportunity to change a patient's course of treatment.

Predictive health analytics operates in three main steps



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How Predictive Health Analytics Works

1

Patient clustering

The process begins by aggregating claims and electronic health record (EHR) data into one database. The dataset is "cleansed," meaning any incorrect, duplicate, or erroneous data are removed. Unsupervised ML scans the data to cluster clinical, biological, socioeconomic, and environmental factors into subsets based on similar treatment progressions and outcomes. This process is vital for the AI to understand the full scope of all possible risk factors for each step of MSK deterioration. Also critical is the completeness and integrity of the data to minimize potential bias in an analysis.

2

Data classification

The next step employs supervised ML methods to analyze past data for relevant patterns and specific queries—cost drivers, leading risk factors, most effective treatments, etc. The AI applies these structures to the current population to stratify risk based on age, sex, medical history, disease state, and other applicable criteria. This algorithmic classification extrapolates clinically significant patterns to identify indicators for musculoskeletal disease (MSD).

3

Predictive modeling

The final phase channels ML analytics into a forecasting model that predicts the likelihood of any member developing MSDs, as well as their potential outcomes and response to treatment. These models continue to change with new data, allowing for up-to-date, year-round MSD risk surveillance. In addition to forecasting outcomes, predictive modeling determines which members are most likely to engage as well as which clinical events will most likely impact quality of life and drive care costs. Insurers and employers can leverage these projections to redirect patients to appropriate treatment before they reach these critical inflection points.

Engaging members with personalized messaging

Predictive health analytics arms health plans and plan sponsors with the necessary information to reach members early in their MSD trajectory. However, the challenge has now become building enough trust with at-risk members to persuade them to disrupt their normal course of treatment. The most successful communication strategies utilize tailored messaging via personal text messages and emails, as opposed to general program messaging. In fact, contacting members with approachable and personalized messaging has been shown to increase engagement and prompt changes in behavior.

One systematic review and meta-analysis found that sending tailored text messaging to 949 patients with Type 2 diabetes produced a statistically significant weighted mean effect size (g = 0.54) on HbA1C values. The analysis also demonstrated the importance of customizing message delivery, direction, and frequency for each individual (Sahin, 2019).

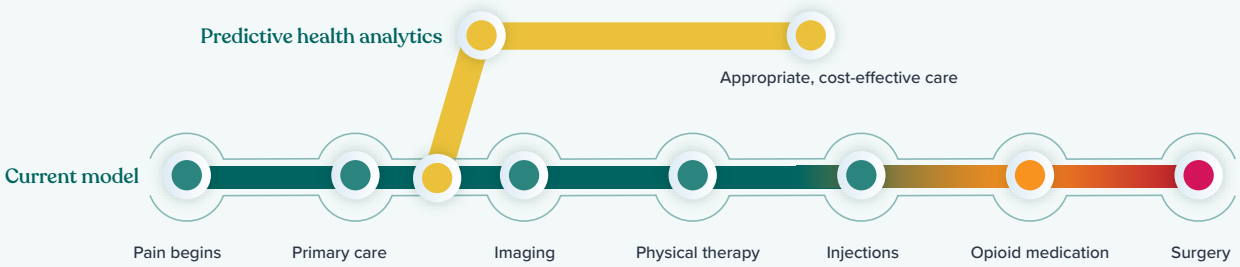
In order to leverage the power of predictive health analytics and inspire measurable changes in behavior, health plans and employers should invest in patient-centered communication strategies. With effective and timely personalized messaging, members can be steered towards a more patient-centered care plan that prioritizes long-term health outcomes above all other metrics.

Measuring success

When it comes to utilizing predictive analytics to cut healthcare costs, the results speak for themselves. A recent report from the National Bureau of Economic Research found that private payers could reduce costs by up to nine percent with AI-driven interventions—totaling almost $110 billion in the next five years (Sahni, 2023). Considering MSK patients represent 27 percent of commercial health plan constituents, lowering costs by even nine percent could have a material impact on budgets and bottom lines (Evernorth, 2022).

As one of the key stakeholders in member health outcomes, employers also stand to benefit from predictive health analytics. MSDs rank in the top three conditions consuming employer healthcare budgets, alongside cancer and cardiovascular disease (BGH, 2022). Employers who invest in optimized MSK care not only drive down health spend but also promote employee productivity. In 2022, MSDs were responsible for an average 8.2 missed work days nationwide (BGH, 2022). Providing access to more effective and targeted MSK care helps employees achieve a higher quality of life which, in turn, channels into greater performance at work.

Likewise, AI-driven predictive modeling can improve patient outcomes by redirecting to appropriate, personalized medical care. MSDs are the second most common cause for surgery across the globe; therefore, helping even a small percentage of these patients trade unnecessary procedures for evidence-based care could dramatically enhance overall member health (Skou, 2022).



The patient journey

Redirecting to holistic, doctor-led care

With predictive health analytics, employers and health plans have the opportunity to transform the trajectory of a member's MSK journey by redirecting to personalized, physician-led MSK care. Vori Health provides the right care upfront with a collaborative team approach, giving patients access to non-operative specialty medical doctors, physical therapists, registered dietitian nutritionists, and health coaches all in one place. These clinicians understand how to elicit the root cause of each condition and craft evidence-based medical treatment plans to address them.

By prioritizing member outcomes with appropriate medical care, Vori Health is leading the way in lowering MSK costs and reducing unnecessary procedures. The Validation Institute recently verified Vori Health's patient outcomes for lower back care. In addition to lowering imaging and injection utilization, this independent report found that Vori's whole-person approach substantially reduces the need for surgery by over 4.5 fold compared to traditional care routed to surgical specialists. Additionally, Vori patients experience a sharp reduction in back pain, with the average pain score decreasing from 5.6 to 2.1 in just 30 days (VI, 2023; Naidu, 2022). These data demonstrate that Vori Health's interdisciplinary team produces quantifiable improvements in MSK conditions and significantly decreases the need for costly imaging, injections, and invasive surgery.

By leveraging the new era of predictive health analytics, health plans and employers can partner with Vori Health to elevate the standard of care they offer to their members. With timely interventions and appropriate treatment, members receive high-quality, non-invasive care focused on root cause diagnoses and long-term healing. This, in turn, reduces unnecessary operations, lowers MSK spend, and, most importantly, improves patient quality of life.

If you're ready to strengthen your MSK strategy with doctor-led care, let's connect.

Schedule a demo

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About Vori Health

Vori Health is a specialty medical practice delivering a virtual-first musculoskeletal (MSK) solution to help members get back to their lives faster. As the only nationwide MSK practice with doctor-led Care Teams, Vori Health is the most convenient way to access appropriate care for back, neck, and joint pain without bouncing around the healthcare system. Whether members need a diagnosis, non-opioid prescription, personalized physical therapy, and/or health coaching, they can turn to Vori Health for evidence-based care and effective, end-to-end support. Learn how this holistic model reduces unnecessary surgeries, enables faster recoveries, and lowers MSK spend with up to a 4:1 ROI.

Let's connect!

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