Data management is transforming the workers compensation industry, but not necessarily in ways you might think.

“In the past, we talked about savings as a dollar amount—from the price of a pill or savings from the pharmacy benefit manager blocking a pill,” said Artemis Emslie, CEO of myMatrixx, a workers compensation pharmacy management company. “We are using tools and analytics to think about pharmacy in a different light. For example, we might ask ourselves, ‘What’s the data telling us about the condition of the patient?’ Education and engagement about the drug therapy early in a patient’s medication journey is essential. Getting the right message at the right time via the right channel comes from what we know about the patient through better outcomes and not just savings. That’s a really cool shift for workers comp.”

Emslie’s comments underscore the shift in focus of predictive modeling from the underwriting side to the claims side—a transition that started just a few years ago.

Until recently, companies in a variety of industries have used predictive modeling to influence behavior, especially in the retail space. Netflix, for example, uses historical customer data to steer customers toward particular types of movies. Similarly, Amazon uses data to anticipate consumer purchasing behavior and to boost sales through product recommendations.

“I’ve been a victim of [Amazon’s] suggestions when the company sends me a message to the effect of, ‘Hey—customers that bought this particular product typically bought this,’ and sure enough, I do too,” said J.J. Schmidt, senior VP of managed care for Wellcomp, a managed care subsidiary of York Risk Services. “We’re essentially using the same best practices to say, ‘OK, a claim that meets this data has the likelihood of doing these other things.’”

The auto insurance industry has been using data to predict outcomes and set premiums for a number of years. In workers compensation, data has been used to help reduce costs to the system, and more recently, significant focus has shifted to providing higher quality care to injured workers.

Rising Medical Solutions, for example, provides a “medical concierge” program to injured workers. It includes such things as risk scoring and triage on 60-plus factors, a ‘concierge’ contact, scheduling of medical appointments, telephonic case management, and ongoing monitoring of all case files with predictive analytics, opioid intervention, and direction of care where applicable.

“We use data analytics to manage the level of service provided to injured workers,” said Anne Kirby, Rising’s chief compliance officer and VP of care management. “For example, in our data set,
In workers compensation, data has been used to help reduce costs to the system and to provide higher quality care to injured workers.
we have all the data from our pharmacy benefit manager, but also the prescribing information from physicians dispensing their own medications. That’s a very rich database.”

Company figures show more than $2 million in medical savings for some customers. In 2015, the average amount allowed per claim for those not included in the program was $4,990. But for those in the program, it decreased to $3,626. In terms of the number of bills per claim, those in the program averaged almost five fewer bills (8.9) than those not included (13.7).

“But perhaps even more impactful is the program’s ability to reduce disability durations by 60 days and litigation rates by 20%,” Kirby said.

Other organizations have also started using data for more complex analyses of claims. These include drug interactions, understanding the trajectory of care, and identifying exactly when a claim is going off course.

Data and Predictive Analytics
The jargon used in the discussions of data can be confusing, as there are a plethora of terms to describe the use of data to improve an organization’s effectiveness and bottom line. Predictive analytics, artificial intelligence, machine learning, and predictive modeling often refer to the same idea—using statistics and probabilities to predict outcomes.

Predictive modeling can be defined as a process used to create a statistical model of future behavior. Predictive analytics concerns data mining to forecast trends.

“Essentially it involves storing large amounts of data and using sophisticated algorithms to analyze it,” said Jeffrey Austin White, director of innovation for Accident Fund Holdings, Inc. “It’s using historical data to make predictions about the future. But it is much more than just simple math.”

Predictive modeling is also different from actuarial science. It is an amalgam of mathematical equations capable of handling hundreds of variables simultaneously.

“The most powerful models are capable of multivariate analysis,” White said. “It’s a form of mathematics that requires a specific skill set that is difficult to find in today’s workforce. It also requires special software and computers—stuff you can’t do with a calculator.”

Finding employees to build predictive models can be challenging, as it is so specialized. Sedgwick, a third party administrator (TPA) that handles workers compensation for employers, has focused on creating a team of more than 100 data analysts. The company says it has invested significantly in mature data scientists and recent college graduates with computer science degrees, teaching them about the workers compensation system. Sedgwick has also made investments in a predictive sciences development company.

Another obstacle is obtaining enough data to make truly effective models. Smaller organizations are at the mercy of whatever they have from their own books of business, and they may not have the capacity to store and thoroughly analyze it.

“The reason predictive analytics started on personal lines is because there’s a lot more data for individuals,” said Marina Ashiotou, director of predictive modeling at Accident Fund Holdings. “The commercial side is a lot more challenging. There is not a lot of information. Organizations don’t want to share their data because they lose their competitive advantage. There are no predictive modeling magazines or conferences for those in the business of processing claims.”

Another obstacle is the presence of so many moving parts for each injured worker.
“That’s what really complicates this,” White said. “Every person and injury is different. It adds a lot of variability.”

Despite the challenges, workers compensation organizations are increasingly focused on claim development. This is especially true for the small fraction of seemingly simple claims that end up costing the most—the so-called creeping catastrophic claims. Some predictive models seek to reduce overall severity and minimize costs; while others focus on shorter durations, speedier recoveries, and improved treatment for the injured worker, with reduced costs as a by-product.

**Cost Reductions**
An escalation alert model that runs behind the scenes for Liberty Mutual Insurance identifies claims with comorbid conditions. Once identified, case handlers are provided with the necessary information on risk factors that may delay recovery and increase the costs of a claim.

The insurer’s compensability model produces alerts that suggest a potential issue with a claim. This helps ensure that the original decision about whether an injury is compensable is correct.

“The model has changed the landscape around how customers are looking at compensability,” said Maureen McCarthy, Liberty’s senior VP of workers compensation claims.

A predictive model at York has reduced the average amounts paid for back injury claims from $14,300 to $9,600 after two years, cut average lost-time days from 64 to 42, and decreased average medical expenses paid from $7,900 to $5,600. Called TeamComp, the model identifies claims in need of expert resources.

“In the past, you would see an adjuster get 30 or 40 alerts daily about medical bills or pharmacy spends, etc., and the adjuster would get clogged up and have to look at these,” York’s Schmidt said. “What we’ve done is, on medical issues, nurses go through all the alerts first to filter them out, so the ones they would interact with are new or different or have complicating factors the adjuster might not understand.”

At TPA Sedgwick, predictive models have saved millions of dollars over the last three years.

“While our data shows we have saved millions for our clients in recent years, it also underscores the value of a positive customer experience and a strong claims advocacy approach,” said Teresa Cheek, managing director of IT enterprise initiatives for Sedgwick. “We’ve improved return-to-work initiatives and reduced attorney involvement by large percentages while delivering better outcomes for all.”
Sedgwick documentation on client outcomes showed improvements in return to work of between 3% and 18%, and the attorney involvement ratio decreased between 5% and 21%. It also shows a return-on-investment range of 2:1–7:1 after one year, and 4:1–9:1 after the second year.

**Quality of Care**

The largest workers compensation insurer, Travelers, recently released a predictive model focused on preventing an injured worker from developing chronic pain—one of the biggest cost drivers of healthcare. This “Early Severity Predictor” helps determine the likelihood of an injured worker developing chronic pain, with the company providing treatment akin to sports medicine. The goal is to reduce or eliminate the need for opioids and other painkillers.

The insurer said its new program is a true regression model that incorporates medical factors with psychological conditions and lifestyle issues. Of 20,000 cases that have gone through the Travelers’ model, 9,000 were identified as being at risk of developing chronic pain. The company says results have shown faster returns to work and as much as a 50% reduction in claim costs for those identified in the model.

“Looking at the average injury costing $40,000—that can produce a $20,000 reduction,” said Dr. Adam L. Seidner, medical director for Travelers. “We’ve seen a major reduction in higher [morphine equivalent] doses with this program. We’ve also seen a reduction in surgeries.”

Expediting recoveries of injured workers is the focus of one of the targeted predictive models at Liberty Mutual. The nurse predictive model pinpoints claims on which a medical person should be engaged to provide interventions at the beginning of the injury. It provides “a much more scientific understanding of where nurses add the greatest value,” Liberty Mutual’s McCarthy explained.

One large self-insured organization has an early intervention program that utilizes a screening tool to identify injured workers at risk for delayed recovery, triggering an offer of voluntary benefits to help the person through psychosocial issues. The early intervention program focuses on the small but significant percentage of workers with noncatastrophic injuries but delayed recoveries.

“We offer cognitive behavioral therapy health coaching,” said Denise Gillen-Algire, director of
managed care & disability of corporate risk management for Albertsons Companies. “It’s based on cognitive behavioral therapy and is offered as a benefit to employees. We facilitate the program through a collaborative multidisciplinary team approach, including the treating physicians and psychologist, our medical director, a claims examiner, and a nurse case manager.”

The Future of Analytics in Workers Comp
While there has reportedly been substantial work on pricing predictive models, organizations typically keep such information close to the vest due to proprietary reasons. However, many are quite vocal about how they plan to fine tune their predictive modeling as it relates to claim development.

“In insurance, a small number of claims lead to high costs,” said Joe Anderson, director of analytics for workers compensation and auto no-fault at Optum. “But statistical tools are not really designed for that. We are using different methodologies that make it easier to go after that small number of claims, and we are getting false positives out of the model.”

Tweaking the existing predictive models could lead to a focus on no loss-time or medical-only claims, to identify those that may become high-dollar claims down the road.

“That’s very much an ask from our customers,” said Liberty Mutual’s McCarthy. “They see claims dormant for years, where suddenly the facts change. It’s another example of targeted modeling addressing a specific issue we face out in the field.”

Using predictive modeling pre-loss is another area that workers compensation practitioners hope to see.

“Most organizations talk about how to better manage claims,” said Albertsons’ Gillen-Algire. “One of the things we want to do is figure out how we can use the information to identify pre-loss information to create a safer workplace for our employees. If we can identify where trends are, we can use that information to improve our health and safety program. That’s our focus right now.”

Wearable devices to prevent injuries are already in use by some companies.

“There is a company with a smart construction helmet that alerts a worker when passing into an area of high risk or too close to dangerous equipment,” said Accident Fund’s White. “So it is essentially providing feedback to the user when an unsafe condition exists.”

White believes wearables could have another use in workers compensation. “The next leap is once a person is injured, the device could monitor recovery,” he said. “For example, if the person is getting too many opioids and other drugs, you’d expect the person’s activity level to drop. You might be able to see that and react.”

White says such an idea would likely be a long way off, since concerns about privacy and the burden of cost must be addressed.

Finally, some look to data and predictive analytics to change the whole way workers compensation is administered.

“Way down the line, what we’ll end up possibly doing is predicting the outcome based on an injury,” said myMatrixx’s Emslie. “Using the data in the right way, you could say an average back injury will cost this much to treat and therefore the payer will charge X amount for a back injury, instead of fee for service. That’s what value-based outcomes are about—actually changing the fee model, which the industry reimburses.”

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