Pharmacogenetics and the Value of Personalized Medication Management

by Kathy Bergstrom, CEBS
Senior Editor
International Foundation of Employee Benefit Plans
Brookfield, Wisconsin

The following is based on a presentation by Veronika Litinski at the 2018 Symposium.

Health plans in North America spend billions of dollars on prescription drugs every year, yet a significant portion of those expenditures is wasted because the medications are ineffective or cause adverse side effects.

Health plans may be able to reap savings while improving the health of their participants through the use of a relatively new science called pharmacogenetics (PGx). This involves the application of genetic testing to guide optimal drug selection and dosing. Its use for evidence-based medication management is gaining acceptance beyond academic medical centers and hospital systems, with many users—individuals, health professionals and health plans alike—expressing interest in using PGx tests to predict efficacy and side effects of drugs for the individual.

Veronika Litinski, chief executive officer of GeneYouIn, explained the science behind PGx and how health plans can use it to save money. GeneYouIn is a Toronto, Ontario-based personalized medicine and technology company.

About $390 billion is spent on prescription medication annually in North America, but 30% is wasted because it doesn’t lead to improved health outcomes, Litinski said. About half of that waste is linked to a mismatch between the drug being prescribed and a person’s genetic makeup. Drug response is highly variable, and some of this variation is due to inherited genetic variants which, depending on the drug, are estimated to affect between 20-95% of response variability.

Litinski used her drug of choice—caffeine—as an example to illustrate the point: “I discovered through many years of trial and error that I can drink coffee only until two in the afternoon. Otherwise I lose my night’s sleep. I’m a slow metabolizer of caffeine. It just stays in my system too long.”

PGx accomplishes in just a few days what took Litinski 20 years to figure out. The test analyzes a cheek swab of saliva to predict an individual’s genetic response to many medications.

For example, a standard dose of one type of medication may build up in the system of a person who is a slow metabolizer of that drug, leading to toxic effects. But the standard dose might be ineffective for someone who metabolizes that medication too quickly.

After undergoing the PGx test, individuals receive a report that provides information on their likely response to a number of medications. Litinski noted that plan participants are more likely to undergo the testing if their health plan covers the cost.

To get the most out of it, review by a PGx-trained pharmacist is helpful. PGx-trained, specialist pharmacists prepare a summary for the doctor. Genetics is still new for many physicians, and most appreciate the reassurance of a pharmacology expert, especially when the results are used to optimize several medications. “When you have your pharmacogenetic profile in your hands, you can have a very different conversation with your doctor about your treatment options. It’s very empowering to know which medications are most likely to work for you and which medications are better avoided,” Litinski added.

A PGx test can cost about $500, but the results last a lifetime. “Once you know your pharmacogenetic profile—if you work with the right vendor and the right clinician—you don’t need to do this test over and over again,” Litinski said. Those who undergo the testing would need only to update the drug gene references based on new information and new PGx knowledge, but the person’s genetic information doesn’t change.

Both individuals and health plans can save money as a result of the genetic information. They avoid spending money on the wrong medications as well as office visits devoted to the traditional trial-and-error process. They also avoid the costs of adverse drug events. “The cost of mismatches between a person’s genetics
and drugs being prescribed is high, and it’s borne by the payer and by us—people who take pills that don’t work,” Litinski commented.

This inherently personalized approach to medicine can improve the effectiveness of drug treatments and has the potential to engage patients in their own health care. Targeting the right medication also has been shown to improve medication adherence and can result in shorter periods of disability and improved health, she said. “When people’s conditions are well-managed with medications, they actually stick to it. They believe this medication is helping them,” she said.

Privacy is an important consideration for plan sponsors. Participants should be assured that a PGx test is limited and looks at only the parts of DNA involved in processing medication, Litinski said. Individuals also should have full ownership and control over their genetic results. Individuals should receive their own personal report, and the genetic information should be shared only with a physician and pharmacist. Plan sponsors should receive only anonymized aggregate data from PGx vendors, showing utilization and impact at the plan level.

Determining who should be offered the test is another key consideration for plan sponsors. Accidents or disability often are triggering events for tests, but Litinski noted that the testing would be valuable for plan participants who have chronic conditions because they represent a majority of drug spending. A PGx test can predict an individual’s response to more than 60% of commonly prescribed medications.

Although some health care providers in North America are already using PGx as part of routine care, it is not yet being used commonly for people who are taking maintenance medication or medication for the treatment of anxiety, depression or pain, Litinski said. In the U.S., pharmacogenetic tests must be ordered by a licensed health care provider. Individuals can purchase them online, and a physician from an independent provider network will review the information and order the test if it is right for them. Patients also can forward an online test requisition form to their own physicians. In Canada, the service is available to the general public without prescription.

“Let’s recognize that this is a new science, but it’s a science that’s now well-understood, and it’s already transforming the lives of people and transforming health systems around the world,” Litinski said. “But like any innovation, it requires small adjustments. It’s a bit of a paradigm shift for people, including physicians and pharmacists, and the big adjustments that need to be made are for the reimbursement design of health plans that allows this personalized medicine to be included in plans.”

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benchmark price is and what the markup is and have a good feel for what type of deal we are getting on the medication. On the other hand, when a hospital negotiates with the carrier, its deal can be very different. Many times, hospitals negotiate off of their billed charge and will apply a discount. I’m sure you’ve seen your utilization reports showing your average discounts and your network performance. It looks great when you are averaging a 70% discount, doesn’t it? The problem arises when, in these cases, the billed price is not based on a benchmark other than whatever the hospital determines. In other words, the hospital can bill $100,000 for the medication, discount it 70% and end up getting paid $30,000 of plan money. It’s a 70% discount, but is it a good deal?

Insurance carriers won’t tell us which doctors have which deals, so we are completely left to chance as to what we will end up seeing when one of these codes comes across the claims line. The general rule is that hospitals utilize discounts, while home infusion, specialty pharma and independent providers work with more clear-cut benchmarked pricing.

J-Codes and medical specialty pharmacy claims are going to be one of the top two procedure categories in terms of cost within your health plan. Knowing the amount of waste and abuse can give you insight into how you can develop strategies to drive more cost-effective utilization of the plan and even enhance benefits to plan members for that efficient behavior. By identifying these specific issues within your plan and implementing targeted, value-based strategies to address them, you could eliminate tremendous costs without any adverse effects to your population.