

BeneCard PBF - PBMI Excellence Award Submission
Program: **BenePrecise Pharmacogenetics**

Overall description

The Importance of BenePrecise

Think about coffee and the effects of caffeine. We all know someone who can enjoy a cup of coffee with their dessert and sleep like a baby. We also know someone who can't drink coffee after noon because it will keep them up all night. This happens because of genetic variables that affect our metabolism. These small differences in our genes cause each person to process caffeine differently. They also affect how well medication works for each patient. Every individual processes medication differently, and that has a significant impact on treatment success and patient quality of life.

Traditionally, medicine has used a trial-and-error approach to find the right medication for each person. As a patient works their way through different treatment options, the prescriber takes note of what seems to be working, and what isn't. This can involve weeks or months of stress and worry for patients until the prescriber is finally able to identify a medication that improves or resolves a patient's signs and symptoms.

Unfortunately, this approach to care contributes an estimated \$935 billion in wasteful spending in the U.S. healthcare system— roughly 25% of total medical spending, according to a new analysis published in JAMA.

Furthermore, the CDC reports that 24% of people are using three or more prescription drugs. The more drugs a patient takes, the higher their risk of adverse drug reactions (ADRs). Patients experience 45-50 million ADRs annually in the United States., and up to 5 million of these lead to serious, debilitating, or even fatal outcomes. ADRs are the leading cause of hospitalization in the country and can double the length and cost of hospital stays as well as the patient's risk of death.

These statistics underscore the importance of safe prescribing to improve health outcomes and reduce overall healthcare spending. However, healthcare decisions are too often financially and not clinically driven in a world where mergers and acquisitions are common, and healthcare companies increasingly report to shareholders on Wall Street. Patients and their health are no longer the priority. This is why BeneCard PBF has introduced ***BenePrecise Pharmacogenetics***. The company aims to inject personalized care back into an industry that has forgotten who it aims to protect – patients whose quality of life depends on compassionate and effective care.

The trial and error approach to prescribing medicine can lead patients down a long, winding path to find right treatment that may help improve their health. This approach is time consuming, and patients can

experience severe side effects along the way. With BenePrecise Pharmacogenetics, patient care is personalized using all available information, including lifestyle considerations, at the point of sale to get straight to the medication that provides the most effective therapy for each individual's needs.

BenePrecise Pharmacogenetics – A Unique Application of Personalized Medicine

Pharmacogenetic (PGt) testing reveals how certain genetic traits affect an individual's metabolism and their ability to process medications. A simple cheek swab can yield valuable information that allows prescribers and pharmacists to quickly identify the safest, most effective medication available for each patient. The patient experiences a better quality of life and avoids the stress, side effects, and financial burdens often incurred through traditional trial-and-error methods of prescribing.

Genetic variations in metabolism can cause a patient's body to process medication in such a way that it provides no therapeutic benefit, in essence leaving the patient's medical condition untreated. They can also cause patients to metabolize medication in a way that increases their risk of side effects or raises the concentration of medication in their bloodstream to toxic levels.

For each patient, BenePrecise Pharmacogenetics uses these genetic markers to identify the medications that offer the best clinical benefit or present the highest risk, allowing prescribers to tailor treatments to a patient's specific needs. BenePrecise Pharmacogenetics facilitates better health outcomes by helping prescribers get to the right medication for their patient as efficiently as possible.

Clinical studies have found that pharmacogenetics can help patients and reduce costs when properly applied. A study conducted by the University of Illinois Hospital and Health System found that PGx-guided prescribing of warfarin and clopidogrel cut 30-day readmissions by 77% and saved \$2,000 per patient. In case studies, BeneCard pharmacists identified instances where clopidogrel put patients at risk due to genetic variations in their metabolism, and were able to counsel prescribers on safer alternatives.

BenePrecise Provides Point-of-Sale Edits that Enhance Real-Time Drug Utilization Review

BeneCard's pharmacists coordinate all aspects of the testing process with plan members. They review the results, apply a robust clinical decision support tool, and apply their clinical judgement to create a concise recommendation to share with the ordering provider. By working together to create a personalized prescribing plan, the pharmacist and prescriber can combine their expertise to put the patient on the optimal path to better health.

Because the data generated from BenePrecise is fully integrated with BeneCard PBF's claim system, it can be applied at the point of sale to protect patients from receiving potentially harmful or ineffective medication. This in turn helps to protect these members and their plan sponsors from the high cost of medical complications and serious ADRs.

Pharmacogenetics also offers a promising tool in the fight against America's addiction epidemic. The American Journal of Surgery reported a 50% reduction in narcotics consumption with the application of pharmacogenetics, as well as improved analgesia and reduced side effects. By reducing unnecessary use of narcotics and targeting these drugs more appropriately to control patients' pain, BeneCard PBF and

the BenePrecise program support coordination of care between healthcare providers and pharmacists, working together with members and their healthcare team to reduce the risk of addiction to controlled substances such as opioids.

The number of prescriptions with genetic markers is nearing 400. This information was not even available until 2003, when the Human Genome Project was completed. Because the markers identified by pharmacogenetic testing do not change over time, a single test has the potential to provide a lifetime of valuable data to assist healthcare providers, pharmacists, and patients in making the best possible decisions regarding prescription drug therapies. By getting patients on the right drug that offers the most benefits and an improved safety profile, BeneCard PBF puts patients first while combatting the ongoing challenge of rising drug costs.

Achieved outcomes

The following examples illustrate the real health benefit of pharmacogenetics.

Case Study – Hypertension & Depression

Alan was prescribed metoprolol succinate, Odefsey, citalopram.

PGT results indicated that Alan is an intermediate metabolizer on the CYP2D6 metabolic pathway. This can cause certain drugs to linger for too long in his bloodstream and raised the risk of side effects from metoprolol succinate. Instead of reducing Alan's cardiovascular risk, the drug could increase his blood pressure and heart rate, putting him at greater danger of a serious cardiovascular event. By reducing Alan's dose by half or switching him to bisoprolol, another medication in the same therapeutic category, his prescriber could treat Alan's hypertension while lowering the risk of adverse drug reactions.

Alan's metabolism also put him at risk with Odefsey, citalopram – again because of the way his body processed medications through the CYP2D6 pathway. By itself, Odefsy can prolong the QT interval, which raises a patient's risk of serious cardiovascular events. However, Alan's unique metabolism caused increased risk from the combination of Odefsy and citalopram. BeneCard's pharmacist recommended Alan switch to Biktarvy, to treat his HIV without interacting with the citalopram.

Case Study – Autoimmune Disease

Carol takes a number of medications to manage her complex medical needs. In addition to bupropion, escitalopram, lisinopril, prednisone, and rosuvastatin, Carol takes azathioprine, a medication specifically indicated to treat autoimmune disease.

Azathioprine is processed through the TPMT metabolic pathway. It can also cause bone marrow suppression, a potentially dangerous side effect that can reduce a patient's ability to fight off infection. Carol's PGT results showed that she was an intermediate or poor TPMT metabolizer. This increased her risk of bone marrow suppression, which meant Carol could find her way to the hospital with a serious

infection that her body was unable to fight on its own. To compound the issue, she was also taking lisinopril, which can increase the risk of side effects from azathioprine.

Carol's risk was easily lowered by switching her to sulfasalazine, a drug that was safer for her and delivered direct savings of approximately \$140 per month of treatment compared to azathioprine.

Case Study – Cardiovascular Disease

At the time of his consultation, Bruce had a complicated medication regimen that included amiodarone, escitalopram, metformin, furosemide, clopidogrel, metoprolol, lisinopril, diazepam, atorvastatin, allopurinol, and gabapentin. One source of concern came from his clopidogrel, which was prescribed to help manage his cardiovascular disease.

PGt results showed that Bruce was an intermediate metabolizer of CYP2C19, a metabolic variation that made clopidogrel ineffective. Bruce's body was not able to break the drug down into its active compound, he was still at risk of a major cardiovascular event despite being on treatment. Bruce needed to switch medications so his cardiovascular disease was properly controlled. He was moved to Brilinta, a safer and more effective alternative.

This change also helped Bruce avoid serious side effects with diazepam. Because of his metabolism, Bruce was at risk of serious drug interactions between diazepam and clopidogrel. This meant that his diazepam could cause excess sedation, increasing the risk of a fall or prevent him from being able to safely drive a vehicle. He was at greater risk of the diazepam causing respiratory depression or increased anxiety. By switching Bruce to Brilinta, his prescriber was able to lower these risks without having to take Bruce off the diazepam.

***All case studies are based on actual BeneCard PBF member experiences. Member names have been changed to protect their privacy.**

Lessons learned

- Pharmacogenetics is not just about cost savings. It is also about providing better care for patients now and in the future. It is easy to get caught up in the financials of prescribing, but the long-term benefits that this program brings by personalizing healthcare have a lasting, positive impact on patient's lives.
- Applying pharmacogenetic data proactively at the point of sale and flagging prescriptions that could be contraindicated with the member's metabolism allows PGt-trained pharmacists to work with prescribers and members to find the most appropriate drug therapy for the member's needs and reduce the risk of ADRs.
- Pharmacogenetics delivers value by improving patient quality of life and lowering net costs through better health outcomes and the prevention of serious ADRs.