What Is Pharmacogenetics and Why You Need to Know About It

When the human genetic code was cracked about 12 years ago, it brought with it enormous belief of instant application to human disease. It was soon after that pronouncements were made that there would soon be a cure for cancer, Alzheimer's and heart diseases, given that we now are aware of the genes causing them. Over the last ten years or so it has become apparent that any given disease is not caused by one gene alone. There is no *cancer gene* and there is no *heart disease gene*. In spite of this realization that one gene does not cause one disease, over the last 10 years, integrative medicine has evolved and several new genetic tests have become available; many with immediate clinical application to daily care.
One of the most powerful of these applications is **Pharmacogenetics**.

What Is Pharmacogenetics?

Pharmacogenetics is an area of personalized medicine that aims to provide safer, more efficient, and customized drug therapies based on an individual's unique genetic profile.
It is the tailoring of drug treatments to people's genetic makeup, a form of *personalized medicine*.
The goal of these tests is to minimize side effects from prescribed medications.

We Are All Different

Patients respond differently to medication. Most respond well and their health improves. Some do not gain any benefits from their treatment, while a minority suffer from side effects. Personalized medicine is the process of getting the right medication, to the right person at the right dosage. Pharmacogenomic scientists look at the genome of an individual patient, identifying genetic factors that influence their response to a drug, that will predict how patients are going to respond to a drug and the dose they should be given.

As written in the Wall Street Journal recently, many common medications can affect people differently, depending on their genetic structure. Some examples include:

DRUGS – Pain relievers codeine or oxycodone, including Tylenol 3 and Percocet

ENZYME PATHWAY AT WORK – CYP2D6, IMPACT. A standard dose can have little effect in up to 20% of people, while as many as 2% can have a life-threatening reaction.

DRUGS – Blood thinner Plavix (clopidogrel) and acid reducers Prilosec (omeprazole) and Prevacid (lansoprazole)

ENZYME PATHWAY AT WORK – CYP2C19, IMPACT. Up to 15% of people metabolize these drugs very slowly, resulting in a higher effective dose and greater risk of side effects.

DRUG – Blood thinner Coumadin (warfarin)

ENZYME PATHWAY AT WORK – CYP2C9, IMPACT. People with some gene variants have twice the risk of severe bleeding, but other factors are involved and population percentages are unclear.

DRUG – Cholesterol reducer Zocor (simvastatin)

ENZYME PATHWAY AT WORK – SLCO181, IMPACT. Up to 40% of people have impaired ability to metabolize this drug, giving them increased risk of muscle pain and other side effects.

Source: Clinical Pharmacogenetics Implementation Consortium

Why Is Pharmacogenetics Important?

With a better understanding of the disease and the treatment through pharmacogenetics, resources can be focused on treatments that are more likely to be effective in a patient. This will minimize adverse reaction to prescribed medications, delivering better healthcare to patients, improve patient adherence while also reduce costs as it is insurance companies who typically pay for prescribed medications.

At Beneplan, we are pleased to offer personalized prescription services to members of the Co-operative. While this benefit is new to Canada, we believe it will soon become standard-of-care, as benefit plans evolve to provide maximum care for their members, while looking for ways to reign in on drug costs.

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Please let us know if you are interested in opting in.

For more information on pharmacogenetics, please visit Personalized Prescribing Inc.