The Future of Health Care is Here: PERSONALIZED MEDICINE

Pharmacogenomics shows great promise for predicting drug treatment responses in individual patients

By Dorothy Merritt, MD

It is well known that drug therapy doesn't work for all patients all the time. In fact, studies show that approximately 40 to 75 percent of drugs are ineffective for individual patients, depending on the drug class. This means that a large number of patients may not only be wasting their money—but they may not be receiving the treatment they're seeking or the results they desire.

Pharmacogenomics

Pharmacogenomics is an exciting new field of clinical research that provides insight into the various factors that impact the way drugs work for different patients. Through the study of gene variations, and the different ways genes are expressed, we can now recognize with greater accuracy how an individual responds to drugs. Genes can influence how drugs work in the body because they determine the structure and composition of human proteins, including enzymes, receptors, transporters, and other molecules, which are involved in disease progression and drug pathways.

These significant developments in the field of genetics are enabling health care providers, pharmacists, patients, and payers to think about new ways to optimize drug therapy.

Pharmacology + Genomics = Pharmacogenomics

- *Pharmacology* is the study of how drugs work in the body.
- *Genomics* is the study of characteristics that result from an organism's complete set of DNA.
- *Pharmacogenomics* is the study of genetic factors that influence how a drug works.

Personalized Medicine

Advances in the application of genetic information determined through genetic testing means that we now possess deeper insight into issues such as drug side effects and effectiveness, disease diagnosis, and other critical

Companion Dx assesses genetic variations in patients to help physicians create optimized drug treatment plans.

"Insurance only" payment special through Dec. 31, 2012

Located in the Texas Medical Center, Companion Dx Reference Lab performs non-invasive, genetic testing that can determine which drugs you will and won't respond to and specific dosing recommendations, as well as determine and prevent drug interaction issues, and help prevent Severe Adverse Drug Reactions (SADR's)—all based on your genetic profile.

Once this test is done, it is beneficial for life. You can carry this information with you from doctor to doctor, and always have this information available to help your physician determine the best course of therapy, personalized to your body. Companion Dx is also developing an app that can help you determine which over-the-counter medication you would best respond to when visiting your local pharmacy.

The genomic test menu includes:

- Pharmacogenomics testing
- Cancer companion diagnostics testing
- Colorectal cancer screening
- NextGen Sequencing testing (in development)

You will receive actionable, easy-to-read test reports within 3-7 days.

Due to the extreme value of the information obtained from these tests, Companion Dx is waiving all patient personal financial responsibility as part of their Field Experience Trial. This means that they will bill your insurance provider for these valuable tests, but your personal financial portion will be waived.

The Field Experience or "FLEX" trial will end December 31, 2012.

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clinical decisions—before a treatment plan is determined for each patient.

Genetic test results can be used to determine if a patient is more or less likely to develop a disease or condition, inform the selection and appropriate dosage of a drug therapy, predict the progression of a disease or the efficacy of a therapy, and monitor treatment. Genetic testing allows for the rapid identification and exclusion of patients at risk of experiencing adverse drug effects, as well as those who are predicted not to respond to a specific treatment. This information can be used to individualize and optimize the treatment by selecting the most appropriate drug and/or dose.

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For example, variations in drug response can result from common differences found in enzymes that metabolize certain drugs. One family of enzymes, known as the cytochrome P450 (CYP)-containing enzymes, are responsible for inactivating numerous classes of drugs, as well as activating certain drugs, such as clopidogrel (brand name Plavix). If patients have a less active or inactive form of CYP enzymes, they are unable to inactivate and efficiently eliminate a drug from the body. These people—known as "poor metabolizers"—run the risk of adverse side effects or overdose because the drug is not efficiently eliminated and builds up in their bodies. On the other hand, patients with very active forms of CYP enzymes—"ultrarapid metabolizers"— can cause the body to eliminate a drug before it has had a chance to work.

Future of health care

Although health care providers and payers currently rely on evidence based information about available drugs to help provide guidance on appropriate use, the importance of genomics in the selection of a drug therapy and ongoing patient management is accepted today—and it is expected to expand in the coming years.

A growing number of genomic tests have significant public health impact, and are currently being used to predict drug responses in the treatment of cardiac, psychiatric, autoimmune and infectious diseases, cancer, and more.

An understanding of the genetic variables that influence how a drug responds could also help pharmaceutical companies design more effective new therapies.

Personalized Medicine provides diagnosis and treatment decisions and practices tailored to each individual patient with the use of genetic or other information to improve the safety, effectiveness, and health outcomes of patients.

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TAKE ADVANTAGE OF THIS "INSURANCE ONLY" SPECIAL OFFER FOR GENOMIC TESTING BEFORE DEC., 31, 2012!

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