

A Personalized Prescription

by Richard H. Cartabuke, MD

Internal Medicine and Geriatrics, Cleveland Clinic

Medical Director, Healthnetwork Foundation



What if a drug that works for most people turned toxic in your body because of your genetic makeup? What if your genes rendered a certain medication useless while making another super effective? It may not be too much longer before we have answers to these kind of questions. In limited cases, we already do!

For most of our modern medical history, drugs have been prescribed with a one-size-fits-most approach. But that is starting to change. Pharmacogenetics, a major up-and-coming area in medicine, looks at how your DNA affects the way you respond to drugs. In my geriatrics department at Cleveland Clinic, for example, we are able to use pharmacogenetics to see which medications a patient might be better suited for to help with high blood pressure or heart disease. This helps us prescribe a drug and a dosage that delivers minimal side effects and maximum benefit.

We've known since the 50s that genetics can influence a person's reaction to medication. But it's only very recently that there's been enough data and research to be practically helpful for physicians like me who work with patients day to day. Let's say someone needs a blood thinner. We do a blood draw and get genetic information about the patient. Then we look at, of the drugs that have been tested, does that person metabolize them normally? Do they need a different dose than the standard protocol, either because they metabolize it so well or because they metabolize it slowly and it stays in their system longer? This approach helps reduce risks like excessive bleeding or muscle breakdown.

When the first breakthroughs in pharmacogenetics happened, there was a lot of excitement and anticipation that many more breakthroughs would quickly follow. But progress has been slower than we hoped. Right now, we know of variations in approximately 20 genes that provide useful predictions related to somewhere around 100 drugs. This represents about 7% of all drugs approved by the FDA. In other words, we have a long way to go.

While recognizing we're in the very early stages of this field, I'm extremely excited about the possibilities. Already because of our application of pharmacogenomics at Cleveland Clinic I've noticed an obvious reduction in side effects in my geriatric patients and the need to change medications has dropped drastically. It's mind-blowing to think about where this could lead. If I knew I know up front what medication to prescribe that would be just right for that particular patient... what a difference that would make for people!

Healthnetwork Foundation connects business leaders to the world's best health specialists and creates customized medical philanthropy opportunities. For more information, contact Healthnetwork President, Megan Frankel at mfrankel@healthnetworkfoundation.org