

How pharmacogenomics enables precision approach to care

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Precision medicine that incorporates pharmacogenomics—matching medication to personal genetics—can improve an individual’s response to certain medications and help facilitate treatment.

More physicians and health systems are taking advantage of pharmacogenomics around the country and with generally favorable outcomes, according to participants in a virtual summit series co-sponsored by the AMA and ASHP (American Society of Health-System Pharmacists).

Interactive modules adapted from the series, such as “Becoming a Better Prescriber: Introduction to Pharmacogenomics,” help familiarize learners with this emerging field of medicine and provide opportunities to earn CME.

Get started today and learn how to implement pharmacogenomics-informed prescribing in your practice to increase efficacy, reduce adverse drug events and build patient confidence. Other AMA Pharmacogenomics Summit Series education modules cover the patient’s perspective and collaboration, education and resources, and there are more to come.

One of those presenting in the virtual summit series was Peter J. Hulick, MD, Medical Director of the Mark R. Neaman Center for Personalized Medicine and Division Head of the Center of Medical Genetics at NorthShore University HealthSystem.

NorthShore is a medium-sized health system with more than 1,300 physicians in six hospitals serving the northern suburbs of Chicago. The system has about 88,000 hospital admissions and 200,000 emergency department visits annually. The Center for Personalized Medicine was founded in 2014 and has about 15,000 patients participating in pharmacogenomic testing, and a clinical genetics program with three physicians and six genetic counselors.

Dr. Hulick said the NorthShore program involves a blend of clinical practice and research. “We believe in the promise of pharmacogenomics, that it will lead to safer and more effective drug treatment, help increase adherence to drug therapy, decrease hospitalizations and help improve health care overall.”

The virtual summit series covered a wide range of topics in pharmacogenomics, including:

- The benefits and limitations.
- The economic environment.
- The role of health equity.
- The process for developing guidelines.
- The FDA perspective.
- Best practices from leading institutions.
- Use cases from a range of practice settings.
- Laboratory technologies in use.
- How to communicate results.
- Strategies to educate clinicians.
- Clinical decision support opportunities and challenges.
- The role of interdisciplinary collaborations.

Emerging demand for pharmacogenomics

Since its founding, the NorthShore center has seen an emerging demand for information and clinical assistance, built upon its outreach to primary care physicians. In 2015, the center opened a dedicated pharmacogenomics clinic to meet the community's need for expertise in this specialty. In 2016, the center began to pilot pharmacogenomics outside of the specialty clinic setting that provided complimentary genetic testing for physicians and five kits each for patients. Testing at this time cost \$475 using an in-house multi-gene panel. The center also provided an educational video geared toward patients, based on experiences from the clinic.

The goal, Dr. Hulick said, was not to turn primary care physicians into geneticists, but to demystify the technology and the processes and to show them how the systems can support their practice and patients.

By 2018, the center was able to cut the price to \$125 and provide best practice alerts and guidance at the time of the order for more than 60 drugs.

“What we learned is that almost everyone has at least one high-risk variant” that can affect response to medication, he said “About 20% of prescriptions in primary care fall into that category. About 50% of patients said they were more likely to take their medications, knowing that this information was being incorporated.”

About 81% of primary care physicians said that incorporating genomic information helped them differentiate their practice.

Know where you want to be

Dr. Hulick offered advice to systems considering increasing involvement in precision medicine and pharmacogenomic research and clinical practice.

“It’s important to know where you want to be in this space. What are you trying to do? What do you want to be?” he said. Not every institution will want to adopt the same approach as the NorthShore programs, with its strong commitment to clinical activity.

“We want to drive clinical adoption of these methods and clinical integration. But to be in personalized medicine, you have to cross different silos. There’s no set playbook. You can’t be afraid to take the first step and then learn from the experience,” he said.

“Every organization will be different, with different levels of adoption of the use of the medical tools,” he said. “But every program will need institutional champions—a clinical champion, an administrative champion.”

Other university health systems and some hospital systems have built their own clinics to conduct research on aspects of pharmacogenomics or provide clinical support and participated in the summit series. These include University of Alabama Birmingham, Indiana University, St. Jude Children’s Hospital and Children’s Hospital and Clinics of Minnesota, all of which presented in the AMA-ASHP pharmacogenomics virtual summit series.

For example, the Children’s Hospital and Clinics of Minnesota opened a pharmacogenomic clinic in 2017 to support broad precision medicine programs with medical genetics and genomics, according to David Gregornik, PharmD, director of the pharmacogenomics program.

Gregornik presented on integration into practice. He described the system’s process, including implementation of an EHR integration that allows clinicians to access genomic information and make referrals to the clinic.

The program integrated physicians and pharmacists, with doctors creating a strategy describing what the pharmacogenomics can accomplish and pharmacists communicating outcomes to patient families.

While these pioneers reported positive program outcomes, general understanding of the value of pharmacogenomics is still lacking, summit speakers indicated.

More education is important to the development of pharmacogenomics, according to Andrew Monte, MD, associate professor at University of Colorado School of Medicine in Denver. During the virtual summit series, he cited a survey of 248 medical schools indicating that education about



pharmacogenomics is slight, with 35% of schools providing only one or two hours of education in the topic and an additional 50% offering two to four hours of training.

Only 12.5% of North American medical education programs include pharmacogenomics, compared with a majority of medical schools in Europe and Asia.

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