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New knowledge about the role of genes in health and disease holds the promise of developing safer, more effective treatments for an entire spectrum of diseases. The Department of Veterans Affairs (VA) Office of Research and Development (ORD) is at the forefront of this effort.

VA is superbly fitted to study genomics—the use of patients' individual genetic profiles to customize care—because of its large and diverse patient population; world-class investigators; integrated network of basic research and clinical applications; and an unequaled electronic medical record system that will in time incorporate genetic information.

"The future of medicine is determined by research. And genomics is *the* direction for research in the 21st century," says Joel Kupersmith, MD, VA's Chief Research and Development Officer. Genomics is the key to personalizing medicine—that is, tailoring disease screening, treatment, and monitoring according to an individual patient's genetic makeup.

At VA's Greater Los Angeles (GLA) VA Healthcare System, Drs. Maren Scheuner, Caroline Goldzweig, and others have implemented a comprehensive genetics education program for primary care clinicians that has resulted in better family history documentation, improved recognition of patients at risk for hereditary cancer, and increased referrals for genetic consultation and testing.

Dr. Scheuner, the director of GLA's Health Services Genomics Research Program and the VISN 22 Clinical Genomic Medicine Program, developed a comprehensive genetic education program for primary care providers at GLA's two Women's Health Clinics. Development, implementation, and evaluation of the education program was funded by the Centers for Disease Control and Prevention, Office of Public Health Genomics. The goal of the education program is to improve recognition and referral of patients at risk for hereditary cancer syndromes. The education program consists of three components grouped as informational, clinical and behavioral interventions.

Scheuner says, "The clinical interventions for the electronic health record have probably had the greatest impact in improving the recognition and referral of high-risk patients." Scheuner worked with Dr. Caroline Goldzweig, who is both the director of Health Informatics at GLA and a practitioner at the Women's Clinics, to develop a clinical reminder

for VA's award-winning Electronic Health Record System that prompts providers to get detailed family histories of cancers that they can document using a template. The reminder also prompts providers to decide whether a genetic consult is indicated and an "Indications for Cancer Genetics Referral" guideline is also available through a link embedded within the reminder.

Women with a significant family history of cancer are referred to the Clinical Genetic Service, where a comprehensive consultation occurs. Often genetic testing is discussed as a means to further refine cancer risk. Results from testing can help guide screening and prevention options for patients such as beginning colonoscopies earlier and doing them more frequently or considering preventive surgeries to remove the tissue at risk (e.g., mastectomies or oophorectomies).

During the first nine months of the education program, 886 cancer family histories were completed using the electronic health record template and 79 referrals were made to the genetic consultation service that would likely not have otherwise been made. "This shows how beneficial VA's Electronic Health Record system can be in improving and maintaining Veterans' health," said Dr. Goldzweig. "We've even made referrals for issues like bipolar illness and other mental diseases. This project has great potential to benefit not only Veterans, but their entire families."

"Our early experience with this education program shows that we have successfully changed the behaviors of our primary care clinicians at GLA," Dr. Scheuner recently told the American Society of Human Genetics. "This program may serve as a model for improving genetic risk assessment of other health conditions and with appropriate modifications, it could also potentially be applied in other health care settings as well."

Summing up genomics' potential to launch the world into a new era of customized medical care, Dr. Kupersmith says, "The new day of personalized medicine is dawning. It's about making the treatment as individualized as the disease and providing information to patients so they can have even more control over their own care."

For more information on how VA research, including genomics research, is improving Veterans' lives, go to www.research.va.gov.