NorthShore Mark R. Neaman Center for Personalized Medicine 2020 Donor Impact Report – Your Generosity at Work

NorthShore University HealthSystem Foundation

Thank you for directing your philanthropic support to the Mark R. Neaman Center for Personalized Medicine at NorthShore University HealthSystem (NorthShore). This emerging age of genomic medicine has had tremendous impact on the treatment of disease and predicting an individual's response to treatment. We are pleased to share with you some of the innovations in patient care made possible through your generosity.

Personalized Medicine in Advanced Primary Care

NorthShore completed a year-long pilot program to provide genetic testing through our primary care physician practices, the largest program of its kind nationally. Through the DNA-10K initiative, physicians provided complimentary screening for 10,000 patients for hereditary cancers, cardiovascular disease and pharmacogenomics.

Through genetic testing, if a gene mutation linked to hereditary disease is discovered, our Advanced Primary Care model enables physicians to guide the patient through uniquely tailored screening and prevention steps, as opposed to more standard protocols—all aimed toward improving health outcomes and more informed preventive actions. The results have been remarkable. Ten percent of patients who were tested through DNA-10K showed genetic mutations that could put them at higher risk of developing cancer or cardiovascular disease. Those patients are now connected to genomic experts to continue to follow up on these findings and devise a treatment plan. It is also important to note that 40% of these patients would not have been eligible for genetic testing based on current guidelines. This demonstrates why evidence created through novel programs like DNA-10K plays such a critical role in changing this reality.

The gene panel used in DNA-10K also identifies how patients react to and metabolize certain medications, enabling physicians to choose the right medication at the right dose for each patient, the first time. In fact, 99% of patients who underwent testing through DNA-10K had at least one actionable pharmacogenomic test result. This vital information is now embedded in NorthShore's Electronic Medical Record (EMR) system (Epic), where it interacts with clinical decision-support tools. These tools enable physicians to give the most effective pain medication for patients undergoing elective surgery, or to identify specific antidepressants and dosages most likely to work the first time based on the patient's genetic profile.

Your Gift Changing Lives

Pharmacogenomics and Total Joint Replacement

Working together, Mark Dunnenberger, PharmD, NorthShore's Director of Pharmacogenomics, and Orthopaedic Surgeon Alexander Tauchen, MD, launched a study on the use of pharmacogenomics to improve pain management following total knee replacement. This groundbreaking pilot, titled *The impact of patient pharmacogenomics profile on narcotic consumption and outcomes following total knee arthroplasty,* is designed to help physicians minimize opioid consumption by patients who have undergone joint replacement surgery. The objective is to learn more about pain management as the medical community continues to combat the ongoing, tragic opioid epidemic. This project is generating tremendous interest, not just at NorthShore but at other collaborating institutions that are concerned with the overuse of opioid medications in the management of pain.

The research team is tracking patients' pain medication use and pain levels for 30 days following discharge from the hospital after surgery and comparing that information to the genes associated with metabolizing pain medications and self-reported patient psychosocial traits. Combining genetic data with other clinical information is a major point of innovation for this project. As the only dedicated orthopaedic hospital in Illinois, NorthShore's goal is to create a differentiated expectation of surgical care with an emphasis on safe, effective personalized pain management plans.

Developing Genetic Risk Scores for Disease

The implementation of genetic risk scores in primary and specialty care is a strategic priority of the personalized medicine program at NorthShore. Thanks to research funded over the last five years, NorthShore introduced a polygenic risk score for prostate cancer, a novel test to assess a man's risk of developing the disease. This test is the first commercially available polygenic risk score based on the combined interpretation of 72 genetic variants known to be associated with increased prostate cancer risk. Created and validated at NorthShore's Program for Personalized Cancer Care (PPCC) by Brian Helfand, MD, the Ronald L. Chez Family and Richard Melman Family Chair of Prostate Cancer, and Jianfeng Xu, MD, DrPH, the Ellrodt-Schweighauser Family Chair of Cancer Genomic Research, the polygenic risk score is now being incorporated into care plans for patients within the PPCC. The test is particularly useful for men who have had negative test results for other high-risk genetic mutations and men who have had a previous diagnosis, as it can help explain disease development or progression. Drs. Helfand and Xu and their colleagues have also found a link between genetic risk score and early-age diagnosis of prostate cancer, becoming the first to draw this connection from years of collecting data.

Dr. Xu and his NorthShore colleagues are currently developing additional genetic risk scores for other diseases, such as pancreatic cancer, diabetes and cardiovascular disease, and intend to integrate these scores into primary and specialty care at NorthShore. This is only possible because of years of data collection seeded by philanthropic investment.

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