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Putting precision care on the spot

By DOUGLAS J. GUTH

Photo by FILE PHOTO The main campus of the Cleveland Clinic

In 2015, the Obama administration launched the Precision Medicine Initiative — an effort designed to bring national attention to a health care approach that takes into account variability in genes, environmental factors and lifestyle for each person.

The role of precision medicine in day-to-day clinical care is still limited, but Northeast Ohio could play a major part in bringing it to the mainstream. Proponents point to genomics as an area of personalized health that can revolutionize all aspects of the health care delivery system. Genomics is the study of genes in making pinpoint therapeutic decisions, where care is based on the understanding of unique health and disease attributes.

This potentially transformative discipline is the subject of the Cleveland Clinic's Medical Innovation Summit, to be held Oct. 23-25 downtown. The summit is set to gather more than 2,000 health care and business leaders, among them Dr. Charis Eng, founder of the Clinic's Genomic Medicine Institute (GMI). Eng is a firm believer in the promise of genomics and precision medicine, having identified four of 10 genes known to be associated with breast cancer and another six connected to Cowden syndrome, a disorder that carries high risk of breast, thyroid and other cancers.

Whether it's called precision medicine, personalized medicine or genomic health care, the idea is to tailor medical care, eschewing a traditional "one-size-fits-all" approach. In practice, people carrying genetic variants in their breast cancer tumors may respond well to a particular treatment, while that same therapy may not be as effective in patients without those genetic variants.

"Surveillance and prevention (compared to traditional care) is quite different," Eng said. "We're seeing what organs are at risk, and even what ages are at risk."

Eng also helped developed MyFamily, a tool that stores a patient's family health history in their electronic medical record. By flagging potential genetic conditions that may appear in future checkups, the web-based application predicts disease risks, ideally facilitating personalized preventative care planning.

"If there's any family history or other red flags, these people can be referred for genetic evaluation and testing," Eng said.

Facilitating the MyFamily app is Family Care Path, a local startup led by Eng and CEO David McKee. Hospital systems and health care providers using the company's technology engage patients in discrete data collection prior to medical appointments.

"An individual may find out about colorectal cancer in their family, so a doctor would tell them to get a colonoscopy at age 25 instead of 50," McKee said.

MyFamily covers 12 "actionable" diseases, including osteoporosis and cancer. Including this information in electronic medical records cuts down on the nearly five hours each day physicians spend updating patient records, according to company data.

Although the app is used by clients in Brazil, China and throughout the United States, penetrating hospital systems is generally difficult, meaning the company often reaches clinicians through their electronic medical record providers.

"Health care has shifted to outpatient stay, so it's about bringing in new tools to track patients," McKee said. "Embedding this info into the EMR is critical, considering a doctor's time is so important."

Making life easier for doctors

The Clinic's precision medicine summit includes discussions on genomic sequencing and gene therapy, areas that supporters believe hold the key to managing and eliminating any number of debilitating diseases.

GenomOncology is a Cleveland-based health care IT company developing software that analyzes genomic data, resulting in simple clinical reports that enable clinicians to optimize treatment for cancer patients. Based on data from a person's genome, the company's GO Clinical Workbench tool outlines a drug's effectiveness and indicates what clinical trials are best suited for a particular patient.

"Cancer is a disease of mutation," said GenomOncology president and CEO Manuel Glynias. "We're able to understand some of those mutations and make decisions on what therapies a patient should receive."

As the technology moves ahead, Glynias is charged with solving how oncologists can integrate genomic data into their daily workflows. Offering doctors a playbook boasting detailed disease datasets can speed up the typically arduous process of getting patients into clinical trials, he said.

"About 2,000 trials and 50 therapies have a genomic component," Glynias said. "Analysis is very difficult for the common oncologist who sees every kind of cancer. There are 10 synonyms alone for non-small cell lung cancer. By enabling decision support, doctors will use this information to bring precision medicine to the masses."

Dr. Stanton Gerson, director of the Case Comprehensive Cancer Center, is co-founder of Rodeo Therapeutics, which develops drugs that promote the body's repair of diseased or damaged tissues. The startup's initial focus to create treatments for inflammatory bowel disease and another that can help cancer patients' cells grow quickly following stem cell transplants.

Reaching this goal is just the start, Gerson noted. Rodeo is working on drugs that inhibit an enzyme called 15-PGDH, which has been shown to accelerate the regenerative process. In mice, 15-PGDH inhibitors stimulated healing of colitis and quickened bone marrow recovery following a transplant.

The company's technology is based in part on Gerson's work in stem cell and genetic research, as well as gene therapies and cancer drug development. Though still in the early stages, the new inhibitor drug can serve precision medicine by accessing patients carrying the enzyme.

"There are very few therapeutics where we know precisely the enzyme being targeted," Gerson said. "We have to get to the point where we can link enzyme levels to clinical utility."

Cleveland Clinic's Eng said hospital systems and academic institutions alike must continue to mainstream dialogue regarding the overlap of genomics and precision health.

"Precision medicine support has to come from the top down, then a concerted effort (in the area) must be pushed forward" Eng said. "We're seeing this at the Clinic."