Frederick Health Streamlines Genetic Test Ordering and Result Processes by Over 50% Using Expanse Genomics

Introduction

The understanding of how a patient's unique genetic makeup affects their health has been a rapidly developing area of medicine ever since the completion of the Human Genome Project in 2003. Despite these gains, physicians continue to face barriers to accessing, understanding, and using genetic information in their medical decision-making processes.

SNAPSHOT

Opportunity

To streamline both the genetic test ordering process and the process of receiving and importing discrete test result data into the EHR.

Solution

Work with MEDITECH, First Databank, and laboratories to embed the complete genomics workflow into the Expanse EHR.

Benefits

- 20+ minute time savings during the genetic test ordering process
- 50% reduction in steps for receiving, importing, and displaying genetic test results in the EHR
- Increased patient throughput
- Improved clinician satisfaction

Profile

Frederick Health Hospital (Frederick, MD) is the hub of Frederick Health and the only acute care hospital in the county. Located 50 miles from Baltimore, this nonprofit, 269-bed facility and its outpatient services account for 285,000 visits every year. Frederick Health Hospital was recognized by CHIME as one of Healthcare's Most Wired 8 organizations.

In 2020, Frederick Health launched a precision medicine program which consisted of one dedicated genetic counselor who worked with physicians across the enterprise interested in ordering tests and interpreting results. The program manager initially performed their genomic medicine processes like most healthcare organizations with precision medicine programs — that is, largely outside of the EHR. As a result, they encountered many of these barriers, including:

- **Challenges finding results in the EHR.**
- **A lack of standards regarding how that data is presented.**
- **Difficulty consuming the information (which is typically buried in long PDF reports).**
- **Limited guidance for taking action based on the data.**

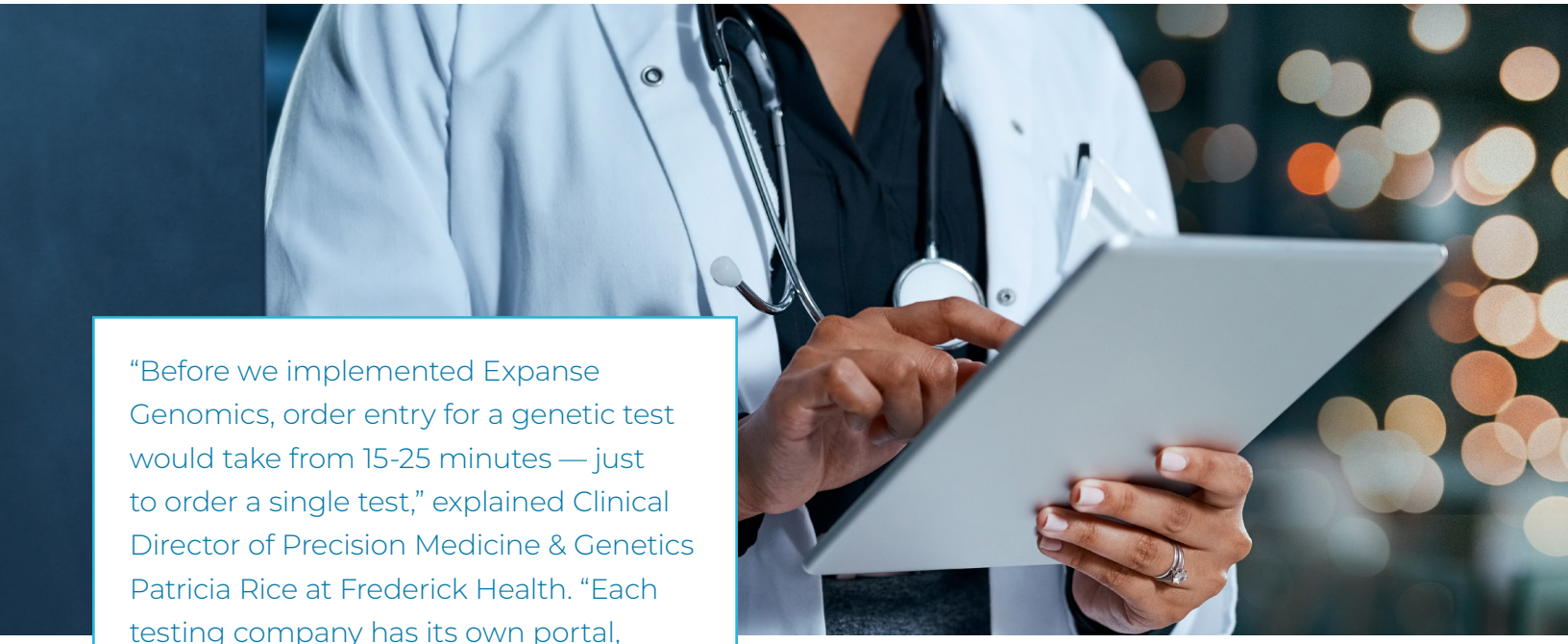
One year later, Frederick Health leadership learned that MEDITECH was developing an EHR-based genomics solution to allow genetic test ordering, as well as storage of discrete genetic test results, directly in the EHR. They agreed to become an early adopter of MEDITECH's Expanse Genomics solution, and the organizations worked intensively to implement and adapt the software to support the program. Since then it has become one of the leading community-based precision medicine programs in the country — removing the barriers that have historically made it difficult for physicians to access and use genetic data.

Before: Inefficient ordering and results processes

Genomic medicine has been expanding beyond research laboratories and into clinical practice, as healthcare providers begin to appreciate the value of genetic testing for risk assessment, disease diagnosis, targeted therapies, and personalized treatment plans. But that pace has been slowed by inefficiencies and a lack of integration between EHRs, genetic testing laboratories, drug database providers, and medical guidance systems. This lack of integration resulted in several pain points at Frederick Health before the introduction of Expanse Genomics.

The Ordering Process

Clinicians who wanted to order a genetic test for a patient were required to leave the EHR, launch a separate application, and perform the entire ordering process in an external system. That meant reidentifying the patient (manually entering patient demographics for patients that hadn't previously been tested), selecting the test, and submitting the order before returning to the EHR to document that the order had been placed.



"Before we implemented Expanse Genomics, order entry for a genetic test would take from 15-25 minutes — just to order a single test," explained Clinical Director of Precision Medicine & Genetics Patricia Rice at Frederick Health. "Each testing company has its own portal, which required us to manually enter a patient's demographics, insurance information, ICD codes, and indications. On average, I would estimate that ordering a genetic test would take 20 minutes."

Rice said that acquiring results, just like placing orders, took 15-25 minutes on average, since they had to be downloaded from each lab vendor's portal and then uploaded into the EHR. Providers often had to search for results in a variety of locations in the EHR because filing was inconsistent among staff members and there was no dedicated place in the patient chart for genetic test results. Sometimes results were filed in Diagnostics. Sometimes they were filed in the Other Clinical section. They could be loosely filed in Other Reports. Moreover, there was no consistent naming convention from the testing laboratory.

"Often the provider would spend a significant amount of time searching for these results during a new patient visit, which would take time away from the encounter with the patient," Rice said.

In addition to these lengthy, multi-step processes, each testing lab provided results in its own unique format, usually as a text-based PDF. This required providers to read reports in their entirety to locate, review, and interpret the findings, which was particularly onerous for non-specialists who did not frequently interact with genetic data.

For Frederick Health to make genomic medicine accessible and usable for clinicians across the enterprise, leadership realized they would need to significantly streamline both the ordering and resulting processes while also providing interpretation of results and guidance regarding treatment options.

The Results Process

The process for receiving and reviewing results was even more cumbersome. Like many organizations, Frederick Health orders genetic tests from several different laboratories, each with its own approach to notifying, sharing, and formatting results. Typically, an administrative member of the Frederick team would receive an email message letting them know that results were available. That staff member would log onto the laboratory's portal, download the PDF report, upload the report into the patient's chart in the EHR, and notify the provider.

Integrating genomics into the EHR

In the spring of 2021, members of MEDITECH's genomics development team met with Frederick Health leadership to present an overview of functionality the team was developing. They had been working with several large genetic testing laboratories since 2017 to begin codifying formats for sharing discrete genetic results. The lack of standards for formatting and sharing discrete genetic data meant that MEDITECH development staff needed to work with these labs to establish an approach that required as little vendor-specific coding as possible. The aim was to enable the Expanse EHR to import and store raw test results directly in the EHR as discrete data elements, rather than in standard, text-based report formats — typically PDFs.

> "To the best of our knowledge, MEDITECH was the first EHR vendor to do this," said CIO and Vice President of Information Technology Jackie Rice at Frederick Health. "And we were among the first healthcare organizations anywhere to bring discrete genetic data into our patient records."

The MEDITECH team built a new data layer on top of MEDITECH's laboratory information system for storing and displaying complicated genetic data, including patients' germline and somatic genetic history.

"This provides a consistent and intuitive place for clinicians to find results," noted MEDITECH Product Manager Jennifer Ford. "It also allows us to develop powerful reports and dashboards that pull in genetic test result data along with other pertinent data such as medications and problems, which is a significant benefit to storing discrete genetic data in the EHR."

Meanwhile, the genetic test ordering process was also simplified, allowing clinicians to order genetic tests out of the EHR just like other types of tests. This too required close collaboration with lab vendors, to allow MEDITECH to securely send patient demographic data to labs to order specific tests and tie test results back to patients in the EHR.

Physicians at Frederick Health's James M Stockman Cancer Institute appreciate how much more streamlined both the ordering and results processes are now that they've been integrated into the EHR.

> "The integration into MEDITECH allows for seamless ordering of genetic testing out of the orders module, parallel with any other orders to be placed. It also offers the opportunity to retrieve all genetic profiling results in one conveniently arranged listing, which keeps all results organized and aggregated in one tab."
>
> **Patrick Mansky, MD**
> Hematologist and Medical Oncologist
> Frederick Health

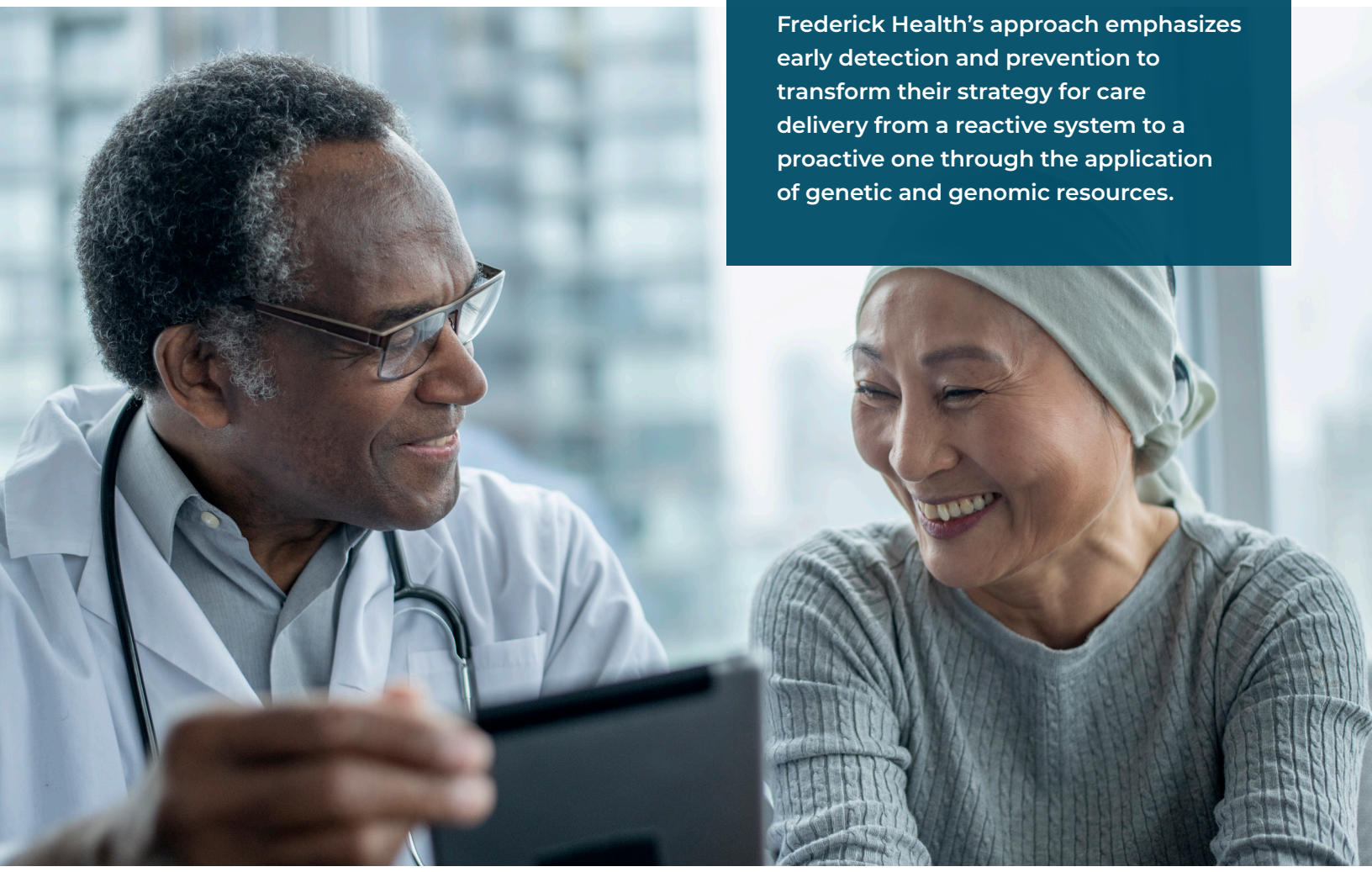
After: Streamlined ordering, results, and guidance in the EHR

The Precision Medicine & Genetics Steering Committee at Frederick Health decided to bring Expanse Genomics live first with oncology providers and clinicians in the new precision medicine clinic. Oncologists at Frederick Health — like those at other organizations — often submit tissue samples for genetic testing to look for certain gene or protein changes which guide prognoses and treatment plans for their cancer patients. Since these clinicians were already routinely ordering genetic tests, receiving results, and interpreting them to determine the best course of treatment, the impact of workflow changes following the implementation of Expanse Genomics could be analyzed.

The Precision Medicine & Genetics Steering Committee was established at Frederick Health in 2021 with a mission to "positively impact the well-being of every individual in the community by using genetic information to prevent and treat medical conditions."

From the start, the vision of the committee was to make Precision Medicine & Genetics a comprehensive offering under one umbrella, including hereditary genetics, pharmacogenomics, precision medicine guided therapy, and precision medicine clinical trials. This required a multidisciplinary team that includes physicians, IT, safety and compliance, laboratory, clinical trials, nutrition, pharmacy, and members of their senior executive team.

Frederick Health's approach emphasizes early detection and prevention to transform their strategy for care delivery from a reactive system to a proactive one through the application of genetic and genomic resources.



Below is a visual representation of the before and after workflows for both the ordering and resulting processes for oncologists at Frederick Health.

Results Process

BEFORE

Standalone Solution

1. Exit EHR and launch web browser
2. Log in to genetic lab portal
3. Identify test to be ordered
4. Enter patient name and demographics
5. Submit order
6. Return to EHR and document test order

Enter patient demographics, ICD codes, clinical information, and insurance information. Upload any required documents.

AFTER

Integrated Solution

1. Select "Order" in the patient's EHR chart
2. Select the genetic test to be ordered
3. Submit order

All demographics and insurance information is prepopulated.

Only ICD code is needed.

Ordering Process

BEFORE

Standalone Solution

1. Await email notification
2. Log in to genetic lab portal
3. Download test results (PDF)
4. Upload PDF into EHR
5. Notify clinician about results

ADMINISTRATIVE STAFF

6. Launch external PDF viewer
7. Read entire report
8. Consult with genetic counselor

CLINICAL STAFF

AFTER

Integrated Solution

1. Automatically notified of results
2. Accesses results like other lab results
3. Reviews results in the EHR
4. Receives interpretation and clinical guidance

CLINICAL STAFF [No need for administrative support]

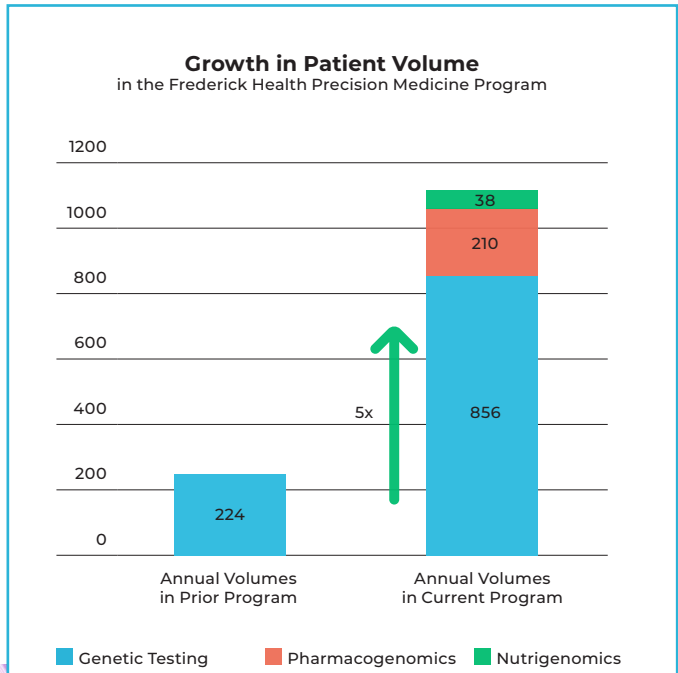
25 **Minutes Saved**
Per genetic test ordered

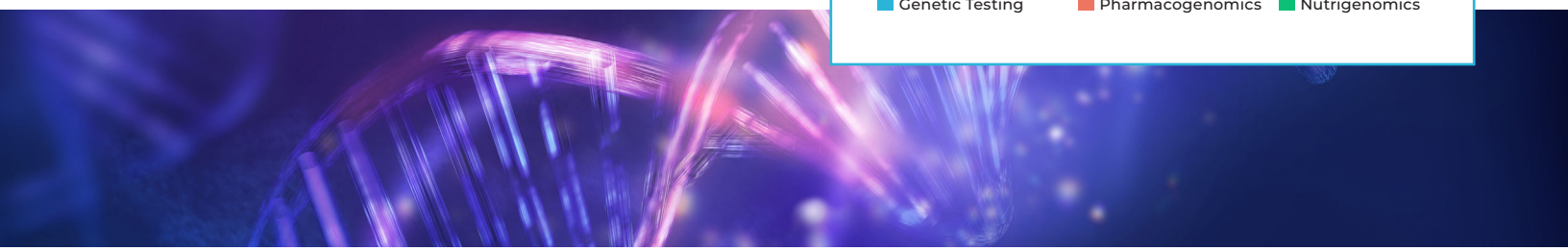
50% **Fewer Steps**
In the results process

By significantly decreasing the time it takes to order new genetics tests — and streamlining the process for receiving, importing, and accessing results — Frederick Health has been able to increase throughput and accelerate the expansion of its precision medicine program. Since the program's inception in the fall of 2021, the number of patients tested has increased more than fivefold. (See the figure to the right.) Approximately 200 patients participated in the program in its first year. By 2023, more than 1,000 patients had enrolled in the program. That number continues to increase as the organization enables physicians across other specialties to order tests.

Physicians quickly experienced the benefits of the streamlined processes for both ordering and resulting. Moreover, the ability to store discrete genomic data directly in the EHR and not in an external system or in a text-based file has had a profound effect on care delivery at Frederick Health.

"With Expanse Genomics, the provider can navigate to the genetics tab and immediately locate the test along with discrete, actionable results, saving 15-25 minutes per visit," explained Pat Rice. "Naturally, this results in improved provider and patient satisfaction."



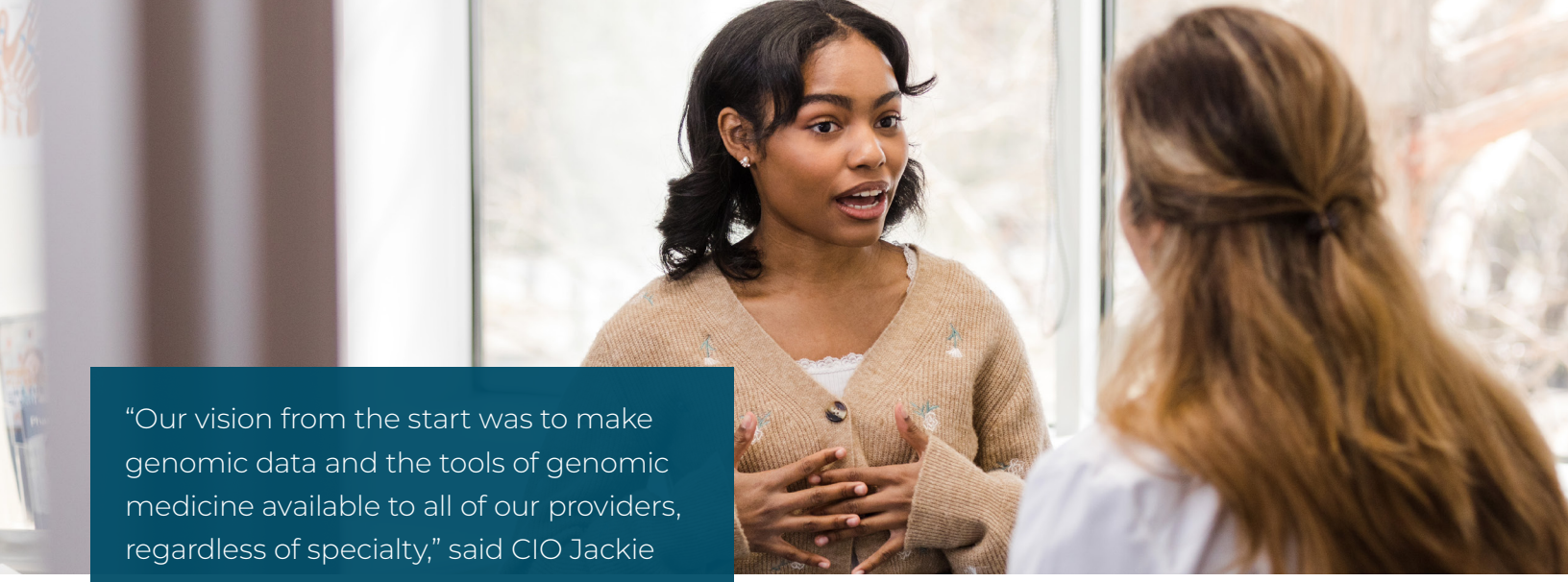


Expanding the use of genomics

Outside of a handful of specialties like oncology, most physicians today have only cursory training in genetics, and rarely use it in their practice. This is problematic since the scope and pace of genomic discovery demonstrates that genetic mutations have impacts across all body systems.

The leadership team at Frederick Health recognized early on how Expanse Genomics could help the organization extend the benefits of genomic medicine to providers of all kinds, including primary care physicians and general medicine practitioners. By storing discrete genetic test results like other test results in the EHR, any physician could access and use key findings.

However, simply making genetic tests easier to order for non-specialists — and making results more readily available to them — does not necessarily make them feel comfortable or confident using genetic data. As a result, the organization has made a concerted effort to educate non-specialist providers on the value of genetic data for their specialties, and showed them how easy it is to order tests and receive results in their system.



"Our vision from the start was to make genomic data and the tools of genomic medicine available to all of our providers, regardless of specialty," said CIO Jackie Rice. "But that requires education. We're doing that now — showing other providers the value of genetic data to their practice, and more and more they're getting it. Their eyes are being opened to the possibilities."

Pharmacogenomic alerts

Frederick Health introduced additional providers to the value of genetic data in the EHR by enabling pharmacogenomic alerts. Drug-gene alerts operate in the same way that drug-drug interaction checking works. Just as certain drugs interact with one another adversely, patients can have adverse reactions to drugs based on their unique genetic profiles. Alerting clinicians to these potential adverse reactions provides an additional layer of safety at Frederick Health.

Pharmacogenomic results can also be found in the genetics tab, and the provider can access the detailed PDF adjacent to the result," explained Pat Rice. "The pharmacogenomics test is linked with First Databank and will alert a provider of any severe interactions associated with the pharmacogenomics result."

Rice added that enabling pharmacogenomic alerts across the enterprise provided an excellent teaching opportunity, helping providers in all parts of the organization recognize the value of genetic data. When a clinician chooses a medication or a dose that is contraindicated for a patient with genetic data in the EHR, they're alerted and provided guidance to select a different medication or dose.

Behavioral health

Patients experiencing behavioral health issues like depression often endure months of "trial-and-error" prescribing before finding a treatment that works for them. Genetic testing can help clinicians narrow down which drugs are likely to be most effective, and at which dose. Frederick Health extended the use of Expanse Genomics to its primary care providers and behavioral health specialists, enabling them to order genetic tests for patients as well as leverage existing patient genetic data to guide their medication decision-making.

Nutrigenomics

Nutrigenomics explores the interaction between nutrients, genetic variations, and gene expression to understand how diet and nutrition influence individual health outcomes. It can provide insights into personalized nutrition strategies for improved wellness and quality of life for patients. Frederick Health has created a nutrigenomics program to help patients understand which types of foods and diets could be most effective for their health.

Population health

Leadership at Frederick Health realized early in the implementation of Expanse Genomics just how valuable genetic data could be when housed in the EHR. The ability to develop reports that capture specific genetic data elements allows clinicians to segment their patient population based on things like the presence of specific genetic markers or mutations. This data can be used to identify groups at risk for developing specific health problems and develop proactive treatment plans. It can also help them detect clusters and trends in genetic mutations across their populations.

Health equity

From the start, leadership recognized the importance of ensuring that the benefits of the Precision Medicine & Genetics program extended to all patients, regardless of their income level, education, housing status, or other social determinants of health. Their aim is to ensure that socially and economically diverse patient populations have access to the program, which is essential for achieving health equity and developing a fuller understanding of community needs. The organization conducts outreach and education to these communities on the benefits of genetic testing, and offers discounted or free testing to those in need.

Therapy and clinical trial matching

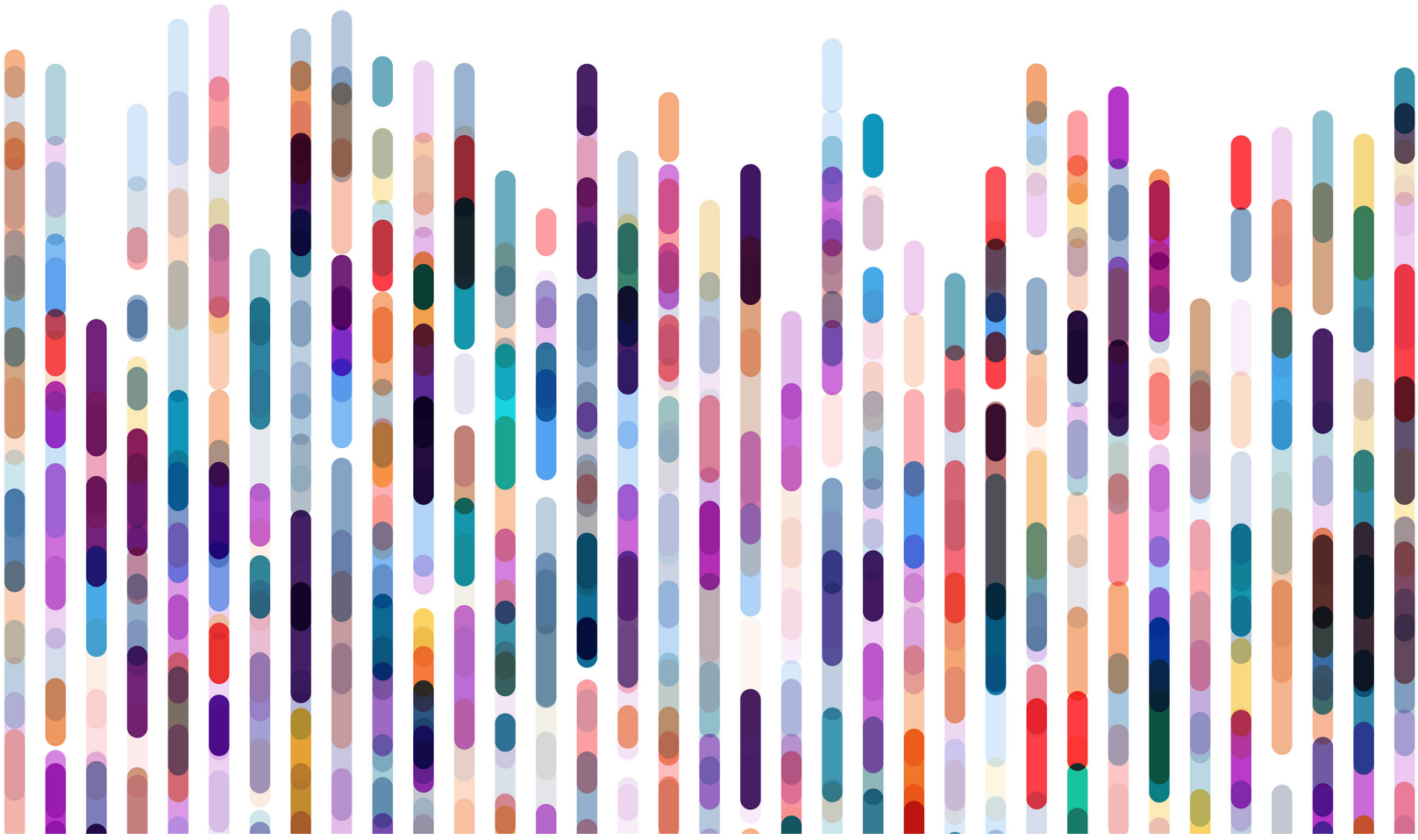
Today, Frederick Health is piloting new functionality in Expanse Genomics that enables patients to be automatically matched and enrolled in clinical trials based on genetic data in the EHR. This is particularly consequential for patients not responsive to standard treatments, as they often have no clear care pathway. Frederick Health conducts many of its own clinical trials and also matches patients with trials underway nationwide. The new functionality in Expanse Genomics identifies and ranks the most relevant and promising trials based on patient conditions and unique genetic profiles, prioritizing those being conducted at Frederick Health. This capability is valuable because manually matching patients to trials is extremely time consuming. Moreover, organizations receive funding for conducting trials but often struggle to identify and enroll enough patients to perform trials.

Conclusion

The ability to order and result genetic tests directly from the EHR and provide clear and actionable guidance at the point of care is a significant step toward making genomic medicine accessible and usable to clinicians of all kinds. Working together, MEDITECH and Frederick Health have begun removing the historical barriers providers have faced accessing, understanding, and using genetic information in their medical decision-making processes.

Just two years after piloting MEDITECH's Expanse Genomics solution, Frederick Health has become a recognized leader, bringing precision medicine out of the realm of the specialized academic teaching and research hospital and into the community. Beyond industry accolades and national press, the organization is beginning to attract patients from larger urban areas, including Baltimore and Washington, DC.

> "The integration of genomic data into MEDITECH represents a transformative step in enhancing patient care," said Hematologist and Oncologist Saro Sarkisian, MD, MHA, at Frederick Health. "Our healthcare providers can now access vital genetic information directly within the patient's record in MEDITECH, enabling precise diagnosis, personalized treatment plans, and proactive disease prevention strategies."



MEDITECH

+1 (781) 821-3000

www.meditech.com

info@meditech.com

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