Providence Genomics Highlights

2025

Providence Genomics

A Letter from Brian D. Piening, Ph.D.

Program Director for Providence Genomics, Technical Director for the Molecular Genomics Laboratory, Associate Member, Cancer Immuno-Genomics Laboratory, Earle A. Chiles Research Institute, Providence Cancer Center

I am incredibly proud of the work the Providence Genomics team has done over the past year. Our caregivers are providing state-of-the-art clinical genomic testing, cutting-edge research in artificial intelligence and precision medicine that remains at the forefront of biomedicine.

As a community-based, mission-driven health system spanning diverse settings across seven states, we have both the opportunity and the responsibility to ensure that advances in genomics and precision medicine reflect the real-world populations we serve—across backgrounds, geographies and lived experiences. By embedding the latest genomic advances within routine clinical practice, we generate evidence that is more representative, more actionable and better suited to delivering truly personalized care for all.

Our diverse team of clinicians, scientists, laboratorians and software engineers are turning that promise into impact. For example, by combining large-scale clinical data with advanced analytics and artificial intelligence, Providence is accelerating the translation of genomic insights into clinical decision-making.

In partnership with collaborators, our teams are developing AI tools that have the power to unlock data-driven insights that can be transformative for precision medicine. Just one year after its release, Prov-GigaPath was downloaded more than 2.5M times by clinical and research teams around the world, with many such teams poised to implement the tool in their own settings. And this progress is only the beginning.

As you read on, you'll see how Providence is advancing a future of genomics and personalized medicine that is grounded in real-world care—one where patients and providers alike have the tools to deliver more precise, equitable, and effective care in service of our shared vision of health for a better world.

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Risk Awareness Programs

Genomics offers a novel way to detect disease long before symptoms may present themselves. Our suite of offerings help to identify a patient's susceptibility to cancer and other diseases so caregivers can recommend personalized, preventive, care plans.

Prevention4ME program expands across Providence to reach more patients

Prevention4ME is revolutionizing cancer screenings by seamlessly incorporating personal and family history risk assessments into routine appointments to guide personalized cancer screening and genetic testing when needed.

Patients who take part in Prevention4ME are also invited to participate in the newly launched Discover Research Registry, a digital "front door" e-consent for non-interventional research participation. The registry empowers Providence patients to contribute to innovations in precision medicine and personalized care. When patients consent to join the registry, they choose to share their health, genomic, and demographic data to advance scientific discovery through research conducted by Providence and its partners. The Discover Research Registry rigorously adheres to data protection standards for health information.

Prevention4Me Milestones:

- **81,000 patients reached**
- **8,000 high-risk patients identified**
- **10 sites offering Prevention4ME in 2025**

Learn more about Prevention4ME.

Novel Cancer Screening program amplifies research and rolls out more testing

Recommended screening tests exist for only five cancers—breast, colon, cervical, lung, and prostate, yet 70% of diagnosed cancers affect other other parts of the body. A new class of Novel Cancer Screening tests are helping to bridge this gap by scanning for a broad range of cancer types, all from a single blood sample.

Novel Cancer Screening Milestones:

- **Groundbreaking PREVAIL study reaches accrual at 1400+ patients:** This first-of-its-kind study aims to understand the ways in which people with a genetic predisposition to cancer access innovative screening tools, including the Galleri test by GRAIL, and how access to screening tools may impact the choices they make and the care they receive over time.
- **PRECEDE research leading the fight against pancreatic cancer:** Providence is participating in PRECEDE, a long-term study of people at increased risk of developing pancreatic cancer based on family history, presence of specific genetic mutations, a health history of chronic pancreatitis, or existence of a pancreatic cyst.
- **New grant helps to expand novel cancer screening research:** Providence and five other institutions are part of a cooperative project using an NCI seed grant to study multi-cancer detection (MCD) testing in hereditary cancer.

Learn more about MCD testing.

Geno4ME® sequencing program demonstrates transformative potential for population health

A publication by Providence researchers in Nature/NPJ Genomic Medicine highlights the design and implementation of the groundbreaking Genomic Medication for Everyone (Geno4ME) study. The paper highlights how whole genome sequencing (WGS) can transform health care by enabling earlier disease detection, tailored prevention strategies, and more precise treatment decisions. A second study published in Frontiers in Molecular Biosciences demonstrates how WGS may impact routine genetic screening by creating a lifelong genomic health record that can be reinterpreted as new discoveries emerge.

The Geno4ME program was established as a pilot across the seven-state Providence Health system to test the integration of population health genomics into routine care. Although new enrollment for the study has closed, the study and its participants continue to generate real-world insights that shape the future of genomic medicine and inform how we deliver more personalized, proactive care.

What's next: Providence researchers are analyzing the health outcomes of participants who received genetic results through Geno4ME. Discrete results will also be added retrospectively into patient records to help ensure more personalized care.

Learn more about Geno4ME.

"At Providence, we imagine a health care system where each patient's journey is informed by their whole-person context, including genomic, clinical, and social factors. We work to ensure that genomic information is accessible and actionable for all patients and caregivers and use scientific research and the latest advancements to weave whole-person precision medicine into the fabric of our care."

Kristin Brown
Executive Director,
Providence Institute for Clinical Innovation

Precision Insight Programs

Our suite of precision therapy programs uses genomic testing to personalize treatment plans. For example, PGx testing identifies gene variations to improve medication prescribing, minimizing adverse drug reactions. If a patient develops cancer, Comprehensive Genomic Profiling (CPG) tests can diagnose genetic anomalies in the tumor to guide targeted therapies.

New genomic tests and treatments are transforming precision oncology

As new precision treatment options emerge for cancer patients, Providence Genomics is offering more genomic testing to patients who can benefit from it.

Biomarker Testing Milestones:

- **Over 30K genomic tests** have been performed by the Providence Molecular Genomics Laboratory.
- **ProvSeq testing expands:** Providence's next generation sequencing portfolio now includes ProvSeq-HRD, a key biomarker to inform advanced ovarian cancer treatment options.
- **Early sequencing improves survival:** Research from a team led by Brian Piening, PhD, program director for Providence Genomics, demonstrated that a majority (67 percent) of patients tested with the ProvSeq Comprehensive Genomic Profiling (CPG) test were candidates for guideline-recommended precision cancer therapy, and those treated with these therapies showed significant improvements in overall survival rate versus chemotherapy.
- **Genomic test ordering is now easier and faster.** Two recent improvements are streamlining how physicians order genetic tests:
  - **Epic integration:** Providence Molecular Genomics Lab tests can now be ordered directly in Epic, significantly improving workflow efficiency.
  - **New Gateway ordering process:** A new, flexible, physician-friendly ordering pathway called Gateway reviews genetic test orders for insurer compliance and offers both internal and external test options. This will help to reduce administrative burden and improve testing traceability.

GenoRx™ expands pharmacogenomics and PGx testing across Providence family of organizations

PGx testing is used to personalize drug dosing based on a patient's individual genomic profile.

GenoRx Milestones:

- **Rollout research for PGx testing:** Before launching PGx testing, the GenoRx™ team partnered with the Center for Outcomes Research & Education (CORE) to explore barriers to and opportunities for testing. The analysis provided actionable strategies for bringing PGx testing into everyday clinical practice and identified areas where PGx testing can have the greatest impact. The GenoRx team is making PGx testing simple to use by providing easy access to results and PGx-guided medication alerts through the Epic Genomics Module.
- **Two pilot sites launch PGx testing:** Providence Genomics successfully launched two PGx pilot programs in Southern California and is evaluating the outcomes of them before further expansion to additional locations.

"Pharmacogenomics is a fascinating field— incredibly necessary and important. The results of my test directly impacted my health. Now I can make much more informed choices about medications and can simply avoid likely medication problems that this test identified. My test results validate my own experience with various classes of medications which I have had negative reactions to over many years. I wish I'd had this data 20 or 30 years ago! I would have been able to prevent some serious problems. This is such an important field, and the information will help so many people avoid unnecessary suffering."

E. Feldman, GenoRx patient

Scientific Research

New ProvAI tools have the potential to transform research and clinical practice.

Providence uses research and data to develop new precision medicine breakthroughs, and tests these innovations before integrating them into care across our family of organizations. As an accelerator for system change, we are building advanced AI tools and programs to expand the use of de-identified data for research help realize our vision of health for a better world.

Scientific Research Milestones:

- **Prov-GigaTIME model published:** Researchers at Providence and Microsoft collaborated to develop Prov-GigaTIME an AI model that can generate virtual immunohistochemical stains from standard pathology cancer tissue images. These virtual stains can then be used to profile the tumor's immune microenvironment in exquisite detail, which can then be used to predict a patient's response to immunotherapy. Cell Journal recently published Providence research about the potential impact of Prov-GigaTIME.

- **Prov-GigaPath downloaded by 2.5 million users:** Prov-GigaPath, our recently developed open-source pathology foundation AI model, has eclipsed 2.5 million downloads by researchers and clinicians around the world, with a number of groups already starting to implement the tool in the clinic. Learn more.

- **TRIALSCOPE AI model could revolutionize clinical research:** BioMedParse is a new tool developed by Providence and collaborators. Research published in Nature Methods describes how BiomedParse can be used to interpret features across nine distinct types of medical imaging data. This work paves the way for innovative multimodal biomedical discovery, by supporting research that can be performed across large datasets regardless of imaging type.

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