Providence
Genomics

2023 ANNUAL REPORT

Transforming Whole-Person Care at Scale

Providence
Genomics

A Vision for Genomics at Providence

We envision a healthcare system where each patient's journey is informed by their whole-person context, including their genomic, clinical, social, and protective factors.

Contents

"Genomics research is quickly transforming patient care, aiding those with diseases and those at risk. We're just beginning a remarkable journey where our current progress only scratches the surface of what's possible for us and our patients."

—Walter Urba, MD, PhD
Director, Providence Earle A. Chiles Research Institute, Robert W. Franz Cancer Center

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Precision Medicine is Transforming Healthcare

Bill Wright, PhD
Vice President of Health Innovation, Providence

We're advancing towards a new era in medicine, tailoring care to each individual's whole-person context including clinical, genomic, and social factors. Precision medicine revolutionizes healthcare, enabling risk prediction, illness prevention, early diagnosis, and more effective treatment. Providence Genomics is leading this transformative journey, bridging cutting-edge science with real-world applications to establish tomorrow's healthcare standards.

Our approach rests on three key strategies:

1. **Integrate Genomics into Clinical Programs:** Implementing precision medicine throughout prevention, diagnosis, and treatment via diverse clinical programs.
2. **Drive Innovation through Scientific Collaboration:** Using interdisciplinary research as an evidence engine to enhance disease prevention, discover treatments, and foster sustainable care advancements.
3. **Enable Genomics at Scale:** Establish the essential data infrastructure to seamlessly integrate precision medicine into everyday care, supporting both caregivers and patients.

These core strategies form a roadmap for seamlessly integrating whole-person precision medicine data into healthcare delivery. By embedding key data and actionable insights into clinical workflows, we empower informed clinical decisions and personalized strategies for prevention and care. As we shape the future healthcare system, we'll test, integrate, and expand these innovations within a learning framework—combining scientific research, clinical innovation, and real-world care across diverse communities.

OUR NORTH STAR

To make personalized medicine available to all.

"Beyond research, genomics is helping to guide actual care transformations. We are learning how to weave a patient's unique genetic blueprint into the fabric of their care plan. This will be a big shift; a move from one-size-fits-all medicine to healthcare that can be as unique as the person it serves."

—Ari Robicsek, MD
Chief Analytics and Research Officer, Providence

A Path to Transforming Care

INTEGRATION Multi-disciplinary Collaboration → **ADOPTION** Clinical Programs → **INNOVATION** Science & Discovery → **SCALE** Infrastructure

Our path to transforming care reflects our understanding that no two patients are the same. We take individual genomic variability into account at every step of the care journey. Working across the continuum of prevention, early detection, and therapies, we turn today's most promising innovations into tomorrow's standard of care.

PROVIDENCE PARTNERSHIPS AND THE DISCOVER PROGRAM

Science is never static, and neither are we. Providence Genomics uses learning partnerships to improve care and move the field of personalized medicine forward. Working together, we are building an evidence engine to uncover new therapies, integrate innovations into standard care, and guide care transformations with evidence that is grounded in real-world care experiences.

The Discover Program is our platform for collaborative precision medicine research. It fuels the discovery of new treatments and care approaches and applies implementation science to incorporate these advances into medical practice. Using real-world evidence studies, we evaluate the effectiveness of new precision medicine treatments and care plans.

The Discover Program is supported by the generosity of patients who consent to provide deidentified data for research.

GET INVOLVED

The CREATE Collaborative is a clinical and patient advisory group guiding the integration of genomics into medicine.
Contact: Genomics@Providence.org

"Genomics is leading a big change in patient care, making personalized treatments possible and reshaping medicine. It's paving the way for a future where treatments are tailored to each person."

—Carlo Bifulco, MD
CMO, Providence Genomics and Associate Member, Translational Molecular Pathology, Earle A. Chiles Research Institute

Integrating Early Detection into Routine Cancer Screening

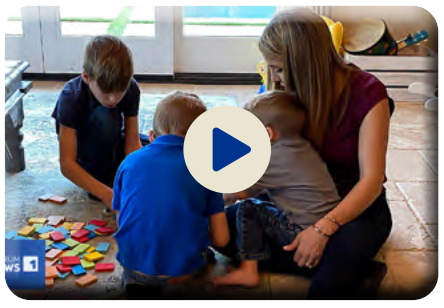
Genomics offers a novel way to detect disease long before symptoms may be present. Our early detection programs identify a patient's susceptibility to cancer and other diseases so caregivers can create personalized, preventive care plans based on the patient's risk.

Prevention4ME revolutionizes cancer screenings by seamlessly incorporating preventive risk assessment and genetic testing into routine screenings. An online questionnaire evaluates patient history and genetic factors, providing personalized screening recommendations following national guidelines. This process aids patients in accessing recommended genomic tests at the point of care.

IN 2024

Several Providence locations will incorporate Prevention4ME into mammography appointment scheduling and collaborate on clinical and implementation research. Over time we will extend Prevention4ME beyond mammography clinics into other healthcare screenings, like annual wellness checks.

PREVENTION4ME ASSESSMENT SITE

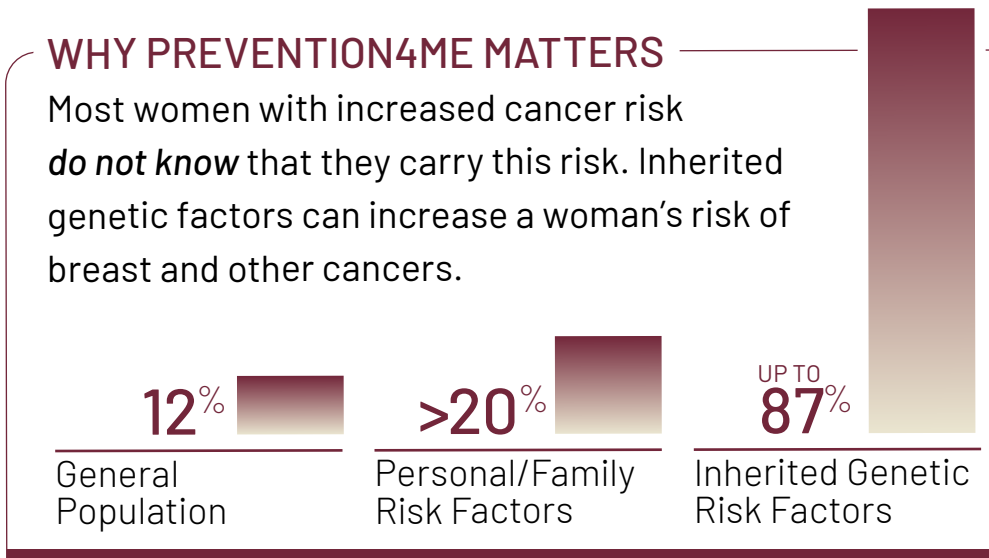


Michelle Jackson had a genetic screening test done at Providence St. Jude Medical Center in Fullerton, Calif. The information she received changed her life.

Watch her story

WHY PREVENTION4ME MATTERS

Most women with increased cancer risk ***do not know*** that they carry this risk. Inherited genetic factors can increase a woman's risk of breast and other cancers.



LIFETIME BREAST CANCER RISKS

"Providence Genomics is shifting the focus from healthcare to well-care by emphasizing individualized prevention. We do this by combining the latest genomic innovations with each patient's genes and family history to assess risk while providing early detection."

—Ora Karp Gordon, MD, MS, FACMG
Clinical Director, Providence Population Genomic Program, and Regional Director Southern California, Clinical Genetics and Genomics

DID YOU KNOW?

We invest in research to understand the experience patients have with our programs. This helps us design processes that work for everyone.

LEARN MORE

Closing the Cancer Screening Gap

While recommended screening tests exist for only five cancers (breast, colon, cervical, lung, and prostate), 70% of diagnosed cancers affect other areas. **Multi-Cancer Early Detection (MCED) testing** could bridge this gap by detecting signals of cancer across over 50 different types with just one blood test.

RESEARCH-DRIVEN CLINICAL DEPLOYMENTS

Providence Genomics makes MCED testing available to patients with an increased lifetime risk of cancer. Through participation in various MCED testing studies, Providence shapes implementation strategies to support adoption and ensure caregiver success in using this novel technology.

LOOKING AHEAD

As MCED testing expands at Providence, we'll conduct more implementation studies and research. We'll also explore other liquid biopsy tests to assess their usefulness as they come on the market.

"Without a strong history of cancer in our family, I didn't expect to learn about a hereditary gene mutation in my test results. Even though this wasn't the news I wanted, I now have information to proactively manage my care."

—Loralie Cole
Research Study Participant

FINDING CANCER EARLY offers the best chance for successful treatment.

MCED testing screens for **50+ cancers** including those *without* recommended screenings.

MCED testing helped Maria Pasio beat cancer.

Watch her story

~70% of cancer deaths are caused by cancers without recommended screening

MCED 2023 MILESTONES

- MCED STUDY: We reached out to more than 1,000 Providence patients at higher risk of cancer and offered MCED testing to identify their cancer risk and understand the long-term impact of MCED testing.
- MCED ROLLOUT: Southern California led the way by establishing the first MCED clinic to assist caregivers in training, education, and testing.
- THE EARLY DETECTION CASE CONFERENCE: We initiated this forum as a learning platform for caregivers to review MCED cases and discuss test results. Contact: MCED@Providence.org

Using Genomics to Personalize Gene-based Medication Recommendations

GenoRx uses pharmacogenomics (PGx) to examine how genes influence a person's response to medication. PGx testing identifies such gene variations, helping caregivers enhance medication effectiveness while reducing adverse reactions.

LOOKING AHEAD

We will pilot PGx programs in clinical care practices at various Providence sites, initially focusing on medications commonly prescribed in primary care. These pilots will run alongside implementation science studies to gather insights for scaling broader program rollouts effectively.

2023 MILESTONES

WE BUILT THE BACKBONE TO INTEGRATE PHARMACOGENOMICS INTO CAREGIVER WORKFLOWS. This included a real-time prescription notification system to alert caregivers when a patient's genetic results could affect dosing or medication choices.

WE PREPARED PILOT PROGRAMS TO ASSESS THE REAL-WORLD IMPACT OF PHARMACOGENOMICS IN MENTAL HEALTH AND CARDIOVASCULAR CARE. Research began to evaluate clinical and operational outcomes in pilot settings, aiming to establish evidence for best practices.

PGx MINIMIZES TRIAL/ERROR PRESCRIBING & REDUCES THE RISK OF ADVERSE DRUG REACTIONS (ADRs)

5–10% OF PATIENTS **may suffer from an ADR** at or during admission, or at discharge, despite preventive efforts

350 medications include PGx info in drug labeling (FDA)

20–30% OF ADRS **prevented** with PGx testing

UP TO **99%** OF PATIENTS have at least one **actionable gene variant** that predisposes them to increased drug metabolism risk

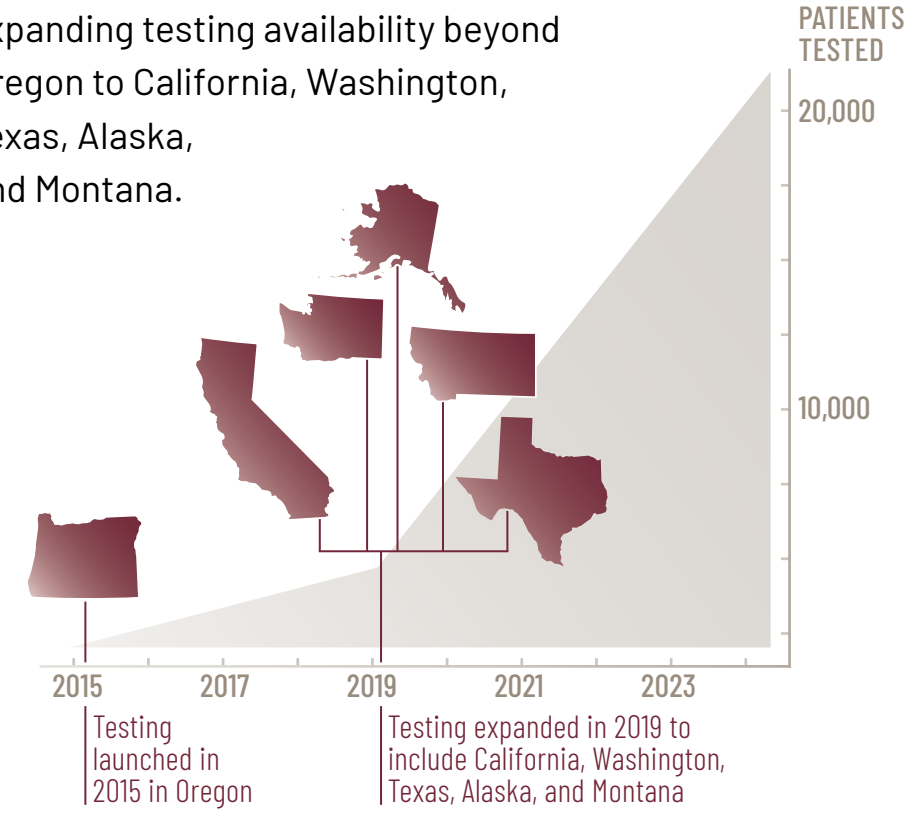
Fighting Cancer with Personalized, Genomic-enabled Therapies

When a patient has cancer, we use advanced tests like Comprehensive Genomic Profiling (CGP) to identify genetic abnormalities in the tumor. This helps caregivers create personalized treatment plans, including approved therapies and clinical trial recommendations.

To support our growing volume of tests, Providence Genomics uses the Providence Molecular Genomics Lab, one of the most experienced, highly sophisticated, and well-respected genomic testing operations in the country.

2023 MILESTONES

SEQUENCE TESTING EXPANSION HIT NEW, RECORD VOLUMES. We provided more than 20,000 patients with genomics testing and personalized care recommendations by expanding testing availability beyond Oregon to California, Washington, Texas, Alaska, and Montana.



INFORMING PATIENTS: We introduced an informative website and proactive patient messaging. This ensures patients are well-informed and connected to essential services and genetic testing information.

MOLECULAR TUMOR BOARD: We launched a tumor board to help caregivers work together with experts from various fields. They review a patient's genetics and other data to make well-informed clinical choices.

HEALTH EQUITY AND THE POWER INITIATIVE

We believe in health equity, which is why we're starting the POWER (Precision Oncology with Equitable Reach) initiative to ensure all our patients—regardless of their background or location—can benefit from precision cancer treatments.

We're collaborating with cancer care providers and reaching out to rural, BIPOC, and underserved communities to identify and address barriers to accessing genomic therapies.

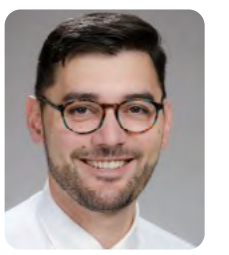
AROUND THE CORNER

EXPANSION OF OUR NEXT-GENERATION SEQUENCING SUITE

We're adding Homologous Recombination Deficiency (HRD) testing, vital for pinpointing targeted therapies for cancers like ovarian, prostate, breast, and pancreatic.

EARLY-STAGE CANCER TESTING RESEARCH

We are launching a new research protocol to explore testing for earlier-stage cancers to help us understand how genomic profiling could improve the course of patient care and treatments even earlier.



"When faced with rare tumors and complex decision-making, Providence Genomics has been a valuable resource to help me provide personalized and cutting-edge care to my patients."

—Alipi V. Bonm, MD, PhD
Director, Neuro-Oncology, Swedish Neuroscience Institute

Integrating Whole-Person Precision Medicine into Real-World Care

In 2023, Providence Genomics achieved significant milestones toward integrating genomics into healthcare. This work centered on building the data and operational infrastructures needed to support caregivers in their transition to precision medicine.

2023 MILESTONES

GENOMICS-NOW PLATFORM: We completed and launched this "universal front door" for patients to access, learn about, and participate in our genomics programs. This dynamic web-based platform and operating system offers the backbone to scale our genomics programs and research.

SITE EXAMPLE: geno4ME PROGRAM

CLINICAL DECISION SUPPORT: We are creating tools to incorporate genetic data into clinical decision-making processes. These tools assist patients and caregivers in making informed healthcare decisions collaboratively. In 2023 this included a real-time prescription notification system to identify when a patient's genetic results contain information that could impact optimal dosing or medication choices.

COMING NEXT

ONGOING DEVELOPMENT OF THE WHOLE-PERSON DATA HUB

This comprehensive data engine integrates and standardizes multiple sources of patient data to inform a whole-person approach to care delivery.

EXPANDING SYSTEM INTEGRATIONS

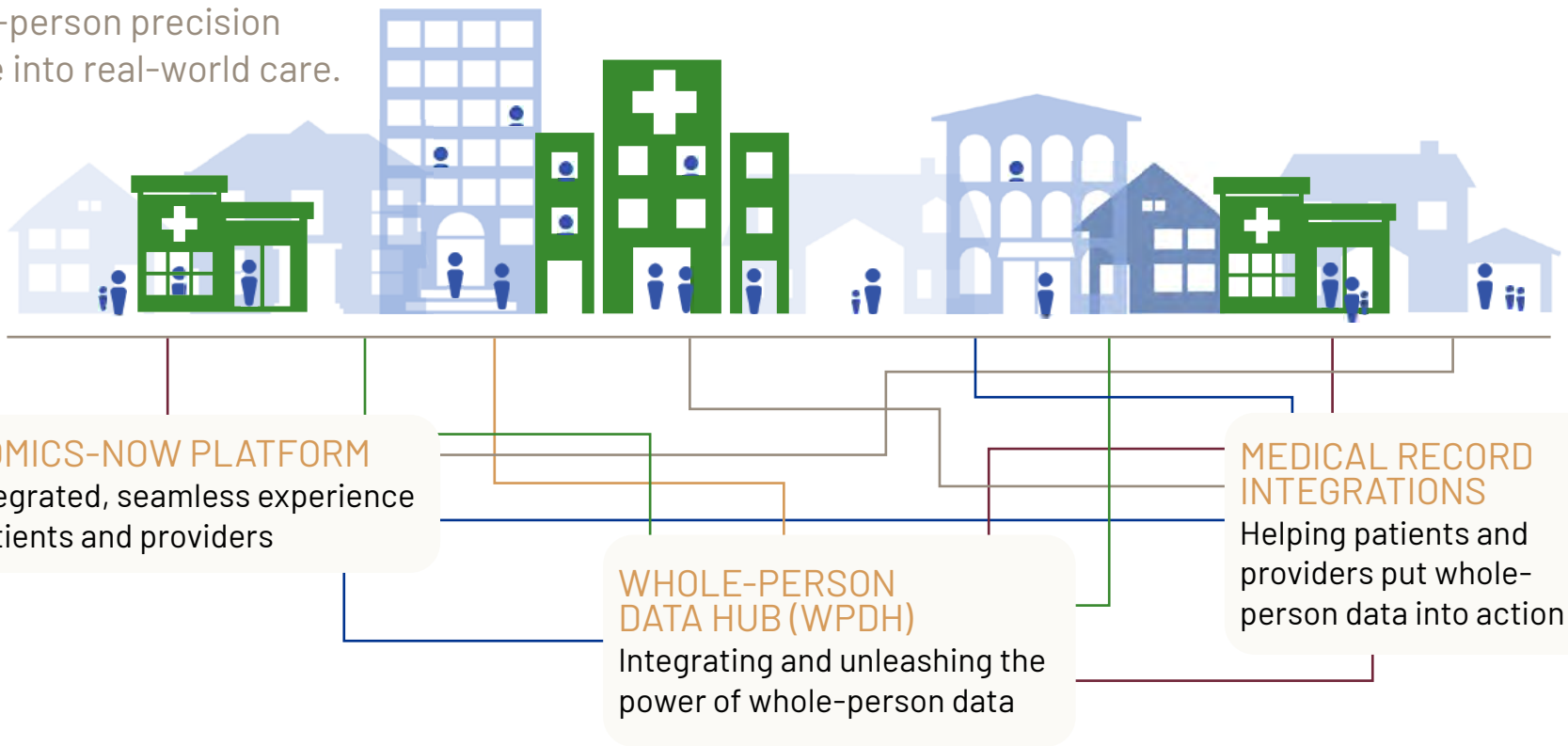
We are simplifying caregiver processes to request genetic tests and view results.

SUPPORTING ACCESS AND EQUITY

We aim to make precision medicine accessible to patients and caregivers in rural, BIPOC, and underserved communities.

INFRASTRUCTURE

Powering the integration of whole-person precision medicine into real-world care.



Using Science to Innovate and Inspire Real-World Change

The **Discover Program** uses interdisciplinary research as an innovation engine to enhance disease prevention, discover treatments, and foster sustainable care advancements. We're committed to health equity and breaking barriers to precision medicine by ensuring access to genomic testing and research for all.

PATIENTS ARE HELPING US REVOLUTIONIZE HEALTHCARE

Patients can contribute to discoveries by consenting to include their deidentified data in the Discover research registry. Providence research teams use deidentified data for studies to help identify diseases earlier and develop treatments and cures.

"As research within whole-person data and genomics expands, we are getting better at predicting risks and finding new treatments. This is creating a significant and promising shift in healthcare."

—Anton J. Bilchik, MD, PhD, MBA, FACS
Professor of Surgery and Director, Gastrointestinal Research Program, St. John's Cancer Institute, Providence

WHAT IS "DEIDENTIFIED DATA"?

In research, your personal information stays private and confidential. One way this happens is by using codes or numbers instead of your name or any other identifiable details.

OUR NEW RESEARCH AIMS TO TACKLE THESE CHALLENGES

When should patients have MCED testing? Expanding on our earlier multi-cancer early detection (MCED) research, we're now investigating serial MCED testing in patients with inherited genetic cancer risks (e.g., BRCA1/2 hereditary breast/ovarian cancer syndrome or Lynch syndrome). This will enable us to optimize MCED testing schedules for early cancer detection.

Can we improve the detection of gene variants in diverse patient populations? Leveraging our diverse patient pool and advanced gene sequencing, we're identifying more genetic variants to enhance medication selection and dosing across different ethnic backgrounds.

Why aren't all recommended targeted therapies administered to patients? Despite the benefits of Comprehensive Genomic Profiling (CGP) in tailoring cancer treatments, some patients don't receive the suggested targeted therapies. We're analyzing the reasons for this underutilization to ensure every patient receives optimal care.

What hinders fair access to genomic testing and research? We prioritize health equity as a fundamental right. Collaborating with Providence caregivers and patients, we want to understand barriers to accessing genomic testing and clinical research. These insights will guide our efforts to expand equitable precision medicine access, especially in rural, BIPOC, and underserved communities.

Providence Genomics

Your Generosity Helps Translate Science into Personalized Medicine

Significant advances are being made in the science of genomics. These innovations are reshaping our understanding of disease.

We are now able to personally tailor preventive care, treatments, and cancer therapies for each patient based on their genetics and whole-person context.

Providence Genomics is a pioneer in bridging innovative science with personalized medicine. We are integrating genomic-based clinical programs with research, technology and infrastructure investments to scale genomics into care.

Our research ensures that our programs are evidence-based, empowering caregivers to personalize treatment plans, screen for multiple cancers, and identify familial risk factors to tailor preventive care and targeted therapies. Through these initiatives we are translating genomics discovery into personalized care and saving countless lives at Providence.

"As genomic sequencing rapidly shifts into clinical practice, we are gathering evidence for widespread adoption while witnessing its transformative impact on real-life care decisions."

—Brian D. Piening, PhD

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

WITH GRATITUDE

Your philanthropic support for Providence Genomics has the power to revolutionize our approach to understanding, treating, and preventing cancer and hereditary diseases. Thank you for contributing to the transformation of healthcare for Providence patients across our communities.

GIVE YOUR WAY

DONATE TODAY

LEARN MORE

Genomics.Providence.org

Research.Providence.org

EMAIL Genetics@Providence.org

Providence Genomics and the molecular tumor board are invaluable for those of us who work in rural areas and are trying to bring the latest and best care to patients. With these resources, I get expert opinions and additional therapeutic options and find potential clinical trials outside of the area.

—Elie M. Richa, MD, MBA, *Providence Medical Group, Medical Director for Hematology and Medical Oncology*

MCED testing fills a critical gap and Providence Genomics helps clinicians understand and offer this test to patients who may benefit. It has helped me discover cancers in my patients, and exclude cancer as an explanation for clinical symptoms.

—Ernie Prudente, MD, FACP, *Internist, Westside Internal Medicine, Providence*

Having the resources of the Providence Genomics program has been practice changing. The close working relationship with the lab and the molecular tumor board provides the necessary testing and insights to provide optimal treatment for patients with both common and rare somatic and germ-line mutations.

—Philip Gold, MD, *Director of Clinical Research, Program Leader, Gastrointestinal Oncology, Swedish Cancer Institute*

We underpin our cutting-edge precision medicine model with ongoing scientific research to constantly improve and innovate. This informs our ability to meet each patient's unique needs and offer personalized and preventative genomic interventions earlier in their care.

—Bill Wright, PhD, *Vice President of Health Innovation, Providence*

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