THE ACADEMY

# PRECISION ONCOLOGY AT PROVIDENCE ST. JOSEPH HEALTH

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## INTRODUCTION

Precision oncology involves the utilization of a patient's unique genetic makeup, as well as the genetic information of the patient's cancer, to identify the most accurate and effective course of treatment for an individual (1). As Leading Health Systems look for ways to improve quality, while making care more personalized and efficient, many are recognizing the opportunities around implementing precision medicine within oncology.

### KEY FINDINGS

- In developing a precision oncology program, Providence St. Joseph Health leveraged its existing data assets to integrate with a precision medicine solution.
- Major challenges around implementing a precision oncology program included physician alignment, education, and buy-in; significant investment in infrastructure and IT, competing resources, and an uncertain reimbursement landscape.
- Key benefits to implementing a precision oncology program and solution include improved quality and efficiency of cancer care, the ability to conduct rigorous large-scale research and increased access to clinical trials, as well as increased patient attraction.

## PRECISION ONCOLOGY AT PROVIDENCE ST. JOSEPH HEALTH

### PROVIDENCE ST. JOSEPH HEALTH

Headquartered in Renton, Washington and operating throughout seven states, Providence St. Joseph Health (PSJH) is one of the largest health systems in the nation. With over $17 billion in Net Patient Revenue (NPR) in 2016, Providence St. Joseph Health comprises 50 hospitals and over 800 clinics that conduct over 526,000 admissions and over 24 million outpatient visits annually (2, 3). Maintaining two health plans, PSJH covers 1.9 million lives and the health system employs approximately 20,000 physicians, 38,000 nurses, and 111,000 caregivers overall (3).

Providing over $1.6 billion in community benefit, Providence St. Joseph Health is a not-for-profit coalition of Catholic, faith-based, and secular organizations focused on delivering compassionate care to the communities it serves and the most vulnerable populations while also pioneering innovative research to transform and improve care (3).

### BEGINNINGS OF A PRECISION ONCOLOGY PROGRAM

Reflective of PSJH's focus on research, innovation, and providing the best quality care, implementing a precision oncology program was established as a system priority in 2013. With support from oncology, research, and senior C-suite leadership, Providence St. Joseph Health

> "This is going to change things. If we don't continue to invest in this strategy and place ourselves as leaders it will be a missed opportunity."
> – Dr. Todd Guenzburger, Chief Medical Informatics Officer, Providence St. Joseph Health

has a highly developed program. Leaders at Providence St. Joseph Health were quick to see the value and potential for precision medicine, and were receptive to implementing a program throughout the health system.

Interest in developing a precision medicine program began at multiple points across PSJH, with various leaders and stakeholders recognizing the potential benefits of developing and implementing a program. As a system, PSJH originally looked to partner with an outside vendor to develop its precision medicine program, but ultimately elected to develop a program in-house utilizing the expertise of their own physicians and leaders. Since precision medicine programs had begun to arise at multiple facilities, a key challenge was bringing together these parallel programs into a cohesive system initiative.

While C-suite leadership was primarily involved in the overall strategic decision making regarding precision medicine, program development and implementation occurred primarily at a local level, beginning at Swedish Cancer Institute (SCI) in Seattle, Washington and in Portland Oregon at the Earl A. Chiles Research Institute in the Providence Cancer Center.

PSJH established robust governance for the development of the precision oncology program, with multiple top level committees including a leadership committee, oversight committee, and IT and information steering committee involving crucial stakeholders and experts.

## PRECISION MEDICINE DEVELOPMENT AND IMPLEMENTATION

Precision medicine at Providence St. Joseph Health at a system level was born when the precision medicine programs developed at Swedish Cancer Institute and Oregon's Providence Cancer Center were brought together. Swedish Cancer Institute (SCI) highlighted precision medicine as a priority emerging from an intensive strategic planning process in 2013 that involved dozens of clinical and administrative stakeholders. SCI decided that personalized medicine would be a cornerstone of the institute's strategy moving forward. SCI defined personalized medicine in two parts, the first focusing on precision medicine or, "the use of genetic and molecular information from patients or their tumors to pinpoint the genetic alterations that cause cancerous cells – and then to use targeted therapies, when applicable, to disarm them." (4) Additionally, in line with SCI's and Providence St. Joseph Health's mission and values, personalized medicine was defined to include "providing holistic, supportive care for each patient's unique, psychological, social and spiritual needs." (4) This dual definition allowed SCI to improve the efficiency and quality of cancer care through precision medicine, but also focus on the personal wellbeing of the whole cancer patient.

Similarly, leaders at Oregon's Providence Cancer Center recognized the potential benefits of developing a precision medicine program on quality of care and patient outcomes. Additionally, due to its central focus on research and desire to retain top physician leaders, implementing a precision medicine program was a priority at Providence Oregon. Key physician leaders were crucial to the development of precision oncology at Providence Oregon, as the program was largely driven by physicians, who wanted to have sequencing technology available to serve patients, and by researchers who needed to have a DNA sequencing facility to conduct research. Additionally, leaders recognized that implementing a precision medicine program and having the capability to perform genomic sequencing could elevate the medical oncology and molecular pathology units to Centers of Excellence, a designation that would help attract and retain top talent, including pathologists, to Providence Oregon. Clinicians and researchers at Providence Oregon are dedicated to improving cancer care, and the implementation of a precision medicine program can help facilitate research that can help achieve that goal. With these goals in mind, convincing administrative leaders at Providence Oregon – including the CEO as well as pathology and research leaders – was successful.

As PSJH began to develop their precision medicine program in oncology, a key decision was made to create their own next generation sequencing (NGS) panel. The creation of this panel allowed for a standardized method for genomic sequencing, a common barrier to the development of precision medicine programs among other organizations. SCI's team worked with a pathology partner and recruited a molecular pathologist specifically to develop the NGS panel. Beginning in-house sequencing in 2014, SCI started with a 68-gene panel of actionable gene mutations associated with potentially impactful cancer therapies, primarily in solid tumors. Plans are underway to expand this panel, to over 300 genes, to include coverage of gene mutations relevant to hematologic malignancies. Additionally, leaders at SCI hope to expand the panel further to include RNA sequencing,

immune profiling, and proteomics, among other genetic factors involved in cancer diagnosis and treatment. In line with its research mission, Oregon Providence Cancer Center utilizes a larger panel and has expanded into exome and RNA sequencing, as well as comparing tumor and normal germline sequencing.

While developing and integrating precision medicine was a top priority, leaders were mindful of the potential burden that might be placed on physicians especially in terms of integration into the electronic health record (EHR) and physician workflow. To ensure greatest coordination, an electronic report was created containing information such as tumor gene alteration information, potential effective drug treatments, literature references, and clinical trials for which the patient might qualify.

While the electronic report made the information easily accessible, leaders recognized that physicians might not have the expertise to adequately analyze and interpret the results of genomic sequencing. To provide expert consultation, a molecular tumor board (MTB) – a multidisciplinary panel of clinical experts that review patients' NGS results and recommend the proper treatment to the primary physician – was created.

> "Patients look for this – they want to know you are a cutting-edge program. To stay competitive in our market and attract top physicians was part of the potential value." – Dr. Walter J. Urba, Director of Cancer Research, Providence Health & Services - Oregon

## IMPLEMENTATION OF PRECISION MEDICINE SOLUTION

As SCI was developing the precision medicine program, a crucial component of their success was the adoption and integration of a precision medicine software solution. From the beginning, stakeholders at Providence St. Joseph Health understood that a precision medicine platform for clinical decision support and data management would always be a requirement for the successful implementation for precision medicine in oncology. A precision medicine solution would help to aggregate, organize, and analyze genomic data, and could connect patient results to potential treatment options and clinical trials in a format integrated with the health system's EHR.

When determining which precision medicine software platform to select, important factors to stakeholders at Providence St. Joseph Health included the ability to integrate fully into the EHR and physician workflow, overall cost, capacity to do clinical trials matching, and the opportunity to aggregate data into a database allowing for large-scale data mining and analysis of treatments and outcomes. After a thorough process that reviewed all options, Syapse Oncology was chosen as the oncology precision medicine solution for the health system.

A major factor in the decision making process for a precision medicine solution was the ability to do clinical trials matching. Determining if a patient is eligible for a clinical trial is increasingly predicated on a patient's tumor's molecular "fingerprint," and Syapse's solution streamlines the clinical trial matching process.

Additionally, SCI has elected to ask all patients in the precision medicine program who receive the NGS panel to allow the collection and analysis of their molecular data and outcomes in an integrated database, thus facilitating large-scale genomic data analysis. Reflective of SCI's focus on precision medicine, the NGS panel is offered to all eligible patients prior to treatment, not just those who have had unsuccessful prior treatments. This is intended to prevent patients from potentially receiving ineffective treatment options or being exposed to unnecessary treatment, while also providing data to SCI's database. PSJH is a founding member of the Oncology Precision Network (OPeN), along with Stanford University Cancer Institute and Intermountain Healthcare. OPeN aggregates de-identified data from multiple health systems to create a massive database of clinical data and outcomes. This network will provide additional evidence and resources for oncologists throughout Providence St. Joseph Health and throughout the country to improve cancer care overall.

Implementation of Syapse Oncology began at Swedish Cancer Institute as a pilot, and then spread to Providence Oregon's Cancer Center. When looking to implement the Syapse platform, leaders at Providence Oregon evaluated the impact of the solution at SCI. Key factors that were convincing included the integration with the EHR, a relatively user-friendly experience for the physicians, and the ability to do clinical trials matching. Additionally, leaders at Providence Oregon evaluated whether the implementation of the Syapse solution would be beneficial to the research arm of the organization. After evaluating the solution at SCI, leaders at Providence Oregon decided to implement Syapse as well. With the two largest cancer centers in the PSJH system implementing this solution successfully, PSJH has decided to adopt the platform throughout the entire system. This process of expansion is just beginning.

> "Our implementation of Syapse was extremely robust because we involved from the start a strong cadre of highly knowledgeable clinical and cancer analytics professionals. The key roles in this implementation are data engineers." – Mark Gargett, VP for Digital Integration, Providence St. Joseph Health

A crucial lesson learned in the initial implementation of Syapse Oncology was the importance of IT involvement to oversee implementation and integration into the EHR, as well as the significant investment in IT infrastructure needed to support precision medicine. Coordination between the clinical and IT teams was essential, and having dedicated IT staff and data engineers, as well as expert clinical and cancer analytics professionals was highly important to make sure there was clean and comprehensive data to power the software solution. This ensured data flowed between the EHR and the Syapse solution reliably and accurately. As PSJH begins to scale precision medicine across the health system, it will be important to prioritize the IT infrastructure and dedicate the resources necessary to support the program.

Common barriers to implementing precision medicine include physician alignment and education, cost, and the undefined reimbursement landscape creating uncertainty of whether payors will pay for genomic sequencing, and associated therapies, or not. Additionally, while Providence St. Joseph Health views implementing precision medicine as a high priority, other priorities at the health system compete for funding and resources. With constrained budgets for the development of precision oncology or implementation of the Syapse precision medicine solution, leaders can struggle to obtain the resources necessary for successful implementation. Long-term commitment to investment and dedicated resources are crucial to success.

> "A recent evaluation of our registry data showed the clinical impact - 20% of physicians felt that initial sequencing results impacted the care of their patients." – Dr. Thomas Brown, Executive Director, Swedish Cancer Institute

An evaluation of the program at SCI revealed a significant impact, with 20 percent of physicians reporting sequencing results impacted patient care whether indicating a potential treatment plan, assignment to a clinical trial, or guidance on when not to take certain courses of treatment, which thereby impacts patient experience as well as cost. Overall, implementation of a precision oncology program has led to improved quality of cancer care, the ability to conduct rigorous large-scale research, as well as increased patient attraction.

## BEST PRACTICES ESTABLISHED:

- Creation of a molecular tumor board (MTB) to provide expert clinician interpretation, analysis, and treatment recommendations to the primary physician based on patients' NGS results and to educate clinicians.
- A crucial component of Providence St. Joseph Health's success in developing a precision oncology program was the adoption and integration of a precision medicine software platform to help aggregate, organize, and integrate genomic data, connecting patient results to potential treatment options and clinical trials.
- Close collaboration between stakeholders in the development of a precision medicine program and the integration of the precision medicine software solution was key in a smooth and successful implementation.
    - Collaboration between physicians and molecular pathologists allowed for coordination in developing the precision medicine program, particularly for confirmation of diagnoses, treatment recommendations, and clinical trial identification.
    - Significant involvement of the IT team and data engineers helped in maximizing the standardization and cleanliness of data, and integration of the Syapse precision medicine solution into Providence St. Joseph Health's EHR while diminishing disruption of systems or workflow.

## FUTURE PLANS FOR PRECISION MEDICINE AT PROVIDENCE ST. JOSEPH HEALTH

Launching and going live with their Precision Medicine Program in April, 2014, Swedish Cancer Institute has profiled approximately 1,000 patients thus far. SCI sees about 8,000 cancer patients per year and plans to rapidly scale up accrual of participating patients with a goal of accruing 5,000 annually. Additionally, over 1,000 patients have undergone genomic profiling in the Providence Oregon region, where Syapse and the program have more recently been deployed.

The health system plans to expand the precision oncology program to other major cancer centers within the system, while also linking smaller community hospitals to regional MTBs and the Syapse Oncology network and database. Integrating precision oncology throughout the health system is expected to magnify potential benefits, especially around access to clinical trials and MTB expertise for community hospitals, and will help the system build one of the nation's largest databases and evidence networks of precision oncology practice.

# REFERENCES


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## METHODOLOGY

In August, 2017, The Academy conducted in-depth telephone interviews with five executives at Providence St. Joseph Health around the process and impact of implementing a precision medicine program in oncology. The Academy thanks the following individuals for their participation in this project:

- **Thomas Brown, M.D., M.B.A.,** Executive Director, Swedish Cancer Institute
- **Mark Gargett,** VP for Digital Integration, Providence St. Joseph Health
- **Todd Guenzburger, M.D., FACP,** Chief Medical Informatics Officer, Providence St. Joseph Health
- **Paul Tittel, M.H.A.,** Principal Consultant & Founder, Akesis Solutions LLC; former System Director, Enterprise Amalga & Data Services, Providence Health & Services
- **Walter J. Urba, M.D., Ph.D.,** Director of Cancer Research, Providence Health & Services – Oregon

The purpose of this report is to provide an example of successful development and integration of a precision oncology program, identify the process and impact of adopting a precision medicine solution in oncology, and highlight the challenges and successes experienced by Providence St. Joseph Health in their program development and implementation thus far.

None of the participants listed above shall derive any personal profit or gain through participation in this case study. No participants reported a conflict of interest in participating in this case study.

## THE HEALTH MANAGEMENT ACADEMY

The Health Management Academy (The Academy) is a membership organization exclusively for executives from the country's Top-100 Health Systems and most innovative healthcare companies. The Academy's learning model identifies top priorities of health system leaders; develops rich content based on those priorities; and addresses them by convening members to exchange ideas, best practices, and information. The Academy is the definitive trusted source for peer-to-peer learning in healthcare delivery with a material record of research and policy analysis. Offerings include C-suite executive peer forums, issues-based collaboratives, leadership development programs, research, advisory, and media services. The Academy is an accredited CE provider. More information is available at www.academynet.com.

## SYAPSE

Syapse is on a mission to deliver the best care for every cancer patient through precision medicine. Our software platform, data sharing network, and industry partnerships enable healthcare providers to bring precision cancer care to every patient who needs it. By bringing together leading healthcare innovators into a unified ecosystem, we are working toward a future in which all cancer patients have access to the best personalized care, regardless of location or income. Our customers — including Intermountain Healthcare, Providence St. Joseph Health, Henry Ford Health System, Aurora Health Care, Catholic Health Initiatives and Dignity Health — manage one million active cancer cases at nearly 300 hospitals in 25 states. Headquartered in San Francisco, Syapse is backed by investors including Social Capital, Safeguard Scientifics, Ascension Ventures, GE Ventures, Intermountain Healthcare Innovation Fund, Merck Global Health Innovation Fund, Medidata Solutions, Roche Venture Fund, and Amgen Ventures. For more information, visit syapse.com.

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