

# Swedish Cancer Institute

Personalized Medicine Program



**SWEDISH**  
CANCER INSTITUTE



## Transforming Cancer Care through Personalized Treatment

Cancer care is at a transformative moment. Conventional treatment methods are being enhanced by an approach that pinpoints the genetic alterations that can cause cancerous cells and then uses targeted therapies, when applicable, to disarm them. The Swedish Cancer Institute (SCI) launched its Personalized Medicine Program (PMP) in April 2014 to speed this transformation.

Personalized medicine has a dual meaning. First, it means evaluating genetic and molecular information from a patient or their tumor to address cancer risk as well as the best treatment options – accelerating progress toward a future where all cancer treatments are more effective and less toxic than today’s therapies. Second, it means going beyond treating cancer to provide holistic, supportive care for each patient’s unique psychological, social and spiritual needs.

SCI built the Personalized Medicine Program to address these two areas, with the goal of making treatment fundamentally better so we can improve outcomes and quality of life, while setting a new standard of extraordinary care nationwide.

## Raising the Bar on Cancer Care

While the term “personalized medicine” is becoming increasingly popular, Swedish has provided patient-centered care for more than 75 years. Swedish built the Pacific Northwest’s first cancer center in 1932. Since then, SCI has cared for more people diagnosed with cancer than any other hospital in the region and is a leader in developing – and delivering – cutting-edge treatments that put patients and their families first.

For instance, SCI has been at the forefront of radiation therapy since it established the first radiation facility west of the Mississippi. Never satisfied with the status quo, SCI continually enhanced its radiation

oncology program, finding ways to make radiation therapy more precise. Swedish's John Blasko, M.D. was the nation's first physician to treat prostate cancer using brachytherapy which uses small radioactive seeds to target a tumor and reduce radiation exposure to surrounding tissues.

The team now includes renowned experts in stereotactic, Gamma Knife and CyberKnife radiation – techniques that focus radiation on a tumor and limit damage to the healthy tissues around it.

Today, patient care at SCI is organized around teams of experts in nine different cancer areas: breast, gastro-intestinal, genitourinary, gynecologic, head and neck, hematologic, neurologic, sarcoma/melanoma, and thoracic.



### **Dawn's Story of Survival**

When Dawn Dotson's cancer came back for the second time, it had reached stage IV before her doctors could detect it. With her disease considered incurable, Dawn was planning her goodbyes to her daughters until Swedish Cancer Institute's Tanya Wahl, M.D., gave her new hope: the chance to participate in a clinical trial of an experimental therapy.

In less than a year, Dawn went from having few options to going into remission.

"Now I'm planning my life again," she says.

## Milestones in Swedish Cancer Institute Cancer (SCI) Treatments

- 1932** Swedish Tumor Institute (STI) opens; Swedish launches first radiation therapy west of the Mississippi and second unit of its kind in the world.
- 1967** STI opens the School of Radiation Therapy Technology, eventually becoming the Pacific Northwest's only accredited program.
- 1969** First medical oncologist (i.e., physician specializing in chemotherapy administration) joins STI.
- 1971** STI becomes the first center in the nation to use technetium, a bone-scanning agent that revolutionized the ability to determine the degree to which a tumor has metastasized. STI joins Southwest Oncology Group (SWOG).
- 1975** Arnold Medical Pavilion opens on Swedish's First Hill campus, becoming the Swedish Tumor Institute's new home. Fred Hutchinson Cancer Research Center is founded at STI.
- 1976** STI receives National Cancer Institute (NCI) funding to perform sponsored clinical trials, largely through SWOG, a cancer research cooperative group primarily supported by NCI. The administrative entity formed to coordinate these clinical trials is now known as the Puget Sound Oncology Consortium (PSOC).
- 1985** Radioactive seeds introduced, including radioactive seeds to treat brain tumors and prostate cancer.
- 1993** STI becomes the number one SWOG affiliate nationally based on the number of patients registered to research studies.
- 1995** Marsha Rivkin Center for Ovarian Cancer Research opens.
- 1996** Ralph Aye, M.D., performs the first video-assisted thoracoscopic Surgery (VATS) lobectomy in the Northwest.
- 1999** Swedish Tumor Institute is renamed Swedish Cancer Institute; the Ovarian Cancer Screening Program launches jointly by SCI and the Fred Hutchinson Cancer Research Center.
- 2000** SCI introduces Seattle's first intensity modulated radiation therapy (IMRT), which delivers a high dose of radiation to a targeted area while dramatically limiting the exposure of surrounding tissue. Early Lung Cancer Action Program (I-ELCAP) brings lung cancer CT screening to the Northwest.
- 2004** Swedish rolls out its new Breast Care Express—the world's most advanced mobile mammography center.
- 2005** Robotic surgery comes to Swedish and is first used to remove cancerous prostate glands. SCI is one of the first in the world to offer image-guided radiation therapy (IGRT), the first of its kind to target cancerous tumors with an integrated, three-dimensional imaging system.
- 2006** Advanced CyberKnife treatment becomes available at SCI – the first machine of its kind in the region.
- 2006** Jed Gorden, M.D. introduces Endobronchial Ultrasound (EBUS) to the Northwest to diagnose lung cancer. SCI opens its Hereditary Cancer Clinic to focus on patients and families at risk for hereditary cancers, particularly breast, ovarian and colon cancers.
- 2008** SCI becomes the first center in the United States to offer Elekta's new volumetric modulated arc therapy (VMAT) delivery solution. SCI also becomes one of the first centers in the world to offer electronic brachytherapy.
- 2009** Swedish performs the first robotic colon surgery in Washington and the first robotic anatomical lung cancer resection. Advances in Head and Neck surgery, such as microvascular reconstructive surgery, become available with the arrival of Namou Kim, M.D.
- 2011** SCI becomes the first center in Seattle offering Tomotherapy.
- 2012** True Family Women's Cancer Center opens.
- 2012** Tobacco-related Diseases and Lung Cancer Screening Program launches.
- 2013** Swedish announces the launch of The Robert and Jean Reid Family Innovative Therapeutics & Research Unit at SCI.
- 2014** SCI Personalized Medicine Program (PMP) launches. SCI receives the highest level of accreditation from Commission on Cancer (CoC) survey. SCI launches several new programs: Surgical Oncology, led by Evan Ong, M.D; Hematologic Malignancies led by John Pagel, M.D; Neck mass and thyroid clinic, led by Joseph Sniezek, M.D; Outpatient Palliative Care led by Ellyn Lee, M.D. A consortium of cancer care providers, led by the SCI, received a \$6.6 million National Cancer Institute Oncology Research Program (NCORP) award to improve access to clinical trials and cancer care across a five-state region.



## Pinpointing a Tumor's Genetic "Fingerprint"

Personalized cancer therapy starts by using genomic sequencing to pinpoint the alterations/mutations that help a particular tumor grow.

The Swedish Cancer Institute, in partnership with CellNetix Pathology and Laboratories is developing a targeted and highly actionable gene alteration panel. The current PMP panel sequences the genes that are most relevant to known cancer treatments. Through this partnership, SCI can quickly expand the panel when new alterations and targeted treatments are discovered, with the intention to add additional data that will assist in the application of molecularly targeted therapy (e.g., gene copy number, RNA sequencing, proteomics, etc.).

SCI and CellNetix have also developed a new, electronic report that makes the panel results easy for providers to understand and use. The report details findings on each available gene, explains which alterations are present in a patient's tumor, and indicates which drugs might

be effective against those alterations. The report includes links to literature that provides context for the findings, and links to clinical trials of treatments that might be viable options for the patient. This helps physicians identify targeted treatments or relevant clinical trials for their patients.

The end result: SCI can create a detailed portrait of a patient's tumor, enabling the team to select the most promising targeted therapies for an individual patient. The goal is within the next 36 months to offer this gene alteration panel to every new eligible patient within the Swedish Cancer Institute Network.

## PMP Therapeutics Program: Unparalleled Access to the Latest Research and Treatment Options

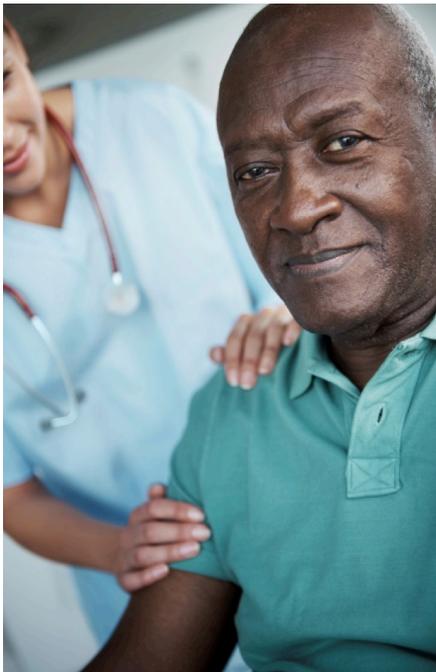
For people diagnosed with cancer, the Swedish Cancer Institute delivers the best of both worlds – it bridges the gap between a community hospital that emphasizes patient care and support and an academic medical center by providing one of the most established research programs in the region.

SCI patients have unparalleled access to the latest clinical trials. As of July 2014, SCI was participating in 76 clinical trials of new cancer therapies, including 50 personalized therapy trials. The team has placed more than 6,000 patients in cancer clinical trials over the past 10 years and has more than 100 patients enrolled in trials for personalized treatments. The program continues to expand as it completes construction of the new Reid Family Innovative Therapeutics & Research Unit.

The Reid Family Innovative Therapeutics & Research Unit will contain a specialized pharmacy and new treatment rooms that improve patients' abilities to participate in Phase

I clinical trials. One of these rooms, for example, will be pressurized so that no outside air – and therefore no outside germs or contaminants – can enter. This gives an extra layer of protection to patients with compromised immune systems.

These early trials of new therapies are often the best hope for patients who have already tried conventional therapy or have a type of cancer with limited treatment options. Looking ahead, the Reid Family Innovative Therapeutics & Research Unit will become the epicenter of SCI's clinical research efforts, enabling the team to quickly translate findings into real-world tests and treatments that improve patients' lives.



### Clinical Trials by Disease Site

As of July 2014, SCI was participating in 50 clinical trials of personalized therapies, including the following number of trials per disease site:

- Breast: 15
- Lung: 16
- Hematology: 6
- Gastrointestinal: 6
- Gynecologic oncology: 5
- All tumors: 2



### **Personalized Medicine Research Program: Using Research to Improve Personalized Treatment**

In addition to participating in a number of external clinical trials, SCI will be conducting its own research and evaluation through the Personalized Medicine Research Program (PMRP). The Personalized Medicine Research Program will help SCI match many patients with therapies and investigate key questions about personalized treatment. This investigational patient registry will be open to thousands of new patients with cancer seen at SCI each year and will initially focus on enrolling patients with breast, central nervous system, gastrointestinal and thoracic cancers.

When a patient agrees to participate in a study, SCI will collect key information such as the type of cancer they have and their molecular testing results. Over time, SCI will gather details about how the patient's tumor was treated at SCI and whether that treatment was effective. The treatment findings will be stored in a secure database where all unique participants' identifying information will be removed when it is

not being used to assist in the individual's treatment plan. SCI is building this database in partnership with CellNetix. The database will ultimately include profiles of thousands of individual tumors, making it one of the largest databases of its kind. All patient information will be made anonymous when used for research.

Over time, SCI will be able to mine the data and research results to identify which treatments work best for tumors with particular gene alterations. This will help physicians select the most promising therapies and, when possible, recommend clinical trials to patients. SCI will also be able to alert study participants when new treatments that could be beneficial for them become available.

SCI hopes to enroll 9,000 patients in the study during its first three years. The ultimate goal is to routinely publish results from this database, and help doctors and researchers across the globe find better ways to find, treat and stop cancer.

## Caring for the Whole Patient

At the Swedish Cancer Institute, the care team understands that cancer is more than a medical crisis – it's a personal crisis that affects all aspects of a patient's life.

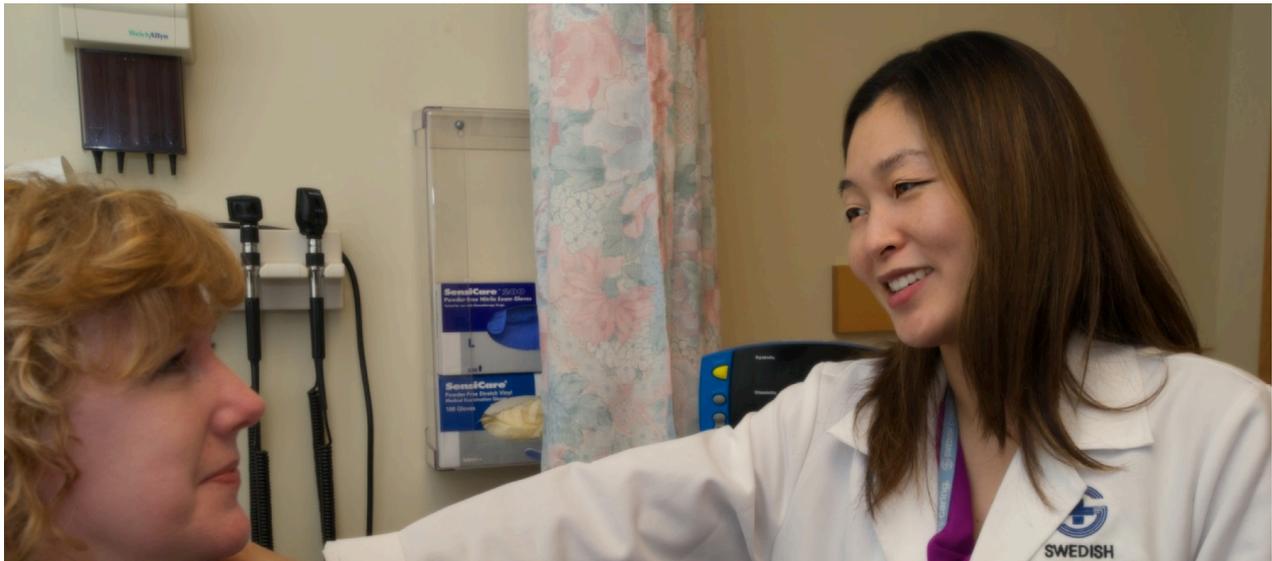
In 2003, SCI launched one of the nation's first supportive care services programs. This program offers a full spectrum of services for cancer patients and their families, including psychological counseling, naturopathic care, social services, nutritional counseling, touch therapies, art therapy, palliative care and symptom management – services that help people diagnosed with cancer handle the unique issues that face them. In 2014, SCI added the Outpatient Palliative Care and Symptom Management Clinic. It is important to underscore that this palliative care initiative is meant to assist patients with symptom management needs, regardless of their disease status; i.e., whether they are undergoing anti-cancer therapy with curative or palliative intent, or whether they are receiving only comfort-directed care.

For example, financial stress is one of cancer treatment's most common – and least discussed – challenges. Those diagnosed with cancer are more than twice as likely to experience bankruptcy as those who do not suffer from the disease. SCI offers financial counseling and assistance services to help patients absorb and manage these financial demands.

Many patients at SCI have immediate access to social workers. Whether it's a brief check-in while patients sit in a waiting room or a weekly counseling session, social workers are available to help patients cope with the challenges that accompany a cancer diagnosis, and the extensive treatment and recovery that often go along with it. And because the supportive care team includes some of the field's most experienced – and most renowned – experts, they can often anticipate a patient's needs and provide care for depression, anxiety, fatigue and other issues before they become entrenched.

Some of SCI's supportive care services are also available to patients' families and caregivers. For instance, family members can receive counseling to help them cope with the trauma of a loved one's diagnosis – and to help them support the patient throughout treatment and beyond.

Services are still available to patients long after they stop treatment. In fact, as patients recover from the stress of their disease and adapt to their changed bodies and minds, re-entry into regular life can be challenging. SCI's supportive care helps patients through all phases of survivorship and is available for as long as patients need them – whether it's for a few weeks after treatment ends or for a few years.



## How Patients Experience the Personalized Medicine Program

### **Step 1: Discuss options**

Every patient learns how personalized medicine and genomic testing work, and how their care may be affected.

### **Step 2: Collect cancer cell samples**

This may be done through a special biopsy or as part of an already planned surgery.

### **Step 3: Sequence the genes**

A sample of DNA from a patient's cancer cells is analyzed at a pathology lab using complex sequencing equipment.

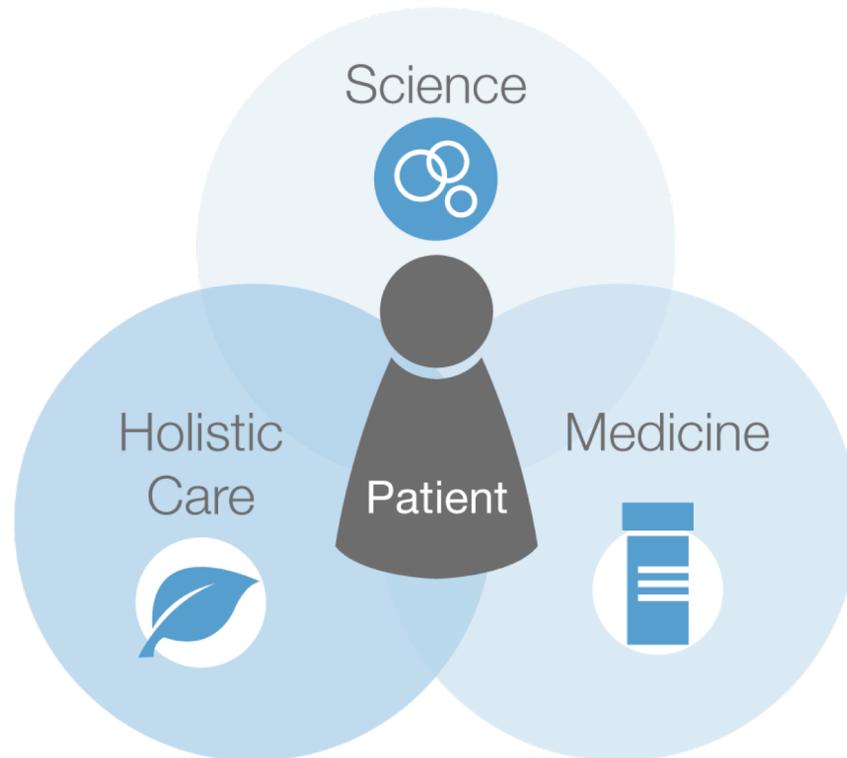
### **Step 4: Analyze the test results**

A molecular pathologist reviews the data generated from the DNA sequencing and prepares a report.

### **Step 5: Set a treatment plan**

The patient's oncologist collaborates with specialists to develop a treatment plan personalized to the patient.

## Concept of SCI Personalized Medicine

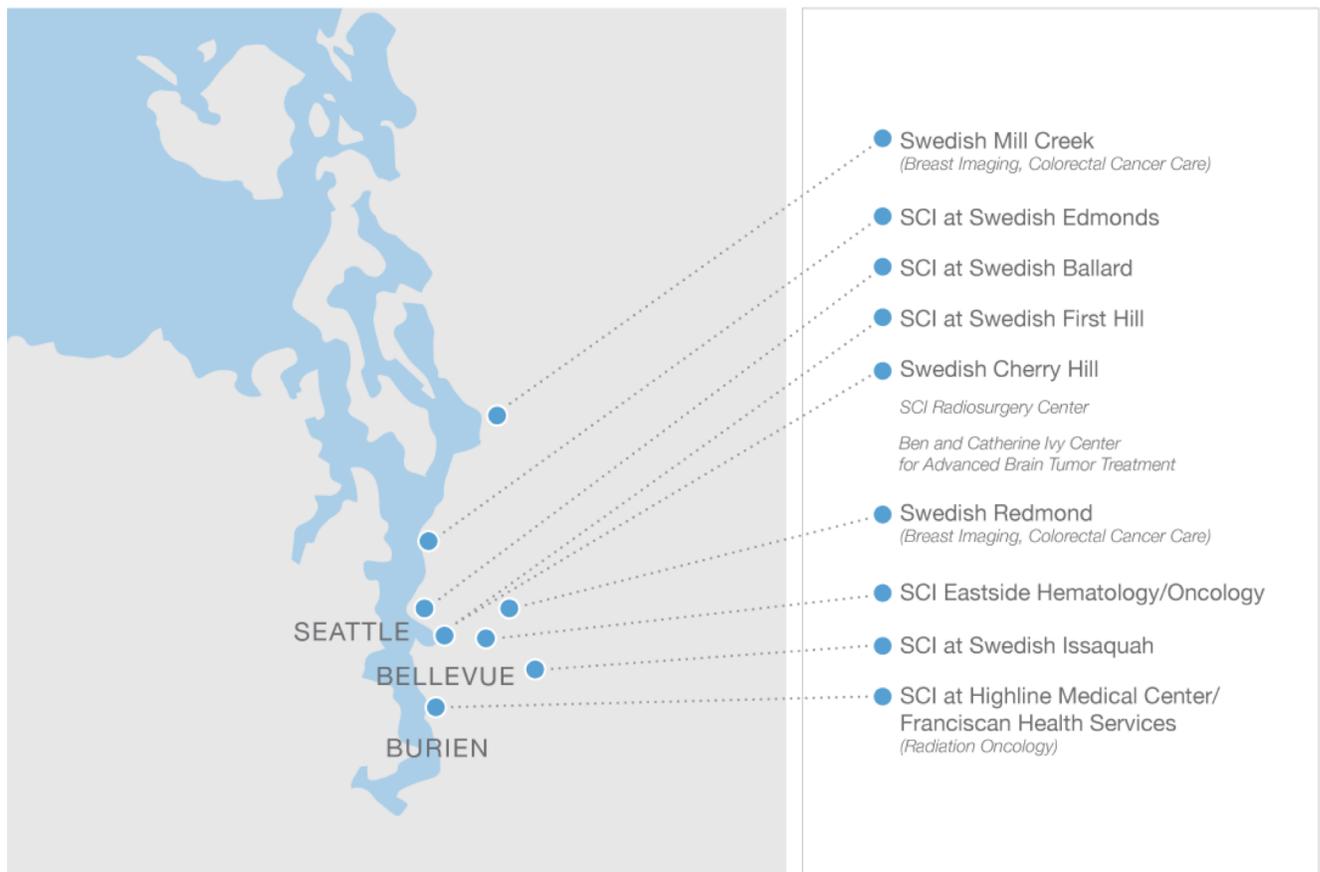


### Five Things to Expect from a Personalized Medicine Program:

1. A genetic sequencing program that pinpoints the mutations that drive your tumor
2. Consultation with a genetic counselor, when appropriate, about gene-associated risks and risk-reduction strategies
3. Access to the latest clinical trials
4. Holistic care that addresses psychological, social, spiritual and financial needs
5. Providers who stay by your side for each step in the cancer journey – and long after treatment ends.

## Seven Sites, One Mission

This comprehensive cancer care approach is available to patients at seven Swedish locations, delivering on SCI's goal of providing the right care, at the right time, in the right place. Seattle-area and affiliate locations include:



1-855-XCANCER (1-855-922-6237) | [SwedishCancerInstitute.org](http://SwedishCancerInstitute.org)