

PROVIDENCE HEART INSTITUTE

2016 ANNUAL REPORT

CARE



DISCOVER



INSPIRE



PROVIDENCE HEART INSTITUTE

People are all so wonderfully different. Small and tall. Funny, serious, studious, frivolous, laid-back, hard-driving, and on and on in an amazing diversity of interests, experiences, passions, and approaches to life. And within each and every one of them is this remarkable engine, this beating heart, that keeps them going and growing.

That's why we're here. Everything we do, we do to ensure the health of that marvelous machine and the health of the person it powers. Our job is nothing less than guiding people through life-changing moments that are also, in a very important way, sacred. That understanding is at the core of everything we do – from the way we answer the phone to the way we design our facilities to the way we relentlessly pursue the science and technique of our treatment.

This is not just a job, not for any one of us. This is a promise we make to the people who need us: you can put your heart and your health in our hands and, together, we will move heaven and earth for you.

That's who we are.



I'm pleased to provide this annual report on progress at Providence Heart Institute. We bring the world's best heart care to Oregon and provide national thought leadership to heart care innovation and heart disease prevention and wellness.

Providence Heart Institute is the leading heart care provider in Oregon and southwest Washington, as well as a leader in heart care excellence for the entire Providence St. Joseph Health system. We serve 15,000 patients annually from 16 locations, including 40 percent of the Portland-metro market. Last year our rapidly growing prevention and wellness programs served more than 4,500 people.

Our institute has been an innovator in heart care for generations, from the first coronary artery bypass surgery on the West Coast in 1968 to the first non-surgical valve replacement procedure in Oregon in 2012. We recently implanted our 600th valve using this less-invasive approach. We also implanted our 50th ventricular assist device, a mechanical pump that helps weakened hearts to pump blood. As a trusted partner in clinical trials and home to nationally respected researchers serving the entire Providence system, we continue to lead in bringing innovative technologies to the communities we serve.

In 2014, anticipating rapid growth in heart disease and continued changes in the health care market, we launched a plan to advance a statewide service line unified under strong physician leadership. Through this service line, we are providing best-in-class care that is patient-centered and integrated from prevention programs to specialty clinics delivering the most advanced heart care available.

Such an approach improves business and medical decisions, boosts patient outcomes, and lowers overall costs. To implement this, we have organized our work into three complementary centers: Clinical Care, Research and Innovation, and Prevention and Wellness.

Our plan calls for the creation of a destination center of excellence for cardiac care at Providence St. Vincent Medical Center. We made significant progress in 2016, opening a new facility for clinical care and beginning construction on Basecamp, a health care facility like no other, dedicated to cardiovascular wellness. We have also made tough choices, consolidating open-heart surgery to Providence St. Vincent to create the highest volume heart surgery center in the Pacific Northwest. At the same time, we have dramatically expanded vascular surgery at Providence Portland Medical Center. All these choices position us to provide better care and greater opportunities for our patients and clinicians.

If you would like to see our work first-hand, please call (503) 216-7153 or email welovethat@providence.org. We would love to host you for a visit, observation or tour.

Thank you very much,

A handwritten signature in black ink, appearing to read "Dan Oseran". The signature is fluid and cursive, with the first name "Dan" and last name "Oseran" clearly distinguishable.

Dan Oseran, M.D.
Executive Medical Director

PROVIDENCE HEART INSTITUTE – BY THE NUMBERS

108,276	Clinic Visits
21,019	Cardiac Rehabilitation Visits
15,032	Patients Served
8,503	Acute Admissions
4,738	Catheter Lab Procedures
4,099	Free Youth Heart Screenings
1,254	Electrophysiology Procedures
890	Open-Heart Surgeries
627	Heart to Start Exercise Program Participants
296	Transcatheter Aortic Valve Replacements
86	Physicians, Surgeons and Advanced Practitioners
37	Active Clinical Trials
20	Practice Locations
8	Acute Care Hospitals

ACCELERATING THE TRANSFORMATION OF HEART CARE

In 2014, Providence Heart Institute launched a plan to respond to rapid changes in health care economics, technology, and the delivery of cardiovascular care. With this plan, Providence Heart Institute is transforming and accelerating growth in our clinical practices, in research and innovation, and in our prevention and wellness initiatives. This plan has already

resulted in significant accomplishments and will position the Institute as a national leader in delivering the highest quality care.

Our plan includes continued refinement of our statewide-integrated cardiovascular service line in a hub-and-spoke model with a destination center of excellence at Providence St. Vincent Medical Center. Strategies are in place to further grow market share, reduce costs, advance innovation, and recruit and retain top medical talent.

Providence Heart Institute's activities are being organized into three centers to deliver on these goals. The following pages summarize key progress in each of these three centers.

Providence Heart Institute brings significant assets to this plan, including:

- **Outstanding physicians**
- **Oregon's highest patient volumes and largest market share in cardiovascular care**
- **Advanced facilities**
- **A broad base for excellence in the full spectrum of care, from population health management to highly technical and sub-specialized services**
- **Robust clinical trial capability and industry relationships**
- **One of the world's largest cardiovascular databases with longstanding expertise in data analytics**
- **Cardiovascular care leadership for the Providence St. Joseph Health system – the third largest integrated health system in the country**

CENTER FOR CLINICAL CARE: ADVANCING THE VERY BEST CARE

Despite tremendous advances in medical science and technology, heart and vascular disease remains this country's leading cause of death. With an aging population, we face a rising tide of heart disease. Oregon's aging Boomer generation is twice as large as those before it, while precursor diseases and conditions are growing more prevalent.

To meet this challenge, Providence Heart is creating a statewide Clinical Care service line with the most innovative drugs, treatments, and medical technology. This service line is integrated, physician-led, and patient-centered. It provides

excellent general cardiovascular care as well as leading specialty care programs in valves, heart failure, arrhythmia, and vascular treatment.

We are also changing where we provide some of our care. Because volume of care brings quality of care, we are concentrating some of our most specialized care at new facilities at Providence Portland and Providence Medford and a new flagship facility at Providence St. Vincent.

At the same time, we are enhancing partnerships with primary care physicians and using telemedicine and smart devices to care for patients without asking them to visit a hospital, especially critical for those with chronic conditions such as congestive heart failure.

Clinical Care Priorities

- **Advance statewide hub-and-spoke model with strategic distribution of specialty care services**
- **Grow size and excellence of specialty care programs: valve, heart failure, arrhythmia, and vascular care**
- **Recruit director of cardiac surgery**
- **Expand and enhance facilities**



Diagnosed with coronary artery blockages at Providence Newberg Medical Center, Jan Aden was quickly transferred to Providence St. Vincent where cardiac surgeon Gary Ott, M.D. performed triple bypass surgery. Her caregivers kept her informed and answered her many questions all along the way. She went home in just four days, then completed cardiac rehabilitation and lost more than 25 pounds. Jan's youngest daughter just started high school in September

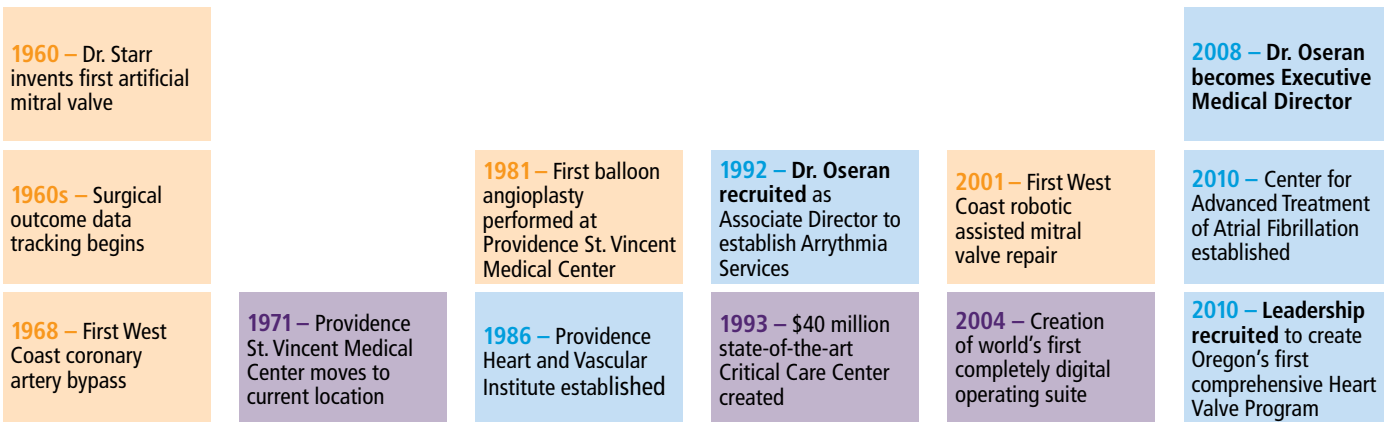
2016. "I am so grateful to be here," she said.

Jan's speedy treatment and recovery didn't happen by chance. "We constantly strive to improve the care of all our patients," explains Ty Gluckman, M.D., medical director of Clinical Excellence. "We start by asking them for feedback and continually refine protocols to ensure that each one receives the best and most integrated care possible."

Providence Heart Institute: 50 YEARS OF ACCELERATING PROGRESS

CARE. DISCOVER. INSPIRE.

Providence Heart Institute advances the very best care to every heart at risk, accelerates innovation in heart health, and empowers people to become their best, healthiest selves.



Clinical Care

Research and Innovation



						2017 – Continued expansion of Play Smart and Heart to Start
						2017 – Women's Heart Program to launch
					2016 – Destination Center for Clinical Care opens in Mother Joseph Plaza	2017 – Heart Healthy Nutrition Program to launch
			2015 – Creation of Providence Vulnerability Index to improve heart failure care		2016 – Valve Program expands clinical trials testing expanded TAVR use	2017 – Clinical trial for transcatheter mitral valve replacement
	2013 – Creation of innovative accountable care model for coronary artery bypass	2014 – First Mitraclip in Oregon	2015 – First-in-Northwest monitoring of patients' hearts via smart phones	2016 – Largest-in-Northwest Heart Valve Program completes 500th TAVR		2017 – Clinical trial of low-carb diet therapy for heart failure
	2013 – Establishment of integrated state-wide service line with unified leadership	2014 – One of two West Coast locations chosen for leadless pacemaker trial	2015 – US' first use of TAVR implant for a pregnant patient	2016 – Open heart surgery consolidated to super-high volume center		2017 – Clinical trial for novel treatments of aortic aneurysms
2011 – Leadership recruited to create Center for Advanced Heart Failure	2013 – Launch of Heart to Start expands Prevention and Wellness programming	2014 – First subcutaneous ICD in Oregon	2015 – Heart to Start expands to Newberg and Oregon Coast	2016 – First Portland-region use of absorbing stent		2017 – Basecamp for Heart Health to open in Mother Joseph Plaza
2012 – Heart Valve Program completes first TAVR in Oregon	2013 – Leadership recruited to create Women's Heart Program	2014 – PH&S commits capital to create destination center of heart care excellence	2015 – Providence Willamette Falls cardiac rehab center opens	2016 – Heart to Start expands to Spokane		2018 – Providence Portland and Providence Newberg cardiac rehab centers to open
2012 – Launch of Play Smart and Prevention and Wellness initiative	2013 – Telemedicine clinics launched	2014 – Top rating from Society of Thoracic Surgeons	2015 – On-demand web videos serve coronary artery bypass patients	2016 – PlaySmart provides free heart screening to 10,000th youth		2019 – Center for Research and Innovation to open in Mother Joseph Plaza

2011-12

2013

2014

2015

2016

2017-18

Prevention and Wellness

Facilities

RESEARCH AND INNOVATION: ACCELERATING DISCOVERY IN HEART HEALTH

Science and technology are creating a new era of innovation and Providence Heart is growing its capacity to care for patients in ways unimaginable just a few years ago.

In 2016, we advanced 37 heart-related clinical trials, more than anyone else in Oregon. We tested heart valves, leadless pacemakers, bio-absorbable stents, implantable biosensors, implantable cardio defibrillators (ICDs), and other treatments and technologies. We helped achieve FDA approval for a bioabsorbable stent that opens arteries, and then gradually dissolves leaving them unclogged and flexible.

Clinical trial success has helped our arrhythmia program grow into the largest in the Northwest. Clinical trials and significant philanthropy created one of the nation's top 10 sites for replacing defective heart valves using catheters rather than open-heart surgery.

We expanded our longstanding expertise with data. In 2016, researchers in our Medical Data Research Center published in Future Cardiology, Journal of Heart and Lung Transplantation, Texas Heart Institute Journal, Annals of Thoracic Surgery, and Journal of Clinical Lipidology. Our biostatisticians and physicians created a tool to better identify and provide preventive treatments to heart failure patients at high risk of readmission or death. Now used throughout Providence, we plan to combine this tool with

Key Research and Innovation Priorities

- **Expand capacity to use data and predictive modeling**
- **Recruit additional research leadership and biostatisticians**
- **Continue to grow clinical trial partnerships**
- **Expand research fellowships**
- **Create a new physical home for research close to centers for clinical care and wellness**

mobile monitoring and expand its use to other conditions. This type of tool is essential to effectively manage our growing patient population. Our vast cardiac databases are a unique asset and, even considering our recent progress, have enormous yet-to-be-tapped potential for more such predictive tools.

We continue to accelerate this progress. We are creating fellowships to give physicians time to pursue new treatments and develop new technology. We plan to create partner fellowships with collaborators in biomedical engineering, digital technology, and other fields. We also plan to add data analysts and a chair of Research and Innovation.

Last summer Nathan Strutt climbed Mount St. Helens. Two years prior, he wasn't sure he'd be able to climb stairs after suffering cardiac arrest at age 27. Brought to the Providence Heart Institute, Nathan received a subcutaneous implantable cardioverter defibrillator (S-ICD). About the size of a deck of cards, the S-ICD is installed under the skin below the armpit. If it detects a dangerous change in the heartbeat, it delivers a shock to reestablish a normal rhythm.

Nathan was the first in Oregon to receive a new type of S-ICD better suited to younger and more active patients. "I really appreciated that Providence gave me the opportunity to consider a new technology," said Nathan, now an engineer at Intel. "Most of the time I forget that the device is there. It really doesn't affect my life."



CARDIAC PREVENTION + WELLNESS: EMPOWERING HEALTH

Research consistently shows that 80 percent of heart disease is preventable with early detection and lifestyle changes. To capture this 80 percent opportunity, Providence Heart Institute is growing programs to empower people to become their best, healthiest selves.

Cardiac rehabilitation remains one of the most successful interventions to reduce the risk for further cardiac events in patients with heart disease. For several years, we have achieved 20 percent year-over-year growth in this service. In response, we are tripling our capacity from 1,000 to 3,000 patients per year.

In 2016, we achieved rapid growth at Providence Willamette Falls Medical Center, after adding facilities there in 2015. In 2016, we began construction on facilities, now complete, that have doubled our capacity at Providence St. Vincent. Facilities at Providence Portland and Providence Newberg medical centers will be next.

In 2016 Play Smart, our youth heart screening program, provided free screenings to more than 4,000 youth and reached a milestone of more than 12,000 youth screened since 2012. High-volume screening events resulted from strong relationships with schools and a growing partnership with Portland Parks and Recreation. Our goal is to screen 5,000 youth every year.

Key Prevention and Wellness Priorities

- **Open Basecamp | Cardiac Prevention + Wellness with innovative and engaging exhibits and programming**
- **Grow cardiac rehab, Play Smart and Heart to Start programs**
- **Launch the Women's Heart Program and a heart-healthy nutrition program**
- **Develop a sports cardiology program**

Hundreds of people have participated in our exercise program, Heart to Start. Launched in Portland in 2013, we added programs in Newberg, Seaside, Spokane, and Walla Walla. We plan to develop flexible guidelines that cardiologist leaders can use to create more groups.

We completed plans for a Women's Heart Program to serve the unique cardiovascular care needs of women of all ages and socioeconomic classes. To launch in 2017, it will build on the clinical and partnership-building experience of Play Smart and cardiac rehab.



Andrew Matto and his family were stunned when a family friend his age died of an undetected heart defect. That's why, when he turned 12, his mother brought him and his twin brother to Providence Heart Institute for a Play Smart™ screening.

Initial tests indicated Andrew might have a problem, but further diagnostics ruled that out. Because of his experience, Andrew became a loyal Play Smart volunteer, preparing materials for schools hosting screenings.

Now in his freshman year of high school and a member of the JV soccer team, he continues to volunteer and urges more youth to be screened. "It's important to be checked," he said, "and it's easy. If I can get just 20 or 30 more kids my age to go through it, it's worth the work."



Basecamp | Cardiac Prevention + Wellness

To provide a home base for continued growth, in 2016 we began the construction of Basecamp | Cardiac Prevention + Wellness.

Basecamp encompasses 25,000 square feet on the highly visible ground floor of Mother Joseph Plaza at Providence St. Vincent Medical Center. It takes its name for the place where mountain climbers and adventurers come together to prepare for a journey of discovery and accomplishment.

Designed to help people see themselves as active members of a movement for cardiovascular health, Basecamp will feature creative displays, profiles of inspiring patients, and interactive activities allowing patients to plot their course to better health.

The “Apple a Day Cafe” will serve nutritious food and drink, as well as offer heart-healthy recipes to try at home. Flexible classrooms will support ongoing learning activities and provide beautiful and dynamic space for community events.



For several years Providence Heart Institute has achieved 20 percent year-over-year growth in the number of people we serve with cardiac rehabilitation. In response, we are tripling our capacity to serve these patients, from 1,000 to 3,000 per year.

Key to this is the new Steve and Donna Shepard Cardiac Rehabilitation Heart Fitness Center, which will more than double the number of patients we serve at Providence St. Vincent. This new

center will allow 1,200 patients to make more than 40,000 visits each year. It will also provide space for training and diagnostics for participants in women's heart health, sports cardiology, and more.

Basecamp opened in March 2017. Visit www.welcometobasecamp.org to learn more and register for classes.

CLINICAL TRIAL HIGHLIGHTS

Providence Heart Institute's Clinical Research brings cutting-edge medical treatments to our patients while advancing the clinical science of cardiovascular research worldwide. Led by Medical Director for Clinical Research Ethan Korngold, M.D., in 2016 our research coordinators screened, enrolled and followed more than 400 patients in 37 clinical trials.

2016 highlights include the following:

MICRA Transcatheter pacemaker

Providence participated in the clinical trial investigating the world's smallest pacemaker. The Medtronic Micra Transcatheter Pacing System is one-tenth the size of traditional pacemakers – about the size of a large vitamin. The device earned FDA approval in 2016 and is now available commercially at Providence.

The device is placed directly into the heart using a common minimally invasive procedure – a catheter that is inserted into a vein in the patient's leg. Once the Micra is pushed into place, small tines are used to attach it to the heart wall. The Micra then delivers electrical impulses through a tiny electrode on the end of the device, which help the heart beat at a normal rhythm.

PARTNER 3 (transcatheter aortic valve replacement for low-risk patients)

Transcatheter valve replacement has evolved over the last few years and Providence Heart Institute remains one of the leading locations in the Northwest to offer the newest clinical research trial for patients with low operative risk for surgical aortic valve replacement. Patients are randomized 1:1 to receive either transcatheter heart valve replacement (TAVR) with the Edwards SAPIEN 3 or surgical aortic valve replacement with a commercially available bioprosthetic valve.

BEST CLI (surgical vs. endovascular treatment to improve blood flow in limbs)

This clinical trial supported by the National Heart and Blood and Lung Institute and coordinated by New England Research Institute allows Providence Heart Institute and other trial participants to assess the best endovascular or surgical therapy in patients with critical limb ischemia who are eligible for both treatment options.

“The valve clinic and research team make it just about the easiest thing I’ve ever done.”

A vigorous outdoorsman and rodeo participant, Jon Englund was diagnosed with aortic stenosis, a dangerous hardening of the valve that controls the flow of oxygenated blood from his heart to the rest of his body. “My local hospital recommended open heart surgery, but I didn’t really want it,” he said.

Jon sought other options at Providence Seaside Hospital where cardiologist Masud Ahmad, M.D., referred him to the valve clinic at Providence St. Vincent. There Jon was able to enroll in a clinical trial testing transcatheter aortic valve replacements (TAVRs). A leading participant in national trials that secured FDA approval of TAVRs for higher-risk patients, Providence Heart Institute is one of just 26 national participants in a trial for lower-risk patients like Jon.

Jon’s experience has been seamless. “The valve clinic and research team make it just about the easiest thing I’ve ever done,” he said. “It’s just remarkable.”





9205 SW Barnes Road
Portland, OR 97225