

A decorative graphic on the left side of the page consists of a grid of small squares in various shades of teal, blue, green, and orange, arranged in a pattern that resembles a staircase or a series of steps.

Building a leading stroke center

# One hour at a time

By Shirleen Holt | Photos by Jerome Hart

When he was writing “Outliers: The Story of Success,” author and pop sociologist Malcolm Gladwell discovered a humble truth about people who excel: They simply work harder. The Beatles played eight hours a day, every day, before they made it big. A young Bill Gates stayed up most nights writing code on his high school’s computer. By the time each achieved mastery, they’d clocked more work hours than would seem possible. Social researchers have a name for this: “the 10,000-hour rule.”

Tami Dougherty recovered fully from her stroke, thanks to her husband, Pad, their dog Freeway, and the work of Providence's stroke team.

It's a Tuesday morning and the stroke team gathers in a cramped classroom at Providence Portland Medical Center. They're from different disciplines – neurology, nursing, rehabilitation, discharge, pastoral care. They call this daily meeting “stroke rounds,” a place for the group to discuss each stroke patient under their care. One patient is recovering nicely but has continued slurred speech. Another needs encouragement to quit smoking.

Without taking her eyes off the checklist before her, stroke team coordinator Sandy Dancer hands a nurse a packet of information about strokes. “That’s my way of reminding them to always do patient education,” she says.

Today’s meeting is routine, the conversation predictable. It’s one meeting among dozens. One checklist among hundreds. One conversation among thousands. One hour among 10,000.

It’s one of the countless incremental steps that over the past 10 years have led Providence Stroke Center to become a program of consequence: to become Oregon’s first nationally certified primary stroke center; to win top national awards for excellence. And, most important, to save the lives of people like Tami Dougherty.

### “She was having a stroke”

The day after Thanksgiving 2008, Dougherty, a 49-year-old librarian’s assistant from Milwaukie, woke around 5 a.m. to let out her aging dachshund, Freeway. In the darkened bedroom she groped under the covers with her left hand, feeling her way to the furry lump. She led Freeway to the door, then crawled back into bed. Minutes later Freeway returned through the dog door and whined for Tami to pick him up.

“He’s diabetic and blind, but he knows how to get back into our bedroom and snuggle back in with Mama,” says Pad Dougherty, a cement contractor and Tami’s husband of 25 years.

Tami leaned over to grab Freeway and fell on the floor.

“What are you doing?” Pad asked.

“Picking up the dog” was the answer Tami thought she gave.

What Pad heard, however, was gibberish – sounds, but no words. He switched on the light and saw his wife slumped against the side of the bed.

“I haven’t been through anything like that before,” he says, “but I recognized immediately that she was having a stroke.”

He called 9-1-1.

“I thought he was crazy,” Tami recalls. “I just wanted to get back into bed and sleep.”



### The drug that changed everything

Strokes, often called “brain attacks,” occur when blood flow to the brain is interrupted. While one in five strokes is caused by bleeding in the brain, most are like Dougherty’s, caused by a blood clot blocking an artery.

Until 1996 doctors could do little to prevent damage from stroke, the third-largest killer behind heart disease and cancer and the leading cause of long-term disability. That year, however, the federal government approved a clot-busting drug already used on heart patients: tissue plasminogen activator, or tPA.

For stroke patients, tPA resembles a miracle drug, able to dissolve clots quickly and even reverse the damage from stroke. But it also carries a big risk: It must be given within three hours of the stroke’s onset or it could cause dangerous bleeding. > > >

# “Hospital stroke-patient care is akin to trench warfare. It’s very methodical.”

TED LOWENKOPF, M.D.

This new urgency turned stroke care across the country upside down. Suddenly strokes required the same speed and calibrated response as heart attacks.

For Providence Brain Institute, this shift presented a larger opportunity. Providence was already involved in clinical trials to test advanced stroke treatments. It was time to decide whether Providence should take the next step and become a two-hospital “stroke center” – at Providence St. Vincent Medical Center and Providence Portland Medical Center – ensuring the hospitals were destinations for stroke services throughout the region.

The center would provide the best emergency care by skilled stroke specialists, comprehensive post-stroke care, clinical research to continue developing the drugs and devices of the future, and a strong education component to help people become aware of stroke symptoms and seek prompt treatment.

So in 1999 Providence set out to do just that. As with most lofty goals, setting it was easy. Reaching it would be more involved than any of the architects could have imagined.

## Starting to build

“Hospital stroke-patient care is akin to trench warfare. It’s very methodical,” says Ted Lowenkopf, M.D., Providence Stroke Center’s medical director. “It’s the day-to-day focus on data-driven protocols to achieve the highest standards of care. Although not as dramatic as acute stroke treatment, this truly leads to the best patient outcomes.

“And it’s something that requires a lot of infrastructure. Every step and every minute of that patient’s care must be carefully scrutinized and reflect the highest professional standard.”

Providence hired Dr. Lowenkopf in 2000 in part because he’d helped develop

an acute-stroke protocol at Washington University School of Medicine in St. Louis.

At the time, most U.S. hospitals weren’t set up to treat stroke patients aggressively. Busy emergency rooms often delayed diagnosis. Laboratory tests were slow to arrive. Neurologists were not available for 1 a.m. calls. And the biggest barrier to treatment: The patients themselves waited too long to seek help. As a result, only a fraction of stroke patients qualified to receive tPA.

One of the first things Dr. Lowenkopf and his team needed to do was ensure there were enough neurologists, neurosurgeons and interventionalists – physicians

skilled in catheter-based procedures – to cover a 24/7 schedule.

Providence had already teamed up with Oregon Stroke Center, part of Oregon Health & Science University, to conduct clinical trials. So it made sense for this “team of rivals” to collaborate on acute care. In 2000 they formalized their partnership, creating a pool of on-call specialists from around the area to answer stroke emergencies, regardless of hospital affiliation.

Providence also needed to work with ambulances, fire departments and Life Flight to ensure that stroke patients received the same urgent response as trauma and heart attack patients. It needed emergency rooms that would rapidly evaluate the patient. It needed fast diagnostic imaging and a nursing staff skilled in stroke care.

Protocols and deadlines soon followed: no more than 10 minutes for the patient to see a doctor; 15 minutes to consult with a specialist; 25 minutes to get a CAT scan to help diagnose the stroke; 60 minutes to receive tPA. Every step and time would be noted on the protocol form, which included a central phone number to summon the acute stroke team.

## She was lucky

Without these protocols, Tami Dougherty might have died.

“She had a right middle cerebral artery clot,” says Lisa Yanase, M.D., associate medical director for Providence Stroke Center. The artery feeds a huge section of the brain; Dougherty’s stroke was massive.

Dr. Yanase was on call the morning Dougherty arrived at Providence Portland Medical Center. Unlike many stroke patients, Dougherty was lucky. She and Pad knew when her stroke occurred: At 5 a.m. she was using her left hand to retrieve her dog; by 5:10 a.m., the hand was immobile.



**It started with one:** Ted Lowenkopf, M.D., joined Providence in 2000 with the goal of creating a leading stroke center. He was soon joined by Lisa Yanase, M.D. (top photo, opposite page), whom he’d known from their fellowship days in Missouri. As the program grew, so did the support teams (right).





That meant Dr. Yanase could safely administer tPA, knowing that it was within the three-hour window.

It didn't take long for the medication to do its job. When Dougherty gained full consciousness, her clot had dissolved and she could wiggle her fingers and speak clearly. No impairment, no permanent damage.

"I felt great," she says. "I honestly felt that I could go to work later that day."

Dougherty's case, like those of all Providence stroke patients, was entered into a database that details each patient's diagnosis, treatment and eventual outcome. The registry had taken months to compile, but it quickly proved its worth. In 2001, it helped Providence to win a \$1.4 million grant from the U.S. Centers for Disease Control and Prevention, which aimed to create a national stroke registry by using data from each state.

The registry also provided a wealth of information, not just on patient care but on how well the stroke center's protocols were working. It allowed Dr. Lowenkopf and others to spot patterns or delays that might signal a flaw in the process.

"There were cases where it seemed like it was taking too long to get the CAT scan," Dr. Lowenkopf says. "Working with the emergency team and radiology, we were able to identify what caused the delays and ensure they weren't reproduced."

Stroke patients who didn't qualify for tPA benefited from other sophisticated treatments, some of which were tested in clinical trials at Providence Stroke Center. Some patients had clots removed through a catheter; others received tiny mesh stents to prop open a blood vessel; some were treated with drugs placed directly on the clot.

Some of these devices and drugs have since been approved by the U.S. Food and Drug Administration. Others are still being tested.

"We're looking to the future, so when these treatments become the standard of care," Dr. Lowenkopf says, "we'll be in the position to say, 'OK, we already do that.'"

### "It's the scrutiny"

Providence Stroke Center developed a team approach to daily care, which distinguishes it from other hospitals in the country. This approach includes those cross-discipline groups that participate in daily rounds. > > >



## SYMPTOMS TO WATCH FOR

If you think someone is having a stroke, remember

### FAST

#### FACE

When you ask the person to smile, does one side of his face droop?

#### ARMS

Is one arm drifting downward when the person raises both arms?

#### SPEECH

Does the person have difficulty repeating a simple sentence? Are her words slurred?

#### TIME

If the answer is yes to any of these, call 9-1-1 immediately.

SOURCE: AMERICAN STROKE ASSOCIATION

**The teams:** Ten years after its inception, here are just some of the people who make up Providence Stroke Center's hidden architecture – and who ultimately help patients such as Tami Dougherty.

1. Marti Leven, chaplain
2. Tamela Stuchinar, Providence Brain Institute data analyst
3. Nancy Rynex, stroke registrar
4. Susie Fisher, R.N., regional program manager
5. Lisa Yanase, M.D., associate medical director
6. Ted Lowenkopf, M.D., medical director
7. Sandy Dancer, A.N.P., stroke team coordinator
8. Jen McAtee, occupational therapist
9. Kathy Kearns, R.N., stroke team coordinator



“This is one of the more important pieces of our program,” says Susie Fisher, R.N., the center’s regional program manager. “Dr. Lowenkopf talks about scrutiny. It’s the scrutiny of those daily rounds, the scrutiny of care. The goal is not only to provide the best care and not miss anything, but also to get people back home.”

Implementing scores of new ideas and getting everyone on board wasn’t seamless. In one case, the center decided that nurses would start using a stroke-assessment form – a tool of sorts – to monitor a patient’s condition after a stroke, when complications can arise. Leaders spent hours teaching the nurses how to use the tool and printing up instructions. When they followed up a few months later, the results were disappointing. Hardly anyone was using the tool; it took too long, the

nurses said, the terminology was too complicated and the results too uneven.

And so the work began anew: more rounds of training, more how-to booklets and pocket cards, more video instruction, more encouragement by the stroke team. When the stroke center checked back, the number of nurses using the tool had nearly tripled.

### The 10,000-hour rule

In “Outliers,” Gladwell calculates the number of years it typically takes a person or organization to achieve that 10,000-hour threshold – to go from good to excellent. His conclusion: about 10 years.

It’s doubtful that the people at Providence were aware of that benchmark in 1999 when they set out to build a leading stroke center. The purpose of each new policy or

protocol was to benefit the patient.

Studies provide the evidence: Stroke patients cared for by neurologists at the time of their emergency have better outcomes. Stroke units that treat a higher volume of patients with clots, hemorrhages and aneurysms have a lower percentage of stroke deaths. Patients who are involved in clinical trials benefit more than patients who aren’t. An organized, multidisciplinary approach to post-stroke care and rehabilitation – the purpose of those stroke rounds – reduces death and disability.

Each of those practices has helped Providence Portland and Providence St. Vincent medical centers earn the highest awards for quality granted by the American Stroke Association. And they’re positioning Providence Stroke Center for its next goal: to become one of a limited number of

## The evolution of Providence Stroke Center

1999

- Providence convenes stroke center task force

2000

- Creates Providence Stroke Center
- Performs the first stroke procedure using a catheter

2001

- Creates a patient “outcomes” registry

2002

- Initiates cross-discipline daily stroke rounds
- Participates in trials for the Merci Retriever, a corkscrew-like clot remover, later FDA-approved

2004

- Providence St. Vincent certified as Oregon’s first primary stroke center



## HOW TO PREVENT STROKE

Control your blood pressure; 120/80 is optimal.

■  
If you smoke, quit.

■  
Keep your cholesterol within healthy limits.

■  
Maintain a healthy weight.

■  
Eat right. Cut back on salt, saturated fat and cholesterol.

■  
Eat more fruits, vegetables and low-fat dairy products.

■  
If you have diabetes, control your blood sugar.

■  
Exercise regularly. Physical activity lowers your risk of high blood pressure.

comprehensive stroke centers in the Northwest, where patients with complicated conditions would be referred in the same way that critically injured patients are taken to trauma centers.

In previous years, or at a hospital less prepared for stroke emergencies, Dougherty's odds of survival would have been 50 percent. With survival, she might have faced months of physical rehabilitation. She might have lived with a speech or motor impairment for the rest of her life.

She thinks about that morning. What if she hadn't gotten up to put the dog out? She might have slept through the stroke, awakening after it was too late to reverse the damage.

"That's what kind of freaks me out," she says.

Pad rubs her shoulder. "Well, honey, you've done really well. Within five hours of a life-threatening situation," he adds, "she was out of it. It was all good."

Her ordeal is behind her, but Dougherty can never return to a life where stroke was something "I'd never given a second thought to." The subject pops up whenever a library patron checks out a book on the condition; when her dentist shares the story of a stricken co-worker; when her husband's colleague says that the exact same thing happened to his wife.

Dougherty is taking care to avoid a second stroke. She takes aspirin daily, exercises, and eats well. And she shares her story, hoping that others will recognize the symptoms and get help quickly. ■

**The good news:** Now there are effective treatments for stroke. **The bad news:** People rarely recognize their symptoms early enough to fully benefit.

For stroke specialists, this lost opportunity is like watching someone wandering in the desert and just missing the oasis. This is one reason Providence Stroke Center is working hard to educate people.

Susie Fisher, R.N., regional program manager for Providence Stroke Center, helped create Streaks for Stroke, a novel outreach effort supported by the American Stroke Association. Each May, stylists at Robert's of Portland salon offer free red hair

extensions while explaining the risks and symptoms of stroke to their clients.

The idea came from a 2007 study in Cincinnati, in which hairstylists at African-American salons were taught the warning signs of stroke

## The community is the classroom

and the importance of urgent treatment. They passed along that information to their clients. African Americans are at higher risk for stroke than other races, and women in general are more at risk than men. In fact, women are twice as likely to die from stroke than breast cancer.

Providence Stroke Center hopes greater awareness will result in greater numbers of patients who are successfully treated.

"Having been a nurse for more than 20 years and remembering when there were no treatments," Fisher says, "it is so gratifying to see that people can actually recover from a stroke and go home."

Susie Fisher, R.N. (left), helped create Streaks for Stroke, a promotion in which stylists such as Ruth Bachhuber at Robert's of Portland offer clients a streak of red hair and educate them on stroke symptoms.



### 2005

- Providence Portland certified as a primary stroke center

### 2006

- Both hospitals earn awards for quality from American Stroke Association

### 2007

- Participates in trials for a device that uses laser beams to salvage damaged brain cells
- Participates in trials for the Penumbra device, which acts like a vacuum cleaner to remove clots

### 2008

- Recruits for epidemiologist to study Oregon's high stroke rate
- Both hospitals earn the highest awards for quality from American Stroke Association