

## Vivian Shepherd is thankful for her second chance to enjoy Saturday mornings with her granddaughters.

Like many of her favourite Saturdays, Vivian began this one making pancakes with her three granddaughters. After that, she doesn't remember much.

### technology overview

A modern Interventional Imaging Lab is a highly-sophisticated and coordinated suite of technologies that includes a state-of-the-art, high-resolution x-ray imaging system on a movable arm that can be rotated around the patient to produce accurate 2D and 3D images of the body. Live 2D fluoroscopic images can be digitally integrated with 3D reconstructions of blood vessels providing highly detailed images that enable physicians to navigate complex vascular and other structures with precision, speed and confidence.

She doesn't remember collapsing on the kitchen floor. She doesn't remember her then nine year old granddaughter's frantic call for help. She doesn't remember the ambulance ride to Royal Columbian Hospital (RCH) in New Westminster, B.C. Nor, does she remember the lifesaving treatment she received that day before she woke up, hours later, in the hospital's recovery room.

When she arrived at the Emergency Room, doctors quickly determined that Vivian had suffered a major stroke.

"She was paralyzed on the right side, unable to speak and numb," says Dr.

William Siu, an Interventional Radiologist at RCH. "I recall thinking how sad for this patient and her family to have this happen so close to Christmas. Fortunately, time and technology were on our side that day."

Following the hospital's acute stroke protocol, Vivian was rushed to Medical Imaging where a CT scan showed a clot in her left middle cerebral artery. That, along with her clinical picture, was enough for on-call Neurologist, Dr. Sheila Savedia-Cayabyab to start intravenous thrombolysis therapy, and to consult with Dr. Siu for further evaluation for intra-arterial thrombolysis.

"When you're dealing with a stroke patient, every second counts," says Dr. Savedia-Cayabyab.

With no time to waste, Dr. Siu and his team performed an angiogram of Mrs. Shepherd's left carotid artery, using the hospital's then new Interventional Imaging Lab.

One of the functions of the interventional imaging lab is interventional angiography, a procedure that allows doctors to "intervene" inside a patient's circulatory system in a minimally invasive method. A thin tube, or catheter, is inserted into a blood vessel and threaded through the circulatory system to the site of the problem. The sophisticated x-ray imaging technology designed into

the interventional imaging lab allows doctors to "see" inside the body and monitor the position of the catheter.

"We saw a severe narrowing at the origin of the left internal carotid artery," explains Dr. Siu. Using the interventional imaging lab, the medical team was also able to identify an extensive blood clot in the carotid artery in Vivian's neck, reaching up into her left middle cerebral artery. They performed an angioplasty: they inserted a narrow catheter into her circulatory system to position a "stent" – or expandable mesh tube – that opened up the narrowed portion of Vivian's artery. They then advanced a microcatheter into the middle cerebral artery in Vivian's skull.

Once the microcatheter reached the blood clot inside Vivian's brain, doctors injected a powerful thrombolytic medication through the catheter to dissolve the clot. This restored the blood flow to the left side of Vivian's brain. The whole procedure took less than 60 minutes, and would not have been possible with the hospital's older angiography system.

According to Dr. Siu, visualization is key when performing neurological interventions. He credits the interventional imaging lab, which had been installed just three weeks earlier, with Vivian's positive outcome.



"There's no room for doubt when you're deep within the brain and feeding microcatheters a couple of millimeters in diameter through delicate and complicated vessels," says Dr. Siu.

Despite her brush with death and the high-tech drama that unfolded so rapidly around her, Saturdays at Vivian's house have returned to

normal. She is thankful for the quick action of the ambulance and hospital teams that intervened to give her a second chance, and the amazing technology that made their efforts possible.

Even more important, Vivian is thankful she can continue to spend Saturday mornings with her three granddaughters.

### fast facts

- Stroke is the fourth leading cause of death in Canada, killing more than 14,000 Canadians each year.<sup>1</sup>
- There are between 40,000 to 50,000 strokes in Canada each year.<sup>1</sup>
- Stroke costs the Canadian economy \$2.7 billion a year.<sup>1</sup>
- The average acute care cost is about \$27,500 per stroke.<sup>1</sup>
- Canadians spend a total of 3 million days in hospital because of stroke, each year.<sup>1</sup>

<sup>1</sup> Heart and Stroke Foundation of Canada. <http://www.heartandstroke.com/site/c/ik1QLcMWJtE/b.3483991/k.34A8/Statistics.htm>. (2008)

