

Kaiser Permanente Research



Telestroke

Creating new tools to better treat stroke patients

Dr. Navdeep Sangha, Dr. Adam Sharp

Stroke is a major cause of death and a leading cause of serious long-term disability in the United States.

When it comes to strokes, time to treatment matters. Each minute without treatment can mean the death of 2 million neurons in the brain.

Past research has shown U.S. hospitals have not consistently delivered the only FDA-approved treatment for acute ischemic stroke, a clot-dissolving treatment called Tissue Plasminogen Activator, or tPA. The treatment breaks up the stroke-causing clots by thinning the blood, but can be risky and its success depends on how quickly patients receive it.

Navdeep Sangha, MD, an assistant chief of neurology at the Kaiser Permanente Los Angeles Medical Center,

remembers, “I was really getting disheartened by all the cases that we were getting from other hospitals in which patients were not being adequately treated with intravenous tPA soon enough. As a stroke physician, it was heart wrenching.”

Research uncovers variations in stroke care

At the same time, Adam Sharp, MD, MS, an emergency physician and a research scientist with the Department of Research & Evaluation, was working with colleagues to understand patient and facility variables contributing to the quality of stroke care for Kaiser Permanente Southern California members.

Dr. Sharp and his colleagues found there were differences in stroke care among KPSC hospitals.

Physicians apply technology to treatment plan

Dr. Sangha knew something had to change to get immediate specialized care to stroke patients regardless of where they were treated. He and his colleagues applied some of the technology being used by rural hospitals to develop a video conferencing system for KPSC called Telestroke.

Telestroke allows an emergency department physician to contact a neurologist 24 hours a day from any KPSC hospital. The neurologist can see the patient on their computer monitor, review the charts, determine if tPA is appropriate, and assist in administering tPA if needed.

Dr. Sharp, the scientist, heard about KPSC's efforts to create a Telestroke system. "Telestroke made sense from both an efficiency and a quality perspective," Dr. Sharp said. "So, we asked if we might be able to build in an evaluation arm as we rolled this out."

In summer 2013, Kaiser Permanente's Telestroke program started as a pilot at the Kaiser Permanente Woodland Hills Medical Center. Dr. Sangha and others donated their time to be on call for other hospitals. Improvements were immediate and the decision was made to expand to all KPSC medical centers.

From putting the new training process in action, changing the flow of responsibility for reading tests, rewriting manuals, and everything else involved, implementing Telestroke was a "tour de force," said Todd Sachs, MD, regional medical director of Operations, Southern California Permanente Medical Group.

"This is a great example of the KP Promise: improving quality for members and improving the access to medical care," Dr. Sachs said. "That is always our true north."

Stroke care can be immediate with Telestroke

Now when a stroke patient goes to the emergency department, the physician pages an on-call Telestroke neurologist who may be at home or in the office. If they are in the car, they pull over on the side of the road, said vascular neurologist William P. Neil, MD, the San Diego Medical Center Stroke Program director.

"We have access to the CT scan, all the labs, and past medical history. And on the video, we can see the patient," Dr. Neil said. "We've got everything we need right on our laptops."

Research shows Telestroke is effective

As Telestroke rolled out to all the KPSC medical centers from August 2013 to December 2014, the use of tPA for patients with stroke increased by 73%.



Dr. Navdeep Sangha, Dr. Adam Sharp (monitor image: Leah Sanderson, Ivan Victoria, Liliana Hawken)

The study Dr. Sharp led, which included co-authors Dr. Sangha and Dr. Neil, was published in 2016 in *The Permanente Journal*. It showed:

- The use of tPA among acute ischemic stroke patients increased from 6.3% before Telestroke implementation to almost 11% after implementation.
- Overall bleeding complications were slightly lower after Telestroke was implemented (5.1% versus 4.9%).
- Two key quality measures improved: Median time for a patient to receive diagnostic imaging was reduced from 56 to 44 minutes, and the time to tPA administration for those eligible was reduced from 66 to 55 minutes.

Dr. Sangha said that being able to reference a study of our own patients has allowed the program to roll out even more effectively because physicians understand how well it works.

"In 2016, our tPA percentage utilization was above 20%," Dr. Sangha said. "The national average is about 6%."

Telestroke saves lives and livelihoods

At the Los Angeles Medical Center emergency department, Dr. Sangha no longer sees patients transferred from other KPSC medical centers in need of immediate stroke care. He believes Telestroke has saved lives, and livelihoods.

"Most people don't die from strokes. What happens is that they end up being severely debilitated," he said. "We're saving their livelihoods, and so they are normal, functional people who get to walk their daughters down the aisle, or be at their grandchild's graduation."