



# Telemedicine Leads to Better Stroke Evaluations in Rural Areas

## **Study between Mayo Clinic and UCSD shows promise for timely treatment**

SCOTTSDALE, Ariz. — A growing number of medical centers that have access to stroke specialists are transmitting their expertise to rural communities via audio/video telemedicine consultation, with significant clinical results, according to a new clinical study that examined trials conducted in Arizona and California.

The study, Pooled Analysis of the STRoKE DOC and STRoKE DOC-AZ Telemedicine Stroke Trials, followed two primary "hub" stroke centers — Mayo Clinic in Arizona and the University of California, San Diego — and six rural "spoke" hospitals. Results support the hypothesis that compared with telephone consultations, telemedicine evaluation of stroke patients results in more accurate diagnoses, better emergency decision-making, fewer complications and encouraging long-term outcomes. STRoKE DOC (Stroke Team Remote Evaluation using a Digital Observation Camera) connects stroke specialists at the hub site to a remote spoke site, using an internet connection.

According to Bart Demaerschalk, M.D., Mayo Clinic neurologist and principal investigator of the Arizona trial, "This pooled analysis, with replication of the hub-and-spoke network infrastructure, supports that telemedicine could be generalized to broader rural settings and communities — among more states, hospitals, and providers." Investigators were encouraged by the pooled results that allowed for a larger patient sample size that was able to demonstrate good 90-day outcomes.

The 276 patients exhibiting symptoms of stroke at their respective emergency departments were randomly assigned to telephone

consultations versus two-way telemedicine consultations using a digital observation camera.

Results of the five-year study showed that the correct emergency stroke treatment decision-making was made 96 percent of the time with the audio/video telemedicine technology, compared with 83 percent for telephone only. Importantly, diagnosis by telemedicine means that use of clot-busting medications for stroke can be increased to 29 percent, noting that one in three acute stroke patients are able to receive disability-reducing emergency clot-busting medications. Previously, fewer than 5 percent of patients in the rural communities had access to such treatments.

Current data reveals that only 55 percent of Americans have access to primary stroke centers within 60 minutes. Roughly 135 million people in the U.S. do not have access to a primary stroke facility located within an hour of their home. "Patients in less densely populated areas may not have immediate access to acute stroke expertise and may not be availed of clot-busting medication necessary for treatment," says Dr. Demaerschalk.

The process of stroke telemedicine goes like this: A call is placed from one of the remote "spoke" rural hospitals to one of the "hub" medical centers. The hub vascular neurologist is equipped with a "telemedicine tool belt," including a smart phone with a teleradiology application and other technology such as a laptop with a web cam. The remote, spoke hospital is equipped with a mobile robot telemedicine camera system that is positioned near the patient's bed. From afar, the stroke physician can observe and speak with the patient, and health care providers do a real-time consultation and review CT scans of the brain. If a diagnosis of stroke is confirmed, appropriate treatment can be quickly administered, such as a clot-busting drug when a clot is blocking blood flow to the brain.

"Results of this trial are significant, in that they confirm the effectiveness of telemedicine as a tool to evaluate acute stroke. This leads to appropriate decisions on behalf of patients — timely

treatment, low complication rates and good long-term outcomes," says Dr. Demaerschalk.

Results of the study were presented at the 2010 International Stroke Conference in San Antonio in February.

To request an appointment at Mayo Clinic, please call **480-422-1490** for the Arizona campus, **904-494-6484** for the Florida campus, or **507-216-4573** for the Minnesota campus.