

making a



difference

Introduction



The health care market is changing rapidly and the use of technology is becoming a necessary component in the triage and treatment of patients. The AR SAVES program is a direct result of providing a high level of care at a distance through the use of technology. Arkansas continues to rank first in morbidity and mortality from stroke. We must continue to offer services that will allow patients quick access to subspecialists who can assist in rapid treatment of critical patients. This program will not only improve the knowledge base of stroke care but will improve the outcomes of a devastating disease.

As a physician, my first thought is always of the patient. As a leader, I must continue to think of the patient but also must consider how systems of care can help the patient. The cooperation we have received from Arkansas Medicaid, consulting neurologists, emergency personnel and key UAMS leaders are making a difference in the lives of Arkansans. As this statewide program continues to grow, we will capitalize on providing the following:

- Comprehensive specialty care to patients experiencing strokes
- An image repository allowing for efficient use of time and treatment
- Educational training programs for all areas of stroke care
- Program evaluation and research

I look forward to addressing new challenges within our ever-changing health care system. With the nine sites added in 2009, we will be able to provide even more care to rural Arkansans.

Respectfully,

A handwritten signature in black ink, appearing to read "Curtis Lowery".

Curtis Lowery, M.D.

DIRECTOR, CENTER FOR DISTANCE HEALTH
CHAIRMAN, DEPARTMENT OF OBSTETRICS & GYNECOLOGY,
COLLEGE OF MEDICINE, UNIVERSITY OF ARKANSAS
FOR MEDICAL SCIENCES

making a



difference

Overview	Page 2
Participants	Page 3
The Heartbeat of AR SAVES	Page 4
Mountain Home Nurse	Page 6
A Larger Window	Page 7
Testimonial - James Sack	Page 8
Testimonial - Sharita Gilbert	Page 9
Crittenden Regional Hospital CEO, Jamie Carter	Page 10
McGehee Physician, Steve Obama Asemota, M.D.	Page 11
Spreading The Word	Page 12
Technology Explained	Page 13
Team Members	Page 14
Success Is In The Numbers	Page 17
Valueable Spokes	Page 18
Public Awareness	Page 20
Medical Director, Saleh Kayrouz, M.D.	Page 21

AR SAVES (Arkansas Stroke Assistance through Virtual Emergency Support) is a dedicated system of providing education, diagnosis and treatment for acute ischemic strokes through technology. A team of highly trained technology and stroke professionals have designed a streamlined system for the treatment of stroke in rural Arkansas. Through a contract with the Arkansas Department of Human Services' Division of Medical Services, this program is serving 20 hospitals (18 spoke, 2 hubs) in an effort to improve Arkansas' ranking of first in morbidity and mortality from stroke.

The program began in November 2008 and utilizes existing broadband connections provided by ANGELS (Antenatal Neonatal Guidelines Education Learning System) and the Arkansas Department of Health Biopreparedness Division. During 2009 and 2010, an additional nine spoke sites were added to the original 9 sites creating a larger geographic base for the treatment of ischemic stroke. The nine sites were integrated into the program through:

- Training for EMS providers
- Training for ER staff and physicians
- Telemedicine equipment for consults and education
- IT training for radiology imaging and connectivity

- Marketing and communication of stroke signs and symptoms for community awareness
- Vascular neurology consults available 24 hours a day, seven days a week
- Call Center support 24 hours a day, seven days a week

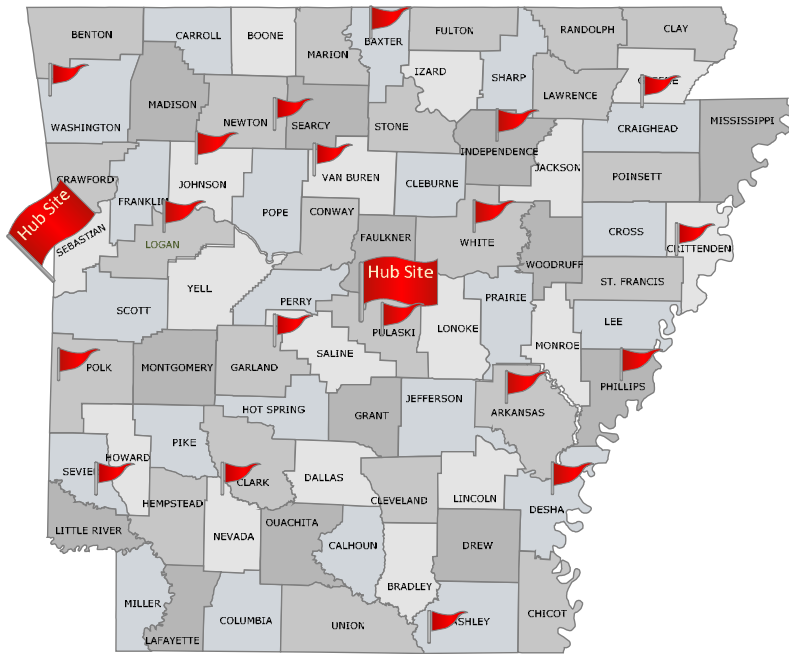
This innovative approach to providing subspecialty care within the confines of the remote emergency room will expand into other critical areas of medicine. The AR SAVES program is the foundation of a statewide emergency room telemedicine network.

AR SAVES added two neurologists to the program in 2009. Sami Harik, M.D., a UAMS professor of neurology, came on board after James Schmidley, M.D., accepted a position in Virginia. Vladimir Karpitskiy, M.D., who has a private practice in Hot Springs, joined the team in 2009. Both physicians bring tremendous experience and a passion for treating stroke patients.

In 2009 the program has doubled and continues to improve its processes and program outcomes.



Participants



The statewide telestroke care program includes two hub sites and 18 spoke. Spoke sites are rural hospitals providing onsite care of acute stroke patients using telemedicine technology for neurology consults to participating regional medical centers or hub sites. Hub sites are regional medical centers providing 24/7 support for neurology consultation and intensive care transport of patients receiving treatment at participating rural hospitals for spoke sites. This hub and spoke model will allow for multiple sites to provide expert care to other areas of the state.

Hub Sites



County	City	Facility
Pulaski	Little Rock	UAMS Medical Center
Sebastian	Fort Smith	Sparks Health System

Spoke Sites



County	City	Facility
Arkansas	Dewitt	Dewitt Hospital
Baxter	Mountain Home	Baxter Regional Medical Center
Clark	Arkadelphia	Baptist Health
Desha	McGehee	McGehee Desha County Hospital
Independence	Batesville	White River Medical Center
Johnson	Clarksville	Johnson Regional Medical Center
Logan	Booneville	Booneville Community Hospital
Phillips	Helena-W. Helena	Helena Regional Medical Center
Polk	Mena	Mena Regional Medical Center
Pulaski	Sherwood	St. Vincent Medical Center/North
White	Searcy	White County Medical Center
Washington	Fayetteville	Washington Regional
Crittenden	West Memphis	Crittenden Regional Hospital
Ashley	Crossett	Ashley County Medical Center
Van Buren	Clinton	Ozark Health Medical Center
Saline	Benton	Saline Memorial Hospital
Howard	Nashville	Howard Memorial
Greene	Paragould	Arkansas Methodist Medical Center

“
Nurses
are pivotal
and play an
indispensable
role at every
level.”

Nurses are indispensable in nearly every aspect of the stroke program

If technology is the backbone and neurologists are the brain of Arkansas (AR) SAVES, then registered nurses are its strong, steady heartbeat.

From the minute a stroke patient comes through the emergency room door at one of the outlying SAVES hospitals, specially trained nurses take control. They work seamlessly with SAVES nurses and neurologists at distant locations using the latest interactive video communications technology to make diagnoses in time to save the patient.

“Nurses are pivotal and play an indispensable role at every level of the program,” said UAMS’ Salah Keyrouz, M.D., stroke neurologist and medical director for SAVES. “This started during the early days of planning and launching of SAVES. It continues through education, training, triage, discussions and feedback. And it extends to the logistics and actual conduct of every one of those consults.”

Pioneering Program

When the SAVES program got up and running in November 2008,



(front) Terri Imus, R.N., (back, left to right) Tammy Northcutt, R.N., Loretta Williams, R.N., Debi Johnson, R.N.

word of this revolutionary, life-saving stroke program traveled nearly as fast as its telemedicine connections.

“When we first started setting up the pilot program, we were asking hospitals if they wanted to be part of this program,” said Terri Imus, R.N., the lead outreach nurse for SAVES. “But now, even outside of Arkansas, people say, ‘How can we get this in our hospital?’ It’s everywhere we go.”

It’s not surprising, considering that a neurologist in Little Rock, Hot Springs or Fort

Smith can recommend use of the clot-busting drug tissue plasminogen activator (t-PA) in the far reaches of the state – and with dramatic results. Many patients who likely would have died or become physically and mentally disabled due to stroke are now celebrating full recoveries after receiving the emergency treatment.

Technology has enabled the handful of stroke neurologists in Arkansas to offer their rare skills to hospitals throughout the state. In fact, thanks to federal bioterrorism funding in 2002, the Arkansas Health Department

has established dedicated high-speed communications connections with all 85 hospitals. This makes it possible for all of them to become part of the SAVES program and puts the state in a unique position to address its No. 1 rank in stroke mortality. As of April 15, 17 hospitals were participating in the program.

Training Extensive

When a potential stroke patient arrives at a SAVES site, months of preparation and training are called upon to ensure the best outcome for the patient.

“Our main goal is to make sure each site has as much exposure to the training as they need,” said Imus, a critical care nurse who helped develop guidelines for the ANGELS Call Center. On-site training visits are followed by mock cases that involve use of the telemedicine equipment. They perform two to five in the first couple of weeks after the initial training, and are expected to do at least one a week for as long as it takes for them to remain proficient.

“We’re trying to make this the standard of care across Arkansas, so we spend a lot of extra time keeping those smaller sites proficient,” Imus said.

Following Up

Imus and other nurses on the SAVES team assess the mock sessions as well as real cases so that when weaknesses crop up they can address it with the hospital staff.

After the initial site visits, Loretta Williams, R.N., an outreach nurse for SAVES, builds close relationships with nurses at each site as she reviews their readiness. She also explains to them how UAMS will work with their hospital after a SAVES consult.

“If we decide to give this life-saving drug, we’ll have a bed available for them to transfer that patient,” Williams said. “From the ER until they are discharged, we are making sure the patient’s needs are met.”

Making the Call

When a stroke patient presents in the emergency department of a participating hospital, the local ER nurses perform the initial stroke assessment. Each nurse must be certified to perform the National Institutes of Health (NIH) Stroke Scale to assess potential stroke patients.

If the assessment indicates a move to the next step, the emergency room physician is alerted and more tests are

ordered — the most important is a CT scan — and a call is placed to the UAMS Call Center. There, nurses like Tammy Northcutt, R.N., reviews with the local ER the time, onset of symptoms and when the CT image was completed to determine if the SAVES on-call stroke neurologist should be consulted.

Under SAVES guidelines, patients have a 4.5-hour window to get treated with the t-PA.

Northcutt, whose responsibilities include training other Call Center nurses, provides some guidance by phone, establishes a video connection with the outlying site and gathers information before paging one of the four participating neurologists.

Debi Johnson, R.N., whose office is adjacent to a telemedicine equipment room near Keyrouz’s office, makes final preparations for Keyrouz to take stroke consults.

“I’ll make sure the CT is up on the screen, and we are ready to go when he walks in,” Johnson said.

Johnson also keeps records of patients receiving t-PA, and tracks their outcomes with 24-hour and three-month follow-up

visits via telemedicine.

Once a SAVES consult has begun, the neurologist works almost exclusively with the local ER nurse, to obtain necessary camera views.

“The nurse is the hands of the neurologist,” said Julie Hall-Barrow, Ed.D., project director for AR SAVES and education director for the UAMS Center for Distance Health.

Since the program began Nov. 1, 2008, through March 31, 2010, 32 patients have received t-PA following consultation with a SAVES neurologist. Another 168 patients seen by SAVES neurologists did not qualify for t-PA, either because they arrived beyond the 4.5-hour threshold, had a hemorrhagic rather than ischemic stroke, or were diagnosed with other conditions.

“Nurses are the heart and soul of this program, and it would not be as successful as it has been without their expertise and dedication,” Hall-Barrow said.

A Mountain Home nurse takes stroke message to the community

Delbert McCutchen wears a lot of hats.

As a registered nurse at Baxter Regional Medical Center in Mountain Home, McCutchen serves as nursing facilitator, IT analyst and telemedicine coordinator. His roles put him squarely in the middle of his hospital's participation in the AR SAVES program.

In addition to training his own nurses for the stroke program, McCutchen has adopted the informal role of a SAVES community promoter.

"This is so important because of the far-reaching effects stroke has on families and the health care system," McCutchen said. "Think of the long-term costs and burden on families and the patients; the 90-day cost after a stroke is \$35,000."

McCutchen has taken his passion for the program to his community, telling them the importance of getting to the emergency room quickly enough to receive the powerful clot-busting drug t-PA.



Delbert McCutchen, R.N.

"As a nurse facilitator I'm responsible for the equipment, staff, training, protocols and guidelines, but I think it's just as important to talk to people and explain what an impact this program can have on their lives, their friends' lives, loved ones' lives," he said. "Nothing is as effective as word of mouth to really get that message out there."

McCutchen speaks regularly to churches, civic groups, nursing homes and assisted living groups. At a recent medical screening for the public, he was able to reach 3,300 people

with information about the SAVES program.

The reward, for him and all other emergency room nurses, is witnessing a life saved.

"What a powerful thing," he said. "You don't often get to see a patient go from nearly comatose and paralyzed on one side to being awake and mobile within minutes."

“
Nothing is
as effective
as word of
mouth to
really get that
message
out there.
”

Three-hour threshold for t-PA use expanded to 4.5 hours

In 2009, the AR SAVES program made a significant change in the time limit for administering the clot-busting drug tissue plasminogen activator (t-PA) to stroke patients.



Prior to Aug. 10, 2009, the SAVES program followed the U.S. Food and Drug Administration's guidelines, which call for a three-hour limit. But SAVES neurologists have expanded that window to 4.5 hours.

UAMS' Salah Keyrouz, M.D., a stroke neurologist and medical director of SAVES, said the change follows new recommendations of the American Heart Association, which are supported by a study published in the Sept. 25, 2008, issue of the *New England Journal of Medicine*.

By expanding to 4.5 hours, Keyrouz said, SAVES joins virtually all major medical institutions in the United States.

Keyrouz said the change has already meant significantly better outcomes for patients and will continue to help. But it doesn't mean that doctors and nurses should allow themselves extra time to prepare the patient for a t-PA injection.

"An extra 1.5 hours is significant, but you should keep in mind the earlier

the treatment the better the outcome; that's the message here," Keyrouz said. "We need to remain aggressive and get the t-PA in the system as soon as possible because patients are more likely to do better the sooner they get it."

Signed consent is required by patients (or a family member) when t-PA is given between three and 4.5 hours.

“
The earlier
the treatment,
the better.”

Through the AR SAVES program all participating hospitals utilize evidence-based guidelines and orders for the treatment of acute ischemic strokes.

“
The
telemedicine
and getting
to the
emergency
room in time
was the
whole key.”
”



James Sack.

James Sack is back to his hobbies in Mountain Home thanks to ARSAVES

Rhonda Sack remembers the sense of déjà vu watching her nearly comatose husband, James Sack, in the emergency room at Baxter Regional Medical Center in Mountain Home.

He was experiencing a stroke that was identical to her brother's; it was ischemic, meaning a blocked blood vessel. Also like her brother's, it was on the right side of the brain, and the whole left side of his body was paralyzed.

After her brother's stroke in 1991, he must use a wheelchair

and has a speech impediment.

But James' experience, on his 76th birthday, would be different.

UAMS stroke neurologist Salah Keyrouz, M.D., worked from Little Rock with the local nurse and emergency room physician via two-way video to diagnose the type of stroke James was having. Once that was done, he was able to recommend use of the clot-busting tissue plasminogen activator (t-PA).

“I could see the doctor on the video monitor looking at his watch and taking notes,” Rhonda said. “And between 10-15 minutes later, James' eyes fluttered, and Dr. Keyrouz said, ‘Mr. Sack!’ And James' eyelids flew open and he said, ‘Yes, sir!’ Everybody in the room started clapping and saying, ‘He's back!’”

He was sent home in less than two days.

James said he's feeling nearly as well as he did prior to his stroke. He's bowling, woodworking, spending time on his computer and upgrading his classic Corvette.

Only six months before James' stroke, Baxter Regional had joined the AR SAVES program, which allows a stroke neurologist from a distant location to recommend the use of the powerful drug that quickly breaks up blood clots and restores blood flow and oxygen to the brain.

“The telemedicine and getting to the emergency room in time was the whole key,” Rhonda said. “Dr. Keyrouz was right there; he was basically in the room – he just couldn't physically touch him. That was pretty amazing that they could actually do it right there, and they did it so fast.”



Husband credits clot-dissolving drug for helping his wife recover from a second stroke.

For Herman Gilbert, Christmas of 2009 goes down as his worst and his best.

His wife, Sharita Gilbert, was in the kitchen of their North Little Rock home when he realized something was wrong.

"She was making dressing for Christmas dinner and she started to say something and her words came out jumbled," Herman said.

Sharita, 38, had experienced a stroke in November 2008 and required extensive speech and physical therapy. As soon as Herman realized she was having another stroke, he rushed her to St. Vincent Medical Center/North in Sherwood, just as he had done the year before.

But this experience was different. Just two months before her second stroke, St. Vincent Medical Center/North had joined the AR SAVES stroke program, which allows a neurologist off site to examine the patient through video in real time.



"The doctor was actually talking to us through video at his home that night," Herman said, referring to UAMS' Salah Keyrouz, M.D., a stroke neurologist and medical director for the SAVES program. Keyrouz and three other stroke neurologists have telemedicine equipment in their homes as well as their offices so at least one neurologist is available 24 hours a day, seven days a week.

Herman said his wife was unable to respond to the doctor's commands, such as moving her arms or describing a picture. Keyrouz explained the benefits and risks of the tissue plasminogen activator (t-PA) drug, a clot-busting drug that can be given within four and a half hours of symptoms.

"We made the decision instantly," Herman said. The drug was given to her, but she also started having seizures, and was taken by ambulance to UAMS in Little Rock. She was unconscious, and the situation seemed bleak.

But on Christmas morning, her condition suddenly improved.

"It was a good day because God gave her back to me one more time," he said. "That's one of the best Christmas presents I could have ever had."

“
That’s one
of the best
Christmas
presents I
could have
ever had.
”



Jamie Carter

West Memphis hospital leader says participation in SAVES was an easy decision.

Hospitals leaders across the state are eager to be a part of the Arkansas (AR) SAVES program, and Jamie Carter, CEO of Crittenden Regional Hospital, was no different.

Carter's West Memphis hospital became the 14th hospital to link to the telemedicine stroke program in March 2010.

"It was brought to our attention by UAMS, and after listening to it we were absolutely sold," Carter said. "With the amount of stroke we're seeing in our ER, it's important for us to be able to tap into that resource. It increases our ability to improve the quality of care."

SAVES gives Crittenden Regional 24-7 access to a stroke neurologist, whereas before, the hospital had only limited access to a consulting neurologist.

"We are right next to a metropolitan market in Memphis, so for us to have that here has really increased the value we can bring to the patient and really has provided a better quality of life," Carter said.

His entire medical staff also was excited to begin the program.

"We really had a lot of enthusiasm, and the leadership with the SAVES program at UAMS guided us extremely well," Carter said. "They provided us with the direction and the confidence that we could accomplish this in a short period of time."

“

With the amount of stroke we're seeing in our ER, it's important for us to be able to tap into that resource.

”

McGehee ER Physician Values Connection With SAVES

As an emergency room physician at McGehee-Desha County Hospital, Steve Obama Asemota, M.D., is grateful for its connection to the AR SAVES program.

As with most outlying community hospitals, before SAVES, patients often missed the opportunity to receive the clot-dissolving drug tissue plasminogen activator (t-PA) simply because there was no stroke neurologist available to recommend its use. Patients must receive the drug within four and a half hours, so even

if they got to the local hospital in time, that window usually passed by the time they saw a stroke neurologist.

Since his hospital joined the SAVES program in February 2009, he's seen the program's remarkable results. The hospital has had 12 stroke consults with SAVES – three of them from Asemota.

"In some cases the t-PA has reversed stroke's effects on patients," Asemota said. "It's been quite rewarding for me and the patients."

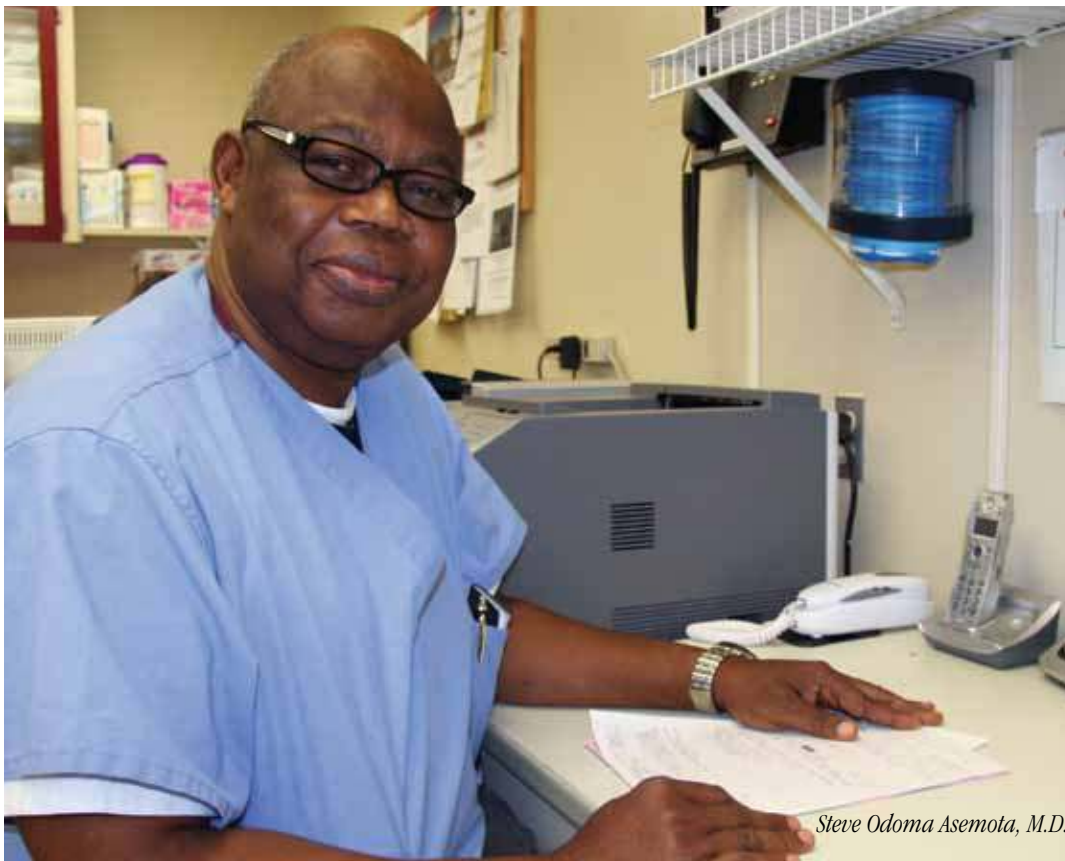
Asemota said many stroke patients arrive at the hospital too late to receive the t-PA,

and he is glad that the SAVES program includes a strong public awareness and education campaign.

"It is very necessary to educate people about the need to come quickly to the hospital," he said.

"Dr. Asemota is a wonderful, caring physician, who always puts the patients first," said John Heard, CEO of McGehee-Desha County Hospital. "His willingness to accept change for the betterment of the community is evident in his use of telemedicine."

“
It’s been
quite
rewarding for
me and the
patients.
”



Steve Odoma Asemota, M.D.

“
It’s affected
my family,
and I want
to make a
difference for
other families
that may be
affected by
stroke.

”



Rick Washam with Lamar High School students.

Educator motivates stroke patients to get help sooner.

Rick Washam was considering retirement as a public school teacher last year when AR SAVES came along.

“The opportunity to become SAVES’ health educator presented itself, and I felt like it was a perfect fit for me,” Washam said. “I could make a difference in Arkansas, just with a different audience.”

Washam, 55, also doesn’t have to look far for inspiration.

“I lost my grandfather to stroke,” he said. “It’s affected my family, and I want to make a difference for other families that may be affected by stroke.”

Washam is on the road a lot, preaching the good news of Arkansas SAVES. As SAVES’ health educator, he is tasked with delivering the program’s good news along with an urgent public plea: Call 9-1-1 as soon as stroke symptoms appear.

When stroke symptoms appear, patients have just 4.5 hours from that point to receive the clot-dissolving

drug tissue plasminogen activator (t-PA).

Washam works with the SAVES team to develop educational and informational materials and has found effective ways to get his message out by piggy backing on other UAMS outreach programs, such as through its eight Area Health Education Centers (AHECs) and eight Centers on Aging. He also works with

each community's existing programs designed to reach its residents to get the word out.

“The ultimate goal is for everybody to work together not just to educate the population but to motivate them to act on that information and get to the hospital just like they would if it were a heart attack,” Washam said.

Washam said one of his most rewarding experiences has been working with about 50 students at Lamar High School's Environmental and Spatial Technology (EAST) Program. The students made the SAVES program its community service project. They created printed materials and video, as well as a cheer, to engage children and adults about the importance of

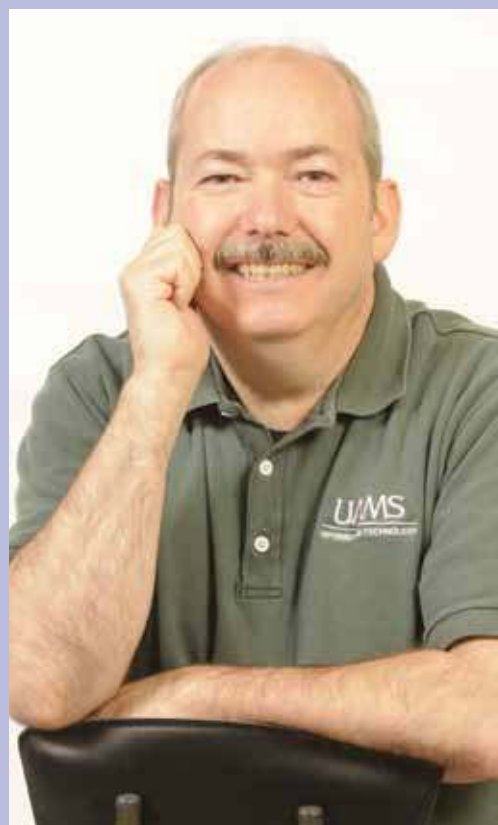
recognizing stroke symptoms and getting to the hospital as quickly as possible.

“When I see kids wanting to make a difference in their community and realizing they can really make a difference, it gives me a great deal of hope for the future of Arkansas,” Washam said.

IT Expert Phillip Martin Explains the Sophisticated System Used in the ARSAVES Program.

IT Video support helps coordinate all broadband connections of the AR SAVES program including the Business Class ISP for Physician's Residence. After installing and configuring Tandberg video units and PC for PACS access from physician's residence, we use the Tandberg Management Suite (TMS) to manage video calls and allow UAMS Call Center to use TMS Scheduler to manage the Stroke Consults. Using remote Management Software to keep the PC at the physician's residence up to date with updates and changes, both Tandberg equipment and PC are monitored to make sure they are online and not down when needed for a live stroke consult.

UAMS has a Virtual PACS Image Repository server for all the AR Saves hospitals to be able to send CT Images directly to UAMS for the Stroke Consult. A VPN connection was created for sites to be able to send UAMS the images securely. A few sites had existing T1 lines to UAMS and these lines were utilized to send the images. All of these processes and tools are now in place to help make the AR Saves program successful in providing fast, responsive care available to stroke patients all over the state of Arkansas.



Team



David Fletcher is the program director for the Center for Distance Health, where he evaluates the efficacy and efficiency of distance health programs by examining UAMS data and Medicaid claims information.

Fletcher joined UAMS in October 2005. Before that, he worked for more than 10 years in financial analysis in the health care industry, including two years at the Walmart corporate office designing and building a third-party billing system for their Vision Centers. He then worked five years for Electronic Data Systems, the fiscal agent for the Arkansas Medicaid program, as a financial analyst examining recipient and expenditure data.

He received a Bachelor of Science in economics and finance and Bachelor of Science in management and marketing from Arkansas Tech University. He earned his M.B.A. from the University of Arkansas at Little Rock.



Salah G. Keyrouz, M.D., is the AR SAVES medical director and spearheaded an effort that led to primary stroke certification of UAMS. He is also working on creating and leading a neurology and neurosurgery intensive care unit service that will tend to the complex needs of such critically ill patients.

Keyrouz joined the UAMS Neurology Department in July 2007. He completed neurology residency training at UAMS, and joined Washington University in St. Louis for a fellowship in neurocritical care. He is a certified neurointensivist and board-certified stroke neurologist.

Keyrouz sits on the Arkansas Acute Stroke Task Force, which evaluates the status of stroke prevention and care in the state, identifies opportunities for improvement and recommends action. He is also a member of the Delta State Stroke Network and a fellow of the American Heart Association.



Julie Hall-Barrow, Ed.D., is the director of education for the Center for Distance Health, where she provides oversight of the educational programs and provides training, communications and resources to networks across the state.

Also, she coordinates pediatric telemedicine activities at Arkansas Children's Hospital and the University of Arkansas for Medical Sciences and is the lead project director for AR SAVES. She received a doctorate in higher education from the University of Arkansas at Little Rock. She has published in peer-reviewed journals in the areas of health promotion, wellness and telemedicine. Hall-Barrow is also a member of the Delta State Stroke Network and the statewide Cardiovascular Committee.



Sami I. Harik, M.D., is a professor of neurology in the UAMS College of Medicine and is one of three on-call neurologists in the AR SAVES program. He received a medical degree from the American University of Beirut, School of Medicine in 1965. He served a residency in neurology at Cornell University College of Medicine, and in pharmacology at Johns Hopkins University.

After postdoctoral training, he served as an assistant professor of medicine and attending neurologist at the American University Medical Center in Beirut, Lebanon, then as assistant professor of neurology and associate professor of neurology at the University of Miami before joining Case Western Reserve University, School of Medicine, in Cleveland, Ohio, as professor of neurology. In 1987, he became vice chairman of the Department of Neurology at Case Western Reserve University.

He joined UAMS in 1991 as chairman of the Department of Neurology, stepping down from that post in June 2010.



Terri Imus, R.N., is the lead outreach nurse for AR SAVES. She is an experienced registered nurse specializing in telemedicine and outreach in distance health. She has 15 years experience in high-risk obstetrics, adult critical care, post-anesthesia care and telemedicine.

Imus educates the public as well as health care providers in basic life support, maternal-fetal monitoring and hands-on training in the use of telemedicine equipment. She also provides community and professional education in the areas of stroke, telemedicine and high-risk obstetrics.

She became a licensed registered nurse in 1988. She is certified in critical care and received a Legal Nurse Consultant diploma in 2001.

Vladimir Karpitskiy, M.D., Ph.D., joined AR SAVES in 2009 as an on-call neurologist. He is board certified in adult neurology, neuromuscular medicine and vascular neurology. He opened a private practice in 2003 in Hot Springs, where he still practices.

Karpitskiy obtained his medical degree and a doctorate at the Crimea Medical School. Before immigrating to the United States, he was a professor of medicine in the USSR. He completed a neurology residency at Washington University Medical School Medical Center in St. Louis in 2003.

Tammy Northcutt, R.N., is assistant manager of the ANGELS Call Center. She is the lead triage nurse for AR SAVES, which entails coordinating the training of the triage nurses to facilitate the telestroke calls, including interactive video, documentation of the consults, and mock calls between the emergency room distant sites, the call center triage nurse and the neurologist. She also collects data of all stroke calls.

Northcutt received her L.P.N. from Baptist Health School of Practical Nursing and earned an associate degree in registered nursing from the University of Arkansas at Little Rock. She is certified by the American Heart Association in CPR and holds a NIH Stroke Scale Certification.

Margaret Tremwell, M.D., is an on-call neurologist with the AR SAVES program. She received her medical degree from the University of Florida, College of Medicine in Gainesville, Fla., where she also completed her residency. She completed a fellowship in cerebrovascular disease and stroke at the University of California, Los Angeles.

Tremwell is board certified in neurology and vascular neurology by the American Board of Psychiatry and Neurology. She is a member of the American Academy of Neurology and the American Medical Association

Professional Presentations

American Telemedicine Association 2010 - 15th Annual International Meeting and Exposition.

One Link Many Lives:

Outcomes of a Rural Telestroke Program

San Antonio, TX; May 15-18, 2010 / Oral Presentation
Julie Hall-Barrow, EdD; Curtis Lowery, MD.; Salah Keyrouz, MD.; Tina Benton, BSN.; Terri Imus, RN, LNC and Rachel Ott, BA

33rd National Rural Health Association Annual Rural Health Conference

Loosening the Stroke Belt:

A Rural State Fights Stroke through Telemedicine

Savannah, GA; May 18, 2010 / Poster
Julie Hall-Barrow, EdD; Curtis Lowery, MD.; Tina Benton, BSN.; Salah Keyrouz, MD; Terri Imus, RN, LNC.; David Fletcher, MD; Laura Rakes, BA; Rachel Ott, BA

International Stroke Conference; 2010 State-of-the-Art Stroke Nursing Symposium.

Nurses Play Integral Role in Telestroke Consultations in a Rural State

San Antonio, TX; February 23-26, 2010 / Oral Presentation
Terri Imus, RN, LNC; Tammy Northcutt, RN; Julie Hall-Barrow EdD



Debra Johnson, R.N., B.S.N., has 15 years experience in the field of neurology. She works closely with the neurology physicians specializing in stroke and with communities outside Little Rock on the AR SAVES project. Johnson follows the patient from the initial call through the three-month review examination. She also works with the nurse facilitators in the rural hospitals to coordinate ongoing training through mock calls and to ensure that all telemedicine units are running smoothly.



Rick Washam, B.S.E., M.A.T., M.Ed., is the health educator for the AR SAVES program. He educates the public on the warning signs of stroke and the need to identify stroke as a medical emergency. Washam facilitates the planning and organizing of AR SAVES stroke health education programs for group and community needs. He develops and maintains cooperation between public, civic, professional and voluntary agencies as well as prepares and disseminates stroke educational and informational materials throughout these communities.

Washam received a Bachelor of Science in education, health education and biology from the University of Central Arkansas, a Master of Arts in teaching from Harding University and a Master of Education from Harding University.



Loretta Williams, R.N., is the assistant outreach nurse for AR SAVES. She has an extensive background in rehabilitation nursing. She provides support to the AR SAVES distant sites through person-to-person visits, interactive video training and continuing education. She collects and reports data to the Center of Distance Health.

Williams received a Diploma of Nursing from Baptist Health School of Nursing, and NIH Stroke Certification from the American Heart Association. She is a participant of the Silent/Clinical Disease Workgroup at the Arkansas Department of Health - Heart Disease and Stroke Prevention Section.



Administrative Staff

Tina Benton, B.S.N., is the program director of the Antenatal & Neonatal Guidelines and Education Learning System (ANGELS) in the Department of Obstetrics and Gynecology at UAMS and the clinical division director and operations manager of the Center for Distance Health.

Benton assisted in the development of ANGELS in 2003 after 12 years as a perinatal outreach nurse in the Department of Obstetrics and Gynecology's Division of Maternal-Fetal Medicine. Benton, along with UAMS' Ann Bynum, accepted the American Telemedicine Association's Innovation Award for the ANGELS program in 2007. The program was also a finalist in the 2007 Innovations in American Government Awards by the Ash Institute for Democratic Governance and Innovation at Harvard University's John F. Kennedy School of Government.

Benton received a Bachelor of Science in nursing at Henderson State University. She has presented posters at several telemedicine-associated meetings in the United States and is a long-standing member of the Association of Women's Health, Obstetric and Neonatal Nurses.

Acknowledgments

Rebecca Pillert – As the project program specialists for AR SAVES, Pillert coordinates AR SAVES hospital contracts as well as credentialing for the program. Pillert is also responsible for administrative communications for AR SAVES partners.

UAMS Center for Distance Health Video Department – The CDH Video team provides all technical assistance for video conferencing equipment and all of the AR SAVES sites and consulting physicians.



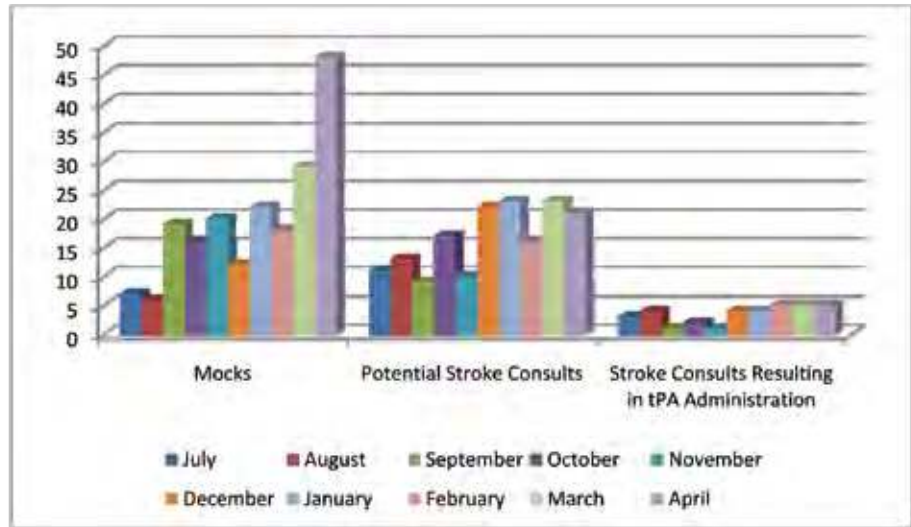
Roy Kitchen, B.S., M.S., is the business administrator for the Center of Distance Health and the deputy administrator for the Department of OB/GYN. He develops and oversees day-to-day administration of the center, training and technical assistance, and programs. He works with grants and assists with negotiations of contracts, including development of new business proposals, affiliation agreements, memorandums of understanding and preparation of cost analysis and financial impact.

Kitchen received a Bachelor of Science in business administration and Master of Science in operations management both from the University of Arkansas, Fayetteville. He joined UAMS in 2002 as administrator in the Division of Cardiovascular Medicine before moving to the Center for Distance Health in 2006

SUCCESS IS IN THE NUMBERS

In an effort to maintain proficiency with the technology and protocols, over the course of the first ten months of state fiscal year 2010, AR SAVES conducted 197 mock stroke calls with 19 different hospitals. Fifteen of these hospitals

engaged in consultations with a neurologist 165 times over this time period. The average age of these patients for whom a stroke was suspected and a consultation was performed was 63 years. Thirty-four of these consultations led to the administration of tPA.



Valuable Spoke Teams



White River Health System



DeWitt Hospital



Baptist Health Medical Center



Arkansas Methodist Medical Center



Washington Regional Medical Center



Ozark Health Medical Center



White County Medical Center



McGehee-Desha County Hospital



Booneville Community Hospital



Mena Regional Health Center



Johnson Regional Medical Center



Baxter Regional Medical Center



Helena Regional Medical Center



Saline Memorial Hospital



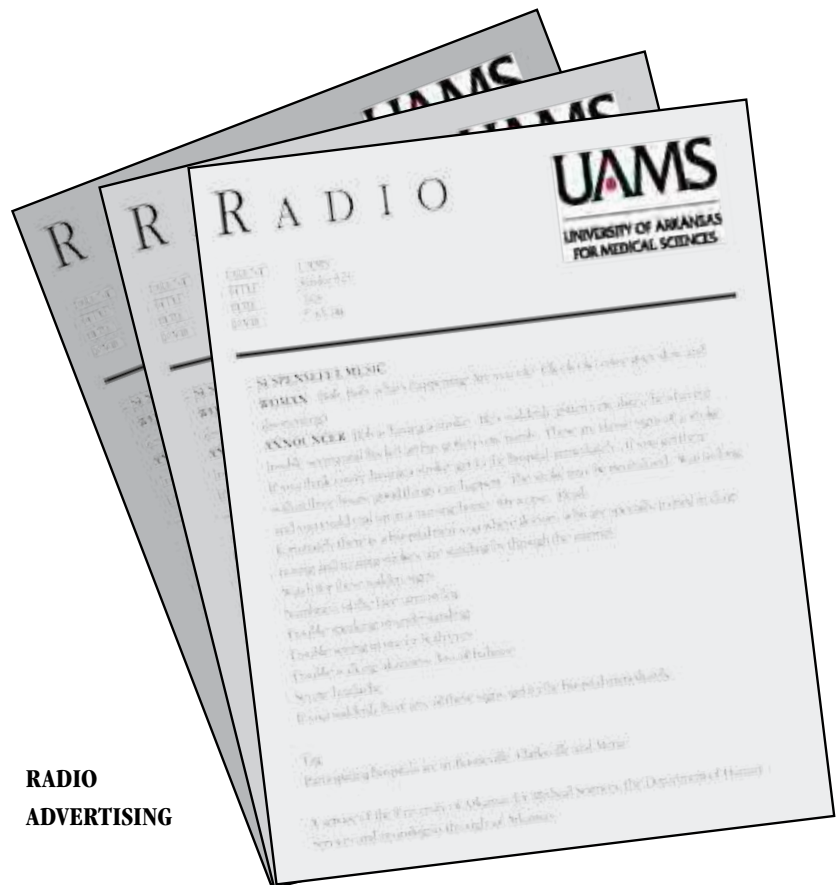
Ashely County Medical Center

Public Awareness

Public awareness continued to be a major part of our program for 2009. Outdoor billboard and radio advertising were used throughout areas in which AR SAVES operates. The media schedule for each area included twelve months of billboards and a three-week radio schedule using sixty-second commercials. Each advertisement featured the local hospital as the source for help. Refrigerator magnets and other awareness-oriented items were produced and distributed at health fairs and other public events in each area. A newspaper ad ran in all markets during May that promoted the ACT FAST idea.



OUTDOOR BILLBOARD ADVERTISING



RADIO ADVERTISING

Since its inception, AR SAVES has been in perpetual change in keeping with the mission of the program, which is to add more hospitals to the network.

Over the past year, this growth brought the number of hospitals in the partnership to 18, scattered throughout the state. Furthermore, two new neurologists and two outreach health educators have joined our ranks, which enabled us to continue dedicated education and training of site nurses and others involved in the program. Nurses at all the sites have shown an unprecedented enthusiasm that allowed the program to flourish. Their role was highlighted in a scientific presentation given at the International Stroke Conference in San Antonio in February 2010.

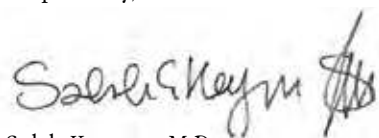
Since the program began Nov. 1, 2008, through March 31, 2010, 201 consults have been performed, with 32 of these receiving the clot-busting drug t-PA. The others didn't qualify either because they arrived beyond the time limit, had a hemorrhagic rather than ischemic stroke, or were diagnosed with other conditions.

In addition, AR SAVES neurologists decided to expand the window for eligibility to receive t-PA from three hours to four and a half hours based on the positive results of a landmark 2008 European study. This factor undoubtedly has permitted the administration of intravenous t-PA to more patients.

The program remains very well received in the community, and it has been embraced by the stroke task force that the state Legislature mandated to research ways to lessen the adverse effects that strokes have on Arkansans. In February, AR SAVES was applauded by the UAMS College of Medicine Founders Society, which donated \$50,000 to the program for research

The future of AR SAVES is busy. The number of interested hospitals keeps growing. Our plans include recruiting more stroke-dedicated neurologists, expanding our hospital networks, continuing to improve logistics, and working on an efficient and quick transport system for patients who could benefit from more aggressive intervention following t-PA. We also will continue educating the public and health care professionals, conducting outcome research, and taking on other scientific questions in the field of telestroke.

Respectfully,

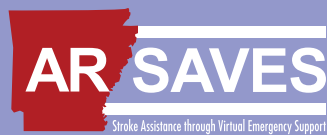


Saleh Kayrouz, M.D.

Medical Director AR SAVES

Assistant Professor of Neurology, College of Medicine,
University of Arkansas for Medical Sciences





www.uams.edu/saves