



# Strong Heart Study Newsletter

Investigating Cardiovascular Disease in American Indians

Volume 28, Issue 1 Winter 2018

## STRONG HEART STUDY

### PHASE VII PROPOSAL

The next phase of the Strong Heart Study is proposed to be funded, with tribal approval, by the National Heart, Lung, and Blood Institute of the National Institutes of Health through contracts with three Field Centers (Arizona, Oklahoma, and North and South Dakota) and one Coordinating Center. Our Coordinating Center proposal includes continuing the Data Center in Oklahoma, the Medstar Health Research Institute Laboratory in Maryland, the Cornell Medical Center Cardiovascular Diagnostic Center in New York, and the Texas Biomedical Research Institute Genetics Center in Texas. The next phase (11/2018 through 11/2026) will fund ongoing follow up of cardiovascular and other health conditions, as approved by tribes, among Strong Heart Study and Strong Heart Family Study participants. It will also provide support for new studies focused on health areas of interest to tribal communities, including heart health, diabetes, nutrition, physical activity, stroke, cancer, disease prevention, environmental health, and other areas. New programs will be funded including community-based pilot projects. There will be a greater emphasis on community education and training in addition to ongoing training of American Indian students, health professionals and researchers. The funding application is due on February 9, 2018. **Thank you for your participation and support of the Strong Heart Study!** Without your commitment this study would not be possible. We look forward to our continued collaboration and work to improve the health of American Indian communities.

#### Phase VII Proposal

- Project period: November 2018 – November 2026
- Ongoing participant follow up and clinical exam
- New, approved, health studies
- Community-based pilot projects
- Training and education: community members and American Indian students and investigators

## WHAT IS A STROKE?

Some people confuse a "stroke" with a heart attack. Both often occur suddenly, and they are caused by pretty much the same thing; but they affect different parts of the body. "Hardening of the arteries" (the medical term is "atherosclerosis") causes calcium and cholesterol and scar tissue to form blockages inside arteries all over the body. If a blockage stops the blood flow in an artery giving oxygen and nutrition to part of the brain, then it causes a stroke, if the artery is feeding a part of the heart muscle, then it becomes a "heart attack". Just like if you tied a string tightly around your finger, the end would turn blue, then black, then dry up and fall off. The same thing happens to tissue inside your brain, except that it just shrivels up and is replaced by scar tissue when it loses its blood supply. The blockage causes what we call an *ischemic* stroke. Another type of stroke, a *hemorrhagic* stroke, occurs when a weakened blood vessel in the brain bursts (causing bleeding in the brain). Hemorrhagic strokes are less common than ischemic strokes.

The effects of an ischemic stroke depend on where the brain blood flow is blocked. The "wires" from the left side of your brain cross over to the right side of your body; and different parts of your brain do different things. So if you lose control of the muscles on the right side of your face, then probably a small area, maybe the size of an olive, on the left side of your brain is without blood flow. There is a special part of the brain where almost all the nerves to the muscles on one side of your body run, and if the stroke occurs there, then a person usually loses control of the whole other side of the body, face, arm and leg. There can be strokes in some parts of the brain that affect our thinking ability or memory, but don't cause clear symptoms, like a limp arm or leg.

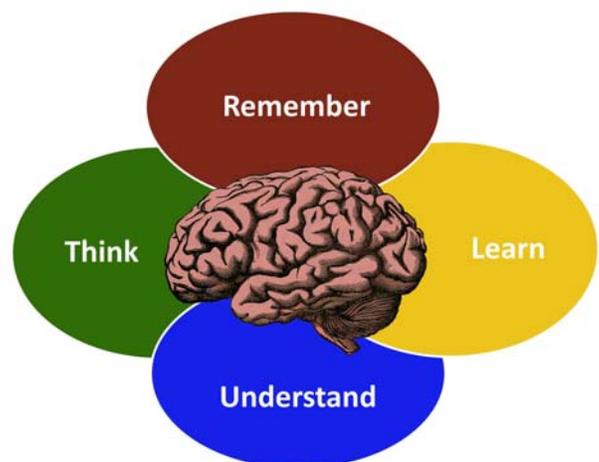
*The SHS investigators recognize that your participation is a gift which is very much appreciated but also recognize that every participant has the right to refuse participation at any time.*

## STRONG HEARTS, STRONG BRAINS, HEALTHY MINDS

The Strong Heart Stroke Study (SHSS) uses the latest methods to examine brain health in American Indian elders. Between 2010 and 2013, SHSS researchers collected new data from more than 1,000 surviving participants in the Strong Heart Study. So far, these new data have resulted in six articles in scientific journals, with more to come in the future. The new findings have a lot to tell us about cognition – the ability to think, learn, understand, and remember – and its relation to the health of the brain.

- **Heart Size and Brain Function:** A study led by Dr. Bernhard Haring benefited greatly from the long-term data collected by the Strong Heart Study. The researchers compared measurements taken about 25 years ago, when participants were in their mid-50's, to measurements collected in 2010-2013, when participants were in their early 70's. Dr. Haring's group found that the mass of the left ventricle (a region of the heart) in middle age was related to the volume of the hippocampus (a region of the brain) and to performance on cognitive tests in later life. Specifically, participants whose left ventricles were larger when they were in their 50's were likely to show shrinkage of the hippocampus and a slight decline in cognitive ability when they reached their 70's.
- **Brain Size and Learning:** Another SHSS article published in 2017 reported the relation between brain health and learning. Led by Dr. Brenna Cholerton, this study found that SHSS participants with smaller hippocampus volume (a region of the brain) had a harder time learning and remembering. Overall shrinkage of the brain – not just the hippocampus – was associated with slower processing of information.
- **Blood Measures and Memory:** Dr. Cholerton's group reported another interesting finding about a specific measure in the blood, the level of the protein epsilon-4 allele of apolipoprotein E (APOE-e4). Among Whites, this protein is associated with brain volume, memory, and risk of Alzheimer's disease. However, the researchers found no similar associations among the Native elders who participated in their study. In a separate study, Dr. Suchy-Dicey studied the relation between brain health and the length of telomeres, a particular type of molecule that occurs in the genes and forms a protective end cap (like the plastic end of a shoestring). Telomere length shortens as people get older and may be an early sign of future memory problems.
- **Brain Injuries:** Dr. Astrid Suchy-Dicey led a study focused on blood pressure and types of vascular brain injuries, like stroke. Her team found that most SHSS participants had high blood pressure, and one-third had the type of brain injuries that were probably caused by damaged blood vessels. These types of injuries are different from the type of injury caused by external trauma, such as a blow to the head from a fall or an accident. Vascular brain injuries are more like a stroke, but can occur without symptoms. Future research will look more into whether these types of brain injuries can result in loss of physical or mental capacity.
- **Environment and Brain Function:** Dr. Clint Carroll studied links between exposure to arsenic in the surrounding environment, including water sources, and measures of learning, memory, problem solving and fine-motor skills (finger tapping). They found that participants with higher arsenic measures in their urine had slower fine-motor functioning and required more time to process information to solve problems.

As Natives live longer, the population of American Indian elders is growing fast. SHSS researchers will continue to study the connections between the brain and elders' abilities to think, learn, understand, and remember. Their findings will help protect brain function and memory and prevent, detect, and treat physical and mental health problems among Native elders. **The overarching goal of this work is to ensure that elder's lives are as joyous and fulfilling as possible.**



## STROKE INFORMATION SHEET



The brain is a complicated part of the body. Many things can affect how well it works. Memory, concentration, and the ability to think clearly can be affected by the aging process, strokes, and diabetes, just to name a few.

In the Strong Heart Stroke Study, we are looking at two main things. First, we are interested in determining the nature of several possible changes in the blood vessels of the brain and how these may influence brain structures. Second, we are investigating whether vascular (blood vessel) changes in the brain correlate with func-

tions such as memory, concentration, and thinking.

We are asking participants in the Strong Heart Stroke Study to have an MRI scan of their brain. We are looking at the structure of the brain using the MRI images. These images of the brain can help us understand brain health. For example, the MRI scan can give us information on stroke and the effects of changes such as high blood pressure on brain health.

We first took brain pictures for participants using an MRI machine during the Strong Heart Stroke Study visit about 5 years ago. The purpose of the new MRI scan is to see if any changes in the structure of the brain have developed since then. We are also going to ask participants to complete tests that assess their memory, concentration, the ability to think clearly, and other brain functions. Some of the same tests were completed during the Strong Heart Stroke Study visit 5 years ago. We will be able to compare the two tests to determine if the brain function has changed over time.

While we are focused on changes in the brain blood vessels and stroke, the study is likely to provide insights into related factors such as diabetes, Alzheimer's disease, smoking, and weight, and how these may be associated with vascular changes in the brain. We may also be able to discover if there are correlations between brain dysfunction and physical activity, weight, and perhaps other factors that may influence the function of the brain.

**Strong Heart Stroke Study participants are an important part of this effort, and we thank you for your participation!**



## STROKE CHANGES EVERYTHING

It is a cold windy day in the Dakotas, leaving the paved roads, dust covers the snow along the 16 miles of gravel road that it takes to reach the rural home of Janice and Al Aberle. We arrive at their ranch and are greeted by Janice who waves us into her welcoming home. Janice, her husband Al and her son Roger are there, Roger is waiting to start cattle chores on this cold December morning. As the coffee is passed around the table, we settle in to visit with Janice about her run-in with a stroke the previous year...

*"I was sitting at the window talking with my son Henry (Robert) and he said, 'Mom are you sitting down, tell me when you are sitting down', I wasn't talking right, I knew something was wrong."*



While keeping her on the phone, Robert called brothers Roger and then Don on another line to come and check on her. The next call was to his physician nephew.

The roads were snowy, so they had to pull the vehicle out with a tractor to get on the road to the local Indian Health Hospital some 65 miles away. Everyone knew something was wrong because when Janice tried to talk it came out all garbled and then she just stopped talking. Roger said that about half way to the hospital he noticed that her left side went limp. There was no school because of the bad weather but in route they got behind a funeral procession so they had to slow down. Once they reached the I.H.S. hospital, Janice was met with testing to determine what kind of stroke was occurring and then because the weather was too bad to fly, she was soon back out on the snow packed roads transferring to the area tertiary health care center 160 miles away by ambulance.

Today, with the support of family, speech, occupational and physical therapy, Janice is home with her husband and sons who live nearby. Life has never been more precious to this amazing woman of faith and determination. Already a close-knit family, Janice's stroke has brought them to a new normal. The caregiver has become the care receiver. Each member of this family has brought their strength to this event, but it has not been without recognizing that the sentinels have changed. As Robert noted, "the notion that I don't have to wear the pants because my elders will do it, is no longer true".

More than 370 individuals participated in Phase I of the Dakota Strong Heart Stroke Study 4-5 years ago and today, many of them who are able to are still committed to participating in the second phase of this very important study. People here understand that they have been the beneficiary of many of the studies that have been done across the nation, but the need for continued research for American Indian people is critically important for improving health. Janice and her family believe that health will improve for their community because of the work that is being done with studies like the Strong Heart Stroke Study.



Janice and Al Aberle

American Indian health research is vital. Most people don't know that the incidence of stroke in American Indian people is nearly double that of folks in main stream America. Studies such as this along with ongoing education about signs and symptoms of stroke and knowing stroke risk factors will continue to make a difference in people's lives. Health is never more personal than when it knocks at your door. After 28 years of participation in the Strong Heart Study, Janice continues her commitment to help improve health outcomes in her community.

*By Marcia O'Leary, R.N.  
Manager, Missouri Breaks Industries Research, Inc.  
Dakota Center Field Manager*

## STUDYING STROKE IS PERSONAL FOR ME



*Cynthia West's family with the First Chief and Second Chief of the Wyandotte Nation of Oklahoma (left to right): 2nd Chief Norman Hildebrand, Jr; Shirley Barber (mother); Emma West (daughter); Elizabeth Ivins (sister); Pam Goux (sister); Kellie Ivins (niece); Cynthia West; Chief Billy Friend*

I am Cynthia West, Field Manager and member of the Strong Heart Team in Arizona. I am proud to be working towards a better understanding and potential improvements in the detection and treatment of stroke in the American Indian population. But it's so much more personal than that for me. My mother, my sister and my husband have all had strokes.

My sister who is a nurse was only 39 years old when she experienced an ischemic stroke; a blood clot blocked an artery that supplied blood to her brain and she immediately had the classic symptoms of slurred speech and weakness on one side of her face and body. She was rushed to the hospital and began the long process of rehabilitation and treatment. She is now an expert on blood thinners and bruise avoidance...and fortunately, it is nearly impossible to tell that she had a stroke. Still, the anxiety of the next stroke is always there.

My husband, Greg, had a stroke in the fall of 2016 when he was 62 years old. I had come home from work to find

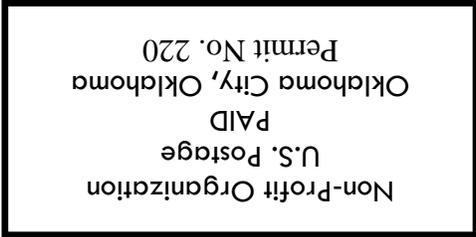
him shuffling around in circles in his studio. When I asked him what he was doing, he said that his left leg was acting strange and showed me with a slow circle how it was dragging behind. I immediately (and I mean immediately) got him in the car and to the Emergency Room where they quickly diagnosed his condition as an ischemic stroke. During that intake, other symptoms such as slurred speech and balance issues emerged. To recover from this stroke, Greg underwent occupational, speech and physical therapy for the next several months. His voice has changed permanently, but his balance is much better and he has full use of his left leg. The impact on his memory is up for grabs – he seems to remember what he really wants to and quickly forgets whatever I tell him.

Then, in October 2017, my 77 year old mother experienced a severe stroke. We had seen evidence of prior silent strokes from MRI images that were taken to help explain memory and speech issues she had developed at times over the last decade. This, however, was different. When this stroke came, my mother could only speak gibberish and she couldn't understand what we were saying. Her face drooped on one side and there was weakness on that same side. Fortunately, she was with my father at a doctor appointment just across the street from the hospital when it struck. Rushed to the Emergency Room, the physician was able to identify that this was an acute ischemic stroke and that we were within the time window that allowed them to administer a new drug only for ischemic (blood clot) stroke that has to be given within a 3-4 hour time range of the onset. She ended up sedated and intubated and we had to wait several days to see if she made it through with her mind intact. When she spoke for the first time after they woke her and removed the breathing tube, we were elated; however, it was clear she was a long way from 'normal'. After three weeks of inpatient neuro-rehabilitation, my mother continues with outpatient therapy for her balance, speech and memory. We are so grateful she is with us, but we've had a look at the future and it's getting more frightening.

My family is just one more example that American Indians experience a higher rate of stroke than the general population. I want answers for myself and for my daughter and her children. I want to know what we can do NOW to improve our odds to avoid stroke - and if we experience a stroke, how to reduce the impact. The Strong Heart Stroke Study and follow-up Strong Heart Stroke Study2 are positive and substantial steps in the process of understanding why the American Indian population experiences higher rates of stroke and potentially, what we can do about it. I'm all in, 100%.

By Cynthia West, Strong Heart Study  
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Wyandotte Nation of Oklahoma





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## REGIONAL UPDATES

### ◇ PHOENIX FIELD OFFICE

In the first *Strong Heart Stroke Study*, the Phoenix Field Office worked with 314 participants from the original *Strong Heart Study*. Generally the participants in this study found the results very helpful and in some cases, life changing. Magnetic Resonance Imaging (MRI) and lab tests were shared with all participants and if they requested, their physicians. We are now recruiting for *Strong Heart Stroke Study 2* which follows up with those participants from the original stroke study. This study will compare the data from four-five years ago to see how aging is affecting our brain function. We are excited to get going and looking forward to visiting our old friends from the first *Strong Heart Stroke Study*. If you participated in the Strong Heart Stroke Study in Arizona or know someone who did, please contact the Phoenix Field Office at **(602) 277-0488** and we can tell you about how to participate in this next phase.

### ◇ OKLAHOMA FIELD OFFICE

The *Strong Heart Stroke Study* (SHSS) recently started its second phase (SHSS 2). The first phase (SHSS 1) was conducted between 2010 and 2013 and was well received by the *Strong Heart Study* (SHS) participating communities in Oklahoma. Three hundred forty six Oklahoma SHS participants were enrolled in SHSS 1, and, thus far, 53 participants have been enrolled in SHSS 2. The study researchers are grateful for the support of community members and leaders that helped make SHSS 1 very successful, and that same level of support is being demonstrated in SHSS 2. Most tests and procedures that participants underwent in the phase 1 exam are being repeated in the phase 2 exam. These tests include Magnetic Resonance Imaging (MRI) of the brain (this test is being done at Comanche County Memorial Hospital in Lawton), physical function, blood pressure, lab tests, and tests to assess brain functions such as memory. A few new tests have been added in the phase 2 examination that assess attention and concentration, memory, language, conceptual thinking, and orientation. SHSS 2 can only enroll individuals who participated in SHSS 1. It takes about 4 hours to complete the full SHSS 2 exam, and it can be completed in one or two visits. To participate in SHSS 2, please contact our study staff at **(580) 353-1163**. Our staff will ask you some questions to verify your eligibility.

### ◇ DAKOTAS FIELD OFFICE

More than 370 individuals participated in Phase I of the Dakota *Strong Heart Stroke Study* 4-5 years ago and today, many of them who are able to are still committed to participating in the second phase of this very important study. As in Phase I, participants in Phase 2 are being provided with the results of their brain MRI, lab tests, and results of the physical exam. Participants are notified of abnormal results and are advised by the study staff to follow-up with their healthcare providers. If you participated in the Strong Heart Stroke Study in the Dakotas or know someone who did, please contact the Dakotas Field Office at **(605) 964-1260** and we can tell you about how to participate in this next phase.