

LEADERSHIP

Curtis L. Lowery, M.D.
ANGELS Medical Director



When ANGELS began in 2002, the mission was daunting: address the overwhelming needs of high-risk obstetric patients in Arkansas to diminish disparities, improve outcomes and save health care dollars.

Yet the collaboration that developed between Arkansas Medicaid, UAMS and rural obstetricians has witnessed amazing successes. Utilizing innovation, creativity, education, and improved communication and cooperation to decrease morbidity and mortality for mothers and their newborns, ANGELS continues to deliver.

With Arkansas being a rural state and having historically some of the worst perinatal outcomes in the country, it was difficult to deliver specialist care to the mothers and newborns who needed it most. But ANGELS has brought the specialist care out to the rural areas through telemedicine, a vital component of the multi-faceted program.

This report highlights some of the program expansion that was accomplished in 2009, as well as existing services. For instance, with the help of a \$1.5 million federal grant, we were able to install interactive video equipment in nine more rural hospitals to give them access to obstetricians and neonatologists at UAMS and Arkansas Children's Hospital.

I am not only proud of but amazed by the success of ANGELS. I am humbled by the support that continues year after year for this vital program. We are revolutionizing health care and those who benefit are Arkansans.

Respectfully,

A handwritten signature in black ink, which appears to read "Curtis L. Lowery, M.D." The signature is written in a cursive, flowing style.

OVERVIEW

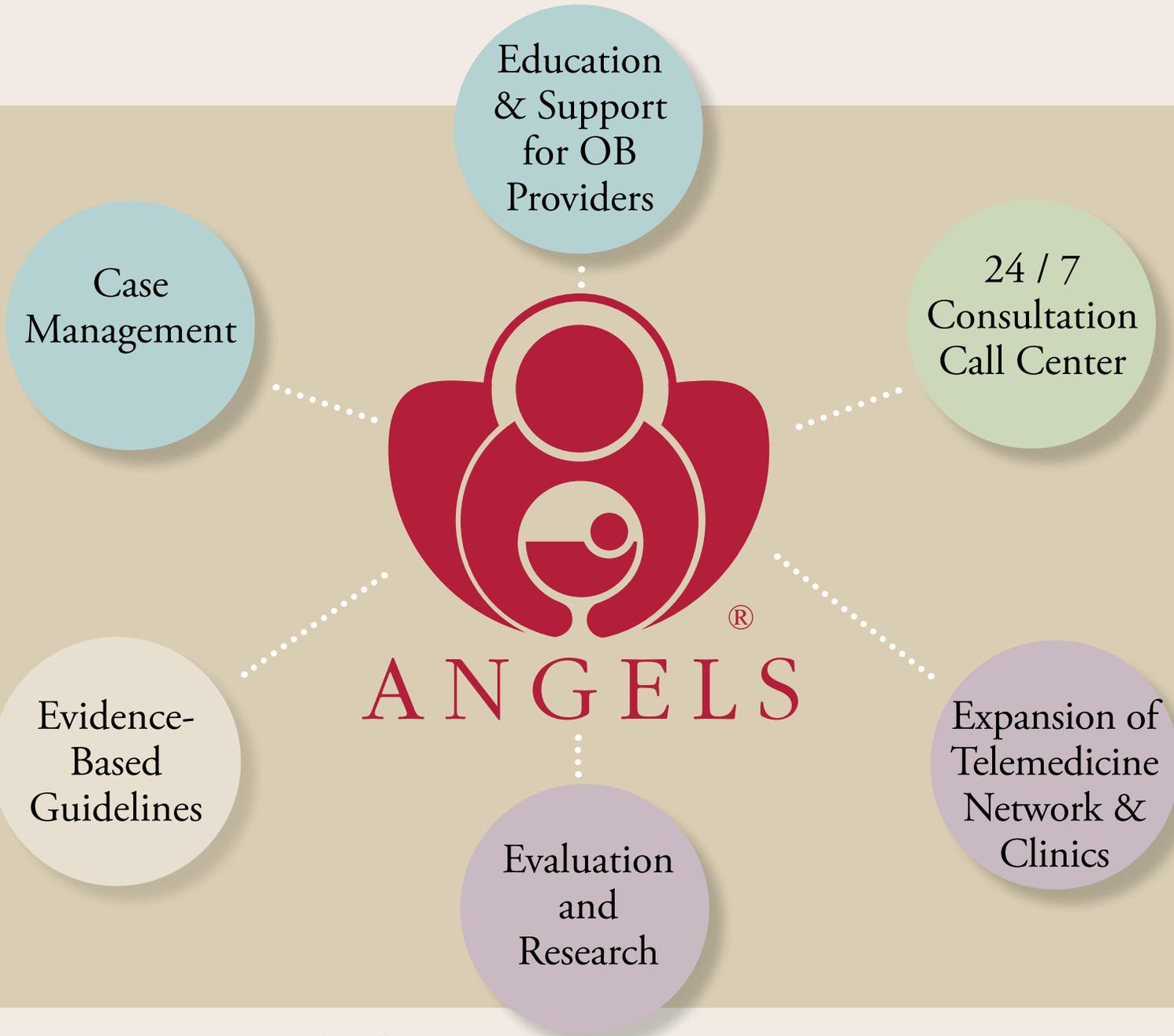


The ANGELS mission is to ensure that every woman in Arkansas at risk of having a complicated pregnancy receives the best possible perinatal care.

In its eighth year, ANGELS continues to uphold its mission of providing excellent perinatal care for all high-risk women. The program is providing success year after year with the help of specialists and sub-specialists, a dedicated and compassionate team, telemedicine and other innovations and regionalization of care. The program still functions under the six-pronged model developed in 2002.

The program is the first of its kind to link three state agencies to serve a common purpose in statewide management of high-risk obstetrical patients, targeting the impoverished, the unhealthy and those at risk of having premature and low-birth-weight babies.





Education
& Support
for OB
Providers

24 / 7
Consultation
Call Center

Expansion of
Telemedicine
Network &
Clinics

Evaluation
and
Research

Evidence-
Based
Guidelines

Case
Management

Curtis Lowery, M.D.,
ANGELS Medical Director
Tina L. Benton, R.N.,
ANGELS Program Director
Judith McGhee, M.D., M.P.H.,
Medical Director, Division of Medical Services AR DHS

Marilyn Strickland,
Assistant Director, Division of Medical Services AR DHS
Roy Kitchen, M.B.A.,
ANGELS Business Administrator

EDUCATION & SUPPORT for OB Providers



ANGELS Web Site for Teleconferences & Guidelines

2009 Quick Facts - ANGELS Web site

422 new Web page registrants include 140 physicians, 128 nurses, 41 advanced practice nurses, and 18 health care administrators

1,713 registrants to access guidelines and teleconferences

22,224 page views for the ANGELS Web site

Guideline & Teleconference Registrants hail from
45 States

New states added in 2009:

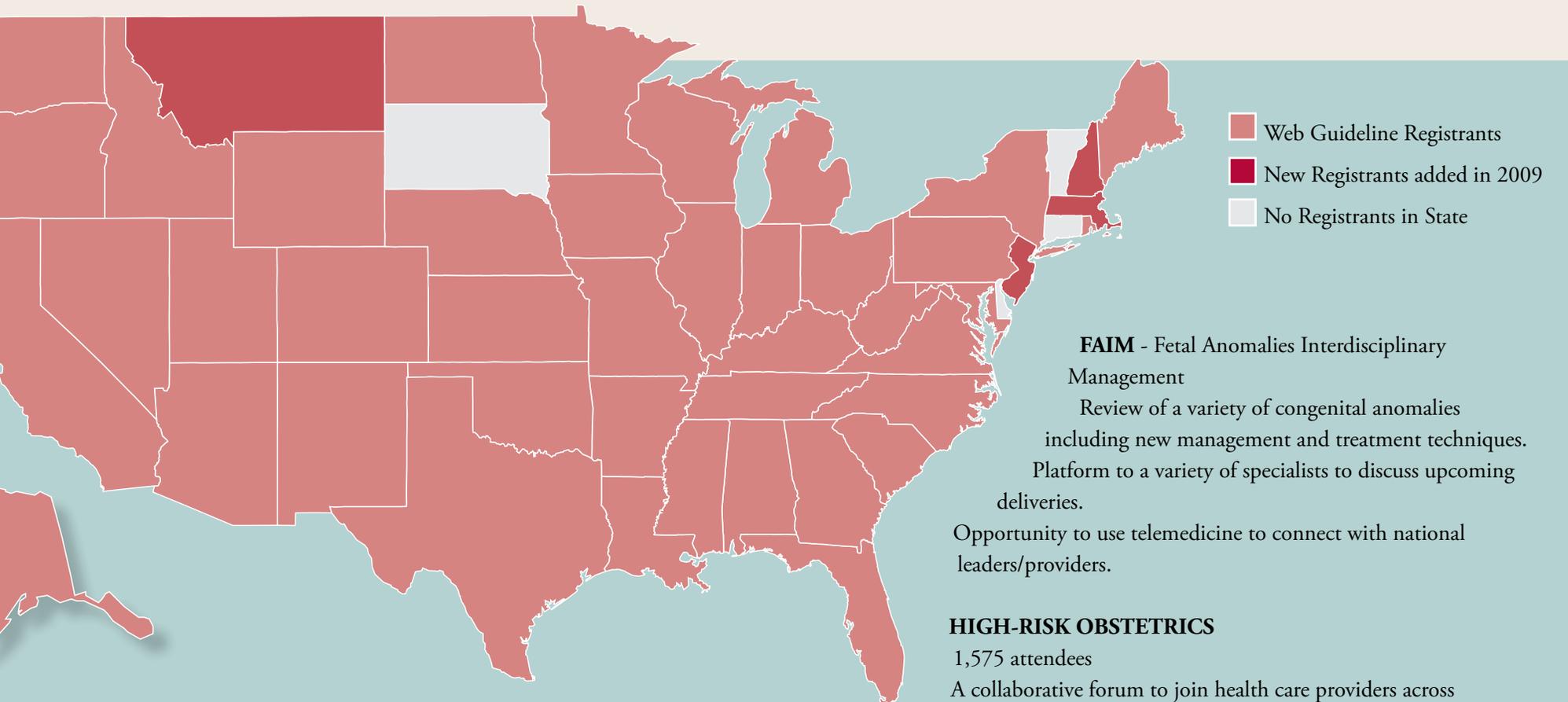
Massachusetts

Montana

New Hampshire

New Jersey





Regularly Scheduled ANGELS Teleconferences

OB-Gyn Grand Rounds

- Provides physicians and other medical professionals the opportunity to present clinical and research topics relating to OB/GYN and women's primary health care.
- UAMS specialists as well as national medicine leaders serve as presenters

FAIM - Fetal Anomalies Interdisciplinary Management

Review of a variety of congenital anomalies including new management and treatment techniques. Platform to a variety of specialists to discuss upcoming deliveries.

Opportunity to use telemedicine to connect with national leaders/providers.

HIGH-RISK OBSTETRICS

1,575 attendees

A collaborative forum to join health care providers across Arkansas to develop best practice guidelines for selected conditions.

Lively and informative discussions of case studies presented by statewide obstetrical and family practitioners.

The teleconference has grown beyond Arkansas borders to include discussions with physicians from other universities in the United States and around the world.

Sarah Rhoads, D.N.P., A.P.N.

Tesa Ivey, R.N.c.

Stephanie Wyatt, A.P.N.

Barbara Smith, R.N., C.P.C.

Gordon Low, A.P.N.

www.uams.edu/angels

ONE Team Teleconference - Obstetrical – Neonatal Exchange for Nurses

- An interactive exchange of information for nurses by nurses.
- A forum to discuss best practices and communicate the standards for patient care with colleagues across Arkansas.

Schedule of Regular ANGELS Teleconferences

*High-Risk Obstetrics Teleconference

Weekly on Thursdays, 7 – 8 a.m.

*OB-Gyn Grand Rounds

Weekly on Wednesdays, 7 – 8 a.m.

*FAIM (Fetal Anomaly Interdisciplinary Management Teleconference)

Monthly on the fourth Friday, 7:30 – 8:30 a.m.

**ONE Team (for Nurses)

Obstetrical Exchange – First Friday, noon – 1 p.m.

Neonatal Exchange – Second Friday, noon – 1 p.m.

*CME credit can be earned

**Nursing continuing education credit can be earned

Special Educational Courses

ANGELS partnered with the UAMS Rural Hospital Program and UAMS Medical Center staff education to provide a two-day *Inpatient Obstetrical Nursing Review Course* in 2009. This partnership provided resources for UAMS nurses and used technology to reach nurses in rural areas via interactive video. Eight certified nurse instructors taught the course, and the course will be taught annually. Additional courses were provided for UAMS and rural Arkansas nurses by ANGELS and the Rural Hospital Program at the request of the nursing community.

Quarterly simulation exercises throughout 2009 for obstetric emergencies provided multidisciplinary interaction for nurses and physicians. Drills related to shoulder dystocia and breech delivery were conducted. This provides an excellent venue for obstetrical providers to discuss emergent situations and use it as a learning experience.

Annual Conference on Perinatal Care

ANGELS experienced continued success in 2009 with the 25th Annual Conference on Perinatal Care. The annual event, titled *Continuous Quality Initiatives: Pathways to Excellence in Obstetrics and Neonatology* highlighted the importance of continuous quality improvement (CQI) in the fields of obstetrics and neonatology. This timely topic impacts health care workers

“Good program with practical, useful information”

throughout medicine and nursing, insurance companies and hospitals, among others. Although the concept of CQI is easy to overlook, it is crucial for health care providers to embrace, and this conference is certain to deepen attendees’ appreciation for this topic. New to the conference was a demonstration utilizing a multi-disciplinary simulation manikin to illustrate effective management of two obstetrical emergencies. Attendees who enjoyed the conference included maternal-fetal medicine specialists, obstetricians, neonatologists, psychiatrists, family practitioners, pharmacists, advanced practice and other nurses, sonographers, social workers and many more. Comments included:

- “Good program with practical, useful information.”
- “This was an excellent conference. Great facility. Thank you for the hard work that went into making this conference happen.”
- “I enjoyed the speakers, very educational.”

Support for ADH: ANGELS-Health Department Connection

During 2009, UAMS ANGELS and the Arkansas Department of Health continued to expand on existing collaborations as well as to find exciting new ways to provide high-risk prenatal and gynecological care to the state’s most vulnerable women. The following provide on-going support for rural advanced practice nurses:

1. **REGIONAL TELEMEDICINE:** Our regional site at the Hempstead County Health Unit continued to provide high-risk obstetrical consults for Health Department patients in the southwest region of the state.
2. **IN-CLINIC TELEMEDICINE:** Expanding on the concept of reducing patient travel burden and keeping care close to home, ANGELS and the Health Department established telemedicine connections with five local health units to provide high-risk obstetrical consults in the patient’s own community or region.
3. **APN TELEPHONE CONSULT LINE:** To further facilitate connection when telemedicine consults are not possible or practical, ANGELS continued to provide telephone back-up to Health Department nurse practitioners who provide routine prenatal care at the health units.
4. **TELECOLPOSCOPY:** Rewarded for a successful demonstration project at the Hempstead County health unit, ANGELS received a \$750,000, three-year HRSA grant to establish three telecolposcopy sites at the Health Department’s health units in Clarksville, Wynne and Hope. This collaboration will provide follow up for Health Department patients with abnormal pap smears.

CONSULTATION CALL CENTER



24/7 Consultation Call Center

118,527 patient or physician consultation calls in 2009

ANGELS Call Center has taken traditional telephone triage to another level through interactive video (IAV), allowing nurses to assess patients both audibly and visually. This infusion of video has enabled the ANGELS Call Center to create a comprehensive, on-the-spot telemedicine experience. The ANGELS Call Center uses IAV paired with a 24/7 RN-staffed call center to comprehensively triage and direct care for inpatients and outpatients. As ANGELS grows, the supporting call center must adapt to offer new services to a growing range of telemedicine patients across all medical disciplines.

Services offered by ANGELS Consultation Center

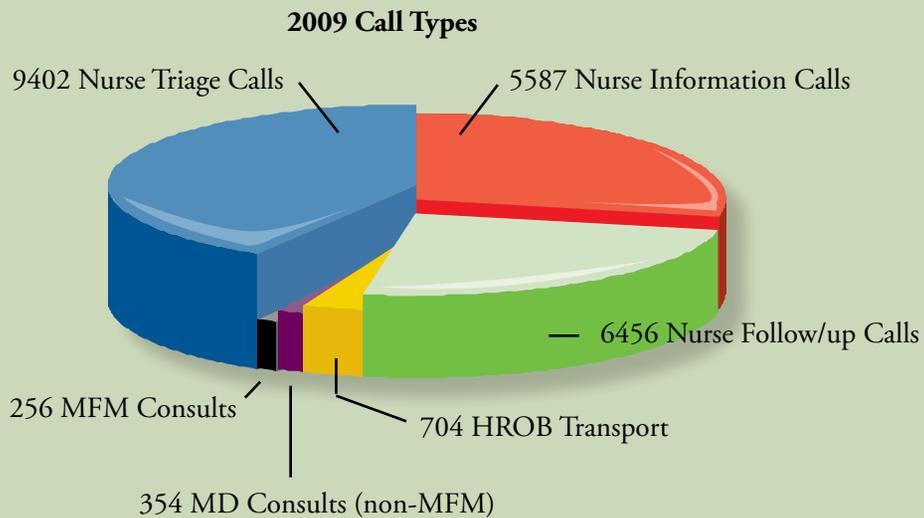
- Telephone consults with maternal-fetal medicine faculty, OB faculty or a chief resident
- Telephone consults with ANGELS Advanced Practice Nurse (APN to APN)
- Facilitate OB transport arrangements beginning with physician and hospital acceptance, through nurse-to-nurse report, including transportation assistance if needed
- Telephone triage for UAMS OB/GYN patients
- Follow-up calls to OB patients after discharge from the hospital



Donna Williams, R.N.
ANGELS Call Center Manager

Lee Kitchen
Spanish Interpreter

Viola Jaramillo
Spanish Interpreter



Services offered by ANGELS Appointment Center

105,499 appointment calls in 2009

- Make all appointments for UAMS OB-GYN services and ANGELS appointments
- Appointments include provider referrals or self-referrals for consultation, care, genetics and telemedicine

Spanish Translation

In answer to the rapid growth of Spanish-speaking patients in Arkansas, Spanish translation has been available for OB patients through ANGELS. In 2009,

1153 calls were translated as well as
370 telemedicine visits.

Services are offered for patients in ANGELS:

- Telemedicine clinics
- Face-to-face clinics
- Diabetic clinics
- UAMS Reproductive Genetics Clinic
- ANGELS 24/7 Consultation Call Center

EXPANSION of Telemedicine Network & Clinics



Telemedicine continues to make great contributions in maternal-fetal health care. ANGELS along with our Arkansas community health providers are faithfully making a difference. In 2009, we had the pleasure of providing 2,095 consults.

Diabetic telemedicine consults were conducted for OB patients with co-management and care recommendations for mothers with type I, type II and gestational diabetes. These diabetic exclusive consults are provided by ANGELS at UAMS' AHEC Northwest in Fayetteville and AHEC Southwest in Texarkana. Fetal echocardiography telemedicine consults debuted in 2009 at many ANGELS sites with expansion plans in progress.

High-risk obstetric telemedicine consults provide co-management and care recommendations for pregnancies complicated by a variety of medical conditions such as chronic hypertension, coagulation disorders and thyroid dysfunction. Although a high-risk consult may be obtained at any ANGELS site, they are a major focus at the AHEC Northeast in Jonesboro, and health departments in Hempstead, Sebastian and Sevier counties.

Maternal-Fetal Medicine telemedicine consults for targeted ultrasound, management recommendations and genetics counseling are provided throughout the state. ANGELS is holding true to ensuring that every woman in Arkansas at risk of having a complicated pregnancy receives the best possible perinatal care regardless of where they live.

Upcoming telemedicine sites for 2010 include:

El Dorado (AHEC), Arkansas

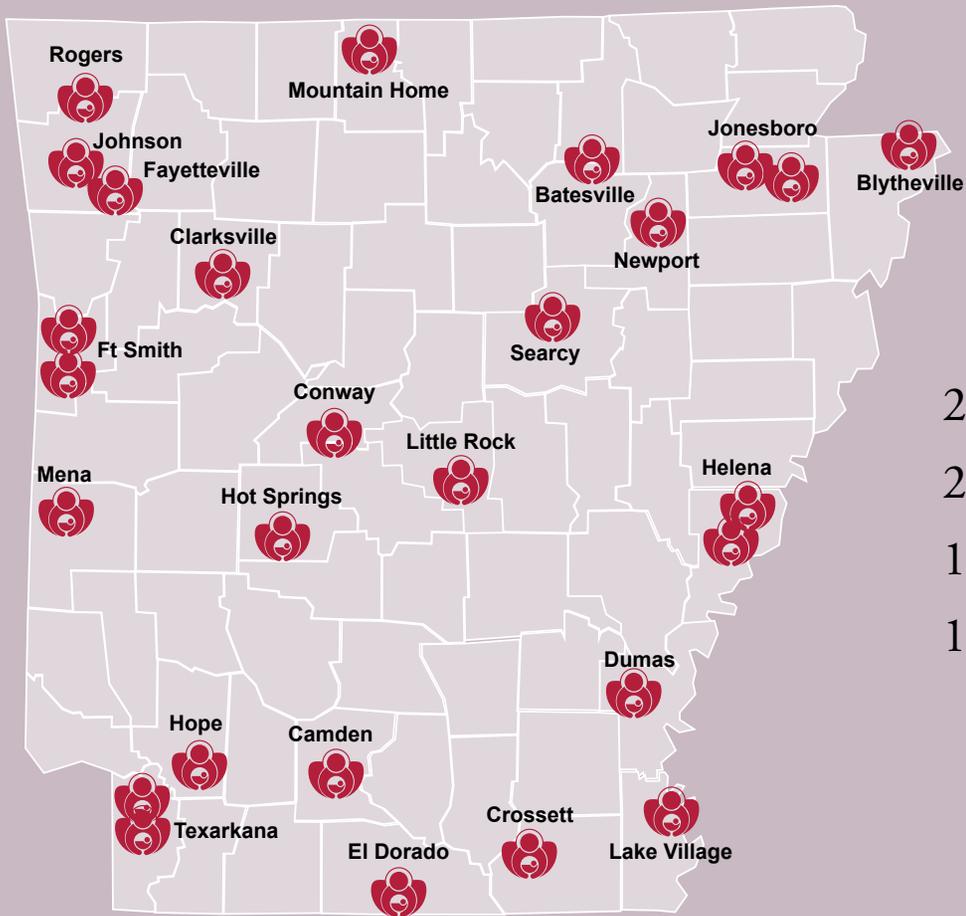
Pine Bluff (AHEC), Arkansas

As ANGELS telemedicine grows, so does our telemedicine family. Our 2009 additions are: Lisa Cain, R.D.M.S.; Lori Heil, R.D.C.S.; Lynn Tate, R.D.M.S. and Stacie Ford, R.N.

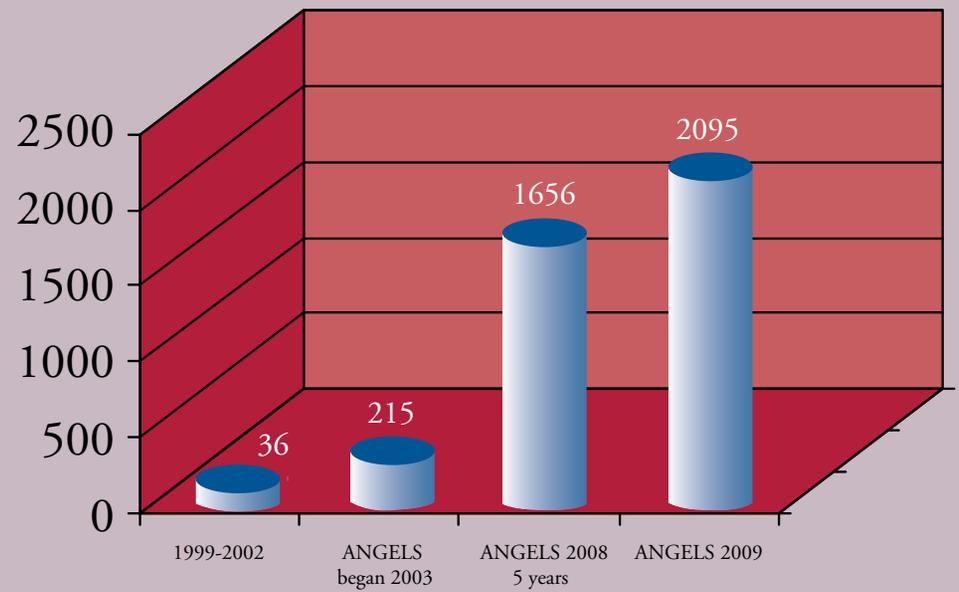


Rosalyn Perkins, A.P.N.
Stacie Ford, R.N.
Lori Heil, R.D.M.S.
Mandi Dixon, R.D.M.S.

ANGELS Telehealth Sites 2009



ANGELS Telemedicine Overview





Giving ANGELS *its Wings*

Delivering specialty medical care through real-time audio/video and data connections to locations across the state has become a cornerstone of the ANGELS program's commitment to improving health care access.

ANGELS may not have coined the term "telemedicine" but the program has used technology to allow community physicians and pregnant patients to consult maternal-fetal specialists at any time of the day or night without leaving their hometown. The technology helped the program earn national recognition in 2007 from the American Telemedicine Association.

"Technology is very important to our program because it's how we see patients statewide," said Rosalyn Perkins, an

Bottom row, left to right:
Stephanie Tackett, Phillip Martin, Debbie Weaver

Upper row, left to right:
Eric McKenney, Dustin Vance, Buddy Presley, Richard McBain



“Technology is very important to our program because it’s how we see patients statewide”

advanced practice nurse and ANGELS telemedicine manager for clinical services. “Since UAMS has the only maternal-fetal specialists in the state, our telemedicine technology extends their reach to allow care for more patients.”

From the Area Health Education Center (AHEC) in Texarkana or a clinic in northeast Arkansas, the ANGELS information technology (IT) team maintains 430 “end points” around the state and even into Oklahoma and Texas. These end points are connections for interactive video that allow for patients to be seen by UAMS specialists, including real-time view of ultrasound images and heart monitoring.

The connections allow for regular teleconferences with community health care professionals for case reviews or continuing education. They allow for specialists to accompany local physicians in a virtual sense on their patient rounds each week.

The end points are in hospitals, clinics, schools, the network of UAMS AHECs, prisons and other locations.

In the ANGELS Call Center, nurses answer calls at all hours of the day and night. With the addition of interactive video in recent years, the nurses are able to assess patients visually as well. This can be critical for other programs under the ANGELS telemedicine umbrella such as the Arkansas SAVES stroke program.

“The addition of video allowed the ANGELS Call Center to offer a comprehensive telemedicine experience,” said Donna Williams, R.N., manager of the ANGELS Call Center. “Our IT team does a good job, understanding that minutes count when establishing a connection with a patient for treatment of a possible stroke or arranging transportation to

UAMS of a high-risk pregnancy or a newborn.”

IT support includes maintaining the database housing the software used in patient assessment, Williams said. “Every call we get is entered into the database and we use the system to guide us toward treatment,” she said.

Eric McKenney, a manager for video conferencing in IT, said a team of seven is charged with monitoring the data and video connections on a day-to-day basis. The team handles equipment installation all over the state, video conference scheduling and troubleshooting.

“It’s challenging work sometimes, when we are dealing with different types of old and new pieces of hardware,” McKenney said. “But it’s also enjoyable work and we are proud to help ANGELS with the work they are doing because through technology there are no borders in health care.”

Technology changes quickly and Perkins, with seven years in the ANGELS program, has seen many improvements. The connection capacity has grown to allow more than 150 people to be in a conference at one time. McKenney noted that the hardware allows the controllers to switch between different physicians and protect patient privacy while maintaining multiple connections.

Video quality has improved from roughly the equivalent of TV reception using an antenna to high-definition digital resolution. The ability to get ultrasound images in real time was boosted recently with technology to allow real-time connections to fetal heart monitors, noted Perkins.

“IT has given us improved connections and more capabilities that allow us to better serve our patients and community health care providers,” Perkins said.



UAMS Expands Access to Cervical Cancer Testing in Arkansas

More low-income Arkansas women now have access to needed cervical cancer tests thanks to an innovative research project and communications technology that links doctors at UAMS to state health clinics at Clarksville, Hope and Wynne.

The cervical colposcopies and biopsies became available in January 2010 and will help an estimated 4,500 women over three years who would have had difficulty – due to travel distance and cost – accessing this potentially life-saving medical service.

The telemedicine program works through the use of two-way, high-definition interactive video, which enables an obstetrician/gynecologist at UAMS in Little Rock to oversee the exams and biopsies administered by an advanced practice nurse at the remote clinics.

The \$735,000 grant from the federal Health Resources and Services Administration and its Office for the Advancement of Telehealth allows UAMS to expand its research into the use of telemedicine for colposcopies and biopsies. UAMS began its research with a smaller pilot study at the clinic in Hope.

Called Arkansas START (System To Access Rural Telecolposcopy), the program is funded through the UAMS ANGELS program. Chuck Hitt, M.D., chief of the UAMS Division of General Obstetrics and Gynecology, is the lead researcher on the grant. Gordon Low, an advanced practice nurse, is program manager for the three-year grant.

“It is a real Catch-22 for many Arkansas women, but thanks to this grant we are better able to provide the bridge they need to get from Pap smear to cancer treatment,” Low said.

Evidence-Based Guidelines

GUIDELINES

Over **150** ANGELS obstetrical, neonatal and pediatric guidelines are now available. Guidelines are reviewed annually for the most current and best practices.

Guidelines developed in 2009 include:

- Obstetrical
 - Umbilical Cord Prolapse
 - Breech Delivery & External Cephalic Version
 - Dermatologic Conditions associated with Pregnancy
 - Parameters for Routine Pregnancy
 - Dermatologic Conditions associated with Pregnancy
 - Influenza during Pregnancy (Novel Influenza A –H1N1-Virus)
- Neonatal & Pediatric
 - Late Premature Newborn
 - Regionalization of Neonatal Care
 - Approach to Altered Consciousness
 - Evaluation and Treatment of a Child with Apparent Febrile Seizures

The ANGELS guideline titled “*Eating Disorders during Pregnancy and Postpartum*” was accepted by The National Guideline Clearinghouse in August 2009. It is available at www.guideline.gov. It was a collaboration by obstetricians, maternal-fetal medicine specialists, psychiatrists, and internal medicine specialists and was reviewed by a national expert on the topic. The guideline was developed by Linda L.M. Worley, M.D., with Samantha McKelvey, M.D., Sara Tariq, M.D., Curtis Lowery, M.D., all with UAMS; and Joel Yager, M.D., with the University of New Mexico. For this guideline and others, visit <http://www.uams.edu/angels/guidelines.asp>.

<http://www.uams.edu/angels/guidelines.asp>



Barbara Smith, R.N., C.P.C.

CASE MANAGEMENT



Arkansas Reproductive Genetics Program

Significant changes in staff and leadership occurred in this program. Three certified genetics counselors and one RN saw more than 2,100 patients in the UAMS Genetics Clinic in 2009. Additionally, an ANGELS program advanced practice nurse took on the role of administrator. This team, along with maternal-fetal medicine specialists and sonographers, was able to provide genetics counseling, targeted ultrasounds, amniocentesis, CVS (placenta biopsy), and/or fetal echocardiograms. About 10 percent of those patients/families received an abnormal prenatal diagnosis that required detailed case management.

Following Baby Back Home

This program provides home visiting for medically complex infants after discharge from the NICU. This project is under the leadership of UAMS KIDS FIRST director Patrick H. Casey, M.D. The goals are to decrease hospital readmissions due to preventable health complications, assist patients with adherence to medical appointments, and remind parents of immunization

Genetics Team



Shannon Barringer, M.S., C.G.C.
ANGELS Program Manager

Mindy Simonson, M.S.

Kate Zellmer, M.S.

LaJuana Whyte, R.N.



Curtis L. Lowery, M.D.
E. "Pat" Magann, M.D.
Nafisa Dajani, M.D.
Paul Wendel, M.D.

Maternal-Fetal Medicine Team

appointments. Services are offered to families in the northwest, northeast and southern regions of the state. Utilizing registered nurses and case coordinators, the program seeks to educate parents on the health needs of their fragile infant.

Tele-Nursery ANGELS Tele-Nursery Program

This program continued throughout 2009 working in conjunction with the TOUCH Program (featured on page 18). Whit Hall, M.D., UAMS neonatologist, meets interactively from UAMS with 17 sites three days a week. Hall conducts census rounds, works on back transport issues, and holds collaborative discussions on neonatal-related issues. ANGELS works with Angel One dispatch and the ANGELS Call Center to provide video connections with these sites if needed for a consult or if neonatal transportation is warranted.

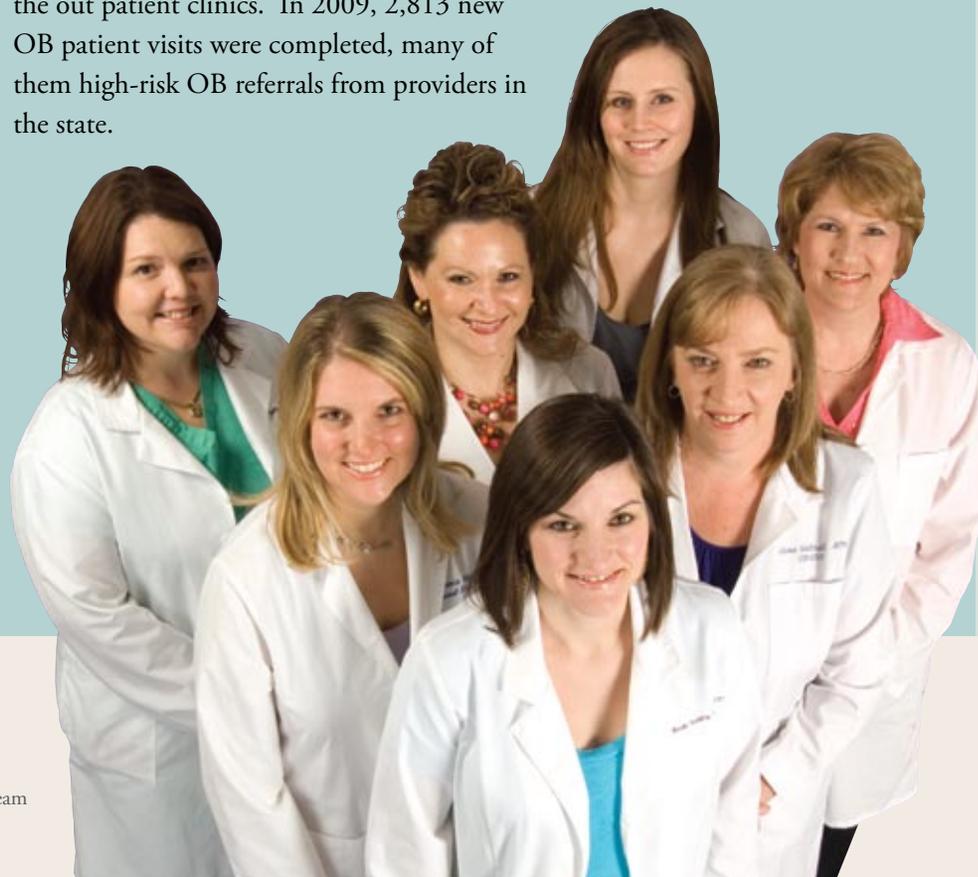
Our APN Team on the front lines

The complex nature and diversity of high-risk obstetrical problems encountered daily requires careful triage of patients who are referred. Nurses are on the front lines to assure that each patient receives the

appropriate type of appointments and services necessary. Finally, these nurses serve as the liaison to the patient, UAMS and referring providers by communicating plans of care with the referring providers.

Outreach nurse Paige Hare, R.N., managed the cases of 1,160 high-risk obstetrical outpatients and 663 high-risk obstetrical inpatients who were referred by providers throughout the state.

Eight advanced practice nurses work alongside physicians and residents to help care for high-risk obstetric patients referred through ANGELS in the out patient clinics. In 2009, 2,813 new OB patient visits were completed, many of them high-risk OB referrals from providers in the state.



Page Hare, R.N.

APN Team

TOUCH



In 2009, the UAMS-based ANGELS program began its latest endeavor using telemedicine to ensure a healthy outcome for pregnant Arkansas women and their newborns.

Called TOUCH (Telemedicine Outreach Utilizing Collaborative Healthcare), the program wrapped up its first year on March 31, 2010, with expectations that it will spur the transformation of labor and delivery and neonatal nursery practices in Arkansas, one of 17 states that lacks a designated system of neonatal care.

TOUCH partners the University of Arkansas for Medical Sciences (UAMS) with Arkansas Children's Hospital (ACH) and nine outlying hospital nurseries and labor and delivery units. The \$1,502,301 grant from the Center for Medicare and Medicaid Services (CMS) will study the cost effectiveness of TOUCH's telemedicine strategy. Its primary goal is to reduce the mortality rate of neonates (younger than 28 days) and infants (28 days to 1 year old) by 1 death per 1,000 births. There are about 37,000 births each year in Arkansas, which last year experienced 7.5 deaths per 1,000 births.

Working with Arkansas Medicaid, which covers about 60 percent of deliveries, TOUCH will have data to compare outcomes from the nine outlying hospitals and the rest of the state.

Whit Hall, M.D., a UAMS neonatologist and the TOUCH grant's principal investigator, says that TOUCH has helped:

- Provide better access to specialty and subspecialty support at UAMS and ACH
- Improve evidence-based clinical practice compliance
- Provide better coordination when managing discharges of very-low-birth-weight neonates and high-risk OB patients
- Make fetal echocardiography available to identify congenital heart conditions in more high-risk obstetrical (OB) patients in the partnering hospitals



Whit Hall, M.D.
Sam Greenfield, M.D.
Julie Hall-Barrow, EdD,
Education Director, UAMS Center for Distance Health
Shannon Lewis, R.N.,
ANGELS TOUCH Project Director

“The TOUCH grant has really helped solidify relationships between UAMS and community hospitals.”

Meeting of Minds

Many of TOUCH’s accomplishments are the result of a simple 15-minute telemedicine meeting on Mondays, Wednesdays and Fridays among the physicians from each hospital nursery, and on Mondays and Fridays for the OB physicians.

Hall leads the meetings with the nursery physicians, four of whom are also neonatologists. Each meeting starts with a roll call and a census of patients at each hospital. Next, Hall asks the physicians if there’s room at their nurseries to accept patients ready for discharge from UAMS and ACH. These neonates typically were the result of a high-risk pregnancy and were premature and at a very low birth weight.

Hall also asks the physicians if UAMS or ACH can assist with any subspecialty care issues or questions. Hall conducts consults with the physicians and babies via the two-way video. Sometimes it is determined that they need to be transported to UAMS or ACH, where a variety of subspecialty care awaits. The primary care physicians also receive assistance getting follow-up appointments with subspecialists.

An identical approach is taken with the nine outlying hospitals’ OB physicians in virtual meetings led by William W. “Sam” Greenfield, M.D., a UAMS obstetrician. These regular meetings promote the collaboration and regionalization of care that are among TOUCH’s goals.

“The TOUCH grant has really helped solidify relationships between UAMS and community hospitals,” Hall said. “It’s one thing to practice medicine at an academic institution, but the real payoff is when we can take

that and translate it into community medicine. It can only lead to better medical care for our state’s population.”

Shannon Lewis, R.N., TOUCH’s project director, said the program also includes a nurse-to-nurse report that links, via telemedicine, the labor and delivery nurses at the outlying sites with the labor and delivery nurses at UAMS. Nurses also communicate this way to update each other about patients being transported.

“People are nicer when they’re face to face,” Lewis said. “There’s better interaction, and more information gets exchanged.”

In non-emergencies, patients who are about to be transported also get to meet and talk to the nurses at UAMS who will be in charge of their care when they arrive.

The Fetal Heart

Another key component of TOUCH is an effort to identify congenital heart defects in the fetus by training sonographers or physicians – whoever performs the maternal ultrasounds – at the outlying sites.

Renee Bornemeier, M.D., a UAMS pediatric cardiologist based at ACH, said the ultrasounds allow her to rule out a significant percentage of suspected congenital heart defects and avoid costly transports to ACH.

“The TOUCH program gives us an exciting opportunity to increase detection rates of congenital heart defects in outlying areas, which will allow earlier management of those high-risk pregnancies and planning for delivery of high-risk newborns,” said Bornemeier, director of the Fetal Heart Center at ACH.

UAMS' Brad Schaefer, M.D., a geneticist based at ACH, also provides pediatric consults through TOUCH. In many cases, Schaefer is able to rule out the need for a costly trip from a remote hospital.

Logging, Tracking, Coordinating

TOUCH staff will track the patient until discharge. The program staff will keep a record of the site of delivery, gestation of the baby, birth weight, and if the baby was transferred after delivery. The data will be used to compare delivery patterns for TOUCH and non-TOUCH hospitals.

Also among TOUCH's goals:

- Saving five lives per year for every 50 neonates that weigh less than 1,000 grams (2.2 pounds) by ensuring appropriate care and delivery
- Achieving a 21 percent decrease in mortality of all very-low-birth-weight neonates
- Saving seven neonate lives per year from severe intraventricular hemorrhage

Hall said since the arrival of ANGELS in 2002, neonatal and infant mortality have declined in Arkansas, going from almost dead last nationally to the middle of the pack.

The TOUCH grant was for one year, but the program will continue to operate as designed and could even be expanded, depending on the outcome of a grant application with the National Institutes of Health.

Hall said ANGELS will establish the Arkansas Neonatal Perinatal Network, comprised of the stakeholders from all of the TOUCH sites that will carry on the program's mission.

"We will be using this to help improve neonatal care throughout Arkansas and to advocate for better neonatal and infant care to lower mortality in this state, which is something that I think can be done," Hall said.

TOUCH Sites

Jefferson Regional Medical Center, Pine Bluff

Mercy Medical Center, Rogers

National Park Medical Center, Hot Springs

Ouachita County Medical Center, Camden

St. Bernards Healthcare, Jonesboro

St. Edward Mercy Health System, Fort Smith

CHRISTUS St. Michael Health System, Texarkana

Washington Regional Medical Center, Fayetteville

Willow Creek Womens Hospital, Johnson

TOUCH Resonates

A neonatologist finds the support he needs

Victor Coloso, M.D., said he can feel isolated at times as the only neonatologist at the St. Edward Mercy Medical System neonatal intensive care nursery in Fort Smith.

So when the TOUCH program was established in March 2009, he enthusiastically embraced it, and his enthusiasm hasn't waned.

"It's a great program," he said. "In a small community hospital, you don't have a lot of subspecialty support, but the TOUCH program changes that for me."

TOUCH (Telemedicine Outreach Utilizing Collaborative Healthcare) was established by the UAMS-based ANGELS program with doctors like Coloso in mind. The program uses telemedicine – two-way, high-speed interactive video – to connect nine community hospitals' labor and delivery units and nurseries to UAMS subspecialists.

Coloso said a variety of problems have been resolved through interaction with neonatologists at UAMS and the four other outlying Arkansas hospitals that are partners in the TOUCH program.

"We discuss things like treatment management and other important issues," Coloso said. "It's very important to be able to get a second opinion sometimes. And if a baby needs surgery or a higher level of care than we can provide, then we make sure they are transported to UAMS or Children's Hospital."





the Power of **TOUCH**

Van Buren sisters experience new
ANGELS program in action

Brittany Shipley's 18th birthday involved a surprise helicopter ride, but it wasn't part of any celebration.

Shipley, in her 30th week of a high-risk pregnancy, was flown from Fort Smith's St. Edward Mercy Medical Center to UAMS because her blood pressure was out of control.

“I was glad I was going to be at UAMS.”

The doctors thought she might have to deliver that very night to save her baby’s life and her own.

But knowing she was headed to UAMS also was a relief because she and her family had witnessed her sister’s high-risk pregnancy and premature delivery at UAMS just months before. In that case, Terri Dean, 22, of Van Buren, gave birth to a 15-ounce boy at 27 weeks.

Prior to her transport, Shipley’s obstetrical care was being directed by Don Phillips, M.D., in Fort Smith. That day, he connected with the ANGELS Call Center to arrange Shipley’s transport.

“Her case really concerned me,” Phillips said. “The ANGELS staff was very helpful. They got me a helicopter in short order.”

St. Edward is one of nine outlying TOUCH sites in Arkansas whose labor and delivery units and nurseries are connected to UAMS by high-speed two-way video communication. Phillips, like many other obstetricians at the other ANGELS TOUCH sites, regularly attends the program’s weekly high-risk pregnancy teleconferences.

“I find it to be a valuable learning tool – a way for me to stay current on the latest recommendations,” Phillips said. “ANGELS is not just a transport mechanism but a very valuable system that’s accessible to physicians in Arkansas.”

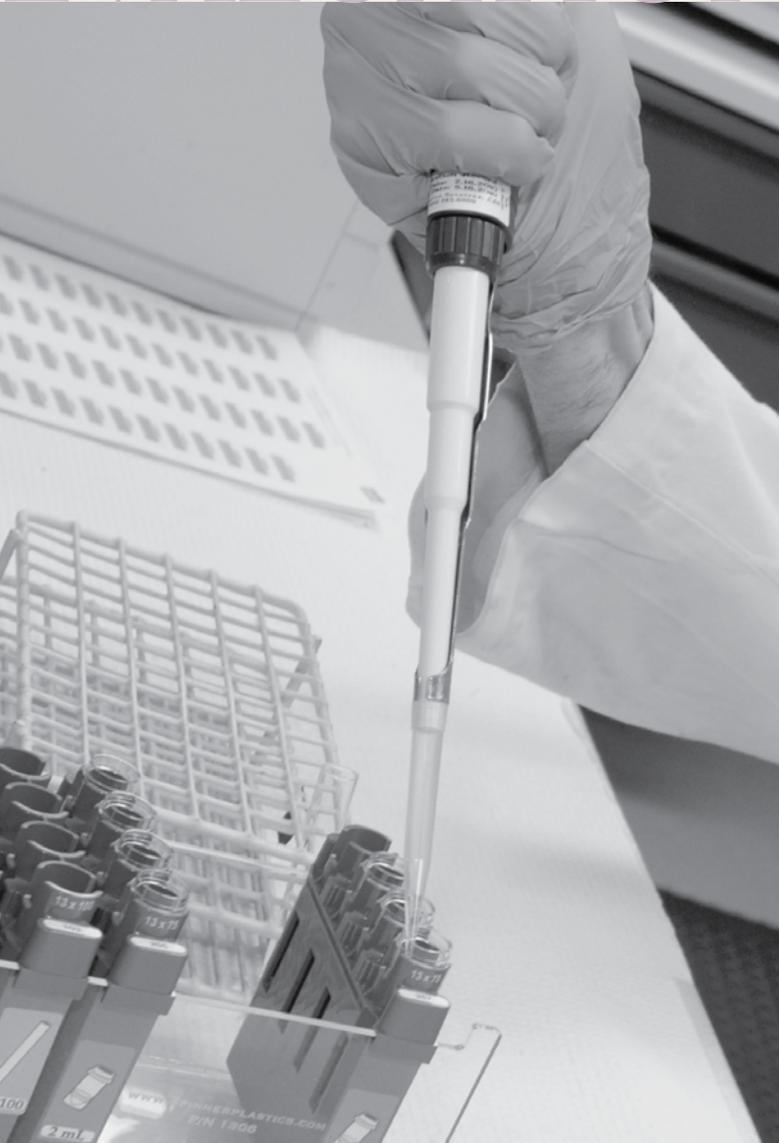
Shipley’s baby, Kaydence, was born Oct. 7, weighing 2 pounds, 9 ounces. After nine days at UAMS, she was transferred back to St. Edward where her care was overseen by Victor Coloso, M.D., a neonatologist.

Coloso also oversaw the intensive care of Dean’s baby, Hunter, for two months after he was transferred from UAMS.

As the hospital’s only neonatologist, Coloso said the TOUCH program was a big help in managing Hunter’s care. He said it was especially helpful in resolving a respiratory treatment issue for Hunter. Telemedicine made it possible for Coloso to learn a certain breathing treatment for Hunter in a demonstration by a UAMS respiratory therapist.

“That’s one of the advantages of TOUCH,” Coloso said. “We could see them and talk to them and how they were using the breathing equipment.”

EVALUATION & RESEARCH



Evaluation

In an effort to measure the efficacy and efficiency of our services, we carefully evaluate our programs to ensure that the targeted populations are reached in a cost-effective manner. Some of the programs we began or continued to evaluate include:

- ANGELS - Using Medicaid claims data, birth certificates and hospital discharge records, we have developed a uniquely rich database with which we can evaluate changes in mortality, morbidity and Medicaid costs that have occurred since the beginning of the program.
- TOUCH Grant – This program will be evaluated to determine its ability to appropriately manage very-low-birth-weight babies in Arkansas. Factors to be evaluated include appropriate use of antenatal steroids, the use of prophylaxis or early administration of surfactant, discharge coordination of high-risk neonates, regionalization and transfer of high-risk mothers prior to delivery when feasible, and appropriate stabilization of very-low-birth-weight babies born at facilities without tertiary care NICUs when transfers are not feasible.

By using empirical evidence to evaluate the costs and benefits of these programs, along with qualitative information about each program, we intend to demonstrate to our stakeholders the value that they provide for the state of Arkansas.

Grants and Special Recognition for the ANGELS Model Program

What began as a dream of dedicated obstetrics professionals has become a nationally recognized model in providing care for women and babies at risk. In its seventh year, the program ensures women in all areas of Arkansas have access to the care they need for the health and the well-being of their newborns.



David Fletcher, M.B.A.

Sarah Rhoads, D.N.P., A.P.N.

Rachel Ott, B.S.

Janet Bronstein, Ph.D.

ANGELS consistently receives exposure and recognition in Arkansas and around the country. These activities not only improve the quality of perinatal care in the state, but also increase the knowledge of professionals providing care in Arkansas and states across the nation.

In 2009, ANGELS' researchers participated in successful grant proposals totaling more than \$20 million. Awards such as these allow for ANGELS expansion, development of new sub-programs, and the strengthening of university wide and statewide collaborations.

ANGELS 2009 Funded Grants

Arkansas START: System to Access Rural Telecolposcopy - Telehealth Network Grant Program, Health Resources and Services Administration Office for the Advancement of Telehealth, 2009 (\$734,458.64)
Principal Investigator: W. Charles Hitt, M.D.; Co-Investigator: Gordon Low, A.P.N.

Arkansas ranks fourth in the nation in cervical cancer mortality. Health studies and professionals consider this a disease almost entirely preventable through proper care. Access to colposcopies in rural Arkansas is extremely limited, and many women forgo appropriate follow-up to abnormal Pap tests, allowing cervical cancer to develop or worsen. The goal of Arkansas START is to demonstrate how telemedicine can improve access to colposcopy in a rural state, while catalyzing improvements in clinical outcomes, quality of care, and cost effectiveness. UAMS partnered with three rural health facilities for this grant, which increases access to health care options for rural women through the use of innovative technology.

FAAST: Five "A's" Approach Stops Tobacco. March of Dimes Arkansas Chapter Grant. March of Dimes, 2009 (\$10,000)
Principal Investigator: Stephanie Wyatt, M.N.Sc., A.P.N.

Cigarette smoking is a national problem affecting millions. Of those adversely affected by cigarette smoking, there is no greater innocent victim than the fetus whose mother smokes during pregnancy. The resulting suffering lasts a lifetime. Facing greater incidence of low birthweight, premature rupture of membranes, preterm delivery, stillbirth, and placental abruption, these at-risk babies rely on our efforts to battle smoking in pregnancy. As such, ANGELS created FAAST: Five "A's" Approach Stops Tobacco, a provider education program designed to help obstetric providers encourage their pregnant patients to quit smoking. FAAST offers an interactive video to obstetrical providers that gives them ways to approach their smoking patients. Leveraging an existing distance learning network, FAAST accommodates the busy, distant provider serving Arkansas' pregnant patients. FAAST will instruct in the "5 A's" approach, promote open discussion, and evaluate the impact among participating providers.

Preventing Alcohol-Exposed Pregnancies: Brief Intervention via Telemedicine in Primary Care Setting: Innovation Grant – AHEC, 2009 (\$75,000)
Co- Investigator: Sarah Rhoads, D.N.P., A.P.N.

Alcohol consumption during pregnancy is a known risk factor for birth defects and developmental disabilities. Many women drink before they discover that they are pregnant. Preventing alcohol-exposed pregnancies can be achieved through alcohol abstinence or effective contraception in women of

And the work continues ...

child-bearing age. This randomized controlled study measures and compares risk reduction of non-pregnant women of childbearing age who participate in brief interventions at the Area Health Education Center (AHEC) sites in Pine Bluff and El Dorado versus interventions through telemedicine. Study results may provide rationale for delivering brief intervention using telemedicine to patients in primary care at sites with staffing limitations. Trained nursing staff will carry out this initiative to develop strategies in the primary care setting to address alcohol exposure in pregnant patients.

Of special note, ANGELS Director Curtis Lowery, M.D., served as principal investigator on a historic, university wide grant that credits ANGELS' achievements as one of the many strengths of the successful proposal. As such, the Clinical and Translational Science Award is considered a grant achievement for ANGELS and UAMS as a whole.

CTSA: Clinical and Translational Science Award - National Center for Research Resources of the National Institutes of Health, 2009 (\$19,931,344)

Principal Investigator: Curtis Lowery, M.D.

The CTSA helps support the Arkansas Center for Clinical and Translational Research (CCTR), which unites UAMS' five colleges and graduate school behind the translational research endeavor. The overarching goal is to establish a center that transforms the pace, effectiveness and quality of translational research at UAMS, resulting in better health for all Arkansans. The CCTR is one of 46 medical research institutions working together as a national consortium to improve the way biomedical research is conducted across the country. The consortium shares a common vision to reduce the time it takes

for laboratory discoveries to become treatments for patients and to engage communities in clinical research efforts. It also is fulfilling the critical need to train a new generation of clinical researchers.

ANGELS earned several awards in 2009 in special recognition for the “angels” that make our program possible:

ANGELS Award for Outstanding Service in Obstetrical Nursing - Tina Benton, R.N., ANGELS Program Director

Hawks-Workman Award - Paul J. Wendel, M.D., associate professor in the College of Medicine's Department of Obstetrics and Gynecology, Division of Maternal-Fetal Medicine

Throughout 2009, ANGELS spread the word about its innovative program at conferences nationwide. In fact, a stunning 13 ANGELS presentations were selected for the American Telemedicine Association Annual Conference, the premiere telemedicine conference in the country. ANGELS presenters even led a special panel discussion on telemedicine in Arkansas. Other posters, presentations and publications in 2009 were:

- Accommodating Rural Practice: Standardized Courses Receive an Injection of Technology - Sarah Rhoads, D.N.P., A.P.N. American Telemedicine Association Annual Conference
- Assimilate to Simulate: How Multidisciplinary Simulator-Driven Training Prepares for Obstetrical Emergencies – Sarah Rhoads, D.N.P., A.P.N.; Ayasha Stewart, M.N.Sc., A.P.N.; Patty Dufrene, M.S.N., R.N and Rachel Ott, B.A. UAMS College of Nursing Arkansas Educator Conference
- Assimilate to Simulate: How Multidisciplinary Simulator-Driven Training Prepares for Obstetrical Emergencies – Sarah Rhoads, D.N.P., A.P.N.; Tesa Ivey, M.S.N., R.N.C.; Ayasha Stewart, M.N.Sc., A.P.N.; Samantha McKelvey,



- M.D.; and Rachel Ott, B.A. Association of Women's Health, Obstetrical and Neonatal Nursing Annual Convention
- Blueprints for Successful, International Learning: Teleconferencing Fuels Healthcare Collaboration - Curtis Lowery, M.D. American Telemedicine Association Annual Conference
 - Bringing Together Rural and Urban Obstetrical and Neonatal Nurses - Barbara Smith, B.S.N., R.N.; and Tesa Ivey, M.S.N., R.N.C. Arkansas Nurses Association Annual Convention
 - Colposcopy in Cyberspace: Using Telehealth Technology to Diagnose Women with Abnormal Pap Smears - Gordon Low, M.S.N., A.P.N.; and Delia James, A.P.N. Arkansas Nurses Association Annual Convention
 - Distant Physicians, Close Support: Telemedicine Recruits and Retains Rural Providers - Michael Manley, M.N.Sc., R.N. American Telemedicine Association Annual Conference
 - Education Panel Discussion - Bryan L. Burke Jr., M.D., F.A.A.P. American Telemedicine Association Annual Conference
 - Evaluating the Arkansas Medicaid Population's Utilization of Telemedicine - David Fletcher, M.B.A., Judith McGhee, M.D., M.P.H., Janet Bronstein, Ph.D., Curtis Lowery, M.D., Donna Williams, A.D.N, R.N, American Telemedicine Association Annual Conference
 - Fetal Alcohol Syndrome: Are We Educating Childbearing Women on What They Need to Know? - Sarah Rhoads, D.N.P., A.P.N. Arkansas Nurses Association Annual Convention
 - Fostering Professional Standards - Sarah Rhoads, D.N.P., A.P.N. Gamma Xi Chapter Sigma Theta Tau International
 - From Scratchpad to Ironclad: Building a Rural-Urban Statewide Telemedicine Alliance - Curtis Lowery, M.D.; Bruce Thomasson, B.S.E.; Rhonda Jorden, M.B.A.; Julie Hall-Barrow, Ed.D.; Roy Kitchen, M.B.A.; and Rachel Ott, B.A. Rural Telecommunications Congress
 - If We Build It, Will They Come? Hosting Successful Teleconferences - Barbara Smith, B.S.N., R.N. American Telemedicine Association Annual Conference
 - Legislative Lessons: Telemedicine Sustainability Strategies of a Proven Program - Curtis Lowery, M.D. American Telemedicine Association Annual Conference
 - Meeting Minds: Rural & Urban Telemedicine Collaboration Saves Infants – R. Whit Hall M.D.; Tim Conaway, R.N.; Julie Hall-Barrow, Ed.D., Shannon Lewis, R.N.; and Rachel Ott, B.A. Rural Telecommunications Congress
 - New Ideas in Nursing: Telehealth - Sarah J. Rhoads, D.N.P., A.P.N.; Shannon Lewis, B.S.N., R.N.; Theresa Bubbenzer, M.S.N., F.N.P.; and Rachel E. Ott, B.A. Pediatric Annals
 - Outpatient Panel Discussion - Julie Hall-Barrow, Ed.D. American Telemedicine Association Annual Conference
 - Practical Applications of Telemedicine for Pediatricians - Neil E. Herendeen, M.D, M.S.; and G. Bradley Schaefer, M.D. Pediatric Annals
 - Reflecting on Rural Practice: Telemedicine Satellite Clinic Lessons Learned - Noelle Agan, M.S., C.G.C. American Telemedicine Association Annual Conference
 - Rich Resources for Rural Education: Telecommunications Delivers Standardized Healthcare Courses - Sarah J. Rhoads, D.N.P., A.P.N.; Elizabeth Cohen, M.M.; Anne Bynum, Ed.D.; Tina Benton, B.S.N., R.N.; and Rachel Ott, B.A. Rural Telecommunications Congress
 - Screening and Brief Intervention in Women to Prevent an Alcohol Exposed Pregnancy - Sarah Rhoads, D.N.P., A.P.N. Protecting Babies' Brains: A workshop on fetal alcohol spectrum disorders for health care professionals
 - STDs Effects on Pregnancy and Treatment Options - Sarah Rhoads, D.N.P., A.P.N. ONE Team: Telecommunicated to rural hospitals throughout Arkansas.



- Substance Abuse and Mental Health: Improving Co-Morbidity Services through Telemedicine - Shannon Barringer, M.S., C.G.C. American Telemedicine Association Annual Conference.
- Tagged for Success: Telemedicine Action Group Aligns Multi-Institutional Efforts - Christopher Smith, M.D. American Telemedicine Association Annual Conference
- Technologically Forward Triage: Connecting Call Center with Interactive Video - Donna Williams, A.D.N., R.N. American Telemedicine Association Annual Conference
- Tele-education: Linking Educators with Learners via Distance Technology - Christopher E. Smith, M.D., F.A.A.P.; and Beatrice A. Boateng, Ph.D. Pediatric Annals
- Telehealth: How Is It Impacting Nursing Care for Arkansas' Patients? - Michael Manley, M.N.Sc., R.N., and Tina Benton, B.S.N., R.N. Arkansas Nurses Association Annual Convention
- Telemedicine: A Business Model - Roy Kitchen, M.S. American Telemedicine Association Annual Conference
- Telemedicine and Child Abuse Examinations - Randell Alexander, M.D., Ph.D.; and Karen Farst, M.D., M.P.H. Pediatric Annals
- Telemedicine and Neonatal Intensive Care: Regionalization and Supporting Your Competition - R. Whit Hall, M.D. American Telemedicine Association Annual Conference
- Telemedicine and Neonatal Regionalization of Care: Ensuring that the Right Baby Gets to the Right Nursery - Julie Hall-Barrow, Ed.D.; R. Whit Hall, M.D.; and Bryan L. Burke Jr., M.D. Pediatric Annals.
- Telenursery: Bucking the Trend toward Regionalization – R. Whit Hall, M.D. American Telemedicine Association Annual Conference.
- Telestroke Methodology and Preliminary Outcomes in a Rural, Underserved State - Julie Hall-Barrow, Ed.D.; Curtis Lowery, M.D.; Tina Benton, B.S.N., R.N.; Salah G. Keyrouz, M.D.; Terri Imus, R.N., L.N.C; Rachel Ott, BA. Rural Telecommunications Congress
- The Hospitalized Infant and Separated Family: How Nurses can Use Technology to Heal – Sarah Rhoads, D.N.P., A.P.N.; Stephanie Wyatt, M.N.Sc., A.P.N.; and Rachel Ott, B.A. Association of Women's Health, Obstetrical, and Neonatal Nursing Annual Convention
- Thrombophilias in the Childbearing Woman - Stephanie Wyatt, M.N.Sc., A.P.N. Arkansas Nurses Association Annual Convention
- Training for Shoulder Dystocia and Breech Delivery: Simulation Manikin - Sarah Rhoads, D.N.P., A.P.N.; William Greenfield, M.D.; Tesa Ivey, M.S.N., R.N.C. ; and Ayasha Stewart, M.N.Sc., A.P.N. University of Arkansas for Medical Sciences Perinatal Conference
- Truth in Telemedicine: Improving Care for Patients Receiving Adverse Diagnosis - Stephanie M.N.Sc., A.P.N. American Telemedicine Association Annual Conference
- Why Be Many When You Can Be One? How Team-based Collaboration Narrows the Divide between Rural and Urban Obstetrical and Neonatal Nurses – B. Smith, B.S.N., R.N.; T. Ivey; Sarah Rhoads, D.N.P., A.P.N.; Julie Hall-Barrow, Ed.D; and Rachel Ott, B.A. Association of Women's Health, Obstetrical, and Neonatal Nursing Annual Convention.

Perhaps most impressive, ANGELS witnessed these accomplishments in the midst of a year-long, strategic grant-writing collaboration that is still seeking federal stimulus funding to strengthen the state's health care, higher education, public safety and research broadband networks. Leaders from ANGELS were key in the development of a grant proposal that may significantly upgrade and expand the telemedicine capabilities in 474 facilities throughout Arkansas.

OUTREACH



In the past, medicine has been about bringing the patient to health care, a method that has broad access gaps. With the technology of ANGELS, we have been able to bridge that gap by putting the patient as the priority, and bringing the clinical and educational specialty health care to them.

Because of this technology, we are able to better support those physicians and nurses who are continuing to care for pregnant patients. We have also been able to assist with physicians who would like to practice in those rural areas but still stay connected.

The success of our outreach efforts in 2009 is evident in many ways. Relationships with our hospitals, providers and patients continue to increase in satisfaction. They are now coming to us and asking if other clinical and educational endeavors are possible. It was because of our providers that we came up with our telenursery rounds and instituted fetal-heart echos. With this mode of educational delivery, we are able to respond quickly to their needs to give our patients the most timely and best practices.

We get calls daily from across the country by those who wish to replicate ANGELS in

their areas, including rural clinical groups from Virginia, Mississippi, Indiana and Washington. We have been approached by a private hospital group interested in starting telemedicine in their two facilities in the Virgin Islands area.

We were able to share this message in 2009 with U.S. Sen. Mark Pryor of Arkansas and Federal Communications Commission Chairman Julius Genachowski. We told them that increased support of the FCC in expanding broadband to the unserved and underserved areas, along with more payors reimbursing for telemedicine continues to help provide quality care for Arkansans. This may be the only way to meet rural needs in the future.

All of this happens because of the ANGELS team work and commitment by the providers we serve in Arkansas. Everyone involved in ANGELS is an outreach coordinator in some fashion. Every contact we make, whether it's a senator, a physician, or a billing professional in a hospital, is important for our success.

Because of ANGELS, rural areas are no longer at the end of the line when it comes to delivering quality care.



Michael Manley, M.N.Sc., R.N.
ANGELS Outreach Coorninator

NO worries

Katie and James McLean were worried. A prenatal test indicated their second child had an increased risk of being born with genetic anomalies, including Down syndrome. Katie's doctor in Batesville, E. J. Jones, M.D., who delivered their first child, knew he could call upon genetic counseling services and maternal-fetal expertise through the ANGELS program to help answer the McLeans' questions and ease their worries.

Jones, who has been practicing obstetrics-gynecology in Batesville for 27 years, said he has long been a believer in the ANGELS program. He often uses its evidence-based guidelines as consultation for difficult cases or to answer a particular question.



“ANGELS is a great resource for difficult cases”

He has participated in collaborative teleconferences, giving him access to the latest thinking in high-risk obstetrics and the experience of colleagues across the state delivered via interactive video.

“As a community obstetrics and gynecology specialist, I can’t provide the level of expertise offered by the ANGELS maternal-fetal subspecialists,” said Jones, a 1979 UAMS graduate. “ANGELS is a great resource for difficult cases.”

White River Medical Center in Batesville offers a robust array of services and he’s proud of its ability to meet most of his clinical needs. Still, there are cases like Katie’s when his patients benefit by having specialists in the ANGELS program available to provide additional analysis of ultrasound images, he said.

At 36, Katie has a greater risk for health problems affecting her or her baby. This led Jones to consult ANGELS for advice on managing the mononucleosis that Katie developed early in her pregnancy.

Then a second-trimester blood test showed the increased risk of Down syndrome – the genetic disorder characterized by distinctive facial features, a range of developmental delays and often, heart defects.

McLean said it was a nervous Christmas for her and James, a Batesville funeral director and member of the state Legislature, after they learned the results of the test.

She came to Little Rock in early January to see Paul Wendel, M.D., director of the Division of Maternal-Fetal Medicine in the UAMS Department of Obstetrics and Gynecology.

“I remember he asked, ‘What will it take for you not to worry?’ ” McLean said.

Genetic testing and high-level ultrasound ruled out Down syndrome.

By mid-March, when Katie, a church youth director, came to Little Rock for a follow-up visit with Wendel, she was at ease about the impending June birth of a little sister for five-year-old Evan.

Katie said she feels like she has been well taken care of by Jones and well served by the referrals through ANGELS to specialists at UAMS.

“Dr. Jones has always been so thorough and answered all of my questions,” McLean said. “But I feel good that he referred me to UAMS. I felt safe.”

Jones followed his father, a retired ophthalmologist, to Batesville and spent several years as the only obstetrician in town. He loves the small town life and knows there are patients who would not want to make the hour-and-a-half drive to Little Rock unless it was absolutely necessary. He said he feels fortunate to have the resources of an academic medical center a phone call or teleconference away.

“The ANGELS program has done a great job understanding the challenges of community medicine and providing the resources to help hometown physicians better care for their patients,” Jones said.

