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Leadership



Curtis Lowery, M.D.
ANGELS Medical Director



Tina L. Benton, R.N.
ANGELS Program Director



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*ANGELS Business
Administrator*

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

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University of Arkansas for Medical Sciences

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Leadership

It's official: ANGELS is now a decade old, having provided over 21,000 telemedicine consultations and even more with specialty care in our clinics. It's good to be 10 years old. It's a formative age, where anything can happen and the sky is the limit.

Through the last decade, we have accomplished a lot. In the past 10 years, we have...

- ☐ Grown our ANGELS' statewide network to include over 69 clinical and educational interactive video connections at 48 different self-sustaining sites across Arkansas.
- ☐ Finalized 101 obstetrical, 57 neonatal, and 39 pediatric evidence-based guidelines available for free on the ANGELS' website with 3,778 national and international registered users.
- ☐ Delivered over 21,000 high-risk obstetrical telemedicine consultations to rural women.
- ☐ Facilitated 5,499 maternal transports to the most appropriate hospital.
- ☐ Provided continuing obstetrical and neonatal education to 16,939 evidence-based conference attendees.

In 2013, ANGELS was invited to speak at the Governance Studies at Brookings Institution, which highlighted our many efforts to bring specialty clinical care and continuing education to Arkansas. We also continue to serve as a replicable model for other states, as we demonstrated the ANGELS model to specialists from the University of Mississippi Medical Center in 2013.

Within Arkansas, our efforts have proven instrumental in creating a Neonatal Intensive Care Units (NICU) Classification system in the state, which when enacted, will help ensure babies are delivered at the most appropriate hospitals for their medical needs. Additionally, ANGELS created the Program for Obstetrician & Gynecological Observation (POGO), an alliance of Arkansas providers who meet regularly to discuss ways in which they can affect obstetrical problems across the state. As health care reform has rolled out, we provided Arkansas government officials with information on pregnancy benefits for private option and health insurance marketplace enrollees.

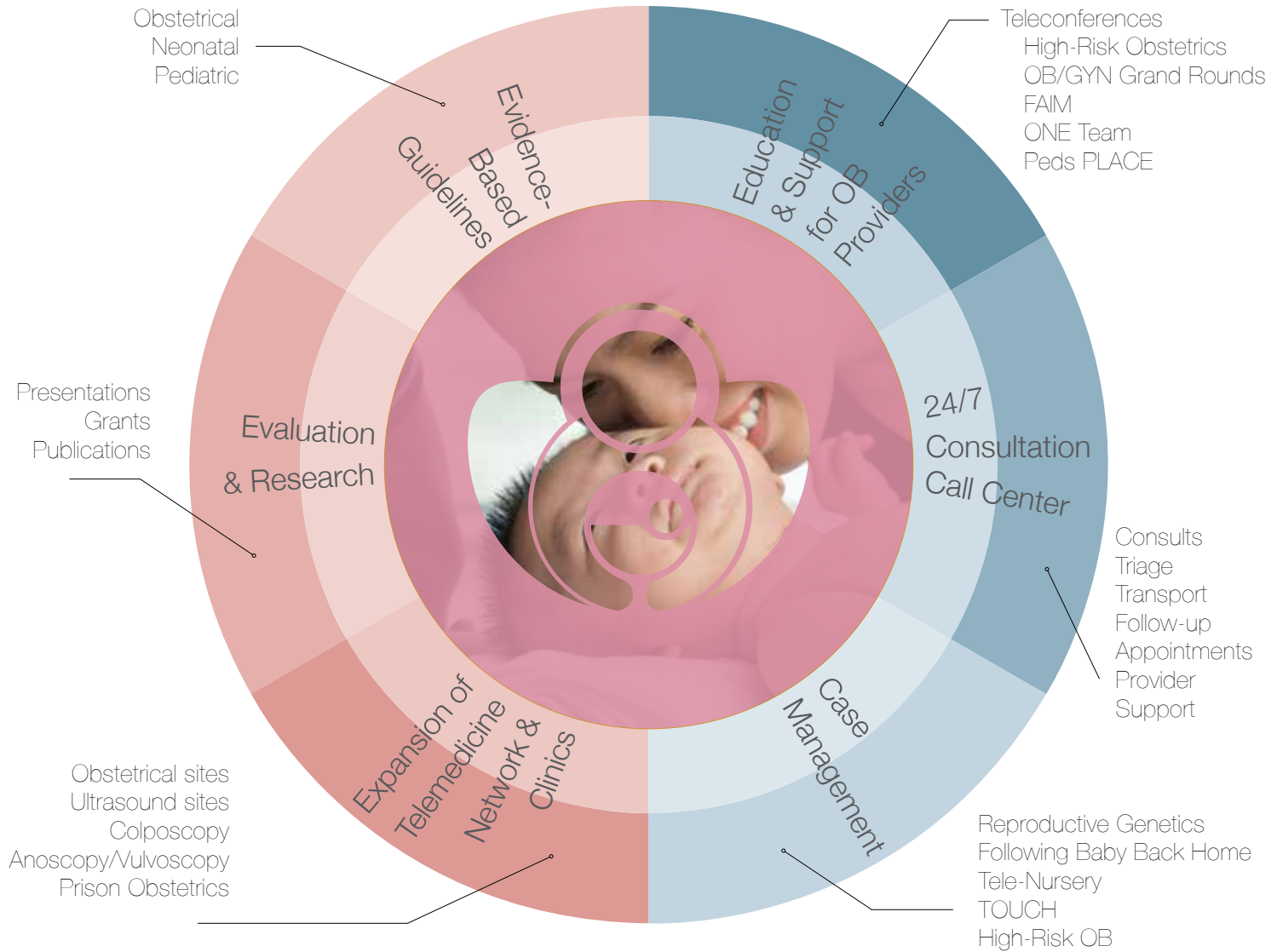
As you will see described herein, 2013 was a great year. Where we take ANGELS in its next decade of life is up to you – our partners, providers, staff, and patients. Only you hold those precious answers to how obstetrical care will improve in Arkansas.

Sincerely,



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





Education & Support

Interprofessional continuing education has been a focus for ANGELS over the past 10 years. The ANGELS educational and clinical team members strongly believe that each person on the health care team is valuable and is an essential part of providing family- and patient-centered care for our pregnant women and neonates.

Interprofessional education strives to provide a collegial learning environment for more than one health care profession during an education event. Many of ANGELS' programs provide a venue where multiple types of health care providers can learn together and receive continuing education. Over the past 10 years ANGELS has provided continuing education to at least 12 different types of health care providers. ANGELS believes that this multidisciplinary continuing education enhances evidence-based practice, improves patient management, and improves patient outcomes.

Learnondemand.org

Our on-line educational system launched in the fall of 2013 – learnondemand.org. Visit it today for selected archived teleconferences, interactive educational modules, and your continuing education transcript with events beginning January 2014. **LOD launched in October of 2013 and had over 450 register for the system by the end of 2013.**

Educational Team



2013 Teleconferences Stats

Total
187 educational hours for weekly
teleconferences

In 2013
4,978
professionals attended our
educational events

Special Event Topics

- ☐ Basic Fetal Heart Monitoring
- ☐ AWHONN Intermediate Fetal Heart Monitoring Course
- ☐ AWHONN Fetal Heart Monitoring Instructor Trainer Course
- ☐ STABLE
- ☐ Breastfeeding Symposium
- ☐ Diabetes Update
- ☐ APN Statewide Teleconference
- ☐ Obstetrics for the Critical Access Hospital
- ☐ Childbirth Educator Workshop
- ☐ Antimicrobial Stewardship

56 special
educational
event hours

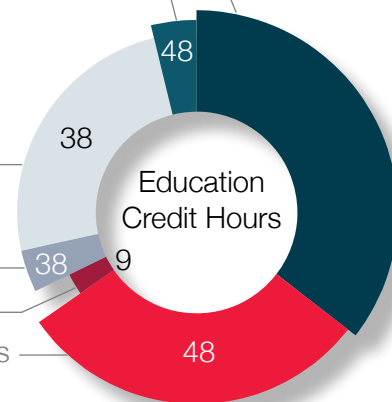
Other Programs and
Events-1,766 attendees
PedsPLACE-190 attendees

Grand Rounds-
1,224 attendees

ONE Team-
190 attendees

FAIM-122 attendees

HROB-1,486 attendees



Teleconferences Offered Each Month

Teleconference	Dial-In Number	Date	Time
ONE Team Nursing Teleconference	068773	1st-4th Friday	Noon - 1:00 p.m.
PedsPLACE	070231	Thursday Weekly	12:10 - 1:10 p.m.
Connecting Across Professions (CAP)	010630	Tuesdays Weekly	Noon - 1:00 p.m.
OB/GYN Grand Rounds	060130	Wednesday Weekly	8 - 9:00 a.m.
HROB Teleconference	Call 501-526-7178 to register	Thursday Weekly	7 - 8:00 a.m.
FAIM	Call 501-686-8666 to register	4th Friday	7:30 - 8:30 a.m.

Visit LearnOnDemand.org for topical listing and a detailed calendar. Click the education events tab at the top of the page and the calendar will display below.

29th Annual Perinatal Conference

The 29th Annual Conference on Perinatal Care: Comprehensive Care from A to Zzzzzzz and the Third Annual Women's Health Update were held September 26-27, 2013 at the Embassy Suites in Little Rock.

More than 370 total registrants attended the events, highlighted by keynote speaker Joshua Dahlke, M.D., a third-year Maternal-Fetal Fellow at Women and Infants Hospital of Rhode Island and the Warren Alpert Medical School of Brown University in Providence, R.I., who spoke on sleep disorders in pregnancy.

Other highlights included:

- Other panelists and speakers included UAMS experts Sara Peeples, M.D.; Vivien Yap, M.D.; Paul Wendel, M.D.; Curtis Lowery, M.D.; Whit Hall, M.D.; David Grimes, M.D.; Zachary Stowe, M.D.; and E.F. "Pat" Magann, M.D.
- Breakout sessions included seminars on lactation complications, ACLS Maternal Focus research and non-invasive aneuploidy screening, among others. Those sessions were led by Ashley Ross, M.D.; Mindy Simonson; Imelda Obdio, M.D.; Carla Rider, M.B.A., B.S.N., RNC-LRN; and Mary Salazar, A.P.N.

Total **230** perinatal conference registrants

141 women's health update registrants



*Whit Hall, M.D.
was awarded the
Hawks-Workman
award in 2013*



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

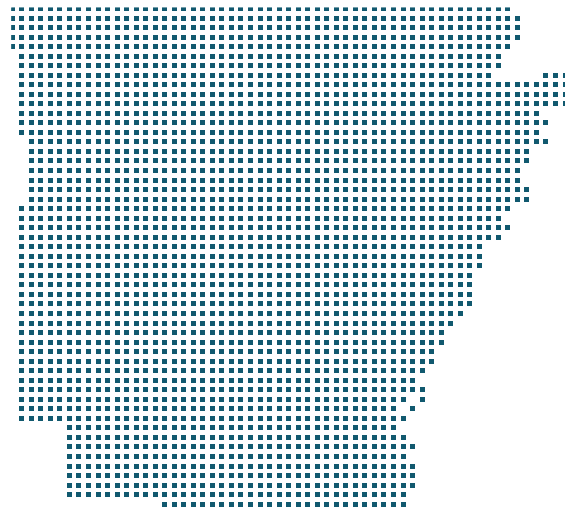
Evidence-Based Guidelines

197 obstetrical, neonatal, and pediatric
guidelines currently available on line

In 2013 **335** new registrants to our ANGELS

Guidelines website which includes 148 physicians, **104 of whom
are Arkansans.**

44 states in
the union are
represented as
being registered
for our ANGELS
Guideline
Website



In 2013 **4,583** hits to the ANGELS Guidelines website from 44 states in the U.S. and from 25 countries

1,141 physicians registered

764 Arkansas physicians registered

Total **3,778** registrants to date

In 2013 **31.71 %** of new visits were from mobile devices. 350 visits on mobile devices (176 from Apple iPhone and 141 from Apple iPad)

Outside of the U.S., the following countries are represented by our guidelines registrants.

United Arab Emirates	India	Vietnam	France	Moldova	Slovakia
Saudi Arabia	Azerbaijan	Columbia	Australia	Ireland	Ukraine
Philippines	British Columbia	Mexico	Thailand	Taiwan	Japan
Albania	Ireland	Indonesia	Turkey	Canada	Brazil
Egypt	Germany	Ecuador	Lithuania	Nigeria	
	Italy	Spain	United Kingdom	Qatar	

New for 2013: Makah Indian Nation, Cuba, Belarus and Moldova



Tammi Bowen, R.N.

Consultation & Appointment Call Centers

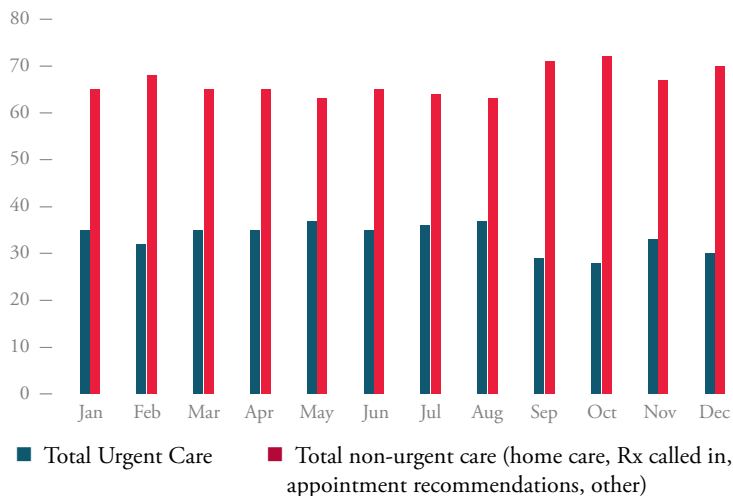
ANGELS Call Center (ACC) provides triage services to Arkansas Department of Health (ADH) maternity patients when the local health unit is not open and during clinic hours when a provider of maternity services is not available. Services cover all Arkansas Health Departments that provide maternity care.

The local health units (LHU) notifies its maternity patients of the after-hours services through ANGELS using a flier and verbal instruction. These patients then call directly using the information they were given. The ACC then sends patient triage call results to the maternity patient's LHU and ADH Women's Health Section the following business day.

The program was created because the health department patient utilization of emergency departments for prenatal care when LHUs are closed was inappropriate due to the high cost associated with emergency department care. Extended waits at overcrowded emergency departments also can deter patients from needed visits. Use of emergency departments to address minor problems that can be resolved via phone triage and require simple treatment is a wasteful use of already scarce health resources and increases costs.

The program began as a pilot at the Miller County Health Department in January 2011. The Southwest region was added in the fall of 2011 and soon afterward the rest of the state was rolled out as they became trained in the program. To train the health departments, an ANGELS nurse traveled to each health department explaining the program and supplying the health department with informational materials for the staff and the patients.

2013 Triage outcomes by Month



In 2013

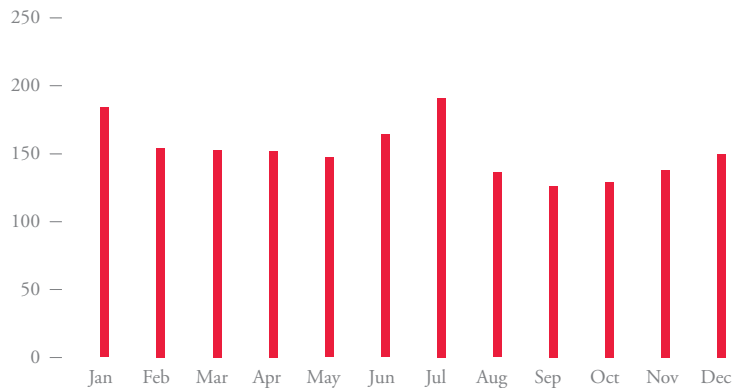
206,481

total calls to Angels Call Center. 604 were OB transport requests, 554 were OB transport arrival calls, 483 were OB consults, 23,736 were nurse triage calls, 50,383 were calls through the ANGELS appointment center and 332 were ADH calls.

2013 Urgent Care Avoided by Month

1,824

urgent care visits were avoided



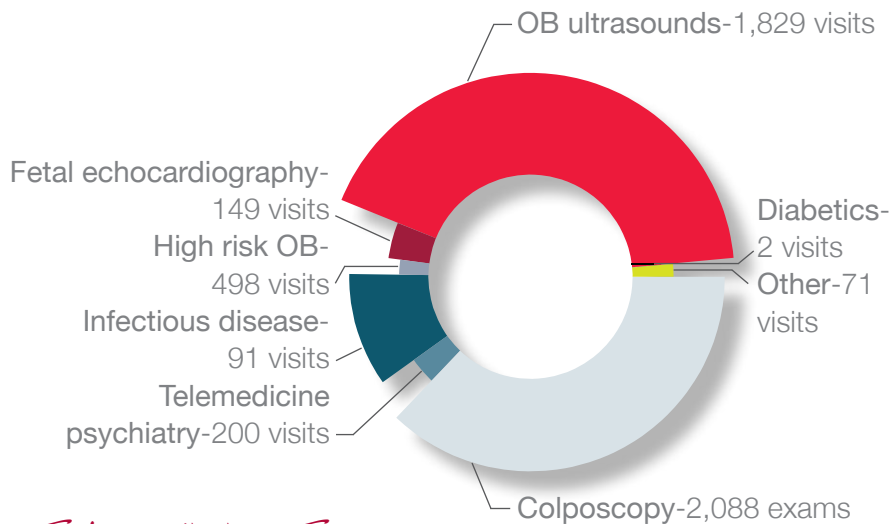


Telemedicine

Network and Clinics

In 2013

4,928 telemedicine visits



Telemedicine Team



Rosalyn Perkins, M.N.Sc., A.P.N.



Mandi Dixon, R.D.M.S.



Stacie Ford, R.N.



Tesa Ivey, M.N.Sc., A.P.N.



Lori Heil, R.D.M.S.

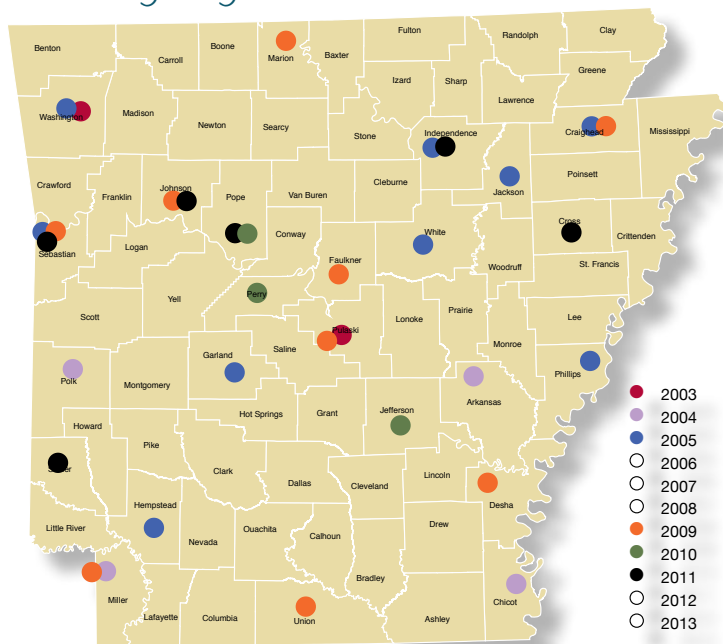
2,088 colposcopy exams

identified 399

women with high-grade lesions requiring treatment

and 10 diagnosed with cancer

Telemedicine Sites (From beginning to now)



Colposcopy APN Team



Jeni Warrior, A.P.N.



Becca Austin, A.P.N.



Tina Butler, A.P.N.



Tesa Ivey, A.P.N.



Delia James, A.P.N.



Gordon Low, A.P.N.

Healthy Minds = Healthy Mothers

Women's Mental Health Program Has Many Specialized Services

A key collaborator in the comprehensive care model within the UAMS Women's Clinic is the Women's Mental Health Program (WMHP). The WMHP, directed by Zachary Stowe, M.D., an international expert in women's mental health, is part of the Psychiatric Research Institute at UAMS that offers an array of highly specialized services. Women with neuropsychiatric illnesses such as bipolar disorder, depression, migraine headache, and pain syndromes often face difficult treatment decisions during pregnancy and the postpartum period. The WMHP clinicians are highly experienced in the management of these cases. Services at the WMHP include: comprehensive diagnostic evaluations in the office or via telemedicine, ongoing outpatient care, a specialized inpatient psychiatric unit for women, and a variety of clinical research studies. The program has reached out to patients from across the state and bordering states and established collaborative psychiatric care at numerous health centers via telemedicine.



Dr. Zachary Stowe discussing fetal development with patients.

The WMHP is a central component in the educational and research mission of UAMS, providing rotations/electives for medical students, residents in psychiatry and obstetrics & gynecology, and clinical research experiences for residents, fellows, and junior faculty. Collaborative studies have included the impact of anti-emetics on child neurodevelopment, the beneficial effects of pet therapy for hospitalized obstetrical patients, and the use of electroconvulsive therapy during pregnancy. Working together, the Department of Obstetrics & Gynecology and the WMHP are changing perinatal health care in Arkansas and improving outcomes across the country.

Hometown HIV Care

HIV HEART Program Provides Care That's Close to Home

With more than half of the nearly 5,300 people living with HIV infection in Arkansas considered to be “out of care” for not having had a lab evaluation or a medical visit within one year, the need for telemedicine intervention is paramount.

HIV specialists at UAMS are addressing this need and boosting better outcomes by giving these patients a provider that is “closer to home” through telemedicine efforts.

The HIV HEART (Health, Education, Assessment, Research, and Telehealth) program offers various formats by which providers statewide can interact and learn. It offers online education through learnondemand.org, one-on-one telehealth sessions, quarterly lecture series, and ongoing teleconferences. Faculty members present to communities of providers, such as specialists in OB/GYN, pediatrics and family medicine, along with pharmacists and nurses.

As enduring materials, four of the recorded lectures were placed on learnondemand.org



Providers are able to contact Jon Allen, PA, an experienced ID/HIV specialist at UAMS, and Jose Romero, M.D., at Arkansas Children's Hospital, for consultations and program-related information. Their contact information is given to the providers that are participating in the HIV HEART programs. The ANGELS Call Center at UAMS also allows providers to call in and speak with a health care professional 24 hours a day. They are able to connect with on-call providers at any time and conduct consultations as needed.

Visit the HIV HEART website for more information: angels.uams.edu/HIVHEART.

Telenursery

Telenursery and Mother/Baby Connections

The Telenursery program is in its fifth year of providing three-times-a-week virtual rounds to nursery sites statewide.

These rounds include neonatology and subspecialty consultations, coordination of transports, follow up, collaboration and education, and connectivity from mother to her baby.

Whit Hall, M.D., professor of neonatology in the UAMS College of Medicine, leads these virtual rounds to 26 statewide nursery sites, including Ashley County Medical Center in Crossett, which was added in October 2013. Consultations have been done through telemedicine this year not only by the Department of Neonatology, but also others including genetics, urology, and dermatology.

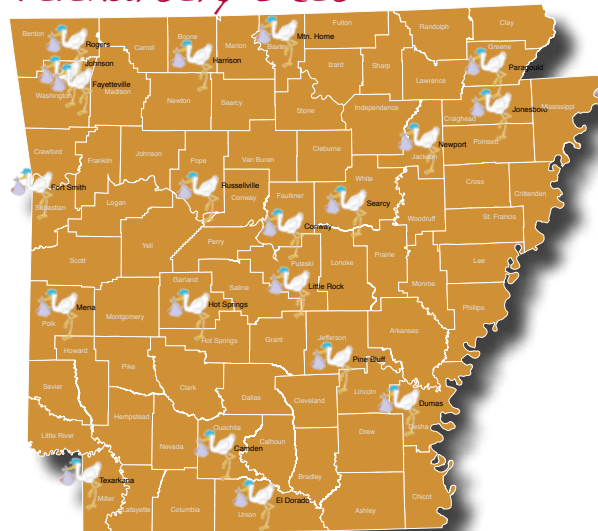
A major benefit of having telemedicine units in nurseries is the ability to connect postpartum mothers with their babies that were transferred to Arkansas Children's Hospital (ACH). When the mother delivers a baby that needs to be transferred to ACH for treatment, the mother typically remains hospitalized for 24 hours or more at her distant hospital. But thanks to the telenursery technology, she can still connect to her baby.

The telemedicine unit is usually brought directly to the mother's room, or she goes to the nursery and

connection is made to ACH directly to her baby's bedside with a live view. The mother is not only able to see her baby, but can talk directly to the baby and the baby's nurse and physician about the plan of care. Some mothers end up in intensive care units and connections have also been made possible.

In 2013 we connected **23**
mothers with their babies

Telenursery Sites



Technology

Award-Winning Approach

Hall Continues to Cover the State's Infant Mortality Rate



Hall and resident Caroline Mazoch, M.D. work in the Sim Lab with the video-laryngoscope

Whit Hall, M.D.'s vision of impacting the state's infant mortality rate continues to drive his passion to create studies like *"Resident Training Enhanced by New Innovations: Tele-Intubation."* He was awarded the 2013 *Department of Pediatrics Innovations in Pediatric Education Program Award* for his innovative approach to educate students, residents, and/or fellows to

successfully intubate a low birth weight neonate, infant, or child. New technology, which has now been adapted to the existing telemedicine network in Arkansas, offers an exciting opportunity to improve the ability of pediatric trainees to accomplish this critical skill. A mastery learning practice approach with immediate feedback and a video-laryngoscope is being used to achieve competency in advanced airway management. It is anticipated this training will dramatically improve intubation skills, and with the use of telemedicine, the training can be utilized in community nurseries throughout Arkansas.

Text4Baby

Arkansas Was the 2013 Winner for Medium-Sized State Enrollment

Arkansas came in first place for the medium state group, enrolling 57.9 per 1,000 estimated new pregnant women and moms into the service. During the contest period, a total of 1,938 new users enrolled in the text4baby service in Arkansas. Arkansas's enrollment was 32 percent higher during the contest compared to the 23-week period before the contest began. Total enrolled users went from 7,485 to 9,423.



ANGELS partnered with the Arkansas Breastfeeding Coalition to provide the Arkansas Breastfeeding Symposium on August 9, 2013 at the UAMS Jackson T. Stephens Spine & Neurosciences Institute.

Topics included health care reform and its impact on breastfeeding consultation and initiatives, dental perspectives related to breastfeeding, physician support and lactation referral, and laid-back breastfeeding. Continuing education credit was provided for 140 health care providers including physicians, nurses, dietitians, health educators, pharmacists, and lactation consultants.

- ☐ Interactive breastfeeding modules to provide education to expectant moms
- ☐ ANGELS partnered with UAMS patient education to develop the in person breastfeeding education course into an interactive online module in 2013.

Right from the Start

Breastfeeding Initiatives Get Mothers Set Up

- ☐ Breastfeeding Promotion Workgroup
- ☐ ANGELS partnered with the Arkansas Department of Health

Baby Friendly Task Force

UAMS implemented a task force to work toward “Baby Friendly” status for the UAMS Medical Center. Misty Virmani, M.D., is leading the effort.

The Baby Friendly Hospital Initiative (BFHI), also known as Baby Friendly Initiative (BFI), is a worldwide program of the World Health Organization and UNICEF, launched in 1991 to improve the role of maternity services to enable mothers to breastfeed babies for the best start in life. It aims to improve the care of pregnant women, mothers, and newborns at health facilities that provide maternity services for protecting, promoting, and supporting breastfeeding.

There are presently no hospitals in Arkansas that have earned this status. ANGELS is assisting with the provider and patient education steps.

The ten steps for “**Baby Friendly**” status include:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in the skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6. Give infants no food or drink other than breast milk, unless medically indicated.
7. Allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no pacifiers or artificial nipples to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or birth center.

Why breastfeeding?

- ☐ If 90 percent of U.S. mothers exclusively breastfed for six months as recommended by medical providers, the nation could save \$13 billion and prevent the loss of 911 lives, annually.
- ☐ Breastfeeding protects mothers and their breastfed children from many illnesses and diseases including obesity, diabetes, and some cancers.

Initiative Team

Misty Virmani, M.D., Neonatology Fellow at UAMS and ACH, Becky Sartini, MSN, RNC-NIC, Clinical Services Manager for the Neonatal Intensive Care Unit and Ginny Smith, RN, MSN, NEA-BC, Director of Nursing, Maternal/Infant Services are a part of the multidisciplinary team that is leading the way for UAMS to be the first Baby Friendly designated hospital in Arkansas.



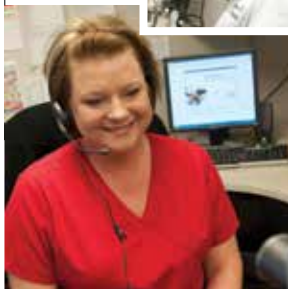
A Decade of Growth

When ANGELS began in 2002, the program began to perfect the model by which telehealth was conducted in Arkansas. In effect, ANGELS offered infrastructure, lessons learned, and protocols essential to the formation of future telehealth programs at UAMS. While the focus of UAMS'

telehealth programs remained within obstetrics and neonatology in the early years, they soon expanded to include services ranging from real-time language interpretation to emergency neurology consults in later years. All the while, UAMS expanded its video network and partner with other health care



2002
ANGELS
start



ANGELS
24-hr Call
Center
Service



High-Risk
OB &
Neonatal
Guidelines



2004
ANGELS
Tele-
Nursery



ANGELeye and
the development
of the **Center for
Distance Health**

2006



UAMS
**CENTER FOR
DISTANCE HEALTH**
UNIVERSITY OF ARKANSAS
FOR MEDICAL SCIENCES

2007
PedsPLACE



New Clinical Services:
Diabetes, Colposcopy, Resident-
facilitated HROB Clinic



**Spanish
Translation
Interpretation
Services**

FAIM CE for MDs

ONE Team
Obstetrical
Neonatal
Exchange
CE for nurses

**Federal Communications
Commission Rural Health
Care Pilot Program**



and educational entities who used or sought to use real-time technologies to conduct their services throughout Arkansas. The result today is seen through a sprawling, statewide telehealth network, capable of linking to well over 400 health care sites and even more educational sites found in every county

of Arkansas. To complement this network, a range of UAMS telehealth programs are now available to patients and providers in Arkansas, with each program utilizing ANGELS' telehealth model as its foundation for operation and success.

2008

TOUCH: Telemedicine Outreach
Utilizing Collaborative Healthcare



Telehealth KIDS

2007

2009

AR SAVES
Stroke
Assistance thru
Virtual
Emergency
Support



Fetal Echo Clinic



Learn2telehealth.org
\$102 Million BTOP
Grant Award

BROADBANDUSA



2010

2011



Arkansas e-Link
Linking health, education,
research, and public safety



HIV HEART

Health
Education
Assessment
Research
Telehealth

2012

2013

**Completion of the
BTOP Grant**
Connecting 410+
Health Care Sites



Adult Sickle Cell
Clinic



Case Management

Arkansas Fetal Diagnosis and Management (AFDM)

Arkansas Fetal Diagnosis and Management (AFDM) is a multi-disciplinary program developed for pregnant woman and their families that have been given a diagnosis of a fetus with a known congenital anomaly or genetic or chromosomal abnormalities.

AFDM uses a team approach to case coordinate and provide treatment options, as well as delivery planning and plan of care for the newborn. The multi-disciplinary team meets regularly to discuss individualized plans for each patient, and the team is notified of scheduled deliveries with the proposed plan of care. Follow-up is provided to referring physicians.

AFDM Team



Paul J. Wendel, M.D.



Ashley Ross, M.D.



Lori Gardner, R.N.

Total **391** new cases admitted into AFDM program

167 live deliveries at UAMS **77**

babies transferred to ACH

ANGELS Sonographers



Lisa Caine, R.D.M.S.



Mandi Dixon, R.D.M.S.



Bill Hickey, R.D.M.S.



Lynne Tate, R.D.M.S.

UAMS Sonographers



Arkansas Reproductive Genetics Team



Shannon Barringer, M.S., C.G.C.



LaJuana Whyte, R.N.



Mindy Simonson, M.S., C.G.C.



Kate Zellmer, M.S., C.G.C.



Sarah R. Green, M.S., C.G.C.



Noelle R. Danylichuk, M.S., C.G.C.



Christopher Ciliberto, M.S., C.G.C.



Stephanie Jez, M.S.



Angie Hunton, R.N.C.

Total **151** consultations from specialist
20 intrauterine fetal demise or expired
39 deliveries at other locations

Maternal-Fetal Medicine Team

Starting at left: Paul Wendel, M.D.; Nafisa Dajani, M.D.; Curtis L. Lowery, M.D.; E. "Pat" Magann, M.D.



Maternal-Fetal Medicine Fellows

Starting at left: Adam Sandlin, M.D.; Imelda Odibo, M.D.; Nader Rabie, M.D.



Outreach APN Case Management



Lisa Harmon, A.P.N.



Delia James, A.P.N.

APN Case Management Team



UAMS Partners with Chicot Memorial for Training



Misty Rogers

The UAMS Center for Distance Health and ANGELS have long supported the health care needs of rural communities in Arkansas. So when Chicot Memorial Hospital's leadership recognized a need for their staff to obtain additional obstetric (OB) training, their first thought was to contact UAMS.

With the support of UAMS Clinical Services, the American Nurses Credentialing Center (ANCC) and officials at Chicot Memorial Hospital, a collaborative project to provide advanced OB training to Chicot Memorial nurses began.

Using the new LearnOnDemand.org online platform, 10 hours of Web-based OB training was provided at no charge to the nurses at Chicot. This training included ANCC-accredited continuing education, from learning how to handle common obstetric emergencies to the prevention of vertical transmission of HIV. Once this training was complete, each of the nurses participated in a 36-hour observational experience in Labor and Delivery at UAMS. Nurses in Labor and Delivery collaborated with the visiting "sister nurse" from Chicot and ensured our guests learned as much as possible during their visit.

Mary Salazar, APRN, WHNP-BC, clinical services manager for E5 Labor and Delivery at UAMS, met with Misty Rogers, the assistant chief nursing officer at Chicot Memorial, over interactive video before the first nurse visited. This meeting helped clarify goals and expectations. After the first week, Salazar and Rogers both reported positive experiences with the partnership. As one nurse from UAMS said, "We should do this more often. This is wonderful!"

UAMS is unique within the state for the acuity and number of cases seen. Supporting nursing continuing education, and ultimately the health and safety of patients, is a positive step for Arkansas.

TalkingTelemedicine

Lowery has a national discussion about Arkansas' story

Curtis Lowery, M.D., director of the UAMS Center for Distance Health, was one of four panelists from across the United States invited to discuss telemedicine on January 16, 2013 at the Brookings Institution in Washington, D.C. He was chosen due to the Center's role in building the state's e-Link telemedicine network. Arkansas e-Link, led by UAMS, is using high-speed data transmission lines to connect 413 community institutions for videoconferencing between medical professionals, patients and doctors, and others along with the real-time exchange of patient data and readings.

"Applying technology in a meaningful way is how we change the world," Lowery said.

Larry Strickling, administrator of the National Telecommunications and Information Administration, praised the UAMS Antenatal and Neonatal Guidelines, Education and Learning System (ANGELS) program, which gives women with high-risk pregnancies access to genetics counselors and maternal-fetal medicine specialists who can monitor them and conduct live fetal ultrasounds from hundreds of miles away.

Roughly one quarter of 450 mothers and babies in the practice of a Mena obstetrician have received at least one telemedicine ultrasound through ANGELS and e-Link.

"For these women, the ANGELS program means they don't have to drive hours to get the care they need," Strickling said.

During the panel discussion, Lowery told the Brookings audience that UAMS' goal with e-Link has been to shorten that distance and ensure that no Arkansas resident is more than 60-90 miles from a facility with a connection to the network. It also allows specialists to reach out through the high-tech links at those facilities in a state where specialists in many areas are in short supply.

"Applying technology in
a meaningful way is how
we change the world"



The resurrection of an older medical practice helped a UAMS professor bring a baby boy into the world after being considered high-risk for her third pregnancy.

Karen H. Kim Yeary, Ph.D., an associate professor in the UAMS Fay W. Boozman College of Public Health's Department of Health Behavior and Health Education, sought prenatal care with Paul Wendel, M.D., a maternal-fetal medicine specialist at UAMS, due to a history of two preterm deliveries and

High-Risk Pregnancies Benefit From Drug

By Steven Savage

advanced maternal age. Yeary said she went to Wendel because her history of preterm delivery and heard he was one of the best regarding high-risk pregnancies.

"In my first meeting with Dr. Wendel, I was alarmed when he likened my body to an old car with broken parts, but it was exactly what I needed to hear," Yeary said. "I think I was in denial about the seriousness of my condition, and thought that I wouldn't have to do that much more to have a successful pregnancy."

Wendel suggested using progesterone injections. The medication known as 17P (17-alpha hydroxyprogesterone caproate) was an older idea that was reintroduced in 2011 and supported by the American Congress of Obstetricians and Gynecologists for women with a prior spontaneous preterm delivery of a newborn.

In addition to the medication, Wendel suggested that Yeary reduce her stress levels. She was later put on modified bed rest near the end of her pregnancy.

"I needed someone to convince me to change my life for the benefit of my child and I'm very grateful Dr. Wendel was my child's advocate from the very beginning," Yeary said. "He not only showed

compassion for Caleb, but also for me as my pregnancy progressed and the strains of bed rest wore on my psyche.”

Advanced maternal aging puts a pregnant woman at risk for preeclampsia, gestational diabetes and having a baby with Down syndrome, none of which Yearly experienced. In fact, Yearly was in excellent physical health.

Yearly delivered her baby at 34 weeks gestation, the furthest she made it in any pregnancy. Her delivery did not have any complications. Caleb only stayed in the NICU for seven days.

“Because of Dr. Wendel and his amazing team, my pregnancy with Caleb was the longest and most successful pregnancy I ever had — not too shabby for an old, broken car like me,” Yearly said.



*Karen and Mark
Yearly with their
three children,
Madilynn, Caleb
and Isaac.*

Access to Key Premature Birth Drug Improved

As of February, UAMS and ANGELS can now use 17P (17-alpha-hydroxyprogesterone caproate) with pregnant women insured by Medicaid who may be at risk of premature birth.

UAMS has begun a pilot project within the UAMS OB clinic where obstetricians and APRN providers are working through a risk assessment with their pregnant patients. If a patient is at risk for a premature birth, then she may be able to receive 17P. An expectant mother taking the drug must come in once a week for an injection of 17P. The injections start in the 16th week of pregnancy and continue through the 37th week.

A registry of patients receiving 17P through the UAMS Women's Clinic will track their health outcomes for the following three years.

Previous studies of 17P have raised some questions about its effectiveness while others have shown it to be helpful for women at risk of premature birth.

“We will be able to see if it really works,” said Tina Benton, ANGELS program director. “That’s what we want to know.”

ANGELS' BIOGRAPHIES

Rosalyn Perkins, APN

“ANGELS has helped me perform my job better through relationship building,” said Rosalyn Perkins, APN. “Due to telemedicine, patients who cannot afford to come to Little Rock for high-risk prenatal care can be co-managed locally.”

Perkins is director of operations for the ANGELS program. She is responsible for establishing and maintaining telemedicine clinical programs and provider relationships

around Arkansas. She also facilitates telemedicine as an advanced practice nurse. She said before ANGELS, patients would have to drive two-to-four hours to Little Rock to receive prenatal care.

“I have formed relationships with many providers around the state, which has afforded me resources to make provider and patient connections that would have been difficult to arrange years ago,” Perkins said.

The Little Rock native came to UAMS in 1994. “My mother had a stroke and my sister and I had to change our work hours to alternate caring for her,” Perkins said. “Thankfully, our mother recovered 98 percent.”

Perkins credits her involvement with ANGELS to following “great leaders,” including Curtis L. Lowery, M.D. and Tina Benton. She said her role in ANGELS success has evolved from being flexible and steadfast while understanding the vision of providing health care to people where they are. She hopes to see ANGELS grow bigger and better and to assist other specialties and sub-specialties in Arkansas and abroad.

“ANGELS has helped me perform my job better through relationship building”

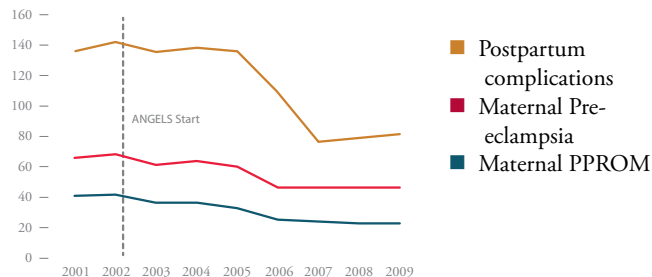


Evaluation and Research

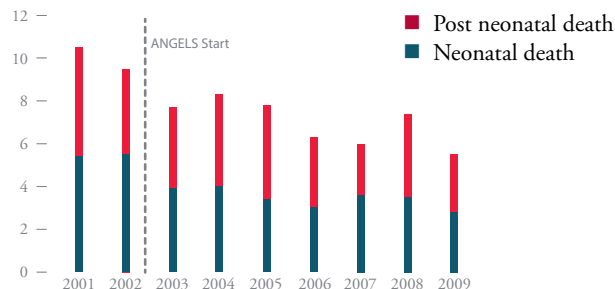
A major initiative of the evaluation and research team this year was to create a dashboard of standard metrics that could be calculated on an annual basis to highlight trends in maternal and newborn care since the implementation of the ANGELS program.

Included in this data was an examination of maternal complications in the Medicaid population. As the graph below illustrates, pregnancy complications decreased significantly within the Medicaid maternity population after implementation of the program.

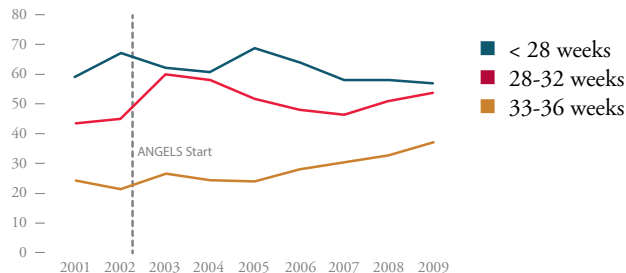
Maternal Complications per Thousand - Medicaid Maternity Population



The dashboard data also included neonatal mortality data. As displayed in the graph above right, neonatal and post-neonatal mortality rates per thousand have decreased in the time period in which ANGELS has been in effect.



The data from the dashboard also highlighted that for infants delivered preterm but later than 28 weeks gestation, there was an improvement over time in the portion delivered in hospitals staffed by neonatologists, as depicted in the graph below.



Grants, Presentations, and Publications



David Fletcher, M.B.A.



Sarah Kinder, D.N.P., Ph.D., A.P.R.N.



Janet Bronstein, Ph.D.



Rachel Ott, B.A.



Laura Rakes, M.A.

Presentations

Curtis Lowery, MD. (2013 January 15) “Arkansas e-Link.” Panel, Brookings Institute, Broadband Technology Opportunities Program, Washington, DC.

Curtis Lowery, MD. (2013 April 2) “Using Technology to Provide Healthcare Across a Distributed Healthcare Network.” Grand Rounds Presentation: Wayne State University Medical Center, Detroit, MI.

Curtis Lowery, MD. (2013 April 2) “How to Use Technology in Practice.” Presentation to Faculty and Residents, Wayne State University Medical Center, Detroit, MI.

Curtis Lowery, MD. (2013 April 5) “Full Healthcare Integration Through Updated Payment Systems, Low-Cost Technologies and Multidisciplinary Caregivers.” Oral Presentation South Central Telehealth Forum, Little Rock, AR.

Sarah Rhoads Kinder, PhD, DNP, APN. (2013 April 9) “Implementing Patient and Family Centered Care in Your Facility.” Tuesday Noon conferences, Center for Rural Health, University of Arkansas for Medical Sciences, Little Rock, AR.

Sarah Rhoads Kinder, PhD, DNP, APN, and Angela Green, PhD, RN, APRN, NNP-BC, FAHA. (2013 April 19). “Impact of Web-Camera Viewing

of Neonates on Parent Stress, Anxiety, and Bonding.” Research Day, University of Arkansas for Medical Sciences, Little Rock, AR.

Curtis Lowery, MD. (2013 May 17) “Reforming OB-Perinatal Healthcare Using Distance Technology.” Oral Presentation: Central Advisory Council & Strategic Planning Meeting, Charleston, WV.

Curtis Lowery, MD. (2013 May 20) “Focused on Developing a Systemic Response to Healthcare Needs.” Keynote Speaker, 2013 Illinois Broadband Telemedicine Multi-State Summit, St. Louis, MO.

Curtis Lowery, MD. (2013 September 5) “ANGELS Telehealth Model for Women’s Health.” Grand Rounds, MD Anderson Cancer Center, Telemedicine and Telesurgery in Cancer Care Conference 2013, Houston, TX.

Curtis Lowery, MD. (2013 September 26) “Implications of the Levels of Care in Obstetrics and Neonatology.” Panel Discussion, 29th Annual Conference on Perinatal Care, Comprehensive Care from A to Zzzzzz. Little Rock, AR.

Sarah Rhoads Kinder, PhD, DNP, APN, and Beth Eaton, MA/CCC-SLP, FASHA. (2013 September 23) “Overview, Implications, Intervention and Prevention of Fetal Alcohol Syndrome in Young Children.” Arkansas Conference for Parenting Education and Home Visitation, Hot Springs, AR.

Curtis Lowery, MD. (2013 October 18) “The Effect of Meconium in Amniotic Fluid on the Lamellar Body Count Fetal Lung Maturity Test. “Discussant with Craig Towers, CAOG Annual Meeting, Napa Valley, CA.

Curtis Lowery, MD. (2013 October 21) “Health Behind Bars: The Affordable Care Act, Jails and the Media.” Panelist, 2013 Journalism Symposium on Correctional Health, New York, NY.

Sarah Rhoads Kinder, PhD, DNP, APN, and Erin Bush, BSN, MA. (2013 October 31) “Telehealth in Arkansas: What Nurses and APNs Need to Know.” Podium presentation, Arkansas Nurses Association Annual Conference, Rogers, AR.

Curtis Lowery, MD. (2013 November 14) “Translational Research with Proven Results in Reducing Health Disparities, with a Major Focus on Chronic and Communicable Diseases.” Panelist, 7th Annual National Conference on Health Disparities, St. Thomas, VI.

27th Annual Southern Nursing Research Society Conference, Little Rock, AR—February 27-March 2, 2013

Sarah Rhoads Kinder, PhD, DNP, APN. “Reaching the Unreachable: Interactive Video Strategies in Rural Research.”

Sarah Rhoads Kinder, PhD, DNP, APN, and Angela Green, PhD, RN, APRN, NNP-BC, FAHA. “Feasibility of Web-Based Surveys for Family Users of a Web-Camera System.”

Sarah Rhoads Kinder, PhD, DNP, APN. “Career Perspective – DNP/PhD.” Doctoral Pre-Conference.

American Telemedicine Association 18th Annual International Meeting & Trade Show 2013, Austin, TX—May 5-7, 2013

Curtis Lowery, MD. “Price Check Aisle 1: Selling Provider-Developed Telemedicine Products to Women.”

Curtis Lowery, MD. “Countdown 2014: Telemedicine Preparation in Meeting the Growing Medicaid Population.”

Tina Benton, RN, BSN, Curtis Lowery, MD and Brian Evans, MBA. “Countdown 2014: Telemedicine Preparation in Meeting the Growing Medicaid Population.”

Donna Williams, RN. “Reducing Urgent Care Visits through Second-Level Triage.”

Gordon Low, MSN, APN, and Wilbur C. Hitt, MD. “Bridging Gaps in Care: Using Colposcopic Telemedicine to Benefit Rural Women.”

Roy Kitchen, MBA. “From Big to Gigantic: Lessons Learned from a Statewide Telemedicine Expansion.”

Michael Manley, RNP, MNSc, Tina Butler, MNSc, WHNP-BC, APN, and Dustin Vance, TCAP. “Moving from Telehealth Provider to Telehealth Certifying Agency.”

Terri Imus, RN. “Telehealth Nursing Special Interest Group—Chair Presentation.”

Council of University Chairs of Obstetrics and Gynecology (CUCOG) Annual Meeting, Chicago, IL—May 7-8, 2013

Curtis Lowery, MD. “Price Check Aisle 1: Selling Provider-Developed Telemedicine Products to Women.” Successful Telemedicine Business Enterprises Panel.

Curtis Lowery, MD. “Countdown 2014: Telemedicine Preparation in Meeting the Growing Medicaid Population.”

Grand Rounds, University of Arkansas for Medical Sciences, College of Medicine, Department of Obstetrics and Gynecology, Little Rock, AR

Curtis Lowery, MD. (2013 July 24) “Payment for Health Care: What Does It Really Mean?”

Sarah Rhoads Kinder, PhD, DNP, APN. (2013 July 31) “Impact of Web-Camera Viewing of Neonates on Parental Stress, Anxiety and Bonding.”

Arkansas Student Nurses Association Annual Conference, Little Rock, AR—October 10, 2013

Sarah Rhoads Kinder, PhD, DNP, APN. (2013 October 10) “Web-Cameras in the Neonatal Intensive Care Unit Assisting with the Neonatal-Parental Connection.”

Sarah Rhoads Kinder, PhD, DNP, APN. (2013 October 10) “Career Planning After Nursing School: What Degree Fits My Needs?”

ONE Team Teleconference, Center for Distance Health, University of Arkansas for Medical Sciences, Little Rock, AR

Sarah Rhoads Kinder. (2013 April 12) “Facilitating Bonding in the New Mother and Father.”

Sarah Rhoads Kinder. (2013 June 21) "Updates from the 2013 AWHONN Convention."

**Health Resources and Services
Administration's Maternal Child Health:
Distance Learning – First Fridays
Webinars**

**Sarah Rhoads Kinder, PhD,
DNP, APN, John Richards, MA,
AITP, and Dorothy Cilenti,
DrPH, MPH, MSW.** (2013 May 3) "Distance Learning: Impact and Investments."

**Dorothy Cilenti, DrPH, MPH,
MSW, David Deere, MSW, MTh,
John Richards, MA, AITP, Sarah
Rhoads Kinder, PhD, DNP, APN.** (2013 March 1) "Interdisciplinary Professional Training and Systems Integration through Distance Learning."

**Sarah Rhoads Kinder, PhD, DNP,
APN, John Richards, MA, AITP,
and Dorothy Cilenti, DrPH,
MPH, MSW.** (2013 January 4) "Distance Learning: How to Improve Retention and Promote Evidence-Based Practice."

Publications

**Wyatt SN, Rhoads SJ, Green AL,
Ott RE, Sandlin AT, Magann EF.** Maternal response to high-risk obstetrical telemedicine consults when perinatal prognosis is poor. The Australian and New Zealand Journal of Obstetrics and Gynaecology. 2013 Oct;53(5):494-7.

**Muenssinger J, Matuz T, Schleger F,
Draganova R, Weiss M, Kiefer-Schmidt
I, Wacher-Gussmann A, Govindan
RB, Lowery CL, Eswaran H, Preissl
H.** Sensitivity of auditory spectral width in the fetus and infant: An fMEG study. Frontiers in Human Neuroscience. 2013 Dec 31;7:917.

**Sriram B, Wilson JD, Govindan RB,
Lowery CL, Preissl H, Eswaran H.** The effect of applying orthogonal projection technique in short window segments to obtain fetal magnetocardiogram. Conf proceedings of Engineering in Medicine and Biology Society (EMBC), 2013 35th Annual International Conference of the Institute of Electrical and Electronics Engineers (IEEE). 2013:421-4.

**Vairavan S, Govindan RB, Haddad
N, Preissl H. Lowery CL, Siegel E,
Eswaran H.** Quantification of fetal magnetoencephalographic activity in low-risk fetuses using burst duration and interburst interval. Clinical Neurophysiology. 2013 Dec 1, pii: S1388-2457(13)01202-9.

Rhoads Kinder SJ. Telehealth in Arkansas: What do nurses and APNs need to know? Arkansas State Board of Nursing Update. October 2013;17(5):23-4.

What's New

in 2014

- **Medical Center of South Arkansas, El Dorado**
- **UAMS South, Magnolia**
- **Baxter Regional Comprehensive Womens Clinic, Mountain Home**
- **Reduction of Arkansas' Infant Mortality Rate**

2013 was be a landmark year for Arkansas in its effort to reduce the state's Infant Mortality Rate (IMR). The Arkansas annual IMR has been higher than the U.S. average for many years. One step to decrease the number of infants dying before reaching their first birthday is to establish Arkansas's first state-designated levels of nurseries and neonatal ICUs (NICU). National and Arkansas data have confirmed that delivering mothers, less than 32 weeks gestation, have a 50 percent decrease in IMR, if the mothers can be transported to a Level III NICU facility before they deliver.

A committee of stakeholders interested in perinatal outcome was formed at the direction of Nathaniel Smith, M.D., director of the Arkansas Department of Health. This committee (Nursery Classification Committee) included leaders in Neonatology and from many organizations including the March of Dimes, the Arkansas Hospital Association, the Arkansas Medical Society, the Arkansas Department

of Health, Arkansas Department of Human Services, Arkansas Foundation for Medical Care, public and private insurance, as well as other medical organizations and interested parties concerned with perinatal outcome. This statewide committee was chaired by Jonathan Bates, M.D., CEO of Arkansas Children's Hospital and produced a report sent to Nate Smith, M.D., outlining the committee's specific recommendations. It is the opinion of this committee that Arkansas could save 20-25 babies lives every year by adopting the recommended guidelines. The Arkansas Department of Health, with the advice of the Nursery Classification Committee is moving forward with its partners in developing levels of care for nurseries and neonatal ICUs and ultimately, reducing the state's infant mortality rate.

- **Non-Stress Test Clinic**

The Non Stress Test (NST) clinic developed out of a need of high-risk obstetrical patients from southwest Arkansas managed by the UAMS Women's Clinic and the Arkansas Department of Health to receive weekly or twice-weekly antenatal testing in their local area.

There are some local health departments in southwest Arkansas that still manage pregnancies until term that need NST support.

With the collaboration between the ANGELS program, UAMS Southwest, and Wadley Prenatal Clinic, the first NST clinic was started at UAMS Southwest.

The ANGELS program appointment center is the entry point for referrals, while UAMS Southwest initiates the NST that is read by a designated UAMS provider. The disposition of the patient is related to the referring entity.

Any patient experiencing a non-reactive stress test is followed up immediately by the Wadley health care team.

- **Home Monitoring Project**

In 2014, ANGELS will be announcing the Home Monitoring Project for UAMS Postpartum Women with Preeclampsia. This project is for patients that are medically stable after delivery yet need further monitoring of their postpartum health. The goal is for the postpartum woman with preeclampsia to be able to care for herself at home with support from the 24/7 ANGELS Call Center staff.

The ANGELS staff will provide the woman with a home health-monitoring device(s) and train the patient how to monitor their postpartum health using the device(s). The woman is encouraged to ask questions, be involved in her care, and make decisions. Home monitoring equipment sends electronic vital sign readings back to the ANGELS Call Center. Triage nurses will receive an alert when vital signs exceed limits set by the doctor. Patients with alerts will be contacted by phone and triaged by the call center nurse. The patient's discharge from the hospital to home monitoring care is possible if her vital signs and symptoms are monitored closely by the patient with the aid of a home health-monitoring device(s) and the nurses at the ANGELS Call Center.



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



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