

# TEXAS FETAL CENTER E-NEWSLETTER

*W*elcome to the e-Newsletter from The Texas Fetal Center at the UTHealth Medical School, in collaboration with Children's Memorial Hermann Hospital.

Kenneth Moise, M.D. and Anthony Johnson, D.O., join Texas Fetal Center

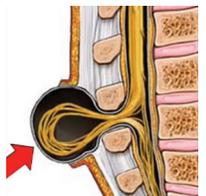
I walked into the first hospital ever chartered in the United States - Pennsylvania Hospital in Philadelphia. Seems Benjamin Franklin was a key figure in establishing the idea of a hospital in colonial America - he raised more than 2,000 pounds from private donors to match funds from the state. The charter was signed in 1751 and the first patients were admitted 2 years later. I walked down hallowed halls to find the medical library. No food or drinks allowed was displayed prominently on a kiosk outside the door. Made sense - there were copies of medical texts from Socrates and Plato inside glass cabinets that lined the room.



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Texas Fetal Center performs First In Utero Surgery for Myelomeningocele in Texas

For Colette and Ivan Hagler, the joys of pregnancy and the eager anticipation of parenthood were met fear and uncertainty as their soon-to-be born daughter, Faith, was prenatally diagnosed with spina bifida (myelomeningocele) at 20 weeks gestation. After her diagnosis was confirmed by a maternal-fetal medicine specialist in Dallas, the Hagler's were referred to the Texas Fetal Center to evaluate the risks and benefits of surgery, and became the first patients to undergo in utero repair of myelomeningocele in Texas.



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Ongoing Research Projects

Read about what we're working on for the advancement of maternal fetal medicine, including projects examining the use of tissue engineering to develop a method for sealing iatrogenic injury to the fetal membrane at the time of fetoscopy and the development of new treatment and diagnostic procedures.



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Upcoming Events

SMFM Annual Meeting  
The Pregnancy Meeting  
Feb. 6-11, 2012  
Hyatt Regency at Reunion  
Dallas, TX

2nd World Congress on Spina Bifida  
Research and Care  
March 11-14, 2012  
Cosmopolitan Hotel  
Las Vegas, NV

Prenatal Diagnosis and Therapy  
Conference  
June 3-6, 2012  
Loews Miami Beach  
Miami, FL

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## A New Year, A New Home

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The year was 1987 and I was a second year fellow in Maternal-Fetal medicine at Baylor College of Medicine in Houston. I was sent as the representative to the first annual Percutaneous Umbilical Blood Sampling (PUBS) conference. This was a new procedure that had only been introduced to the world of fetal medicine several years earlier - we were all novices. I walked another young fellow from Pennsylvania Hospital - he sat next to me and introduced himself - Tony. He was born in West Virginia and was now doing his MFM fellowship in the very hospital where we sat. Little did I know that this would be the start of a life-long friendship and professional collaboration.

We met in Phili every year after that. Between conferences, we did not have much time to keep up with one another - emails and cell phones were not yet on the horizon. The PUBS conference went on for a decade and then disbanded. The International Fetal Medicine and Surgery Society (IFMSS) became our annual meeting place. Our careers took separate paths. I became the Division Director of MFM at Baylor and later moved to the University of North Carolina in that same role. Tony went on to do a fellowship in clinical genetics at Thomas Jefferson and then went on to Boston. When I took the UNC position, Tony asked me if there was any chance of position for him there. We had talked often about our dream of working together. I was inheriting a Division with nine existing faculty so this seemed unlikely. I told him I would sort things out and get back to him. Three months went by and he decided to take a position as the Division Director of Clinical Genetics at Wayne State University in Detroit.

September 11, 2001 came and the IFMSS met outside of Krueger National Park in South Africa. I negotiated hard to have Tony leave Detroit and join me at UNC. It wasn't time yet for him to leave - he had just arrived and I had waited too long to get settled at UNC - another lost opportunity.

Two years later - another recruitment effort - things were not working out as well at Wayne State. He would be the director of a clinical genetics lab and head of the newly formed Fetal Intervention program at UNC. This time it worked - our dream of being professional colleagues was realized. A short time later, we were in Zermatt, Switzerland at the annual IFMSS meeting - a colleague from Paris presented a multi-center trial of laser therapy vs amnioreduction for the treatment of severe twin-to-twin transfusion syndrome (TTTS). Laser was clearly superior. Tony went to Europe for a month before he started with us at UNC. He ferried back and forth between Paris and Leuven, Belgium to watch cases of laser - he tells me it was the hottest summer on record in Paris, and there was no air conditioning there.

One month later, we started doing lasers for TTTS at UNC. The first cases were not easy - we were still on a learning curve. Then there was a change in the chairman of the department - the support we had been receiving for expanding the fetal intervention program melted away. It was time for a change. Tony headed north of the Mason Dixon line to talk with centers in Chicago and Pittsburg; I called Houston.

Texas Children's Hospital (TCH) was interested but we would have to convince them as to the value of the new fetal program. We moved to Houston and established a successful referral base from all over the Southwest part of the United States. Patients even came from as far away as Alaska and Oregon. Five years later and with over 300 lasers under our belt, it was once again time for a change. The vision at TCH was now different. Would our 25-year dream of developing a comprehensive Fetal Center for the treatment of the unborn go unrealized? Things were changing in the Houston MFM landscape.

The chairman at UT Medical School was changing and Children's Memorial Hermann Hospital had a vision for an expanded Fetal Center. The time was ripe for another move - hopefully the last of our careers. In mid September, I found myself as a new employee of the state of Texas. We were accepted into our new position with open arms. The operating team was incredible. What took months to organize in our former shop happened in a matter of weeks.

Eight days after arrival to UT/Children's Memorial Hermann we were doing our first laser case. More importantly, there is a long-term vision here for the Texas Fetal Center. We have partnered with the spina bifida clinic of Shriners' Hospital to counsel patients that are considering open fetal surgical repair of myelomeningocele. More importantly, they are committed to the long-term follow-up of these children. The Department of Pediatric Surgery here at UT has developed a Good Laboratory Practices (GLP) lab for processing stem cells for human use and has several FDA-approved clinical trials already underway. We will be working in collaboration with the stem cell center to develop new strategies for tissue engineering and stem cell therapy for a variety of fetal conditions that can now be detected in utero.

Clearly, Tony and I have landed in a great place where we can continue our contribution to the care of the unborn.



***Kenneth J. Moise, Jr., M.D.***

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*Professor, Department of Pediatric Surgery and Obstetrics, Gynecology and Reproductive Sciences*

*UTHealth Medical School*

## First Fetal Surgery for Spina Bifida in Texas

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For Colette and Ivan Hagler, the joys of pregnancy and the eager anticipation of parenthood were met with fear and uncertainty as their soon-to-be born daughter, Faith, was prenatally diagnosed with spina bifida (myelomeningocele) at 20 weeks gestation. After Faith's diagnosis was confirmed by their maternal-fetal medicine specialist in Dallas, the Haglers were quickly referred to the Texas Fetal Center at Children's Memorial Hermann Hospital and the University of Texas Health Science Center at Houston for fetal repair of myelomeningocele.

After a 2-day consultation with the entire multidisciplinary fetal surgery team, Faith and mother were deemed to be excellent candidates for fetal surgery. After carefully weighing the benefits of surgery with the risks to mother and fetus, the Haglers became the first patients to undergo in utero repair of myelomeningocele performed in the state of Texas. The successful surgery was followed by an uncomplicated pregnancy in which Faith was born approximately 9 weeks later.



On the heels of the landmark NIH-sponsored Management of Myelomeningocele (MOMS) trial (conducted by the University of California, San Francisco, Children's Hospital of Philadelphia, and Vanderbilt Medical Center) which demonstrated significant benefits for children that underwent fetal surgery compared to conventional care, the Texas Fetal Center began offering this therapy in February of 2011.

Today, the Texas Fetal Center continues to evaluate and treat patients that meet surgical criteria with an emphasis on educating our families on the disease as well as living life with a child with spina bifida. Each family undergoes extensive diagnostic testing and a 2-day consultation where they meet the maternal-fetal medicine specialist, pediatric surgeon, pediatric neurosurgeon, neonatologist, anesthesiologist, as well as the child life specialist and spina bifida specialists that provide long term care.

The Center is dedicated to the highest care possible by practicing evidence-based medicine and providing an experienced team of fetal myelomeningocele specialists. The fetal surgery team at the Texas Fetal Center consists of fetal surgeons with extensive previous fetal myelomeningocele repair experience (10 operations prior to the MOMS trial) and fellowship training at the University of California, San Francisco (lead institution in the MOMS trial) as well as maternal-fetal medicine specialist who has counseled over 100 patients during the MOMS trial at the Children's Hospital of Philadelphia. In addition, the Center has partnered with the spina bifida program at the world-renowned Shriners' Hospital for Children in Houston to provide the most comprehensive and state-of-the-art long term care for all children with myelomeningocele.

To learn more about fetal myelomeningocele repair and the fetal surgery team at the Texas Fetal Center, please visit our website at <http://childrens.memorialhermann.org/Services/Spina-Bifida/>



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## Ongoing research projects

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Development of a minimally invasive method for closure of myelomeningocele (MMC). The Center has partnered with bioengineers at the University of Utah to study the use of an underwater glue derived from the sandcastle worm to fix a biocellulose patch over fetal spinal defects. The concept will be tested in an ovine model or MMC.

Development of an engineered tracheal balloon for the fetal treatment of diaphragmatic hernia. The Center has partnered with engineers from the Oak Ridge National Laboratory to develop a special balloon containing an actuatable valve that could be placed in the fetal trachea to allow the cyclic egress of pulmonary fluid in an effort to treat the pulmonary hypoplasia associated with diaphragmatic hernia. The concept is undergoing testing in an ovine model.

Evaluation of amniotic fluid derived mesenchymal stem cells to produce autologous engineered tissues for the correction of fetal structural congenital anomalies. The Center has partnered with the Stem Cell Center at UT School of Medicine to assist in the development of an engineered diaphragm that could be used in the repair of congenital diaphragmatic hernia. In addition, the Center has partnered with bioengineers at Rice University to assist in the development of cardiac patch to repair congenital heart disease.

Use of tissue engineering to develop a method for sealing iatrogenic injury to the fetal membranes at the time of fetoscopy. The Center has partnered with a bioengineer at the University of Utah and an ophthalmologist in Florida to study the use of decellularized human fetal membranes as a tissue bridge to promote healing of the entry site at the time of fetoscopy. In vitro work has been promising. A swine model is being used to study the concept in collaboration with researchers at Texas A&M.