

# MIDWEST FETAL CARE CENTER

The region's leader in the diagnosis and treatment of congenital conditions and abnormalities in unborn infants.



Children's  
MINNESOTA

Allina Health

# OVERVIEW

Midwest Fetal Care Center offers mothers with high-risk pregnancies and babies with complex conditions a continuum of care that is among the best in the nation. As the only advanced fetal care center in the Upper Midwest — and one of only a few in United States — Midwest Fetal Care Center brings together maternal fetal experts and the latest technology and treatments in a coordinated setting. From prenatal diagnosis and fetal treatment, to delivery, postnatal care and long-term follow-up, we are with our patients every step of the way. Our mission is to provide patients and families with an exceptional experience with the best possible outcome.

Located at The Mother Baby Center in Minneapolis, Minnesota, the Midwest Fetal Care Center is a collaboration between Children's Minnesota and Allina Health, bringing together a comprehensive team of maternal, fetal, neonatal and pediatric experts.

## Services

From evaluation and diagnosis to fetal surgery and follow-up care, Midwest Fetal Care Center offers mothers and babies the highly trained experts and cutting-edge technology they need in one convenient location. Through our concierge care model, we communicate every step of our care plan to both patients and referring physicians, ensuring everyone is apprised of progress.

### Diagnostic services

#### Ultrasound

- 1st trimester ultrasound
- Comprehensive/targeted ultrasound
- 3-D and 4-D ultrasound for specific abnormalities
- Nuchal translucency–1st trimester screening

#### Fetal MRI

#### Fetal echocardiography

### Invasive diagnostics

- Chorionic villus sampling (CVS)
- Fetoscopy
- Fetal blood sampling (PUBS)
- Amniocentesis

### Fetal interventions

Our care for babies who have potentially life-threatening conditions includes these fetal therapies:

- Fetoscopic laser ablation therapy for twin-to-twin transfusion syndrome (TTTS)
- Fetal shunt placement
- Amnioreduction
- Fetal transfusion
- Ex-utero intrapartum treatment (EXIT)
- Open fetal surgery (OFS)
- Fetoscopic myelomeningocele repair

### Concierge care model

Our care team helps each step of the way:

- Fetal care coordinators provide initial contact and planning of multi-specialist consultations
- Patient-dedicated perinatal social workers are a continual point of contact to support families from pregnancy through neonatal care
- Same day and ongoing communication with referring physicians





## PROVEN EXPERTISE

### At a glance

We offer one of the **most comprehensive approaches** to fetal care. The fetal care program is a collaboration between Children's Minnesota and Allina Health. Top-tier physicians and surgeons develop comprehensive care plans to treat patients from the surrounding five-state region and beyond.

We have the **highest-trained experts** at hand. Our fetal surgeons acquired training from world-renowned experts in fetal surgery. This advanced training makes the Midwest Fetal Care Center one of only a small number of centers in the U.S. to offer diagnosis and treatment options like in-utero fetoscopy and fetal myelomeningocele repair (in-utero repair of spina bifida).

We are recognized for our **national leadership**. Midwest Fetal Care Center is part of the North American Fetal Therapy Network (NAFTNet), an association of medical centers with proven expertise in fetal surgery and other fetal services. Our fetal specialists are active in national fetal therapy associations and have been published in peer-reviewed medical journals.

Our specialists **collaborate**. All of the caregivers with specialized training and experience in treating mothers and babies with fetal conditions meet regularly to discuss and review patient cases. Our team approach helps drive exceptional outcomes and an unparalleled care experience.

**Our facilities are second-to-none** in one location. We perform our fetal interventions and surgeries at The Mother Baby Center, which combines Abbott Northwestern Hospital's fetal, labor and delivery services with the Children's Minnesota neonatal program. No matter what level of care is needed, we have the best mother and baby experts in one spot, available 24/7.

# CONDITIONS

Experts at Midwest Fetal Care Center are trained to treat any and all types of conditions that affect high-risk moms and their unborn babies.

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- Abdominal wall defects
- Amniotic band syndrome
- Cleft lip and cleft palate
- Cloacal exstrophy
- Club foot
- Congenital diaphragmatic hernia (CDH)
- Congenital heart disease
- Congenital lung malformations
- Congenital high airway obstruction (CHAOS)
- Craniosynostosis
- Fetal tumors
- Gastrointestinal disorders
- Genetic conditions
- Genitourinary problems
- Hydrops fetalis
- Immune and non-immune hydrops fetalis
- Multiple pregnancy
- Micrognathia and agnathia
- Neck masses
- Neurologic disorders
- Oligohydramnios
- Polyhydramnios
- Skeletal dysplasia
- Twin-to-twin-transfusion syndrome (TTTS)
- Other twin-related conditions

## RESEARCH AND OUTCOMES

We are committed to improving outcomes for mothers and babies facing high-risk pregnancy. Research, combined with our high volume experience and utilization of evidence-based practices, is a large factor in our success.

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### Stats

- For babies who need fetal surgery, Midwest Fetal Care Center has among the highest survival rates and the lowest rates of post-operative complications.
- For premature babies requiring surgery, we have among the lowest rate of surgical complications in the nation.
- We have performed operative fetoscopy since 2008. From that time, our outcomes for twin-to-twin-transfusion syndrome TTTS are among the best in the nation.

### Associations

- International Fetal Medicine and Surgery Society (IFMSS)
- North American Fetal Therapy Network (NAFTNet)
- Fetal Heart Society

### Research

Midwest Fetal Care Center team is committed to advancing fetal care. Our fetal specialists are active in national fetal therapy associations and have been published in peer-reviewed medical journals. Members of our multidisciplinary care team regularly generate national research abstracts related to the clinical protocols/algorithms that we create.

We are advancing research and knowledge in the following areas, which correlate with our top diagnoses:

- Congenital lung lesions
- Congenital diaphragmatic hernia (CDH)
- Gastroschisis
- Single ventricle cardiac disease
- Twin-to-twin transfusion syndrome (TTTS)

## Baby Clara hasn't let spina bifida slow down her amazing development

In the fall of 2015, Nicole Carlin and her husband were overjoyed to learn they were pregnant with their second child. During the first few months of her pregnancy, Nicole felt good and things were progressing as expected. However, after her 16-week appointment, which included an ultrasound, Nicole knew something was wrong when the doctor called with results. Her doctor explained it appeared **her baby had spina bifida, which occurs in about one of 3,000 pregnancies in the United States each year.** Nicole and her husband were instructed to undergo additional tests at Midwest Fetal Care Center, a collaboration between Children's Minnesota and Allina Health, to confirm the findings and develop a treatment plan.



Nicole arrived at Midwest Fetal Care Center the day before Christmas Eve and doctors confirmed her unborn baby had myelomeningocele, a severe form of spina bifida. Over the next several weeks, Nicole talked to her care team and researched treatment options. Nicole's care team determined that she was an excellent candidate for a surgery to decrease and reverse some of the impact of spina bifida symptoms while the baby was still in-utero — a surgery that doctors perform routinely at only a few centers in North America.

Nicole was introduced to Dr. Joseph Lillegard, pediatric and fetal surgeon at Midwest Fetal Care Center. Dr. Lillegard explained that he was working to keep the family in the Twin Cities for surgery, and a few weeks later, called Nicole to tell her they could do the surgery at the Midwest Fetal Care Center. An extensive group of specialists, including teams for mom and baby — approximately 20 clinicians and nurse specialists — is needed to perform open fetal surgery and care for mom afterwards.

The fetal surgery was scheduled for Feb. 10, 2016, at 25 weeks gestation. The complex procedure involves placing the mom and fetus under general anesthesia so that both can be operated on simultaneously. A lower abdominal incision was made on Nicole, much like a Cesarean-section incision, and with some dissection, the uterus was exposed. After using medications to relax the uterus, the surgical team used ultrasound imaging to make a safe incision into the uterus, exposing the unborn baby. With the baby's spine in view the team closed the skin and special layers of her spinal cord, thereby stopping the injury to the exposed nerves. At the completion of the two-hour surgery Nicole was safely wheeled to her recovery room with her unborn baby still inside her womb recovering from the big day. The surgery was complete and all were safe.

Following the surgery, the priority was for Nicole to make it to 36 weeks gestation, when a planned C-section would be performed to deliver her baby. Immediately after the surgery Nicole spent a week in the hospital and then two weeks at home on limited activity, followed by moderate rest leading up to the due date.

After 36 weeks gestation, Clara Carlin was welcomed into the world at The Mother Baby Center. Nicole was nervous about the birth, but knew she was in good hands with her team of doctors and other clinicians from Children's Minnesota and Allina Health. Nicole and her husband fondly recall briefly holding their new baby before she was taken to the Children's Minnesota neonatal intensive care unit (NICU) for monitoring.

During Clara's time in the NICU, Nicole met with the multidisciplinary team of experts that would treat Clara throughout her journey to explain the treatment plan and answer questions.

**Clara's care team includes her fetal surgeon, neurosurgeon, neonatologist, urologist, orthopedic surgeon and physical and occupational rehabilitation specialists. This well-integrated care team works with Clara and her family on physical and neurological development and will treat any remaining symptoms resulting from her spina bifida.**

Today, Clara is healthy, happy and doing well. Many of the major complications related to spina bifida seem to be reduced or reversed. She has no significant hydrocephalus and has not needed a shunt. She moves her legs well with good sensation to her lower extremities and is able to empty her bladder and stool without any major problems. It is still early for Clara, but her care team hopes that she will continue to be like many children who undergo fetal surgery for spina bifida and have a chance at enjoying the great experiences of life without many of the debilitating effects of this devastating disease.



# MEET THE TEAM

The Midwest Fetal Care Center (MWFCC), a collaboration between Allina Health and Children's Minnesota, brings together a multi-disciplinary team of highly trained maternal-fetal medicine experts from Allina Health and pediatric and neonatal specialists from Children's Minnesota.

Our comprehensive team works together to coordinate all aspects of your care from diagnosis to postoperative recovery and long-term follow-up. This collaboration allows us to create coordinated care plans that foster exceptional outcomes.

## Leading the team

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**Saul Snowise, MD**  
Medical Director  
Maternal-Fetal Specialist  
Lead Fetal Interventionist



**Lisa Howley, MD**  
Director of Fetal Cardiology  
Pediatric and Fetal Cardiologist



**Joseph Lillegard, MD, PhD**  
Research Director  
Pediatric Surgeon  
Fetal Surgeon



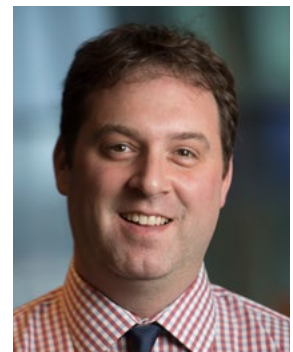
**James Fisher, MD**  
Assoc. Research Director  
Pediatric Surgeon  
Fetal Surgeon



**Clifton Brock, MD**  
Maternal-Fetal Specialist  
Fetal Interventionist



**Andrea Lampland, MD**  
Neonatologist  
Neonatal Director



**Kyle Halvorson, MD**  
Neurosurgeon

To view the full team, visit [www.childrensmn.org/fetal](http://www.childrensmn.org/fetal)

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## Twin to twin transfusion syndrome success story

*"When my husband and I went in for our first ultrasound, we saw twins," said Kathy. "I started laughing. My husband, John, sat there in shock."*

Kathy, a nurse herself, was over 40 and because she was carrying two babies, was sent to a maternal fetal medicine specialist with expertise in high-risk pregnancies, Dr. Peter Van Eerden at Sanford Health in Fargo.

Dr. Van Eerden monitored Kathy closely with an appointment every week. Because the babies shared one placenta, but had two amniotic sacs, it was possible they would develop twin to twin transfusion syndrome (TTTS) — a condition when the blood flow between the babies becomes unbalanced, and one baby donates blood to the other. This causes the donor twin to become dehydrated and experience slow growth, while the recipient baby risks heart failure due to the extra volume of blood.

Dr. Van Eerden tracked the babies' growth, fluid and blood flow, and diagnosed TTTS as well as Twin Anemia Polycythemia Sequence (TAPS), a rare form of TTTS that occurs when there is an imbalance in red blood cells and hemoglobin between the twins in the womb, causing the donor baby to become anemic and both babies to become very sick.

### A trusted partnership

Throughout Kathy's care, Dr. Van Eerden consulted with Dr. Saul Snowise, a fetal surgeon and maternal fetal medicine specialist at the Midwest Fetal Care Center — a collaboration between Children's Minnesota and Allina Health, and one of the few advanced fetal care centers in the Upper Midwest. The two physicians regularly partner together on high-risk pregnancies.

At 22 weeks, Kathy and John followed the advice of the doctors and drove from Fargo to Minneapolis for in utero laser surgery at the Midwest Fetal Care Center. "As a nurse, I was so impressed by the interdisciplinary approach. I felt so well taken care of," said Kathy. "Our care coordinator walked us through everything, and Dr. Snowise and a pediatric cardiologist answered all of our questions. As Dr. Snowise discussed the procedure with us, he could see we were nervous. I remember him looking us in the eyes and saying, 'I got this.'"

### Two heartbeats

Kathy was taken to the operating theater and put under mild sedation. Dr. Snowise performed the laser surgery, sealing the blood vessels that were contributing to the abnormal flow of blood between the babies. She and John knew the first 24 hours after surgery presented the highest risk for the babies,



so when she didn't feel one of the twins move all night, she worried. But early the next morning, Dr. Snowise returned with the ultrasound machine, confirming two heartbeats. They were all ecstatic.

*"Shortly afterward I walked outside to get the car," said John, "Dr. Snowise drove past, giving me an enthusiastic thumbs up. I knew our boys were going to be okay."*

### A very special delivery

Back in Fargo, Kathy's water broke at 29 weeks. She was admitted to Sanford Medical Center where she spent two weeks on bedrest under the care of Dr. Van Eerden. At 31 weeks, Kathy went into labor, delivering babies Cian and Rory via c-section. "We knew they would intubate Cian because of his heart," said Kathy. "They ended up intubating Rory, too."

Kathy and John shared their fears over Cian's chance for survival. "We didn't know what would happen to his heart when he was no longer connected to me," Kathy said. "But he's a fighter! He was on an IV heart medication for less than a week. His heart kept getting stronger."

Six weeks after birth, the brothers were discharged from the NICU on the same day joining their sister, Zoe, at home. Today they are strong, happy boys, meeting their developmental milestones.

Reflecting on the past two years, Kathy says she's grateful for the partnership between Dr. Van Eerden and the MWFCC. Their teamwork allowed her to receive fetal specialty care close to home in Fargo for the majority of her pregnancy, and fetal surgical care in the Twin Cities when it became necessary. "From diagnosis through delivery and beyond, Dr. Van Eerden and Dr. Snowise are why I have two healthy boys today."



## **MATERNAL FETAL**

For 24/7 assistance with maternal fetal consultations, referrals or admissions:

**855-MWFETAL**

(855-693-3825)

MWFetalCare@allina.com

midwestfetalcarecenter.org

## **PEDIATRIC/NEONATAL**

For 24/7 assistance with pediatric or neonatal consultations, referrals, admissions and transport:

Children's Minnesota Physician Access

**866-755-2121**

Services provided by Abbott Northwestern Hospital

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