



Spina bifida is a congenital defect consisting of an opening in the spinal column. The most severe form is called myelomeningocele. Most children with this birth defect survive, but can be left with many disabilities, including paralysis, difficulty with bowel and bladder control, Chiari II malformation, hydrocephalus (excessive fluid in the brain), and learning disabilities. The higher the spinal opening occurs on the back, the greater the impairment.

### Treatment

Infants with myelomeningocele have always had surgery shortly after birth to protect the spinal cord by closing the normal tissues of the back. Often, a ventriculoperitoneal (VP) shunt was also placed to treat hydrocephalus. Due to the success of the MOMS Study, fetal surgery is now considered to be a treatment option for some cases of myelomeningocele.

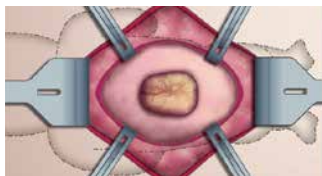
### What is the MOMS Study?

MOMS Study is a NIH-sponsored multicenter clinical trial evaluating the best treatment for myelomeningocele: fetal surgery or surgery after birth.

The trial results showed prenatal surgery significantly reduced the need to divert, or shunt, fluid away from the brain; improved mental development and motor function; and increased the likelihood for a child to walk unassisted. The trial proved some of the problems, like Chiari II malformation and hydrocephalus, develop during the second half of pregnancy. Repairing the defect early may allow some nerve function to be restored in pregnancy, and reverse the development of condition.

### Fetal Surgery

Prenatal repair of myelomeningocele involves a multidisciplinary team of fetal surgery experts. An incision, just large enough to repair the defect, is made in the mother's abdomen and uterus. This is much like a cesarean section but the fetus remains in the womb. The neural tube and other layers of the back are surgically closed by the neurosurgeon. After the procedure, the incisions in the mother are closed.



### Recovery

After surgery, patients will remain in the hospital for 4–5 days, cared for by skilled nurses with years of experience in fetal surgical care and the fetus will be monitored via ultrasound. Upon hospital discharge, the mother is required to stay locally for at least 10-14 days. Travel home is determined by the mother's condition and the availability of medical services.

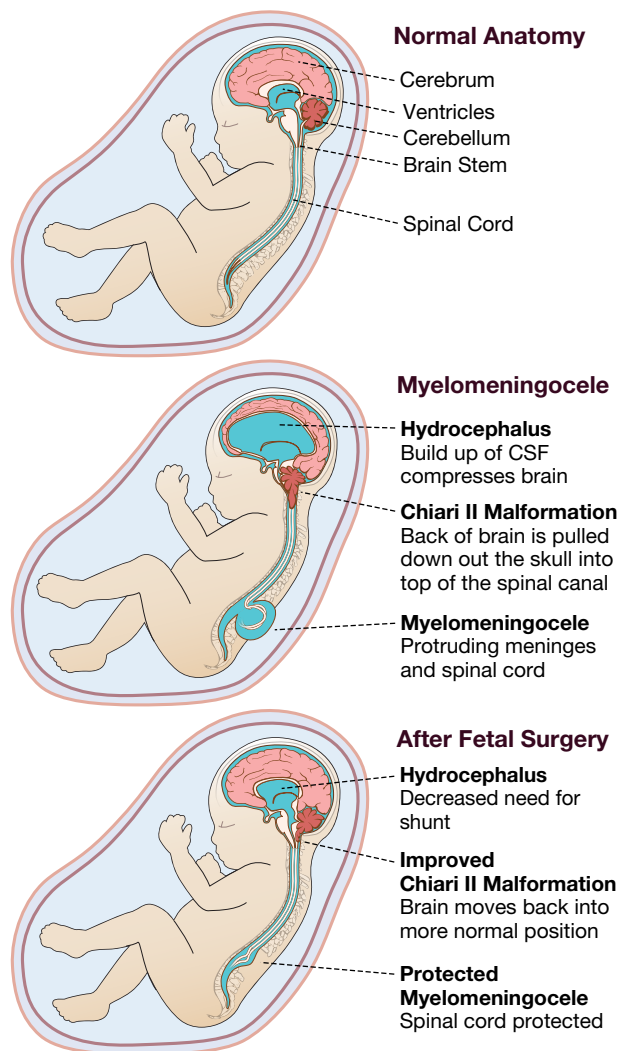
### Components of UCSF Evaluation

- » Level II anatomic survey for fetal anomalies
- » Fetal echocardiography for structural integrity and functional pathology
- » Fetal brain/spine MRI for presence and severity of Chiari II Malformation
- » Consultation with our multidisciplinary team: anesthesia, fetal surgery, neurosurgery, nursing, perinatology, neonatology, and social work

### How to Make an Appointment or Referral

Patients who wish to consider fetal surgery at UCSF for the treatment of spina bifida, and providers making a referral please call us at 1-800-RX-FETUS. Patient medical records should be faxed to 415-502-0660.

More info is available at: <http://fetus.ucsfmedicalcenter.org/spina-bifida>



### Inclusion Guidelines

- » Myelomeningocele defect must start between T1-S1 (may extend below S1)
- » Chiari II malformation by MRI
- » Normal fetal karyotype
- » Gestational age at referral between 19 to 26 weeks

### Exclusion Guidelines

- » Multifetal pregnancy (twins, triplets, etc)
- » Maternal contraindications to surgery or anesthesia
- » Morbid obesity
- » Kyphosis (curve in the spine) in the fetus  $\geq 30^\circ$
- » Other fetal problem not related to the spina bifida
- » Current or planned cerclage or documented history of incompetent cervix
- » Short cervix (< 20 mm)
- » Preterm labor in the current pregnancy
- » Placenta previa or placental abruption
- » Maternal-fetal isoimmunization
- » Uterine anomaly
- » Inability to comply with travel or follow-up