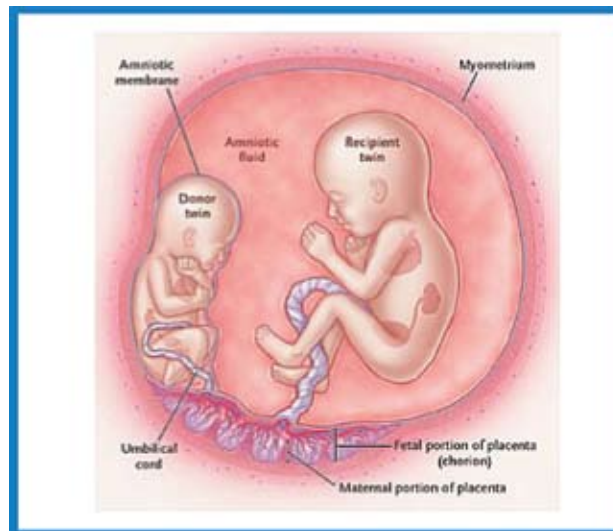


UNDERSTANDING TWIN-TWIN TRANSFUSION SYNDROME

CARMEN AND JOHN THAIN CENTER FOR PRENATAL PEDIATRICS

What is twin-twin transfusion syndrome?

Twin-twin transfusion syndrome (TTTS) occurs in mono-chorionic twin pregnancies. Mono-chorionic twins are identical twins that usually share a single placenta. In most of these placentas, there are blood vessels that connect the twins to each other in a balanced way. In TTTS, there is an unequal sharing of blood through these connecting vessels resulting in changes in regional blood flows and/or alterations in cardiac function in either or both twins. TTTS cannot occur in fraternal twins which have two placentas. Knowing the chorionicity or number of placentas in the pregnancy is very important in determining whether you should be monitored closely for TTTS. This should be determined by ultrasound as early as possible in the pregnancy.



Sperling and Tabor, 2001

In TTTS, there is a donor twin, which donates blood to the recipient twin. The donor twin tends to have little or no fluid around it, a small or invisible bladder, and is often smaller than its cotwin. The recipient twin has too much fluid around it, an enlarged bladder, and is usually larger in size. The recipients are often found to have cardiovascular changes in the later stages of TTTS. At birth, the donor twin is usually pale and anemic while the recipient twin is polycythemic (an increase in cell mass of the blood) and hypervolemic (an increase of fluid in the blood).

How common is TTTS and what causes it?

TTTS complicates 10-15% of mono-chorionic-diamniotic twin gestations. TTTS cannot be prevented. It appears to be the result of communications within the single placenta that result in unbalanced blood flow between the twins. However, there may be other reasons why some identical twins develop this condition and others do not. There are numerous studies underway investigating TTTS and interventions that may decrease the risk of progression of this condition.

How is TTTS detected during pregnancy?

Once a twin or multiple pregnancy has been diagnosed, it is essential to know the chorionicity or the number of placentas and amniotic sacs. If

twins are found to have one placenta, which is mono-chorionic, then you are at risk for developing TTTS. There are specific sonographic criteria for TTTS using the Quintero staging system:

- Stage I: Low fluid in donor twin sac (<2 cm) and increased fluid in recipient twin sac (>8 cm)
- Stage II: Bladder in donor twin not visible, normal blood flow studies
- Stage III: Abnormal blood flow studies in the umbilical artery, umbilical vein, or ductus venosus
- Stage IV: Hydrops (excess fluid in the body cavities) of one or both twins
- Stage V: Demise of one or both twins

Depending on the stage of TTTS, you may be offered different management options which range from observation to in utero placental laser surgery.

How will my pregnancy be managed now that TTTS has been detected?

Any pregnancy diagnosed with TTTS needs to be monitored closely for changes and progression of the disease. The current guidelines at NewYork-Presbyterian Morgan Stanley Children's Hospital/Columbia University Medical Center are for weekly ultrasounds to assess the twins. Fetal echocardiography to evaluate heart function and anatomy is (continued on next page)

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How will my pregnancy be managed (continued)

recommended when TTTS is initially diagnosed. Follow-up echocardiograms will be needed to assess the cardiovascular status in the twins as the pregnancy advances. When TTTS is detected, consultation with a maternal fetal medicine specialist experienced in TTTS is offered. Management options and recommendations will be discussed thoroughly and may include any of the following:

- Expectant management
- Amnioreduction (remove the excess fluid around the larger twin which may promote comfort for the mother and decrease the risk of preterm labor)
- Laser photocoagulation of communicating blood vessels in the placenta (performed between 16-26 weeks gestation)
- Selective reduction of one twin to a singleton pregnancy
- Termination of entire pregnancy

For every option offered, a thorough explanation of potential risks and benefits will be discussed as well as support for all decisions made. These recommendations are individualized based on the condition of the twins and your specific situation. The Maternal-Fetal medicine specialists are here to guide you in making whatever decision is right for you and your family. If you opt for the laser procedure, a MRI to assess the fetal brains is also recommended 3-4 weeks post-procedure.

How will TTTS be treated after birth?

The effects of TTTS tend to improve after birth because the twins are no longer sharing a single placenta. Once the babies are born, they will need to be assessed by experienced neonatologists and pediatric specialists familiar with TTTS. There can be health concerns for the twins including low birth weight, complications of prematurity, and cardiac abnormalities, particularly in the recipient twin. The specialists at Morgan Stanley Children's Hospital are well prepared to care for twins affected by TTTS.

What is the long-term outlook for babies with TTTS?

Without intervention, the long-term outlook for twins with advanced stages of TTTS is poor with a perinatal mortality rate of 90%. Furthermore, of those who survive, there is a 15-50% risk of neurologic handicap. Treatment can improve survival of one or both twins to over 50% depending on the stage of the condition and has been associated with lower neurologic handicap. Survival and long-term outcomes are related to the severity of TTTS and the response to interventions undertaken.

What are the chances I could have another pregnancy with TTTS?

While some families may have another multiple gestation, the likelihood of another identical twin pregnancy affected by TTTS is low. Overall, the recurrence risk remains the same as it was in the initial pregnancy and should not be a reason to avoid future pregnancies if desired.

What can I expect from the specialists at Morgan Stanley Children's Hospital?

Morgan Stanley Children's Hospital is well-equipped to handle your pregnancy and the twin's care after birth. Morgan Stanley Children's Hospital has consistently been ranked one of the best pediatric hospitals in the country: our Maternal-Fetal Medicine specialists have extensive experience with TTTS as well as other complications of multiple pregnancies. Our NICU is one of the most advanced in the United States, and has been cited for its excellence and dedication to patient care.

The well-being of you and your twins are extremely important to everyone involved in your care. Together we are all dedicated to giving you the best pregnancy and healthiest outlook for your twins.

About the Carmen and John Thain Center for Prenatal Pediatrics

Complex pregnancies receive better care when specialists collaborate. The Carmen and John Thain Center for Prenatal Pediatrics is dedicated to helping pregnant women and their families when a birth defect or genetic syndrome is detected before the baby is born. The Center offers sensitive, complete, up-to-date information and testing, and an integrated approach to care that begins in the prenatal period and continues after birth with pediatric follow-up. A collaborative, coordinated program of care is created among specialists in perinatology, neonatology, genetics, pediatric cardiology, pediatric surgery and all pediatric subspecialties.