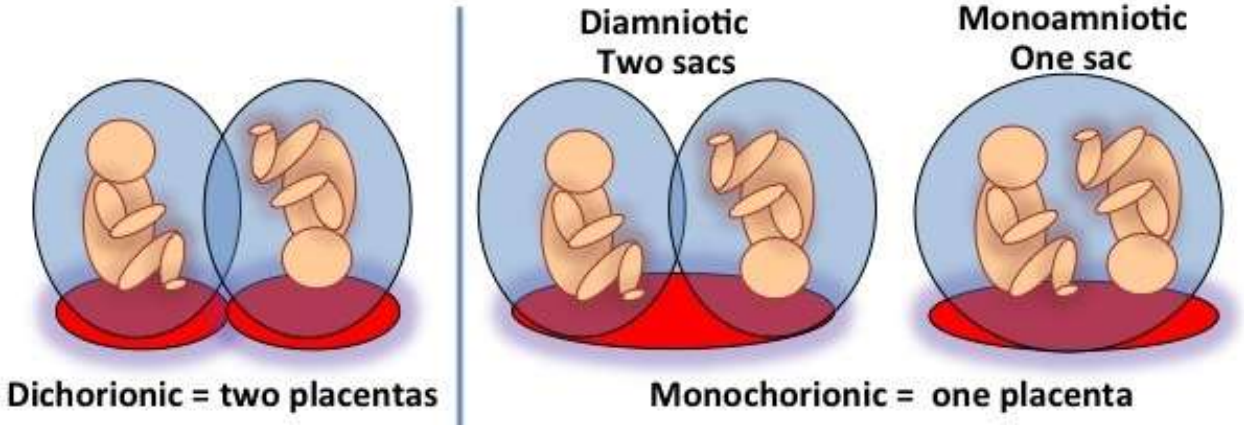
CENTER FOR FETAL THERAPY
The Johns Hopkins Hospital
600 North Wolfe Street, Nelson Building, Suite 228
Baltimore, MD 21287
Phone: 410 502 6561
Email: FetalTherapy@JHMI.EDU

JOHNS HOPKINS MEDICINE
Center for Fetal Therapy
Department of Gynecology and Obstetrics

Identical (monochorionic) twins
Important things to know

What is a monochorionic twin pregnancy?

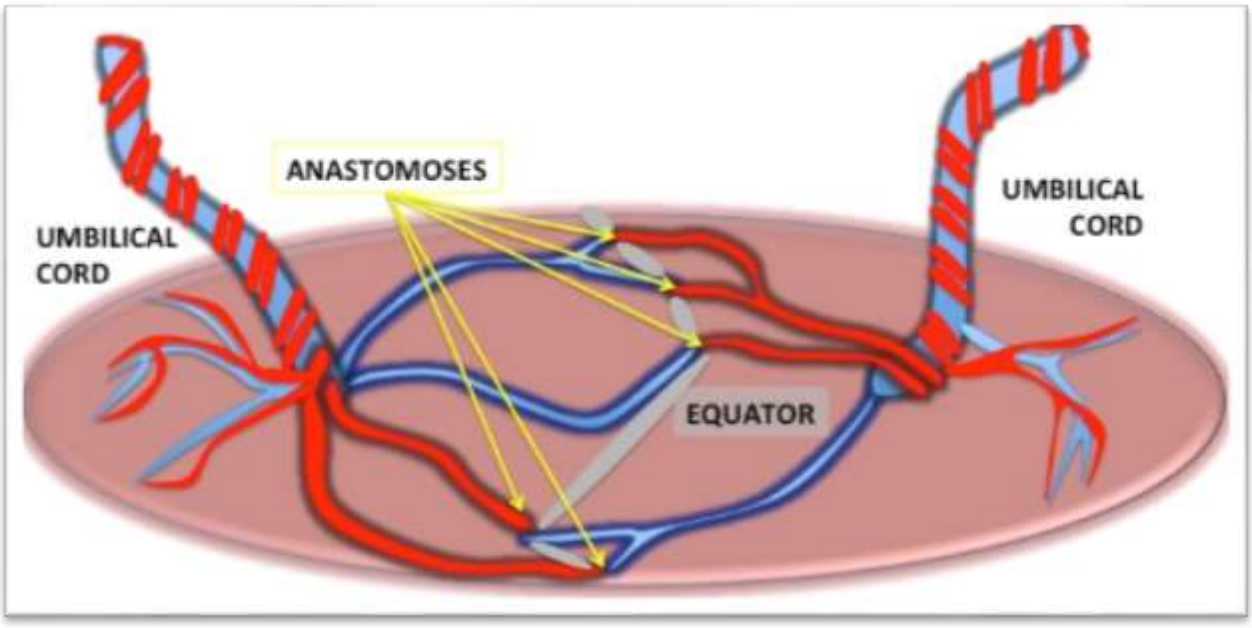
The placenta is the source of nutrients to the growing fetus. In a singleton pregnancy one fetus is in his own sac of fluid (amniotic sac) and is connected to the placenta through its umbilical cord. When there is more than one fetus, such as a twin or triplet pregnancy, two types of placentation are possible. Most commonly, each fetus has its own placenta - this is called dichorionic placentation. When both fetuses share one placenta this is called a monochorionic placenta. When there is a monochorionic placenta both babies may be in one sac – this is called mono-amniotic, or in two sacs (di-amniotic).



What makes monochorionic pregnancies special?

Because monochorionic twins share one common placenta there are certain complications that can only arise in these pregnancies. The complications that specifically arise in monochorionic twins are twin-twin transfusion syndrome (TTTS), selective intrauterine growth restriction of one twin (sIUGR), twin anemia polycythemia sequence (TAPS) and twin reversed arterial perfusion (TRAP). These complications occur because there are blood vessels that run on the surface of the placenta between the cord insertions of both babies. These connections are called anastomoses and it is the nature, type and location of these anastomoses that determines the risk for these complications.

The vessel connections can be between an artery of one baby and the vein of the other baby (AV anastomosis), between an artery from each baby (AA anastomosis) and between two veins from each baby (VV anastomosis). Because the blood pressure is higher in arteries AV anastomoses allow blood or volume exchange from one baby to the other, this is called unidirectional shunting. The direction of blood flow in AA and VV anastomoses depends on which baby happens to have the higher pressure in these vessels and therefore can fluctuate between one and the other side (bidirectional shunting). The area of the placenta where the blood vessels of both babies meet is called the vascular equator because it is the natural dividing lines between the portions of the placenta that belong to either baby. The position of the vascular equator determines the placental share of each baby.



What complications can arise from a monochorionic placenta?

Complications that can arise in monochorionic pregnancies are due to unequal sharing of blood, blood volume, of placental nutrients, or a combination of these. Unequal sharing of volume leads to twin-twin transfusion syndrome. When one baby also has a high blood count (polycythemia) and the other baby has a low blood count (anemia) this is called twin anemia polycythemia sequence or TAPS. When the position of the vascular equator results in unequal placental sharing one baby may develop intrauterine growth restriction (selective IUGR or sIUGR). Sometimes sudden large changes in blood pressure and blood flow between babies happen very early in pregnancy and affect the development of organs in one of the twins. Under these circumstances one baby may be normal and the other has a birth defect (discordant anomalies). In rare circumstances, the co-twin may die and the surviving baby continues to send blood to the dead co-twin. This is called twin reversed arterial perfusion or TRAP.

How can I find out if I have a complicated monochorionic twin pregnancy?

The first and most critical step in identifying risks for complications in multiple pregnancies is to determine whether the placenta is monochorionic. This is best done in the first twelve weeks of pregnancy (first trimester) by a prenatal ultrasound. The finding that identifies a monochorionic placenta with a high level of certainty is the so called “lambda sign”, an ultrasound finding that is found in monochorionic placentas. Once it has been determined that the placenta is monochorionic, detection of complications requires close attention to growth discordance, volume discordance, or discordant blood counts between fetuses. In addition, a detailed, and sometimes repetitive, assessment of the anatomy of both fetuses is required. This is done by advanced ultrasound techniques using high-resolution scanning, Doppler techniques and 3 dimensional imaging. Because the conditions can evolve, ongoing surveillance is required to detect deviations of the clinical course that may require specific therapy. The Center for Fetal Therapy has a twin screening program that predicts over 80% of complications before they manifest, therefore allowing early institution of management.