Multiple Gestations

Zygosity
Refers to how many ova are fertilized and implant

Monozygotic Twins
Arise from a single ovum and produce "true" or identical twins. When a single ovum is fertilized by a single sperm.
- Twins are always of the same gender.
- Occurs about 2 - 4 times per 1,000 pregnancies.
- Associated with increased complications

Placental Variations
A variety of placental and membrane combinations can occur in monozygotic twinning. The specific configuration is determined by the timing of the division of the embryonic disk and results in a varied number of placentas, chorionic membranes and amniotic membranes.

Dichorionic, diamniotic, double placenta (may be fused)
IDENTICAL TO DIZYGOTIC
results when division occurs before the morula stage (Day 5) and implantation-

Monochorionic, diamniotic, single placenta: MOST COMMON
Results when division occurs after differentiation of the amnion (5 - 10 days after conception)

Monochorionic, monoamniotic, single placenta: LEAST COMMON
Results when division occurs after differentiation of the trophoblast (days 10 - 14)

IF DIVISION OF THE CONCEPTUS OCCURS AFTER THE SECOND WEEK, CONJOINED TWINS RESULT.
**Dizygotic twins**

Always have two amnions, two chorions and two separate placentas. The placentas may be fused. As the sacs grow in size, the chorion levae and decidua capsularis become thin and the space between the sacs disappears.

Dizygotic twins arise from separate ova fertilized by separate sperm cells and produce "false" or fraternal twins.

- May be the same or different gender.
- Occurs about 1 in 83 conceptions.
- Some factors associated with dizygotic twinning include:
  - Recent cessation of long term oral contraceptives
  - Maternal family history of twinning
  - Maternal age 35 - 40 year old

**SONOGRAPHIC FINDINGS:**

- Can differentiate monozygotic from dizygotic in early pregnancy
- Presence of a "thick" membrane
- Identification of two separate placental sites

**CLINICAL SIGNS**

- Typical signs of pregnancy
- Earlier and more severe pressure problems in the pelvis such as hemorrhoids, constipation, backaches, difficulty breathing
- Increased fetal activity
- Increased uterine size
- Shortness of breath

**CLINICAL COMPLICATIONS ASSOCIATED WITH TWIN PREGNANCY:** The stress of multiple pregnancy can affect the maternal respiratory, gastrointestinal, renal and musculoskeletal systems.

*Maternal complications include:*

- Anemia
- Urinary tract infection
- Preeclampsia/eclampsia
- Prepartum hemorrhage

*Fetal complications may include:*

- Premature delivery
- Difficult delivery due to abnormal position
- Prolapse, entanglement or compression of an umbilical cord
- Hypoxia of the second twin due to premature separation of the placenta
- Growth retardation due to placental insufficiency
Vanishing twin
The resorption of a nonviable gestation that was previously demonstrated sonographically. May represent resorption of blood in the endometrial cavity related to implantation bleeding.

SONOGRAPHIC FINDINGS:
- Failure to demonstrate multiple gestations on subsequent sonograms
- Failure of sac growth in a twin
- Irregularly margined sac

Twin-twin transfusion syndrome
This serious condition occurs in monozygotic twins with a fused placenta and is also referred to as "cross-transfusion" or "third circulation". It results from an anomalous development of the vascular supply to each twin (artery to vein anastomosis). In its most serious form, significant artery to vein anastomoses shunt blood away from the donor twin to the recipient twin.

SONOGRAPHIC FINDINGS:
Donor twin
- Small for dates
- Oligohydramnios
- "Stuck twin" with empty bladder and restricted movement

Recipient twin
- Hydropic
- Ascites
- Enlarged liver, heart and kidneys
- Polyhydramnios

Twin embolization syndrome
The passage of thromboplastic material or blood clots from a dead monochorionic twin to the remaining live twin through shared intraplacental vasculature. Neurological, gastrointestinal or genitourinary deficits may result from infarction.
SONOGRAPHIC FINDINGS:
- Intrauterine death of co-twin
- Hydrops
- Polyhydramnios
- Ventriculomegaly, porencephaly, microcephaly
- Enlarged, echogenic kidneys

**Stuck twin (fetus papyraceous)**
The presence of a small, growth retarded twin an oligohydramniotic sac. May be the result of twin to twin transfusion syndrome. The restricted fetus has limited motion of the extremities.

SONOGRAPHIC FINDINGS:
- Twin pregnancy
- One twin in sac with normal fluid
- One twin in sac with oligohydramnios
- Restricted movement of "stuck" twin

**Conjoined twins (siamese)**
The incomplete division of a fertilized ovum between the 8th and 14th day results in conjoined twins. They are described by the site of union:
- Thoracopagus (chest) **MOST COMMON**
- Pygopagus (sacrum)
- Craniopagus (head)
- Omphalopagus (abdominal wall)
- Ischiopagus (pelvis)

SONOGRAPHIC FINDINGS:
- Movement in unison, no independent major movements
- Single thorax (thoracopagus)
- Grossly abnormal
- Fused abdomen (omphalopagus)
- Fused head (craniopagus)
**Acardiac twin (parabiotic twins)**

A bizarre malformation of monozygotic twinning in which a severely malformed twin is maintained by the normal twin. Perfusion is accomplished through two anastomoses, one vein to vein and one artery to artery. The non-viable usually does not have a heart (acardiacus) and would have been a simple first trimester twin death. Due to the increased cardiac burden on the pump twin, it is at risk for high-output congestive heart failure.

**PATHOLOGY:**
- Extremely limited upper body development
- Absence of head or, if present, small with holoprosencephaly
- Absent or hypoplastic thorax, cervical spine and arms
- Absent heart, lungs and abdominal viscera
- Dorsal, multiloculated cystic hygroma

**SONOGRAPHIC FINDINGS:**
- Polyhydramnios
- Absent membrane (monozygotic)

**Acardiac twin:**
- Demonstration of above pathology

**Pump twin:**
- Hydrops fetalis