



## 437 Team: Obstetrics and Gynecology

# Multiple Pregnancy

### Objectives:

- List the risk factors for multifetal gestation.
- Describe embryology of multifetal gestation.
- Describe the unique maternal and fetal physiologic changes associated with multifetal gestation.
- Describe the diagnosis and management of multifetal gestation.
- Describe the potential maternal and fetal complications associated with multifetal gestation.

### References:

- Kaplan USMLE step 2 CK - Obstetrics and Gynecology
- Online Meded videos
- Team 435

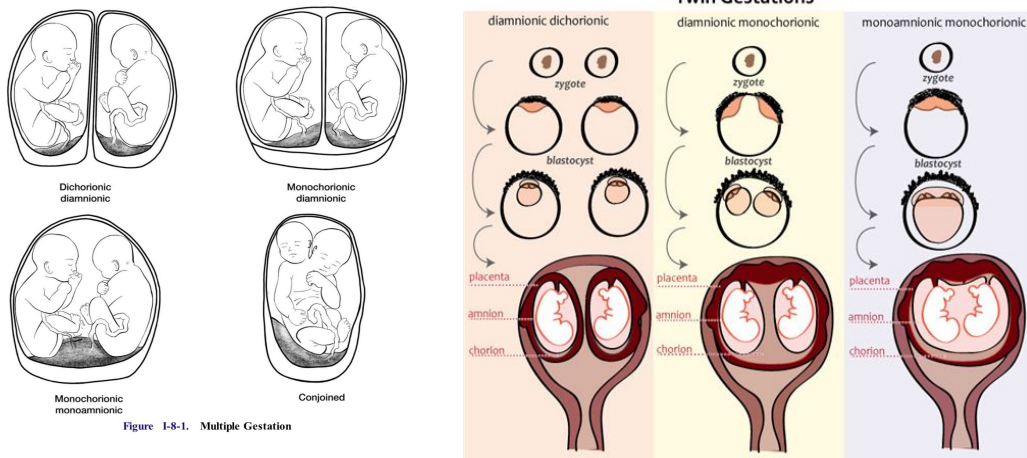
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# Definitions

- **Multiple gestation** is a pregnancy in which more than one fetus is present.
- The fetuses may arise from one or more zygotes and are usually separate, but may rarely be conjoined.



**Dizygotic (Fraternal) twins** arise from multiple ovulation with two zygotes. They are always **dichorionic, diamniotic**

**Splits of an embryo result in Monozygotic (Identical) twins** which arise from one zygote. Chorionicity and amnionicity vary according to the duration of time from fertilization to cleavage.

**Monozygotic (Identical) twins can be:**

**1) Di-di: Up to 72 hrs** (Separation up to the morula stage), There are two placentas and two sacs. This is the **lowest risk** of all monozygotic twins.

**2) Di-mo: Between 4-8 days** (separation at the blastocyst stage), There is one placenta and two sacs. It is the **most common** monozygotic = 69%.

**3) Mo-mo: Between 9-12 days** (splitting of the embryonic disk), There is only one placenta and one sac. This is the **highest risk** of all monozygotic twins.

**After 12 days**, conjoined twins result. Most often this condition is lethal.

Dichorionic–diamniotic	0–3 days Morula
Monochorionic–diamniotic	4–8 days Blastocyst
Monochorionic–monoamniotic	9–12 days Embryonic disk
Conjoined	>12 days Embryo

## Signs With multiple gestation

hyperemesis gravidarum is **common** due to :

- high levels of  $\beta$ - hCG.
- Uterus is larger than dates.
- Maternal serum  $\alpha$ -fetoprotein is excessively higher than with one fetus.

## Risk Factors

- Increased maternal age (>35) Multiparous
- FHx of twin
- Use of fertility drugs
- Hx of assisted technology "IVF" has a 30% risk.

Monozygotic twin > No identifiable risk factor.

Dizygotic twin ( **most common** ) > Race, Geography, FHx and Ovulation induction

"By **clomiphene citrate** has **10% risk** while **Menopausal gonadotropin** has **30% risk**".

What is the difference between Di-di and Di-mo under U/S? **imp**

Diamniotic-dichorionic	Diamniotic-monochorionic
<ul style="list-style-type: none"><li>- Thick membrane</li><li>- Two chorions</li><li>- Two placenta</li></ul>	<ul style="list-style-type: none"><li>- Thin membrane</li><li>- One chorions</li><li>- Single placenta</li></ul>

## Diagnosis

- Fetal heart auscultation in more than one quadrant. "Suggestive"
- Early ultrasound scan "Diagnostic" as early as 6 weeks:
- Fetuses NO.
- Determine zygoty "Most important after determine fetus No. BUT the definitive Dx after delivery examining the placenta carefully.
- Gestational age.
- Chorionicity (**Di-di twins --> lambda sign "Inverted V"**).

# Abnormalities in twins

Monozygotic twins are more likely for congenital anomalies:

1. Conjoined twins "Very rare" in mono-mono → when separation of embryo occur after 12-13 days which embryonic disc is already formed, it is classified acc. to the site of incomplete separation: thoracopagus (anterior) "**most common**", pyopagus (posterior), craniopagus (cephalic), ischiopagus (caudal) → majority require C-section. "Mostly lethal"
2. Inter-placental vascular anastomosis "Communication between two fetuses" → in monochorionic twins "Exclusive". arterial- arterial → **most common**, arterial- venous, venous-venous. can cause hydramnios, abortion, TTTS, and fetal malformation.
3. **Twin- twin transfusion syndrome (TTTS) → more in Di-mo twins than Mono-mono twins. Imbalanced anastomoses in the placenta (arterial-venous), one fetus perfuses to the other twin**

(from the umbilical artery to the umbilical vein), this leads to:

The donor → hypovolemia, hypotension, anemia, growth restriction, and oligohydramnios. The recipient → hypervolemia, hyperviscosity, hydramnios, hypertension, cardiomegaly, polycythemia, thrombosis, edema, congestive heart failure, and ascites. The baby looks big and strong but is doing poorer than donor because of ↑ bilirubin.

In ultrasound we can detect the growth discriminancy, and the oligohydramnios in the donor and polyhydramnios in the recipient

Dx by U/S and the Rx is endoscopic intrauterine laser ablation of vascular anastomoses.

4. Fetal malformation → arterial - arterial anastomoses → the donor gives recipient → leads to thrombosis due to reversed blood flow or atresia due to trophoblastic embolization, the recipient received low O<sub>2</sub> blood → Fail to develop normally → "Acardiac twin"; aplastic and/or dysmorphic anatomic development of cephalad abdomen but, full formed lower extremities.
5. Umbilical cord abnormalities: One umbilical artery absent and associated with renal agenesis, also abnormal umbilical cord insertion "Marginal Or velamentous".
6. Retained dead fetus syndrome: one of the twin die and the other still viable but dead fetus nonviable materials causes DIC in mother so check platelet & fibrinogen weekly in such case. Fetus death < 12 weeks will be reabsorbed While > 12 weeks the Fetus will shrink, dehydrated and flattened "Fetus papyraceus".
7. Mo-mo at high risk of death as both fetuses share the same amnion and chorion "The net mortality is 50%".

# Management

## Antepartum :

- Adequate nutrition (**iron, folate, Ca+2**). Why Iron supplement? → increased risk for blood loss at delivery and optimal wt. gain.
- Cervical length assessment → every 1-2 weeks start in mid trimester (between 16 & 22 weeks) by ultrasound, pt. Should be aware about signs of labor, if marked shortening and contractions → cervix suturing (**cerclage**).
- perform serial ultrasound examinations looking for twin- twin transfusion (amniotic fluid discordance).
- If there is discordant fetal growth → periodic ultrasonic exam (every 4-6 wks at 24 wks) to assess fetal weight.
- Frequent BP monitoring in 3rd trimester for preeclampsia (with other signs such as nondependent edema and urinary protein).
- Prevention of prematurity by bed rest, serial uterine activity monitoring, prophylactic tocolytics “Suppress premature labor only short-term < 48 Hours” → relative contraindications if gest. Age 34 wks or more, growth failure of one or more fetuses, concerning fetal status on biophysical profile and pre-eclampsia. “**The contraction stress test (CST) should not be used, because these pregnancies are already predisposed to preterm labor**”.

## Intrapartum :

### Mode of delivery depends on:

1-Gestational age	2-Chorionicity	3-Fetal presentation *	4-Clinical experience
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Mo-mo	32-34 weeks	C-section? Cord entanglement risk	
Di-mo	34-37 weeks <i>bc of the risk of TTTS</i>	C-section / Vaginal	
Di-di*	38 weeks	Vertex-vertex OR Vertex-breech “ECV”	Vaginal
		Breech-vertex OR Breech-breech	C-section

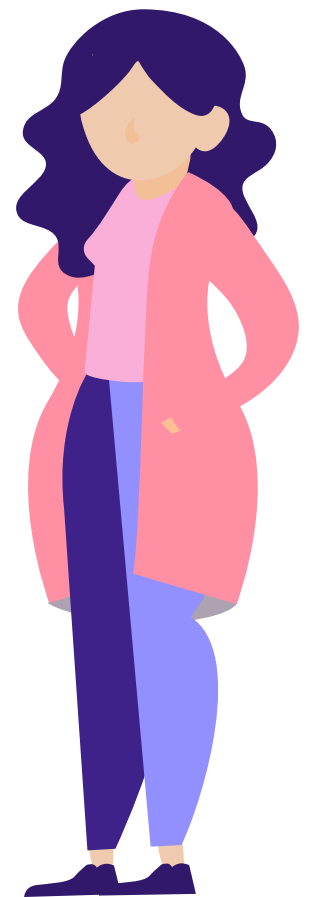
\*Twin A is the first fetus who will be delivered, according to him the decision of delivery in Di-di is done.

## Postpartum :

Watch for postpartum hemorrhage from uterine atony owing to an overdistended uterus.

# Complications

	Maternal	Fetal
ANTEpartum	<ul style="list-style-type: none"> <li>- Anemia ↑ 3x (iron &amp; folate)</li> <li>- Hyperemesis gravidarum</li> <li>- <b>Preeclampsia</b> ↑ 3x</li> <li>- Gestational diabetes ↑ 2x</li> <li>- Thromboembolism ↑ 4x</li> <li>- Hydramnios "Very rare"</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Congenital abnormalities</b></li> <li>- <b>IUGR</b></li> <li>- <b>Placental abruption.</b></li> <li>- Cord entanglement "Forked" (Mono-mono twins).</li> </ul>
INTRApartum	<ul style="list-style-type: none"> <li>- Preterm labor (50%)</li> <li>- Cesarean delivery (50%)</li> <li>- Uterine atony → postpartum hemorrhage</li> </ul>	<ul style="list-style-type: none"> <li>- Malpresentation. 50% chance of C/S</li> <li>- Prematurity (<b>twins at 35wks, triplets at 32wks, quadruplets at 30wks.</b>)</li> <li>- Umbilical cord prolapse.</li> <li>- Placenta previa.</li> </ul>
POSTpartum	<ul style="list-style-type: none"> <li>- Hemorrhage ↑ 5x</li> <li>- Postpartum depression</li> </ul>	<p>—</p>



# Teaching case (video case)

You are seeing a 28 year-old G2P1 now at 12 weeks. Her first pregnancy was full term and uncomplicated. At her first trimester screen she was noted to have a dichorionic diamniotic twin gestation with size equal to dates.

## Questions

### 1. How is the diagnosis of chorionicity and zygosity made?

- **1st trimester or early 2nd trimester ultrasound is the most accurate time to identify chorionicity. It is difficult to determine chorionicity after that.**
- In addition to the identification of 2 placentas, membrane thickness and evaluation of the membrane insertion site are also used to identify chorionicity. **The presence of lambda sign.**
- Monozygous embryos dividing <72 hours after fertilization will be dichorionic (30% of monozygous twins).
- Ultrasound diagnosis of dichorionic twins cannot determine zygosity. **Unless the twin fetus have different sex then it's a definitive dizygotic twin. And when the twin have monochorionic, it's a definitive monozygotic twins. (12 weeks it is too early to see the gender)**
- Monochorionic embryos dividing >72 hours after fertilization are always monozygous.

### 2. What nutritional deficiencies is she at higher risk for in a twin gestation? What recommendations will you make to her because of them, including weight gain?

- The increased circulating blood volume of multiple gestations accentuates the dilutional anemia of pregnancy.
- Each fetus will extract Fe from maternal circulation further exacerbating the physiologic anemia.
- Calcium depletion is also exacerbated in multiple gestations.
- Normal weight woman are recommended to gain an additional 10-15 lbs (total 35-40).
- **Calcium and iron supplementation** should be recommended even prior to anemia.

### 3. You are counseling her about the increased maternal and fetal risks during the pregnancy, what specifically are you concerned about?

- Maternal risks include increased incidence of gestational diabetes, hypertension, anemia as well as ante and postpartum hemorrhage. **Anything that may cause over distention of the uterus consider as a risk for postpartum haemorrhage.**
- There is an increased incidence of thrombosis, compounded by the increased risks of obesity, maternal age, bed rest and Cesarean deliveries in multiple gestations.
- Fetal risks include an increased chance of miscarriage, fetal growth restriction, preterm delivery, perinatal asphyxia and stillbirth (of one or both). All are more common in monochorionic gestations.
- The risk of fetal anomalies is more common in all multiple gestations, but each of a dichorionic twin set has the same risk of structural anomalies as a singleton. The risk to a fetus of a monochorionic gestation is double a singletons baseline risk.

#### 4. What additional management strategies are recommended in twin pregnancy?

- More frequent prenatal visits to screen for maternal hypertension.
- Periodic ultrasound surveillance to screen for fetal growth.
- Serial cervical ultrasound (**Assessing the cervical length**) has been shown to be able to predict preterm delivery in twins to allow time for
- Betamethasone use. **why? Accelerate lung maturity, reduce intracranial bleeding, reduce risk of necrotising enterocolitis "NEC" and reduce NICU stay "Improve survival".**
- Antenatal fetal testing is generally recommended in later pregnancy to evaluate increased fetal risk of continuing pregnancy.

#### 5. Your patient is now at 29 weeks without any complications. You are going to counsel her about delivery planning. What factors will determine the safest timing of delivery in a multiple gestation?

- 38 weeks has been shown to have the lowest risk of perinatal mortality in uncomplicated twin gestations.
- Maternal or fetal complications of pregnancy may warrant safest delivery at an earlier gestational age.

#### 6. What are the risks of delivery in a multiple gestation and what are considerations for mode of delivery?

- Increased fetal risks include perinatal asphyxia, birth trauma; both primarily to the second twin.
- Discussion of mode of delivery needs to include fetal presentation, fetal and maternal status and time of
- delivery and ability to monitor both fetuses reliably.
- Maternal risks include increased risk of Cesarean delivery, postpartum
- hemorrhage, and anesthesia complications.