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## Multiple Gestations

### 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.

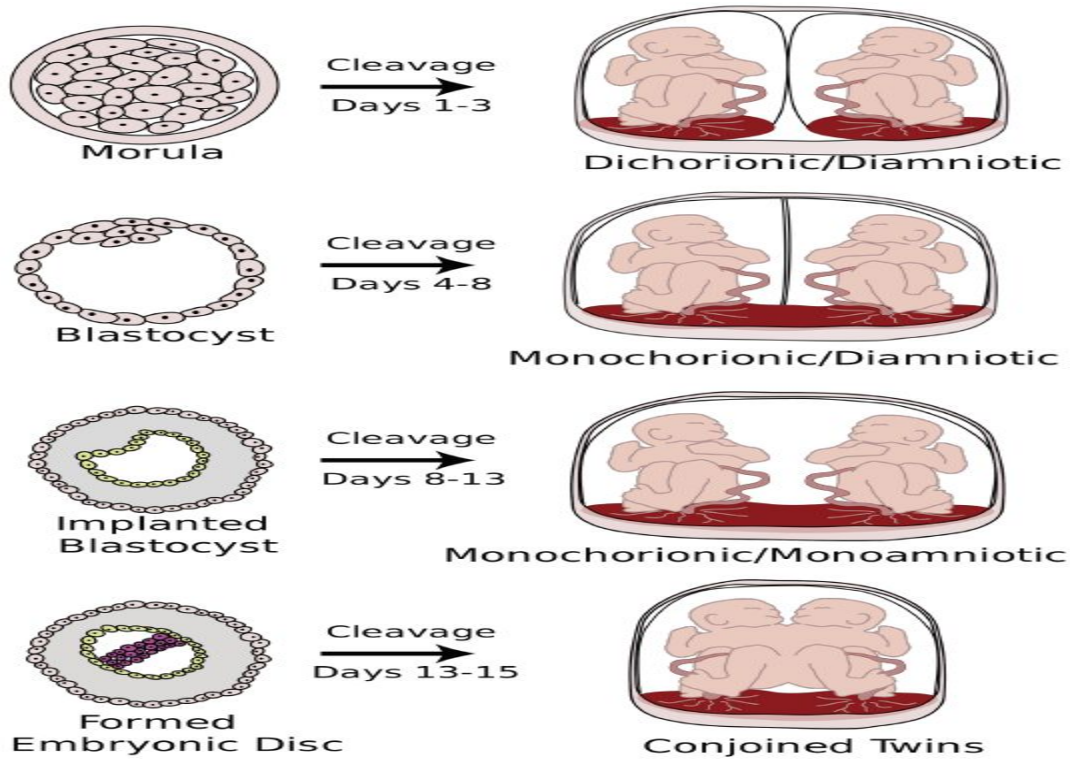
**References:** team433, hacker and moore 5<sup>th</sup> Ed, APGO video and Kaplan lecture note 2018

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## Definition:

More than one fetus occupy uterus simultaneously.



\***Fertilization of two or more eggs** results in Dizygotic (Fraternal) twins and they are always Diamniotic-dichorionic **while splits of an embryo** > Monozygotic (Identical) twin<sup>1</sup> and they can be

- 1) Di-di “The lowest complications risk of all monozygotic twins” OR
- 2) Di-mo “Most common monozygotic = 69%” OR
- 3) Mo-mo “The highest complications risk of all monozygotic twins”.

these are the accurate numbers in next table from kaplan and video the pic up there is just to illustrate

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

Chorion = Placenta.

<sup>1</sup> Same sex and blood group if it occurs in dizygotic and still confusing do HLA typing or DNA analysis.

## 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 > Race, Geography, FHx and Ovulation induction “By **clomiphene citrate** has 10% risk while **Menopausal gonadotropin** has 25% risk”.

What is the difference between Di-di and Di-mo under U/S? **May come in the MCQs.**

Diamniotic-dichorionic	Diamniotic-monochorionic
Thick membrane Two chorions Two Placenta	Thin membrane One chorion Single placenta

When pregnant of more than two fetuses came late and we can not determine neither chorionicity nor amnionicity, What to do? Consider her as **Diamniotic-monochorionic**, Why? as the most complication associated with it.

## Abnormalities in twins:

Monozygotic twins are more likely for congenital anomalies:

- 1- Conjoined twins “Very rare” → 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.

Nuchal translucency is an early ( in 11-13 weeks) sign to diagnose twin to twin transfusion.

**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 O2 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 > 12weeks the Fetus will shrinks, 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%".
- 8- TAP "Twin anemia polycythemia": How to determine? Look at MCA of both fetuses
- 9- Weight discordance "With monozygotic mainly".

### Complications: MCQs !

Maternal	Fetal
Anemia. Hyperemesis gravidarum (due to high beta-HCG). <b>Pre-eclampsia.</b> Gestational DM. Hydramnios "Very rare"	<b>Congenital abnormalities</b> <b>IUGR</b> <b>Placental abruption.</b> Cord entanglement "Forked" (Mono-mono twins).
C-section. Uterine atony > postpartum hemorrhage.	Malpresentation. Prematurity ( <b>twins at 35wks, triplets at 32wks, quadruplets at 30wks</b> ). Umbilical cord prolapse. Placenta previa.
Postpartum depression	_____

### Diagnosis:

- Fetal heart auscultation in more than one quadrant. "Suggestive"
- Early ultrasound scan "Diagnostic" as early as 6 weeks:
- Fetuses NO.
- **Determine zygosity "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"**).

## Management:

- 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**).
- If there is discordant fetal growth → periodic ultrasonic exam (every 4-6 wks at 24 wks) to assess fetal weight.
- Frequent BP monitoring in 3<sup>rd</sup> trimester for pre-eclampsia (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”.**

<b>Mode of delivery DEPENDS ON:</b>	Gestational age
	Chorionicity
	Fetal presentation
	Clinical experience

Mo-mo	32-34 Weeks	C-section? Cord entanglement risk	
Di-mo	34-37 Weeks	C-section / Vaginal	
Di-di	38 weeks	Vertex-vertex* or Vertex-breech <b>“ECV”</b>	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.

# 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.

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

- 1st trimester ultrasound is the most accurate time to identify chorionicity.
- In addition to the identification of 2 placentas, membrane thickness and evaluation of the membrane insertion site are also used to identify chorionicity
- Monozygous embryos dividing <72 hours after fertilization will be dichorionic (30% of monozygous twins).
- Ultrasound diagnosis of dichorionic twins cannot determine zygosity.
- 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.
- 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?**

- a. More frequent prenatal visits to screen for maternal hypertension.
- b. Periodic ultrasound surveillance to screen for fetal growth.
- c. Serial cervical ultrasound has been shown to be able to predict preterm delivery in twins to allow time for
- d. betamethasone use, *why? Accelerate lung maturity, reduce intracranial bleeding, reduce risk of necrotising enterocolitis “NEC” and reduce NICU stay “Improve survival”.*
- e. 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?**

- a. 38 weeks has been shown to have the lowest risk of perinatal mortality in uncomplicated twin gestations.
- b. 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?**

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

