

Twin pregnancy

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Incidence

The prevalence of spontaneous twin pregnancies ranges from

0.6 % of pregnancies in Asia

1 to 2 % in Australia, Europe and the USA

4 % in Africa

- **The rate of monozygotic twins** is constant among populations (3.5 per 1000 live birth), but **dizygotic twins** varies widely with geography, ethnicity, parity and maternal age, as well as use of assisted reproduction (increase in black, maternal age, parity, IOV)

Incidence:Cont,

- 70 to 75 % (dizygotic) diamniotic dichorionic
- 25 to 30 % diamniotic monochorionic
- 1 % monoamniotic and therefore also monochorionic
- All **Dizygotic twins** have separate placentae although these can be fused together (**diamniotic dichorionic**)

classifications:

Twin pregnancies divided according to **zygosity** or **chorionicity** as these have important **implications** for **pregnancy** and **infant** outcome

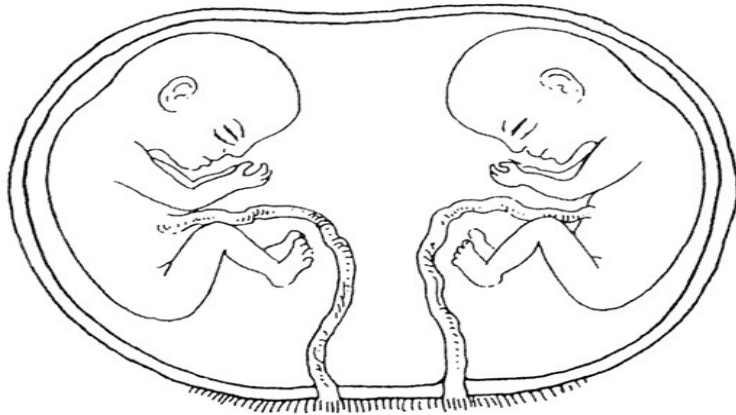
- **Zygosity** whether the twins arose from one (**monozygous**) or from two fertilized eggs (**dizygous**)
- **Chorionicity** refers to placentation;
amnionicity refers to the membrane layers that do or do not separate the gestational sacs of the twins

Cont,

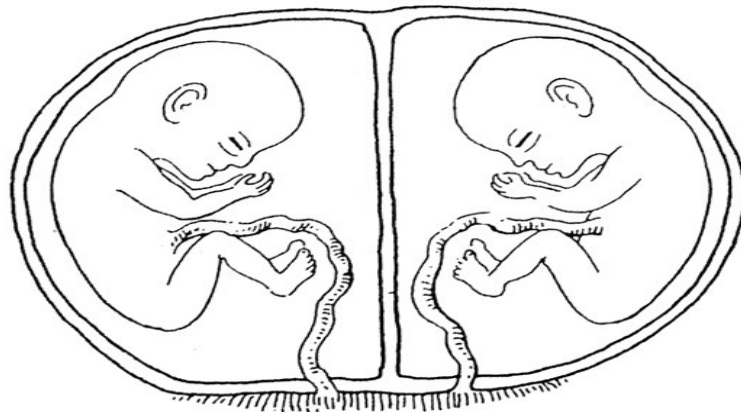
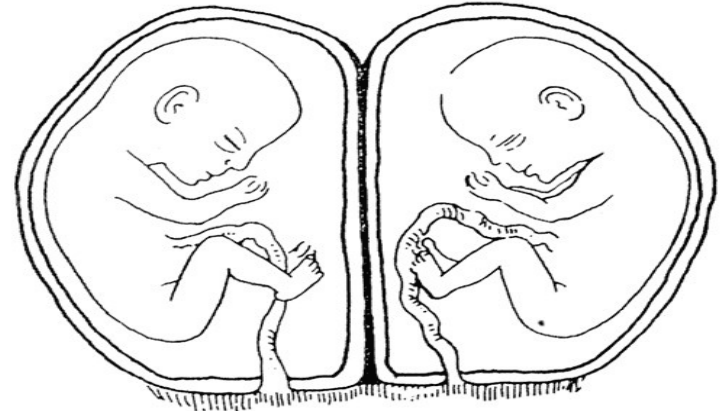
- **Monochorionic Monoamniotic** twins have **no** separating membrane (MC/MA)
- **Monochorionic Diamniotic** (MC/DA) twins **have** a separating membrane consisting of amnion (**two layers**) only
- **Dichorionic Diamniotic** (DC/DA) twins have a separating membrane consisting of **both** amnion and chorion. They may or may not have separate (or fused) placentae
- **Monozygotic twins** have a chorionicity that relates to how early the fertilized egg splits. (65% of monozygotic twins % 4-8 days after fertilization MCDA , 30% --% within 72h , so DCDA, <5%-- %> 8days, so MCMA)

Twin chorionicity

Monoamniotic monochorionic



Diamniotic dichorionic (fused)





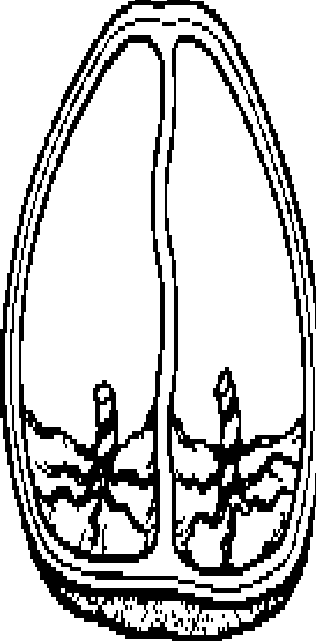
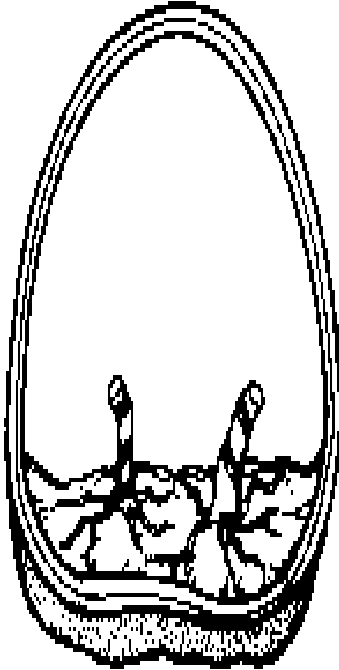
Diamniotic monochorionic



Diamniotic dichorionic (separated)

TWINS

- Dizygotic twins -
 - originate from two zygotes!
 - Account for about $2/3$ of twins
 - rate increases with age
 - same or different sex
 - hereditary tendency

Zygote	Dizygotic	Monozygotic		
Day of division		0-3	3-8	8-13
Placenta				
Central membrane	2 Amnion 2 Chorion	2 Amnion 2 Chorion	2 Amnion	None

Dichorionic diamniotic twins



TWINS

- Monozygotic - (identical)
 - form from one zygote
 - If the division of the inner cell mass occurs after the amniotic cavity occurs (**8days**) the identical twins will be in the same amniotic & chorionic sac
 - this accounts **for only 1% of monozygotic** twins

Monochorionic monoamniotic twins



Monozygotic twins con'd

- **70%** of **monozygotic** twins will have a separate amniotic sac, single chorion, & a common placenta(**MCDA**)
- **29%** develop from early separation of the blastomeres (first 3 days)(**DCDA**)
 - each embryo has its' own amnionic & chorionic sac
 - The placentas may be separate or fused

Maternal Complications

- The **physiologic** changes in the mother with a twin gestation are an **exaggeration** of what occurs in a singleton pregnancy.
- She has a **greater increase** in **blood volume**, **pulse**, **cardiac output**, and **weight gain**.
- a **higher frequency** and **higher severity** of **discomforting** maternal conditions (e.g. **nausea and vomiting** in early pregnancy and **respiratory discomfort** in late pregnancy)

Increased Risk for...

- Miscarriage
- Preterm labor
- Hypertension & pre-clampsia
- Gestational diabetes
- Abruption
- Anemia (10 % , increased demands & dilutional)
- Urinary tract infection
- polyhydramnios
- Congenital anomalies (more common in monozygotic twins)
- Malpresentations
- Cesarean section
- Postpartum hemorrhage

INFANT Complications

- Prematurity
- PROM
- **congenital anomalies** increased **2-3X** in twins, and is mostly confined **monozygotic** infants. **Most common** cleft lip & palate, CNS, CVS. The abnormalities that are **unique** to **multiple** pregnancy are **conjoined twins & fetal acardia**.
- **Umbilical cord problems**: single umb artery, velamentous insertion, prolapse, vasa previa
- **Discordance - unequal weights**(difference > 15% in EFWT)
 - unequal surface area of placenta
 - twin to twin transfusion
 - Genetic synd



Major challenges

- **Perinatal mortality and morbidity** is significantly **higher** in twin , this often relates to:
 - o **Preterm birth**
 - o Intrauterine growth restriction (**IUGR**)
 - o Increased incidence of **medical** complications including **pre-eclampsia**
 - o Twin to twin transfusion (**TTTS**)
 - o Antepartum **death of one of the twins**

Infant complications , cont

- increased frequency of **long-term adverse** infant outcomes including **cerebral palsy**
- **All monochorionic** twins carry risk of twin to twin transfusion(**TTTS**), this complication can also occur (but rarely) in dichorionic twins with fused placentae
- Fewer < **50 %** of twin pregnancies will continue up to or **>38 weeks**
- **2nd twin do not do as well as 1st twin(perinatal morbidity & mortality increased for the 2nd)**

Antenatal care in early pregnancy

- **Early ultrasound** → (confirm GA, number of fetuses and chorionicity)
- **Serum screening** for Down syndrome by mid-trimester screening is **not** applicable to twin pregnancies.
- **Nuchal translucency** can be applied for screening.
- **CVS** or **amniocentesis** can be used as diagnostic tests. But **loss rates** are **greater** in sampling a twin pregnancy (possibly due to **double puncture**) and there is a possibility of **inaccurate** diagnosis due to sampling the **same sac twice**
- **Fetal reduction** or **termination** is possible in cases of **congenital anomaly** in one or both twins

Subsequent care in pregnancy

- **Nutritional advice** include supplementary **iron** and **folate** b/o increased needs in twin pregnancies
- **Antenatal visits** **more frequent** than singleton pregnancies for detection and treatment of medical or obstetric complications

Cont, Care in pregnancy,

- In **dichorionic twin** pregnancy → ultrasound is recommended every **3-4 weeks from 24 weeks** onwards (to detect **discordance** in fetal size, AFV and **umbilical artery Dopplers**). **Umbilical artery flow velocity** studies are indicated especially in **monochorionic** pregnancies and when there are signs of **discordancy**
- **Twins growing to their full potential should follow the singleton growth curve until 32 – 35 weeks**

Cont,

- **Discordant growth** may be due to **IUGR** of one fetus or **TTTS**, **aneuploidy**, **anomaly** or **viral** infection in only one fetus
- Twin pregnancies require **specialist** antenatal care and referral to **hospitals with adequate facilities** when complications such as inadequate or discordant fetal growth occur

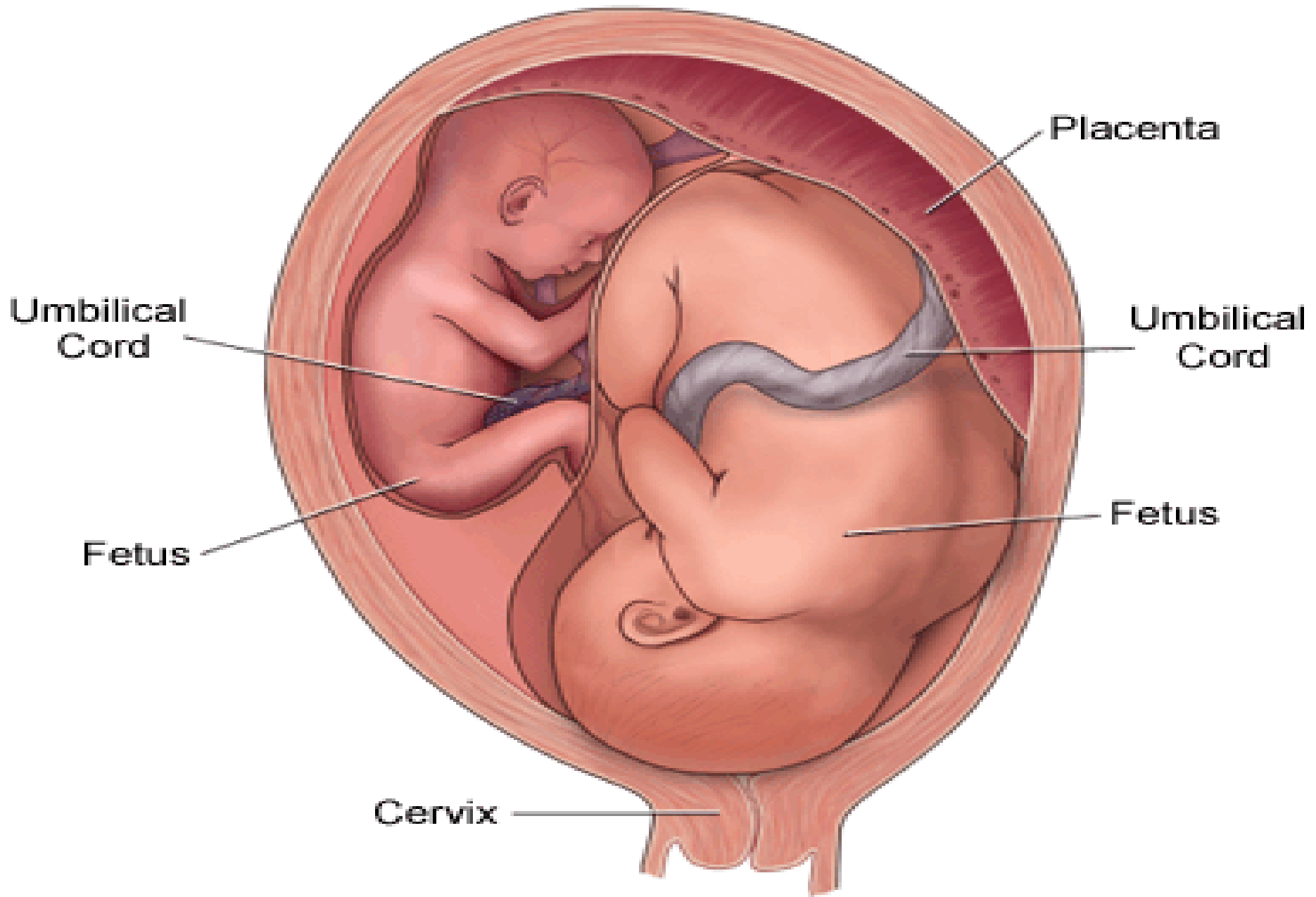
Monochorionic twins

- In addition to **complications** that can be associated with any twin pregnancy,
- complications that can occur **specifically** with **monochorionic twins**
- - 1-**Twin-twin transfusion syndrome**(TTTS)
 - 2-**Death of one twin** has significant implications in the setting of a **monochorionic twin** pregnancy where there is a **shared** placental circulation.

Twin to twin transfusion syndrome (TTTS)

- 15 % of **monochorionic** twin pregnancies show clinical evidence of (TTTS)
- **Vascular communication** (artery to vein) between infants → circulatory imbalance(anemia for one & polycythemia for other)
- **DX**: difference in **HCT & Bwt** >20%
- If **TTTS** is suspected, referral to a **maternal fetal medicine** specialist and frequent **ultrasound follow-up**

Twin Pregnancy: Twin to Twin Transfusion



TTTS

- **Fetal hydrops** is a pre-terminal sign
- Clinical suspicion → if monochorionic twins show discrepancy in **fetal size**. **Polyhydramnios** in the sac of the bigger twin is common while **oligohydramnios** is commonly associated with the smaller twin
- **Stuck twin**: the sonographic appearance of extreme form of TTTS

TTTS

- **Recipient twin:** develop cardiomegaly & CHF & frequently die in utero, polyhydramnios
- **The donor twin:** growth restricted, HF if anemia is severe & hydrops. Oligohydramnios

TTTS treatment

- **Amnioreduction** (by amniocentesis) is an established method of treatment
- In experienced hands, fetoscopic **laser ablation** of **placental vascular anastomoses** in 2nd trim of pregnancy improve infant outcome compared with serial amnioreduction .
- **Preterm** delivery after fetal lung maturity

Death of one twin

Not uncommon.

Mostly occurs **early** in gestation but even late antepartum death is not rare

In **early** pregnancy, **resorption** of the fetus and placenta. The perinatal risk for the remaining fetus remains higher than it would have been for a singleton pregnancy especially in late death

- The **most feared** sequelae is **neurological damage** of the **survivor** from transfer of **thromboplastin** from dead twin causing thrombotic arterial occlusion
- Mother → **DIC**, 25% of mothers, > 3 wk

Death of one twin, cont

- In **monochorionic** twin pregnancy, death of one fetus later in pregnancy is associated with a much **higher** risk of death and subsequent disability for the other fetus.
- Death after 20 weeks of gestation may carry a risk of death or damage for the remaining fetus of up to 20 %.
- For **dichorionic twin** pregnancies, the risk of cerebral damage is far **lower**

Preterm labour

- The **single largest** factor associated with increased **mortality & morbidity** in twin fetuses & neonates
- Due to **distention** of the uterus & early opening of the cx & exposure of fetal membranes to vaginal flora | → **amnionitis** with or without ROM
- **Prevention:** bed rest , tocolytic, cx cerclage
- The wellbeing of both twins should be ascertained by **CTG** before **tocolytics** are considered
- **Corticosteroids** are indicated

Timing and mode of birth

- The optimal timing of birth is unclear, some advocate delivery at 37 weeks.
- The **most important** element in deciding the mode of delivery is **fetal presentation** at time of **labour** (**best determined by ultrasound**)

- The **frequency of different fetal presentation at birth**

**Vx-vx 40%, vx-br 30%, vx-tx 7%, br-br 9%,
br-vx 7%**

Vaginal birth is the preferred mode of birth for all twin pregnancies with the following criteria:

- o **diamniotic twins**
- o **Twin I is cephalic**
- o Neither twin has any evidence of **fetal compromise** requiring **caesarean section**

- 
- Locked twins: br-vx
 - Entanglement of the cord: mono amniotic twins, C/S

Intrapartum management

- **CBC, group and blood**
- Extra equipment for delivery of **twin II** on hand
- **Continuous electronic fetal monitoring (EFM)** for both twins
- Ensure portable **ultrasound** available in Delivery
- Epidural **anaesthesia** at delivery may be useful if interventions for the birth of the 2nd twin are needed

Intrapartum management, cont

- Delivery of the **1st twin** as for normal vaginal birth.
- An experienced **obstetrician** should supervise the delivery
- The **anaesthetist** should be available
- Appropriate neonatal or **paediatric** staff should be present

Delivery of 1st twin

- Birth of twin I as normal vaginal birth
- After birth of the first baby, withhold oxytocic
- If possible a nuchal cord should not be **clamped** and cut until after the birth of twin I

Delivery of 2nd twin

- Immediately after the birth of twin I → **abdominal and vaginal** examination to determine the **lie and presentation** of the 2nd twin
- **Ultrasound** to confirm **presentation** if uncertain
- **Continuous FHR monitoring**
- If the FHR is normal, birth of the second twin can be **awaited**
- **External version** may be used to achieve a longitudinal lie

Delivery of 2nd twin, cont

- If the uterine contractions are inadequate an **IV oxytocin** infusion should be commenced
- **Amniotomy** should not be performed unless the fetus is in a longitudinal lie and well applied in the pelvis or as part of planned internal podalic version
- Be aware of the risk of **cord prolapse**
- If signs of **fetal compromise** occur, → birth can be expedited with an **instrumental delivery, breech extraction or caesarean section**

Elective caesarean section

- If:
- 1-Monoamniotic twins
- 2-Discordant twins
- 3-1st twin non vx
- 4-other major **obstetric risk factors**
require elective caesarean section at **38 weeks**
gestation
- **Breech** presentation of the 2nd twin is not a
contraindication to **vaginal** birth

Paediatric consultation

- The babies should be checked immediately by the paediatrician because of the higher risk of anomalies, IUGR, anaemia, polycythaemia, hypoglycaemia and coagulopathy

Postnatal management

- **Intravenous Syntocinon[®] 40 units** (prophylactic) should run at 250 mL / hour for 4 hours after delivery unless contra-indicated. In all cases **extra observations** are required to ensure the uterus remains contracted to reduce **PPH**
- Fused placentae of like sex twins should be sent unfixed for pathological examination to help **confirm chorionicity**