



**GRADUATE
ENTRY
MEDICAL
SCHOOL**

Pregnancy and Pre-delivery Emergencies

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Objectives

- Physiology of a normal pregnancy.
- Explore the structures relating to reproduction
- Pregnancy related terminology
- Physiological maternal changes during pregnancy

Objectives

- Outline & management of the following pre delivery emergencies:
- Bleeding in pregnancy.
- Ectopic pregnancy.
- Pre eclampsia.
- Eclampsia.

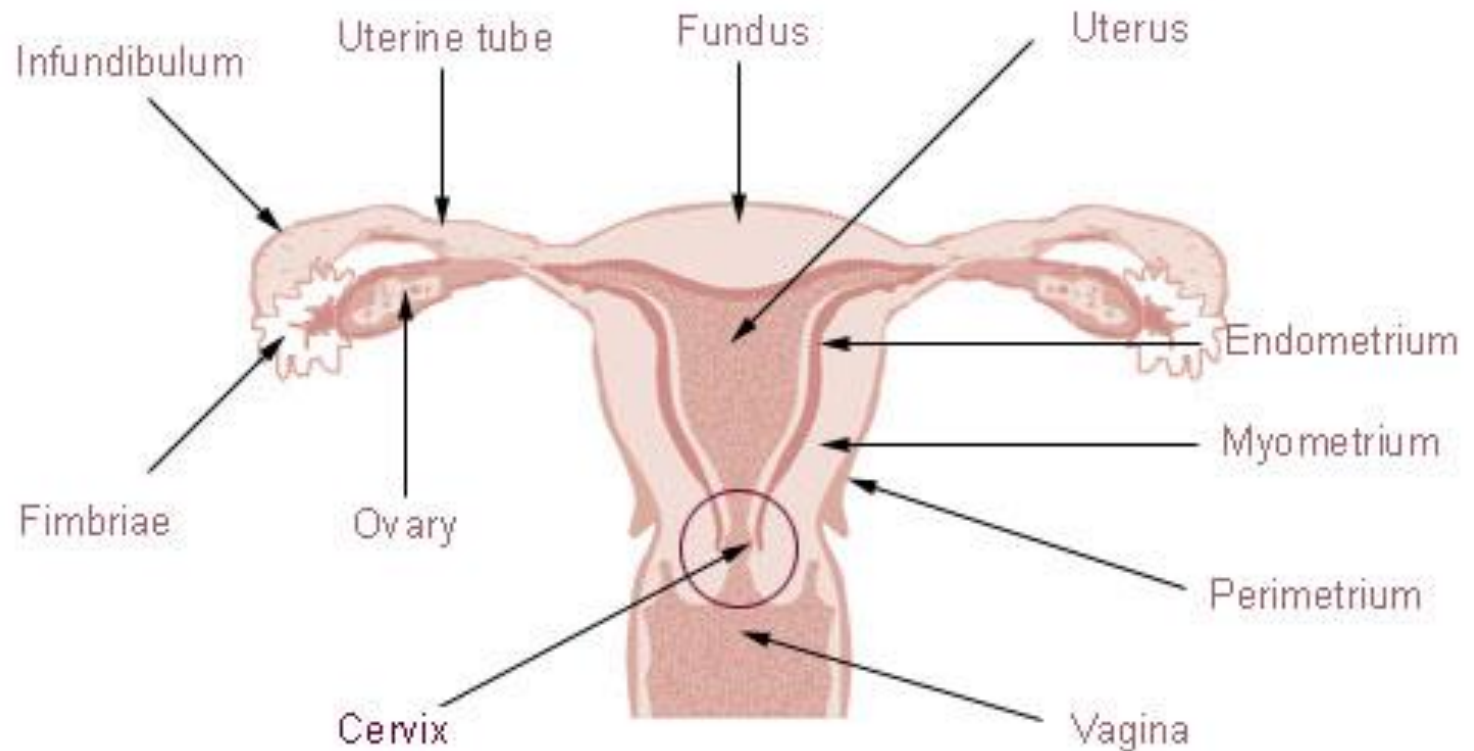
Pregnancy

“Sequence of events that begins with fertilisation; proceeds to implantation, embryonic development and fetal development; and ideally ends with birth about 38 weeks later”.

Reference: Tortora G., Derrickson B. Principles of Anatomy and Physiology; Wiley 2011; Ch 29, p1181

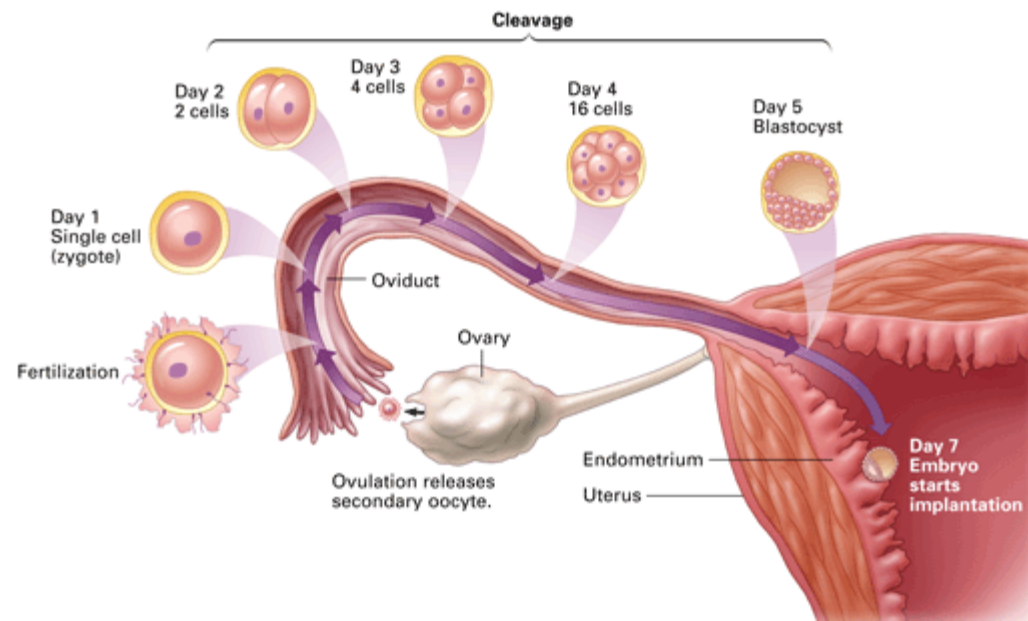
Female Reproductive System

Uterus and Uterine tubes



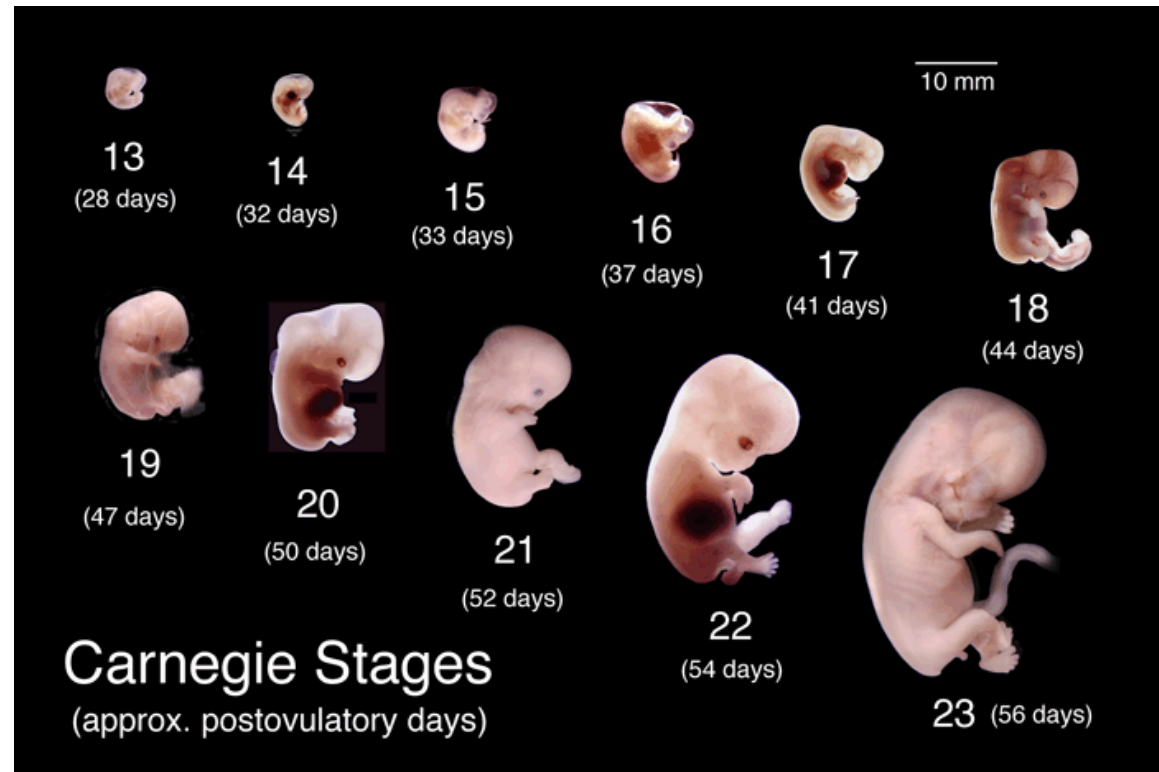
Conception

- Ovulation
- Fertilisation (occurs in distal third of fallopian tube)
- Implantation (occurs in the uterus)



Embryo

- From fertilisation through the eighth week



Fetus

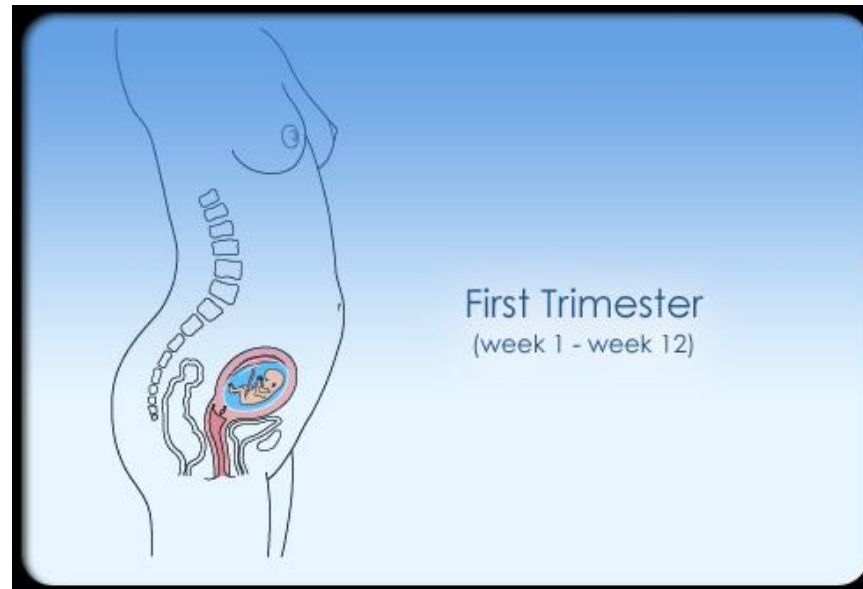
- Growth and differentiation of tissues and organs

Fetal Growth From 8 to 40 Weeks



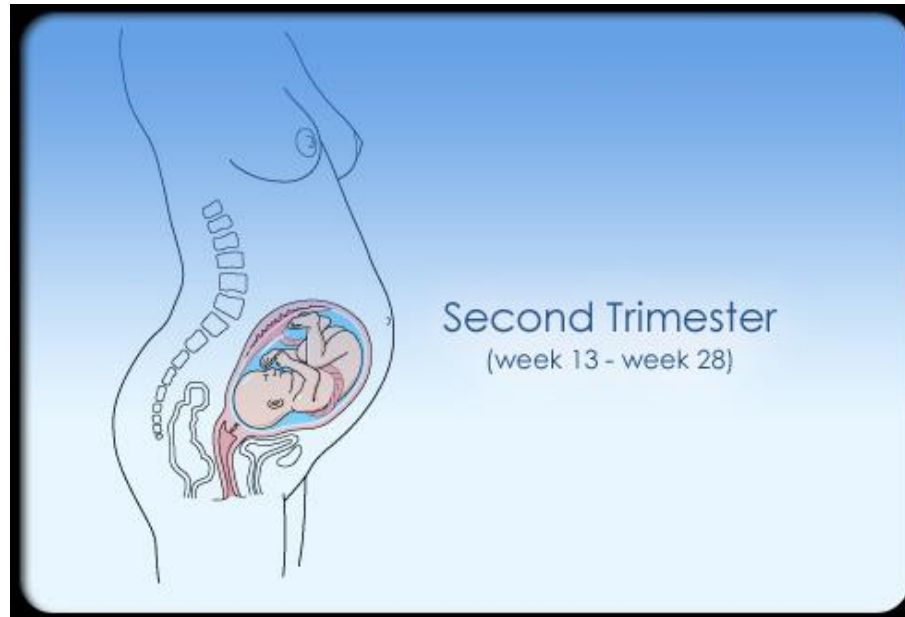
Trimesters of pregnancy

- First trimester – 1-12 weeks
- Rudiments of all major organ systems appear
- Most vulnerable stage



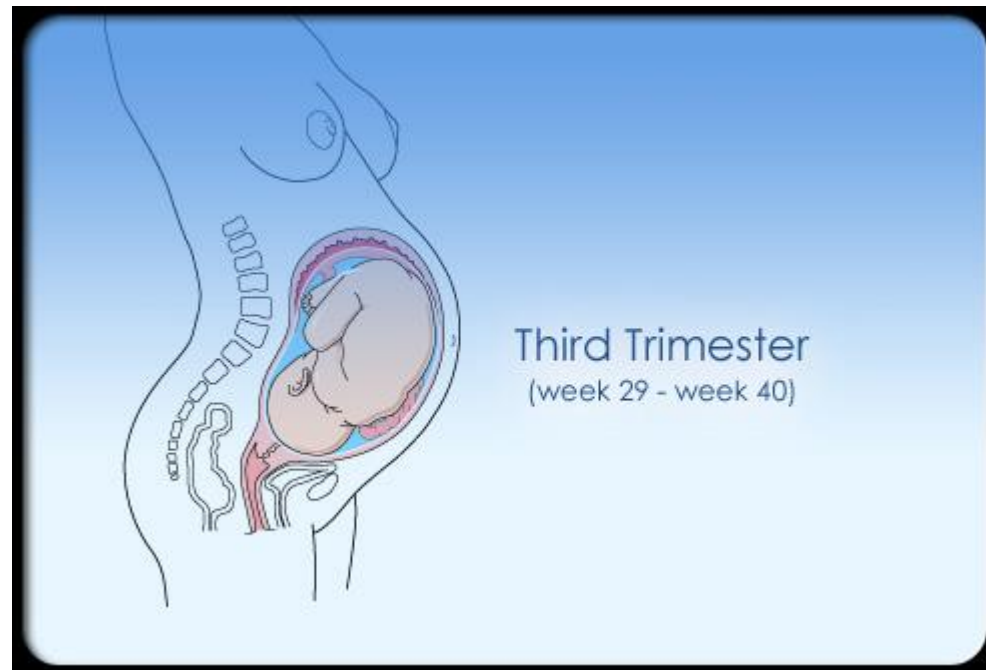
Trimesters of Pregnancy

- Second Trimester – 13-28 weeks
- Near complete development of organ systems
- Distinctive human features



Trimesters of Pregnancy

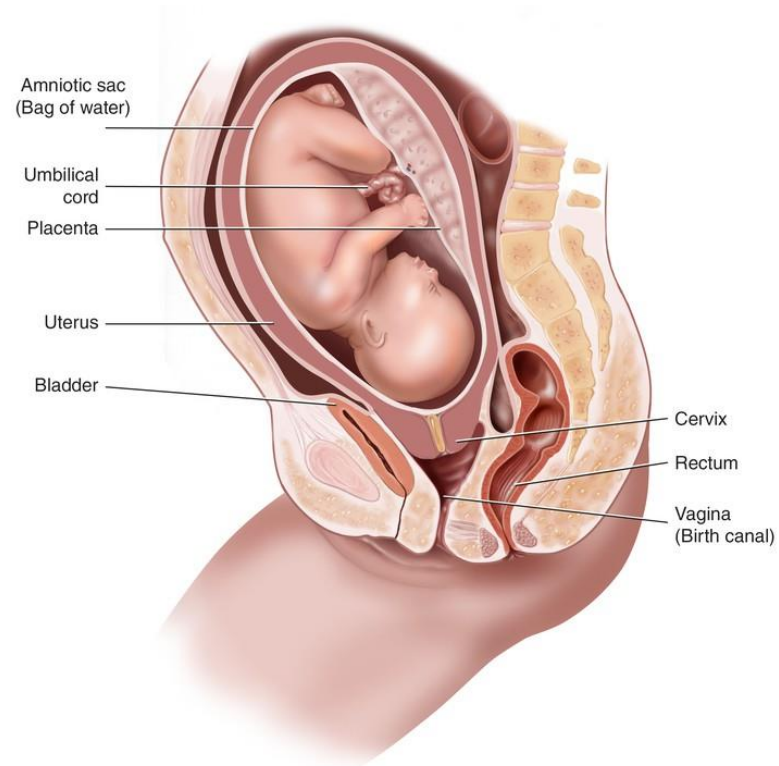
- Third Trimester – 29- 40 weeks
- Rapid fetal growth
- Organ systems become functional



Structures of pregnancy

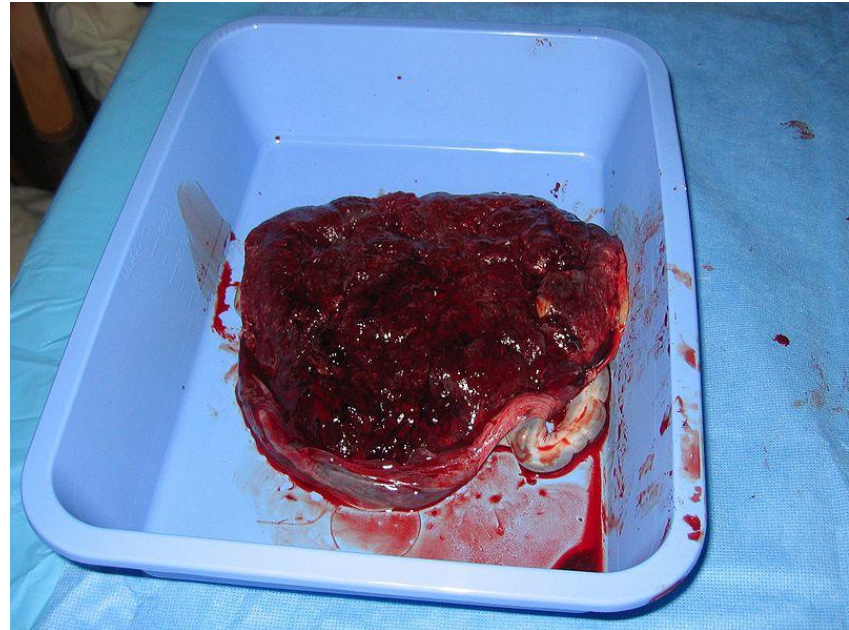
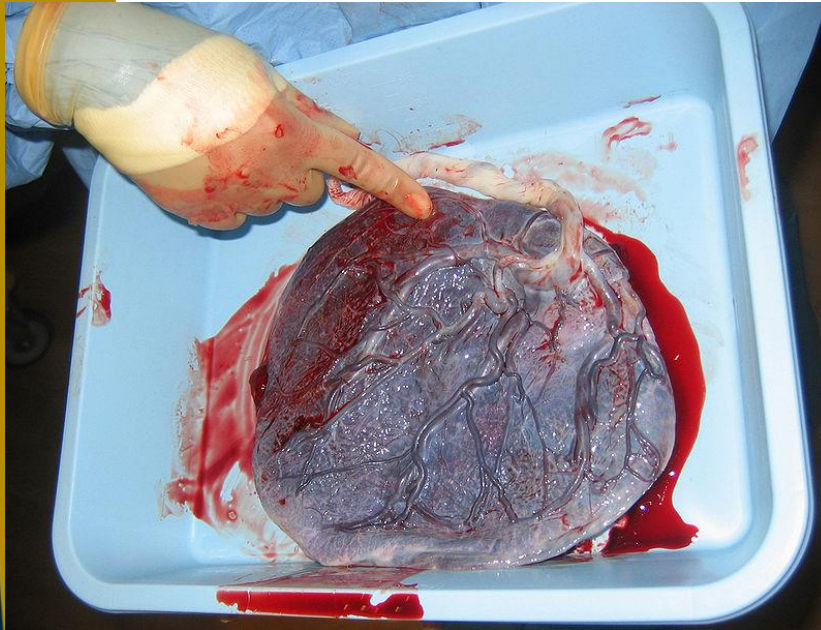
- Placenta
- Umbilical cord
- Amniotic sac and fluid

Normal Pregnancy



Placenta

- An organ attached to lining of the uterus which links fetal and maternal blood supply



Functions of the Placenta

- Exchange of nutrients and waste between mother and fetus
- Respiratory gas exchange
- Transfer of heat
- Hormone production
- Protective barrier against harmful substances

Umbilical Cord

- Connects the fetus to the placenta
- Contains two arteries and one vein.
- Connective tissue called Wharton's Jelly, surrounded by amnion
- Approx 50cm at term

Amniotic Sac

- Membrane surrounding the fetus
- Contains clear amniotic fluid which protects the fetus.
- The fluid contains carbohydrates, proteins, lipids and electrolytes which aid in the growth of the fetus.
- Approx 1L at term

Obstetrical terminology

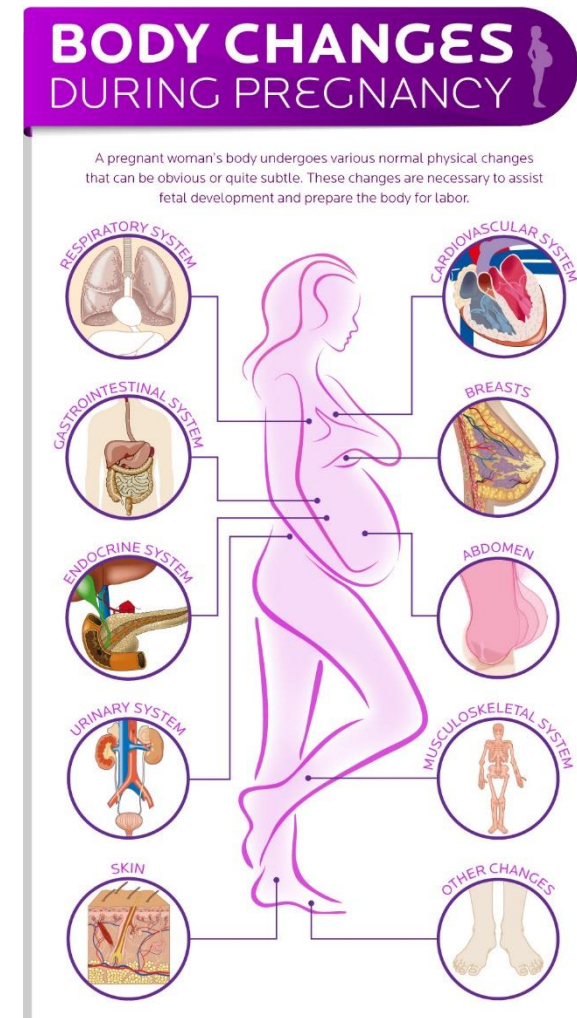
- Gravida – number of all the pregnancies, past and current.
- Para – number of live births
- Gestation – duration of pregnancy
- Antepartum – period before delivery
- Postpartum – period after delivery
- Term – a pregnancy that has reached 40 wks gestation

Obstetrical terminology

- Multigravida – two or more pregnancies
- Nulligravida – has not been pregnant
- Primigravida – first pregnancy
- Multipara – two or more deliveries
- Nullipara – a woman who has never delivered

Physiological Maternal Changes

- Pregnancy causes physiological changes to nearly all organ systems.
- Most return to normal after delivery!



Group Work



Pre-delivery emergencies

- Spontaneous abortion (miscarriage)
- Third trimester bleeding
- Ectopic Pregnancy
- Pre-eclampsia
- Eclampsia

Miscarriage

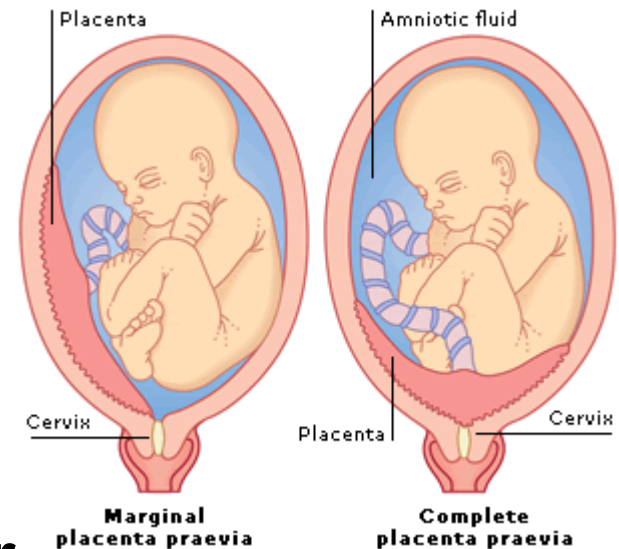
- Natural death of an embryo/fetus in utero before the 20th week of gestation.
- Different classifications:
 - Threatened
 - Inevitable
 - Incomplete
 - Complete
 - Missed
- Management?

Third Trimester Haemorrhage

- Never normal!!
- Three main causes
 - Placenta Previa
 - Placental Abruptio
 - Uterine Rupture

Placenta Previa

- Placenta implanted low in uterus, may partially or fully obscure the cervical canal.
- Painless bright red bleeding which increases as labour begins.
- Fetal compromise

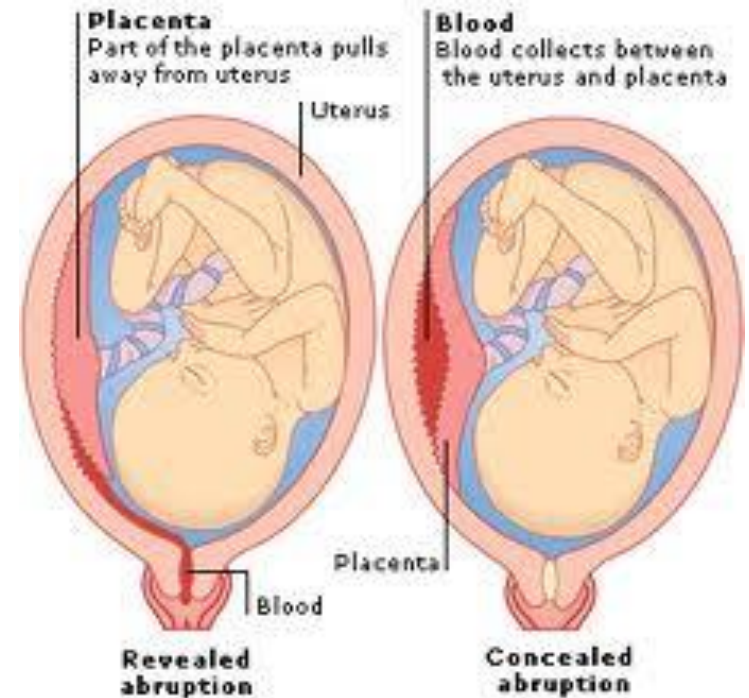


Placental abruption

- Premature separation of normally implanted placenta from uterine wall.
- 1 in 100 pregnancies
- Causes
 - Hypertension (44%)
 - Trauma
 - Preeclampsia
 - Previous abruption
 - Infection

Placental Abruption

- Pain – abdomen may be tender/rigid
- Blood loss may be minimal or concealed – usually dark
- Shock
- Absence of fetal movement

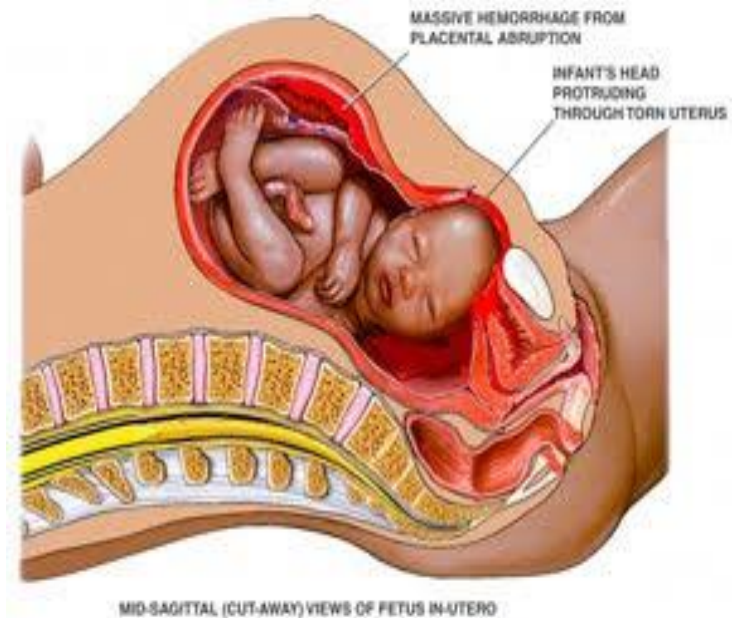


Uterine rupture

- Rare!
- Spontaneous or traumatic rupture of uterine wall
- Causes
 - Previous scar opens
 - Trauma
 - Prolonged/obstructed labour

Uterine Rupture

- Sudden abdominal severe pain
- Signs of shock
- Vaginal bleeding may be hidden
- Active labour



Management

DO NOT PALPATE ABDOMEN: MAY INCREASE BLEED.

DO NOT EXAMINE INTERNALLY

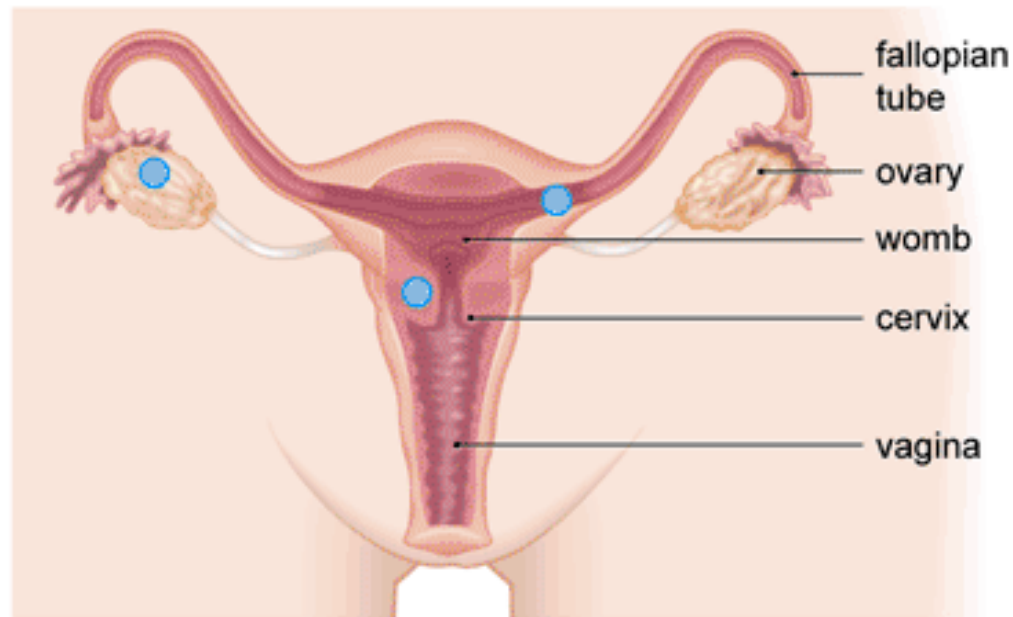
DO NOT PACK VAGINA

- 100% Oxygen via non-rebreather mask
- > 24 weeks = Left Lateral Tilt
- Apply absorbent pad
- Treat for shock
- Call for ALS if haemodynamically unstable.
- Psychological support.
- Rapid transport to hospital.

Ectopic pregnancy

- Fertilised egg implants outside the uterus
- Approx 1 in 100
- 97% occur in fallopian tubes
- 3% occur cervix, ovaries, bowel
- Leading cause of death in the first trimester

Sites for Ectopic Pregnancy



The different places where ectopic pregnancy can occur

Signs & Symptoms

- Early pregnancy symptoms as normal
- Severe abdominal pain – onset 7-12 wks
- Nausea/vomiting
- Vaginal bleeding
- Shock
- Shoulder tip pain – ominous sign
- Cullen's sign – bruising around umbilicus

Management

- 100% oxygen via non rebreather mask
- Nil by mouth.
- Keep warm
- ECG / vital signs. Recheck regularly.
- ALS for IV fluids if sys BP < 90.
- Rapid transport.

Pre-eclampsia

- Hypertensive disorder specific to pregnancy
- Affects approx. 2000 women annually in Ireland
- Accounts for 15.9% of maternal deaths in US
- Usually occurs from 20 weeks gestation

Pre-eclampsia

Diagnosis based on presence of three criteria

- Significant hypertension 140/90
- Proteinuria
- Gross oedema

Pre-eclampsia

Signs and symptoms

- Headache
- Nausea/vomiting
- Abdominal pain
- Lower back pain
- Changes in vision
- Shortness of breath
- Seizures

Eclampsia

- Same signs and symptoms plus seizures or coma
- Tonic clonic seizures
- Often begins as oral twitch
- Patient can become apnoeic during seizure
- Can initiate labour

Management

- 100% oxygen via non re-breather mask
- Rapid transport to ED – left lateral recumbent position
- Pre-alert ED
- If seizures – treat with midazolam
- Check blood sugar – treat if indicated

Summary

- Physiology of a normal pregnancy.
- Define the terms; fetus, placenta, amniotic sac, umbilical cord, perineum.
- Physiological maternal changes during pregnancy

Summary

- Assessment & management of the following pre delivery emergencies:
- Bleeding in pregnancy.
- Ectopic pregnancy.
- Pre eclampsia.
- Eclampsia.

References

- Tortora G., Derrickson B. Principles of Anatomy and Physiology; Wiley 2011; Ch 29, p1181
- <http://embryo.soad.umich.edu/>
- <http://www.imt.ie/clinical/2013/12/clinical-update-on-pre-eclampsia.html>
- Carl H. Backes, Kara Markham, Pamela Moorehead et al, "Maternal Preeclampsia and Neonatal Outcomes," *Journal of Pregnancy*, vol. 2011, Article ID 214365, 7 pages, 2011. doi:10.1155/2011/214365





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Fetal Mal-presentation

Sandra Rock



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Objectives

- To Define Mal-presentation
- Look at the types of Mal-Presentation
- Some factors that may contribute to Mal-Presentation
- Management

Mal-Presentation

- The **presentation** of a fetus about to be born refers to which anatomical part of the fetus is leading into the pelvic inlet of the birth canal. Based on the leading part, it is identified as a cephalic, breech, or shoulder presentation.
- A **mal-presentation** is any presentation other than a vertex presentation (the top of the head first).

Mal-presentation

- Mal-presentations may not be identified until late into the pregnancy and in some cases not until the initial assessment during Labour

Factors that can contribute to a mal-presentation

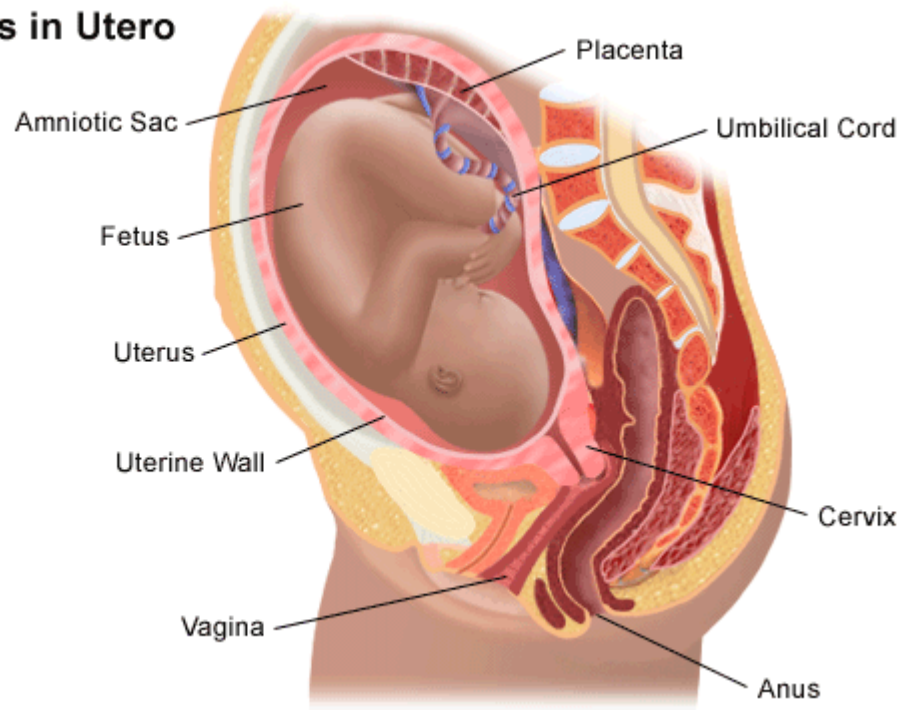
- Pre-term baby
- Multiple fetus in the uterus
- If the Mother has had more than one pregnancy
- Too much or too little Amniotic fluid in the uterus

Factors... continued

- Placenta Previa
- If the Uterus is not normal in shape
- If abnormal growth eg. Fibroids are present in Uterus

Anatomy of pregnancy

Fetus in Utero



All mal-presentations are managed expectantly during labour and may result in a vaginal delivery. When the mal-presentation is identified, the mother should be prepared of the necessity for caesarean delivery if the mal-presentation persists.

Frequency of mal-presentation

- Total mal-presentation 8.6%
 - Cephalic 5.4%
 - Breech 3.1%
 - Transverse 0.12%

Ref:

Acta Obstet Gynecol Scand. 2011

Types of Mal-presentation

- Breech
 - Complete Flexed breech presentation
 - Footling presentation
 - Frank (extended presentation)
 - Kneeling Breech presentation

Breech presentation

Fetus presents into the pelvis by the
buttock/feet/foot first

30% of pregnancy's present as Breech at 30
weeks

3% of all deliveries present as Breech ***at term***

- **Flexed**

Fetal buttock as well as fetal feet present to the
pelvic inlet

- **Extended**

The buttock alone present to the pelvic inlet
(Frank)

Types of Breech Births

Frank Breech

Baby's bottom will present first
legs will be flexed at the hips and
knees extended with feet up at
ears



Complete Breech

- The baby's knees and hips are flexed and they are sitting in a crossed leg position with feet beside the bottom



Footling Breech

- One or both feet present first
- The bottom is higher
- Unusual at full term but can occur in preterm frequently



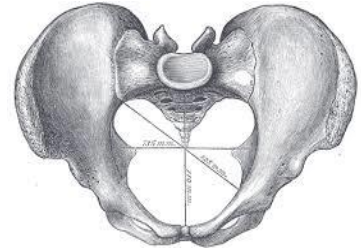
Kneeling Breech

- This is very rare
- The baby is in a kneeling position with legs extended at the hips and flexed at the knees

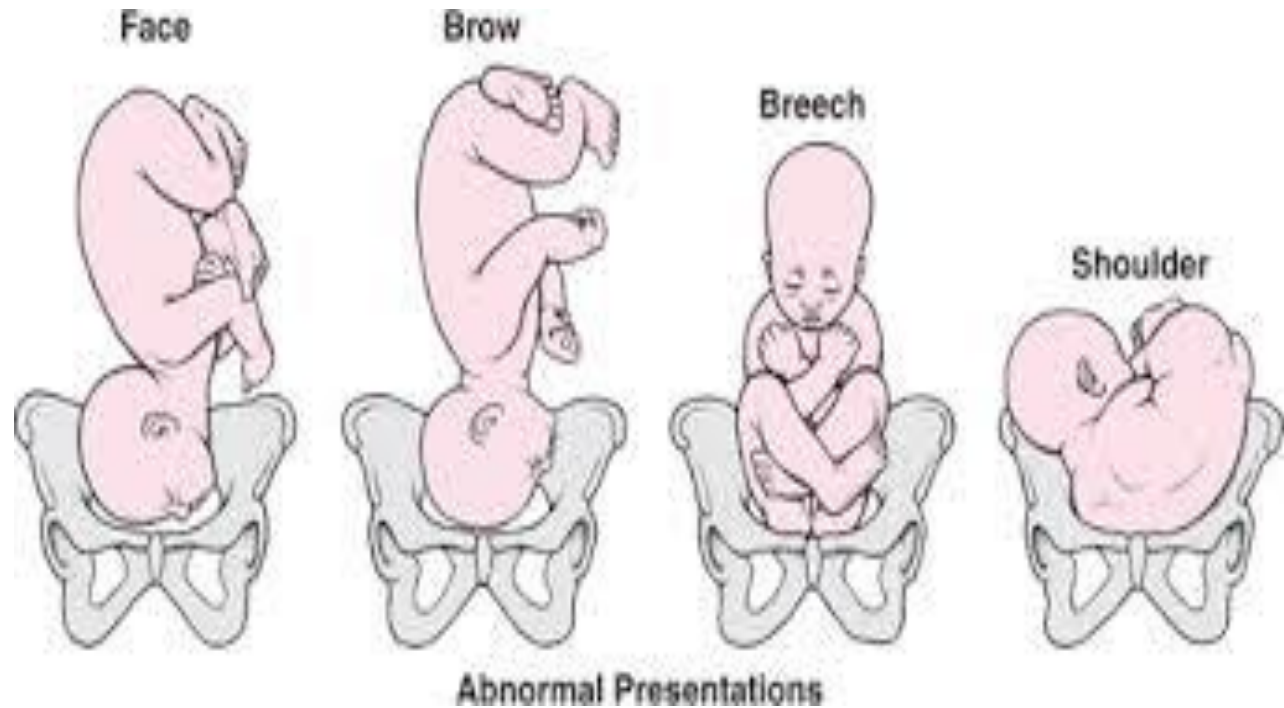


Cephalic/Vertex Presentations

- Cephalic/Vertex presentation is a description of how a baby presents during childbirth, in which the baby leads with the back of the head or occiput, so that the head is the first thing into and out of the birth canal.



Cephalic/Vertex Presentation's



Types of Mal-Presentation

- Vertex
 - Brow presentation
 - Face presentation
 - Cephalic presentation
- Transverse/Shoulder presentation

Brow presentation

Largest part of the head will be trying to fit into the pelvis

Face presentation

The baby's face is first part to present at the birth canal

Compound presentation

Compound presentations occur when a fetal extremity presents in front of or next to the presenting part. Most compound presentations are either a hand or arm next to the fetal head.

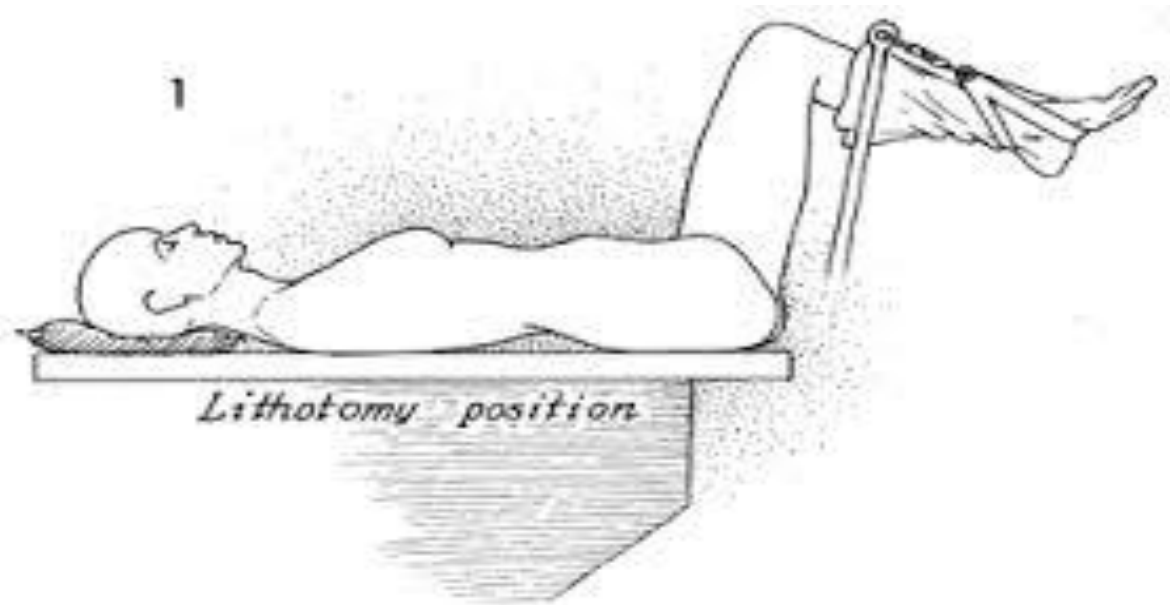


Transverse Lie/Shoulder presentation

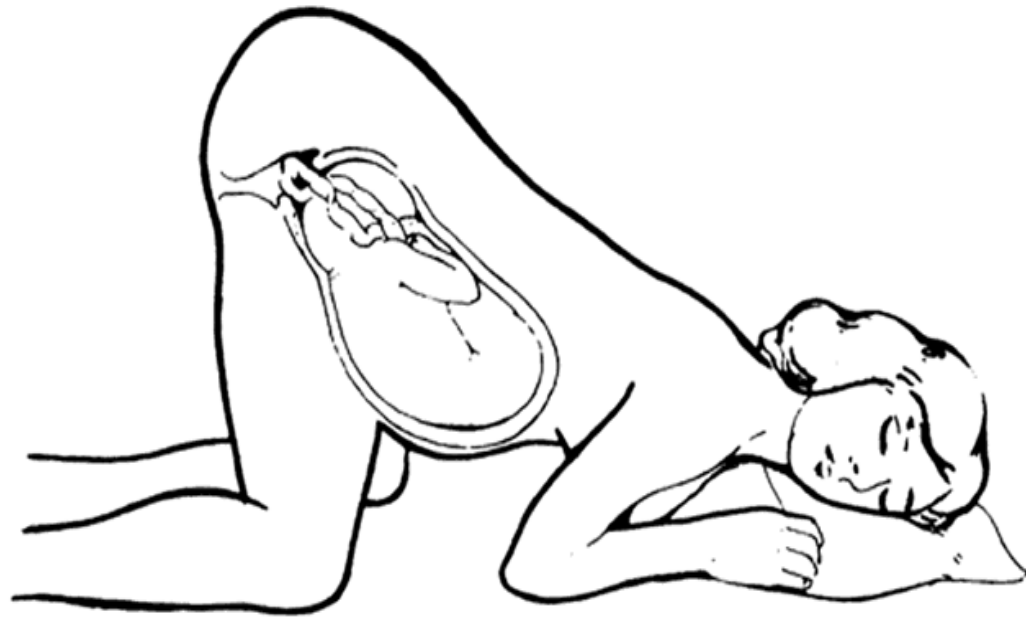
Occasionally (about 1 in every 400 births) the baby is lying across ways in the uterus, called a 'transverse lie'. When this happens, the baby's back or shoulder covers the woman's cervix. This is known as a 'shoulder presentation'.



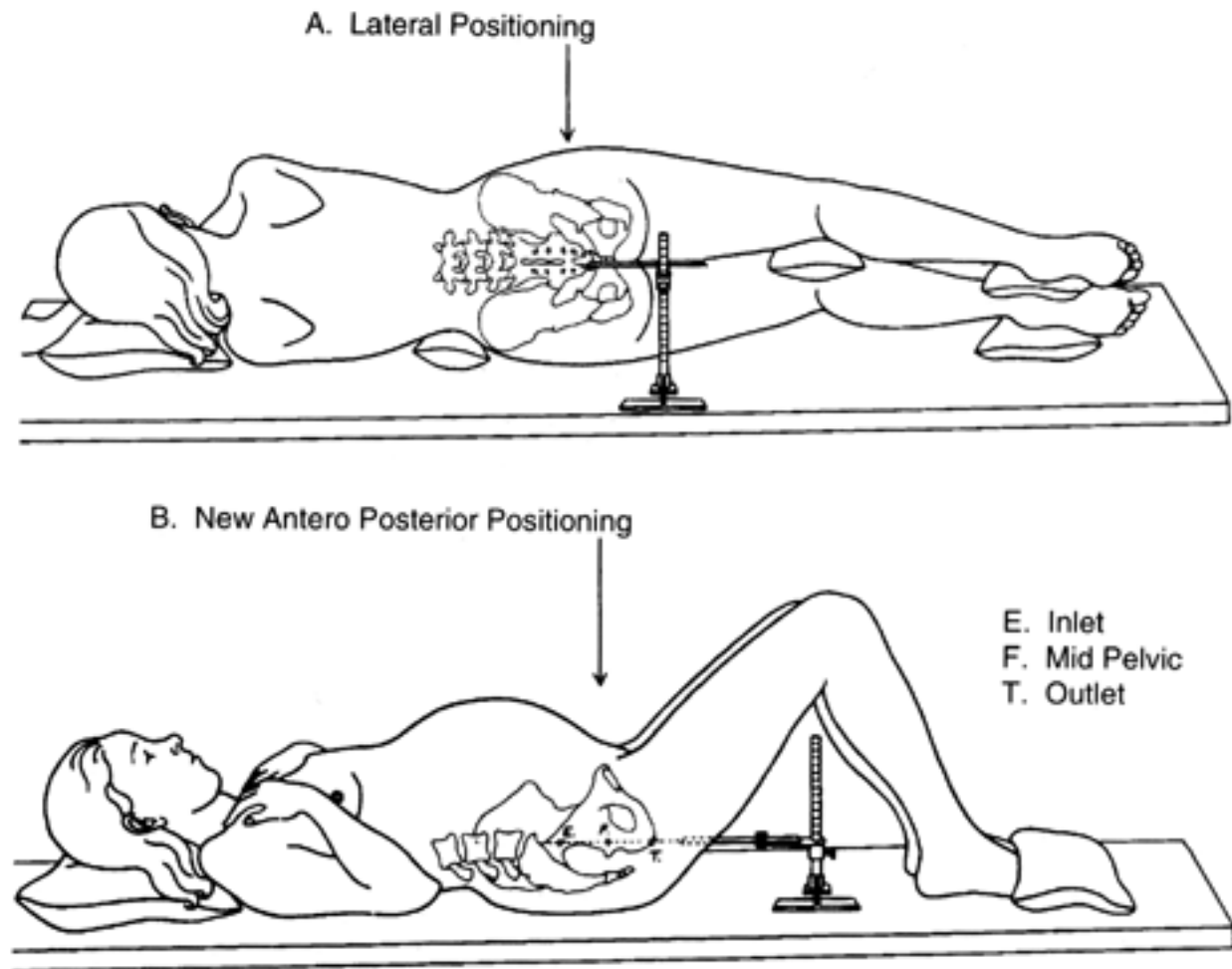
- Breech position



- Prolapsed cord position



Haemorrhage prior to delivery position



Pre-hospital care

- CPG's
 - Pre-hospital emergency childbirth
 - Haemorrhage in pregnancy prior to childbirth
 - Postpartum Haemorrhage
 - Umbilical Cord Complications
 - Breech Birth
 - Basic & Advanced Life Support- Neonate < 4 weeks
 - External Haemorrhage- Adult

Management of Mother pre-hospital Breech childbirth

- Sample History
- If birth is imminent inform control and request ALS
- Monitor Vital signs
- Position Mother (Lithotomy) prepare equipment for birth
- Support baby as it emerges-avoid manipulation of baby's body
- Transport if no ALS available
- Consider Entonox

Management of the baby

- Dry, stimulate by tactile stimulation, wrap and keep warm
- Monitor baby's vital signs, resps and heart rate initiate CPR if Hr <60 or inadequate breathing.
- If HR>100 and resp not adequate assist with ventilations
- Keep warm
- Continuous monitoring watching for any cardiovascular and or respiratory distress.
- Transport

Assessment



Summary

- Mal-presentations
- Positions of mothers for delivery
- Management of mother and baby
- Factors that contribute to mal-presentation

References

- *Phecc CPG's 3rd edition*
- *Nancy Caroline Emergency care in the street's 6th Ed Ch 30,1-31*
- *Acta Obstet Gynecol Scand. 2011*

- *Images*
 - *Dailytelegraph.com*
 - *Transitionparenthood.com*
 - *Science&sensibility.org*

Thank You



Questions?

Thank you.....Questions?





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Thermoregulation in the new-born

Mary O'Neill

September 2014



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Objectives

- Identify the normal temperature range for a neonate.
- Predict the effects of cold stress on the infant.
- Outline the sources of heat loss and suggest ways of avoiding heat loss in the pre-hospital environment.

Background

- Control of thermoregulation is one of the critically important factors in physiology of the well being of the infant
- The neonate is no exception to the general rule that body temperature is the result of a balance between heat production and heat loss.

- A- Airway
- B-Breathing
- C-Circulation
- D-Degrees

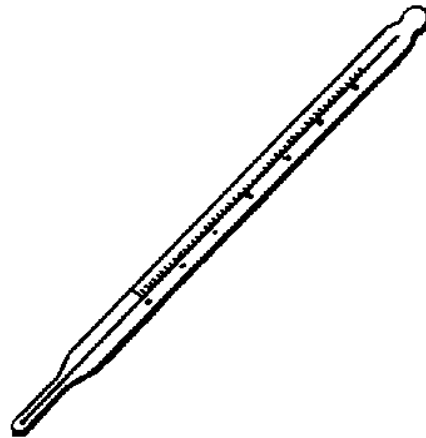


Body temperature in the newborn infant

- Classification of hypothermia is based on core temperature
 - NORMAL – 36.5 to 37.3°C (97.7 – 99.2°F)
 - Cold Stress 36.0 to 36.4°C (96.8 – 97.6 °F)
 - Cause for concern
 - Moderate hypothermia 32 – 35.9°C (89.6-96.6°F)
 - Danger, warm infant
 - Severe hypothermia – below 32°C (89.6 °F)
 - Outlook grave, skilled care urgently needed

Thermoneutral Environment

- Temperature and environmental conditions at which metabolic rate and O₂ consumption are lowest



How does an infant maintain temperature

- Babies try to produce heat by:
- Increasing their metabolic rate
- Non Shivering Thermogenesis
- Increasing their motor tone & activity (limited response)
- Vasoconstriction (limited response)



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Increasing muscle tone and activity



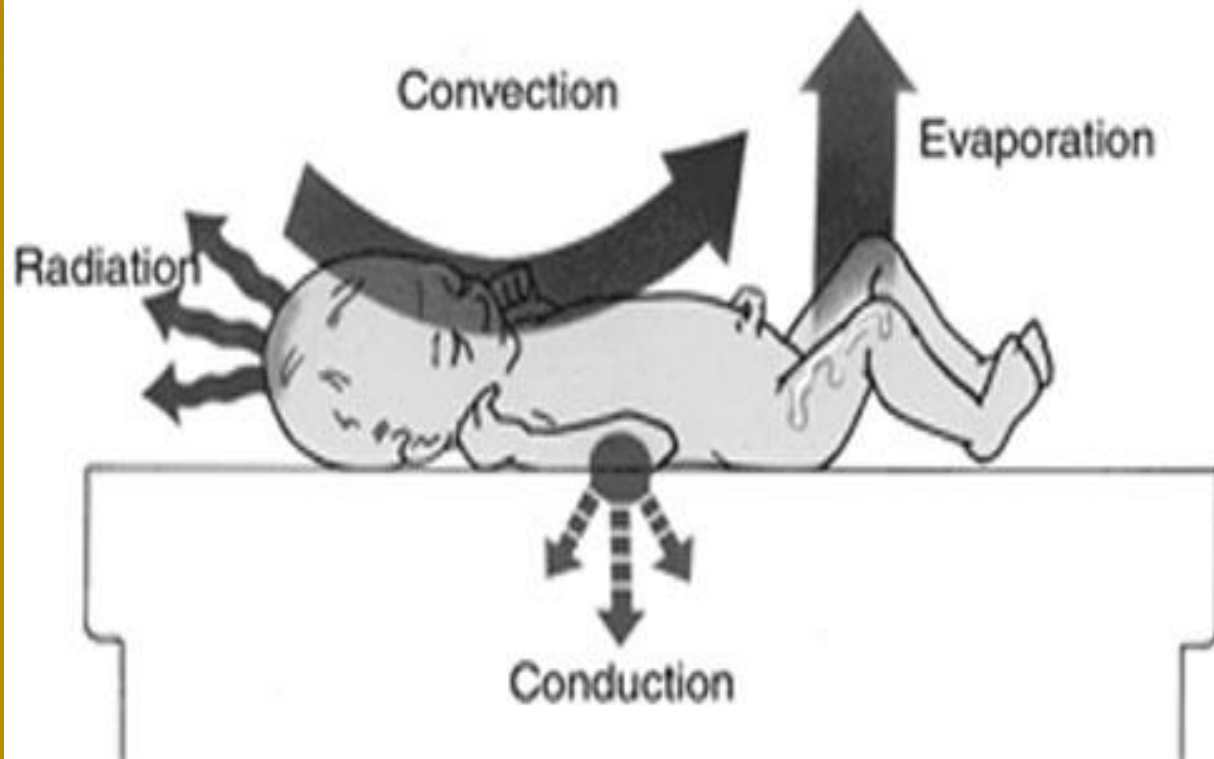
Peripheral Vaso-Constriction.



Infants at risk of Hypothermia

- All infants in first 12 hours
- Low birth weight
- Preterm infants
- Asphyxiated infants
- Abnormal skin integrity
- Neurologically impaired
- Any infant already stressed metabolically.

Mechanisms of Heat Loss



Conduction

- The transfer of heat between two solid objects.
- i.e. infants body and mattress/stretcher/stethoscope/your hands.
- **What can YOU do to prevent conductive heat loss???**

Convection

- When the infants body heat is swept away by air currents.
i.e. drafts from air vents/windows/doors/fans/traffic.
- Heat loss is accelerated when the environmental air temp is colder and/or when the air flow velocity is higher.
- **How would you prevent this??**

Evaporation

- Occurs when moisture on the skin surface or the respiratory tract mucosa is converted to vapour.
- This process ALWAYS has a cooling effect.
- Most commonly insensible loss.
- **How would you prevent this??**

Radiation

- The transfer of heat between solid surfaces that are not in contact with each other.
- i.e. exposed infants body surface and adjacent windows/walls.
- Remove cold objects from the bed/wrap or dress baby quickly/place skin to skin and cover
- **What contributes to this??**

Detrimental effects of hypothermia.

Cold stress



Hypothermia



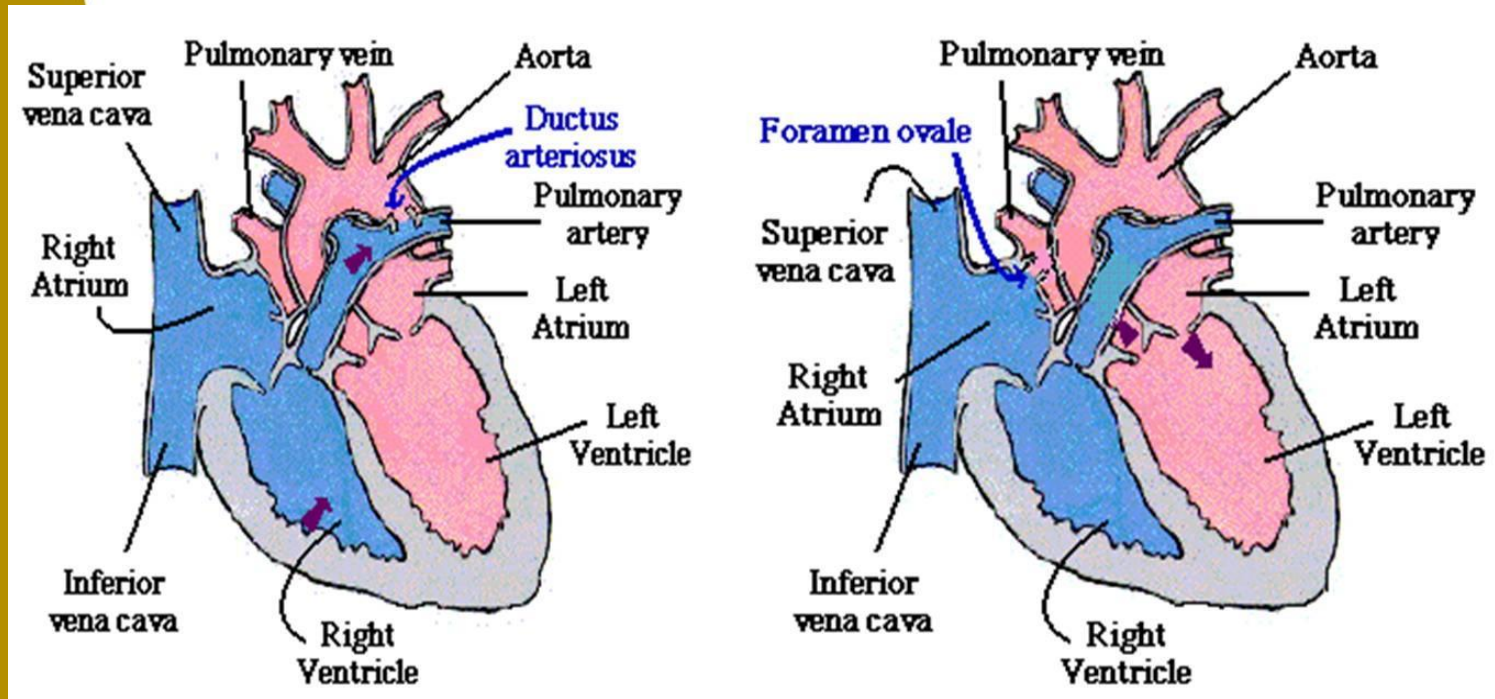
Signals to hypothalamus

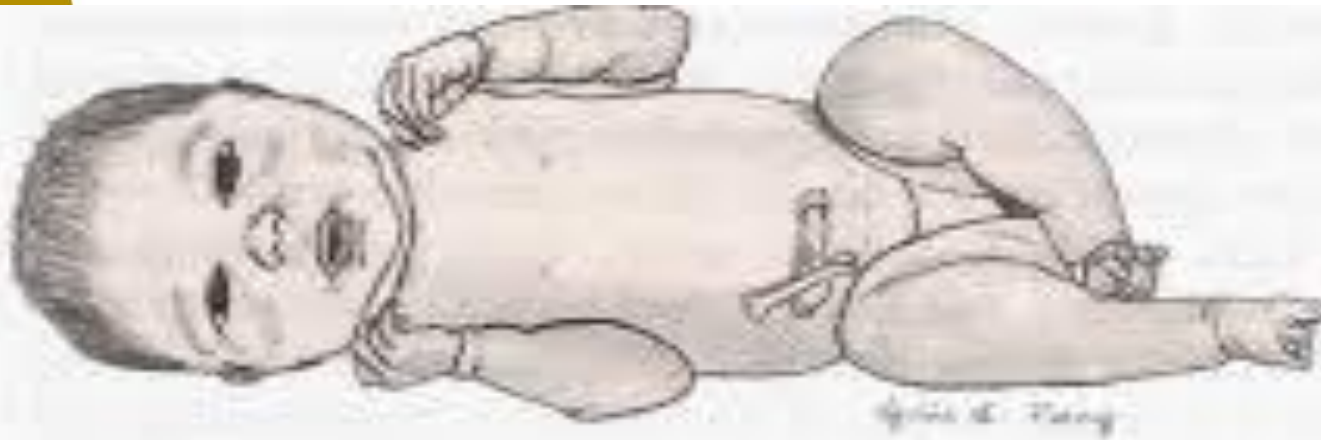


Activates noradrenaline release

Effects of noradrenaline

- Peripheral vasoconstriction
- Pulmonary vasoconstriction





The warm chain

- Warm delivery room
- Immediate drying
- Skin to skin contact
- Breast feeding
- Bathing and weighing postponed
- Appropriate clothing/bedding
- Mother and baby together
- Warm transportation
- Warm resuscitation
- Training and awareness (Who '97)



Preventative measures at delivery

- Environmental temp 25 °C
- Dry baby thoroughly
- Remove wet linen (replace with warm towel)
- Draught free
- <1500g/28 weeks..plastic wrap
- Skin to skin
- Hat on dry head

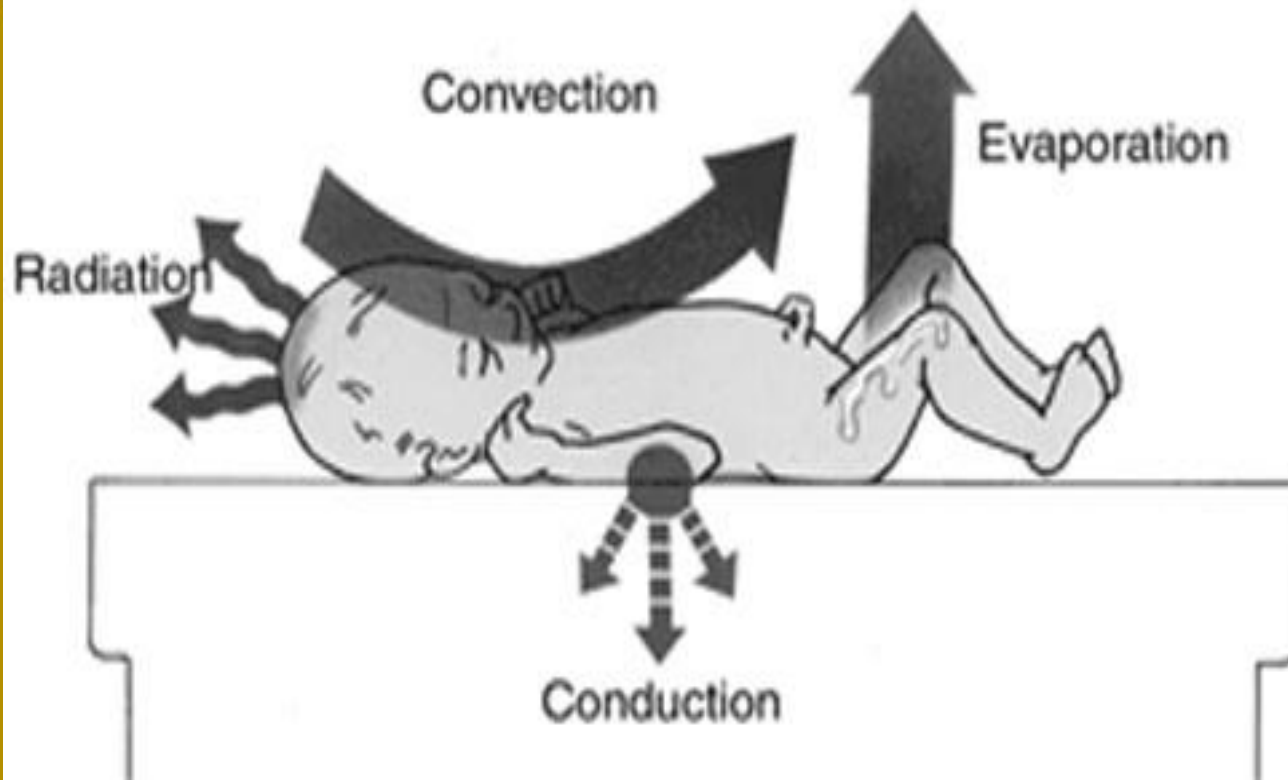
Conclusions

- Hypothermia in the newborn is due more to a lack of knowledge than to lack of equipment.
- Hypothermia is a preventable condition that has well documented impact on morbidity and mortality.
- Therefore, assisting the infant to maintain a normal body temperature and preventing hypothermia during stabilization is critical

References



- Karlsen, K. (2006). The STABLE Program, Learner Manual. STABLE, Park City, UT
- Gomella TL, Cunningham MD (eds): a LANGE clinical manual, Neonatology: 7th ed. McGraw Hill 2013
- Department of Reproductive Health and Research (RHR), World Health Organisation. Thermal protection of the newborn: A practical guide (WHO/RHT/MSM/97.2). Geneva: World Health Organisation. 1997



While I am
Cool...
kids should
never be
as Cold as
I am.



