NEET SS OBG

OBSTETRIC

CONTENT

MATERNAL PELVIS

Pelvis

00:00:21

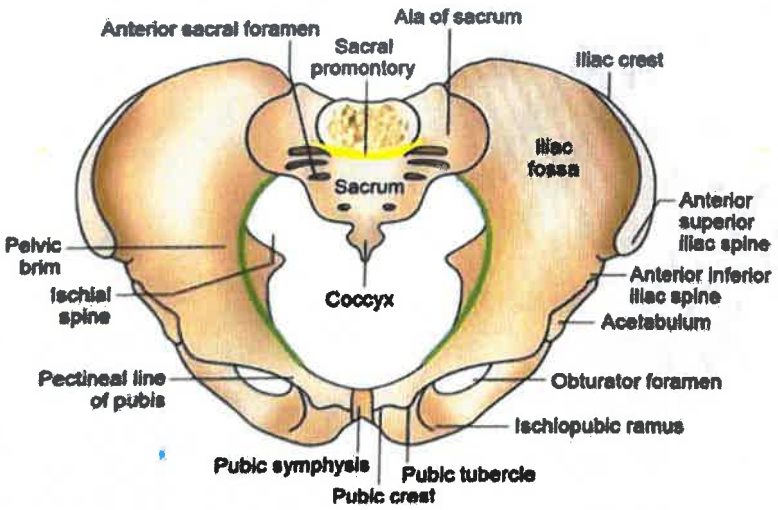
Pelvic brim / Linea terminalis :

From anterior to posterior it is formed by

Pubic symphysis → Pubic crest → Pubic tubercle → Upper border of ascending rami of pubic bone → Iliopectineal eminence → Iliopectineal line → Sacroiliac joint → Ala of sacral bone → Sacral promontory.

Parts above the pelvic brim → False pelvis (only support gravidarum uterus).

Parts at and below pelvic brim → True pelvis (takes part in labor).



Parts of true pelvis :

- Inlet : Lies at the level of pelvic brim.
  Plane : Plane of inlet.
- Cavity : Lies at the level of $S_2 - S_3$ vertebra (in between inlet and outlet).
  Planes :
  1. Planes of greatest pelvic dimension.
  2. Plane of least pelvic dimension.
- Outlet : Lies at the level of tuberosity.
  Plane : Plane of outlet.

Pelvic inlet :

1. Anteroposterior (AP) diameter :

Diameter	Definition	measurement
True conjugate	Upper border of pubic symphysis to sacral promontory.	11 cm
Obstetric conjugate	mid of pubis symphysis to sacral promontory	10-10.5 cm
Diagonal conjugate (can be measured clinically)	Lower border of pubis symphysis to sacral promontory	12 cm

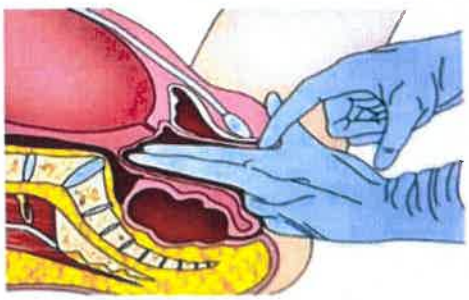
- Smallest AP diameter → obstetric conjugate (OC).

- Critical obstetric conjugate :
  Smallest OC diameter = 10 cm.
  If OC < 10 cm, vaginal delivery is not possible → Such pelvis is called contracted pelvis.

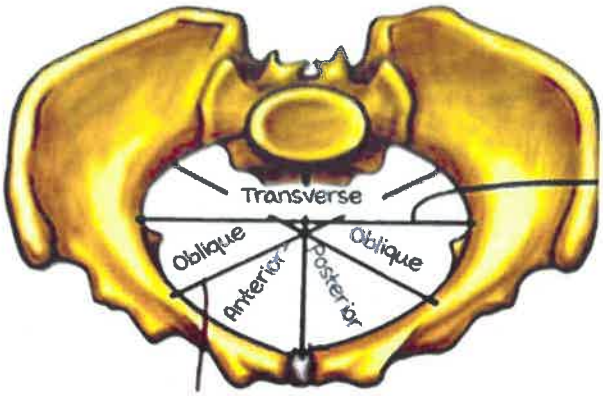
- Longest AP diameter → Diagonal conjugate (DC).

  If DC is normal or 12 cm (ideal) → Finger can't touch sacral promontory.
  If fingers can touch sacral promontory then DC < 12 cm.

OC = (DC − 1.5 to 2) cm.
TC = (DC − 1) cm.



Transverse diameter (TD) : Distance between 2 farthest points in Iliopectineal line, which is 13 cm.
Oblique diameter : Distance between one side's sacroiliac joint to other side's iliopectineal eminence, which is 12 cms.
Right oblique diameter (start from right sacroiliac joint to left side iliopectineal eminence).



Left (start from left sacroiliac joint to right iliopectineal eminence).
Shape of pelvic inlet in normal female is oval (transverse oval).
TD diameter > AP diameter.

Cavity

00:21:34

The part of the pelvis between pelvic inlet and outlet is pelvic cavity. It is shaped like a truncated cylinder.

Plane of greatest pelvic dimension	Plane of least pelvic dimension
Anteriorly : Center of posterior surface of pubic symphysis.	mid pelvis lies at this dimension. Anteriorly : Lower border of pubic symphysis.
Posteriorly : Junction of S2/S3.	Posteriorly : Junction of S4/S5 vertebra.
Laterally : obturator foramen.	Laterally : Ischial spine.
It is the roomiest part of pelvic cavity.	It is the narrowest plane of pelvis.
All of its diameter's are 12cms. It does not have any obstetrical significance. 	AP diameter is 11.5cms to 12cms. 

- mid pelvis : Part of pelvis lies between the plane of greatest dimension and plane of least pelvic dimension.
- Transverse diameter (inter ischial diameter, bispinous

diameter = 10cms) is the distance between two ischial spines. Being the smallest diameter of pelvis, it is the most important diameter during labour.

- Posterior sagittal diameter of mid pelvis = 4.5 to 5 cms. From the posterior boundary, going up till intersection of transverse diameter and AP diameter.

Clinical measurement of interischial diameter (IID):
Try to touch both the ischial spines simultaneously with 2 fingers of your hand, if possible it means IID is contracted, which means mid pelvis is contracted.

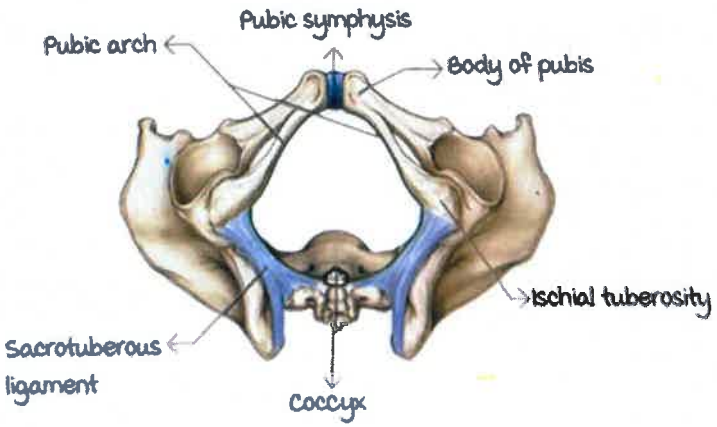
So mid pelvis is called as contracted:

1. If IID is < 8cms.
2. Both ischial spines can be touched simultaneously with 2 fingers of same hand.

Note: In male pelvis or android pelvis, ischial spines are prominent. And, deep transverse arrest occurs at the level of ischial spine in an android pelvis.

Anatomical outlet

00:25:34



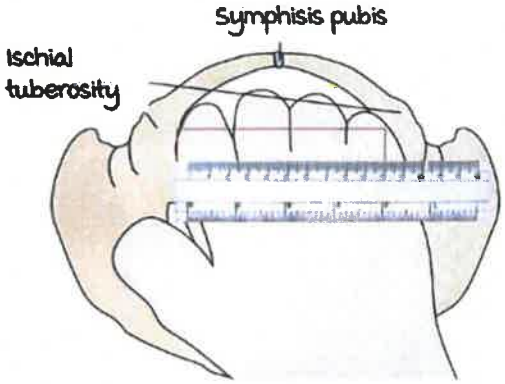
The outlet is diamond shaped.
Boundaries of anatomical outlet:

1. Posterior: Tip of sacrum (or coccyx if it is not pushed back).
2. Anterior: Lower border of pubic symphysis.
3. Lateral: Ischial tuberosity.

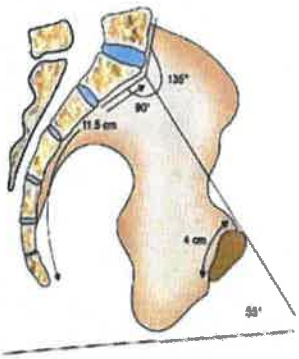
Diameters :

- AP = 13 cms.
- Transverse : 11 cms. It is the distance between a ischial tuberosities. It's also called bituberous diameter.
- If transverse diameter is < 8 cms then it is contracted.
- Posterior sagittal diameter : 7 cms.

Clinical measurement of bituberous diameter : Ideally 4 Knuckles should pass between the two tuberosities.



Angle of inclination : Angle made by pelvic inlet with the horizontal. It is 55 °.



Subpubic angle :
Angle between the a descending rami of pubic bone.
In male : Acute.
In female : Obtuse.

These clinical measurements are called as clinical pelvimetry.

- In primigravida's : Between 38 to 39 weeks.
- In multi gravida : At the onset of labour.

Note : Routine Clinical pelvimetry at the time of admission is not recommended by WHO.

Contracted pelvis

00:32:08

If any of the essential diameters of pelvis is shortened by 0.5 cm, OR
Contracted inlet (OC < 10 cm) OR
Contracted midpelvis (IID ≤ 8 cms) OR
Contracted outlet (Bituberous diameter ≤ 8 cm).

It can be diagnosed by clinical pelvimetry.
mode of delivery : Always cesarean section.

Whenever a female with contracted pelvis become pregnant → Always c-section has to be done. No role of trial of labor.

So, contracted pelvis is a indication for recurrent cesarean section.

Types of contracted pelvis :

1. Naegele's pelvis :
   One Ala of sacrum is absent.
   Only one Ala is present.
2. Robert's pelvis : Both the Ala of sacrum are absent.

management in both the cases is caesarean section.

Normal varieties of pelvis

00:37:08

Caldwell and Mohoy classification :

	Gynecoid (m/c)	Android	Anthropoid	Platypelloid
Prevalence	50 %	20 %	25 %	5 %
Shape of inlet	Transverse oval.	Heart shaped	Antero-posterior oval	Flag bowl like
TD & AP diameter of inlet	TD > AD	TD > AP	AP > TD	TD >>> AP
Ischial spine		Prominent		
Side walls	Parallel and broad	Convergent	Parallel & narrow	Divergent
Subpubic angle	Obtuse	Acute		

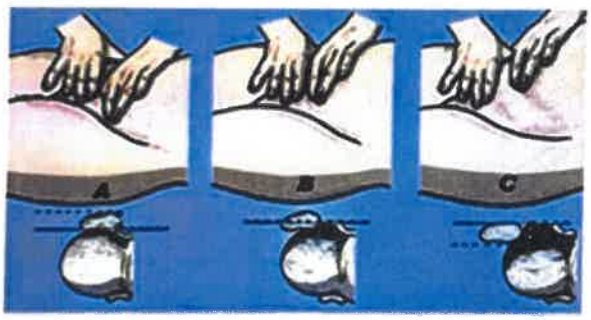
Cephalo pelvic disproportion (CPD) 00:45:18

Pelvis and baby is normal. But, the pelvis is small for this baby.
CPD is a relative finding.
Here every time a female becomes pregnant doesn't mean caesarian has to be done.
Trial of labor can be done.
Clinical assessment is not best methods to assess CPD.
Best method to diagnose CPD : Trial of labor > MRI > clinical pelvimetry.

CPD can occur at level of inlet, mid pelvis and outlet.

CPD at the level of inlet can be diagnosed clinically by 2 methods :

1. Abdominal method.



2. Abdominal vaginal method/ muller munroker method/ Bimanual method :

Trial of labor :
Done only if there is mild CPD at level of inlet.
Not done in case of severe CPD.
Not done in previous cesarean section patient even if there is mild CPD also.
Trial of labor is not equal to Trial of scar (trial of vaginal delivery in previous cesarean section patient) (VBSC).

Management of CPD :

Trail of labor → Successful → Deliver vaginally.

↓

Unsuccessful (CPD at the level of mid pelvis/ outlet).

↓

Cesarean section.

Go for direct cesarean section if severe CPD or previous h/o cesarean section.

No role of instrumental delivery.

CPD at the level of mid pelvis or outlet : Trial of labour fails.

CPD indicators during labor :

1. Moulding + slow progression of labor.
2. Caput succedaneum + slow progress of labor.

MATERNAL ADAPTATION IN PREGNANCY

Changes in metabolic system in pregnancy 00:00:50

Pregnancy is an anabolic state.
BMR increases by 10 to 20%.
O_2 consumption : Pregnancy ⟶ ↑20%
Labor ⟶ ↑ 40–60%
Total serum Ca^{2+}↓: Ionized Ca^{2+} remains normal +
non-ionized Ca^{2+} ↓
Fetus is dependent on mother for :

1. Glucose.
2. Thyroxine (For brain developement).
3. Calcium (30g at term) :
   a. Vitamin D increases.
   b. Calcitonin increases.
   c. PTH → Decreased in early pregnancy.
   → Increased in late pregnancy.

Vitamin D requirement in pregnancy : 10 mcg(400 IU)/day.
Calcium requirement in pregnancy : 1200 mg/day.

Carbohydrate metabolism in pregnancy 00:04:26

Insulin resistance :

- Occurs in pregnancy to spare glucose for the fetus.
- mainly due to human placental lactogen (HPL).
- Other hormones : Estrogen, progesterone & cortisol.
- maximum between 24 to 28 weeks.
- Pregnancy is a diabetogenic state.

Glucose is transported by GLUT 1 & 3 (facilitated diffusion).
In pregnancy, if mother is in :

- Fasting state : Hypoglycemia as glucose is transported to fetus.
- Post-prandial state : Hyperglycemia d/t insulin resistance.

Insulin secretion increases during pregnancy.
In pregnancy there is physiological glycosuria.

Proteinuria is abnormal always.
Lactosuria is physiological during breast feeding.

Skin changes in pregnancy

00:08:37

1) Linea nigra

2) Striae gravidarum

3) Chloasma Gravidarum

4) Striae albicans

5) Spider nevi/ Angioma

6) Palmar erythema

1. Linea nigra : Blue black line from xiphisternum to pubic symphysis (d/t increased melanocyte secreting hormone).
2. Striae gravidarum : Stretch mark of present pregnancy (pink colour).
3. Chloasma gravidarum : Pregnancy mask (d/t hyperpigmentation)which resolves after delivery.
4. Striae albicans : Stretch marks due to previous pregnancy (Silvery white colour).
5. Spider nevi/Angioma : Dilated capillaries below the skin.
6. Palmar erythema : Red areas of skin on the palm.

All the skin changes are due to increased estrogen, except ↑ basal body temperature which is due to progesterone (Thermogenic).

Changes in breast during pregnancy

00:11:47

1. Size and weight of breast increases d/t :
   a. Increased fat : effect of insulin.
   b. Increased alveoli : effect of progesterone (main), estrogen & prolactin.
   c. Increased ducts : effect of estrogen.
2. Hyperpigmentation of breast occurs.
3. Appearance of secondary alveoli occurs.
4. Montgomery tubercles appear : modified sebaceous glands.

Colostrum :

Can be seen as early as 12 weeks.
First thing to come out of breast after delivery (yellowish fluid).
Should be given to neonate : It is rich in Immunoglobulins & vitamins.

Colostrum has everything more than breast milk except
• K : Potassium. • F : Fat. • C : Carbohydrates.

Breast milk lacks Vitamin K and is less in vitamin D.

For milk ejection/galactokinesis/milk let down reflex :

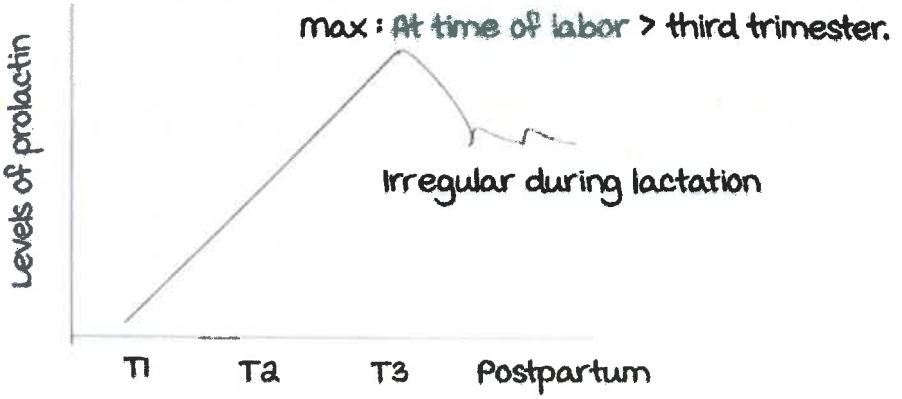
- Hormone : Oxytocin.
- Oxytocin causes contraction of myoepithelial cells of alveoli.

For continuous milk production (galactopoiesis) :

- Prolactin.
- Suckling by neonate is needed.

Prolactin in pregnancy

00:16:10



Prolactin :

Pregnancy (150ng/ml) > Non pregnant female (15ng/ml).

In non pregnant female : > 25 ng/ml → hyperprolactinemia.

Influences on Prolactin :

1. Estrogen :

- +ve effect on lactotrophes : Increased prolactin level.
- -ve effect on activity of Prolactin.

→ Post-delivery ↓estrogen ↑prolactin

↳ ↑Prolactin activity → Milk production

2. Dopamine is a prolactin inhibiting hormone.

After delivery, if a female has less milk production :

- She has less prolactin.
- mx : metoclopramide → ↓Dopamine → ↑Prolactin → more milk production.

In IUD, post delivery, lactation should be stopped.

Dopaminergic drugs :

- Cabergoline & Bromocriptine.
- Pyridoxine.
- High doses of estrogen : Not recommended, D/t risk of deep vein thrombosis.

Female with breast engorgement (milk production is normal) :

- Problem is in milk ejection.
- Advice use of breast pumps.
- Oxytocin can be given.

Vaginal,cervical & uterine changes in pregnancy 00:24:47

Vaginal changes :

Chadwick sign/Jacquemier's sign : Bluish discoloration of vagina.

pH of vagina decreases.

Increased Döderlein's bacteria (Inhabitant lactobacilli bacteria)

↓

more glycogen is converted to lactic acid

↓

Increased acidity/decreased pH

↓

Decreased pathogenic bacteria

Cervical changes :

Cervical secretions thicken to form a plug
& close the cervix mouth

↓

The plug is released during labor alongwith bleeding (Show)

These changes are the body's natural defence mechanisms to prevent infection (main cause of preterm labor).
Candida : Can survive in acidic media (m/c vaginitis in pregnancy).

Uterine changes :

	Non pregnant	Pregnant
Weight	50 to 80 g.	1100 g. marked hypertrophy. Limited hyperplasia.
Length	7.5 cm.	35 cm.
Volume	5 to 10 ml.	5 L (upto 20 L).
Shape	Pear shaped.	Globular → Spherical (12 weeks) ↓ Ovoid

Braxton Hicks contractions :

- 2nd trimester onwards.
- Infrequent and painless.
- Intrauterine pressure : 5-25mm of Hg.
- Near term : more frequent & changes to false labor pain.

As uterus becomes abdominal organ Dextrorotation to the right side (As sigmoid colon is to left side).

Hematological changes during pregnancy

00:32:10

Increased	Decreased
Blood volume increases • Plasma volume (40 to 50 %). • RBC volume (20 to 30 %). • Hemoglobin mass (g). ↓ Increased oxygen carrying capacity of blood. • Maternal erythropoietin levels increases.	• Hemodilution : Liquid component increases more than solid component. • Viscosity of blood decreases. • Hemoglobin concentration (g/dl) ↓ Physiological anemia. • Packed cell volume decreases. • Hematocrit decreases. • RBC life span decrease (110 days). • Hemoglobin concentration never less than 11 g%.

Increased	Decreased
Total leucocyte count (WBC count) increases : • Normal TLC : 11,000. • Pregnant TLC : 15,000. • Postpartum TLC : Upto 25,000. • DLC : Neutrophils & lymphocytes increase. • T lymphocytes increase.	Platelet decreases (but remains within normal range) : • AKA benign gestational thrombocytopenia. • Occurs due to : a. Hemodilution . b. splenomegaly (50%↑). • Eosinophil count decrease.

B lymphocytes and CD 4 : CD 8 remains unchanged.

• Plasma protein mass (g) increases. • Globulin increases (due to estrogen). • Sex hormone binding globulin. • Thyroid binding globulin.	• Plasma protein concentration decreases (g/dl). • Albumin decreases. ↓ Physiological edema.

In pregnancy, albumin : globulin ratio is 1 : 1 (Normal is 1.7 : 1)

All inflammatory markers increase :

- CRP.
- ESR.
- Leukocyte alkaline phosphatase.
- Complement C3, C4.

Pregnancy is an immunodeficient state.

• Humoral immunity increases. • T helper cell 2 increases.	• Cell mediated immunity decreases. • T helper cell 1 decreases.