# BONY PELVIS

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# Learning Objectives

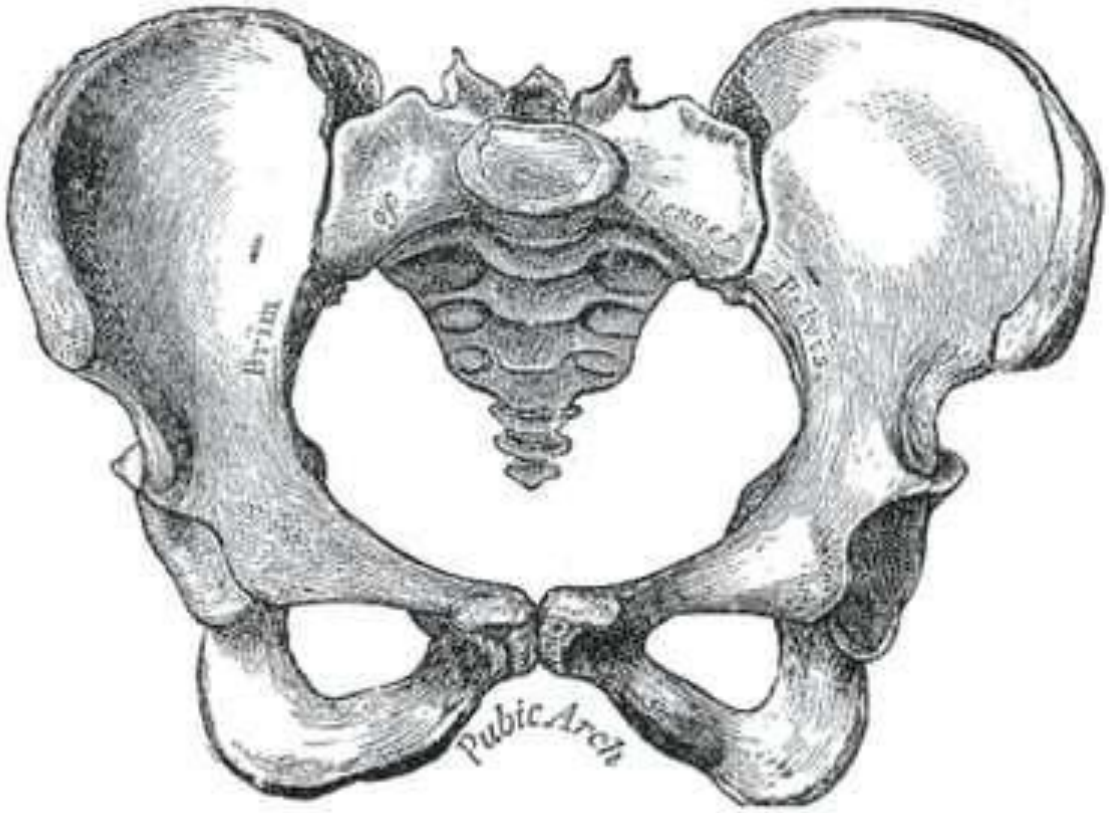
Bony Pelvis:

1. Introduction.
2. Importance of pelvis.
3. Anatomical position.
4. Divisions of pelvis.
5. Diameters of pelvis.
6. Sex difference of adult pelvis.
7. Types of female pelvis.
8. Applied anatomy of pelvis.

# Introduction

- Pelvis(Latin): ‘ a basin’
- Pelvis girdle: Bony ring

1. Two hip bones
2. One sacrum
3. One coccyx



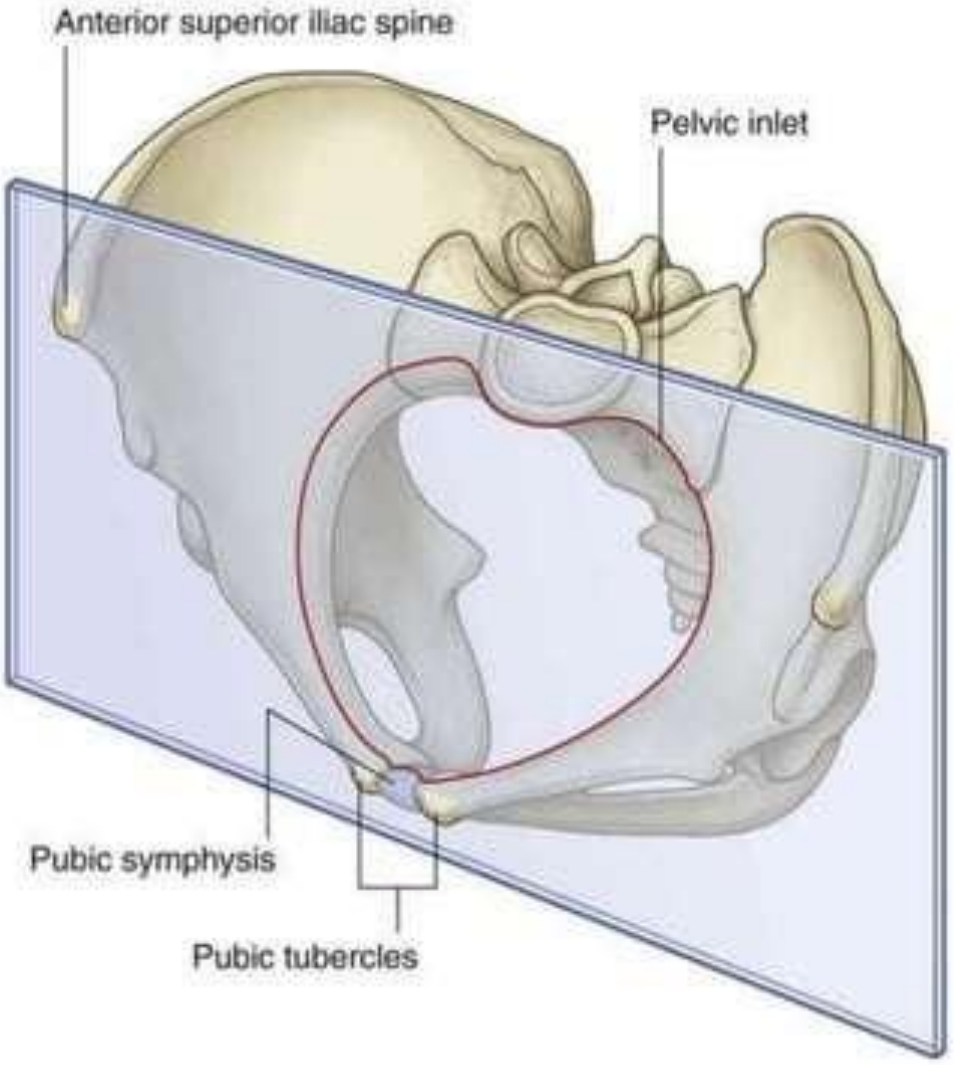
# Functions of pelvis

1. Locomotion
2. Weight transmission
3. Provides areas for the attachments of muscles
4. Protection of pelvic viscera
5. Plays important role in parturition.

# Anatomical position

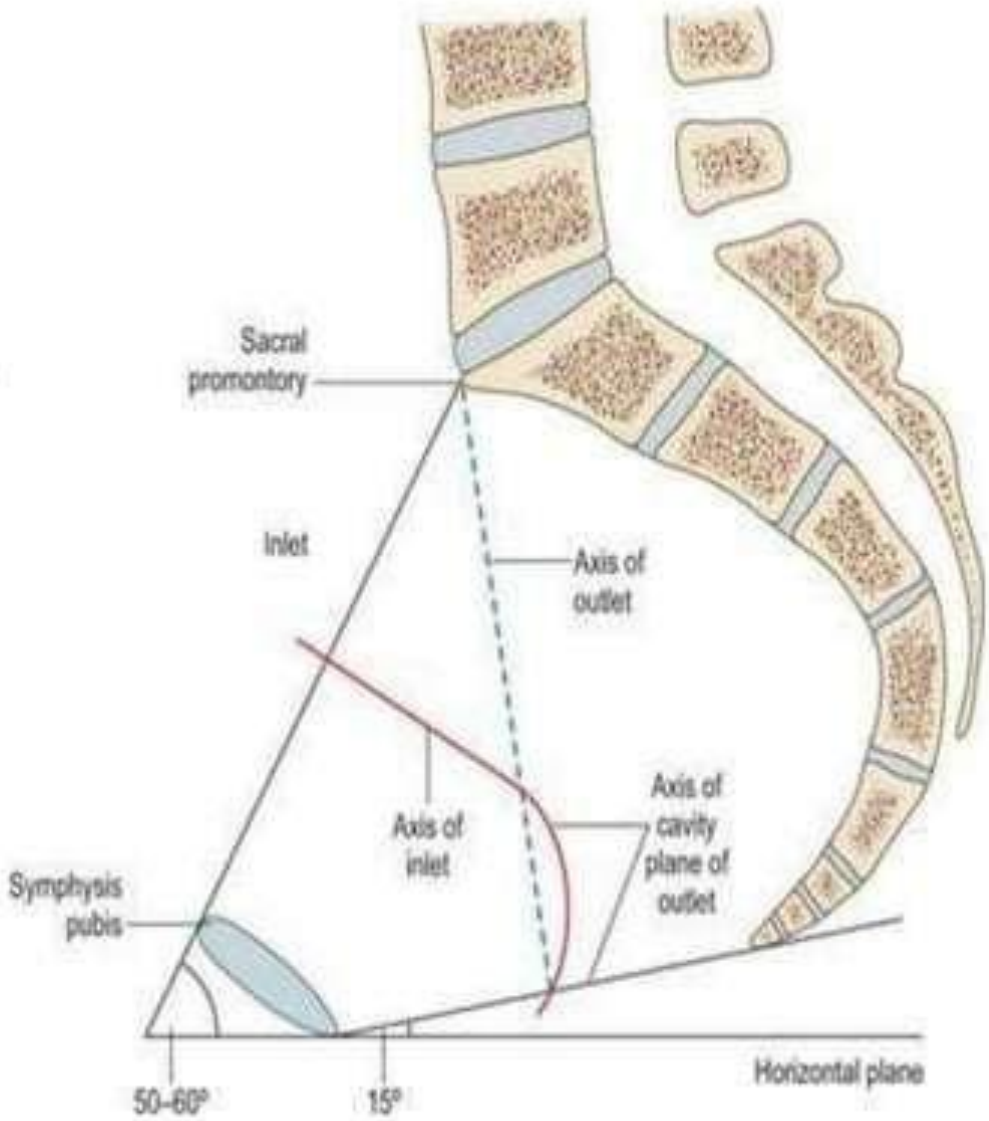
1. Pubic Symphysis lies in midsagittal plane.
2. Anterior superior iliac spine( ASIS) and pubic tubercles line in same coronal plane.

Plane of pelvic inlet forms an angle of 55-60 degree with horizontal plane.

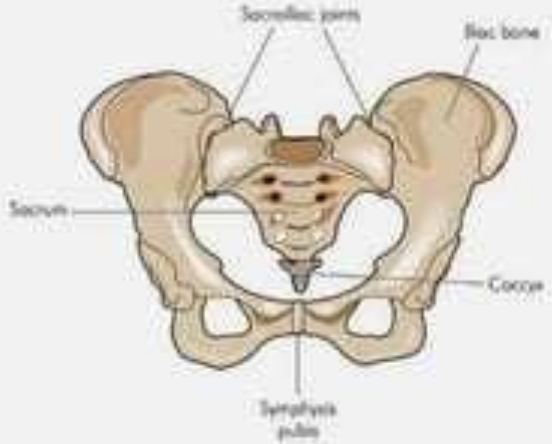


# Axes and inclination of pelvis

1. Axis of inlet
2. Axis of outlet
3. Axis of pelvic cavity



# Joints of pelvis




## Joints within Pelvis:

1.Sacroiliac Joint : Synovial Type

2. Symphysis Pubis

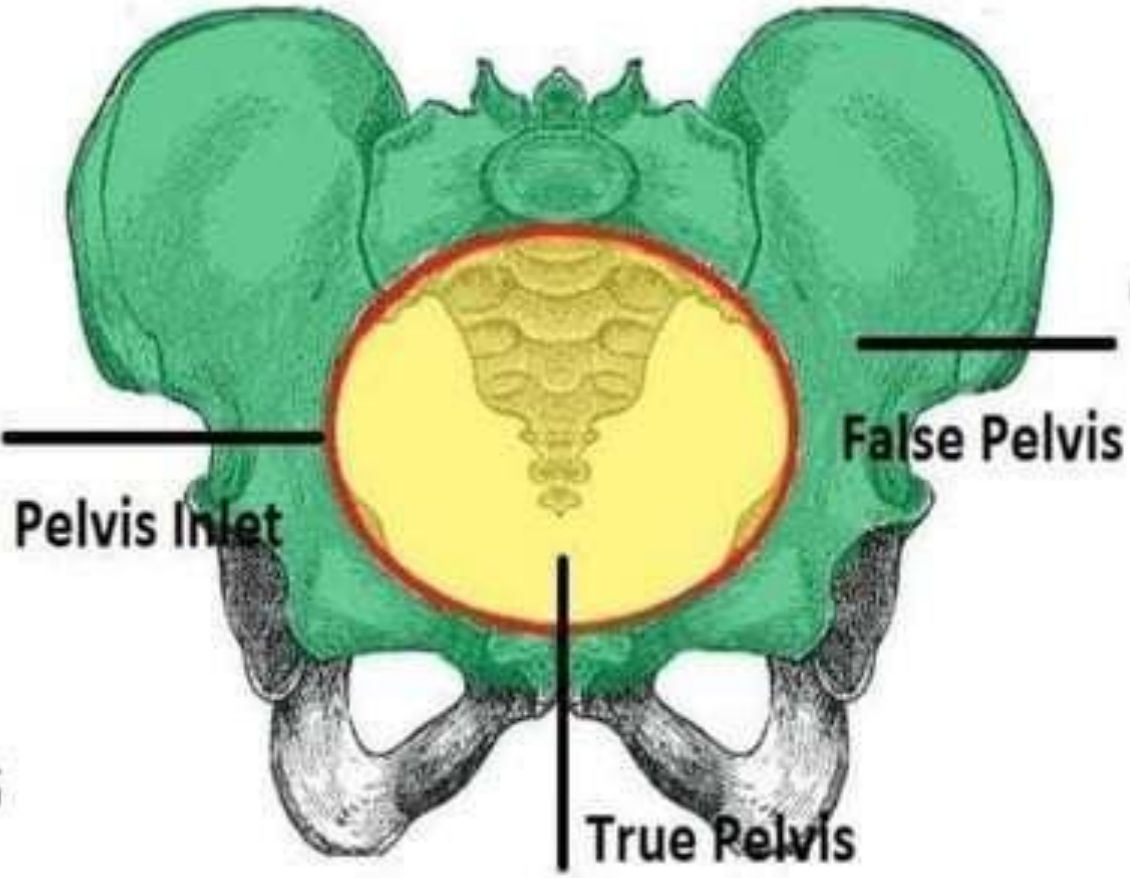
3. Sacrococcygeal Joint

## Joints Associated with Pelvis:

1. Hip Joint: Synovial Type

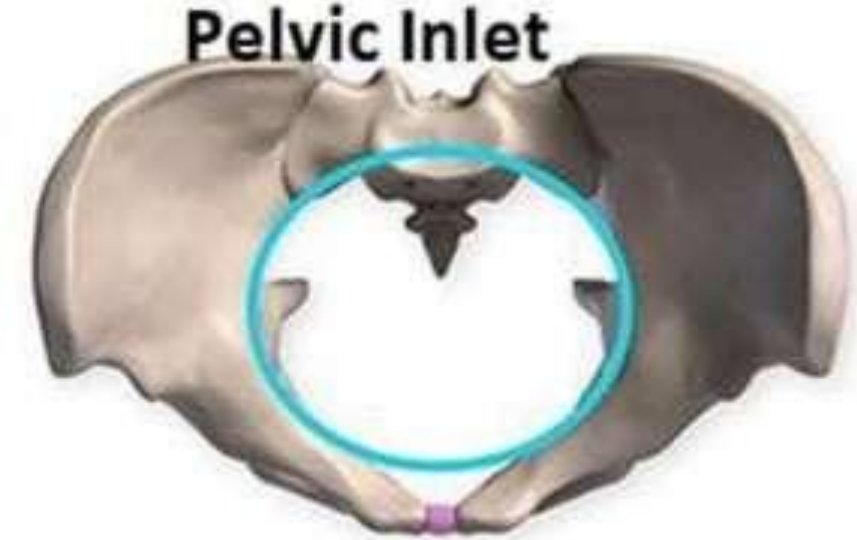
# Divisions of pelvis

1. Greater Pelvis/
   Pelvis Major/
   False Pelvis.
2. Minor Pelvis/
   Lesser Pelvis/
   True Pelvis/
   Obstetric Pelvis



# Divisions of lesser pelvis

1. Inlet
2. Outlet
3. Cavity




# Boundaries of pelvic inlet

I. Bony Contributions(Pelvic Brim)

A. Sacral contributions

a. Sacral promontory

b. Ala of sacrum

B. Contributions by hip bone( linea terminalis)

a. Iliac part ( Arcuate line)

b. Pubic part ( Pecten pubis, Pubic crest)

II. Articular contributions

A. Pubic symphysis ( Anterior midline)

B. Sacroiliac Joints ( Posterolateral)

# Boundaries of pelvic outlet

I. Anteriorly:

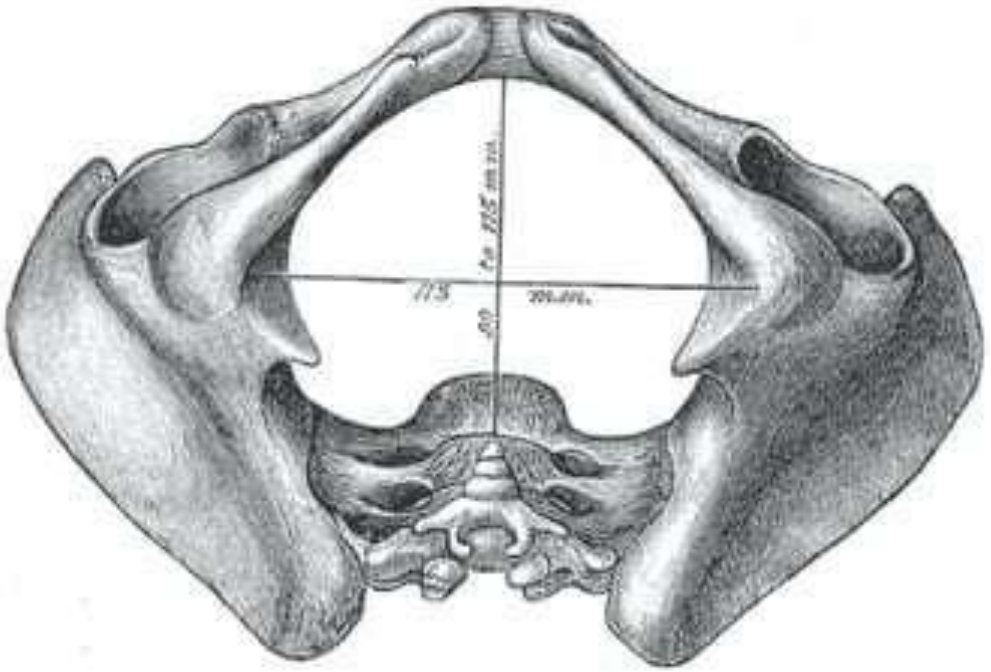
Lower border of Pubic Symphysis.

II. Posteriorly:

Tip of coccyx.

III. Laterally:

1. Half of pubic arch
2. Ishiopubic ramus
3. Ishial tuberosity
4. Sacrotuberous ligament.

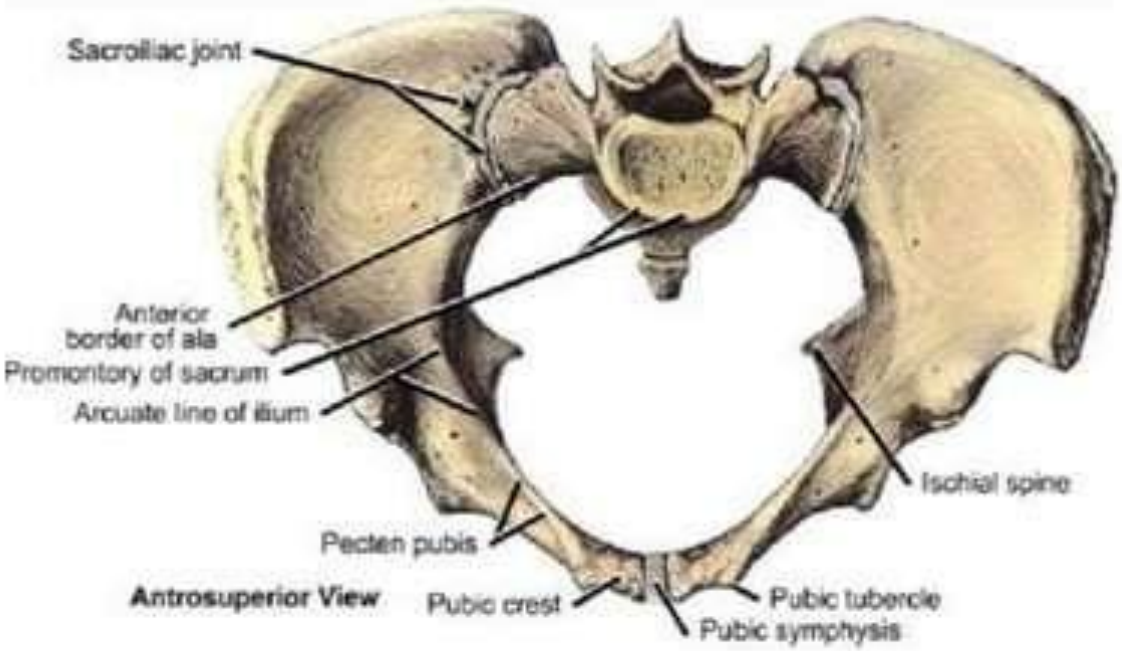


# Boundaries of pelvic cavity

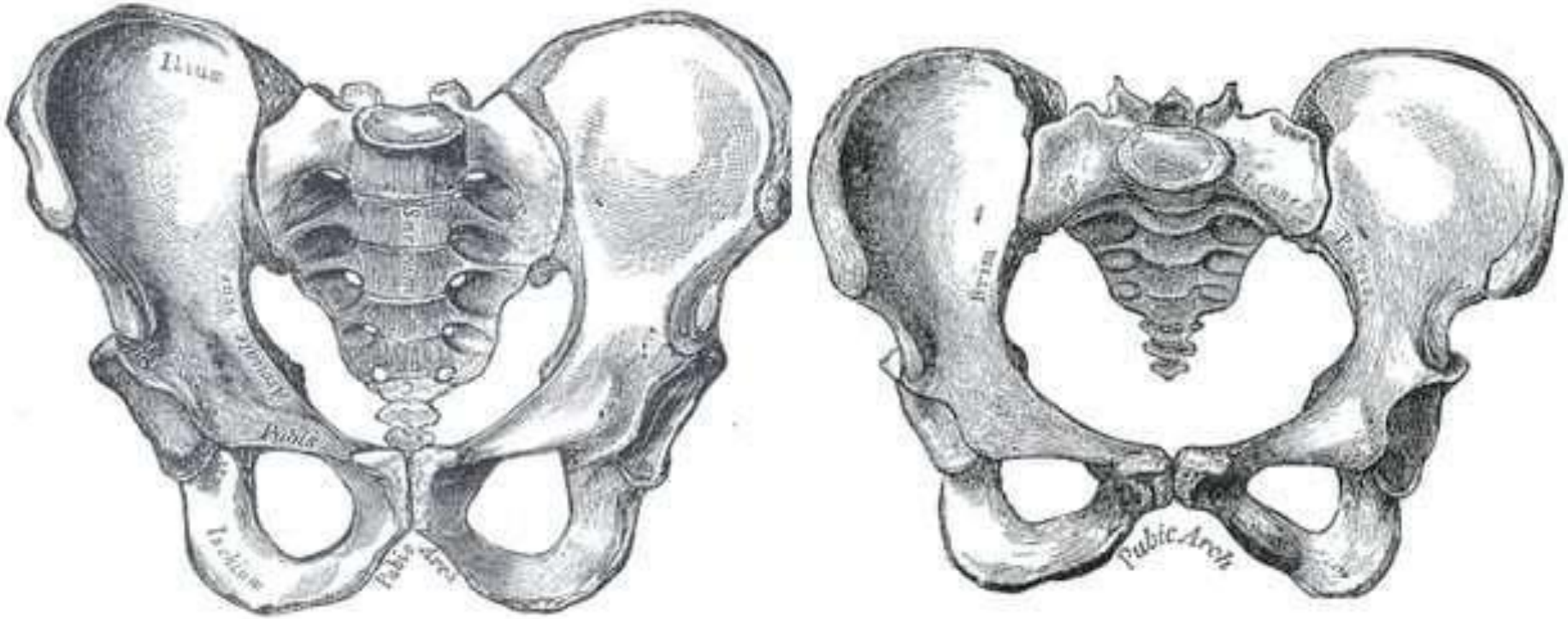
I. Anteriorly:
   Pelvic surfaces of
   a. Pubic Symphysis
   b. Body of pubis
   c. Pubic rami

II. Posteriorly:
   Pelvic surfaces of
   a. Sacrum
   b. Coccyx

III. Laterally:
   Pelvic surfaces of
   a. Ilium
   b. Ischium



# Sex differences in adult pelvis



# Sex differences in adult pelvis

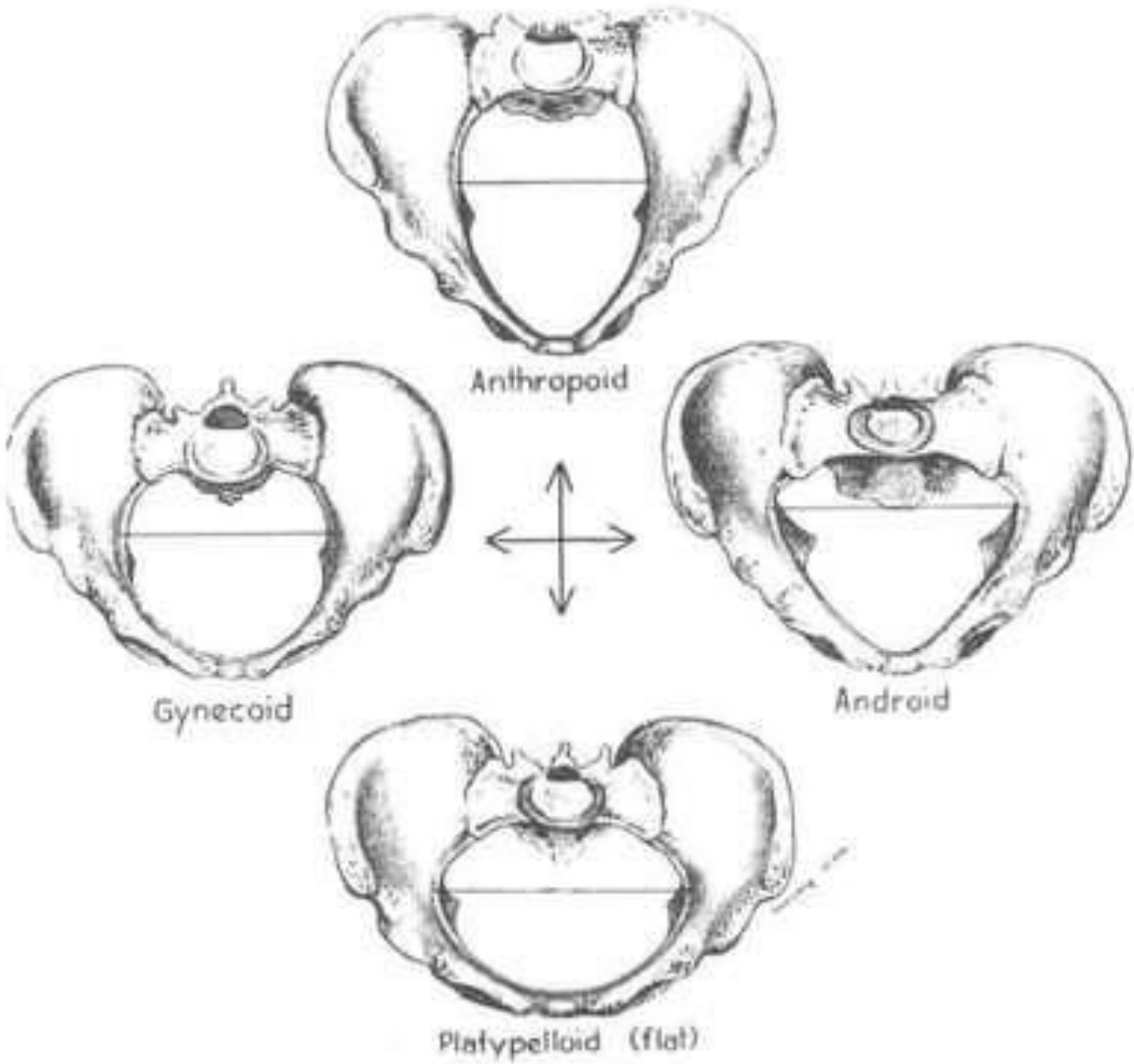
| Features | Male | Female |
|---|---|---|
| 1. General Structure | Thick and heavy | Thin and light |
| 2. Markings for muscular attachments | Very prominant | Less prominant |
| 3. False pelvis | Deep | Shallow |
| 4. Pelvic inlet | Heart Shaped | Circular or Oval |
| 5. Sacral promontory | More prominant | More flat |
| 6. Pubic tubercles | Closer | Wider apart |
| 7. Cavity | Narrower and deeper | Wide and shallower |
| 8. Sciatic notch | Narrower | Wider |
| 9. Ischial spine | Projected inwards | Projected outwards |
| 10. Ischial tuberosity | Inverted | Everted |
| 11. Subpubic angle | Acute <90 | Wider 90 degree or >90 |

# Sex differences in adult pelvis

| Features | Male | Female |
|---|---|---|
| 12. Obturator foramen | Oval | Triangular |
| 13. Preauricular sulcus | Less prominent | More prominent |
| 14. Acetabulum | Larger | Smaller |
| 15. Sacral Index, ie Breadth of sacrum x 100/ Length of sacrum | Lesser | Greater |
| 16. Pelvic outlet | Comparatively smaller | Comparatively larger |

# Types of female pelvis

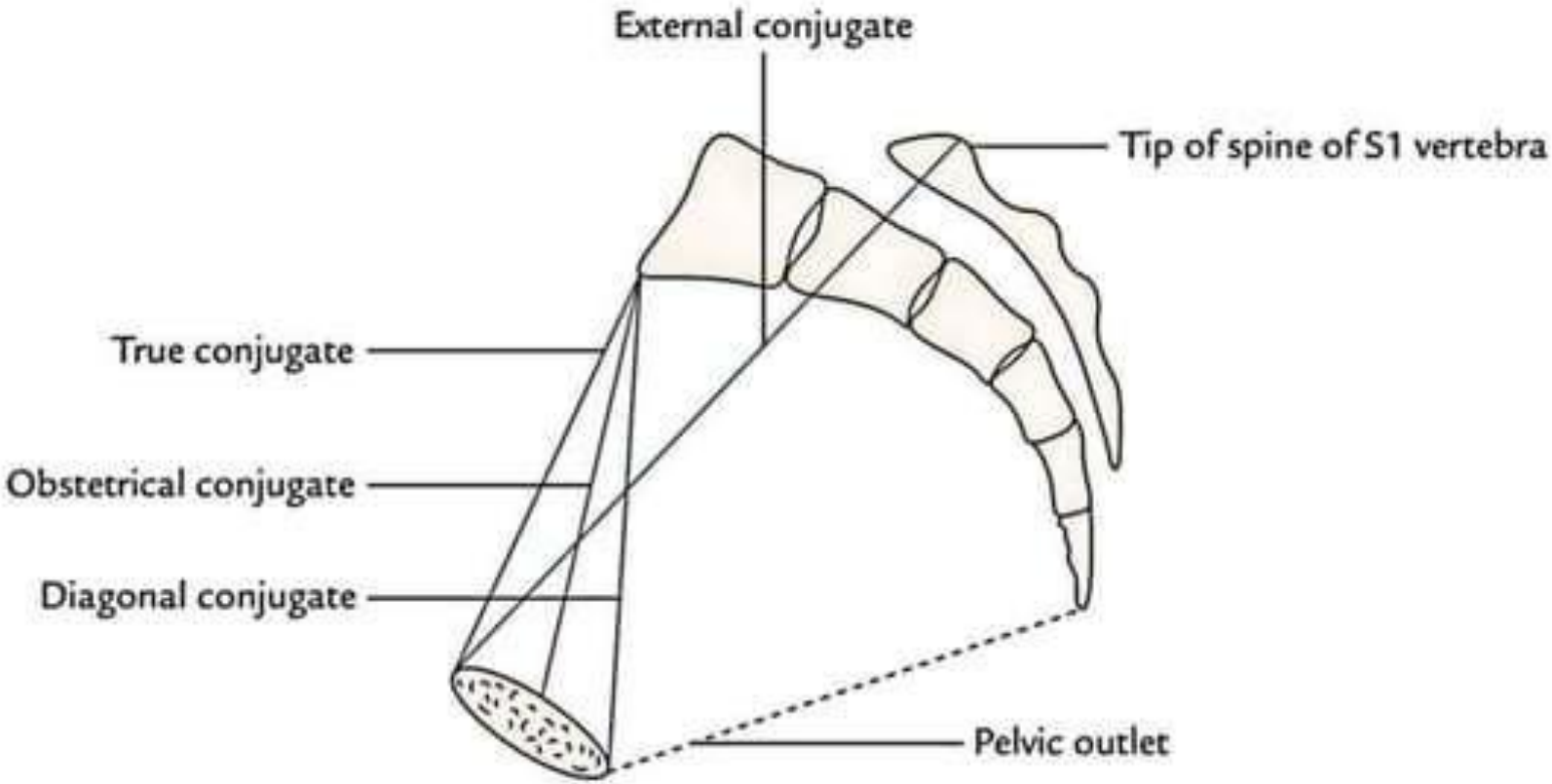
1. Gynaecoid Pelvis
2. Android Pelvis
3. Anthropoid Pelvis
4. Platypelloid Pelvis



| | Gynecoid | Anthropoid | Android | Platypelloid |
|---|---|---|---|---|
| |  |  |  |  |
| Pelvic inlet<br>Transverse diameter | | Narrow | | |
| AP diameter | | Wide | | Narrow |
| Forepelvis | Wide | Divergent | Narrow | Straight |
| Pelvic midcavity<br>Side walls | Straight | Narrow | Convergent | Wide |
| Inclination of sacrum | | Wide | Forward | Narrow |
| Pelvic outlet<br>Subpubic arch | Wide | | Narrow | Wide |

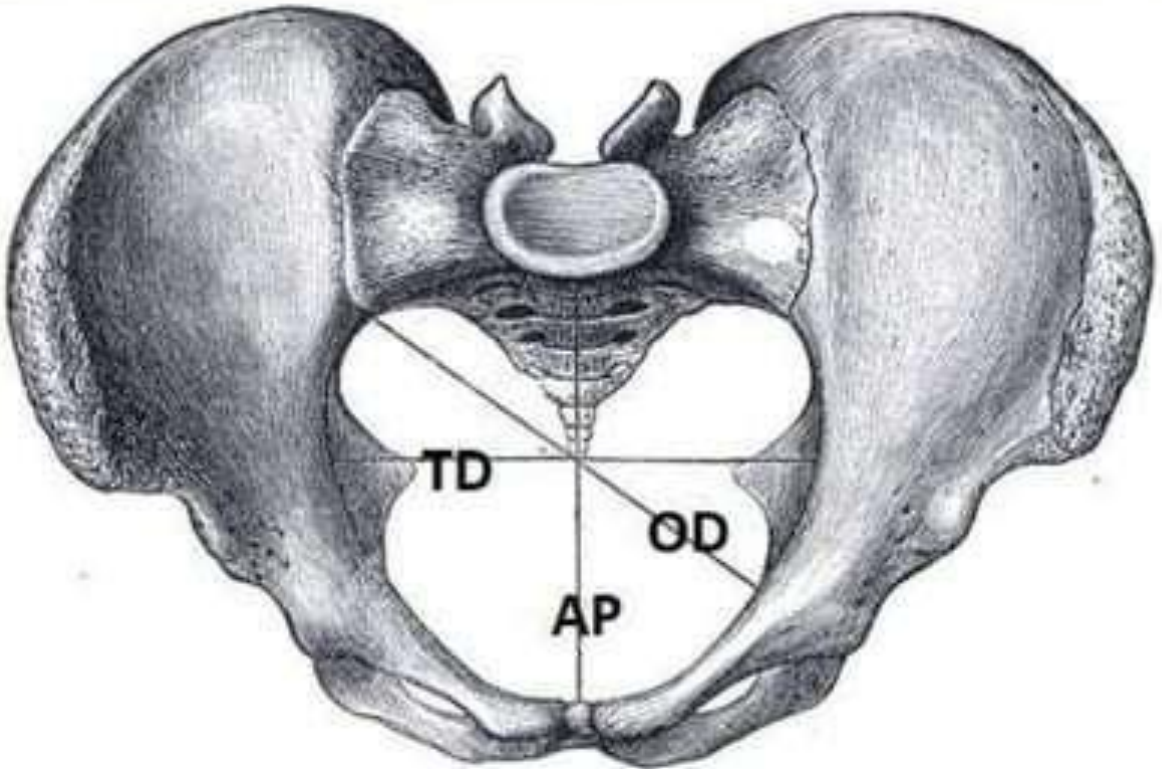
# Conjugate diameters

1. External Conjugate
2. True Conjugate
3. Diagonal Conjugate
4. Obstetrical Conjugate



# Diameters of pelvis

| Pelvis | Diameter ( cm) | | |
|---|---|---|---|
| | Anteroposterior | Transverse | Oblique |
| Pelvic Inlet | 11 | 13 | 12 |
| Pelvic Cavity | 12 | 12 | 12 |
| Pelvic Outlet | 13 | 11 | - |



# Applied anatomy

1. Diameters of the pelvic inlet in females are very important due to obstetrical reasons (to evaluate cephalopelvic dispropotion:CPD).
2. Interspinous diameter (least pelvic diameter) can be estimated by palpating sacrospinous ligament through vagina.The length of this ligament is equal to the half interspinous diameter.

3. Pelvic Fracture:

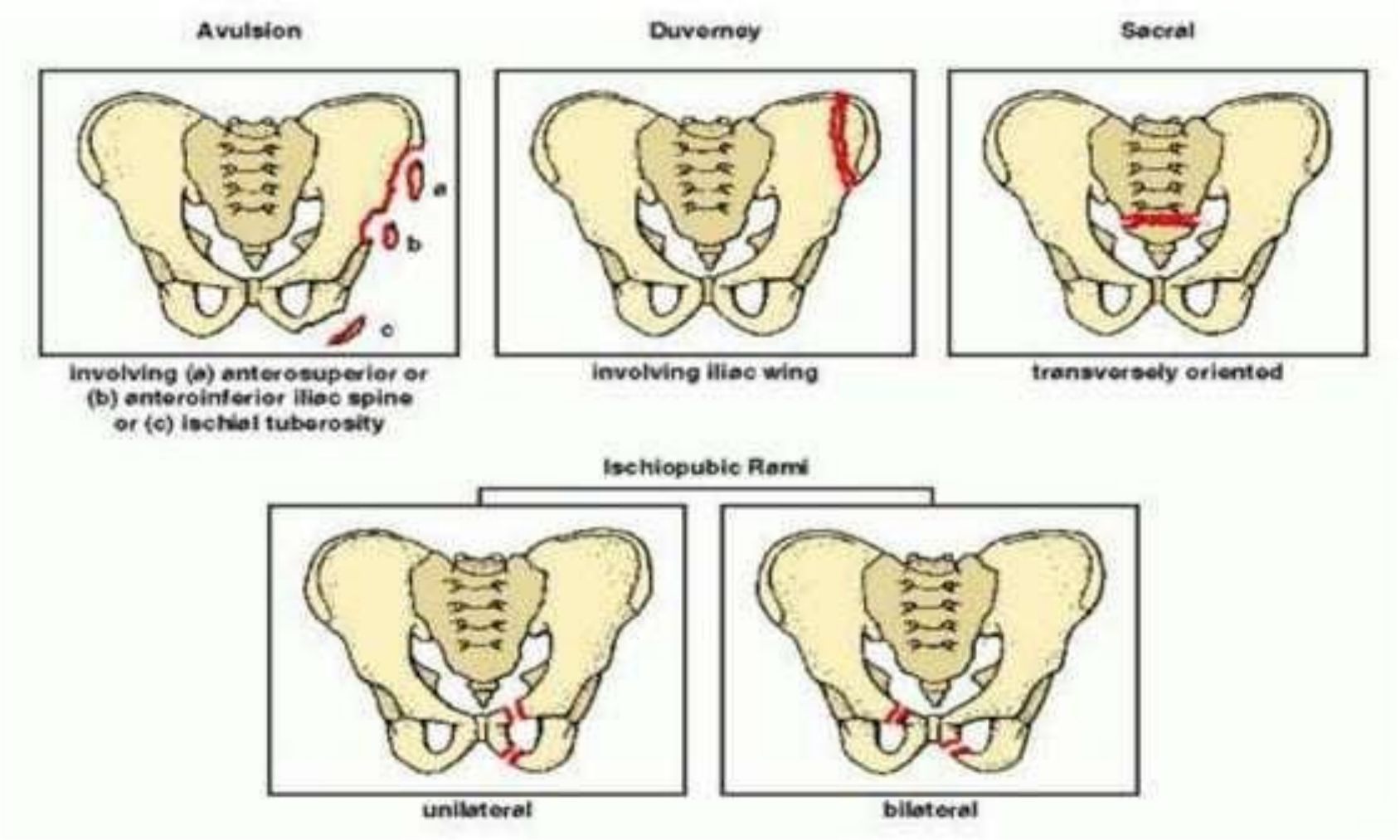
i. Stable fracture: Intact pelvic ring.

ii. Unstable fracture: Disrupted pelvic ring.

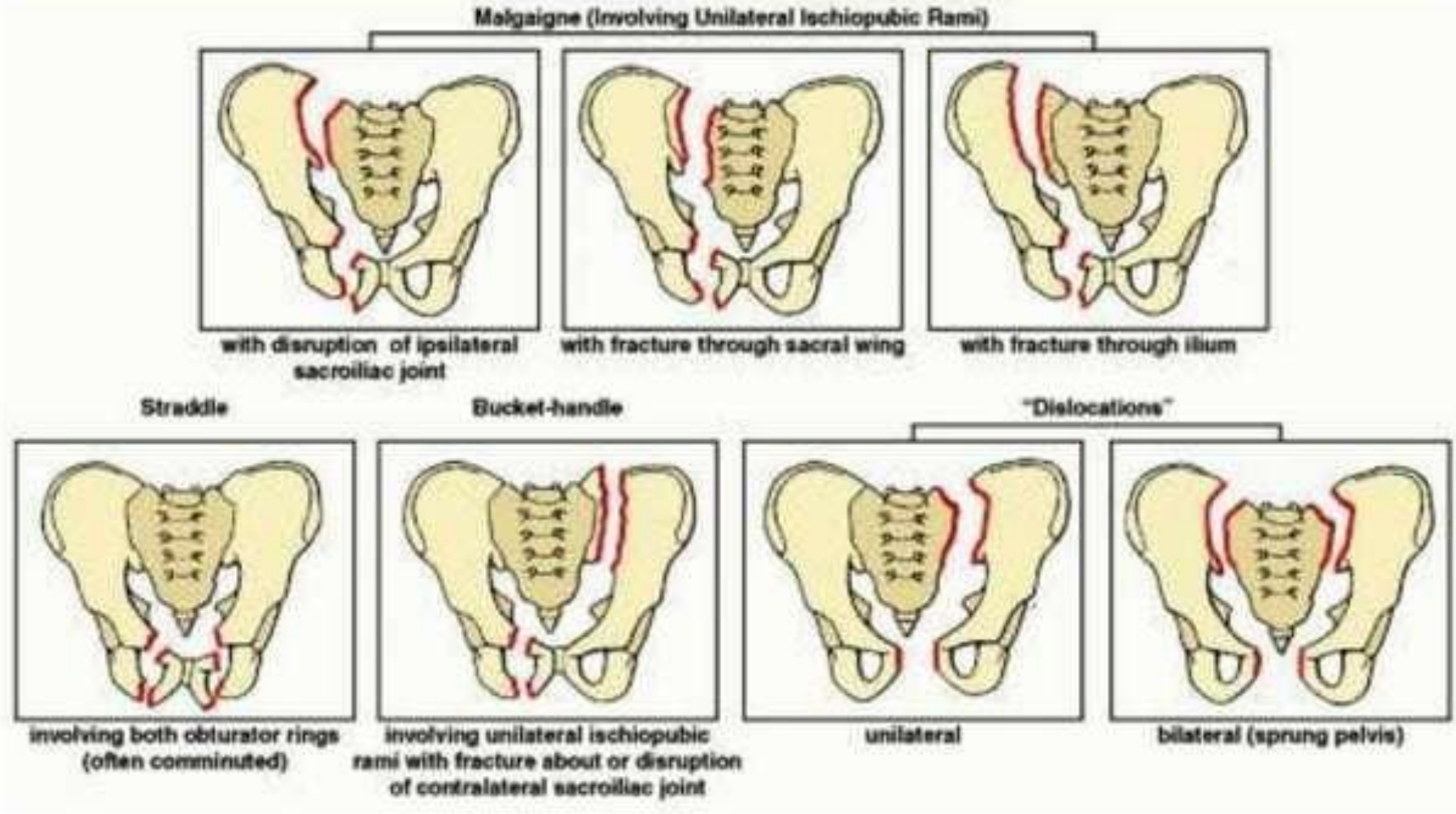
iii. Complicated fracture:

Associated with visceral damage: Urinary bladder and Urethra are most vulnerable viscera.

# Stable pelvic fractures:



# Unstable pelvic fractures:



4. Association with acetabulum:

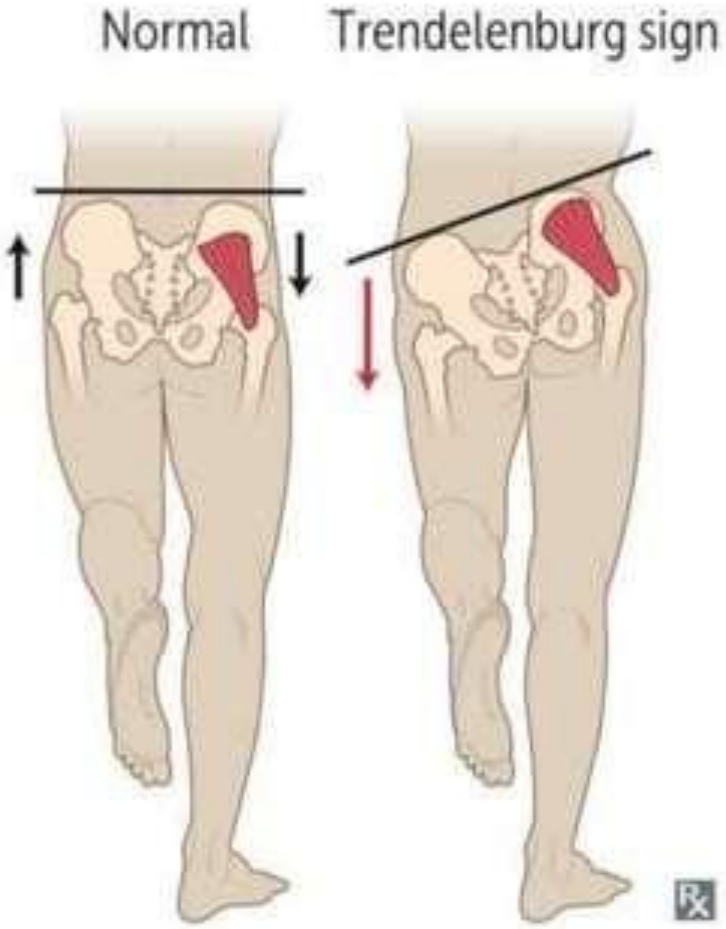
a. Fracture of acetabulum occurs when head of femur is pushed medially.

b. Hip dislocation.

c. Wandering acetabulum: Complication of tuberculosis of hip.

## 5. Trendelenburg's Sign:

Gluteus medius and minimus of one side are paralyzed due to injury of the superior gluteal nerve, the pelvis sags on the healthy side if that foot is off the ground resulting in lurching gait.

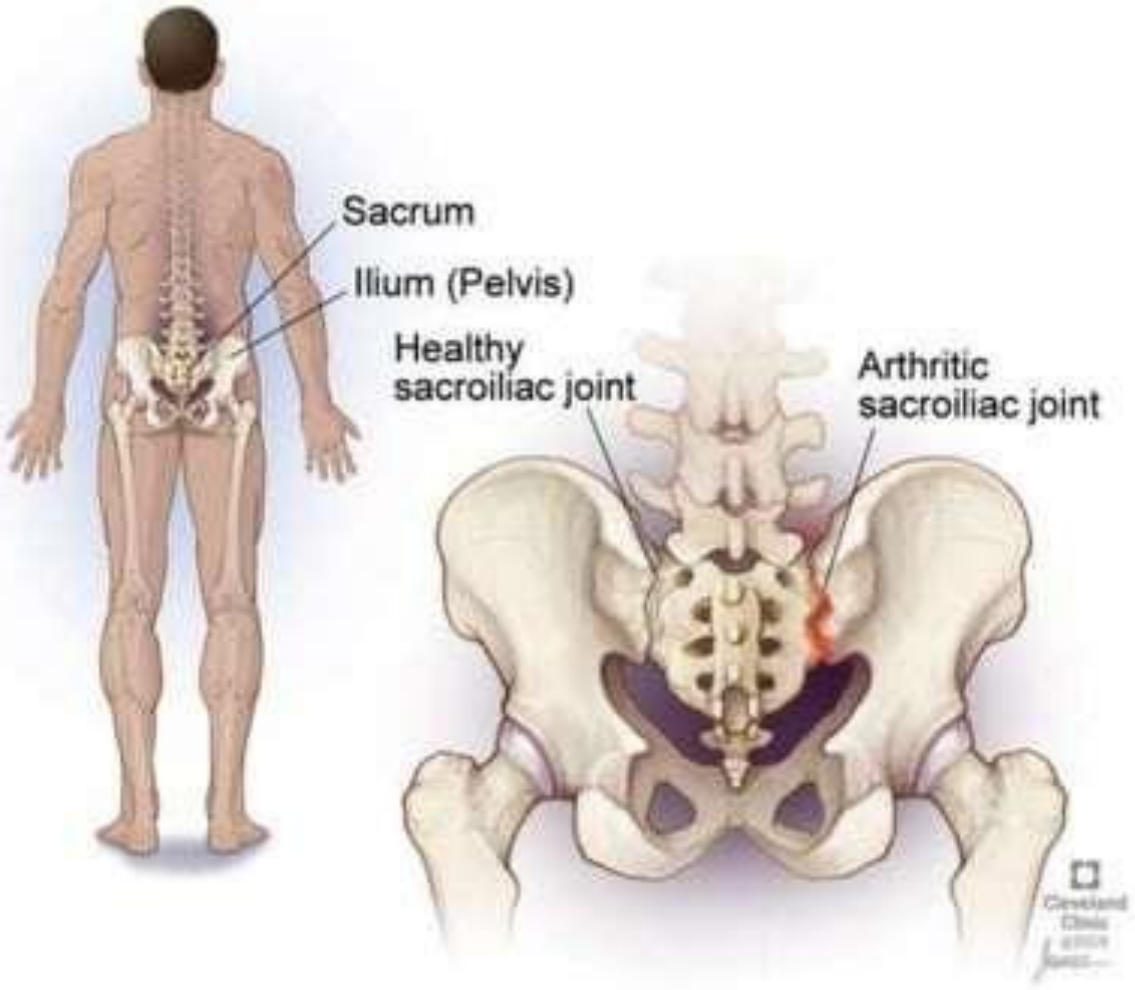


6. Intramuscular(IM) injection in gluteal region:

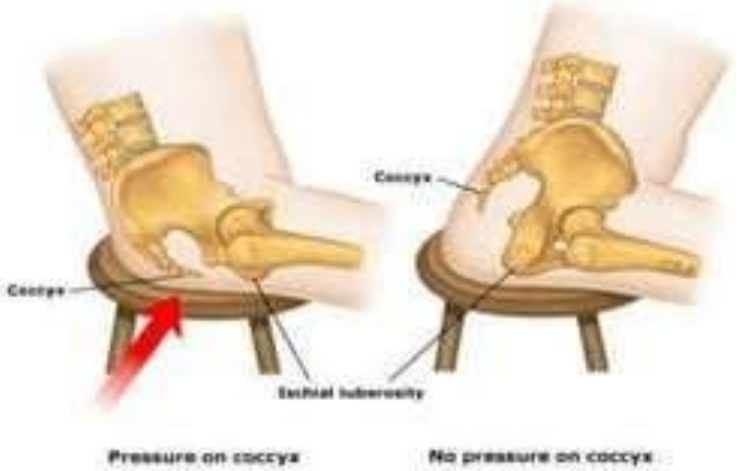
- Upper and Lateral quadrant of gluteal region
- On gluteus medius muscle
- To avoid injury to sciatic nerve.


(b)

# 7. Osteoarthitis : Ex- Sacroilitis



8. Coccydynia: Painful condition in coccygeal region. Ex. Bike riders




9. Sprinter's fracture: # of ASIS caused by violent muscle action(Sartorius) as of start of a sprint.

11. Iliac crest is the ideal site For Bone Marrow Aspiration and Bone Graft Harvesting.

Thank You

Trendel