

## 1e. Streeshroni (Female Pelvis) -Types, Diameters and Obstetric significance

### (e) Strīśroṇi (Female Pelvis) — Types, Diameters, and Obstetric Significance

#### Learning objectives

By the end of this chapter you will be able to:

1. describe the bony female pelvis and the planes used in obstetrics; 2) list and define the standard diameters of **inlet, mid-pelvis and outlet** with their average values; 3) explain the **Caldwell-Moloy** pelvis types and their **obstetric implications**; 4) apply the knowledge to clinical pelvimetry, labour mechanics and cephalopelvic disproportion (CPD).

## 1) Classical anchor and context

Although numerical pelvimetry is a modern development, Suśruta places anatomy on a firm footing of **direct observation**:

शरीरे चैव शास्त्रे च दृष्टार्थः स्याद् विशारदः ।  
दृष्टश्रुताभ्यां सन्देहमवापोह्याचरेत् क्रियाः ॥  
(Suśruta Saṃhitā, Śārīrasthāna 5/51)

This spirit underlies obstetric pelvimetry: **see, measure, and act**—while respecting pelvic marma-kṣetra (e.g., **basti**, **guda**, **vaṇkṣaṇa**, **kukundara**, **kaṭikāṭaruṇa**), which are clinically close to the obstetric field. (Suśruta, Śārīrasthāna 6.)

## 2) Overview of the female bony pelvis

[Female Pelvis Region 3D model](#)

The bony pelvis consists of **two hip bones, sacrum and coccyx**. The **pelvic brim (linea terminalis)** separates the **false (greater) pelvis** above from the **true (lesser) pelvis** below; the **pelvic inlet** is the entrance to the obstetric canal. The inlet's shape varies with pelvis type and governs the **engagement** of the fetal head.

#### Planes used in obstetrics

- **Pelvic inlet (superior strait)**
- **Mid-pelvis** (plane of least dimensions)—at the level of **ischial spines**
- **Pelvic outlet (inferior strait)**—bounded by the pubic arch anteriorly and the tip of coccyx posteriorly; functionally widens as the coccyx moves backward in second stage.

## 3) Pelvic diameters — definitions, average values, and how to remember them

### 3.1 Pelvic inlet (what decides engagement)

- **Anteroposterior diameters ("conjugates")**
  - **True (anatomical) conjugate:** promontory → upper border of symphysis; **~11.0 cm**.
  - **Obstetric conjugate:** promontory → *nearest point* on posterior symphysis; **~10.5 cm**; **smallest A-P of**

**inlet** and the real limiting diameter for the fetal head.

- **Diagonal conjugate:** promontory → lower border of symphysis; **~12.5-13 cm**; **clinically palpable**, used to estimate the obstetric conjugate (subtract  $\sim 1.5-2$  cm).
- **Transverse diameter:** widest distance between iliopectineal lines; **~13 cm** (largest inlet diameter).
- **Oblique diameters:** from sacroiliac joint on one side to opposite iliopubic eminence; **~12 cm**; **head commonly presents in an oblique**.

**Clinical pearl:** If the **obstetric conjugate <10 cm** or **transverse <12 cm**, the inlet is considered contracted and risk of CPD rises.

### 3.2 Mid-pelvis (plane of least dimensions)

- **Interspinous (transverse) diameter:** between ischial spines; **~10.5 cm** on average; **limiting diameter** of the mid-pelvis and often of the whole pelvis—should be **>10 cm**.
- **A-P diameter at mid-pelvis:** **~11.5 cm**.

**Clinical pearl:** Prominent spines or a straight sacrum reduce the effective mid-pelvic space and predispose to **deep transverse arrest**.

### 3.3 Pelvic outlet (what decides delivery of head/shoulders)

- **Transverse (intertuberous/bituberous) diameter:** inner aspects of ischial tuberosities; **~11 cm**.
- **A-P outlet:**
  - **Anatomical** (coccyx tip → lower border of symphysis): **~11 cm**.
  - **Obstetric** (sacral tip → lower border of symphysis *with coccygeal recession*): **~13 cm** in second stage.

**Remember:** “**Inlet 13-12-10.5** (Trans-Oblique-Obstetric), **Mid 10.5-11.5** (T-AP), **Outlet 11-13** (T-AP obstetric).”

## 4) How we measure—clinical pelvimetry essentials

- **Diagonal conjugate** is measured vaginally from the **sacral promontory** to the **lower edge of the symphysis**; subtract **1.5-2 cm** to estimate the **obstetric conjugate**.
- **Ischial spines** (4 and 8 o'clock) mark the mid-plane; **station 0** is at the spines. Interspinous narrowing suggests **mid-pelvic contraction**.
- **Outlet:** the **subpubic angle**, **intertuberous distance**, and **coccygeal mobility** are assessed clinically; the outlet rarely limits labour unless markedly reduced.

## 5) Caldwell-Moloy pelvis types—features and obstetric significance

**NB:** Most pelvis are **mixed**; classification is still useful for anticipating mechanisms and potential dystocia.

### 5.1 Gynecoid (classic female)

- **Inlet:** rounded/oval, **transverse  $\geq$  AP**; **wide subpubic arch**; non-prominent spines; well-curved sacrum.
- **Labour:** **favourable**—engagement usually transverse → internal rotation to **OA** (occiput anterior) and normal descent.

### 5.2 Android (masculine)

- **Inlet:** **heart-shaped**, posterior segment narrow; **convergent sidewalls**; **prominent spines**; narrow arch.
- **Labour:** **CPD, deep transverse arrest**, persistent OP more likely; higher operative delivery rates.

### 5.3 Anthropoid

- **Inlet:** AP > transverse (long oval); sacrum long; arch comparatively narrow.
- **Labour:** engagement often OA or OP; OP deliveries occur more often, but vaginal birth is frequently possible.

### 5.4 Platypelloid

- **Inlet:** wide transverse, reduced AP (flattened); shallow cavity; wide arch.
- **Labour:** late engagement, asynclitism and transverse arrest more frequent.

Epidemiologically, classical series reported roughly **gynoid** ~41%, **android** ~32%, **anthropoid** ~24%, **platypelloid** ~3%, with wide ethnic variability; remember that real-world pelvises are often **intermediate**.

## 6) Why diameters and types matter — obstetric significance

1. **Engagement** (inlet): With a well-flexed head, the **suboccipito-bregmatic diameter (9.5 cm)** must negotiate the **obstetric conjugate (~10.5 cm)** and **transverse (~13 cm)**. Inlet contraction (e.g., severe platypelloid) delays or prevents engagement till labour.
2. **Descent & rotation** (mid-pelvis): The **interspinous diameter (~10.5 cm)** is the **functional bottleneck**. Narrow interspinous or straight sacrum predisposes to **arrest at +1 to +2 station** with **OT/OP** positions (deep transverse arrest).
3. **Expulsion** (outlet): A narrow **intertuberous (~11 cm)** or rigid coccyx impedes delivery of the head/shoulders; however, **coccygeal recession** increases **AP outlet to ~13 cm** during the second stage.
4. **Trial of labour vs. pelvimetry**: Radiologic pelvimetry has limited indications; a **careful clinical trial of labour** remains definitive for functionality of the pelvis.

## 7) Tables you can reproduce in the exam

### 7.1 Planes and diameters (with average values)

Plane	A-P (cm)	Transverse (cm)	Oblique (cm)	Notes
Inlet	Obstetric ~10.5; True ~11.0; Diagonal ~12.5-13	~13.0	~12.0	Obstetric conjugate is the <b>limiting A-P</b> ; head engages usually in <b>oblique</b> .
Mid-pelvis	~11.5	Interspinous ~10.5 —	—	<b>Plane of least dimensions</b> ; spines are key landmark.
Outlet	Anatomical ~11; Obstetric ~13	Intertuberous ~11 —	—	Coccyx moves back in 2nd stage → A-P increases.

### 7.2 Caldwell-Moloy types

Type	Inlet shape	Pelvic walls & spines	Subpubic arch	Labour tendency
Gynecoid	Round/oval ( $T \geq AP$ )	Non-convergent; spines not prominent	Wide	<b>Favourable</b> ; OA rotation and vaginal birth likely.
Android	Heart-shaped	Convergent; <b>spines prominent</b>	Narrow	<b>OP/OT</b> , deep transverse arrest, operative delivery.
Anthropoid	AP-oval ( $AP > T$ )	Straight walls	Narrow-moderate	<b>OP</b> more frequent; often still vaginal.
Platypelloid	Flat, T wide, AP short	Shallow cavity	Wide	<b>Late/asynclitic engagement</b> , transverse arrest.

## 8) Applied obstetrics — how to use this at the bedside

- **At term antenatal visits:** if the head remains **high and floating** in a primigravida, consider **inlet disproportion**; check **diagonal conjugate** clinically and reassess progress in early labour.
- **In labour:** persistent **OT** with slow descent → think **mid-pelvic limitation/interspinous narrow**; optimise **flexion** and **rotation** (maternal positioning, oxytocin when appropriate).
- **Second stage:** delayed head delivery with adequate descent but **tight perineum**—remember the outlet mostly adapts (coccygeal recession), but **narrow intertuberous** may still impede shoulders; use **McRoberts + suprapubic pressure** if shoulder dystocia occurs (after standard sequence).
- **Decision-making:** Pelvimetry numbers guide thinking, but **trial of labour** is the true test of pelvic adequacy in most cases.

## 9) Integration with Āyurveda

- **Strīśroṇi** functionally houses the **apatyapatha** and **garbhāśaya**. Classical learning emphasises **direct observation and cautious procedures** around pelvic marma; modern obstetrics concretises this with measurements and planes. Quote **Su. Śā. 5/51** (above) to justify the centrality of anatomy before intervention.
- **Marma caution:** procedures near **basti** (suprapubic), **guda/perineum**, **vāṅkṣana** (inguinal) should respect vital structures—mapping neatly onto modern concerns of bladder, urethra, rectum, neurovascular bundles.

## 10) High-yield revision bullets

- **Inlet:** obstetric conjugate **10.5 cm**, transverse **13 cm**, oblique **12 cm**. **Diagonal conjugate** is the measurable proxy.
- **Mid-pelvis:** **interspinous 10.5 cm** (key bottleneck); **AP 11.5 cm**.
- **Outlet:** **intertuberous 11 cm**, **AP anatomical 11 cm** → **obstetric 13 cm** with coccygeal recoil.
- **Types:** **Gynecoid** best; **Android** → **OT/OP** and arrest; **Anthropoid** → **OP** deliveries; **Platypelloid** → **late/asynclitic engagement**.
- **Function beats form:** **clinical trial of labour** trumps static imaging for most decisions.

## Self-assessment

### A) Short Answer Questions (60-80 words each)

1. Define **obstetric conjugate**, **true conjugate** and **diagonal conjugate**. How do you estimate the obstetric conjugate clinically?
2. List the **diameters of the mid-pelvis** and explain their obstetric importance.
3. Tabulate the **four Caldwell-Moloy pelvis types** with one obstetric implication each.
4. Write a short note on the **pelvic outlet** diameters and how they change in second stage of labour.
5. Explain the significance of **ischial spines** for clinical pelvimetry and fetal **station**.

### B) Long Answer Questions (10 marks)

1. Describe the **planes and diameters** of the female pelvis with average values and clinical methods of assessment. Add a note on **contracted pelvis** and **trial of labour**.
2. Discuss the **Caldwell-Moloy classification** of pelvis, correlating each type with **mechanisms of labour**, common **malpositions** and likely **interventions**.

### C) MCQs (single best answer)

1. The **smallest A-P diameter** of the pelvic **inlet** is:  
A) True conjugate B) **Obstetric conjugate** C) Diagonal conjugate D) External conjugate. **Ans: B.**
2. The **limiting diameter of the mid-pelvis** is usually:  
A) AP diameter B) **Interspinous diameter** C) Intertuberous D) Oblique. **Ans: B.**
3. In a **platypelloid** pelvis, labour commonly shows:  
A) Easy OA rotation B) **Late engagement/asynclitism** C) Brow presentation D) Compound presentation. **Ans: B.**
4. The **intertuberous** diameter (outlet transverse) in an average pelvis is about:  
A) 9 cm B) **11 cm** C) 13 cm D) 15 cm. **Ans: B.**
5. **Diagonal conjugate** is measured from:  
A) Sacral promontory to **lower** border of symphysis B) Promontory to upper border C) Promontory to posterior symphyseal surface D) PSIS to pubic symphysis. **Ans: A.**

## References

### Classical

- **Suśruta Saṃhitā**, Śārīrasthāna 5/51 emphasising direct anatomical study before clinical action. National Institute of Indian Medical Heritage **e-Samhita** portal.
- **Suśruta Saṃhitā**, Śārīrasthāna 6 — Marma-vibhāga (regional marmas relevant to pelvis/perineum: **basti, guda, vaṇkṣaṇa, kukundara, kaṭikāṭaruṇa**, etc.).

### Modern & standard academic sources

- **StatPearls (NCBI Bookshelf)** — *Anatomy, Abdomen and Pelvis, Pelvic Inlet*: inlet diameters (true/obstetric/diagonal conjugates; transverse, oblique), Caldwell-Moloy overview and typical proportions.
- **Gabbe's Obstetrics: Normal and Problem Pregnancies** (chapter: Normal Labor and Delivery) — planes (inlet, mid-pelvis, outlet), interspinous as limiting diameter, average mid-pelvic diameters, and clinical pelvimetry protocol.
- **GFMER (WHO-collaborating training resource)** — outlet diameters: intertuberous (~11 cm); AP anatomical (~11 cm) vs obstetric (~13 cm with coccygeal recession).
- **ScienceDirect Topic - Pelvimetry** — obstetric conjugate and inlet considerations.
- **Recent imaging review (CT-based)** — descriptive features of pelvis types and obstetric relevance.

### 30-second recap

- **Inlet:** obstetric conjugate **10.5 cm**, transverse **13 cm**, oblique **12 cm**; **diagonal conjugate** measured clinically.
- **Mid-pelvis: interspinous 10.5 cm** (key limiter).
- **Outlet: intertuberous 11 cm; AP increases to 13 cm** in second stage.
- **Types:** Gynecoid best; Android → **OT/OP**; Anthropoid → **OP** often; Platypelloid → **late/asynclitic**.
- **Clinically:** trial of labour decides functional adequacy.