

# Bones, joints, construction of the pelvis

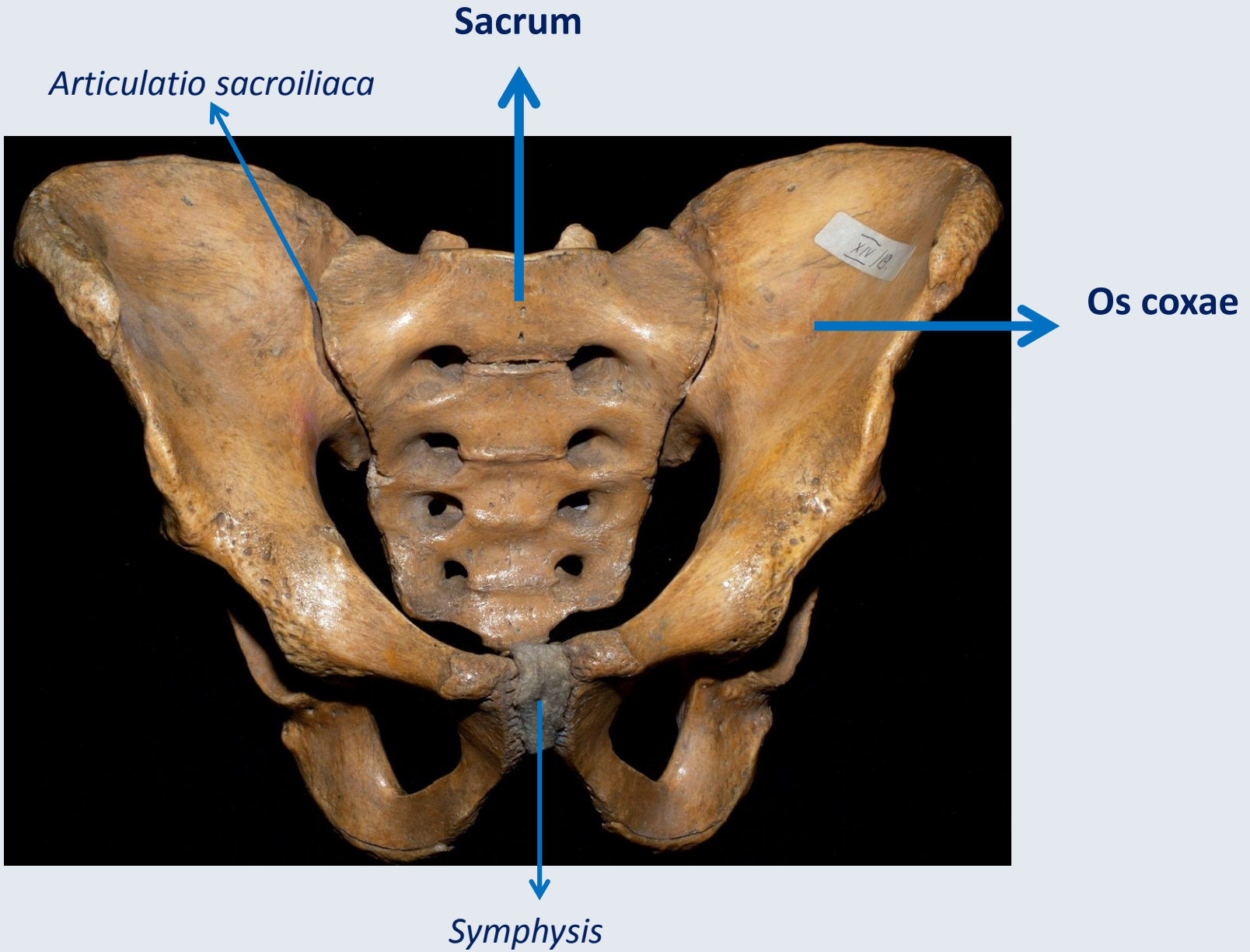


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Anatomy, Histology and Embryology Department

2018.









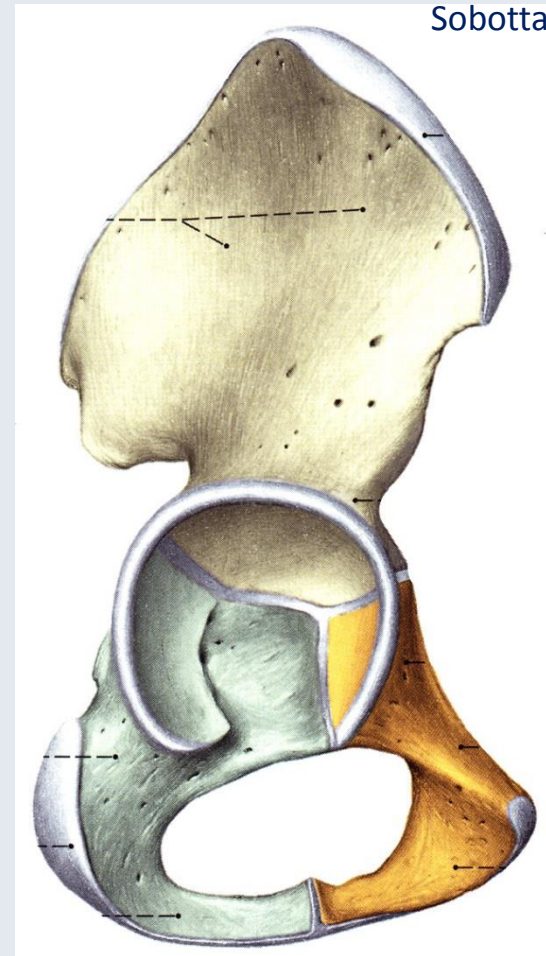
Adult

Os coxae

Os ilium

Os ischii

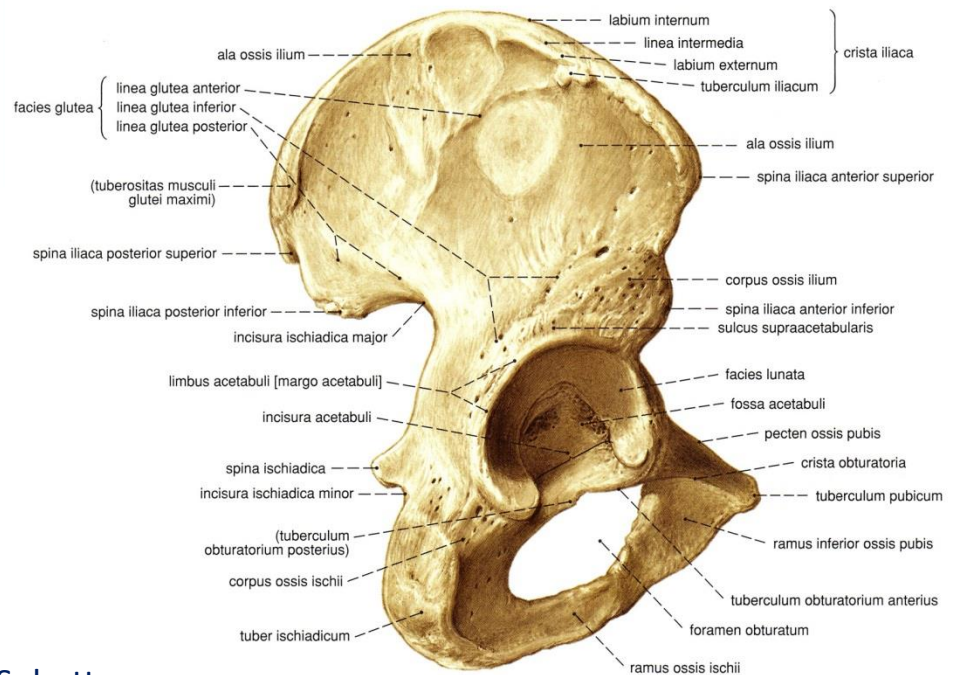
Os pubis



Child

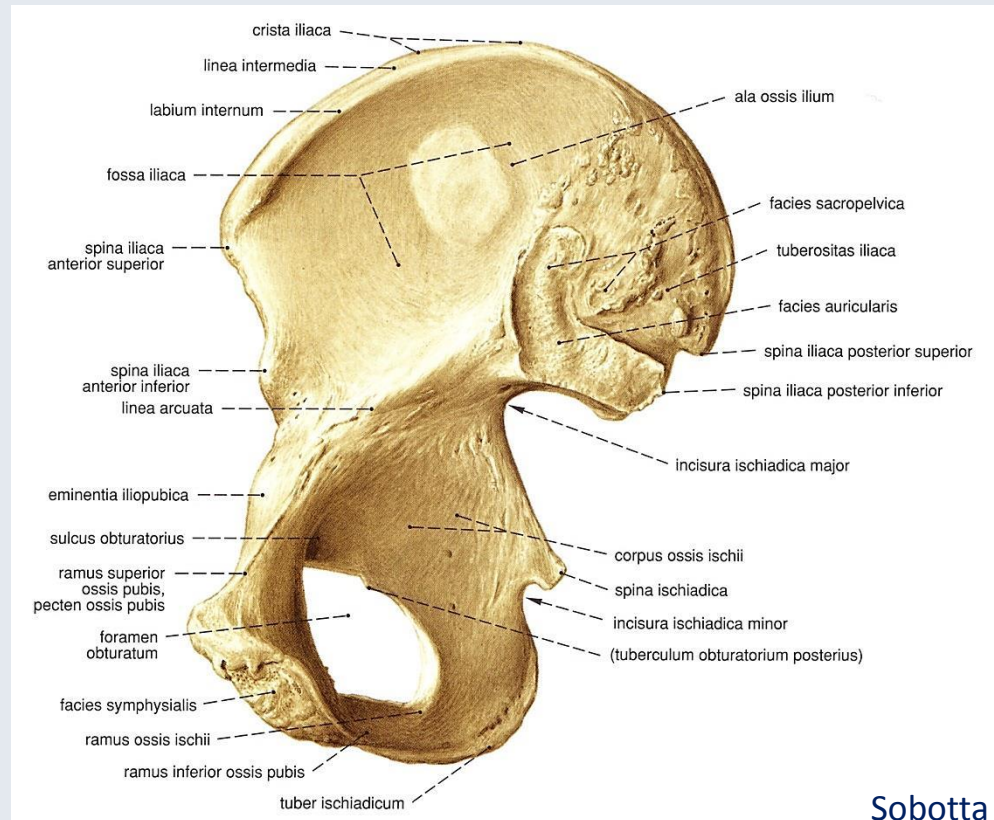


Adult

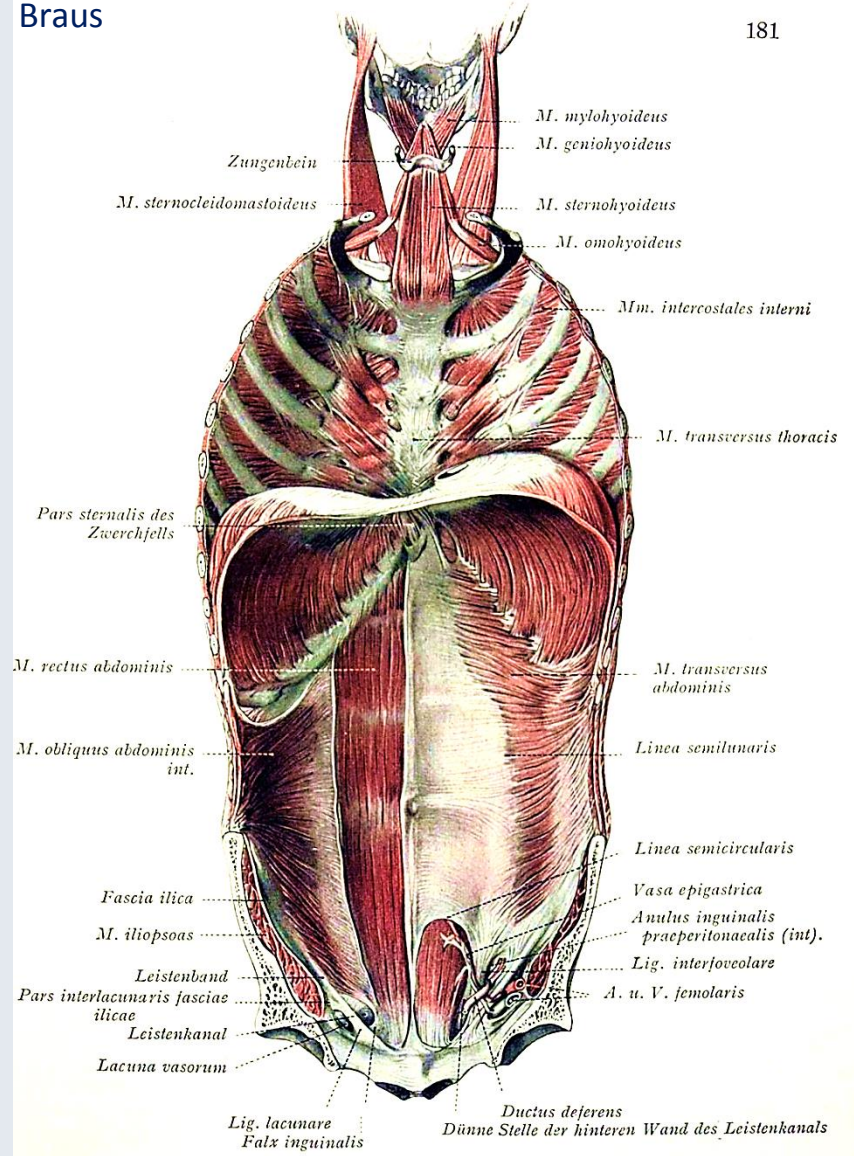


Sobotta







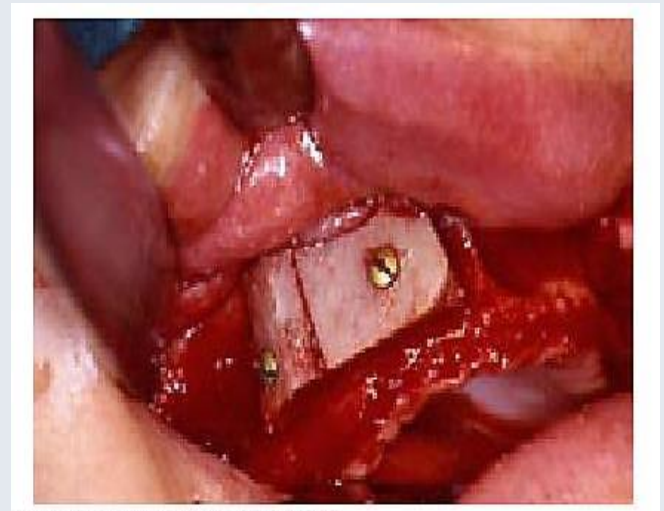




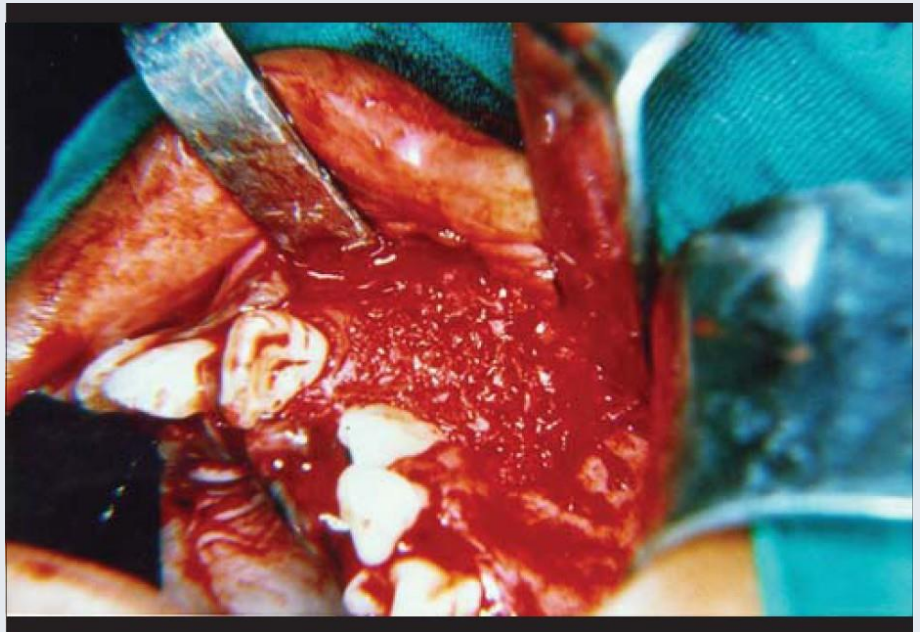


Sharma et al.

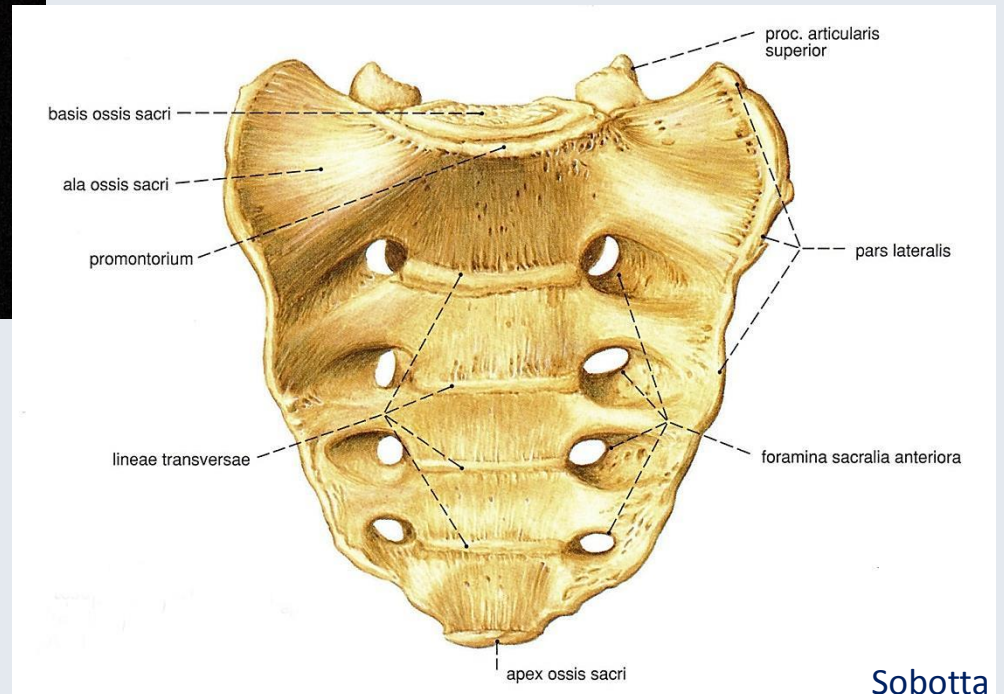
Bonegraft for maxillo facial surgery

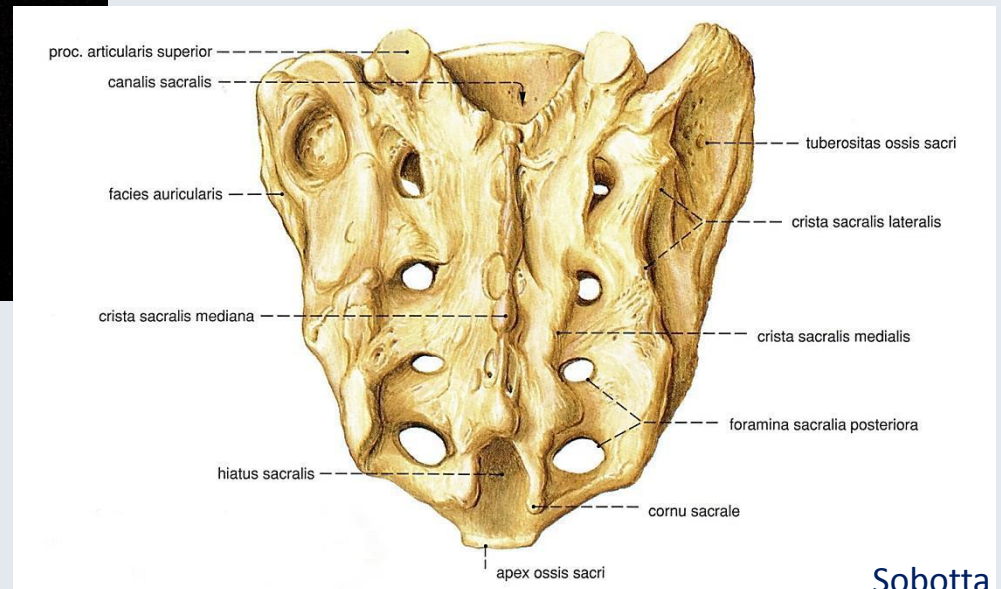
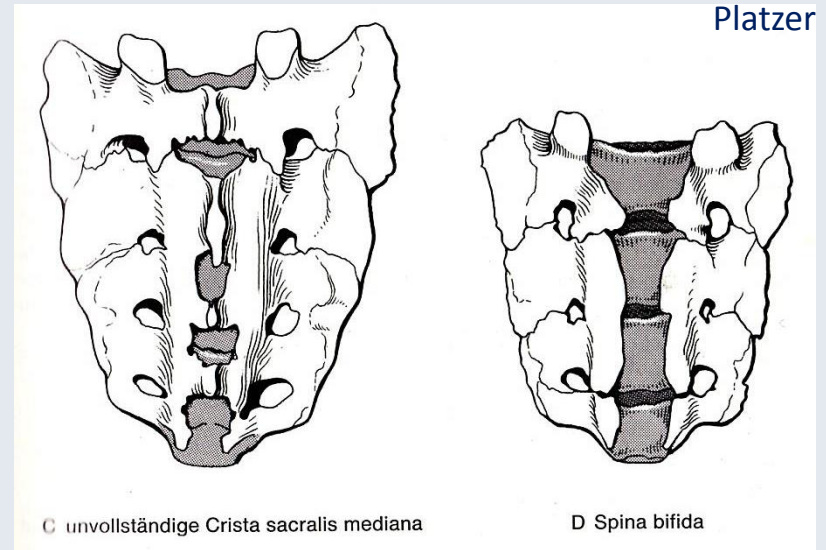


Bertos & Lluch

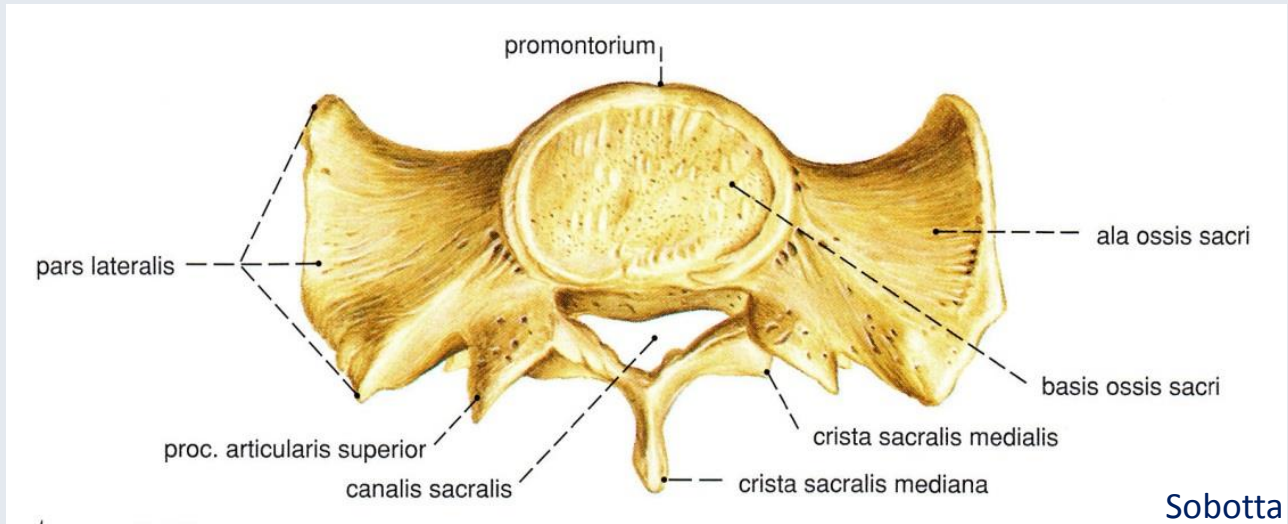


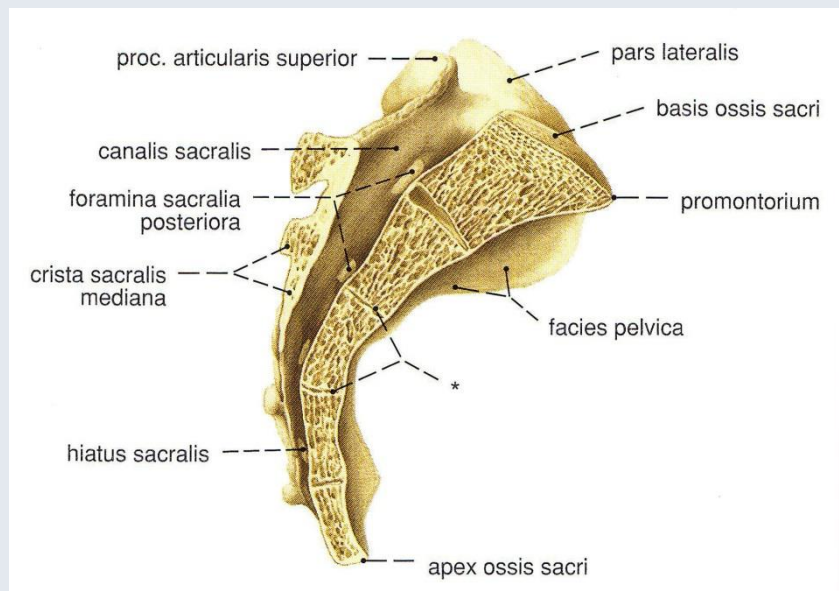
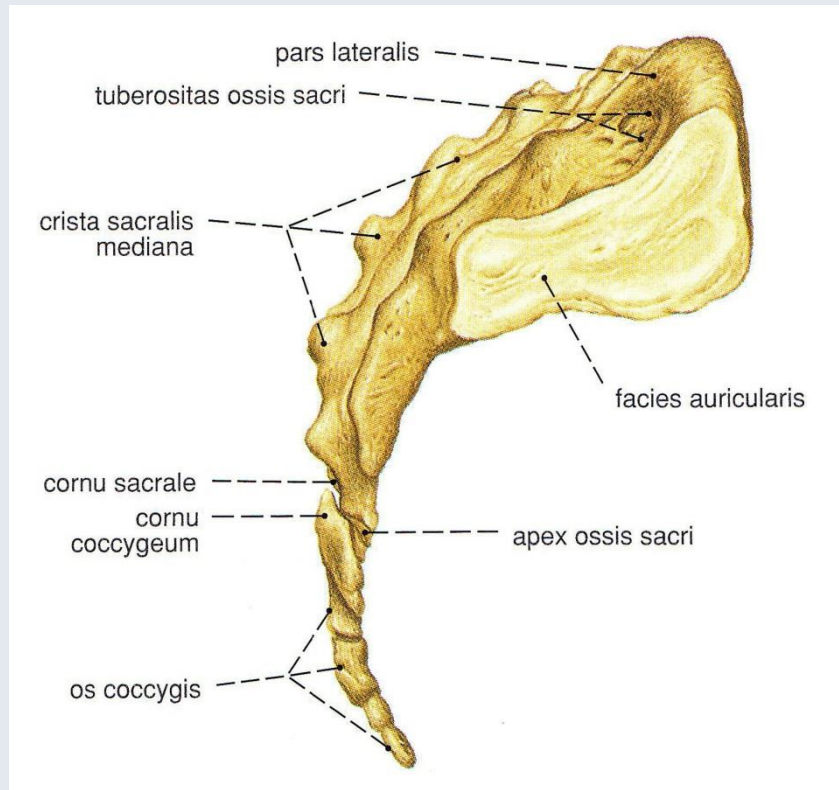






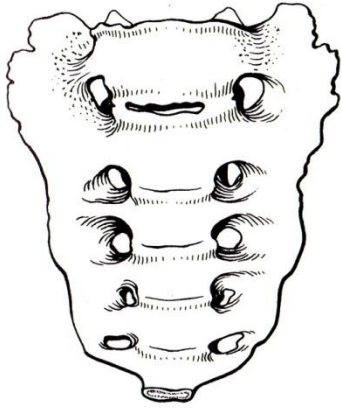




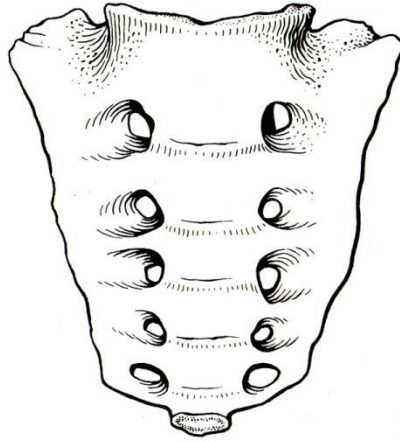


Sobotta





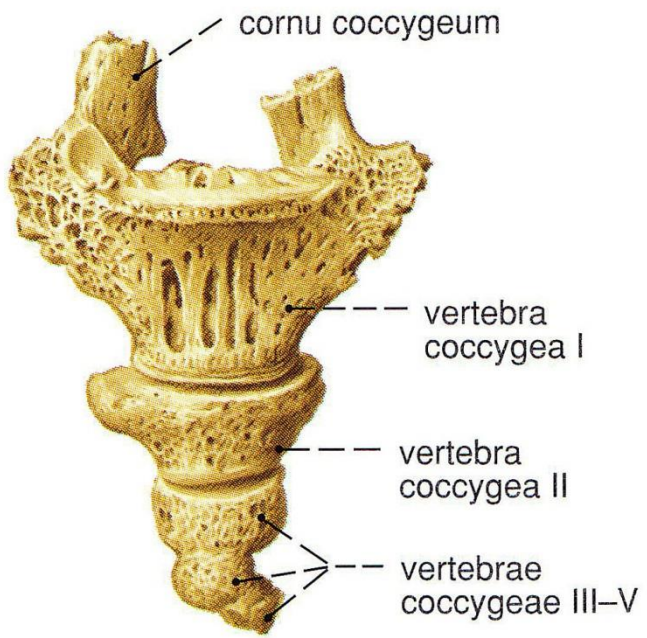
A Sakralisation des 5. Lendenwirbels



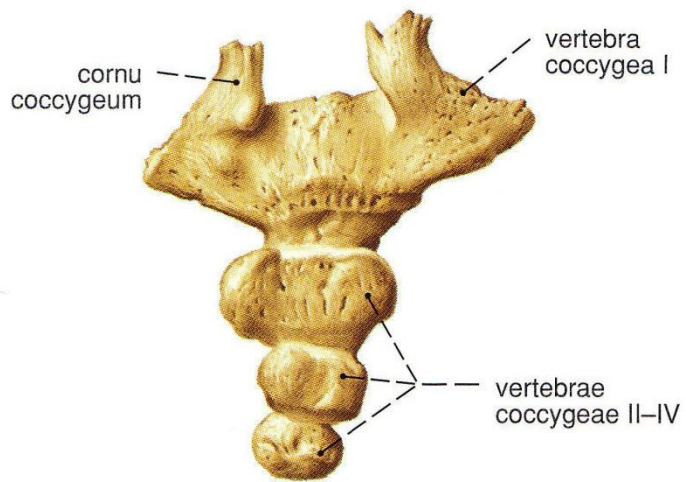
B Sakralisation des 1. Steißwirbels

Platzer

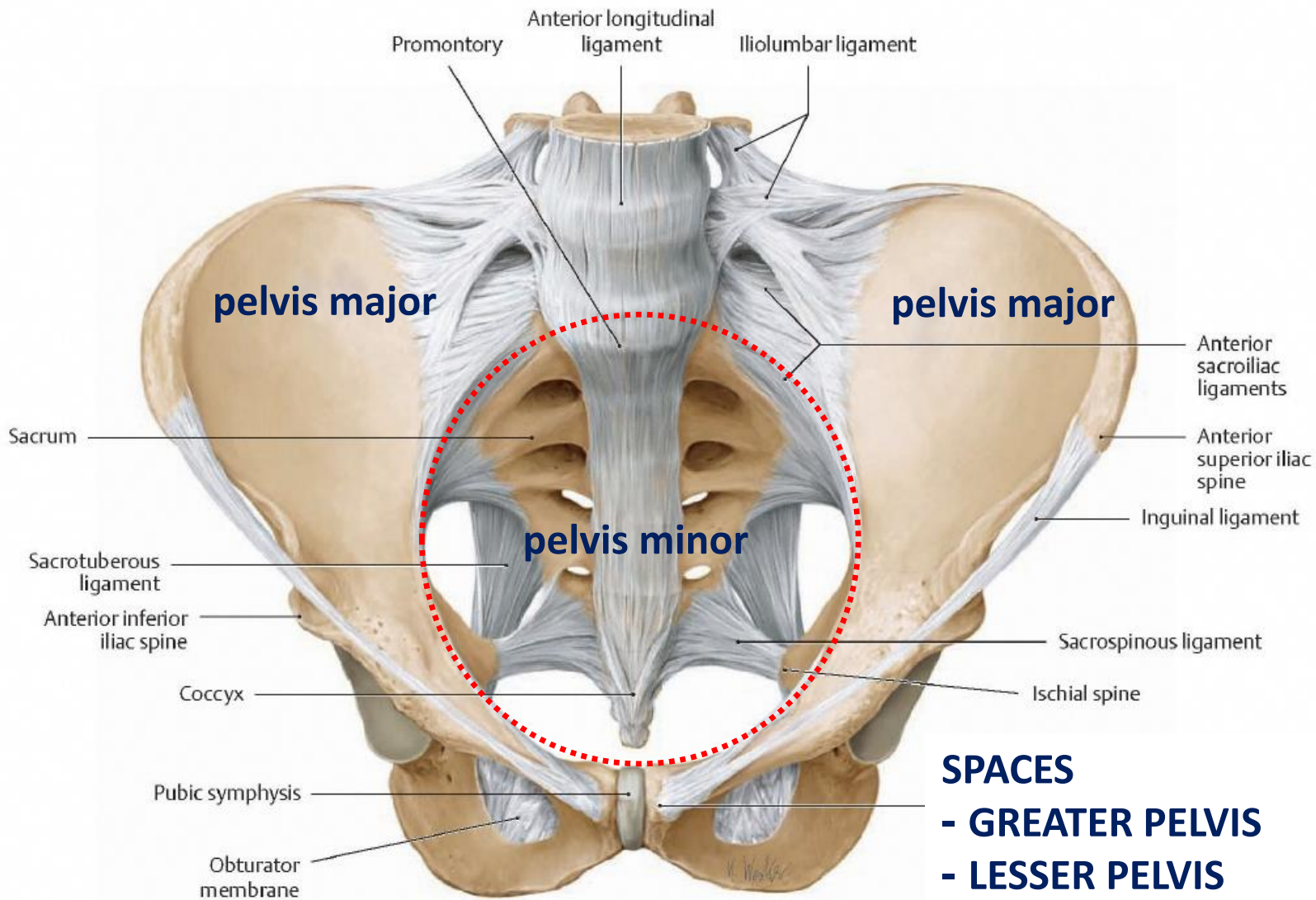




Sobotta



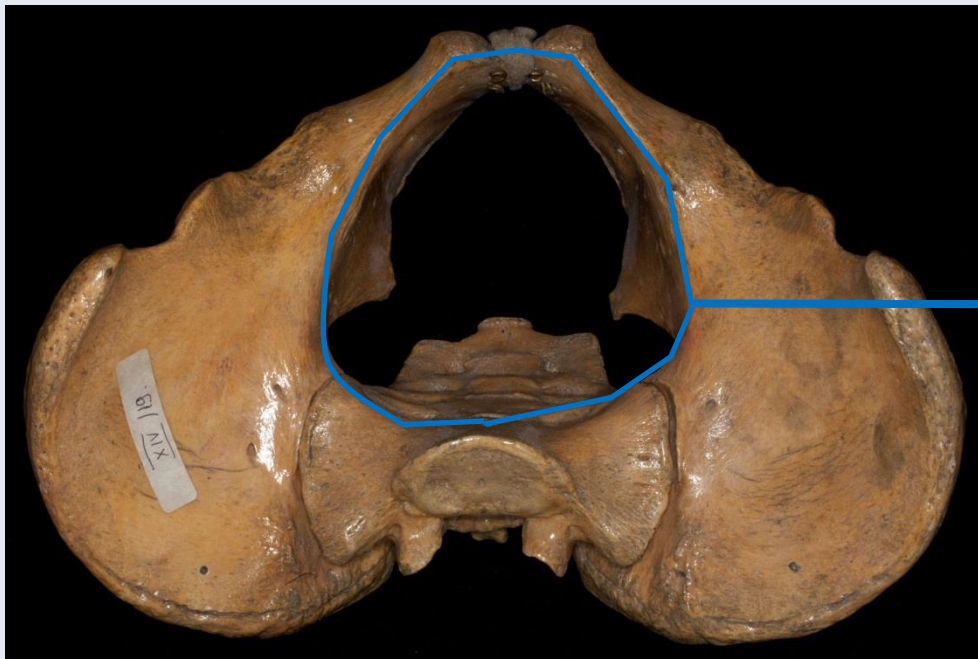




a

**SPACES**  
**- GREATER PELVIS**  
**- LESSER PELVIS**

**SEPARATED BY THE:**  
**LINEA TERMINALIS**

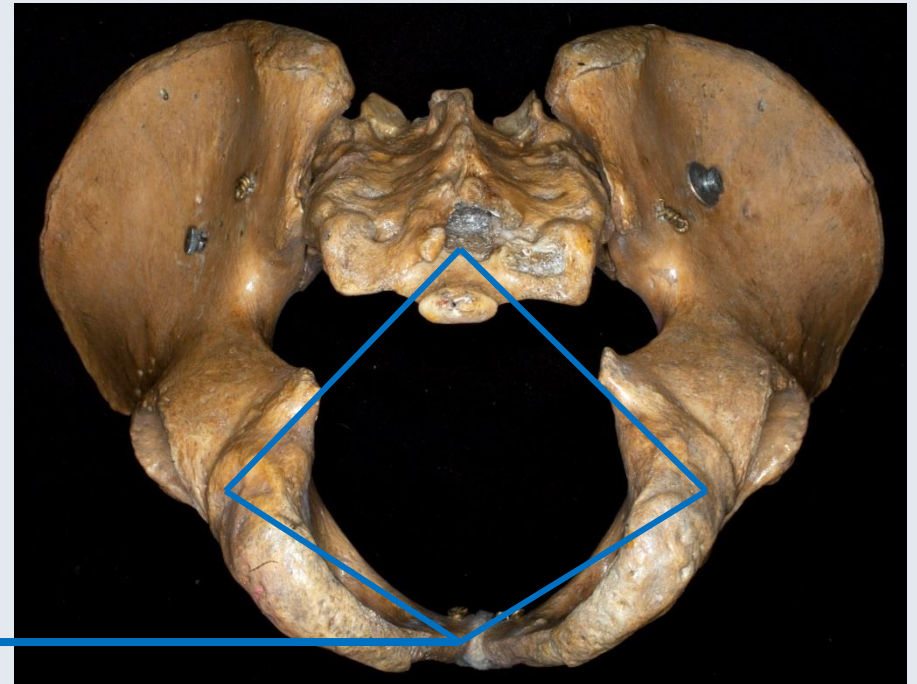
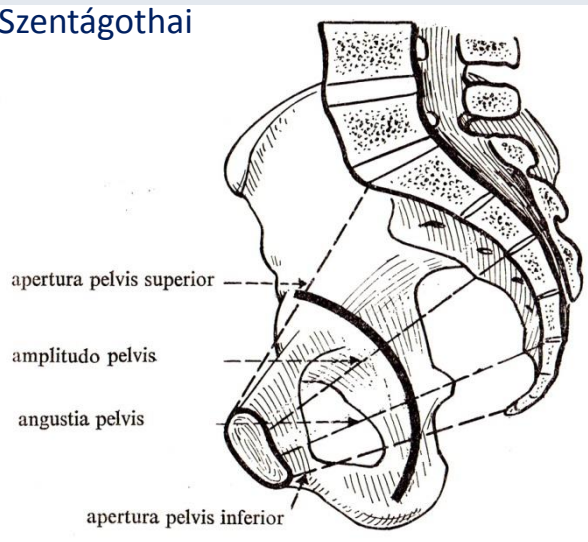


Sup. pelvic aperture:

- Promontorium
- Articulatio sacroiliaca
- Partes laterales ossis sacralis
- Linea arcuata
- Eminentia iliopubica
- Pecten ossis pubis
- Symphysis

Linea terminalis

Szentágothai



Apertura pelvis inferior



# Ligaments of the pelvis

# COMPONENTS AND MOVEMENTS

- Two pelvic bones (left and right) articulating with the axial skeleton via the sacrum.
- The pelvic bones are each made up of three bones:
  - ilium
  - ischium
  - pubis
- These bones are fused by puberty to form the pelvic bone.
- The pelvic girdle can only move as a unit (L and R shoulder girdles can move independent of each other)
  - Sagittal plane
    - anterior/posterior tilt
  - Frontal plane
    - left lateral pelvic rotation: left side moves upward
    - right lateral pelvic rotation
  - Transverse plane
    - left transverse pelvic rotation: left side moves posterior
    - right transverse pelvic rotation



## THE BONY COMPONENTS:

### 1. Sacroiliac joint: os coxae + sacrum

auricular surfaces of sacrum and ilium

hyalin cart. superficialy, fibrous cart. deeply!

Capsule:

tight, dense, limited articular cavity

Ligaments:

- ventral sacroiliac ligament (weak)
- dorsal sacroiliaca ligament (strong)
- interosseal sacroliliaca ligament (strong)

### 2. Pubic symphysis

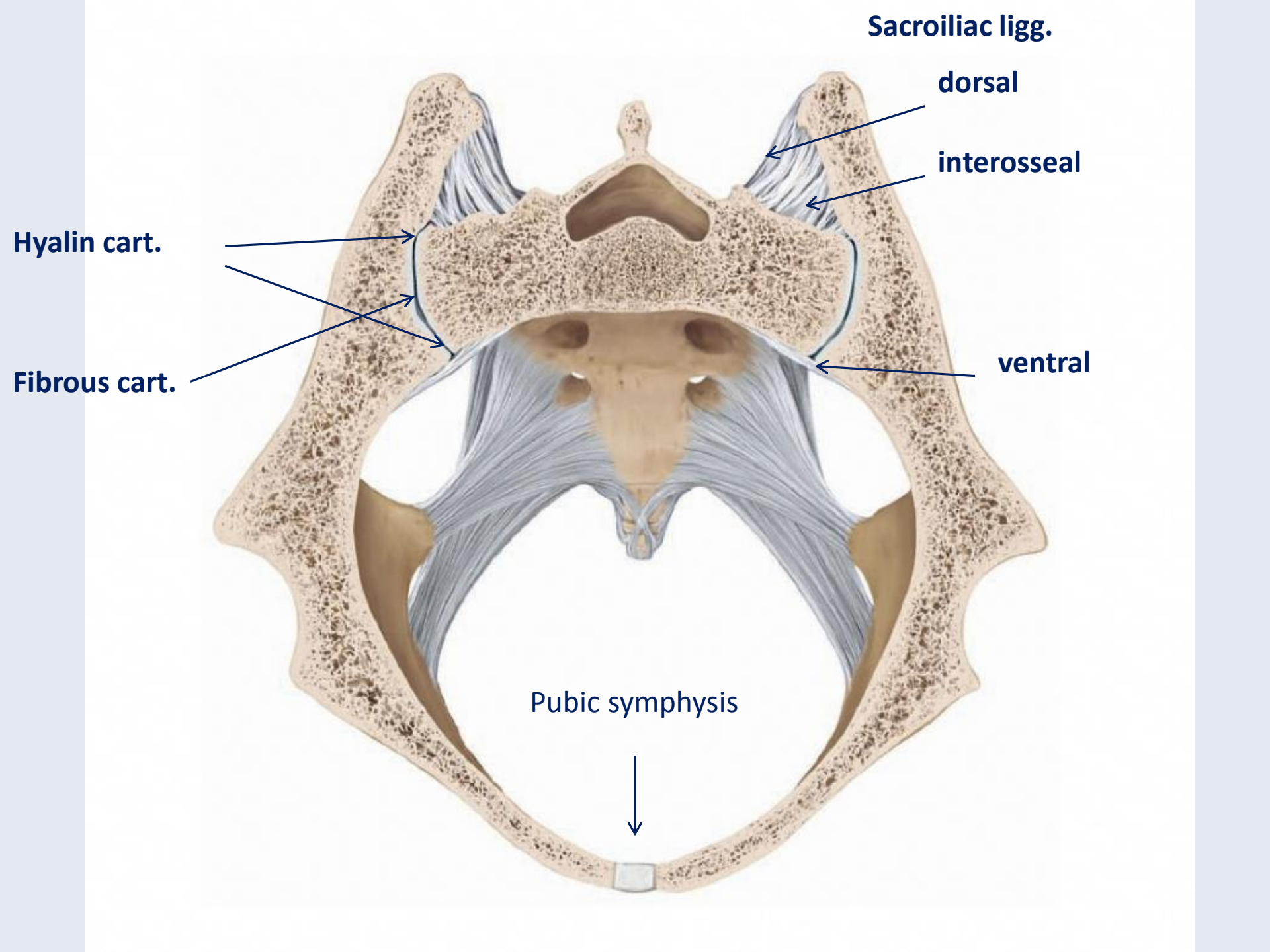
- symphyseal surface of pubis and an interpubic disc

- synchondrosis, fibrocartilage

Not a true joint, however, it may contain a „cavity” within the disc

Ligaments: superior pubic lig.

(inf.!) arcuate pubic lig.





# SACRAL JOINTS

## LUMBOSACRAL JOINT

(**synchondrosis, syndesmosis**)

intervertebral disc

anterior and posterior longitudinal ligg.

ligg. flava

interspinal and supraspinal ligg.

lig. iliolumbale (stabilizes the joint)

## ZYGAPOPHYSIAL JOINT

Synovial joint between the 5th lumbar vertebra and the correspondig articular process of the sacrum

## SACROCOCCYGEAL JOINT

(HINGE JOINT?? SYNCHONDROSIS??)

*sacrococcygeal disc*

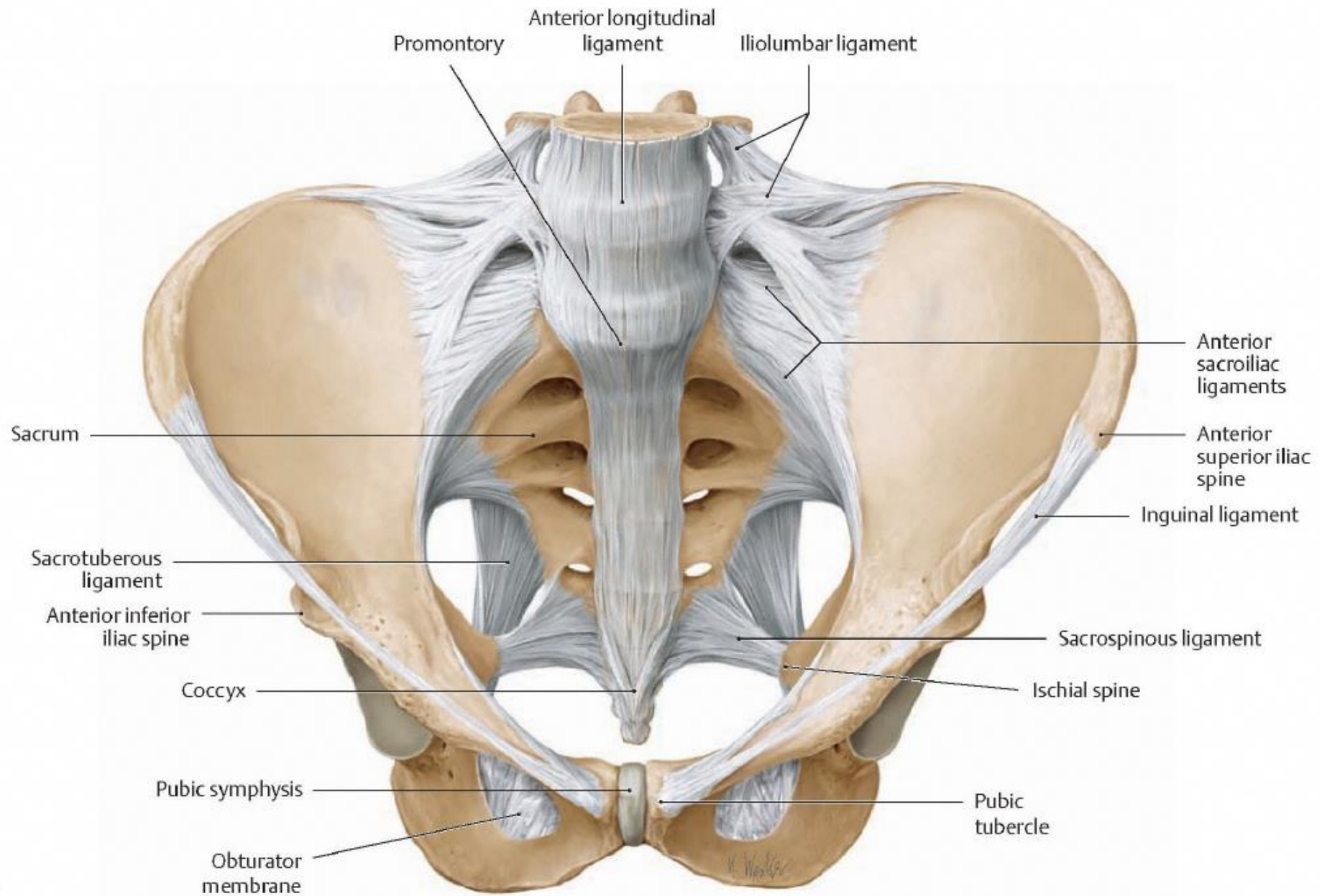
*anterior sacrococcygeal lig. (=lig. long. ant.)*

*lateral sacrococcygeal lig.*

*(lig. intercornuale)*

*post. superficial sacrococcygeal lig. (=lig. long. post.)*

*post. deep sacrococcygeal lig. (=lig. long. post.)*



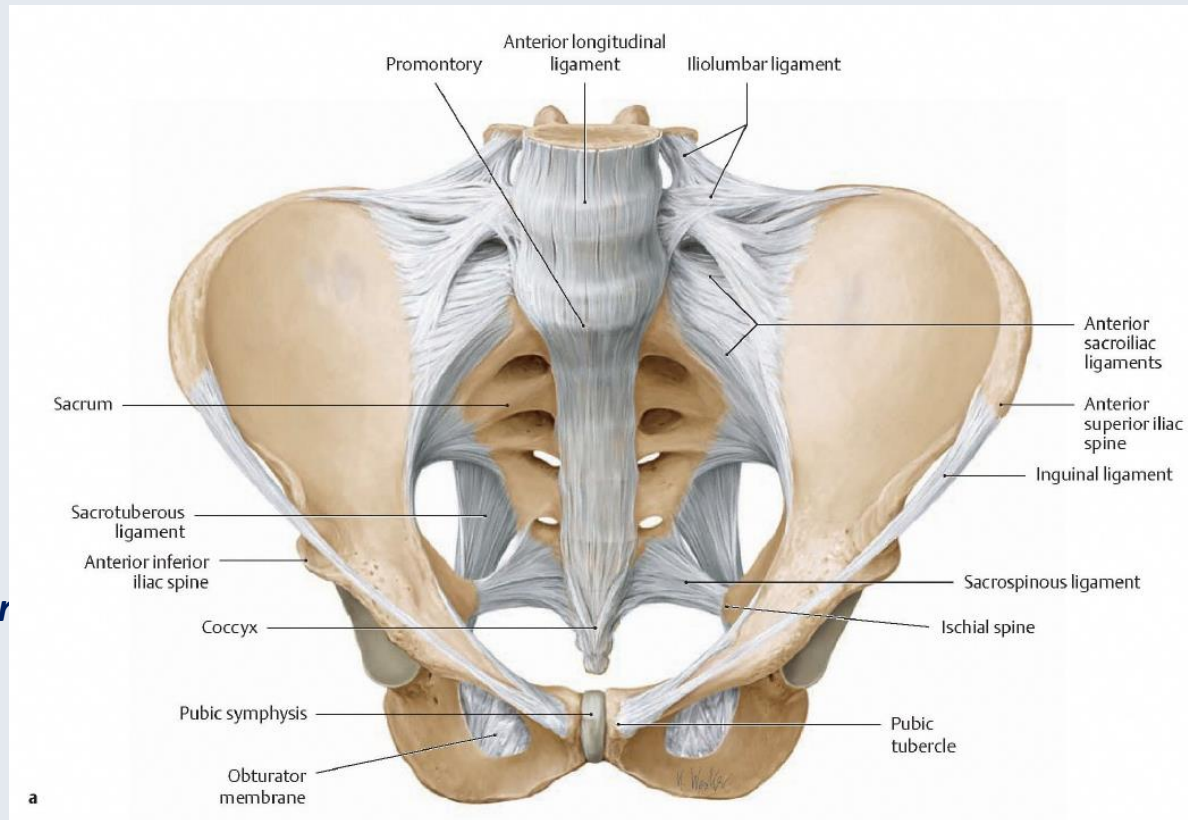
**a**

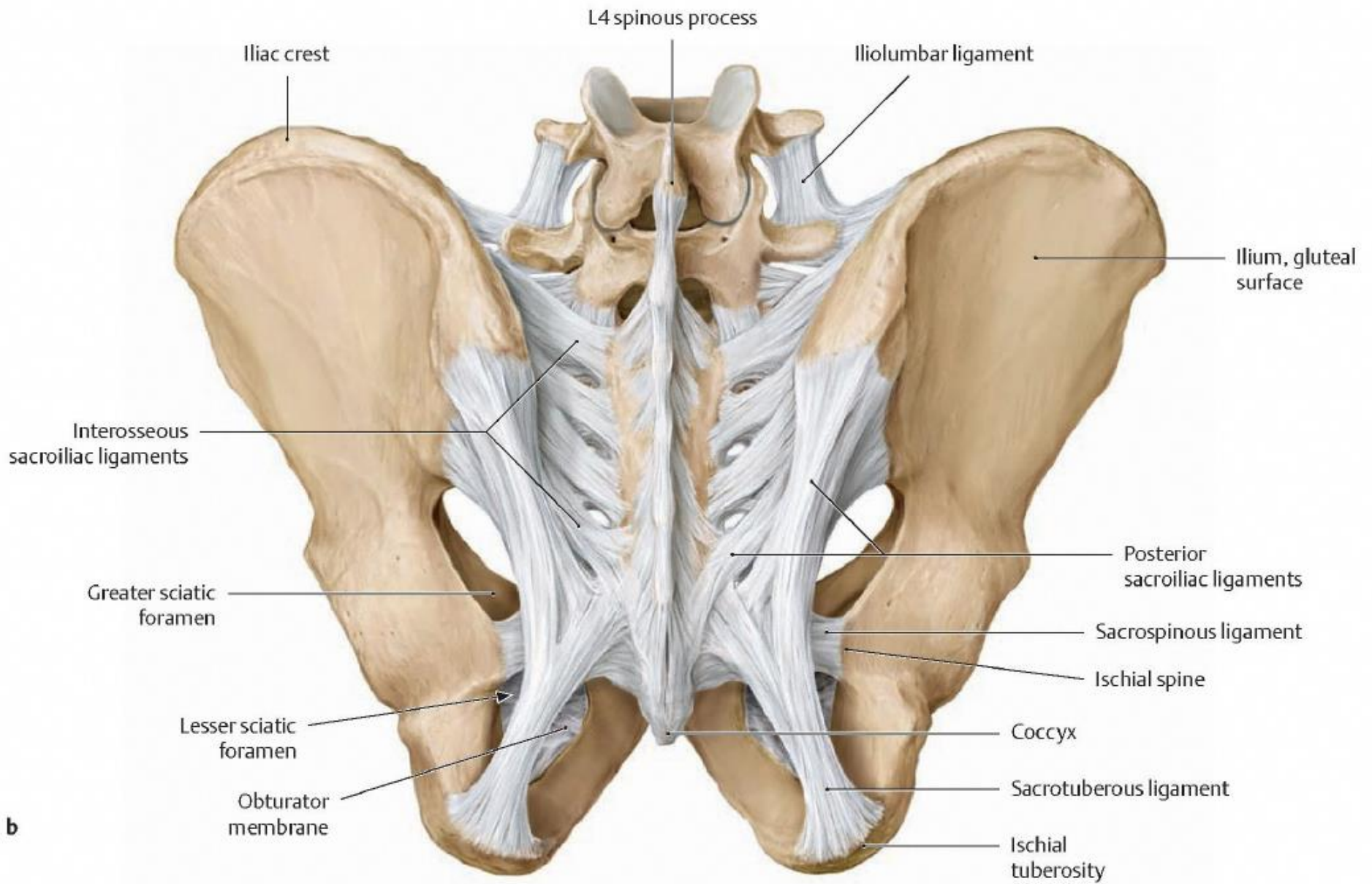


# PELVIC LIGAMENTS

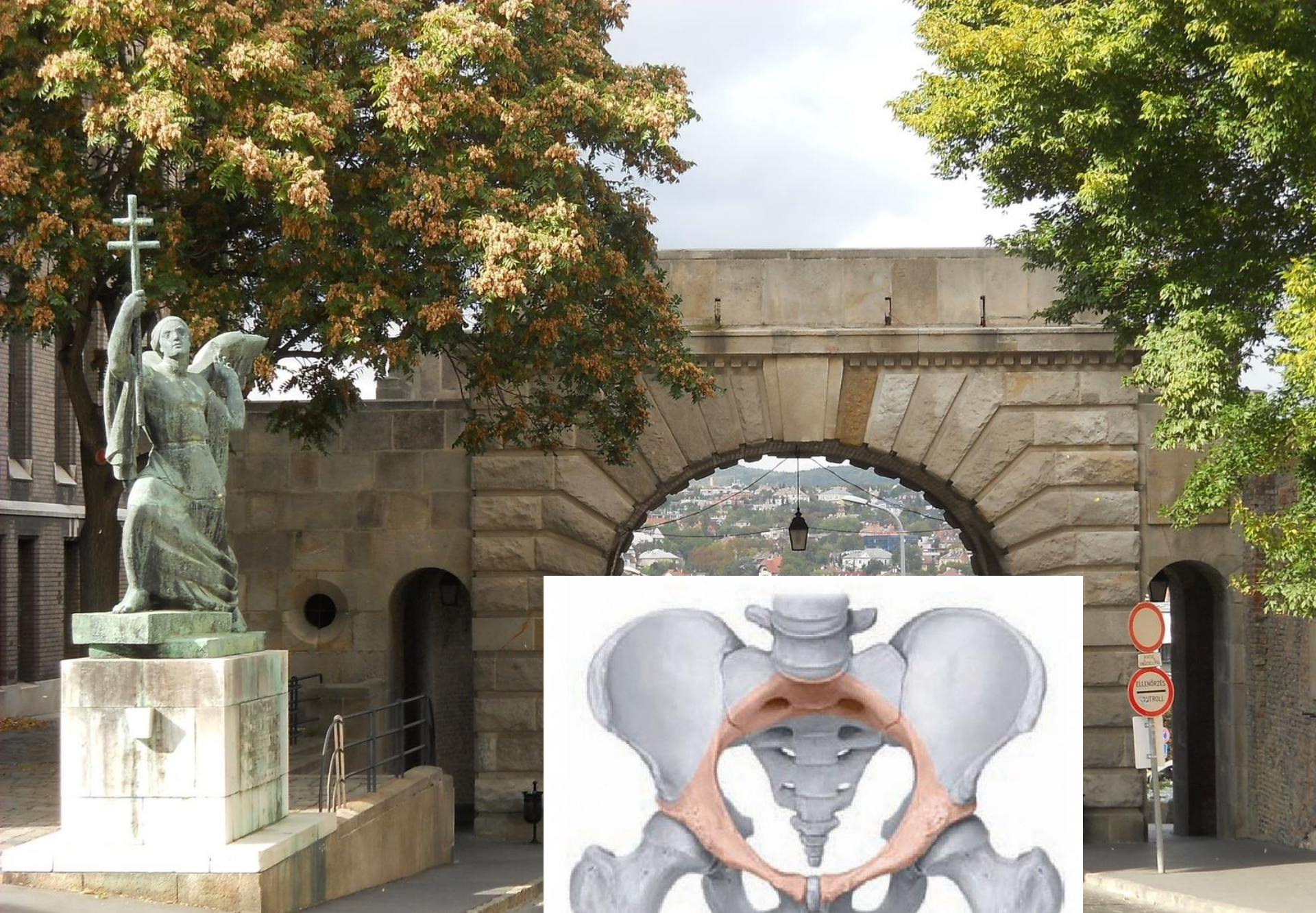
TO COMPLETE THE PELVIC CAVITY

- *sacrospinous ligament*
- *sacrotuberous ligament*  
(continues as *falciform process*)
- *obturator membran*
- *inguinal ligament*  
(*TENDON of the external oblique abdom.!!*)





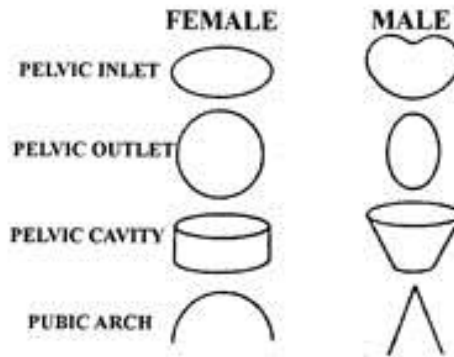
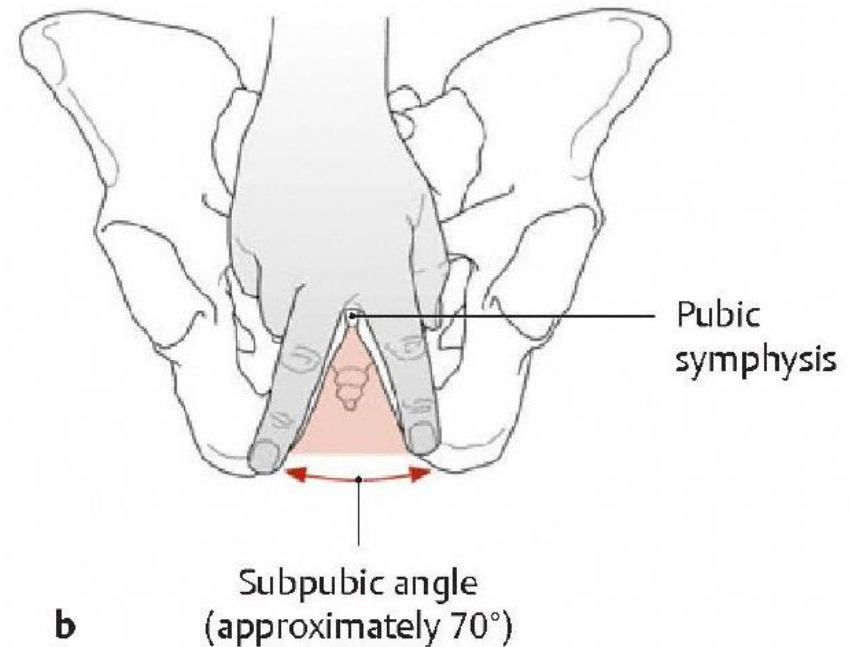
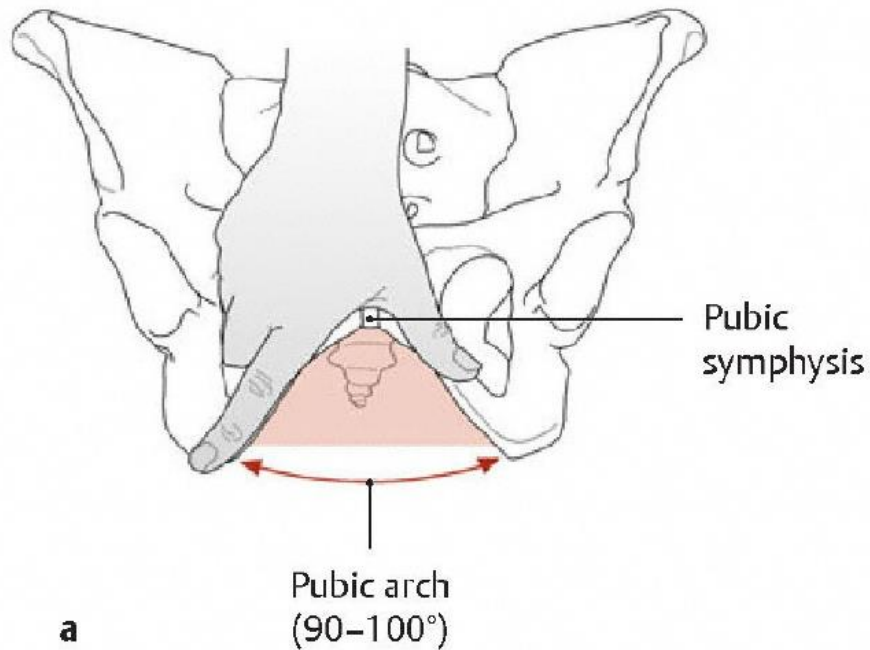




Bècsi kapu (Vienna Gate) The Castle of Buda



# **MALE AND FEMALE FEATURES**



## D Lower pubic angle

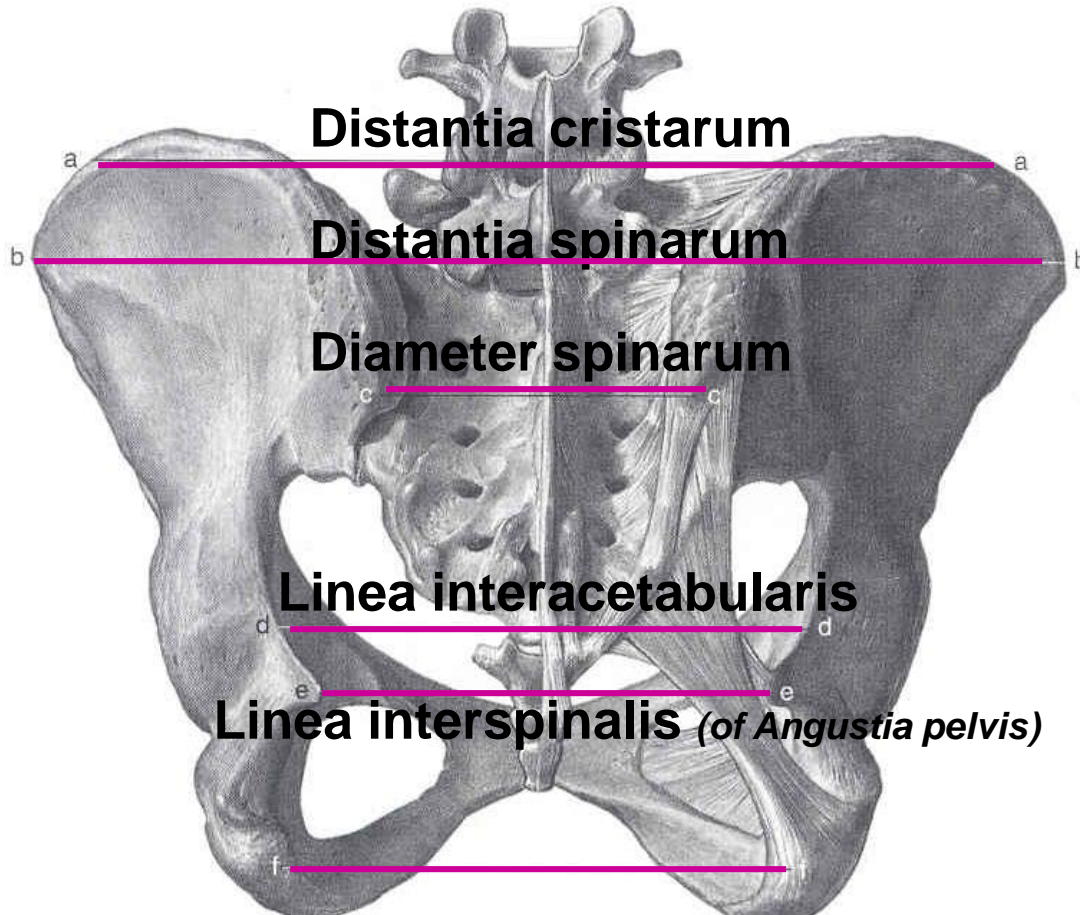
Anterior view.

a Female pelvis: pubic arch.

b Male pelvis: subpubic angle.

# DIAMETERS 1.

## PELVIS FEMININA ASPECTUS POSTERIOR



**Distantia cristarum**

**Distantia spinarum**

**Diameter spinarum**

**Linea interacetabularis**

**Linea interspinalis (of *Angustia pelvis*)**

**Diameter tuberalis**

a-a=distantia cristarum  
28—29 cm\*

b-b=distantia spinarum  
25—26 cm\*

c-c=diameter spinarum  
posterior (sacrum  
szélesség) 10 cm

d-d=a medenceüreg  
harántátmérője  
(=interacetabularis  
vonal) 12—12,5 cm  
e-e=a medence legszűkebb  
szelvényének (*angustia  
pelvis*) harántátmérője  
(=interspinalis vonal)  
10,5 cm  
f-f=a medence kimenet  
harántátmérője  
(=diameter tuberalis)  
11—12 cm

\*A perspektiva miatt  
a distantia cristarum  
rövidebbnek tűnik  
a distantia spinarumnál



# DIAMETERS 2.

## PELVIS FEMININA

## ASPECTUS MEDIALIS

k-k=axis pelvis

a-b=a klinikumban: conjugata (vera) anatomica

a-e=a klinikumban: conjugata diagonalis 12,5—13 cm

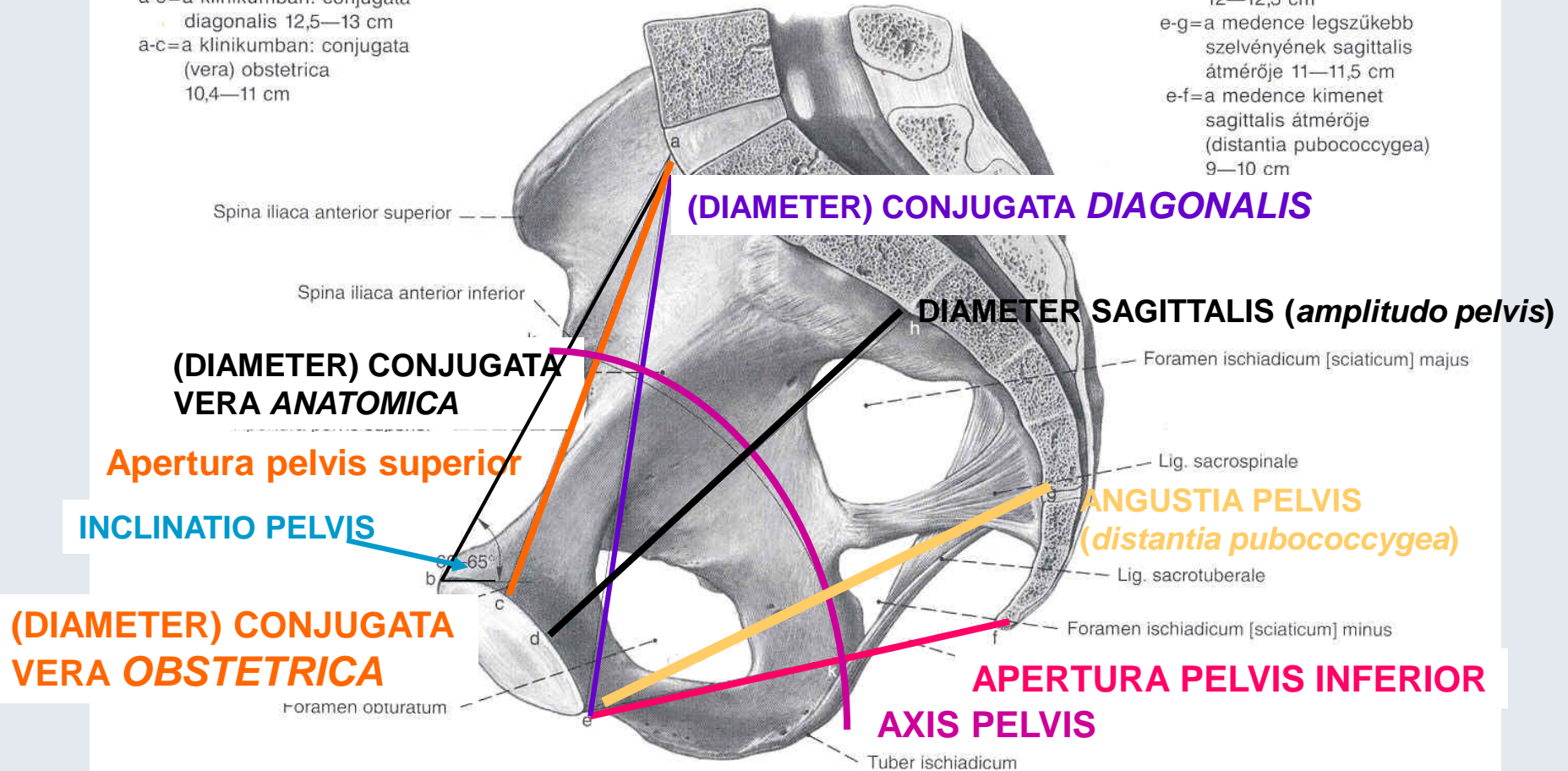
a-c=a klinikumban: conjugata (vera) obstetrica 10,4—11 cm

n-d=a klinikumban:

a medence üreg sagittalis átmérője 12—12,5 cm

e-g=a medence legrészükébb szelvényének sagittalis átmérője 11—11,5 cm

e-f=a medence kimenet sagittalis átmérője (distantia pubococcygea) 9—10 cm

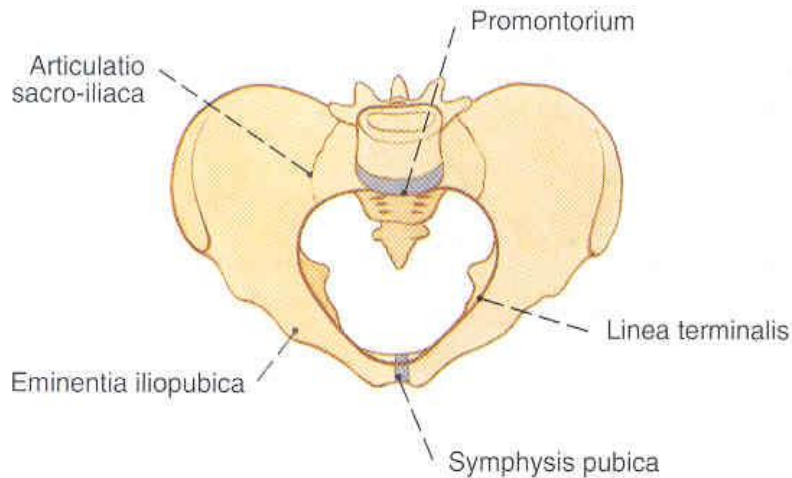


1140. ábra A női medence átmérőinek bemutatása, median metszés medial felől (jobb oldal).

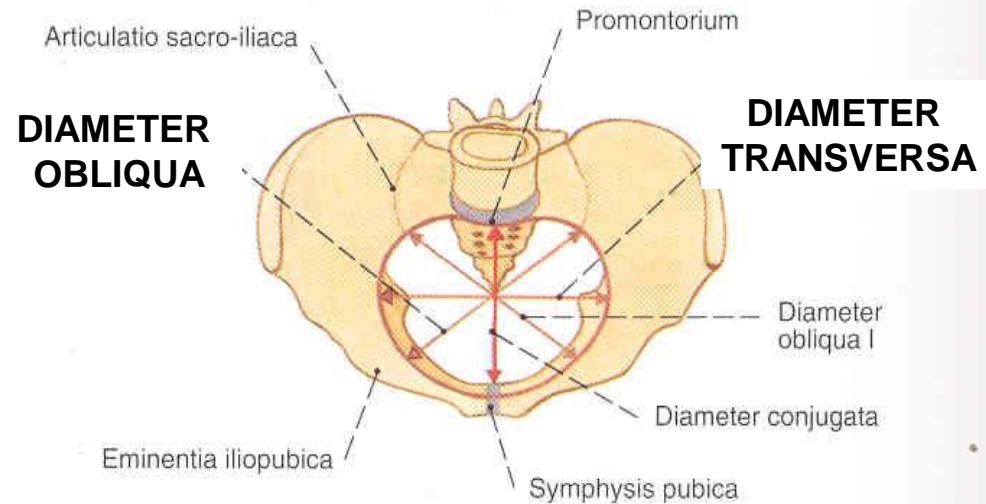
\* Az apertura pelvis superiorit a linea terminalis határolja. Az a-c vonal adja a medence bemenetének síkját. A farokcsont csúcsa, az ülőcsont gumója, az ülőcsont szára és a szeméremcsont alsó szára határolják az apertura pelvis inferiorit

# DIAMETERS 3.

## MALES



## FEMALES



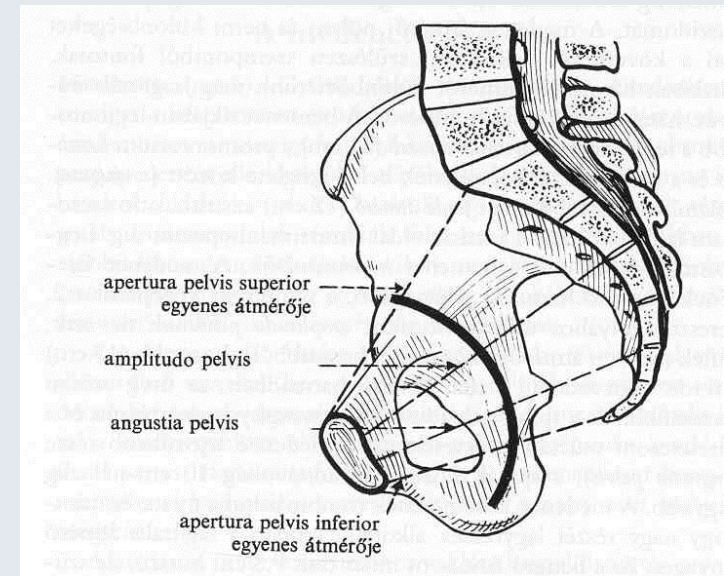
## MOST IMPORTANT MEASUREMENTS

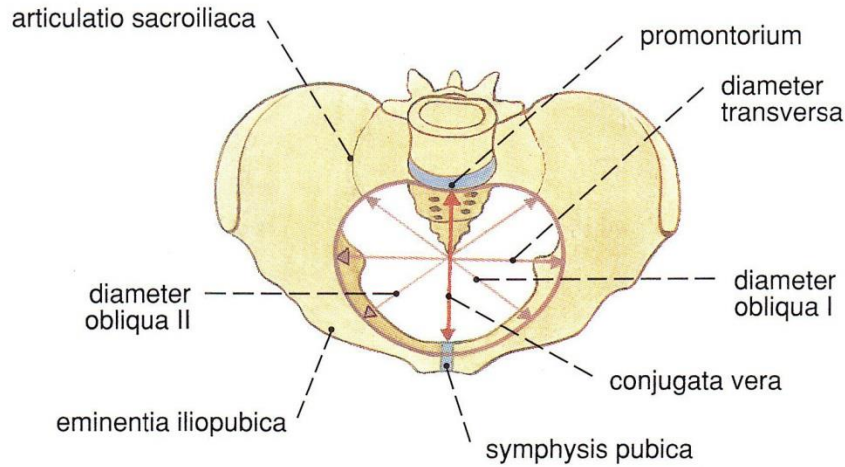
diameter conjugata (anatomica)

amplitudo pelvis

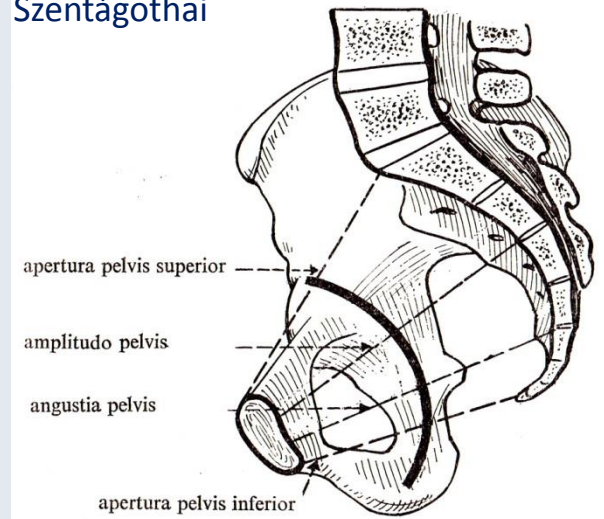
distantia pubococcygea

angustia pelvis

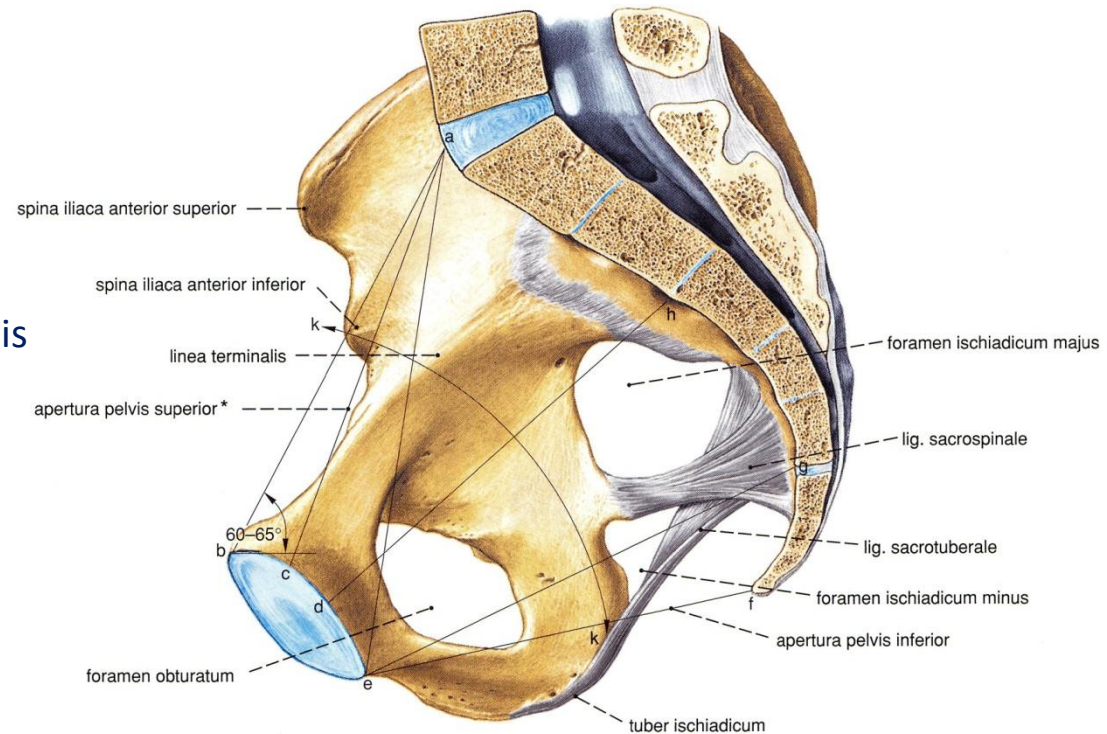




## Szentágothai



## Sobotta



## Pelvic diameter:

Diameter transversa ~ 13,5 cm

Conjugata vera /*obstetrica*/ ~ 11 cm  
(plane of the suo. Pelvis aperture; a-c)

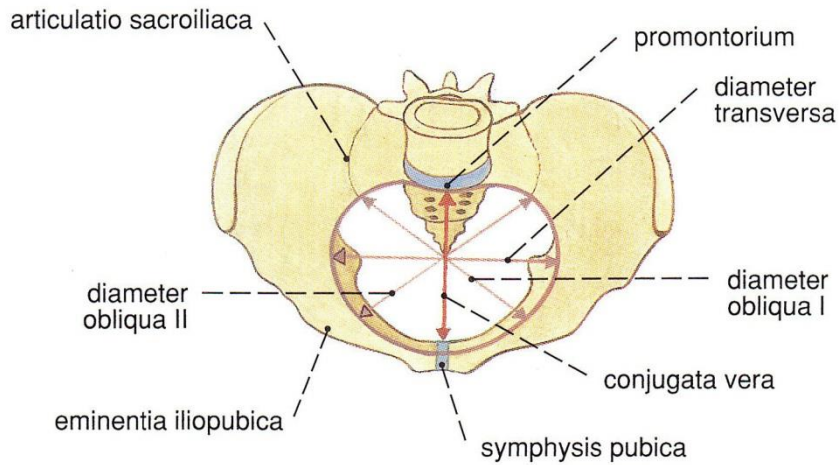
Amplitudo pelvis (plane at the level of 2. Sacral vertebra and the middle of simphisis max. diameter ~ 13 cm

Angustia pelvis (e-g) ~ 11,5 cm

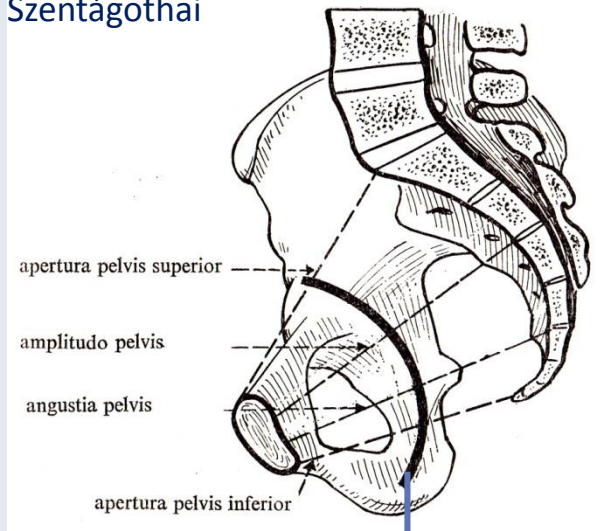
Distantia pubococcygea (e-f) ~ 9,5 cm



### Sobotta

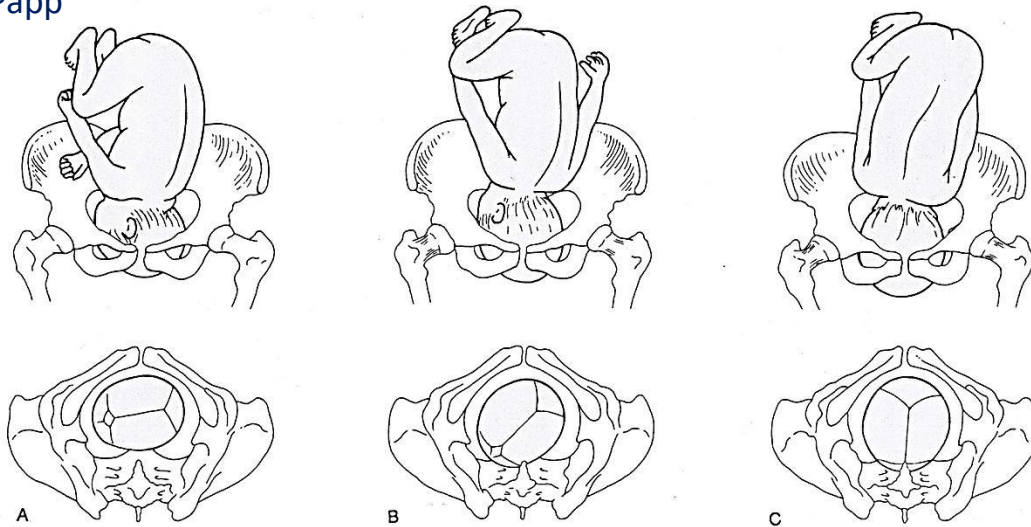


### Szentágothai



↓  
**Axis pelvis**

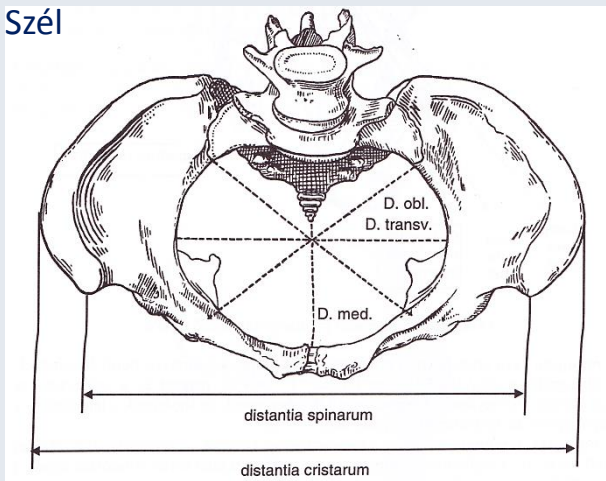
### Papp



[www.baby-guru.hu](http://www.baby-guru.hu)

The head of the infant moves along the Axis pelvis, with the largest Diameter of the head (frontosuboccipital) the respective largest bowl diameter turns.

Szél

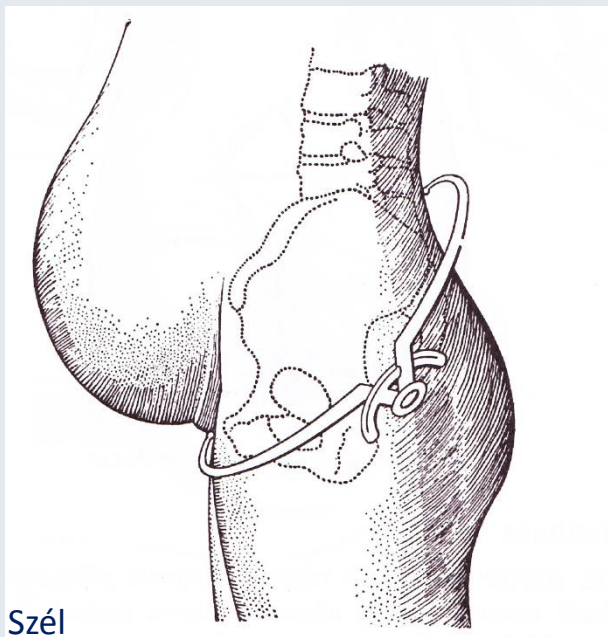


Assessment of the pelvic size with the help from outer bony landmarks



The dimples of **Venus**

Szél

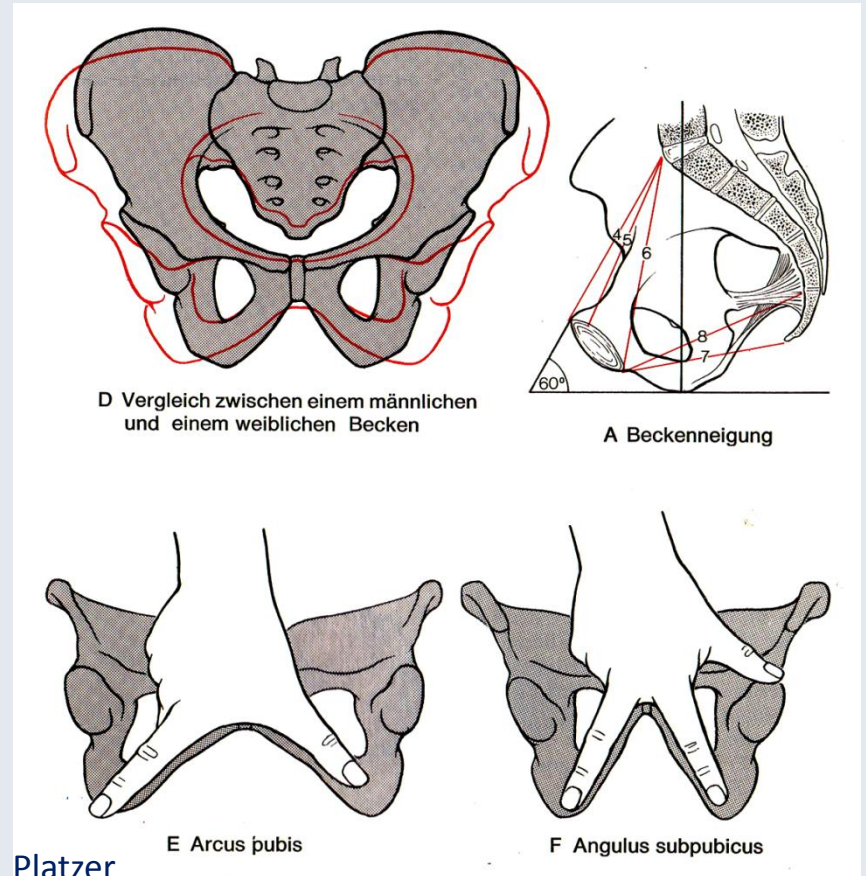
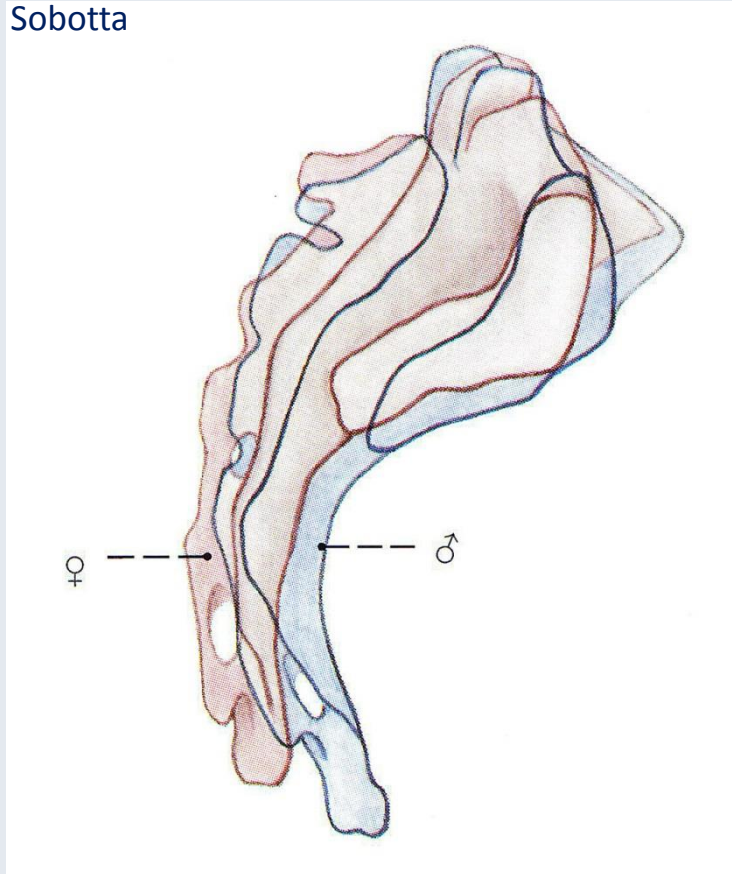


Conjugata diagonalis externa measured with a caliper

Rhombus of Michaelis: between spinous process of the 5. Lumbar vertebrae, the spinae iliacae posteriores sup. and the last coccyx

# Sex differences

Sobotta



Platzer



Braus: Anatomie des Menschen (Verlag von Julius Springer 1929.)

Papp Z.: Nőgyógyászat (Semmelweis kiadó 1999.)

Platzer W: Taschenatlas der Anatomie – Bewegungsapparat (Thieme 1991.)

Sobotta: Az ember anatómiájának atlasza (Alliter 2004.)

Szél: Klinikai anatómia (SOTE Képzéskutató 1999.)

Szentágothai – Réthelyi: Funkcionális anatómia 1. kötet (Medicina könyvkiadó 1971.)

Bertos J, Lluch JM. Rehabilitación de sectores posteriores mandibulares atroficos. Revisión de la literatura. Rev Oper Dent Endod 2007;5:70

Sharma et al. DOI: 10.4103/2231-0746.95316

PMID: 23483067

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