



*Anatomy
Passion*



Lecture: 5

Done By: Lina Imar



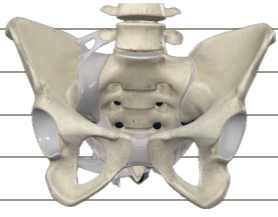
General Anatomy

Lecture 5: Appendicular Skeleton (2): Bones of Lower Limb

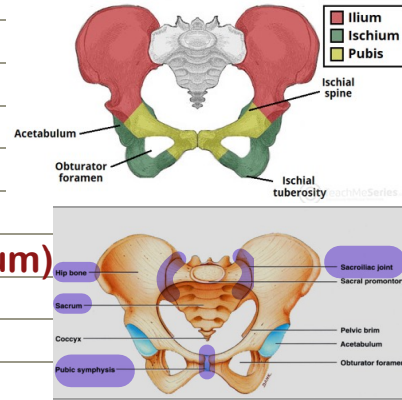
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We must distinguish between girdle and joint: “girdle” refers to a supportive structure connecting the limbs to the axial skeleton, while “joint” refers to the meeting point of bones allowing movement.



The Pelvic Girdle



1. connects bones of lower limb (hip bones) to axial skeleton (sacrum)

2. It consists of the two hip bones.

3. It has 5 joints: Two sacroiliac joints, two hip joints & symphysis pubis joint

A) sacroiliac joints: The hip bones articulate posteriorly with the sacrum

B) symphysis pubis joint: The hip bones articulate anteriorly with each other



6 Bones of Lower Limb



Joints of lower limb

1) sacroiliac joints: The hip bones articulate posteriorly with the sacrum

2) symphysis pubis joint : The hip bones articulate anteriorly with each other (The body of pubis articulates with the body of the opposite pubis)

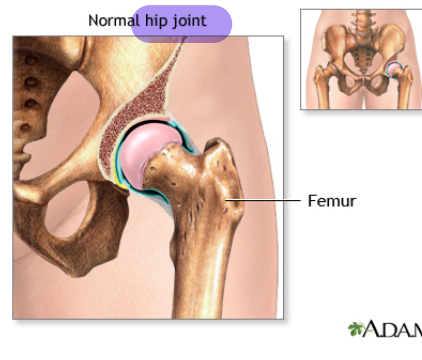
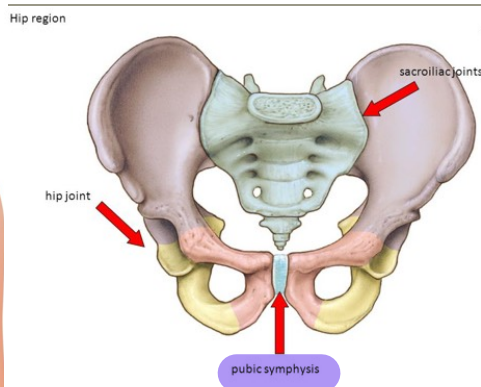
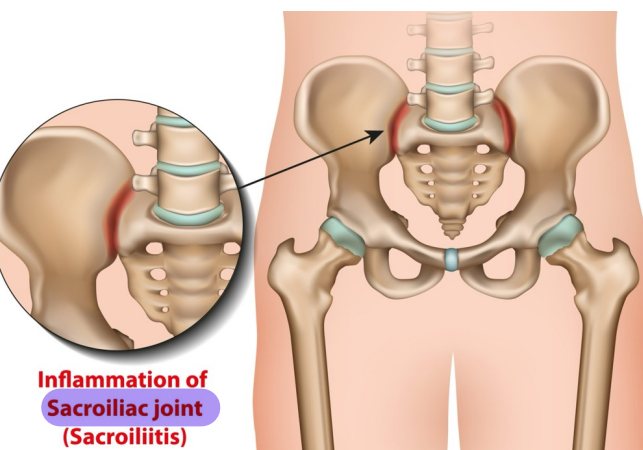
3) hip joint: the head of femur and acetabulum

4) knee joint: femur and patella anteriorly and the tibia below

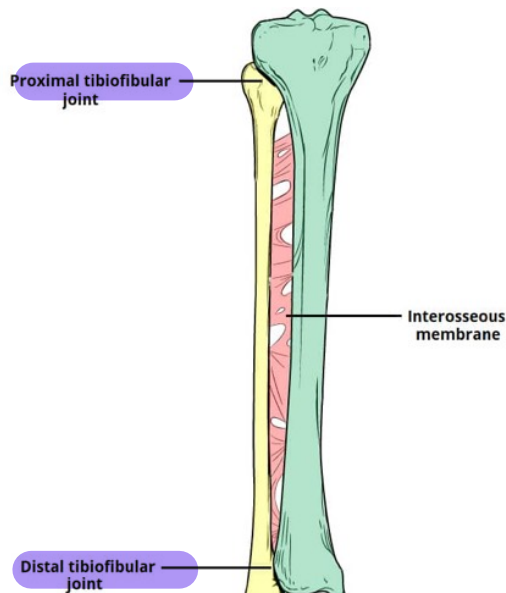
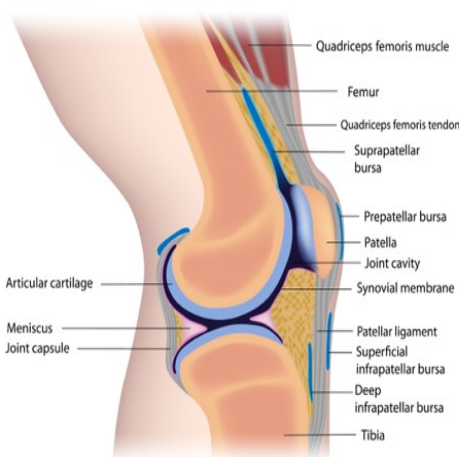
5) superior tibio-fibular joint: head of fibula and facet on the posterior aspect of lateral condyle

6) inferior tibio- fibular joint: fibular notch & the lower end of fibula

7) ankle joint: lower end of tibia & talus bone of the foot

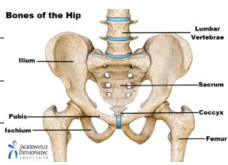


Anatomy of the Knee Joint

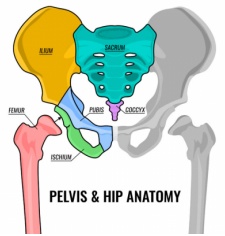


Ankle Joint





The Hip Bone



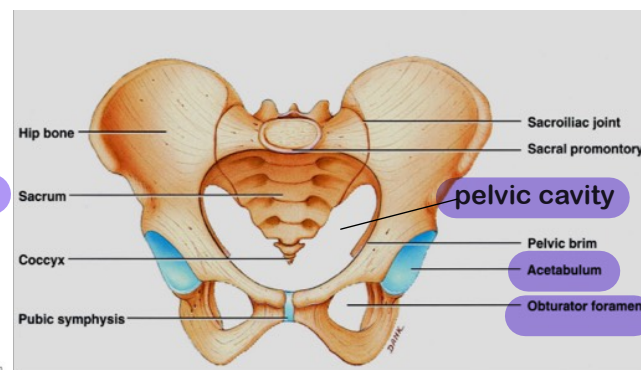
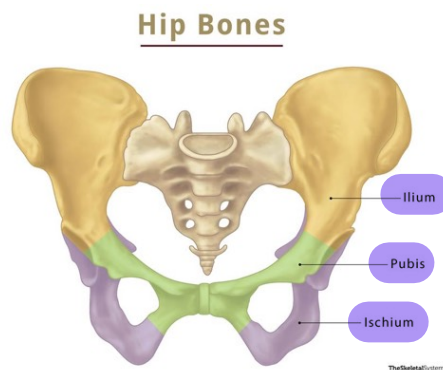
1. large & irregular bone

2. It has 3 parts: ilium (upper part), pubis (medial, anterior part) & ischium (lateral, posterior part)

3. It has pelvic cavity

4. acetabulum: is a cup shaped cavity on its lateral (outer) surface which articulates with head of femur to form hip joint.

5. the obturator foramen (O foramen): is a large oval or triangular gap below the acetabulum, which separates between the ilium superiorly and the pubis medially and ischium laterally



A. The Ilium:

1) flat bone

2) if you can see the acetabulum so this is the outer surface of hip bone which is called lateral (gluteal) surface because you can see the gluteal lines (anterior, posterior & inferior)

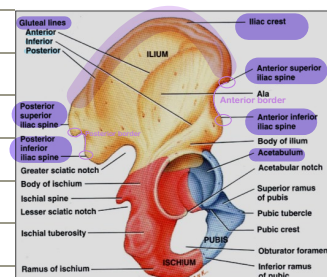
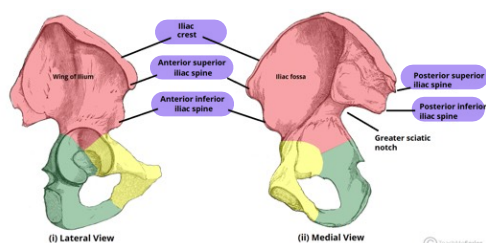
3) It has 3 borders: upper, anterior, posterior

4) Its upper border is curved and is called iliac crest: A link between ASIS & PSIS

5) Its anterior border (We know that it is anterior because it is from the pubis side) presents anterior superior iliac spine (ASIS) & anterior inferior iliac spine (AIIS) & it is pointed sharp border

6) Its posterior border (We know that it is posterior because it is from the ischium side) presents posterior superior iliac spine (PSIS) & posterior inferior iliac spine (PIIS).

7) It includes the upper part of acetabulum & the expanded, flattened area of bone above it.



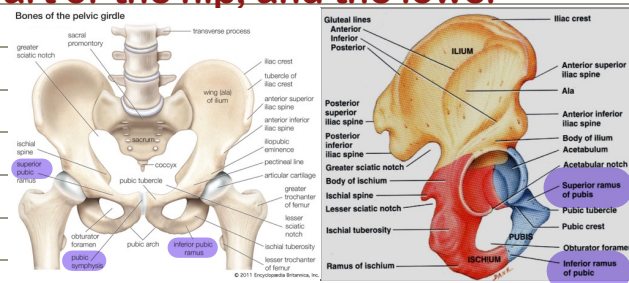
B. The Pubis:



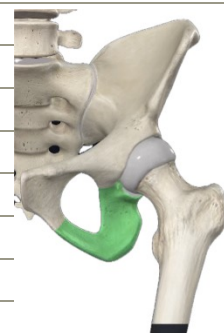
1) medial, anterior part

2) It consists: a body (which articulates with the body of the opposite pubis forming the symphysis pubis), a superior ramus, and an inferior ramus.

3) Forms the anterior portion of the lower expanded part of the hip, and the lower anterior part of the acetabulum.



C. The Ischium:



1) lateral posterior part

2) It consists: a body and a ramus, which is continuous with the inferior ramus of the pubis

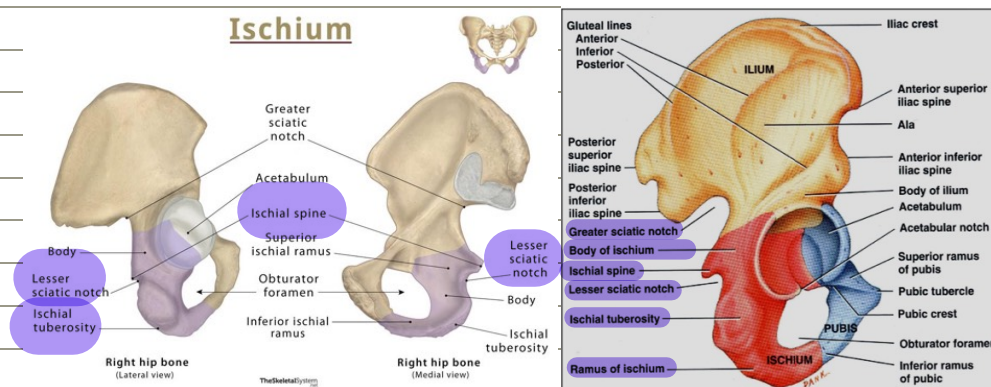
3) It has 2 notches and 1 tuberosity and 1 pointed spine

4) The ischial tuberosity: is a large rough area situated on the lower part of the body.

5) Ischial spine: is a sharp projection, which intervenes between the greater and lesser sciatic notches.

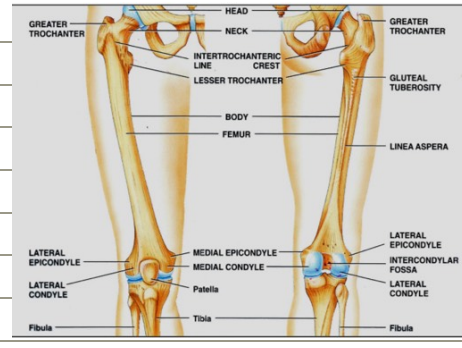
6) The posterior border of ischium is continuous with the posterior border of ilium

7) Forms the posterior portion of the lower expanded part of hip and the lower posterior part of acetabulum.





The Femur



1) bone of the thigh

2) longest bone in the body = 45cm

3) typical long bone, It has two ends → upper end & lower end and shaft

4) It has 2 surfaces: anterior (smooth) and posterior (rough) because of double shaped line (Linea Aspera)

The upper end: head, neck, 2 trochanters, line & crest

The head: which is more than half of a sphere (well circulated), articulates with acetabulum of the hip, to form the hip joint.

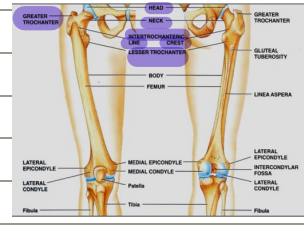
The neck: is about 5 cm long & connects the head to shaft.

The intertrochanteric line: is a rough ridge, which runs downwards and medially on anterior aspect of the bone from greater trochanter to lesser trochanter.

The intertrochanteric crest: is a smooth elevation on posterior aspect of the bone between greater and lesser trochanters.

greater & lesser trochanters: connects to each other:

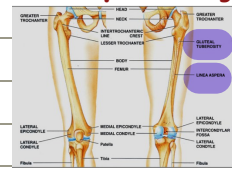
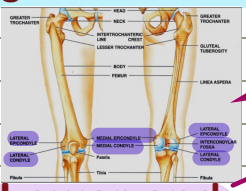
- 1) anteriorly by line
- 2) posteriorly by crest



Shaft: tuberosity & linea aspera

linea aspera: is a broad, rough vertical ridge in middle third of the posterior aspect of femur

gluteal tuberosity: is a vertical ridge which the linea aspera is continuous with it Superiorly



Lower end: 2 condyles & 2 epicondyles & 1 fossa & 1 articular surface

medial and lateral condyles: two large masses found in the expanded lower end which unite anteriorly but separated posteriorly by the deep intercondylar fossa or notch

medial and lateral epicondyles: found superior to the medial and lateral condyles respectively

articular surface: a broad n-shaped articular surface found anteriorly to the condyles, which articulate with the patella anteriorly and the tibia below to form knee joint

- * Medial = head side
- * Lateral = the other side



The Patella

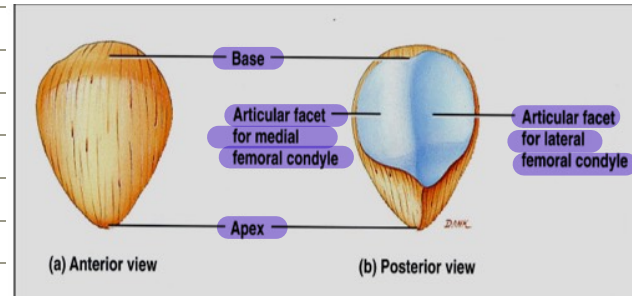
1) triangular sesamoid bone (bone inside tendon)

2) located in front of the knee joint

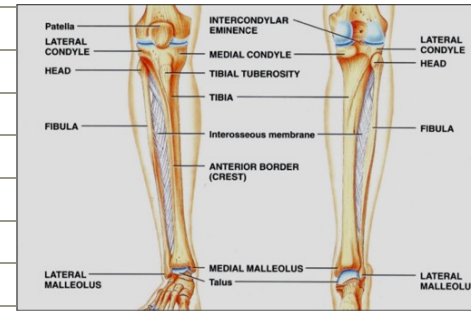
3) The base of the patella forms the upper (superior) border

4) the apex is pointed inferiorly

5) it has 2 surfaces: anterior (smooth) and posterior (rough because it contains two articular facets for articulation with the medial and lateral condyles of the femur to form patello femoral part of knee joint)



The Tibia



1) The medial bone of leg and it is larger, bigger and much stronger than fibula

2) typical long bone, It has two ends → upper end & lower end and shaft

Upper end: 2 condyles & facet

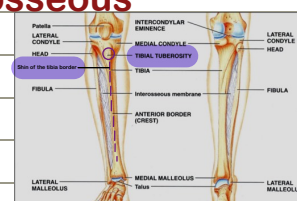
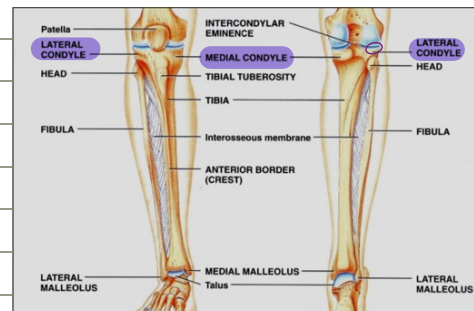
medial and lateral condyles: The medial condyle is relatively larger than the lateral one, The upper surface of each condyle is smooth and articulates with the corresponding condyle of femur (in the knee joint)

facet: found On the posterior aspect of the lateral condyle which articulate with the head of fibula forming the superior tibio-fibular joint

Shaft: tuberosity & border

tibial tuberosity: lies at the upper end of anterior border of the shaft between medial and lateral condyles

interosseous border: The lateral border & it is sharp, to which the interosseous membrane is attached also it is called Shin of the tibia border

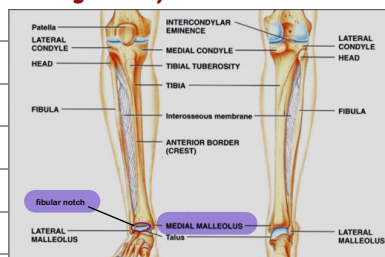


Lower end: malleolus & notch

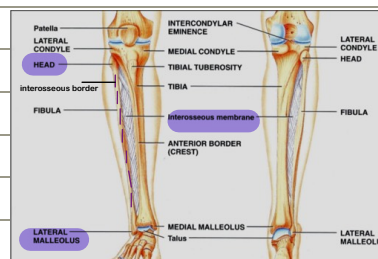
medial malleolus: found inferiorly in the medial aspect of the lower end and forms the prominence on medial aspect of ankle

fibular notch: is a rough depression found on the lateral aspect of lower end to which the lower end of fibula articulates forming the inferior tibio-fibular joint

***The inferior surface of this end articulates with talus bone (in ankle joint)



The Fibula



1) the lateral bone of the leg

2) typical long bone, It has two ends → upper end & lower end and shaft

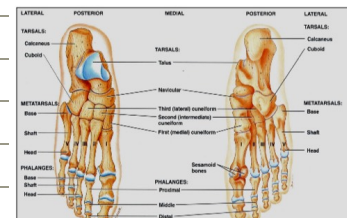
upper end : head

shaft: interosseous border: The medial border to which the interosseous membrane is attached

lower end: the lateral malleolus: forms the prominence on the lateral aspect of the ankle



Bones of Foot



3 types of bones

1) The Tarsal Bones (Tarsus): short bones

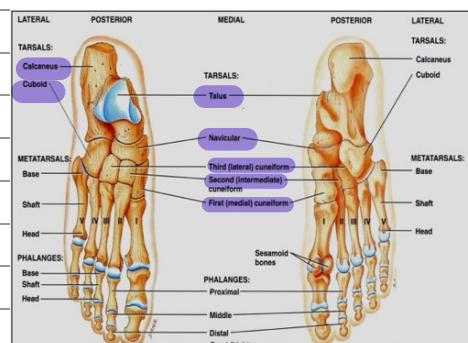
a) 7 bones

b) Form the proximal region of foot

c) It consist of:

two large bones: talus & calcaneus

five smaller bones: cuboid & navicular bones & 3 cuneiform bones (medial, intermediate & lateral)



*The talus bone articulates superiorly with lower end of the tibia to form ankle joint, inferiorly with calcaneus, and anteriorly with navicular bone.

*The three cuneiform bones articulate posteriorly with the navicular bone and anteriorly with the 1st, 2nd & 3rd metatarsal bones.

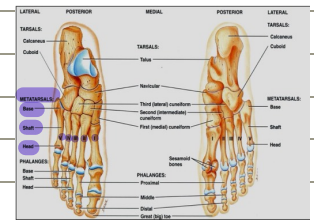
*The cuboid bone articulates posteriorly with calcaneus, medially with lateral cuneiform, and anteriorly with the fourth and fifth metatarsal bones

* Joints between tarsal bones are called the intertarsal joints

2)The Metatarsal Bones:short long bones

a)5metatarsal bones:The 1st one is that of the big toe.

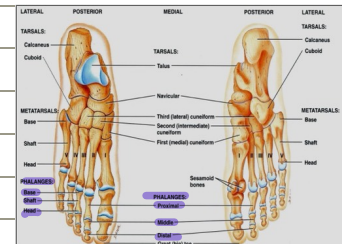
b)Each one has a proximal base, a body & a distal head



3)The Phalanges:short long bones

a)There are two phalanges in the big toe and three in each one of the lateral four digits

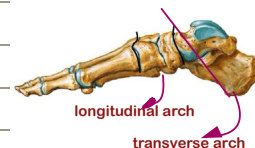
b)Each phalanx has: a proximal base, a body, and a distal head except the big toe it only has proximal base and distal head



Arches of the Foot

* The tarsal and metatarsal bones are arranged in such a way that they form arches (curves)in longitudinal and transverse axes of the foot

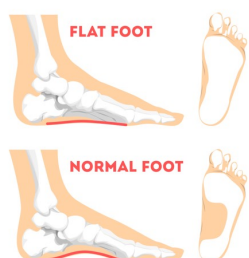
* The function of these arches is to distribute body weight over the soft and hard tissues of the foot.



Flat foot

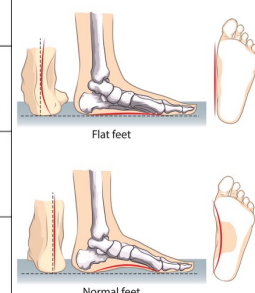
* Bones are held in position by ligaments and muscles tendons

* Weakness of these ligaments and tendons results in a decrease in the height of the arches



Deformation of the foot

Flat foot (Fallen arch)			
Normal foot			



1) sacroiliac joint it is a result of:

- A) the hip bones articulate anteriorly with sacrum
- B) the hip bones articulate posteriorly with coccyx
- C) the hip bones articulate anteriorly with coccyx
- D) one of the component of the pelvic girdle articulate posteriorly with another component of axial skeleton

2) acetabulum it is a term mean:

- A) hip joint
- B) a large oval or triangular gap
- C) a deep cup _ shaped cavity which articulate head of femur to form hip joint
- D) another name of ilium

3) which of the following include the upper part of acetabulum and expanded ?

- A) ilium B) pubis C) ischium D) iliac crest

4) gluteal surface is

- A) Anterior superior iliac spine
- B) Posterior superior iliac spine
- C) Lateral surface of the Ala
- D) Lateral surface of the ilium

5) the pubis form :

- A) Anterior portion of a lower expanded of hip and upper anterior part of acetabulum
- B) Posterior portion of lower expanded part of hip and lower posterior part of acetabulum
- C) posterior portion of lower expanded part of the hip and the lower anterior part of the acetabulum
- D) anterior portion of lower expanded part of the hip and the lower anterior part of the acetabulum

6) Ischial spine intervenes between the :

- A) Greater notch and ramus of ischium
- B) Greater notch and iliac spine
- C) Greater notch and lesser sciatic notch

7) Which show : head and neck and greater and lesser trochanters ?

- A) Patella B) Upper end of femur C) Lower end of femur D) fibula

8) The length of the neck Which could connect the head to shaft:

- A) 5cm B) 7cm C) 9cm D) 3cm

9) The linea aspera is continuous with another vertical ridge called:

- A) Gluteal lines B) Gluteal surface C) Gluteal tuberosity D) medial condyle

10)The intertrochanteric line runs:

A)Downwards and medially on anterior aspect to the bone from greater trochanter to lesser trochanter

B)Downwards and laterally on anterior aspect to the bone from greater trochanter to lesser trochanter

C)Upwards and medially on posterior aspect to the bone from greater trochanter to lesser trochanter

Answers

1)D

2)C

3)A

4)D

5)D

6) C

7)B

8)A

9)C

10)A

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