OSTEOLOGY OF HIP BONE

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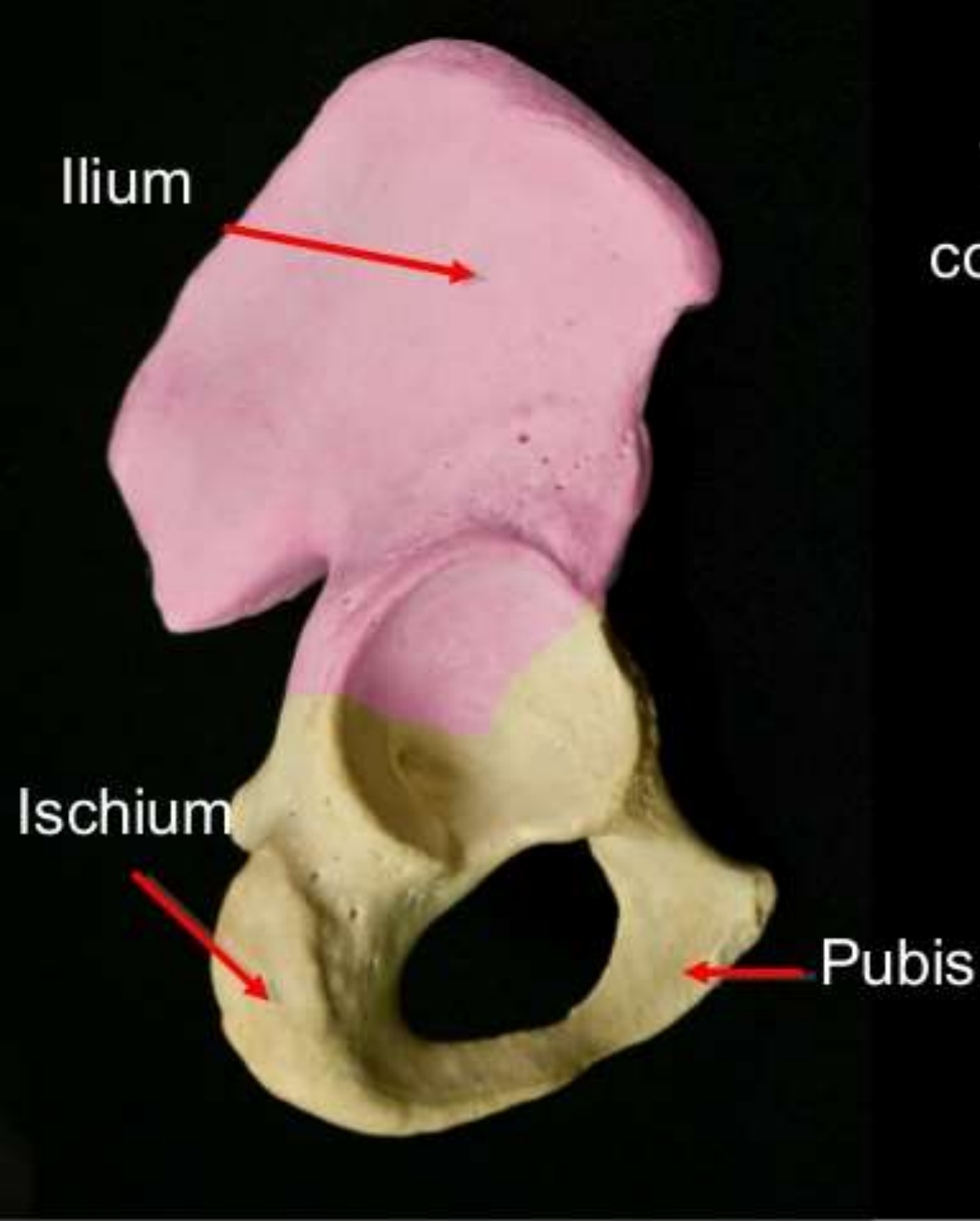


The Hip Bone is a composite of 3 bones

Pubis

Ischium

Ilium

PUBIS BONE

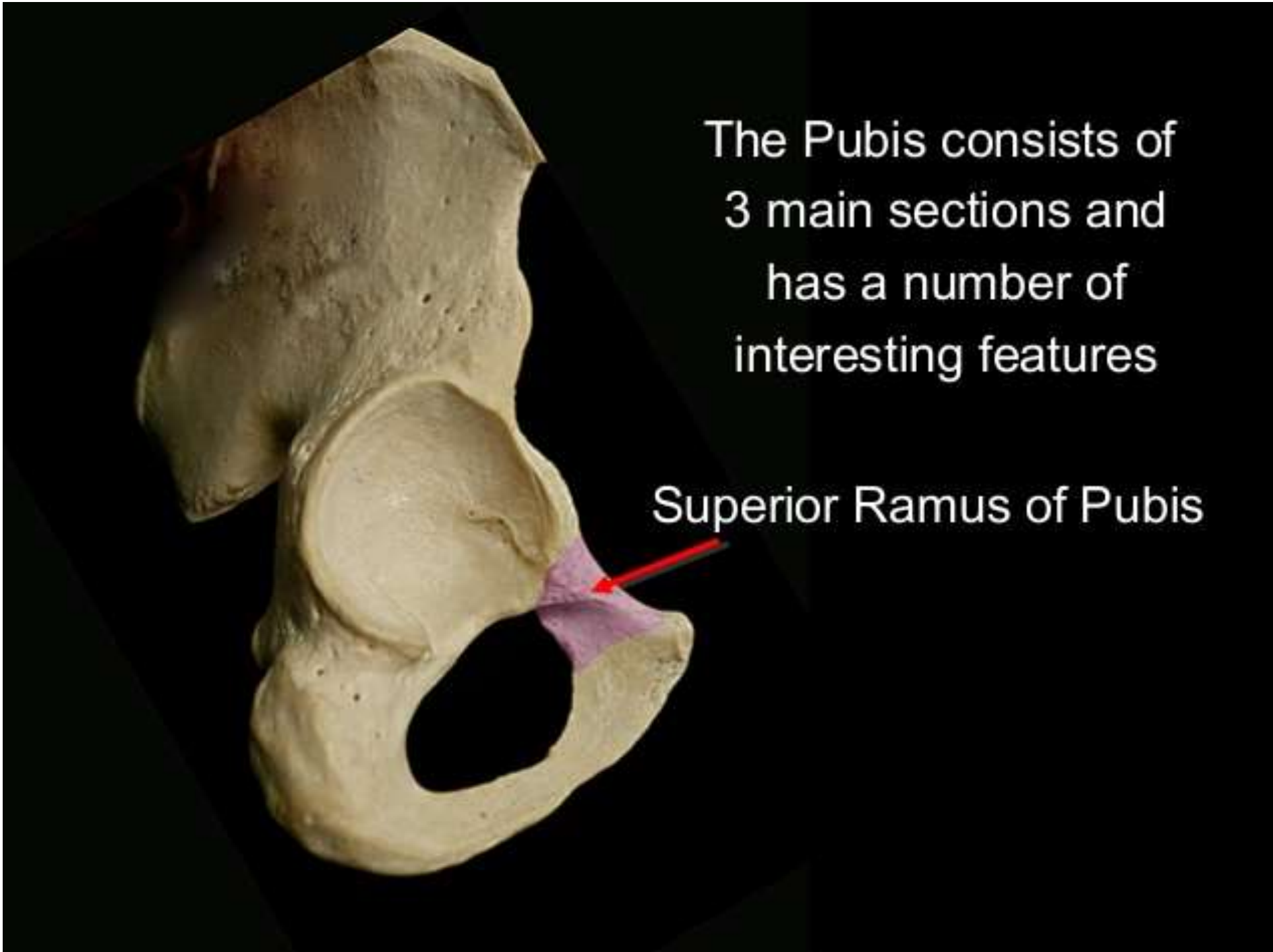
- Forms anterio inferior part of hip bone and anterior one fifth of acetabulum.

- Forms the anterior boundary of obturator foramen.

The Pubis consists of 3 main sections and has a number of interesting features

THREE PARTS

- A BODY ANTERIORLY
- SUPERIOR RAMUS SUPERIOLATERALLY
- INFERIOR RAMUS RAMUS INFERIO LATERALLY.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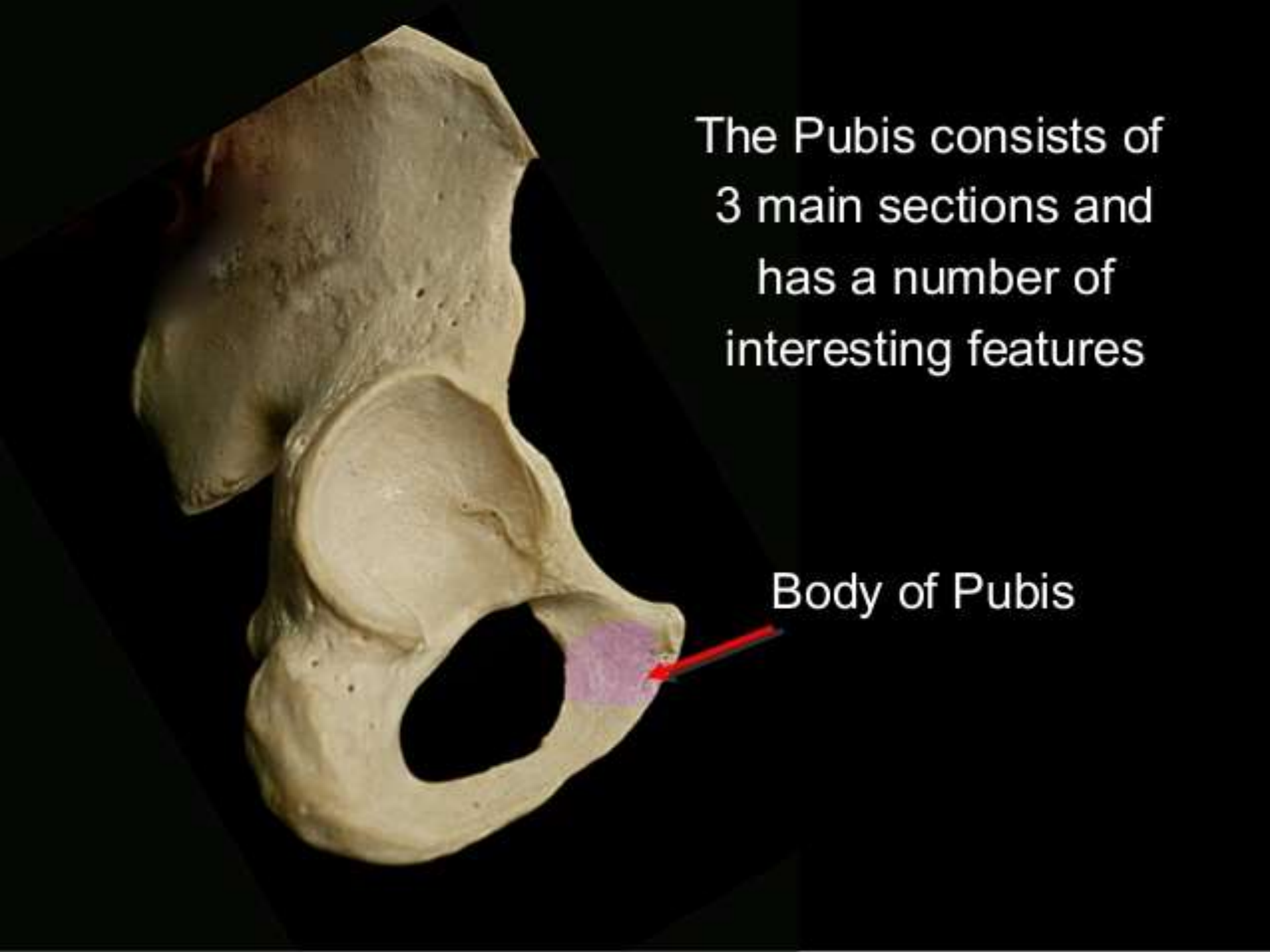
Superior Ramus of Pubis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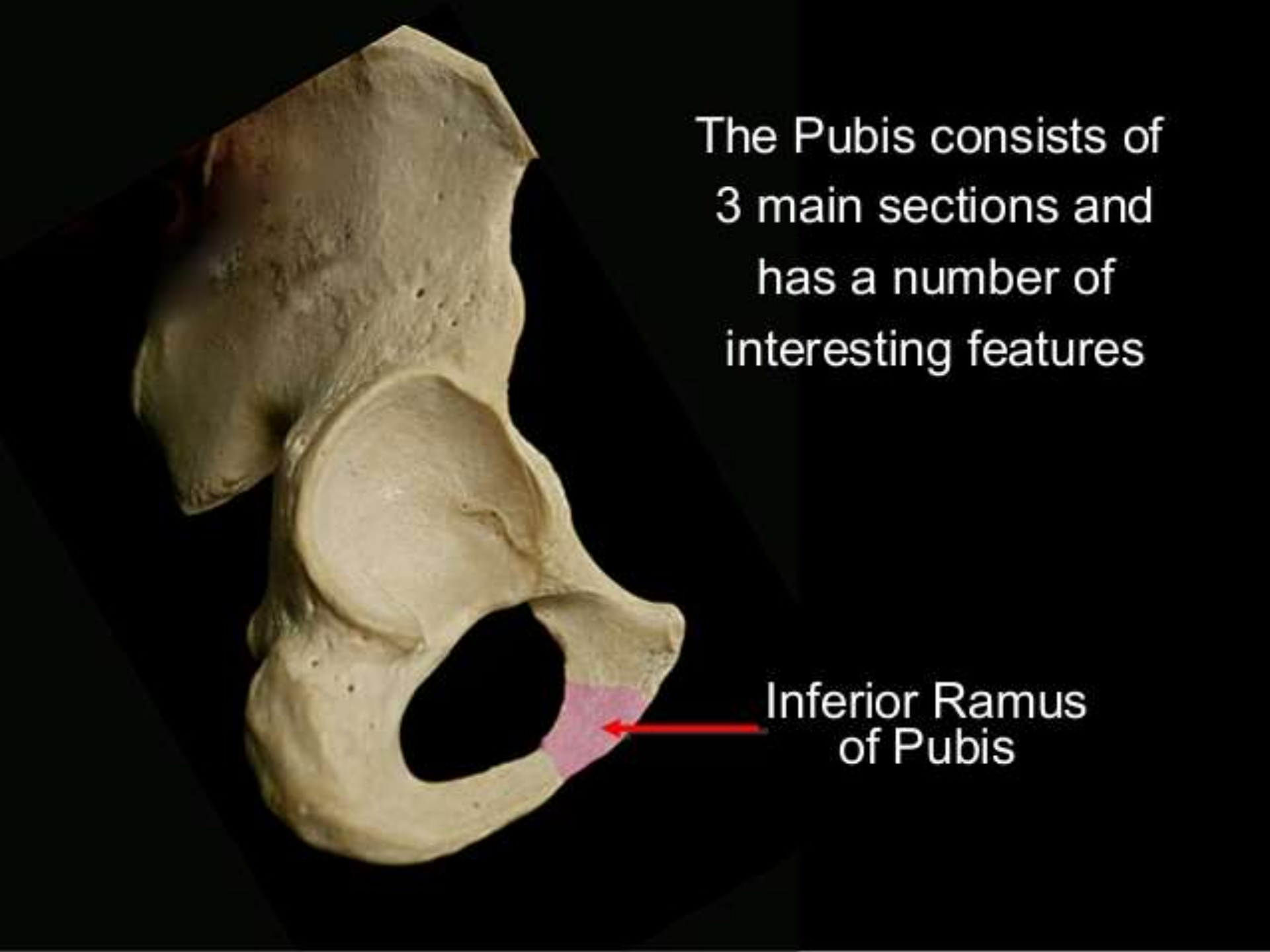
Body of Pubis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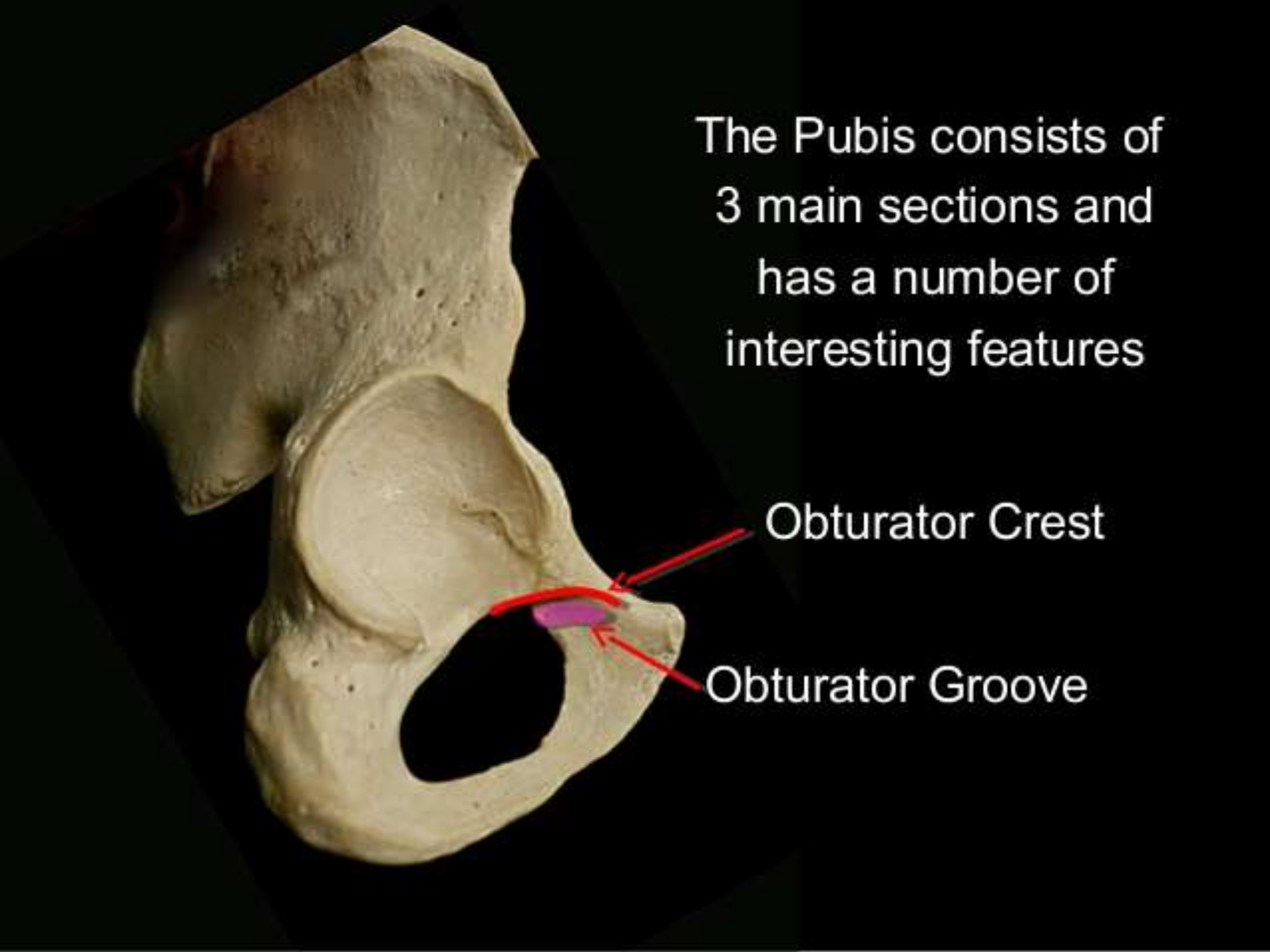
Inferior Ramus of Pubis

BODY OF PUBIS BONE

- Superior border called pubic crest
- Lateral end of pubic crest is pubic tubercle.
- 3 surfaces;
- ANTERIOR….downwards forwards and laterally,rough superiomedially.
- POSTERIOR OR PELVIC….smooth,upwards and backwards.
- MEDIAL OR SYMPHYSEAL SURFACE….articulates with opposite pubis to form pubic symphysis..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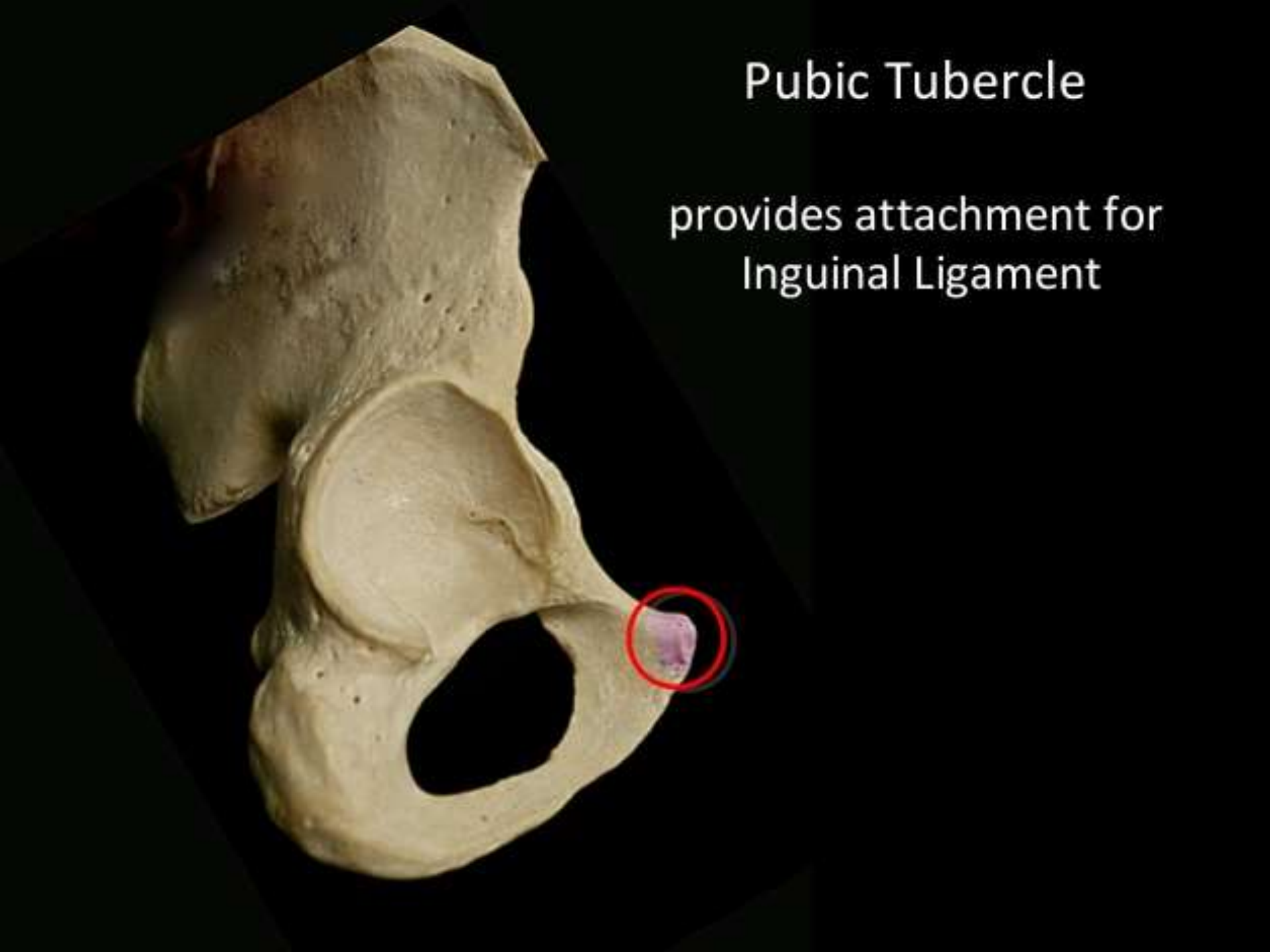
Obturator Crest
Obturator Groove


Pubic Tubercle
provides attachment for
Inguinal Ligament

Pubic Tubercle

provides attachment for
Adductor Longus

SUPERIOR RAMUS OF PUBIC BONE

- Extends from body of pubis to acetabulum over the obturator foramen.
- Three borders and three surfaces.

SUPERIOR BORDER

- Called pectineal line or pectin pubis.
- Has sharp crestextending from pubic tubercle to iliopubic eminence.

- ANTERIOR BORDER….called as obturator crest.
- Border is rounded ridge extending from pubic tubercle to acetabualar notch..

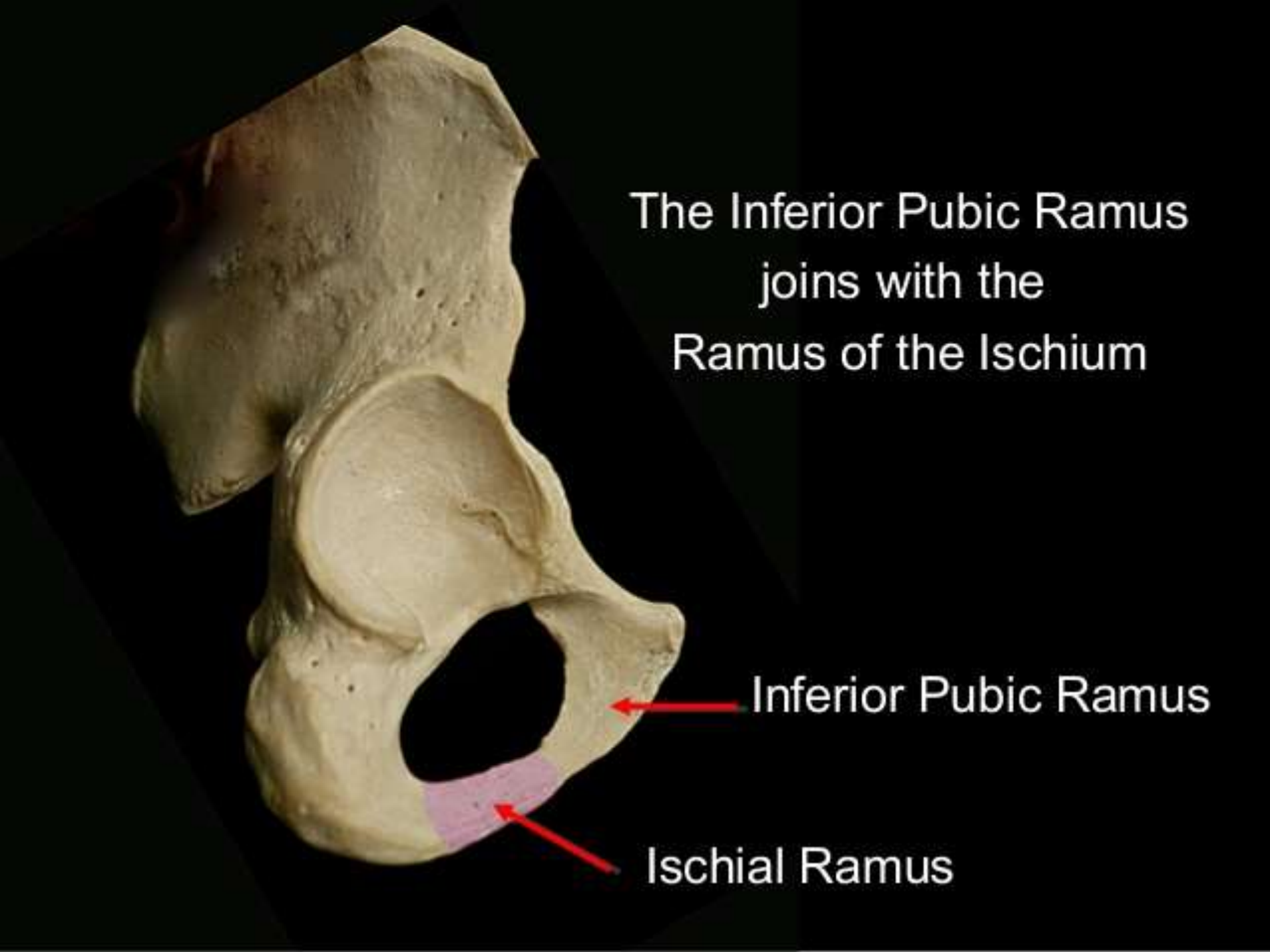
- INFERIOR BORDER….sharp and forms the upper border of obturator foramen

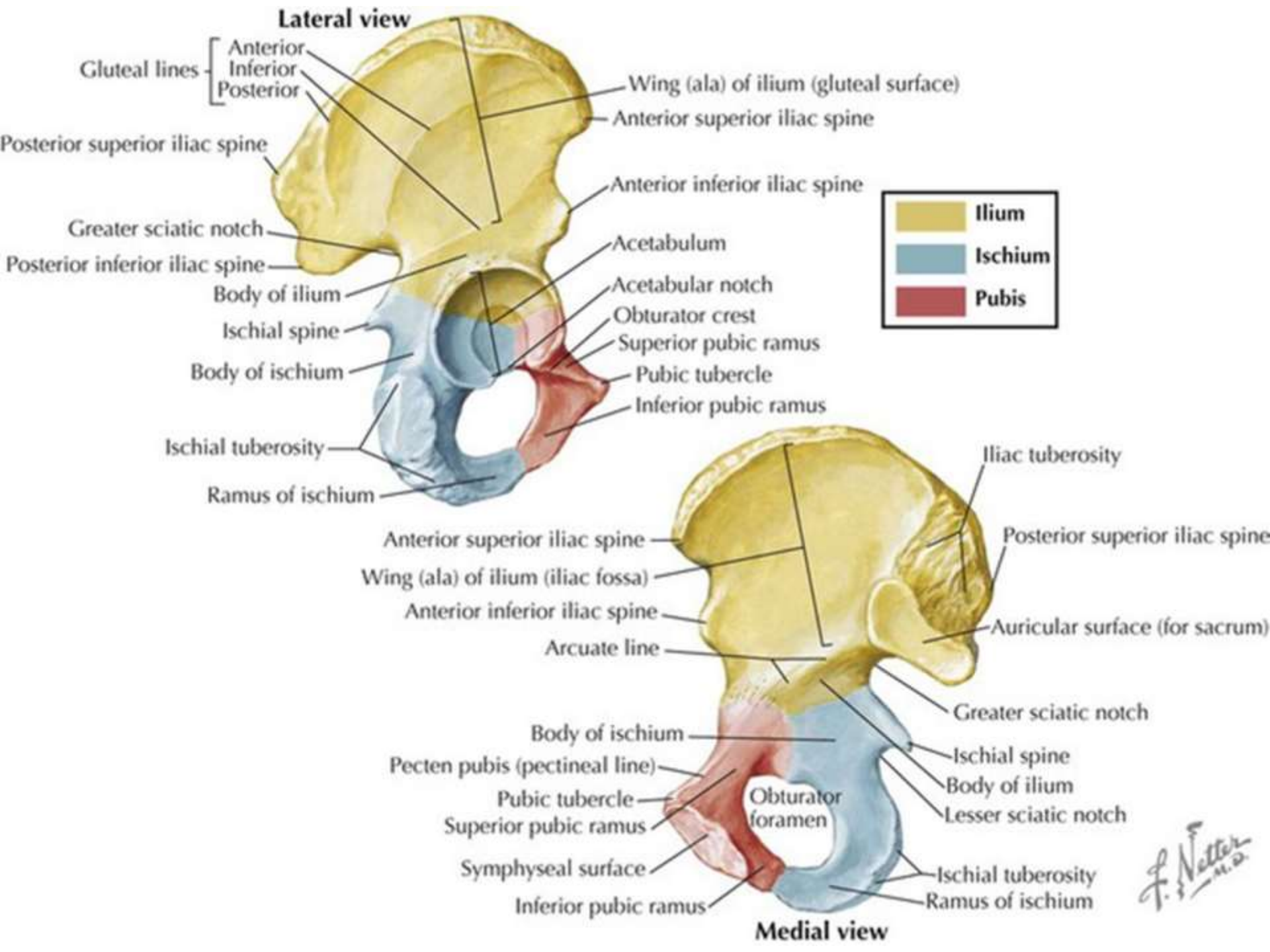
SURFACES

- PECTINEAL SURFACE….triangular area b/w superior and anterior borders.
- PELVIC SURFACE…..B/W superior and inferior border.
- OBTURATOR SURFACE……B/W anterior and inferior borders.

INFERIOR RAMUS

- Extends from body to ramus of ischium.
- Unites wid ramus of ischium to form ischiopubic rami.

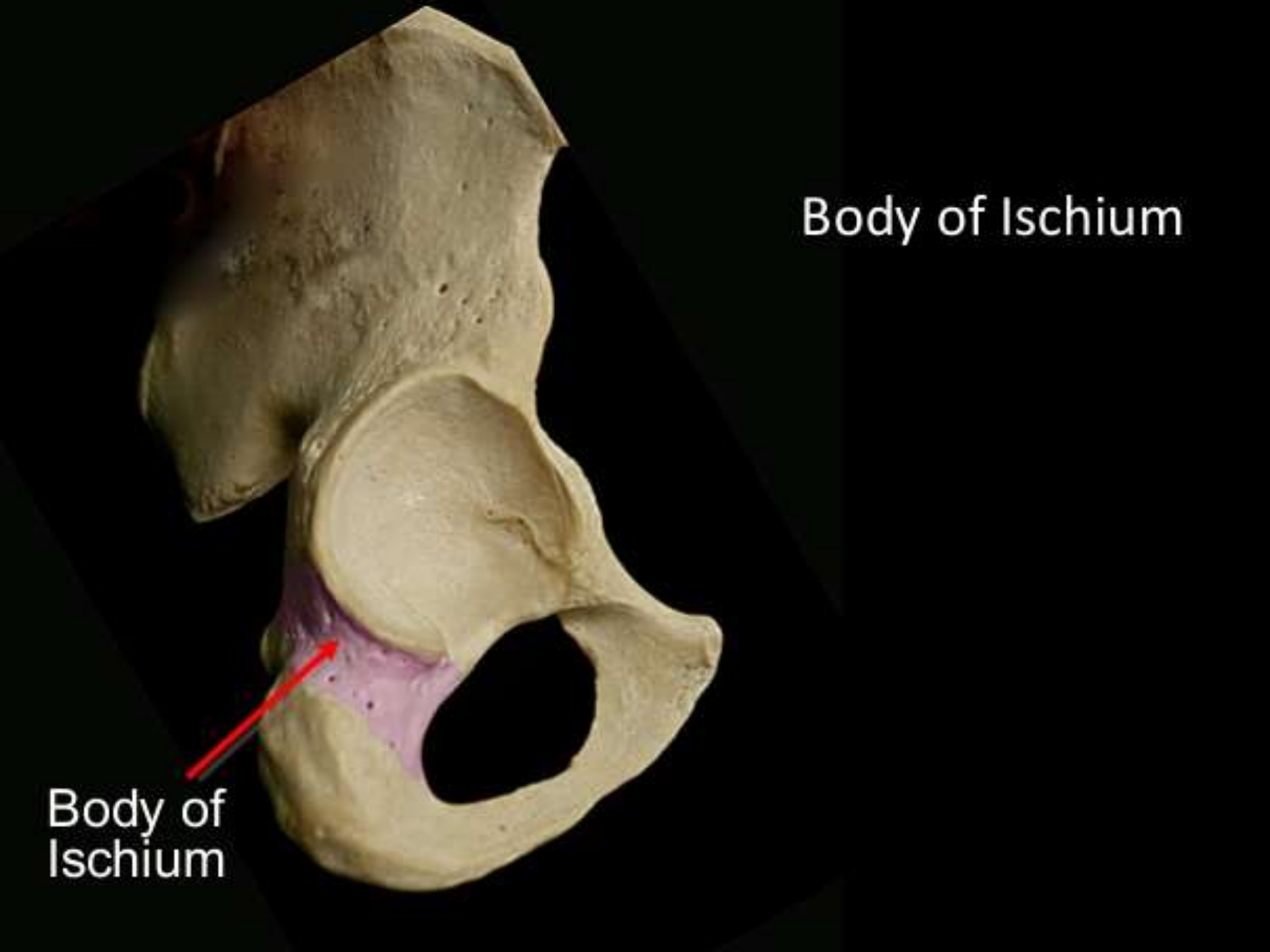

The Inferior Pubic Ramus
joins with the
Ramus of the Ischium
Inferior Pubic Ramus
Ischial Ramus

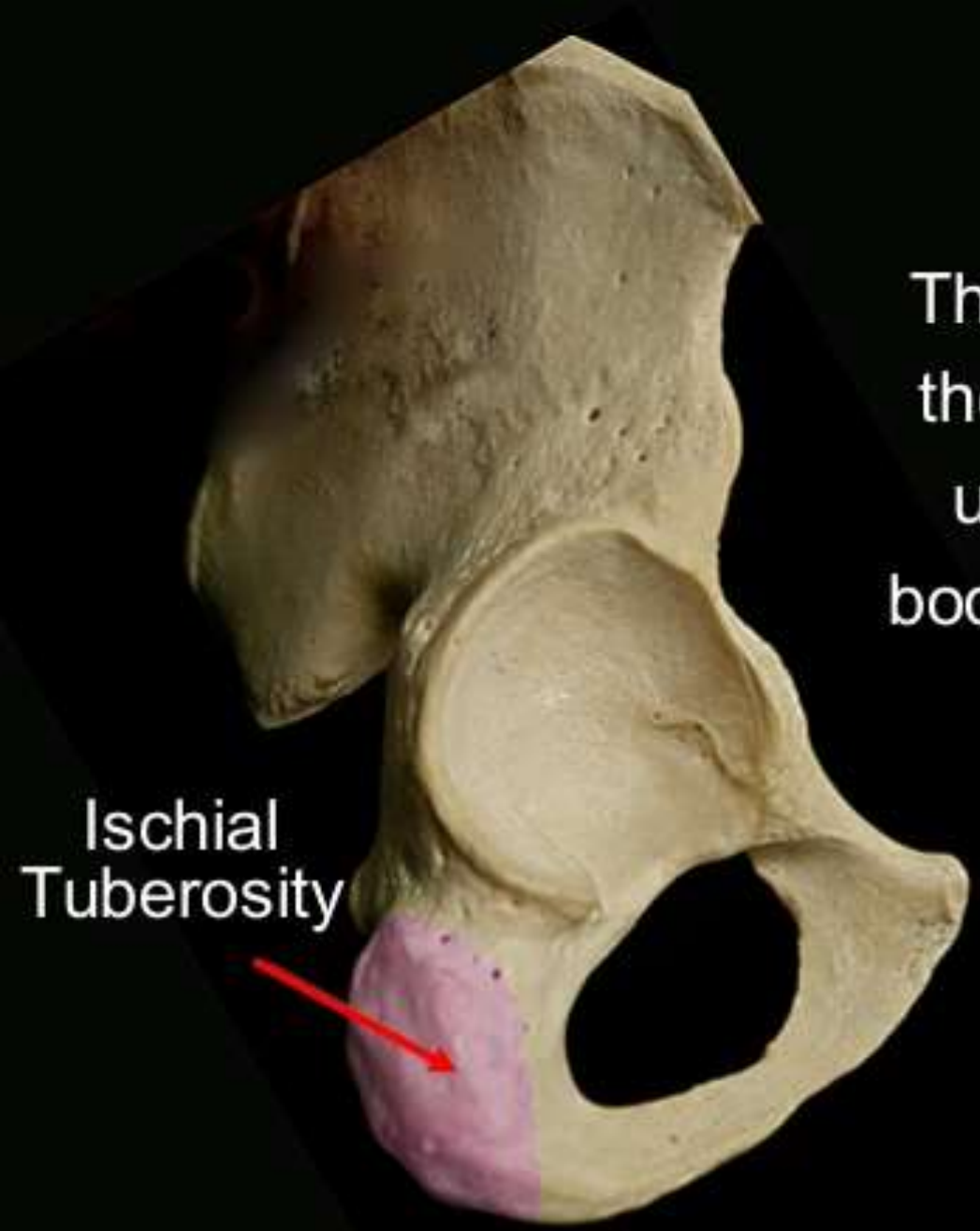

Lateral view
Gluteal lines
Anterior
Inferior
Posterior
Wing (ala) of ilium (gluteal surface)
Anterior superior iliac spine
Posterior superior iliac spine
Anterior inferior iliac spine
Greater sciatic notch
Posterior inferior iliac spine
Acetabulum
Body of ilium
Acetabular notch
Ischial spine
Obturator crest
Body of ischium
Superior pubic ramus
Pubic tubercle
Inferior pubic ramus
Ischial tuberosity
Ramus of ischium
Ilium
Ischium
Pubis
Iliac tuberosity
Anterior superior iliac spine
Posterior superior iliac spine
Wing (ala) of ilium (iliac fossa)
Anterior inferior iliac spine
Auricular surface (for sacrum)
Arcuate line
Greater sciatic notch
Body of ischium
Ischial spine
Pecten pubis (pectineal line)
Body of ilium
Pubic tubercle
Obturator foramen
Lesser sciatic notch
Superior pubic ramus
Symphyseal surface
Ischial tuberosity
Inferior pubic ramus
Ramus of ischium
Medial view

ISCHIUM BONE

- HAS BODY AND CONJOINED ISCHIO PUBIC RAMI.

- BODY……2 ends,,,upper and lower
- Three borders,,, anterior posterior and lateral.
- Three surfaces,,,femoral dorsal and pelvic.


Body of Ischium
Body of Ischium



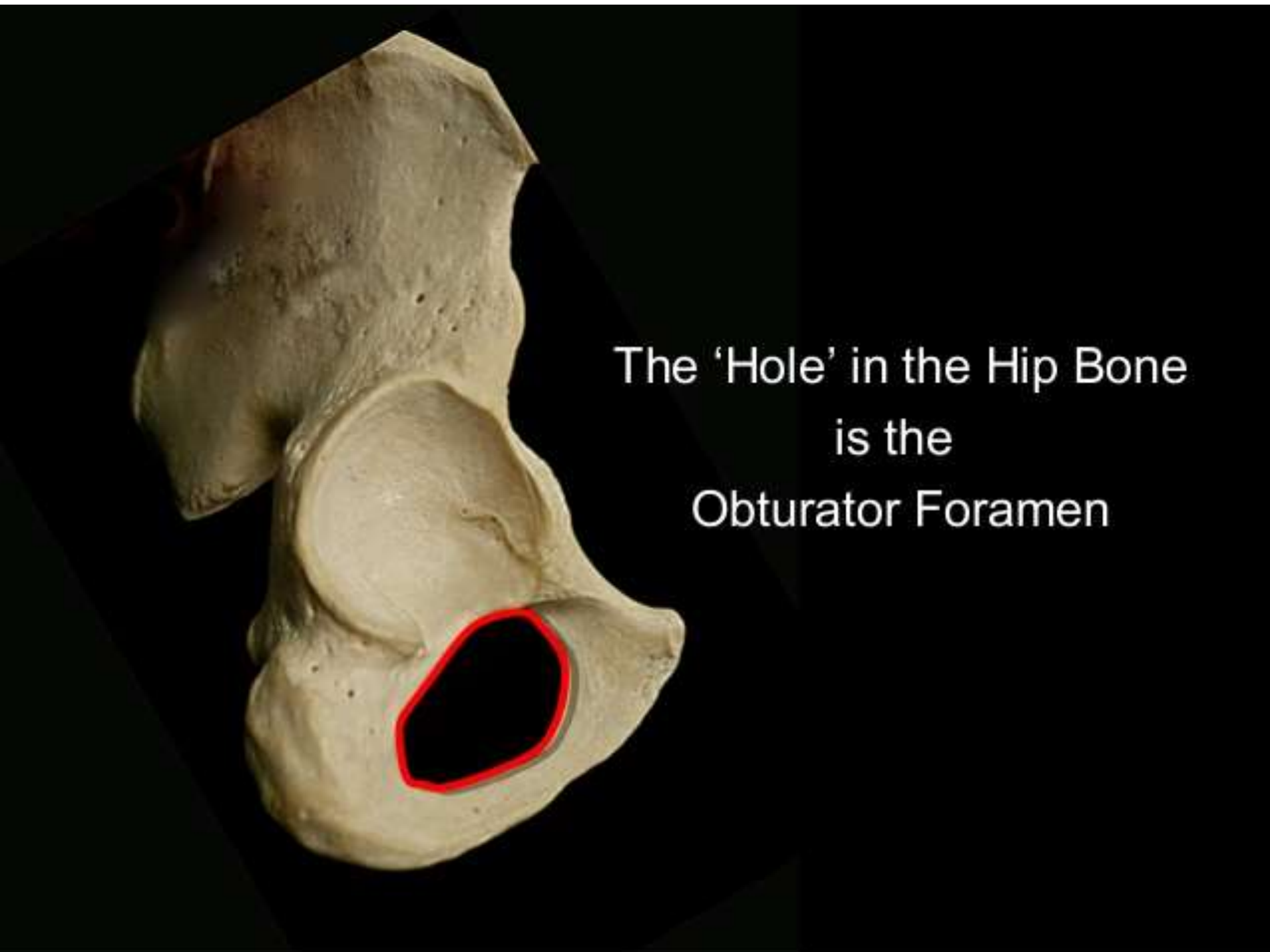
The Ischial Tuberosity is the part of the Hip Bone upon which the upper body rests when a person is seated

The Ischial Tuberosity is the part of the Hip Bone upon which the upper body rests when a person is seated

Hip Bone has been tilted to demonstrate the ischial tuberosity

Ischial Spine

Hip Bone has been tilted
to demonstrate the
ischial spine


The ‘Hole’ in the Hip Bone
is the
Obturator Foramen

BORDERS

- ANTERIOR BORDER…..forms posterior margin of obturator foramen.

- POSTERIOR BORDER….continous above with posterior border of illium.,,,
- Ischial spine,lesser sciatic notch.

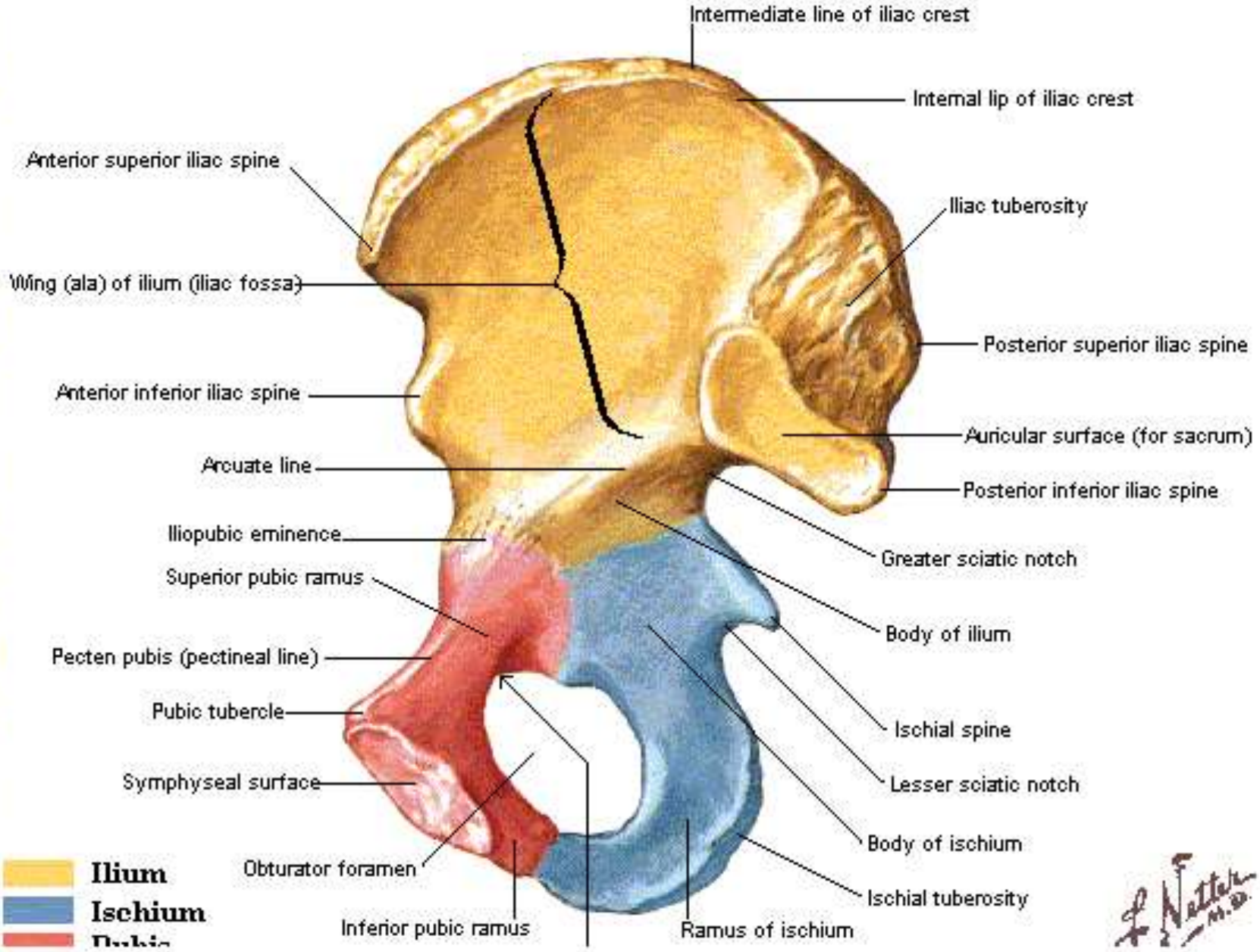
- LATERAL BORDER…forms lateral margin of ischial tuberosity

SURFACES

- FEMORAL SURFACE….b/w anterior and lateral border
- DORSAL SURFACE continues with gluteal surface of illium.
- PELVIC SURFACE….forms lateral wall of true pelvis.

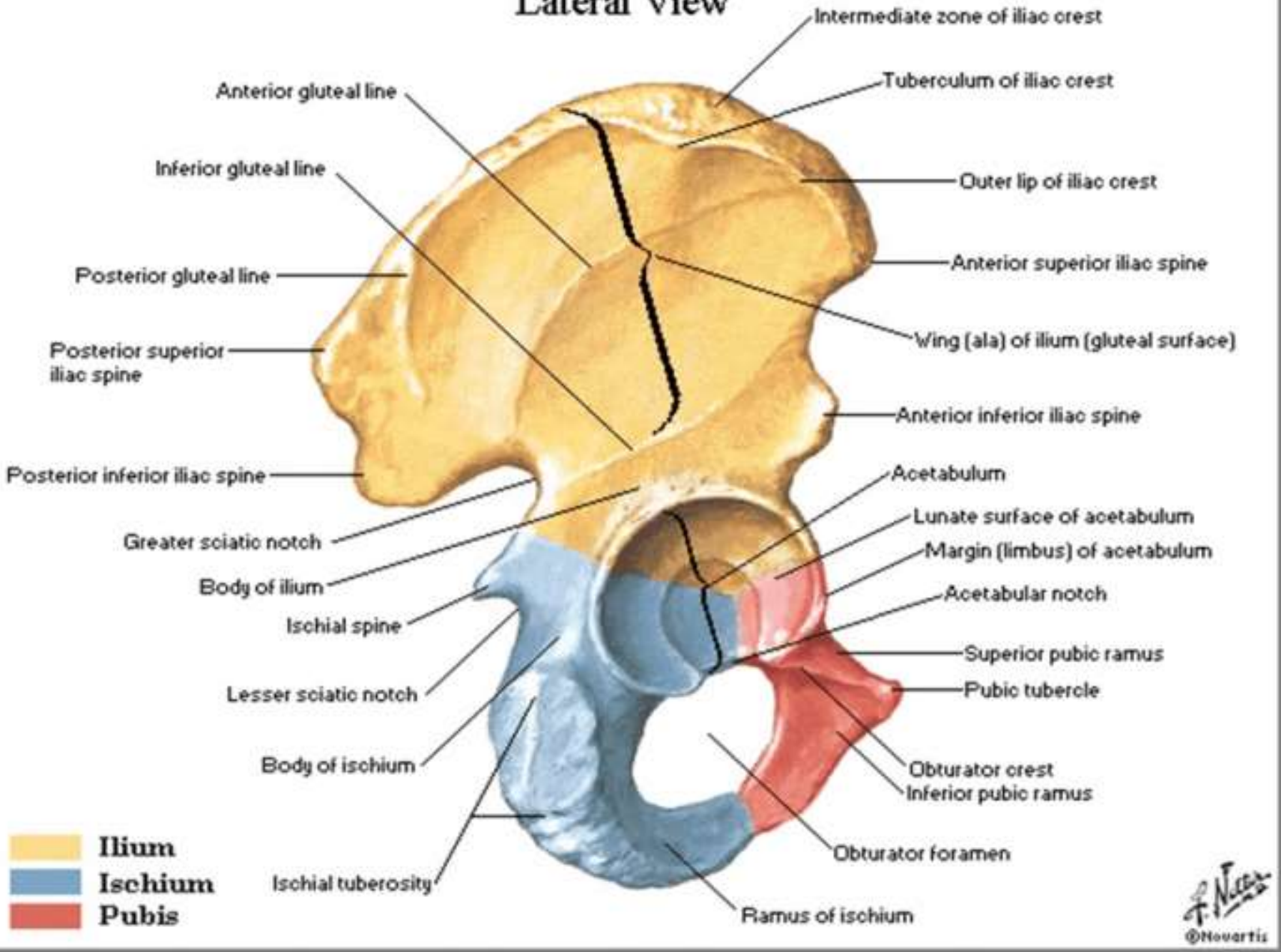
Coxal Bone

Medial View



Hip [Coxal] Bone

Lateral View



MUSCLE ATTACHMENT(ILLIUM BONE)

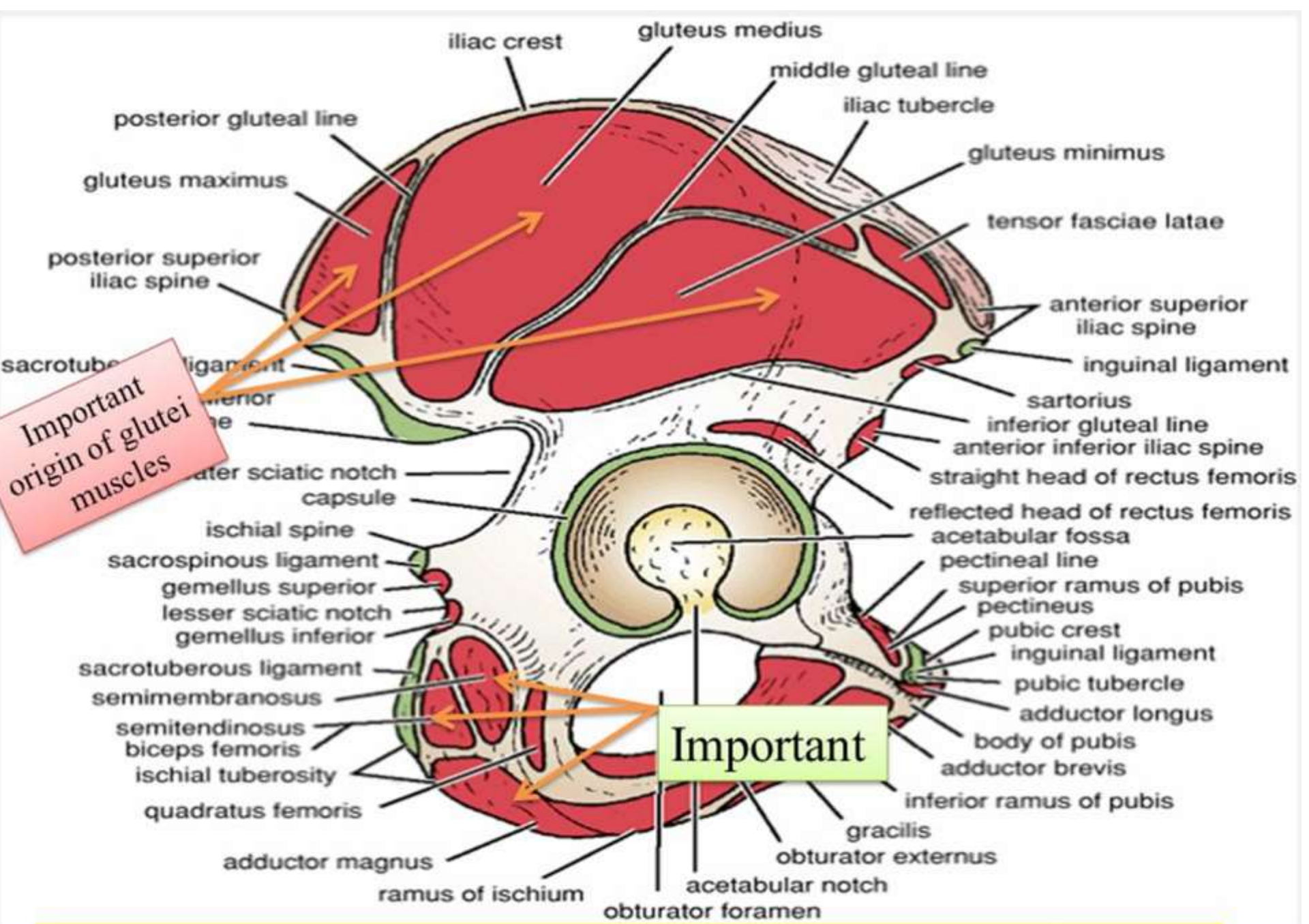
- GLUTEUS MAXIMUS}
- GLUTEUS MEDIUS}
- GLUTEUS MINIMUS} outer surface of the illium}
- ILIACUS
- TENSOR FASCIA LATA….ant sup iliac spine
- SARTORIUS…. ant sup iliac spine
- RECTUS FEMORIS…ant inf iliac spine
- PIRIFORMIS….gluteal surface of illium

MUSCLE ATTACHMENT ISCHIUM

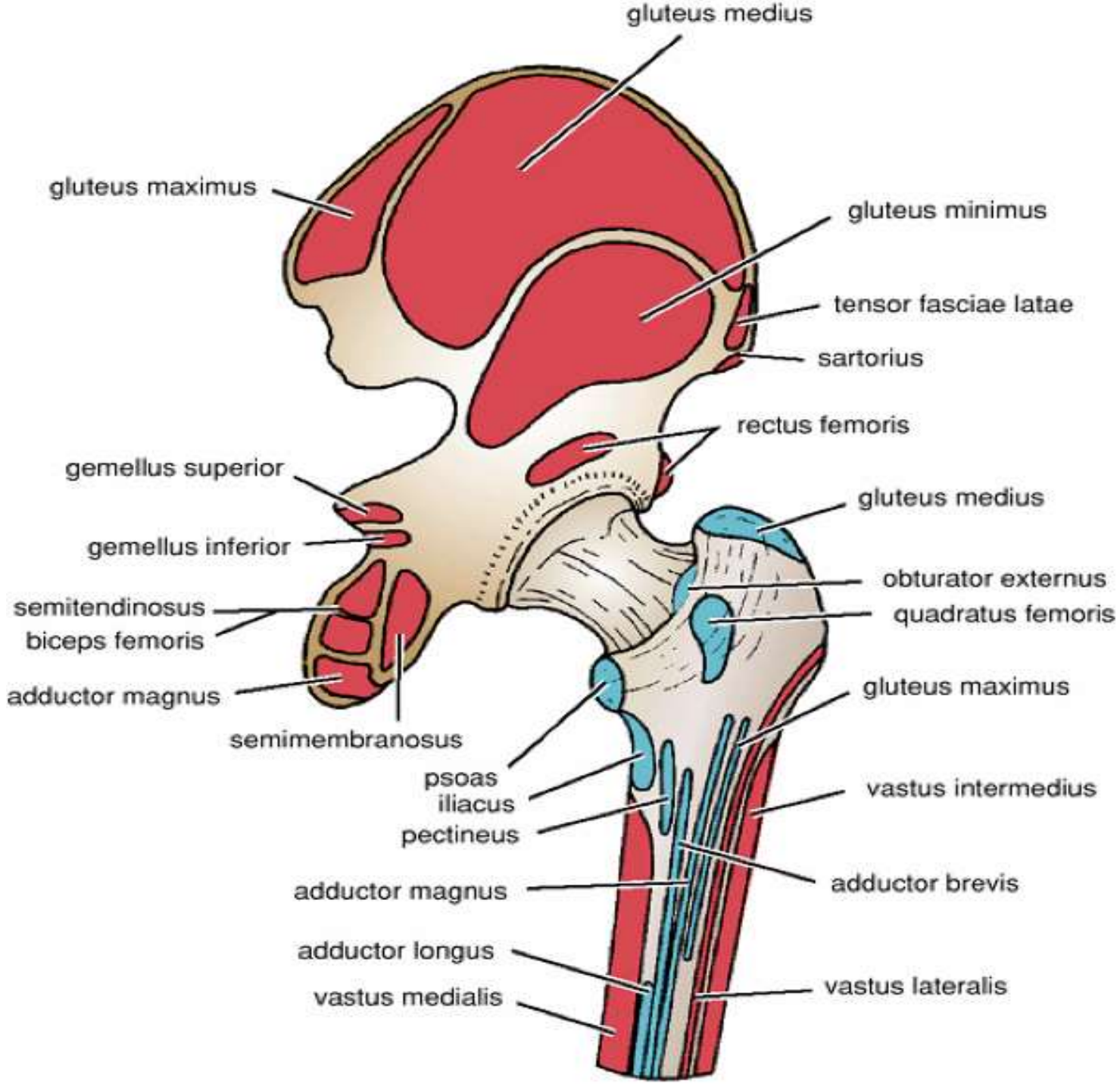
- SUPERIOR GEMELLI….ISCHIAL SPINE
- SEMITENDINOSUS…ISCHIAL TUBEROSITY
- BICEPS FEMORIS….ISCHIAL TUBEROSITY
- SEMIMEMBRANOSUS…. ISCHIAL TUBEROSITY
- QUADRATUS FEMORIS…. ISCHIAL TUBEROSITY
- ADDUCTOR MAGNUS(HAMSTRING PART)…ISCHIAL TUBEROSITY

MUSCLE ATTACHMENT (PUBIS)

- ADDUCTOR PART OF ADDUCTOR MAGNUS….INFERIOR PUBIC RAMUS
- ADDUCTOR BREVIS….INF PUBIC RAMUS AND BODY OF PUBIS BONE
- ADDUCTOR LONGUS….BODY OF PUBIS BONE
- GRACILLIS…INFERIOR RAMUS
- OBTURATOR EXTERNUS…OBT MEMB



Muscles and ligaments attached to the external surface of the right hip bone


gluteus medius
gluteus maximus
gluteus minimus
tensor fasciae latae
sartorius
rectus femoris
gemellus superior
gemellus inferior
semitendinosus
biceps femoris
adductor magnus
semimembranosus
gluteus medius
obturator externus
quadratus femoris
gluteus maximus
psoas
iliacus
pectineus
vastus intermedius
adductor magnus
adductor brevis
adductor longus
vastus medialis
vastus lateralis

CLINICAL ANATOMY

- Illiac crest is used for taking bone marrow biopsy in cases of leukemia or anemia.

- Weavers bottom…..person sitting for longer time gets inflammation of ischial tuberosity bursa…

Clinical - Pubic Rami Fractures

- Pubic rami fractures can sometimes be observed on x-rays in elderly patients who are investigated after simple low energy falls from standing height. In this context and provided they are the only injury a patient has sustained, these fractures are usually treated without surgery.

- Healing can be expected within 6-8 weeks and patients are encouraged to fully weight bear straightaway.

PELVIC FRACTURES

- **Low energy injuries..**Example, a simple fall from standing height in an osteoporotic patient resulting in pubic rami fracture.
- These are usually ‘stable’ injuries, not requiring surgery.
- **High energy injuries** with direct or transmitted trauma:
- For example, after a high speed road traffic accident. These result in more extensive fractures which may include the acetabulum and sacroiliac joint.
- These can be ‘unstable’ injuries and may require urgent surgery.
- Higher energy injuries can be associated with soft tissue and vascular injury. In particular, the bladder and urethra are at high risk of damage. Vascular injury can result in life threatening haemorrhage


Thank
you!