The Hips Don't Lie:

Assessment and Treatment of Pelvic Injuries

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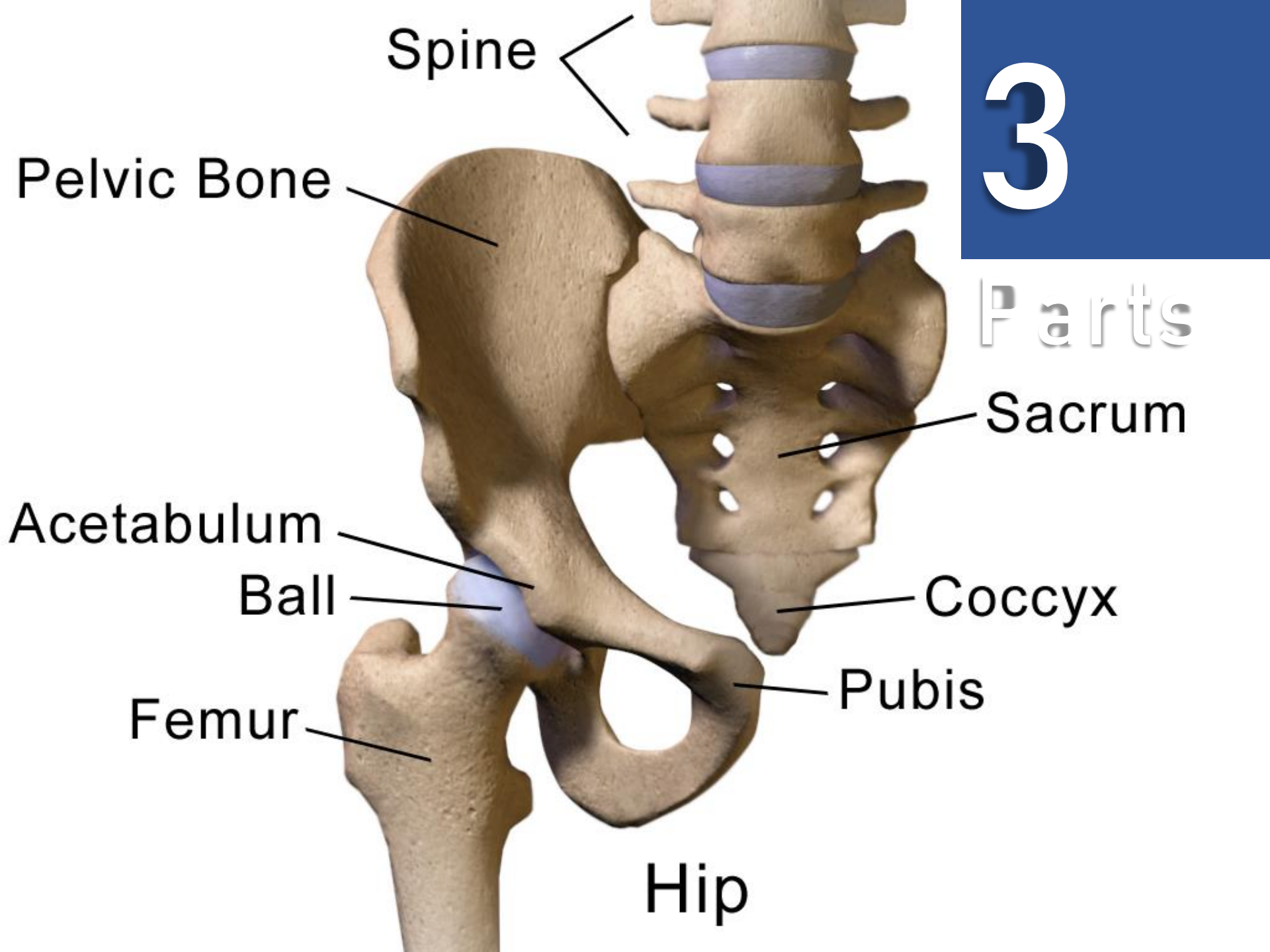
The pelvis is a ring

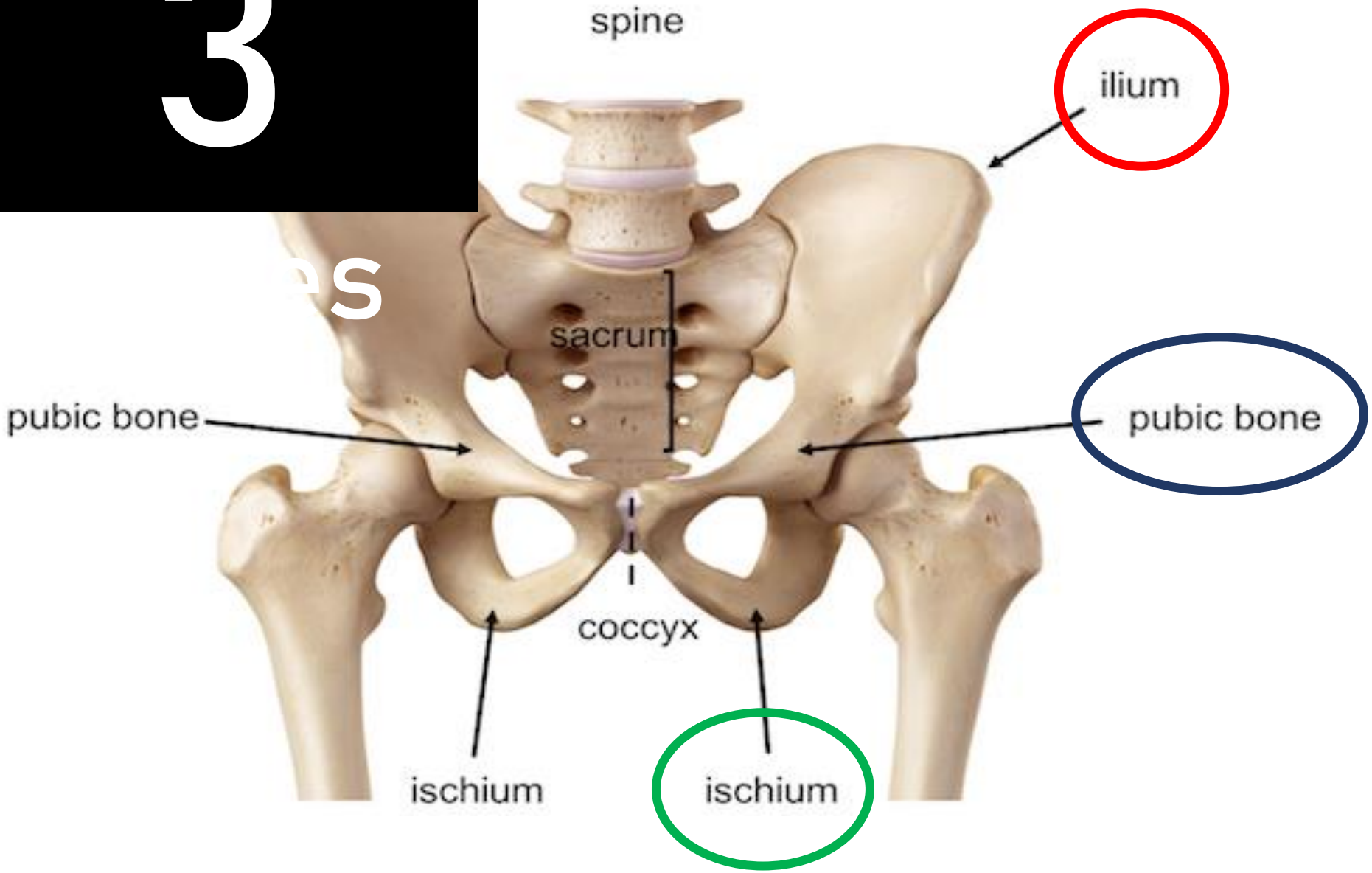
amphiarthrotic

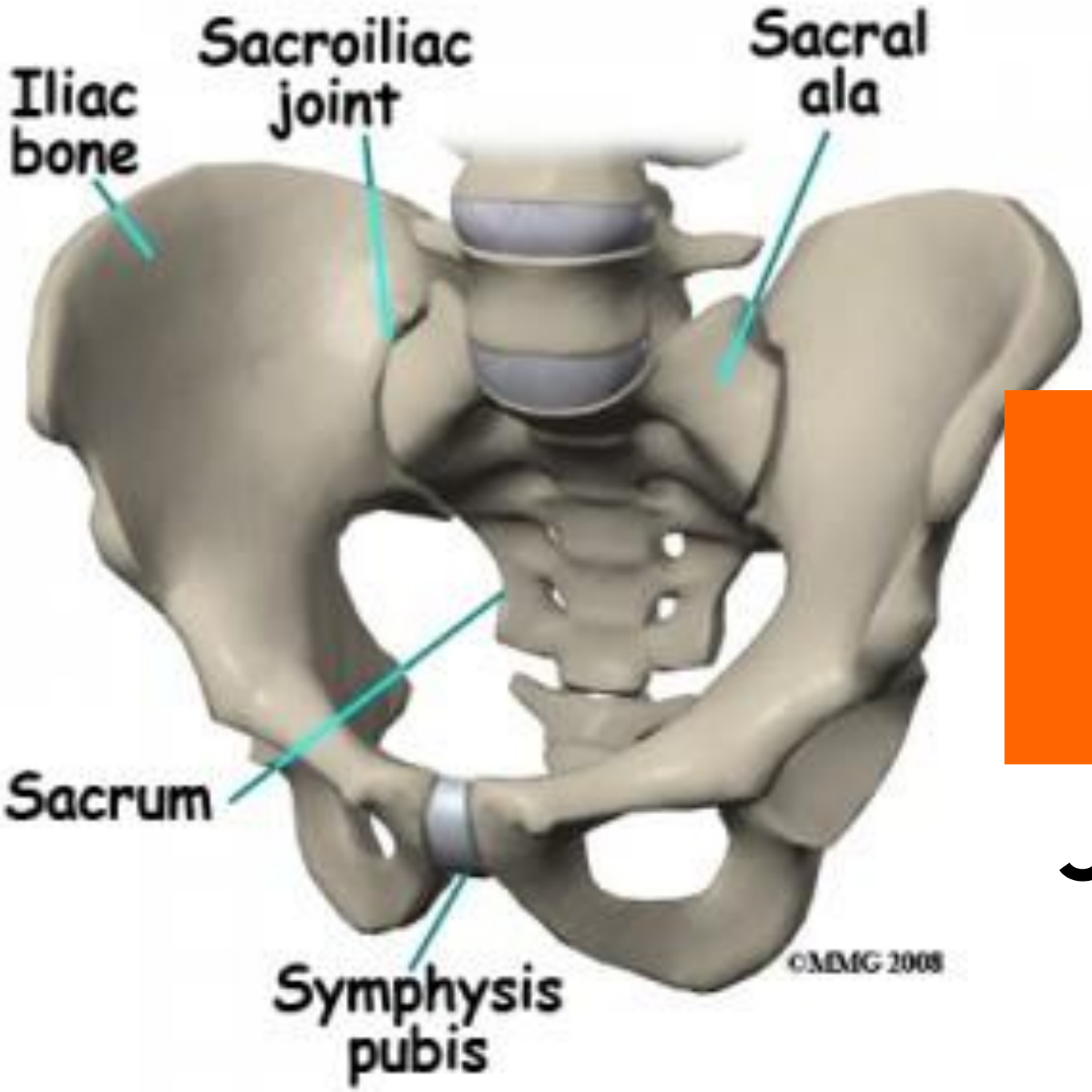

Spine
Pelvic Bone
Acetabulum
Ball
Femur
Sacrum
Coccyx
Pubis
Hip

3

Parts

3

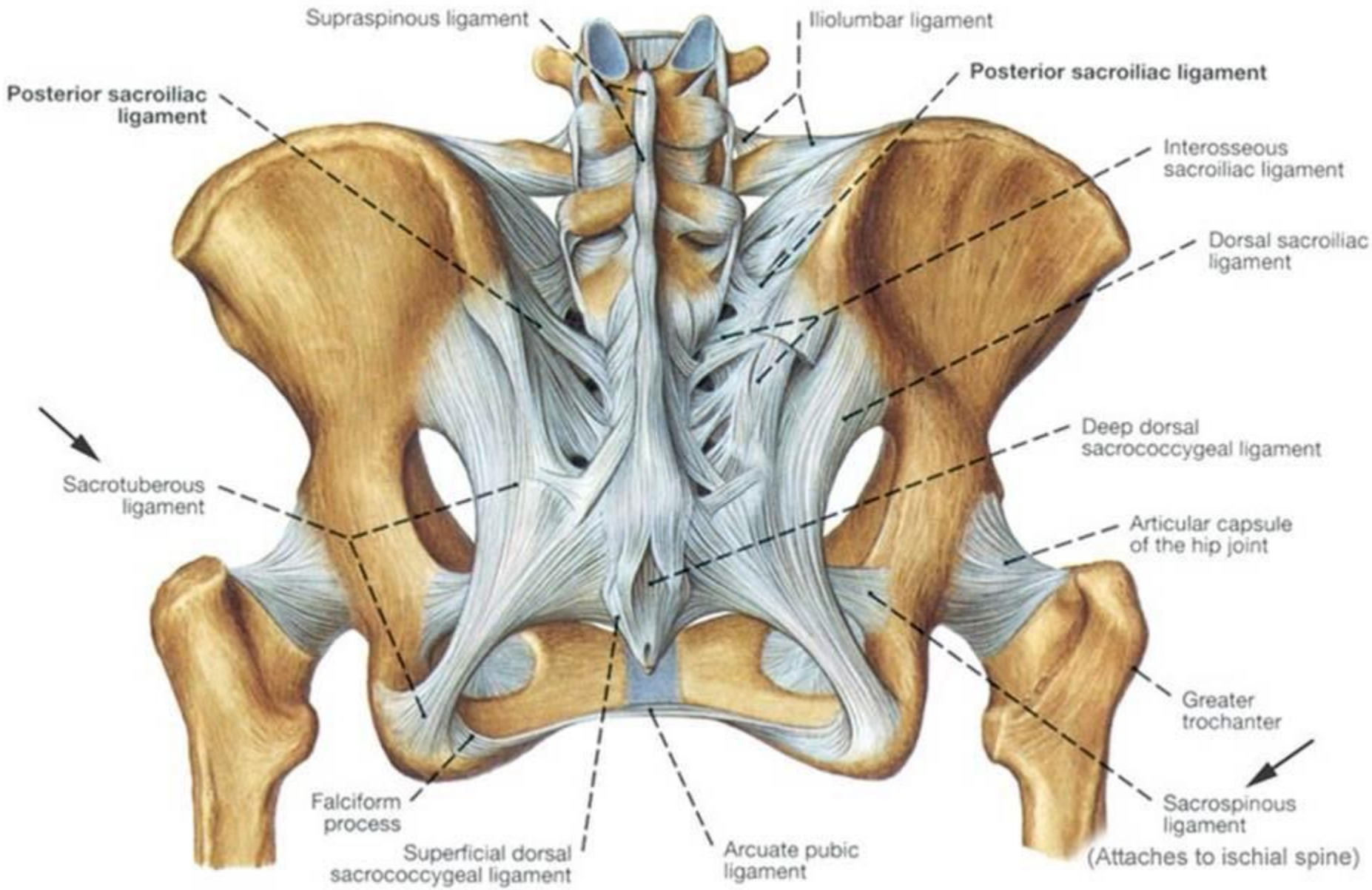

spine
ilium
sacrum
pubic bone
pubic bone
coccyx
ischium
ischium

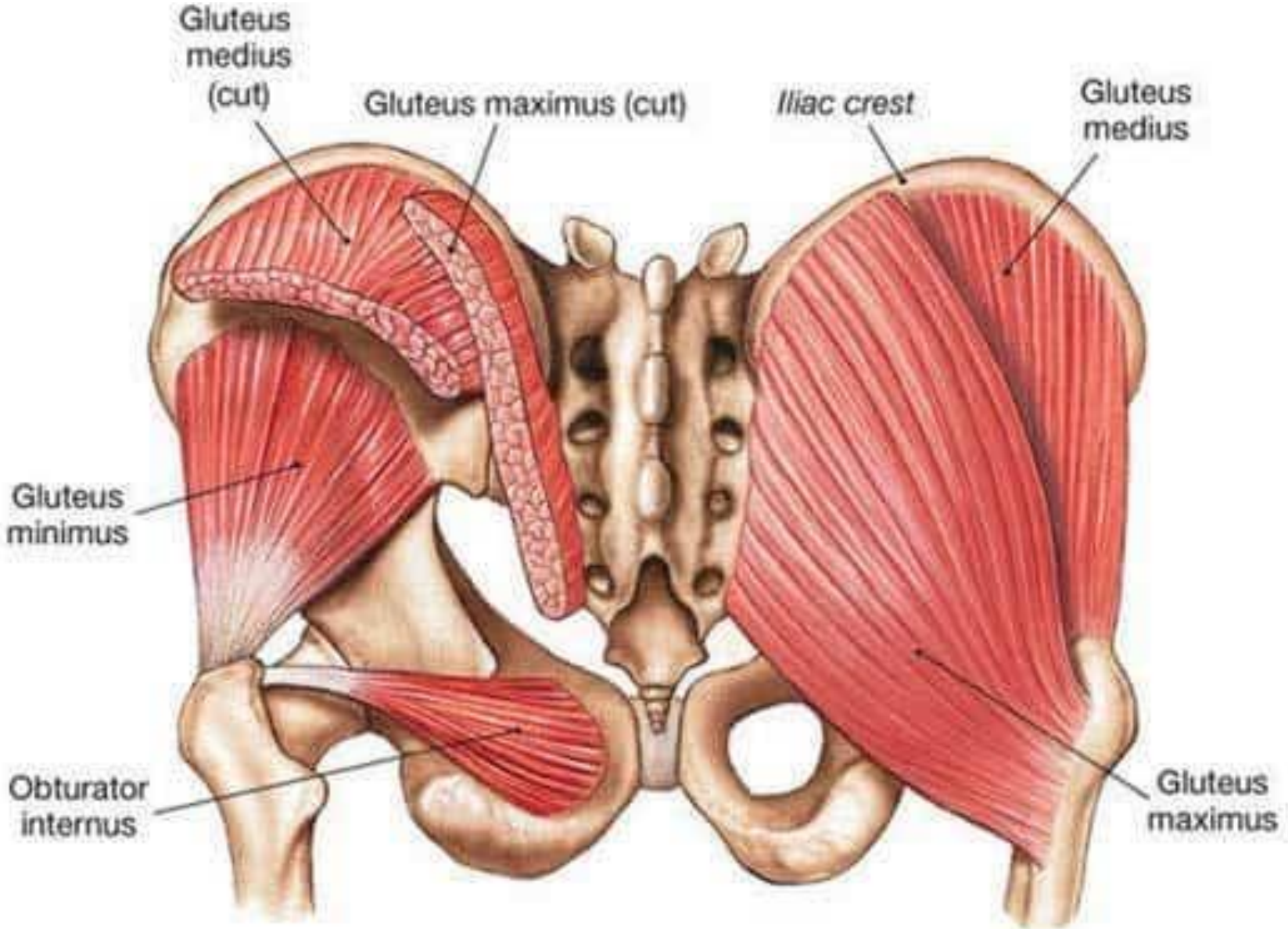

Iliac bone
Sacroiliac joint
Sacral ala
Sacrum
Symphysis pubis
©MMG 2008

3

Joints


ESPNMNF
NFL

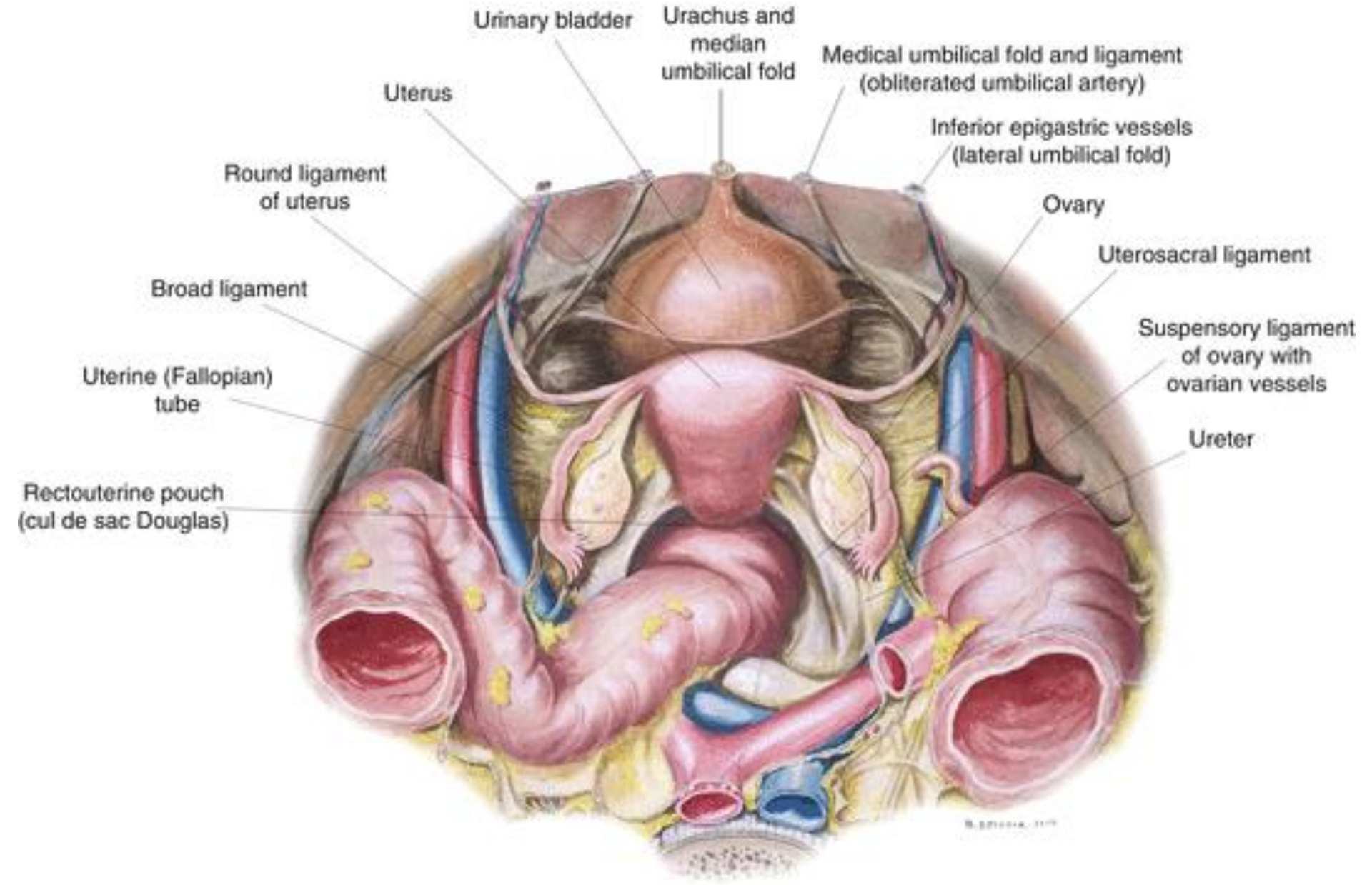

Supraspinous ligament
Iliolumbar ligament
Posterior sacroiliac ligament
Posterior sacroiliac ligament
Interosseous sacroiliac ligament
Dorsal sacroiliac ligament
Deep dorsal sacrococcygeal ligament
Sacrotuberous ligament
Articular capsule of the hip joint
Greater trochanter
Sacrospinous ligament
(Attaches to ischial spine)
Falciform process
Superficial dorsal sacrococcygeal ligament
Arcuate pubic ligament

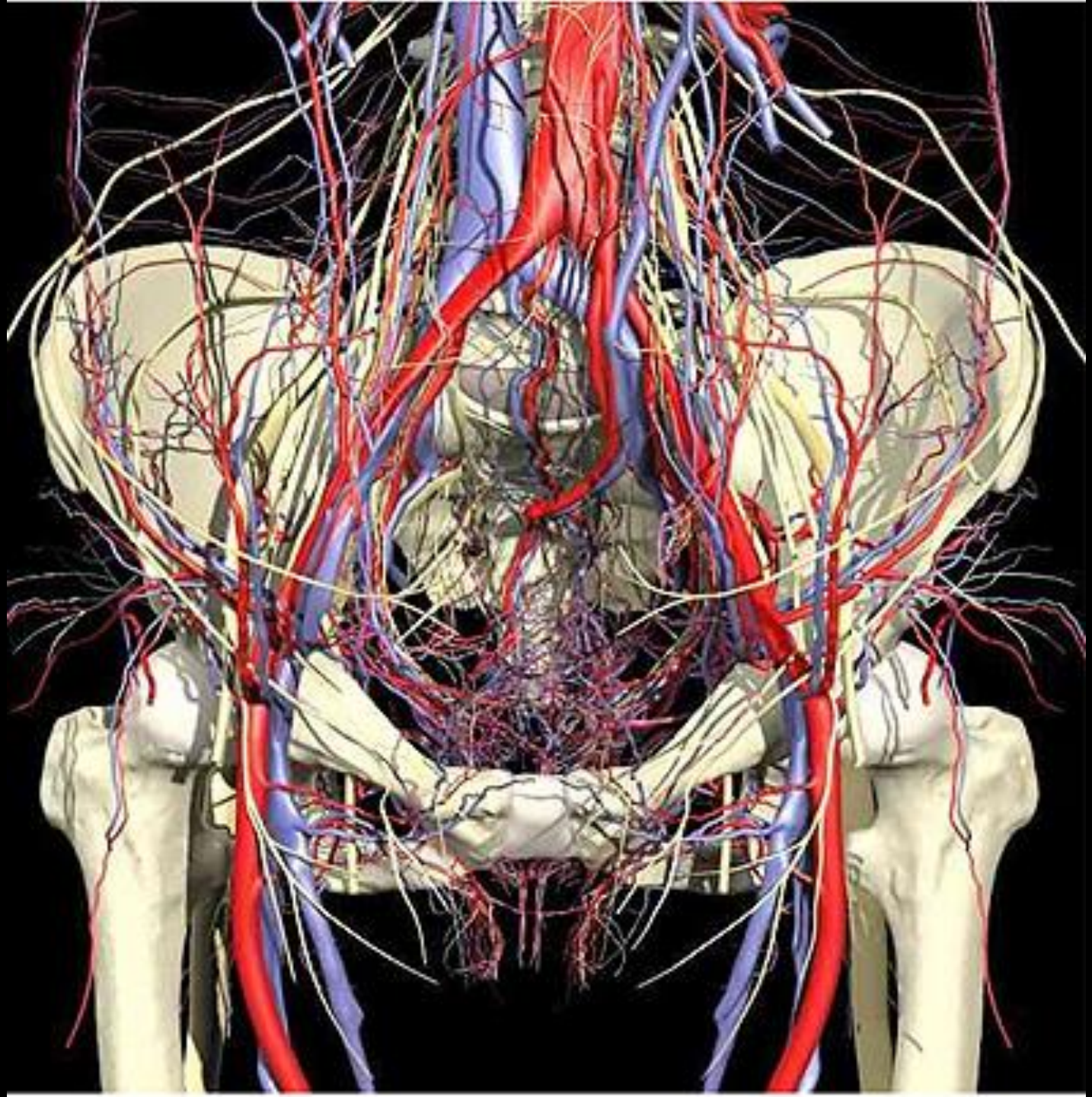


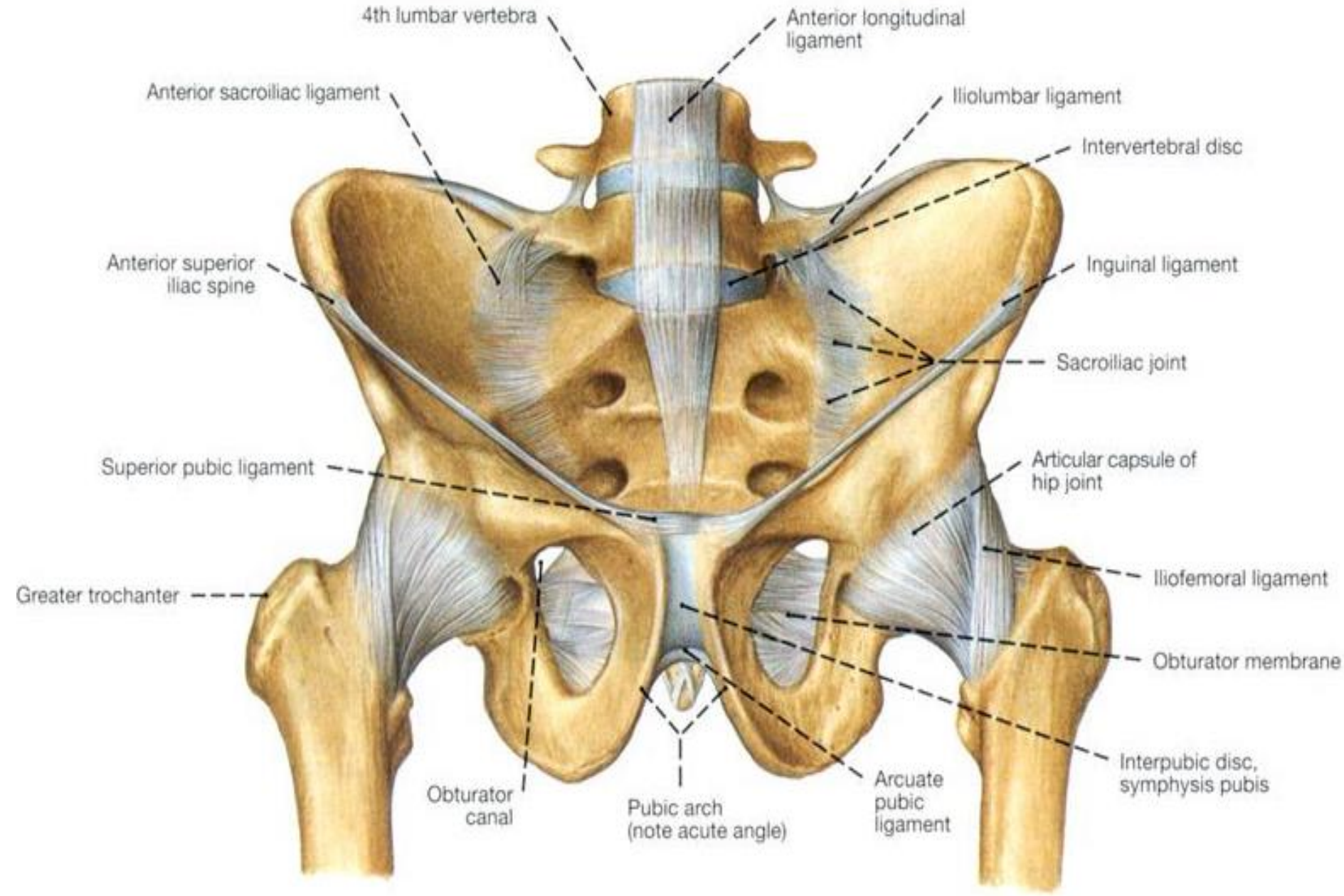
Gluteal and lateral rotators, posterior view

http://www.aast.org/pelvis-injuries

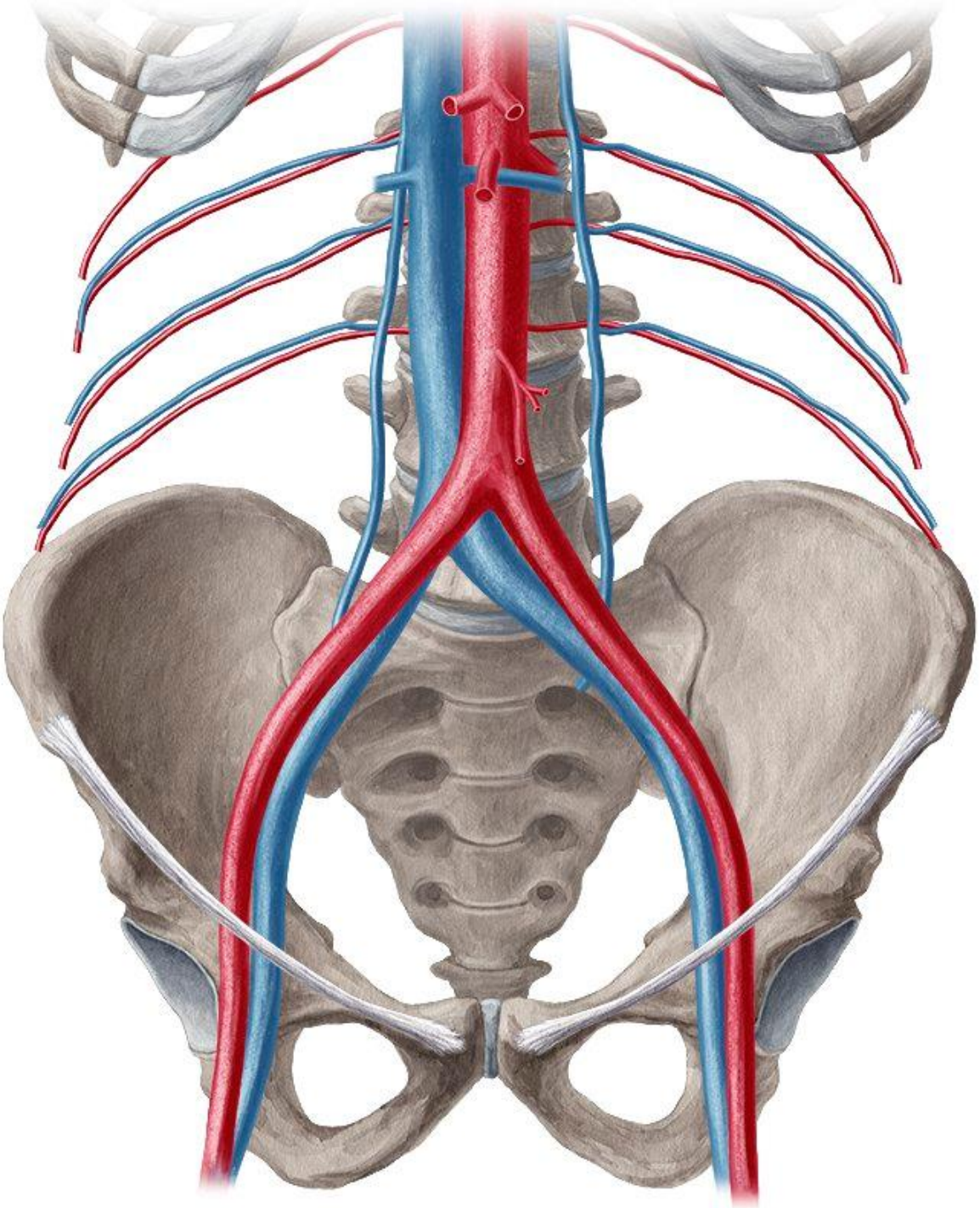
So?


Urinary bladder
Urachus and median umbilical fold
Medical umbilical fold and ligament (obliterated umbilical artery)
Uterus
Inferior epigastric vessels (lateral umbilical fold)
Round ligament of uterus
Ovary
Uterosacral ligament
Broad ligament
Suspensory ligament of ovary with ovarian vessels
Uterine (Fallopian) tube
Ureter
Rectouterine pouch (cul de sac Douglas)


Iliac
Gluteal
Obturator
Vesical


4th lumbar vertebra
Anterior longitudinal ligament
Anterior sacroiliac ligament
Iliolumbar ligament
Intervertebral disc
Anterior superior iliac spine
Inguinal ligament
Sacroiliac joint
Superior pubic ligament
Articular capsule of hip joint
Iliofemoral ligament
Greater trochanter
Obturator membrane
Interpubic disc, symphysis pubis
Arcuate pubic ligament
Obturator canal
Pubic arch (note acute angle)

inguinal

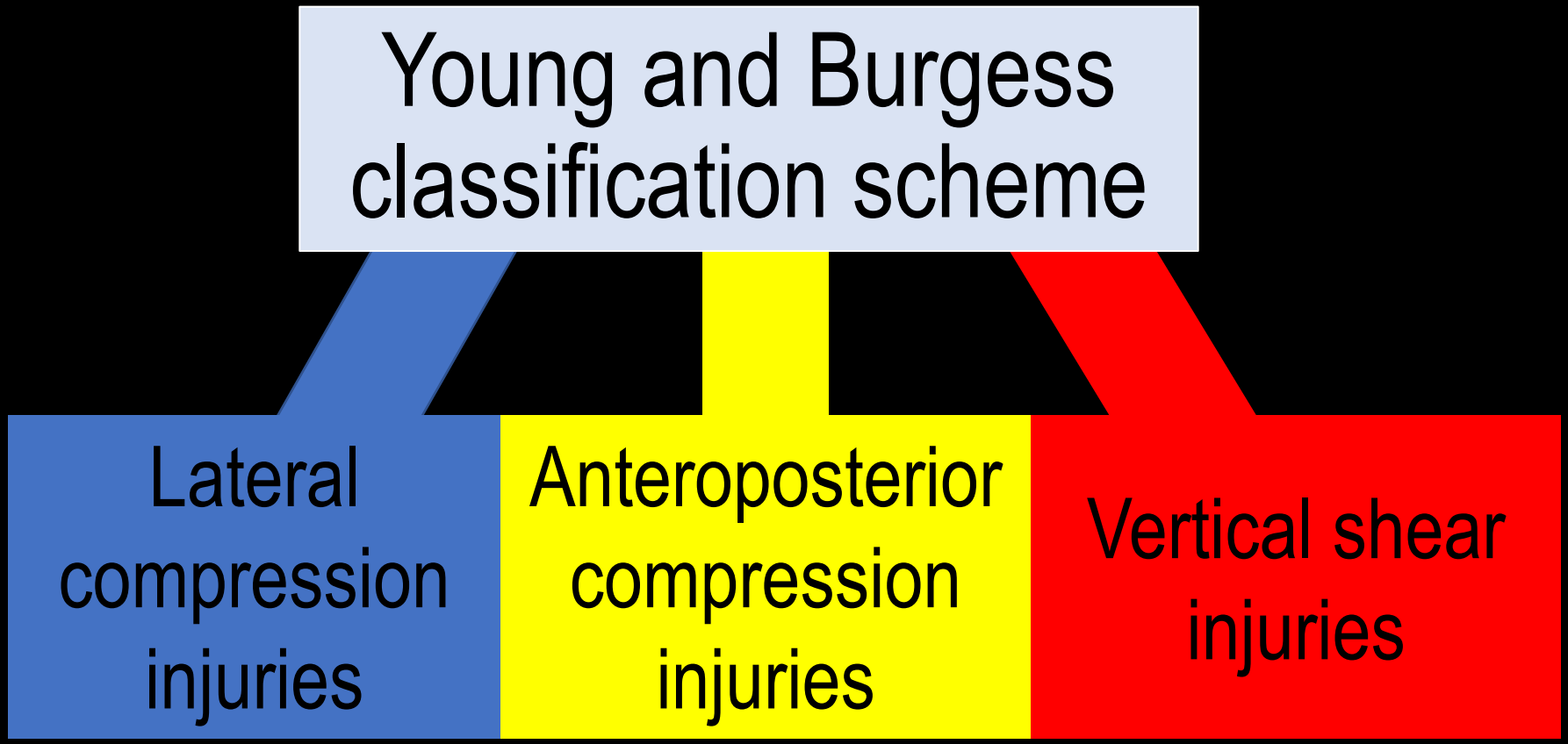


20% result in hemodynamic instability

33% of will require blood transfusions

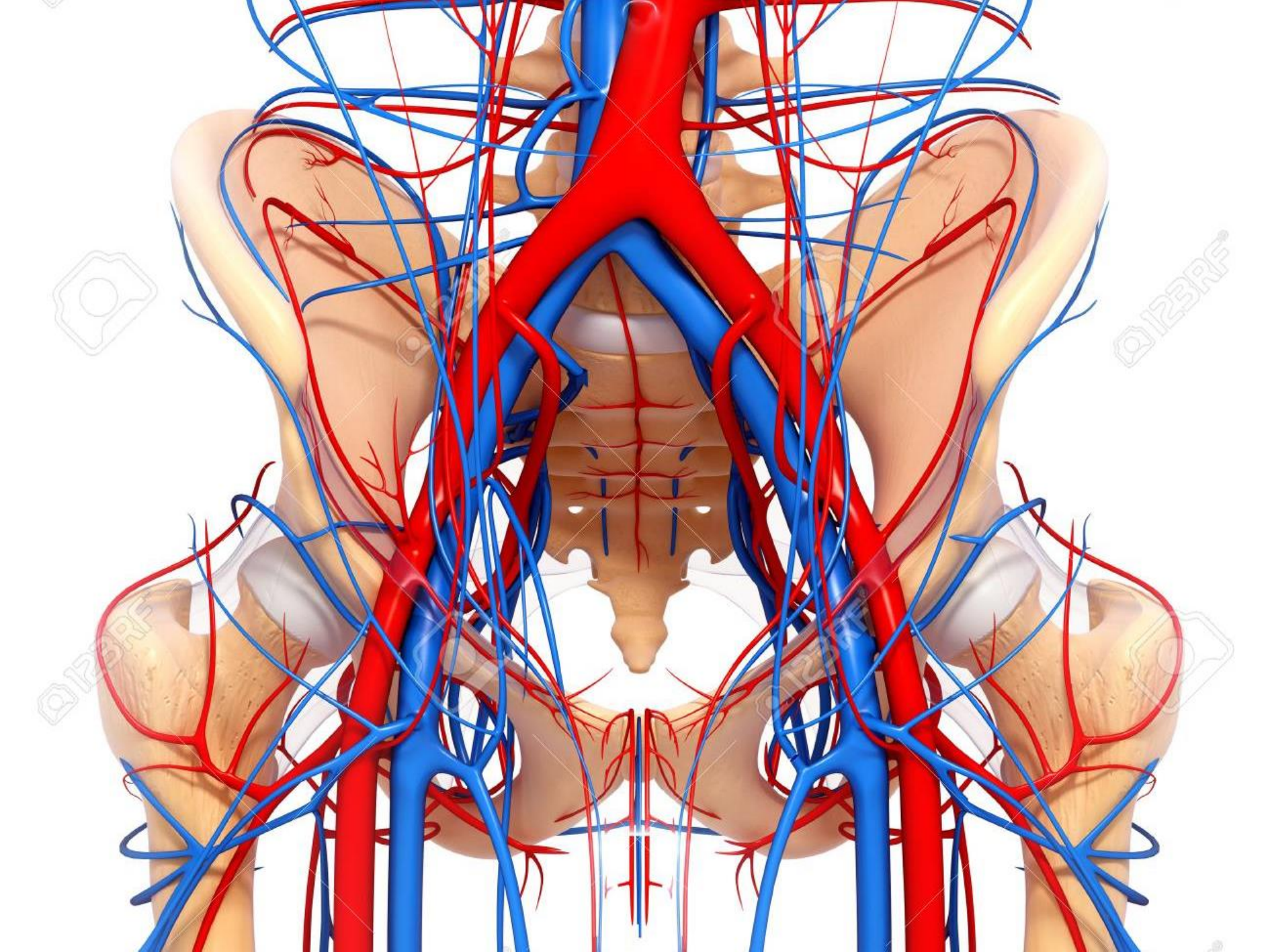
Dente C, Feliciano D, Rozycki G, et al. (2005). The outcome of open pelvic fractures in the modern era. Am J Surg. 190(6):830–835.

Fiechti J, Gibbs M. (2010). An evidence-based approach to managing injuries of the pelvis and hip in the emergency department. Em. Med. Practice. 12(12):1–24.



Burgess A, Eastridge B, Young J, et al. (1990). Pelvic ring disruptions: Effective classification system and treatment protocols. J Trauma. 30(7):848–856.
Fiechti J, Gibbs M. (2010). An evidence-based approach to managing injuries of the pelvis and hip in the emergency department. Emergency Medicine Practice. 12(12):1–24.


SUPINE
R
76



So how do you know?

Abdomen/pelvis**

-Inspects and palpates abdomen (1 point) -Assesses pelvis (1 point)

-Verbalizes assessment of genitalia/perineum as needed (1 point)


Stop Rocking!

IT DOESN'T WORK.

This technique has proved to be very unreliable, detecting only the most severe pelvic disruptions.

Shlamovitz G, Mower W, Bergman J, et al. (2009). How (un)useful is the pelvic ring stability examination in diagnosing mechanically unstable pelvic fractures in blunt trauma patients? J Trauma. 66(3):815–820.

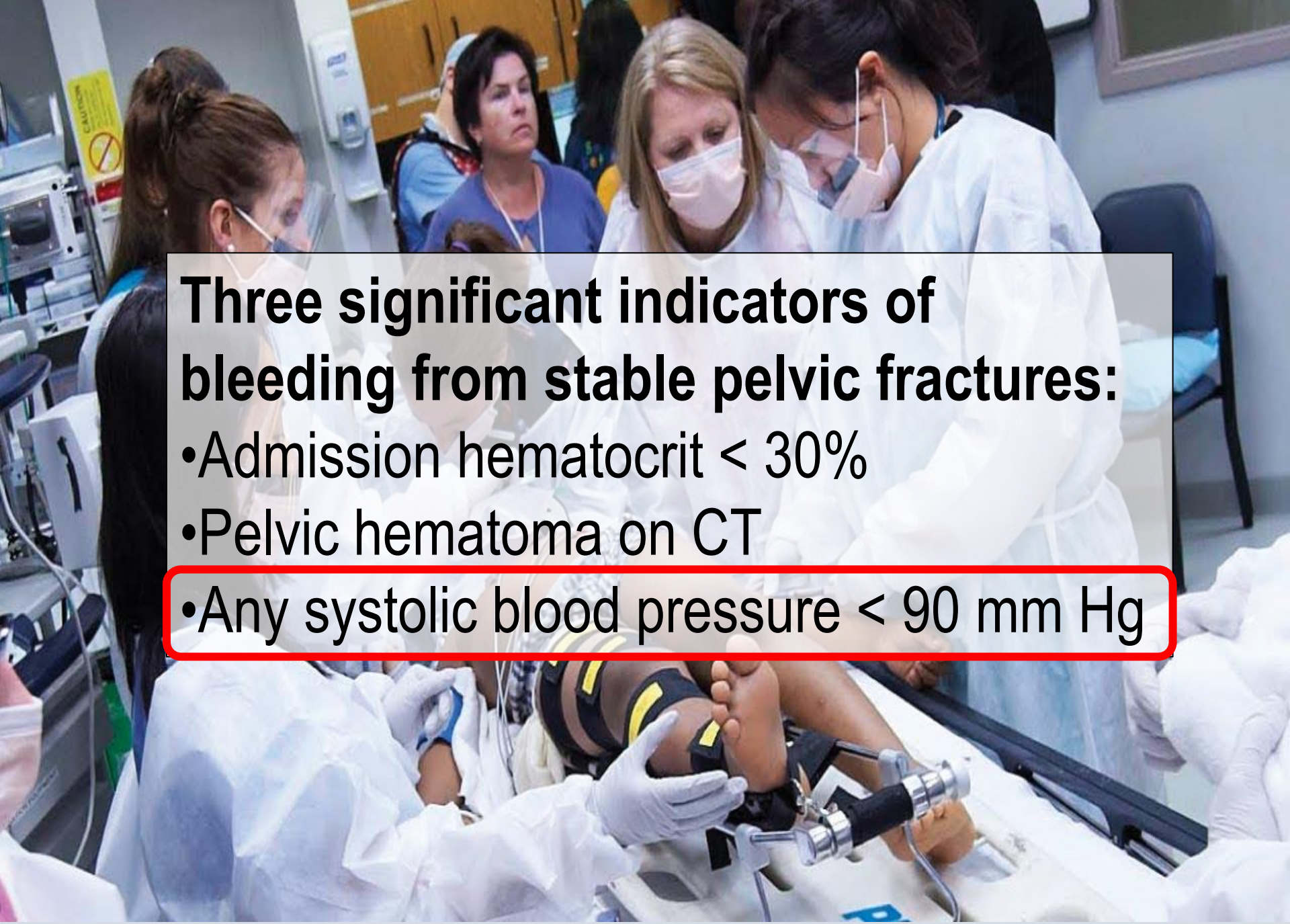
IT WORSENS THE INJURY.

This maneuver may be dangerous to the patient by further displacing fracture fragments and dislodging formed blood clots, resulting in worsening hemorrhage.

White C, Hsu J, Holcomb J. (2009). Haemodynamically unstable pelvic fractures. Injury. 40(10):1023–1030.

Shlamovitz G, Mower W, Bergman J, et al. (2009). How (un)useful is the pelvic ring stability examination in diagnosing mechanically unstable pelvic fractures in blunt trauma patients? J Trauma. 66(3):815–820.


Pain is the most
common finding



Three significant indicators of bleeding from stable pelvic fractures:

- Admission hematocrit < 30%
- Pelvic hematoma on CT
- Any systolic blood pressure < 90 mm Hg

Bramos A, Velmahos G, Butt U. (2010). Predictors of bleeding from stable pelvic fractures. Arch Surg 146(4):407-411.

Other assessment findings:

- Incontinence
- Bruising over the flank, bony prominences of the pelvis, pubis, perineum or scrotum
- Rectal and or vaginal bleeding

Bjurlin M, Fantus R, Mellett M, et al. (2009). Genitourinary injuries in pelvic fracture morbidity and mortality using the National Trauma Bank. J Trauma. 67(5):1033.

What to do about it?

- Rapid, appropriate transport
- Treat for shock
- ALS


Stop Rolling!
PRO LITE

The additional weight and lateral compression of log rolling on an unstable pelvic ring injury may cause fracture fragment movement, disrupt internal blood clots, and worsen further bleeding.

Scott I, Porter K, Laird C, et al. (2013). The prehospital management of pelvic fractures: Initial consensus statement. Emerg Med J. 30(12):1070–1072.

Lee C, Porter K. The prehospital management of pelvic fractures. Emerg Med J. 2007;24(2):130–133.

Scott I, Porter K, Laird C, et al. (2013).The prehospital management of pelvic fractures: Initial consensus statement. Emerg Med J. 30(12):1070–1072.

What about pelvic binding?

This technique is often difficult to consistently reproduce, requires multiple providers to accomplish, and frequently doesn't achieve or maintain the necessary reduction force.

Simpson T, Krieg J, Heuer F, et al. (2002). Stabilization of pelvic ring disruptions with a circumferential sheet. J Trauma. 52(1):158–161.


A
B

Which one is better?

Spanjersberg W, Knops S, Schep N, et al. (2009). Effectiveness and complications of pelvic circumferential compression devices in patients with unstable pelvic fractures: A systematic review of literature. Int. J Care Injured.40(10):1031–1035.

Knops S, Schep N, Spoor C. (2011). Comparison of three different pelvic circumferential compression devices: a biomechanical cadaver study. J Bone Joint Surg Am. 93(3):230-40.

Knops, S, Van Lieshout, E, Spanjersberg W, et al. (2011). Randomised clinical trial comparing pressure characteristics of pelvic circumferential compression devices in healthy volunteers. Injury. 42(10):1020-6.

Case series and some clinical studies report improved hemodynamics after pelvic binding along with a decreased need for blood transfusions, but no high-quality study has demonstrated a clear, statistically significant decrease in patient mortality

Stewart M. (2013). Towards evidence-based emergency medicine: Best BETs from the Manchester Royal Infirmary. BET3: Pelvic circumferential compression devices for hemorrhage control: Panacea or myth? Emerg Med J. 30(5):425–426.
Cullinane D, Schiller H, Zielinski M, et al. (2001). Eastern Association for the Surgery of Trauma practice management guidelines for hemorrhage in pelvic fracture—update and systematic review. J Trauma. 71(6):1850–1868.

Goal is to stabilize jagged bone ends and decrease pelvic volume.

(tamponade bleeding)

White C, Hsu J, Holcomb J. (2009). Haemodynamically unstable pelvic fractures. Injury. 40(10):1023–1030.
Scott I, Porter K, Laird C, et al. (2013). The prehospital management of pelvic fractures: Initial consensus statement. Emerg Med J. 30(12):1070–1072.

Binding is treatment, not packaging

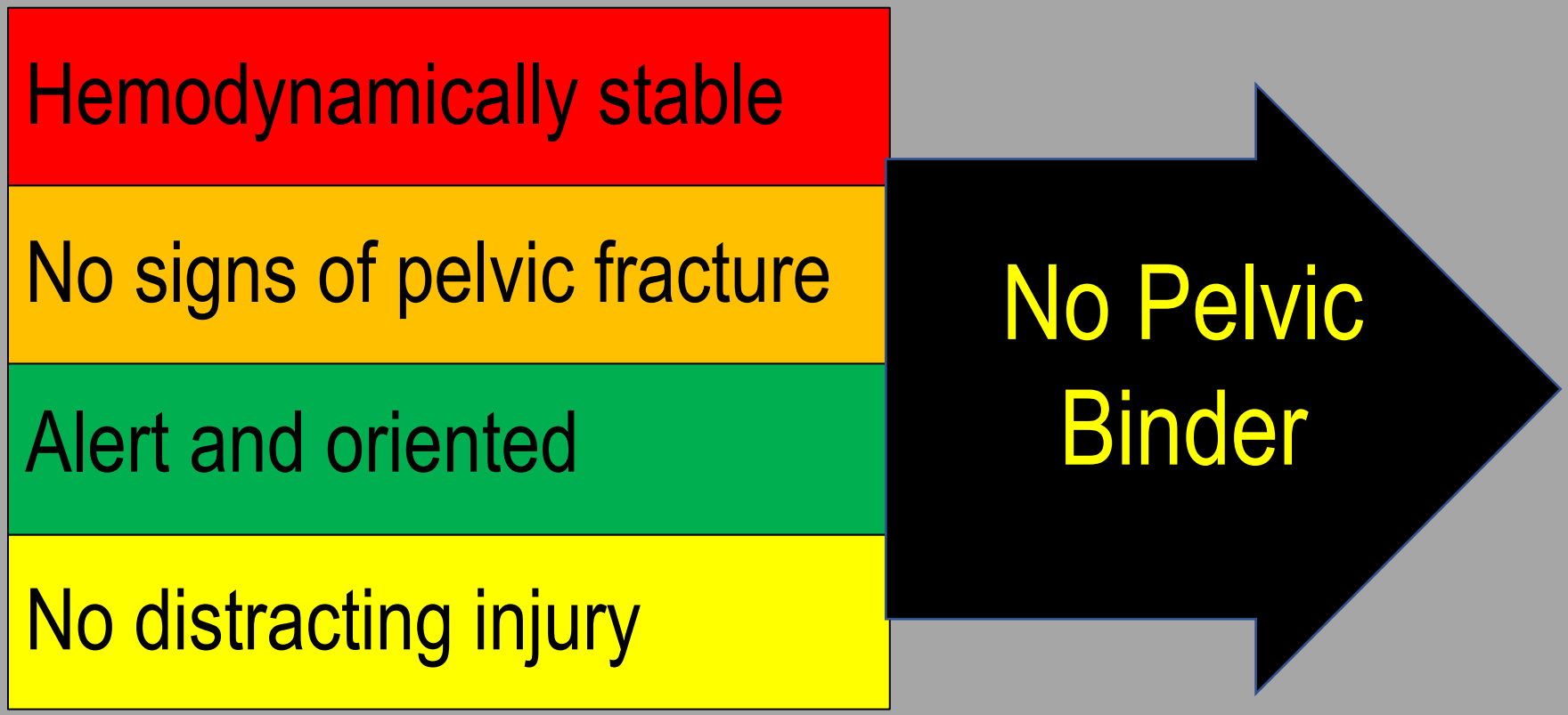
White C, Hsu J, Holcomb J. (2009). Haemodynamically unstable pelvic fractures. Injury. 40(10):1023–1030.
Scott I, Porter K, Laird C, et al. (2013). The prehospital management of pelvic fractures: Initial consensus statement. Emerg Med J. 30(12):1070–1072.

But should we bind everyone?

Bind them all and let God sort them out...

Lee C, Porter K. (2007). The prehospital management of pelvic fractures. Emerg Med J. 24(2):130–133.

Mackersie R, Shackford S, Garfin S, et al. (1988). Major skeletal injuries in the obtunded trauma patient: A case for routine radiological survey. J Trauma. 28(10):1450–1454.



Lee C, Porter K. (2007). The prehospital management of pelvic fractures. Emerg Med J. 24(2):130–133.
Civil I, Ross S, Botehlo G, et al. (1988). Routine pelvic radiography in severe blunt trauma: Is it necessary? Ann Emerg Med.17(5):488–490.

Obvious signs injury/instability

Signs of shock and pelvic or low back pain/tenderness (even if the pelvis seems stable)

Signs of shock and AMS (regardless of presence or absence of pain or instability)

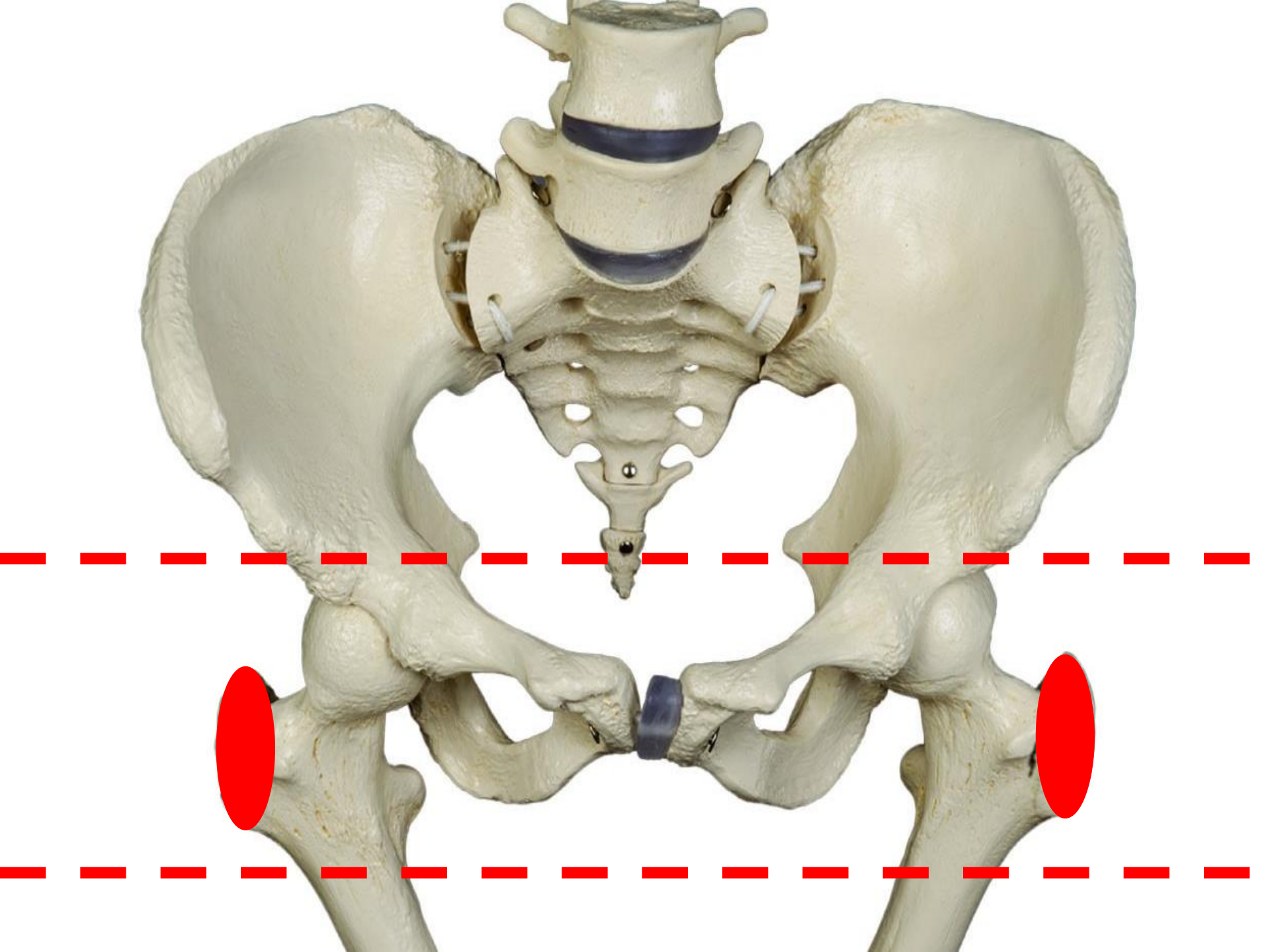
Yes Pelvic Binder

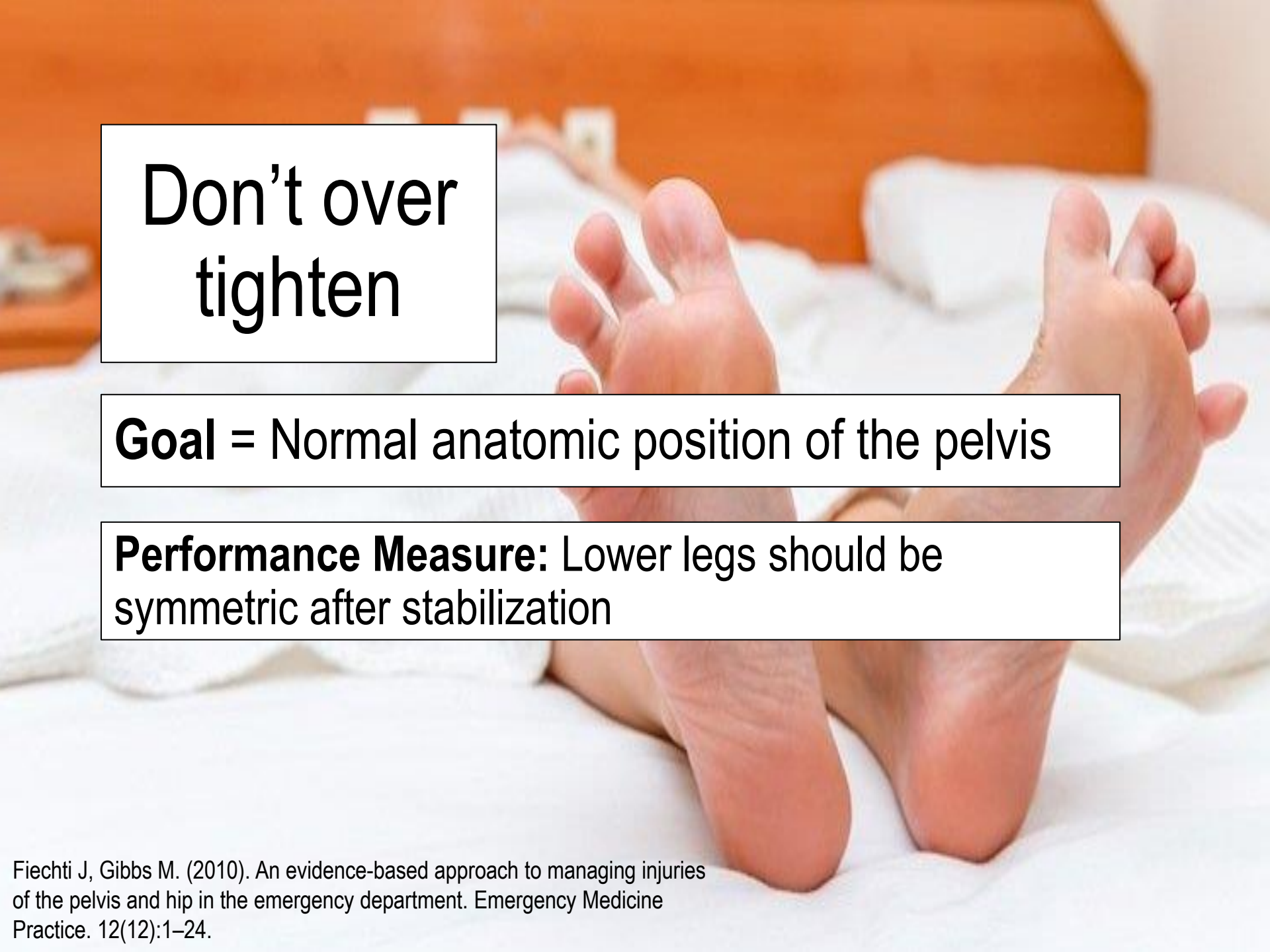
Cullinane D, Schiller H, Zielinski M, et al. (2001). Eastern Association for the Surgery of Trauma practice management guidelines for hemorrhage in pelvic fracture—update and systematic review. J Trauma. 71(6):1850–1868.

Gerecht, R, Larrimore, A, Steuerwald, M. (2014). Critical Management of Deadly Pelvic Injuries. J of EMS. https://www.jems.com/articles/print/volume-39/issue-12/features/critical-management-deadly-pelvic-injuri.html. Accessed Oct 2018.

Place them correctly

Bonner T, Eardley W, Newell N, et al. (2011). Accurate placement of a pelvic binder improves reduction of unstable fractures of the pelvic ring. J Bone Joint Surg Br. 93(11):1524–1528.





Don’t over tighten

Goal = Normal anatomic position of the pelvis

Performance Measure: Lower legs should be symmetric after stabilization

Fiechti J, Gibbs M. (2010). An evidence-based approach to managing injuries of the pelvis and hip in the emergency department. Emergency Medicine Practice. 12(12):1–24.

Place pelvic binder prior to extrication and movement.

Other Treatment Considerations:

- Manage associated femur fractures
- Treat for shock.
- Pain management (early and often)

So what have we learned here?

Questions?

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