SCALPEL
MANCHESTER MEDICS SURGICAL SOCIETY

Paediatric Orthopaedics

Scalpel Surgical Teaching Series

Trauma & Orthopaedics: Session 4

8 October 2020

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What Will Be Provided

- Assessment – Pre-Module
- Case 1
- Case 2
- Case 3
- Case 4
- Assessment – Post-Module

What You Will Need

Pen/keyboard

Paper/word document

Thinking cap

Session Info

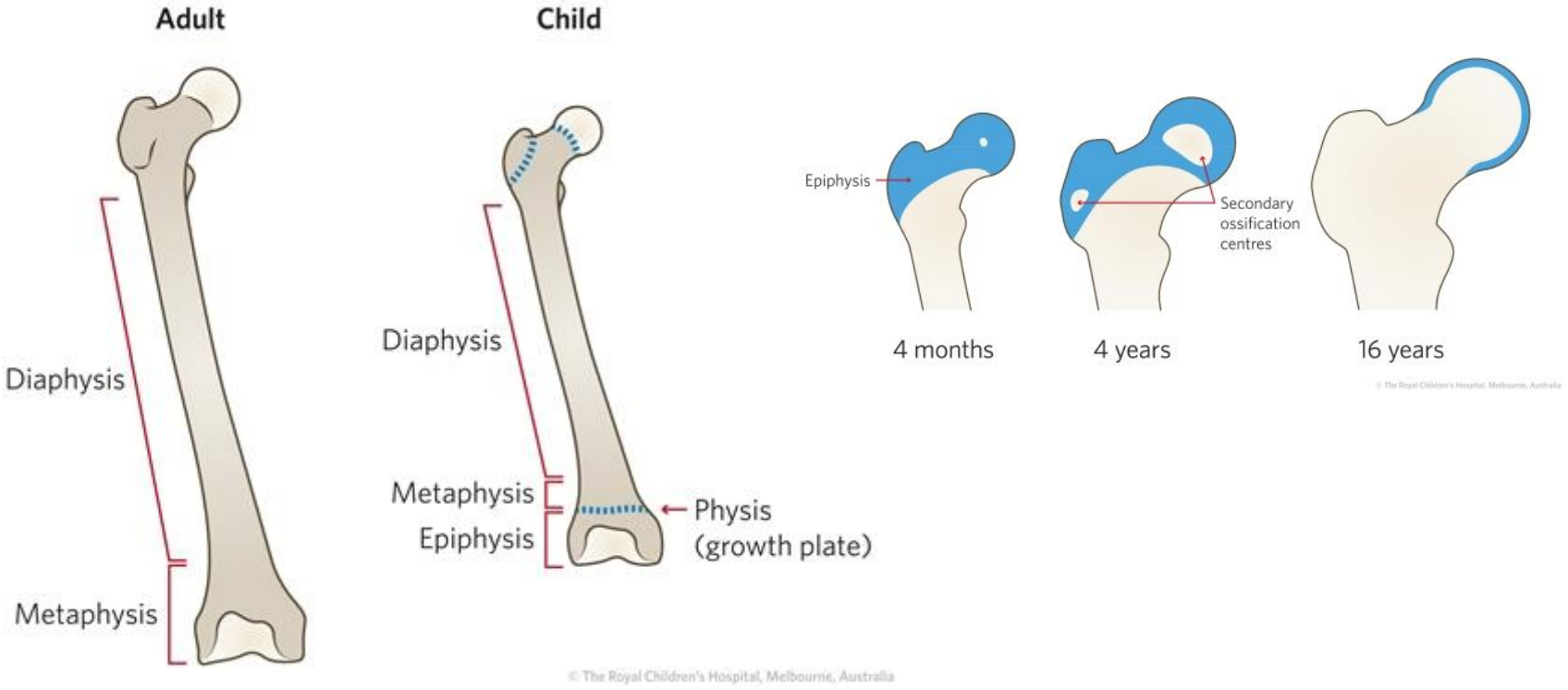
- Post questions throughout
- Slides will be available
- Recording will be available
- Use MCQs for active recall

Pre-Module Assessment
2.5 Min

Phase 1
Basic Science

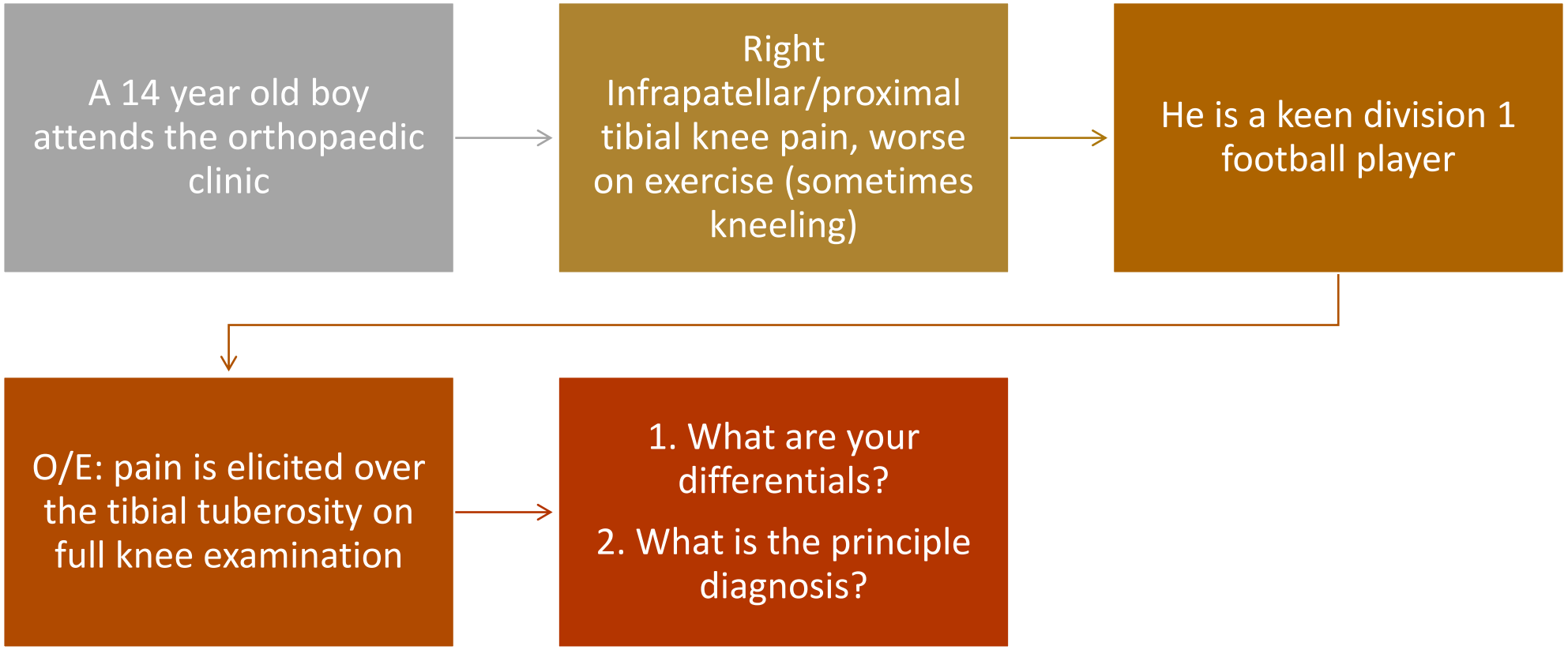
Anatomy

- Paediatric bone is different to adult bone
- Shorter
- More cartilage
- Epiphysis
- Physis
- Metaphysis
- Diaphysis



Phase 2
Clinical Knowledge

Case 1 | Doctor, my knee hurts



Case 1 | Doctor, my knee hurts

Ddx

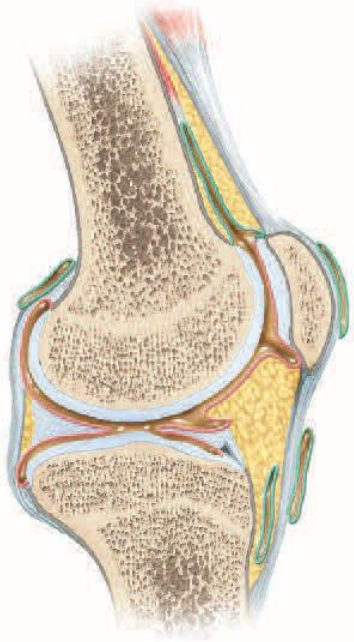
	Osgood-Schlatter	Sinding-Larsen-Johannson	Osteochondritis Dissecans
Aetiology	Extensor stress injury causing osteochondrosis or traction apophysitis of **tibial tubercle**	Extensor stress injury causing traction apophysitis at inferior pole of proximal patellar tendon	Pathological process causing separation of osteochondral fragment
Epidemiology	Boys>girls Boys 12-15 years, girls 8-12 years	Adolescence	Juvenile and adult (10-40) Male>female Affects knee, capitulum, talus
Clinical px	Pain on anterior aspect of knee	Pain on anterior aspect of knee associated with activity	Pain, joint locking, effusions Wilson's test
Investigations	Lateral knee XR	Blazina classification AP and lateral knee XR	Clanton classification XR + MRI
Management	Conservative Operative for ossicle excision	Conservative Operative for debridement of damaged tissue only	Restricted weight bearing + bracing Arthroscopy, K-wire Juvenile best prognosis

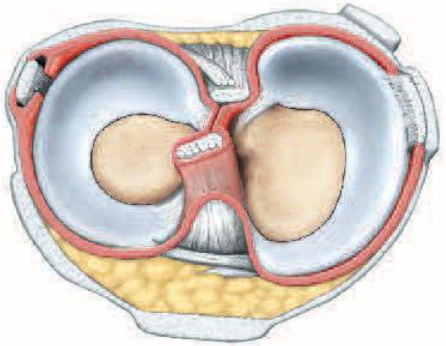
Tibial Tubercle Apophysitis

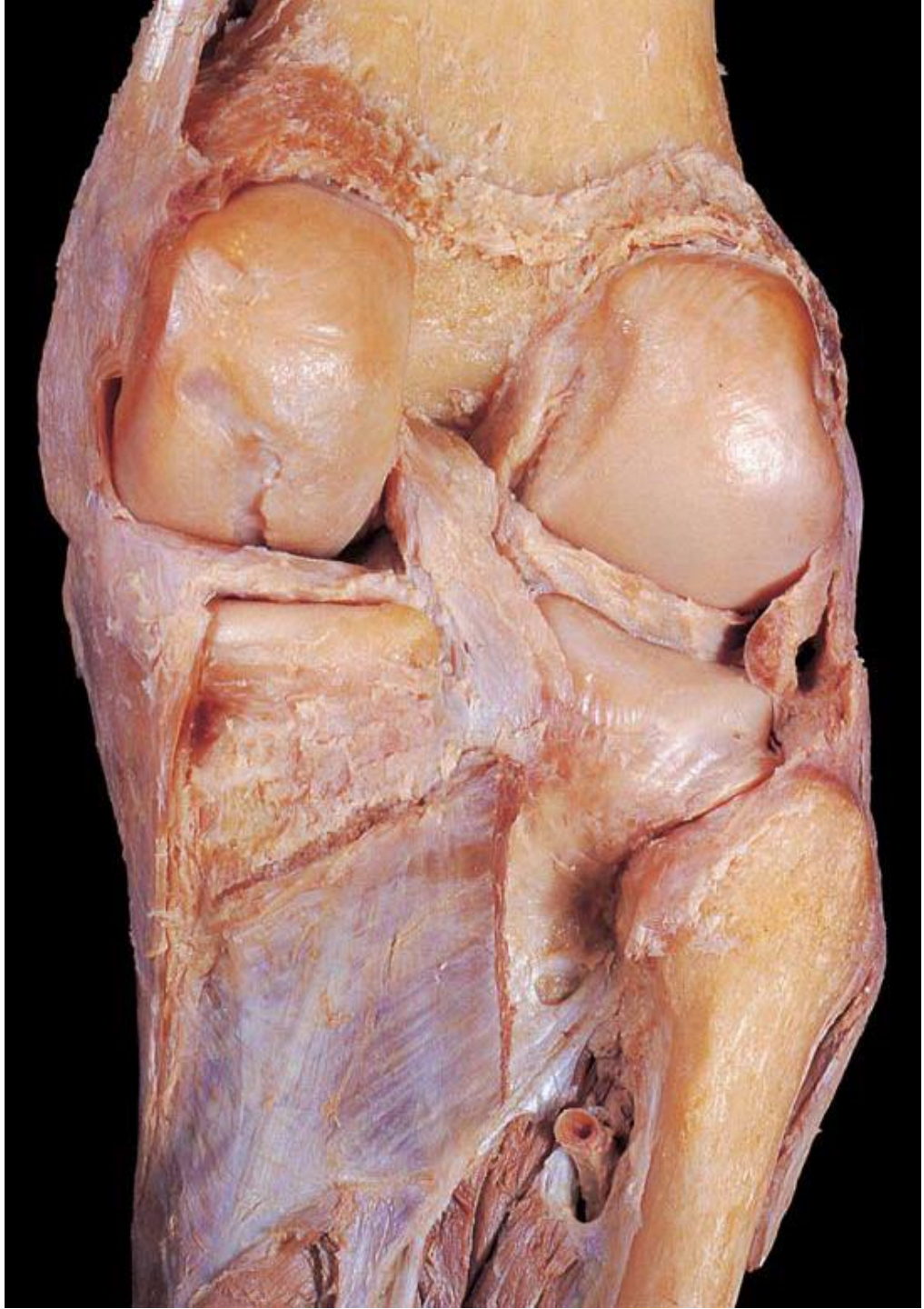
- Osgood Schlatter's Disease or "runner's knee"
- Apophysitis of tibial tubercle
- Sx: pain on anterior surface of knee, worse after running or kneeling
- Signs: enlarged and tender tibial tubercle
- O/E: pain elicited by resisted knee extension
- Ix: lateral XR knee
- Rx: conservative (NSAIDs, rest, ice, limit/adapt activity), self limiting

Image courtesy of Colin Woon, orthobullets.com.

Image courtesy of Assoc Prof Craig Hacking & Assoc Prof Frank Gaillard et al., radiopaedia.org.

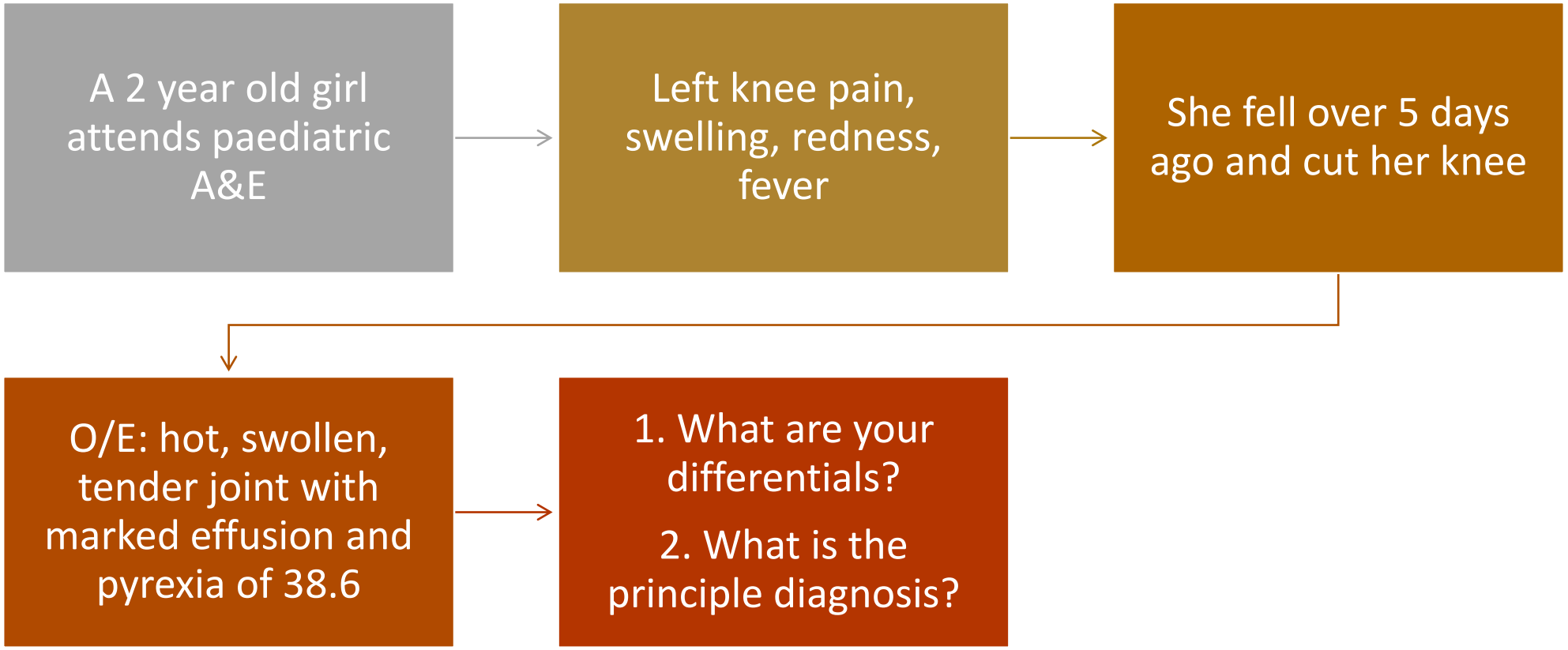






Images adapted from: (Left) Saladin: Anatomy & Physiology: The Unity of Form and Function, Fifth Edition; Chapter 9 Joints (Page 311). (Right) Gosling J et al. Human Anatomy: Color Atlas & Textbook 5 Edition; Chapter 6 Lower Limb (Page 298)

Case 2 | Doctor, my knee really hurts…



Case 2 | Doctor, my knee really hurts…

- **Never miss septic arthritis!**
- Sx: pain, inability to weight bear
- Signs: hot, tender, swollen joint, often overlying erythema
- O/E: pyrexia, localised swelling, tenderness, effusion, warmth, reduced ROM

Case 2 | Doctor, my knee really hurts…

- Workup: Kocher's criteria (Kocher's WIFE)

W – white cells >12 x 10^9

I – inability to weight bear

F – fever

E – ESR >40mm/hr

- Ix: AP and lateral plain XR – may be normal in early stages but can show widening joint space
- Rx: URGENT surgical drainage of joint – delayed intervention = permanent damage

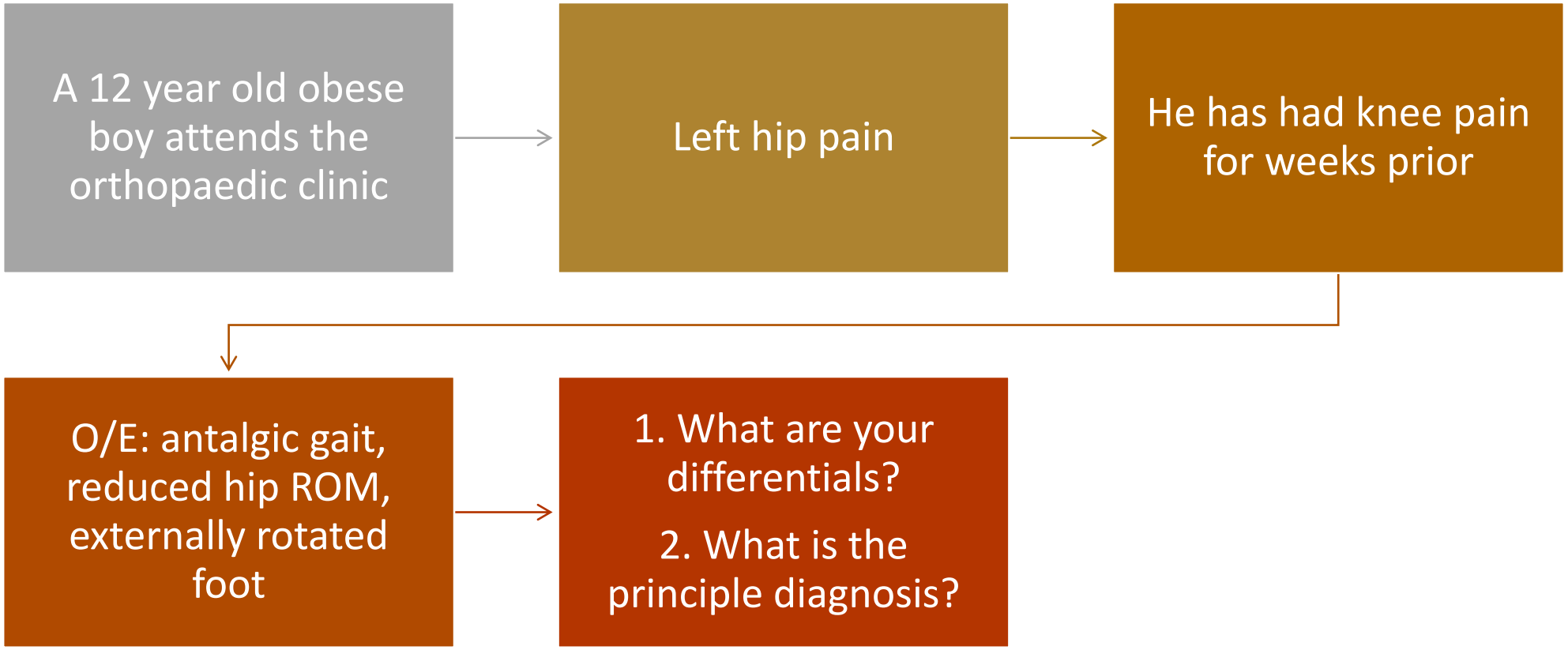
Case 2 | Doctor, my knee really hurts…

Ddx

- **Ewing's sarcoma**
- Small round cell sarcoma affecting diaphysis of long bones
- Often imitates infection
- Px: pain, fever, swelling, local tenderness
- Ix: AP and lateral XR – **periosteal reaction resembling onion skin**; bone scan, MRI, CT for staging
- Bone marrow biopsy, ESR, WCC, LDH
- Chemo +/- radiotherapy and limb salvage resection

Image courtesy of Patrick O’Donnell, orthobullets.com.

Case 3 | Doctor, my hip hurts



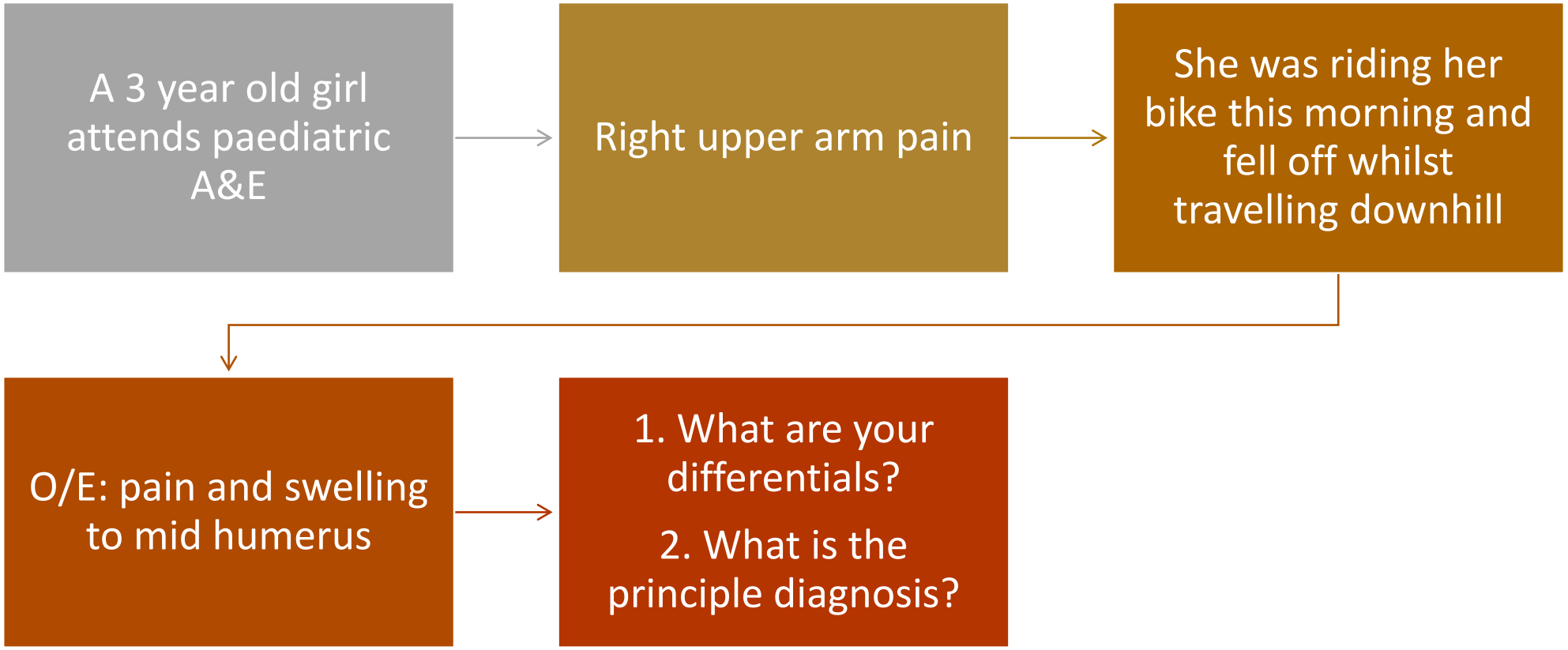
Case 3 | Doctor, my hip hurts

Ddx

	Developmental Dysplasia of Hip	Perthes Disease	SUFE
Aetiology	Infancy Screening tests (Barlow's + Ortolani's)	**Hip pain** +/- knee 5 – 12 years male>female	**Knee pain - > Hip pain** Obese adolescent boy 10-14 years
Epidemiology	Most commonly caused by breech birth	Idiopathic avascular necrosis of femoral head	Brought on by exercise
Clinical px	Limp, hip pain, instability	Insidious intermittent hip pain, limp	Limp, hip pain, decreased hip ROM
Investigations	USS at birth AP + frog lateral	Several classifications AP + frog lateral – medial joint space widening	Loder classification AP + frog lateral XR – ice cream sign Southwick angle indicates severity
Management	Pavlik harness	Observation, physio, activity restriction Femoral osteostomy	Percutaneous in situ fixation Prophylactic fixation of contralateral hip

Image courtesy of Assoc Prof Craig Hacking & Dr Jeremy Jones et al., radiopaedia.org.

Case 4 | Doctor, I fell off my bike



Case 4 | Doctor, I fell off my bike

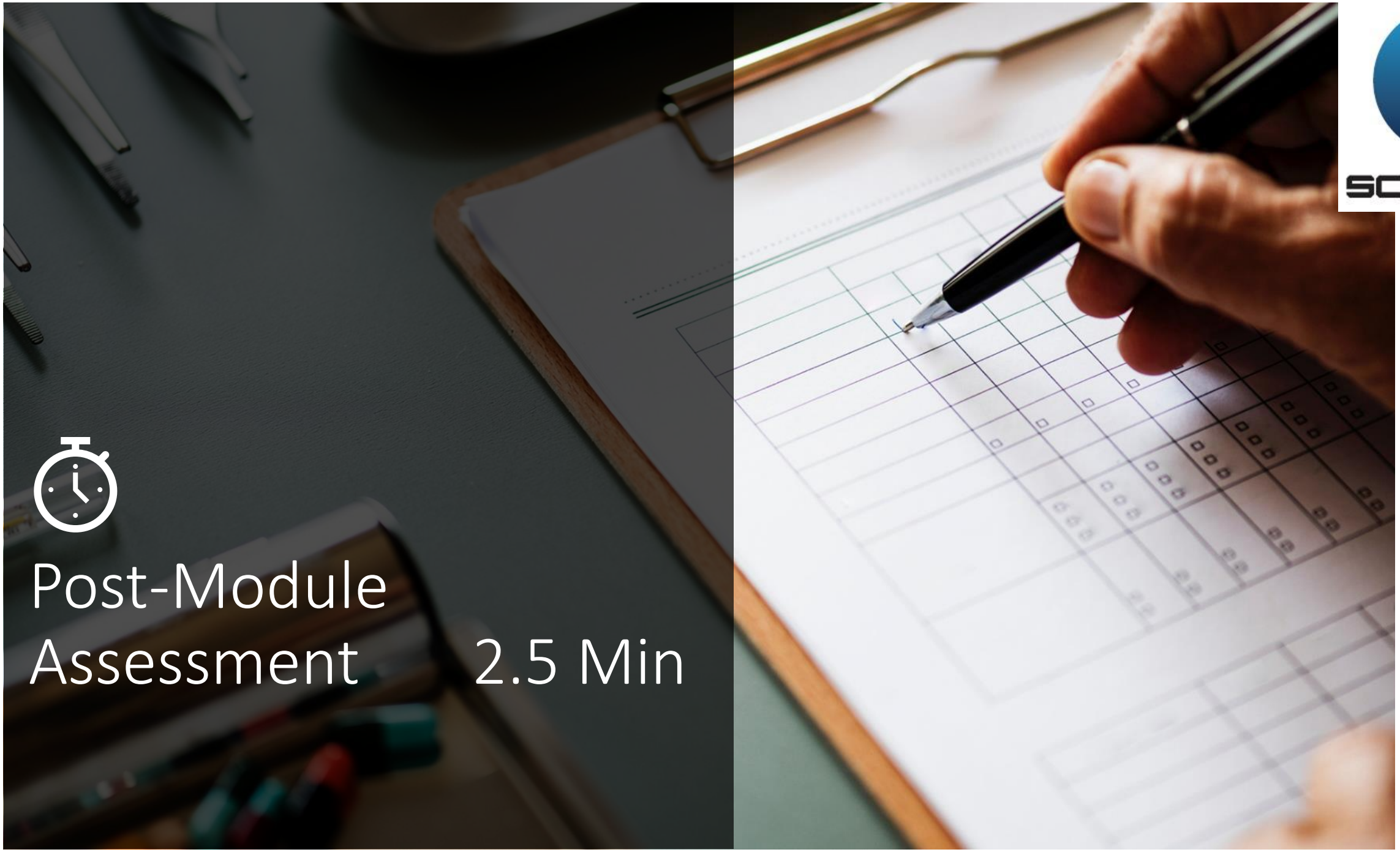
Ddx

- Complete fracture – both sides of cortex are breached
- Toddler's fracture – oblique tibial fracture in infants
- Plastic deformity – stress on bone resulting in deformity without cortical disruption
- Greenstick fracture – unilateral cortical breach only
- Buckle fracture – incomplete cortical disruption resulting in periosteal haematoma only

Case 4 | Doctor, I fell off my bike

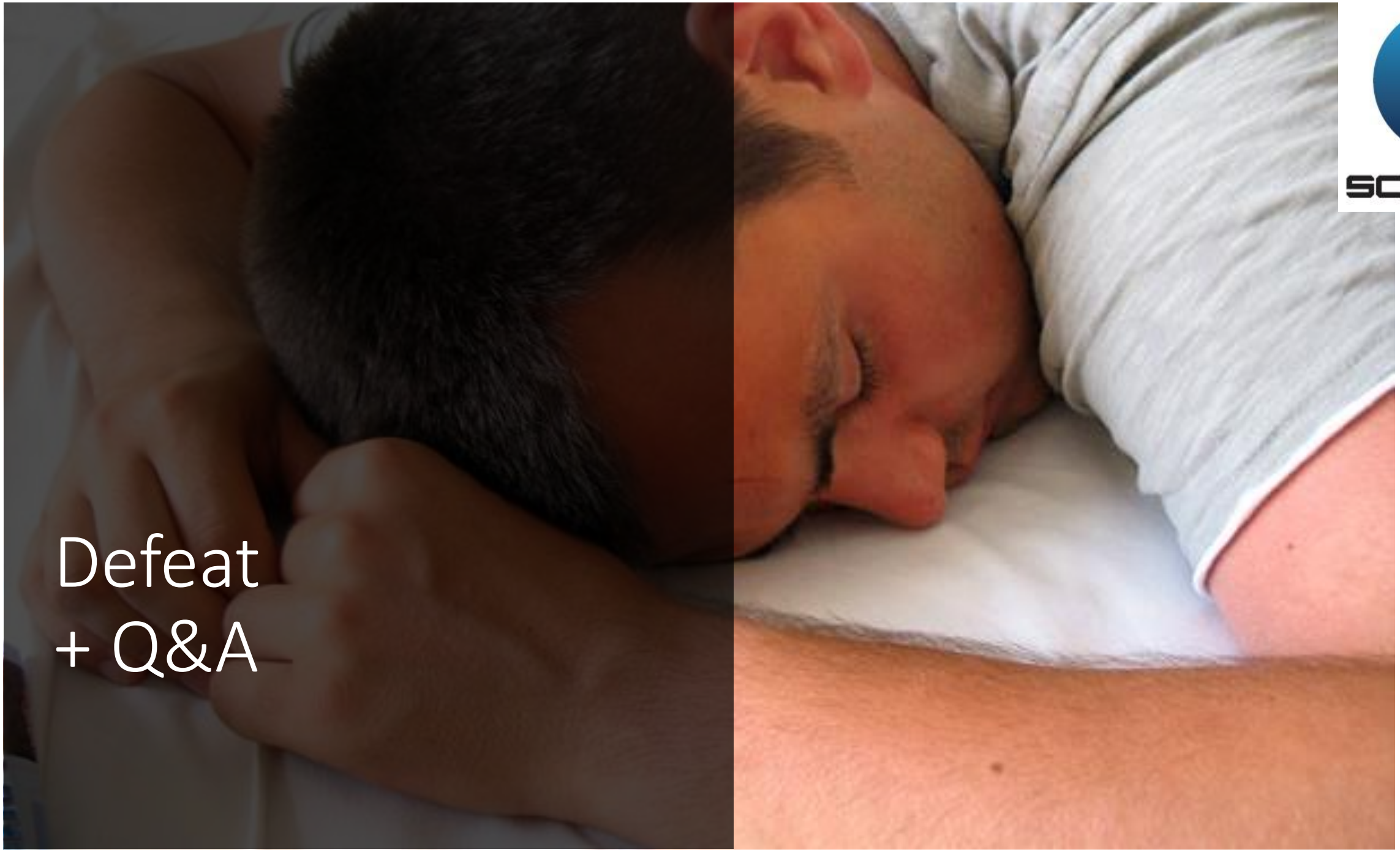
- Fracture classification – Salter-Harris system

Type	Injury pattern
I	Fracture through the physis only (x-ray often normal)
II	Fracture through the physis and metaphysis
III	Fracture through the physis and epiphyisis to include the joint
IV	Fracture involving the physis, metaphysis and epiphysis
V	Crush injury involving the physis (x-ray may resemble type I, and appear normal)

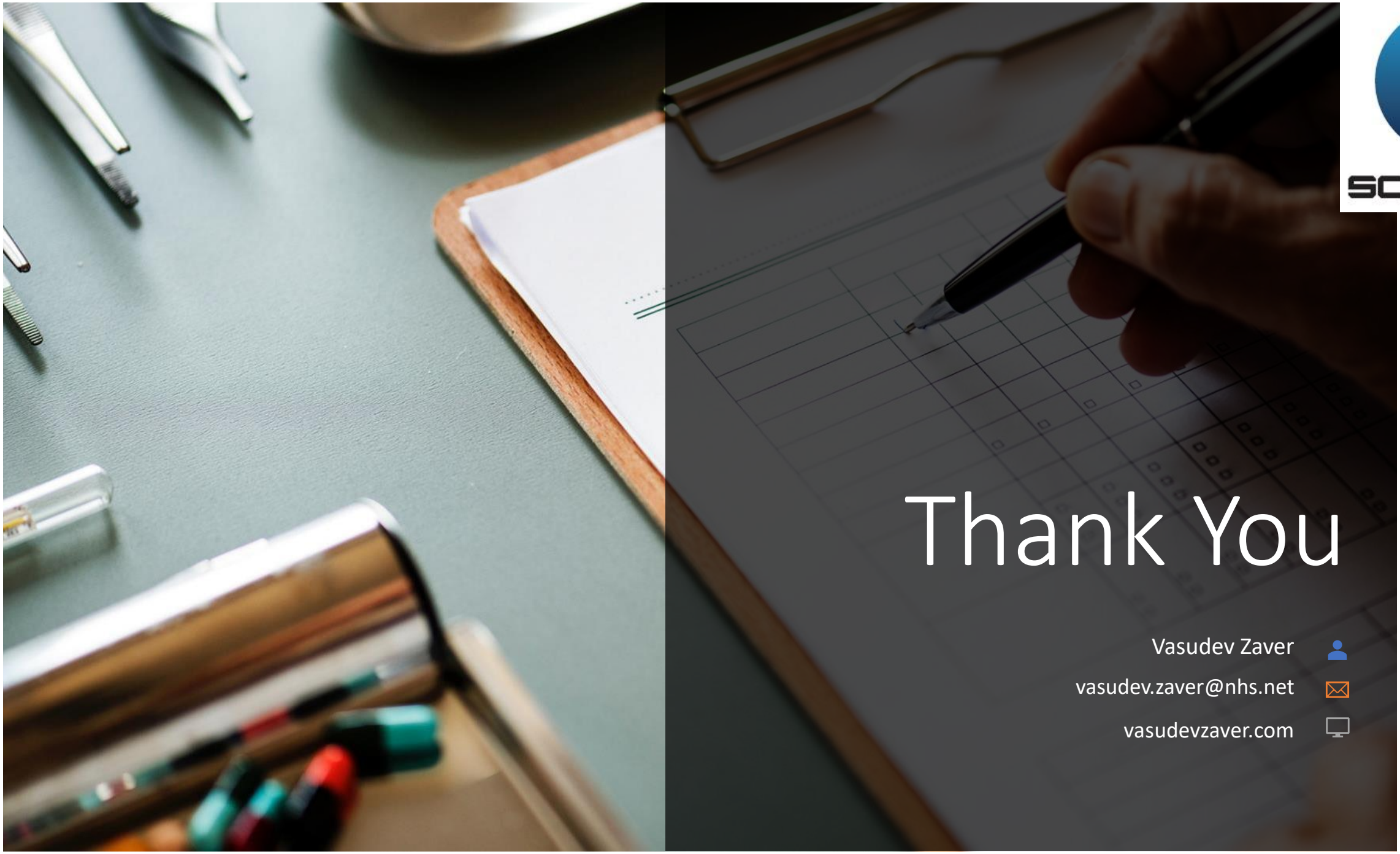


Post-Module Assessment

2.5 Min



Defeat
+ Q&A



Thank You

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