

# Illawarra Shoalhaven Local Health District Emergency Medicine Fellowship Program



## Topic-Based Quiz: Qs and As Orthopaedics – Lower Limb

### Candidate Instructions

- Duration = 30min
- Props are included within the examination booklets
- Allocated marks for each question are shown
- Each mark is of equal weight
- There is no negative marking
- Write answers CLEARLY, and cross out any errors
- Answer within space provided
- Do not begin until instructed
- You may take examination book home with you



Good Luck!

Acknowledgement: Thank you to the trainees who have written these SAQs with the hope of making their colleagues sweat, but ultimately gain more exposure to exam practice. Good job.

**Question 1**

78 year old female, presented to ED via Ambulance for a right ankle injury after trying to stand up from the toilet.



Describe the injury (3 marks)

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Describe the Gustillo-Anderson classification of contamination (5 marks)

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Topic-Based SAQ Quiz: Ortho – Lower Limb

Describe your management priorities in the next hour (6 marks)

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**Question 2**

A 28 year old female dancer, sustained an inversion injury while doing a jump, and is now unable to weight bear afterwards due to the pain. She has tenderness to the top of her midfoot extending laterally. She has sustained no other injuries.

Describe the components of the Ottawa Foot Rule (3 Marks)

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List potential injuries with this patient's presentation (4 Marks)

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An Xray of the right foot is available below



Topic-Based SAQ Quiz: Ortho – Lower Limb

Describe the abnormality in the Xray and state its Eponymous name (2 marks)

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List down your steps in management of this patient (3 marks)

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**Question 3**

A 24 year old male has presented to the emergency department with a painful left knee after a collision during football, hearing a pop. He has had difficulty weight bearing since and has significant swelling of the knee. No other injuries were sustained.

What are the injuries that need to be considered in this patient? (6 marks)

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An Xray of his left knee is available below



Topic-Based SAQ Quiz: Ortho – Lower Limb

What is the main pathology in this Xray and what is it pathognomonic of? (2 mark)

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What are 4 examination findings specific for this injury? (4 marks)

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**Question 4**

A 47 year old roof tiler presents to the emergency department with knee pain after falling off a ladder onto both feet from 2m. He was unable to weight bear due to pain and has a very swollen left knee with poor ROM.

An Xray of the left knee shows a tibial plateau fracture.



List the Schatzker Classification of tibial plateau fracture (6 marks)

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List 3 complications of this condition (3 marks)

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Topic-Based SAQ Quiz: Ortho – Lower Limb

List 4 indications for surgery of this condition (4 marks)

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**Question 5**

An 18 year old male presents to the emergency department with a painful right lower leg after doing a kick with his left leg during a martial arts sparring session. He is unable to weight bear due to pain. No other injuries sustained.

An Xray of the right leg was done.



List the important findings on this Xray and indicate the Eponymous name for this injury (3 marks)

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Describe the mechanism of this injury (1 mark)

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Topic-Based SAQ Quiz: Ortho – Lower Limb

Describe 3 complications of this injury (3 marks)

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List your management for this patient (5 marks)

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## ANSWERS

### Question 1

Describe the injury (3 marks)

- Open left ankle Fracture dislocation
- Lateral displacement of foot
- Large laceration of the ankle near circumferential
- No signs of distal cyanosis

Describe the Gustillo-Anderson classification of contamination (5 marks)

- Grade 1: clean wound <1 cm in length
- Grade 2: wound 1-10 cm in length without extensive soft-tissue damage, flaps or avulsions
- Grade 3: extensive soft-tissue laceration (>10 cm) or tissue loss/damage or an open segmental fracture
  - Grade 3a: adequate periosteal coverage of the fracture bone despite the extensive soft-tissue laceration or damage
  - Grade 3b :extensive soft-tissue loss, periosteal stripping and bone damage
    - usually associated with massive contamination
  - Grade 3c: associated with an arterial injury requiring repair, irrespective of degree of soft-tissue injury

Describe your management priorities in the next hour (6 marks)

- Analgesia – with specific dose / route / titration
- Wound Mx: Washout / Saline-soaked Gauze
- Reduction under Procedural Sedation
- Immobilisation in short leg backslab with stirrups
- IV Antibiotics + Tetanus prophylaxis
- Emergent Orthopaedic Assessment with view to definitive washout / reduction in OT
- Seek and treat other life-threatening injuries

### Supplementary Info

**Resuscitation-** attend to coexistent life-threatening injuries

- control haemorrhage and correct coagulopathy
  - e.g. direct pressure, tourniquets if in extremis

**Specific treatment**

- Assess the limb and seek/treat complications
  - e.g. neurovascular compromise, compartment syndrome, crush injury and rhabdomyolysis
- Remove gross contaminants from the wound
- if there will be more than a 1 to 2 hour delay in going to the operating theatre for washout and debridement then clean by profusely irrigating with saline and cover the wound with a sterile dressing (e.g. saline soaked pads; avoid iodine)

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- reduce gross deformities using gentle traction and splint the injured limb — this is a top priority if there is neurovascular compromise
- immobilise the limb with a POP backslab and elevate the limb

### Antibiotics

- Australian *Therapeutic Guidelines* recommendation for first-line prophylaxis for open fractures is flucloxacillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly as *S. aureus* is the most common cause of secondary infection.
- However, most sources suggest broad spectrum antibiotics that cover both gram-positives and gram-negatives, depending on the severity of the injury and degree of contamination. For example:
  - Grade I/ II —  
1st generation cephalosporin  
e.g. cephazolin 1 g (child: 25 mg/kg up to 1 g) IV, 8-hourly  
e.g. cephalothin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
  - Grade II/ III —  
add an aminoglycoside (e.g. gentamicin)
  - If heavily contaminated —  
add penicillin or metronidazole due to the risk of infection with *Clostridium* and other anaerobes.  
consider adding doxycycline, or changing to ciprofloxacin, if the wound is heavily contaminated with sea water to cover for *Vibrio* species.

### Supportive care and monitoring

- Give analgesia early; e.g. morphine or fentanyl +/- ketamine for analgesia
- Procedural sedation may be required
- Give tetanus toxoid/ tetanus immunoglobulin if indicated

### Disposition

- Consult orthopaedics
- Most open fractures can be safely taken to the operating theatre the next day for washout and further management.

## Question 2

Describe the components of the Ottawa Foot Rule (3 Marks)

Pain in the midfoot

Inability to bear weight right after the injury as well as in the ED

Bone tenderness at the navicular or the base of the fifth metatarsal

List potential injuries with this patient's presentation (4 Marks)

Lisfranc injury

Navicular fracture

Cuboid fracture

Cuneiform fracture

Fifth metatarsal fracture

Non-fifth metatarsal fracture

## Topic-Based SAQ Quiz: Ortho – Lower Limb

Describe the abnormality in the Xray and state its Eponymous name (2 marks)

Fracture of the proximal diaphysis of the 5th metatarsal, distal to the tuberosity, without joint involvement

Jones Fracture

List down your steps in management of this patient (3 marks)

Analgesia

Posterior Ankle Splint

Strict NWB

RICE

ortho follow up in 3-5 days

### Question 3

What are the injuries that need to be considered in this patient? (6 marks)

Knee dislocation

Knee fractures

Patella fracture

Tibial plateau fracture

Meniscus and ligament knee injuries

Patella dislocation

Patellar tendon rupture

Quadriceps tendon rupture

What is the main pathology in this Xray and what is it pathognomic of? (2 mark)

Segond fracture- Avulsion fracture of proximal lateral tibia

Pathognomic of ACL tear

What are 4 examinations specific for this injury? (4 marks)

Lever Sign or Lelli's test (highest sensitivity at 94-100%)

Anterior Drawer Sign

Lachman Test

Pivot Shift Test

Question 4

List the Schatzker Classification of tibial plateau fracture (6 marks)

Schatzker I Lateral split

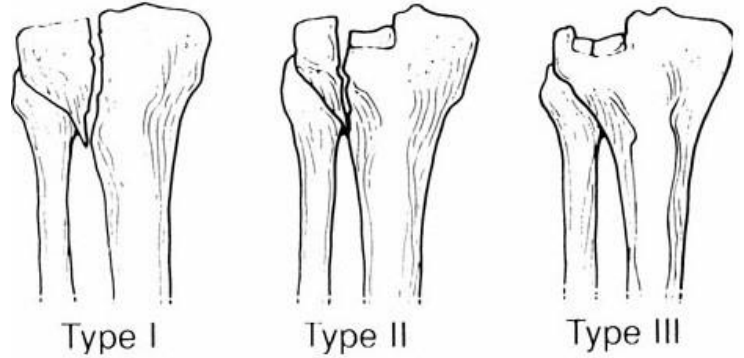
Schatzker II Split with depression

Schatzker III Pure lateral depression

Schatzker IV Pure medial depression

Schatzker V Bicondylar

Schatzker VI Split extends to metadiaphysis

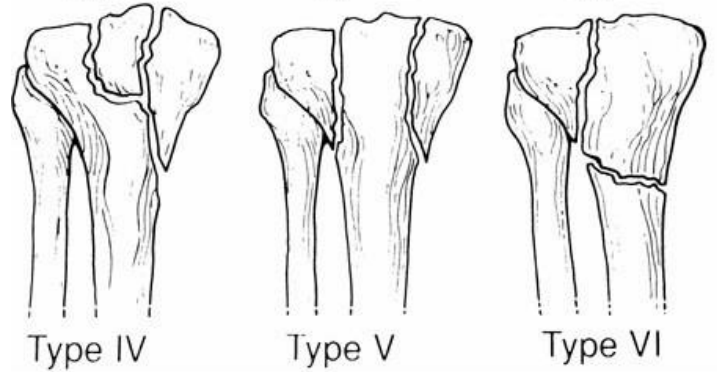


List 3 complications of this condition ( 3 marks)

Meniscus and ligament knee injuries

Compartment syndrome

Neurovascular injury- Popliteal artery and common peroneal nerve injury



Indications for surgery of this condition (4 marks)

Open fractures

Articular stepoff > 3mm

Condylar widening > 5mm

Varus/valgus instability

All medial plateau fractures

All bicondylar fractures

**Question 5**

Describe the pathology in the Xray and indicate the Eponymous name for this injury (3 marks)

Medial malleolar fracture

Spiral fracture of the proximal fibular shaft

Maisonneuve fracture

Describe the mechanism of this injury (1 mark)

Results from external rotation force applied to foot

Describe 3 complications of this injury (3 marks)

Compartment syndrome

Common peroneal nerve injury- foot drop

Unstable ankle joint due to tears in syndesmotic ligament complex

List your management for this patient (5 marks)

Analgesia

No indication for reduction as no talar shift or joint widening

Long leg posterior splint

Referral to Orthopaedic service for outpatient management, requiring operative management (syndesmotic screws)

Education of patient for plaster care and indications for representation to ED ( increasing pain, paraesthesia to toes)