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Precourse online self-assessment: knowledge questions

Advanced Principles of Fracture Management

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Information for course chairs and faculty

The online precourse self-assessment for the AO Trauma Course-Advanced Principles of Fracture Management consists of two parts:

- Demographic questions
- Self-assessment questions, including motivation to learn and multiple-choice test questions

This document contains the multiple-choice test questions from the online precourse self-assessment for the Advanced Principles of Fracture Management Course.

Information for course chairs and faculty only (please do not distribute to course participants)

Competency 01: Understand the concepts of stability, their influence on bone healing, and how to apply implants to achieve the appropriate stability

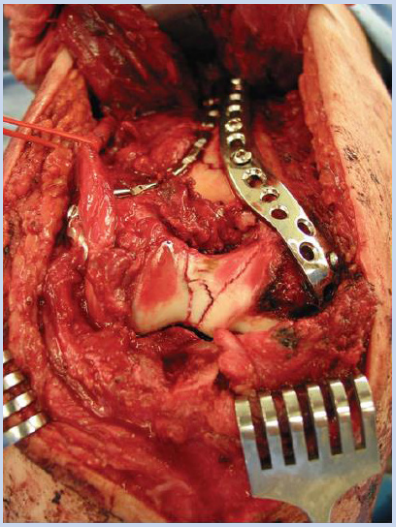
Question 101

[no image]

What is the appropriate plate length for bridge plate fixation of a comminuted diaphyseal fracture?

a Three times the length of the fracture zone
b The plate should span from the metaphysis at one end to the metaphysis at the other end of the bone
c Long enough to place two bicortical screws on each side of the fracture
d Long enough to place four monocortical screws on each side of the fracture

Question 102



What is the **best** screw technique to fix the intercondylar portion of this comminuted distal humeral articular fracture?

a Lag screw
b Position screw
c Locking screw
d Blocking screw

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Competency 02: Plan a treatment based on assessment, imaging, classification, and decision making

Question 201

What type of surgical approach is **best** for plate fixation for the illustrated fracture?

a Lateral transvastus
b Midline quadriceps splitting
c Extended lateral parapatellar d Parapatellar articular approach with submuscular plating

Question 202

A 49-year-old woman sustained a 4-part proximal humeral fracture in a fall from a standing position. The x-rays show her only injury.

Of the following 4 choices, which treatment is **the most favored?**

a Nonsurgical care
b Hemiarthroplasty
c Closed reduction and proximal humeral nail
d Open reduction and internal fixation with a locking plate

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Competency 03: Apply reduction techniques with attention to soft tissues

Question 301

What reduction technique should be used for the fracture shown in the images?

a Open direct reduction
b Open indirect reduction
c Arthroscopically assisted closed reduction
d Fluoroscopically assisted closed reduction

Question 302

A 35-year-old male sustained this injury in a fall from a height of 5 meters. He has a multifragmentary underlying tibial shaft fracture that has been splinted for the past 24 hours. Pain is well controlled, and function of the foot is normal.

Of the following choices, which is the **most appropriate initial** treatment?

a Debride blisters, apply antibacterial dressings, and reapply splint
b Leave blisters intact and reapply splint
c Release all four compartments
d External fixator from proximal tibia to the calcaneus/midfoot (bridging the ankle-joint).

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Competency 04: Apply implants according to their properties utilizing different application techniques

Question 401

A minimally invasive bridge plating technique is planned to fix the complex humeral shaft fracture shown in the x-ray.

What is the main criterion for defining the length of the plate?

a The plate must be long enough to accommodate two bicortical locking head screws on each side of the fracture
b The plate must be long enough to accommodate three monocortical locking head screws on each side of the fracture
c The plate should be three times the length of the fracture zone
d The plate screw density must be 0.7

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Question 402




A 32-year-old man who sustained a split depression fracture of the tibial plateau was treated with open reduction and internal fixation as shown in the x-rays.

In this type of fixation, what is the function of the plate?

a Compression plate
b Bridging plate
c Neutralizing plate
d Buttress plate

Competency 05: Assess and treat diaphyseal fractures

Question 501

Varus deformity may occur with fixation of this fracture.

Which of the following techniques is **most likely** to result in varus if precautions are not taken?

a Failure to perform direct reduction
b Wrong entry point
c Medial support was not restored
d Wrong proximal locking technique

Question 502

[no image]

An 18-year-old who sustained a closed, Type A midshaft humeral shaft fracture in a soccer (football) game is found, on initial exam, to have a complete, high, motor and sensory radial nerve palsy.

Which of the following is the **best supported** initial treatment?

a Nonsurgical treatment while monitoring for nerve recovery
b Open reduction and internal fixation with a plate, plus nerve exploration
c Open reduction and internal fixation with a nail, plus nerve exploration
d Closed intramedullary nailing, without nerve exploration

Competency 06: Assess and treat articular and periarticular fractures

Question 601

For which of the illustrated images fractures is anatomical reduction of both articular and metaphyseal components the optimal management?

a Images A
b Images B
c Images C
d Images D

Question 602

What is the **main disadvantage** of using only a lateral locking plate as fixation for fractures like that shown in the x-rays?

a A lateral locking plate does not provide enough stability to prevent varus collapse
b A lateral locking plate does not provide direct fixation for the posteromedial shear fracture
c Use of a lateral locking plate may create late soft-tissue problems
d The medial plateau component of this fracture cannot be reduced indirectly

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Competency 07: Demonstrate strategies for assessing and treating open fractures and soft-tissue injuries

Question 701

The patient, whose injured right foot and distal tibial instability is illustrated, also has an open fracture from a crush injury of the right tibia. These injuries occurred 8 hours previously. The foot is pulseless and insensate.

What is the **most strongly indicated** treatment at this time?

a Debridement and bridging external fixation
b Debridement and internal fixation
c Amputation through the tibial fracture
d Tibial fracture fixation with Syme amputation

Question 702

A 24-year-old male sustained this isolated injury in a motor vehicle accident. 3 hours later, he reports extreme pain in the right leg. Physical examination reveals good distal perfusion and pulses present bilaterally. There is loss of sensation in the first dorsal webspace.

Which is the **best** treatment option?

a Ice, release splint and reexamine serially
b Bridging external fixation and elevation
c Measure compartment pressures d Fasciotomy and fracture fixation

Competency 08: Manage the polytrauma patient

Question 801

Patients with this fracture pattern are most likely to have which associated injury(-ies)?

a Urologic injury
b Pelvic vascular injury
c Visceral and/or brain injury
d Sciatic nerve injury

Question 802

[no image]

A 20-year-old male sustains the following injuries in a motor vehicle accident: a closed right femoral shaft fracture, an ipsilateral open IIIA tibia shaft, a closed floating shoulder, and a hemothorax on the right side. Upon arrival at the emergency department, his lactate level is normal, blood pressure is 120/80 mm Hg, and his temperature is 37°C.

What term **best** describes the patients physiologic status?

a Stable
b Unstable
c In extremis
d Borderline

Competency 09: Evaluate, classify, and formulate a treatment plan for pelvic injuries and acetabular fractures

Question 901

[no image]

In posterior wall fractures of the acetabulum, the most important factor in predicting outcome is:

a Marginal impaction
b The size of the fracture fragment
c Dislocation of the femoral head
d Previous hip arthritis

Question 902

Which of the following **best** describes the pelvic deformity shown in this x-ray?

a Internal rotation of the right hemipelvis
b Anterior displacement of the right hemipelvis
c Vertical (cephalad) displacement of the right hemipelvis
d Posterior displacement of the right hemipelvis

Competency 10: Recognize risk factors and complications and manage accordingly

Question 1001

A 34-year-old man sustains a closed comminuted fracture of the tibia. The soft- tissue condition is shown. Initial treatment consists of temporary external fixation of the tibia so that the condition of the soft tissues has time to improve before definitive treatment.

Definitive fixation of the tibia fracture should occur after:

a 3 to 5 days from the initial injury
b Unroofing and débridement of the blisters
c The swelling resolves (positive wrinkle sign)
d The blisters have dried up

Question 1002

What problem, shown in this x-ray after temporary external fixation, poses the **greatest risk** of preventable complication?

a The articular surface is not reduced
b The pins in the tibia are too close to the fracture
c Metal bars obscure the x-ray
d The foot is in plantar flexion

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Competency 11: Recognize and treat bone union disorders

Question 1101

This patient sustained a proximal tibial fracture 5 years ago. After multiple operations, she has persistent pain, deformity, and motion at the fracture site.

What is the **most appropriate** treatment at this time?

a Above-knee amputation
b Total knee arthroplasty
c Hybrid external fixation with autogenous bone graft d Compression plate to realign and fix fracture

Question 1102

The cause for this tibial nonunion is **most likely** due to which of the following?

a Chronic infection
b Inadequate fracture stability
c Distraction due to plate fixation of the fibula
d Impaired vascularity at the fracture site

Competency 12: Recognize and manage special fracture circumstances

Question 1201

[no image]

Why is a plate with locking screws **particularly valuable** for fracture fixation in a patient with osteoporotic bone?

a Less risk of screw failure
b Locking screws have a better working length
c Less primary loss of reduction
d Ability to provide fixation and be off the bone

Question 1202

[no image]

When discussing the choice between amputation and limb salvage for a 30-year-old male with a type 3C open tibia mid-shaft fracture, which of the following statements is **most appropriate** to communicate to the patient?

a The functional outcome is essentially the same in either approach
b Near-normal functional recovery is likely with either approach
c Amputation will prevent his return to gainful employment
d Limb salvage has a lower likelihood of serious complications