

Fractures, Dislocations, and Principles of Operative Treatment

Class Size & Organization

Total students: 99

Team formation: 11 teams × 9 students each

Roles per team (rotate each puzzle): Leader, Recorder, Time-keeper, Presenter, Evidence-finder (2), Planner (2), Observer

Game Rules (Apply to All Puzzles)

Time per puzzle: 20 minutes (15 min discussion + 5 min reporting)

Resources: Only provided handouts (X-ray images, vitals, lab sheets, rehab cards)

Participation: All team members must contribute

Reporting: 2-minute oral presentation per team

Scoring Rubric (10 points per puzzle)

Correct diagnosis / injury identification – **3 pts**

Clinical reasoning & justification – **3 pts**

Operative management & principles – **2 pts**

Post-operative rehab planning – **1 pt**

Teamwork & clarity – **1 pt**

Maximum score per team (10 puzzles): **100 points**

PUZZLE SET (10 CASE-BASED GAMES)

Each puzzle aligns with **Bloom's Taxonomy** and emphasizes **Analyze – Evaluate – Create** levels.

Puzzle 1: The Roadside Fall (Bloom: Apply)

Story: A 28-year-old male fell from a bike, severe arm pain, visible deformity.

Clues Provided:

Swollen mid-arm, abnormal mobility

X-ray: transverse fracture shaft humerus

Tasks:

Identify fracture type

Decide operative vs conservative treatment

Justify fixation method

Expected Learning: Indications for ORIF vs functional bracing

Puzzle 2: The Missed Shoulder (Bloom: Analyze)

Story: 45-year-old woman slipped in bathroom, painful shoulder, cannot move arm.

Clues:

Flattened deltoid contour

X-ray AP view shows empty glenoid

Tasks:

Diagnose dislocation

Identify direction

Immediate management steps

Focus: Principles of reduction & immobilization

Puzzle 3: The Elderly Hip (Bloom: Analyze)

Story: 72-year-old female, trivial fall, unable to stand.

Clues:

Shortened externally rotated limb

X-ray: intracapsular neck of femur fracture

Tasks:

Classify fracture

Choose operative option

Predict complications

Focus: Hemiarthroplasty vs fixation

Puzzle 4: The Football Knee (Bloom: Evaluate)

Story: 22-year-old athlete tackled during match, knee swelling, instability.

Clues:

MRI: tibial plateau fracture

Tasks:

Assess stability

Decide need for surgery

Post-op physiotherapy goals

Focus: Articular fractures & early mobilization

Puzzle 5: The Open Wound (Bloom: Analyze)

Story: 35-year-old factory worker injured by machine.

Clues:

Bone visible through wound

X-ray: comminuted tibial fracture

Tasks:

Grade open fracture

Immediate operative principles

Infection prevention

Focus: Gustilo classification & external fixation

Puzzle 6: The Child's Elbow (Bloom: Apply)

Story: 6-year-old fell from swing, crying, elbow swollen.

Clues:

X-ray: supracondylar fracture

Tasks:

Identify fracture type

Emergency red flags

Pinning principles

Focus: Pediatric fractures

Puzzle 7: The Stiff Shoulder After Reduction (Bloom: Evaluate)

Story: 30-year-old male post shoulder dislocation reduction, severe stiffness after 3 weeks.

Tasks:

Identify complication

Evaluate rehab mistake

Redesign rehab protocol

Focus: Post-reduction physiotherapy principles

Puzzle 8: The Failed Implant (Bloom: Analyze)

Story: 50-year-old with previous plating for tibial fracture, now pain & deformity.

Clues:

X-ray: implant breakage

Tasks:

Identify cause of failure

Revise fixation plan

Load-sharing vs load-bearing concept

Focus: Principles of internal fixation

Puzzle 9: Polytrauma Priority (Bloom: Evaluate)

Story: Road traffic accident with femur fracture, chest injury, hypotension.

Tasks:

Decide surgical priority

Damage control orthopedics plan

Role of temporary fixation

Focus: Operative timing in trauma

Puzzle 10: Design the Ideal Rehab (Bloom: Create)

Story: Post-operative patient after ORIF distal radius fracture.

Tasks:

Create phased rehab protocol

Prevent stiffness & CRPS

Patient education plan

Focus: Integration of surgery & physiotherapy