

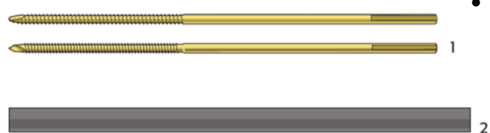
Practical 4:
External Fixation
 60 minutes

Learning Outcomes

- Clinical indications
- Choice of frame type
- Positioning and correct insertion of the Schanz screws
- Construction of the rod-to-rod modular frame

Intro (5-10 minutes)

- **Discussion of indications**
 - Severe soft tissue damage (open and closed fractures)
 - DCO surgery in polytrauma patients
 - Acute and chronic infections in both fractures and non-unions



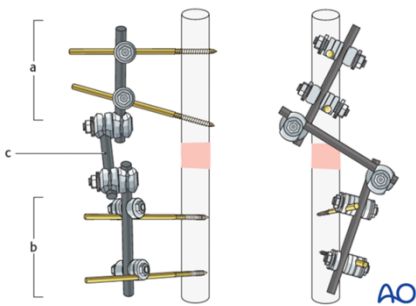
Talk through equipment on table

- Threaded pins (Schanz type pins, standard or self-drilling/self-tapping with radial preload; 5 or 6 mm)
- Carbon fiber rods or metal tubes (diameter of 11 mm)
- Rod-to-pin clamps (titanium, MRI safe)
- Combination clamps (rod-to-rod or rod-to-pin, self-holding, titanium, MRI safe)



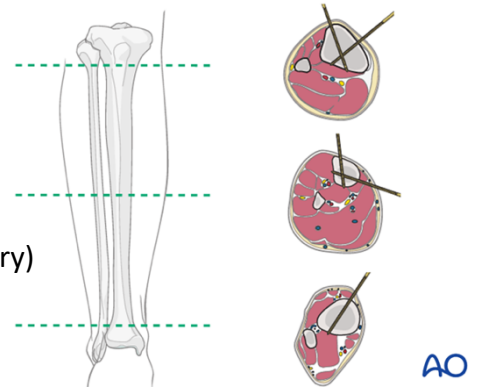
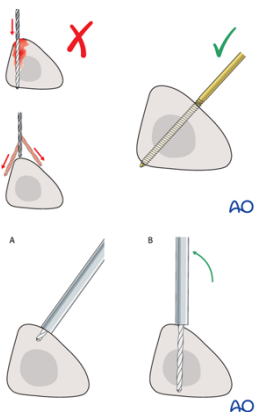
Choice of frame

- Modular vs uniplanar vs ring fixator
- Modular: two partial frames, one in each main fragment. Each partial frame has 2 pins in a bone fragment connected by a rod. The two frames are connected with a rod-to-rod construction / connecting rod



Frame Construction (30 minutes)

- Construct modular frame for tibial fracture
- Considerations:
 - Patient position
 - Optimum frame construction (near/far principle, mindful of zone of injury)
 - Pin site placement (safe corridors, avoid skidding on tibial crest)
 - Pin insertion (how deep? self-drilling self-tapping Schanz screws vs conventional pins)



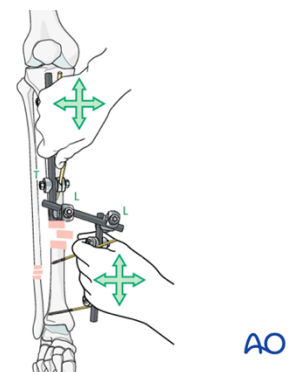
Reduction and Fixation (5 minutes)

- Reduce fracture and tighten clamps

Assessment of Stability & Improvements (10 minutes)

- Delegates and table demonstrators test stability of construct
- Try methods for improving or adding stability
 - E.g. try adding additional rod, distance of rod(s) from bone

T = Clamps tightened
 L = Clamps loose



Summary and Removal of Hardware (5 minutes)