Saw Bone Workshop

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About Me

- Work for Synthes Canada
  - Cover Area North of Toronto from Mackenzie Health to West Parry Sound
- Deal Primarily with Orthopaedic Trauma
- Grew up in Mississauga
  - Moving to Barrie
- Enjoy Sports:
  - Soccer, football, snowboarding, swimming, golf

Schedule

- Introduction to origins of fracture fixation
- Types of Fixation
- IM Nail and SawBone Workshop

What is the AO?

AO ASIF
The AO ASIF was founded in 1958 by a group of Swiss surgeons to improve the care of patients with musculoskeletal injuries

AO is the abbreviation for
Arbeitsgeminschaft fur Osteosynthesfragen,

which in English is translated as

Association for the Study of Internal Fixation.
In North America, the group was previously known as **AO ASIF.** The organization is now known as the AO

Why the AO Began

Swiss citizens experienced a large number of motor vehicle and skiing accidents and Swiss surgeons were dissatisfied with casts and traction -- the methods used to treat fractures in the 1940's and 50's.

These methods led to a high percentage of deformities and an inability to return to work.

AO Principles

The Swiss surgeons identified four guiding principles that they felt would contribute to better outcomes for patients with fractures.

Those principles are still relevant today, and are part of the standard philosophy of fracture care, no matter what company's implants and instruments are used.

The principles are as follows:

1. Reduce fractures anatomically
2. Fix fractures in a stable fashion so healing can occur
3. Preserve the blood supply
4. Mobilize patients early so full rehabilitation can take place

AO Teaching and Education

Another "pillar" of the AO is education and training. Early on, surgeons were required to attend an AO course before they could purchase Synthes implants and instruments.

This requirement was put into place to make sure that the implants would be used correctly and that surgical outcomes would be successful.

Courses and workshops are now conducted world-wide for surgeons, residents, operating room nurses and technicians, and veterinarians.

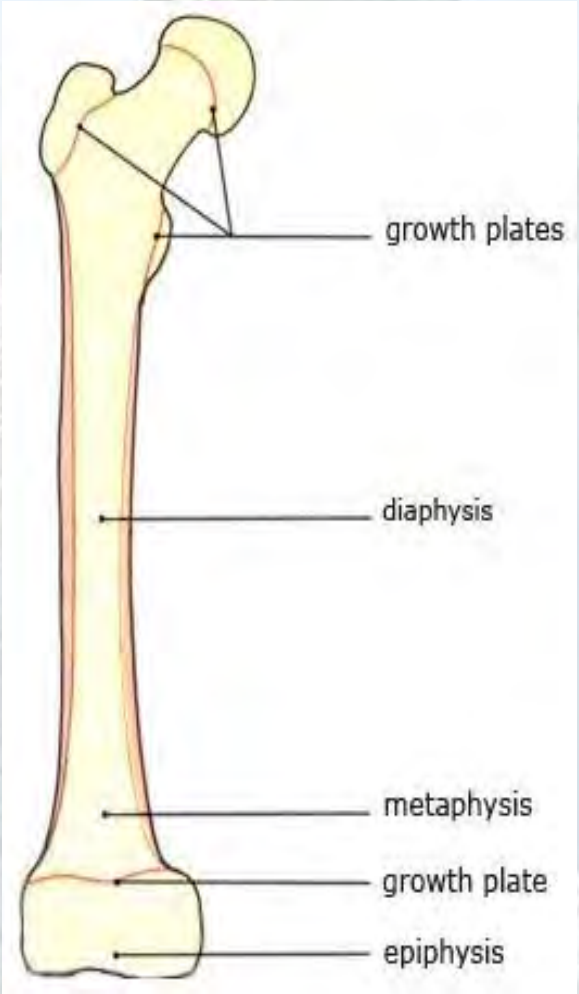
Web-based education is the newest training venue.

Basic Bone Anatomy

The human skeleton is composed of 206 bones, of which the majority are long bones.

The center portion, or shaft of a long bone, is called the **diaphysis**.

The end of a long bone is comprised of the **epiphysis**, or growth center and the **metaphysis**.

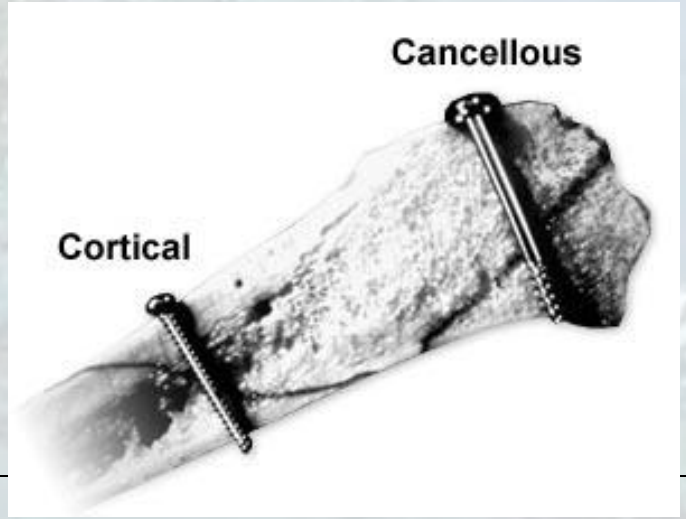


Basic Bone Structure

The outer layer of bone, or **cortex**, is dense and strong in the shaft area where the force placed on the bone is concentrated on a small area.

At the end of bone, or the **metaphyseal** area, forces are exerted on a larger area. The cortex is thinner, and the structure of the bone underneath is not as dense or strong. The bone under the thin cortical shell is called **cancellous bone**.

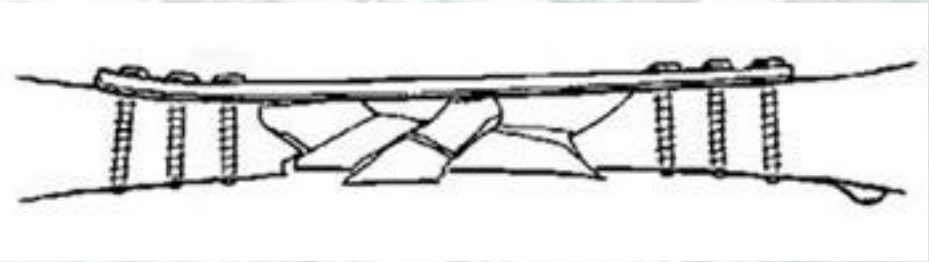
Since the quality of bone in these two areas is different, implants with different characteristics are designed to match the structure of the two areas

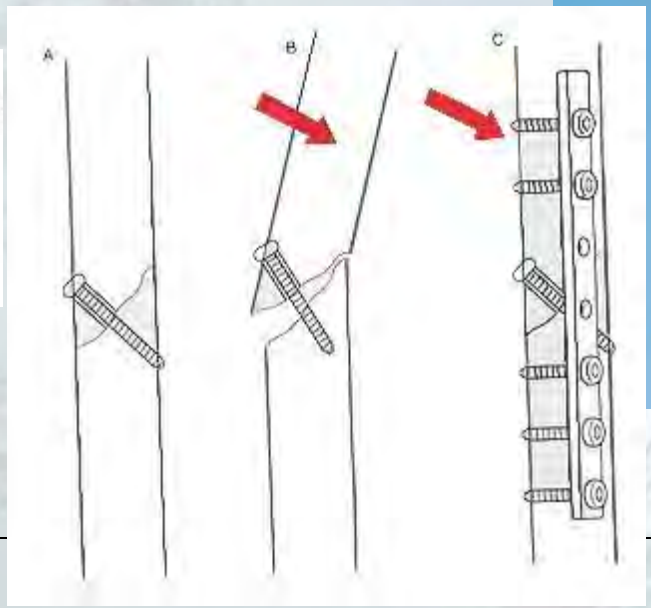


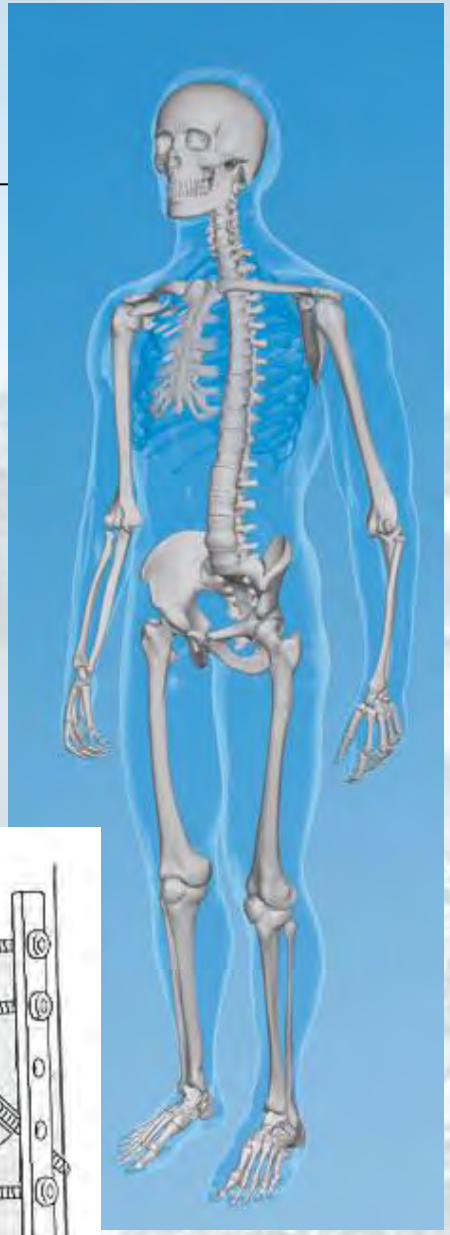
Relative vs Absolute Stability

Surgeons use **Relative Stability** to fix fractures when they wish for callous bone formation to take place. This method allows for limited micromotion to occur at the site of the fracture to speed along the fracture's union.

In contrast, **Absolute Stability** is used when there is a desire for minimizing the amount of movement at the fracture site to minimize callous formation. This is often used around fracture which are in the joint or near a joint surface, or other locations where callous formation is undesirable.







Load Sparing vs. Load Sharing

Bones respond differently to different types of implants.

“Load sparing” implants totally remove stress from the bone, so the bone heals without having to work. Because there is less biologic activity, there is less callus bone formation.

Examples of “load sparing” situations include bed rest, non-weightbearing (NWB) crutches and compression plates.

Load Sparing vs. Load Sharing

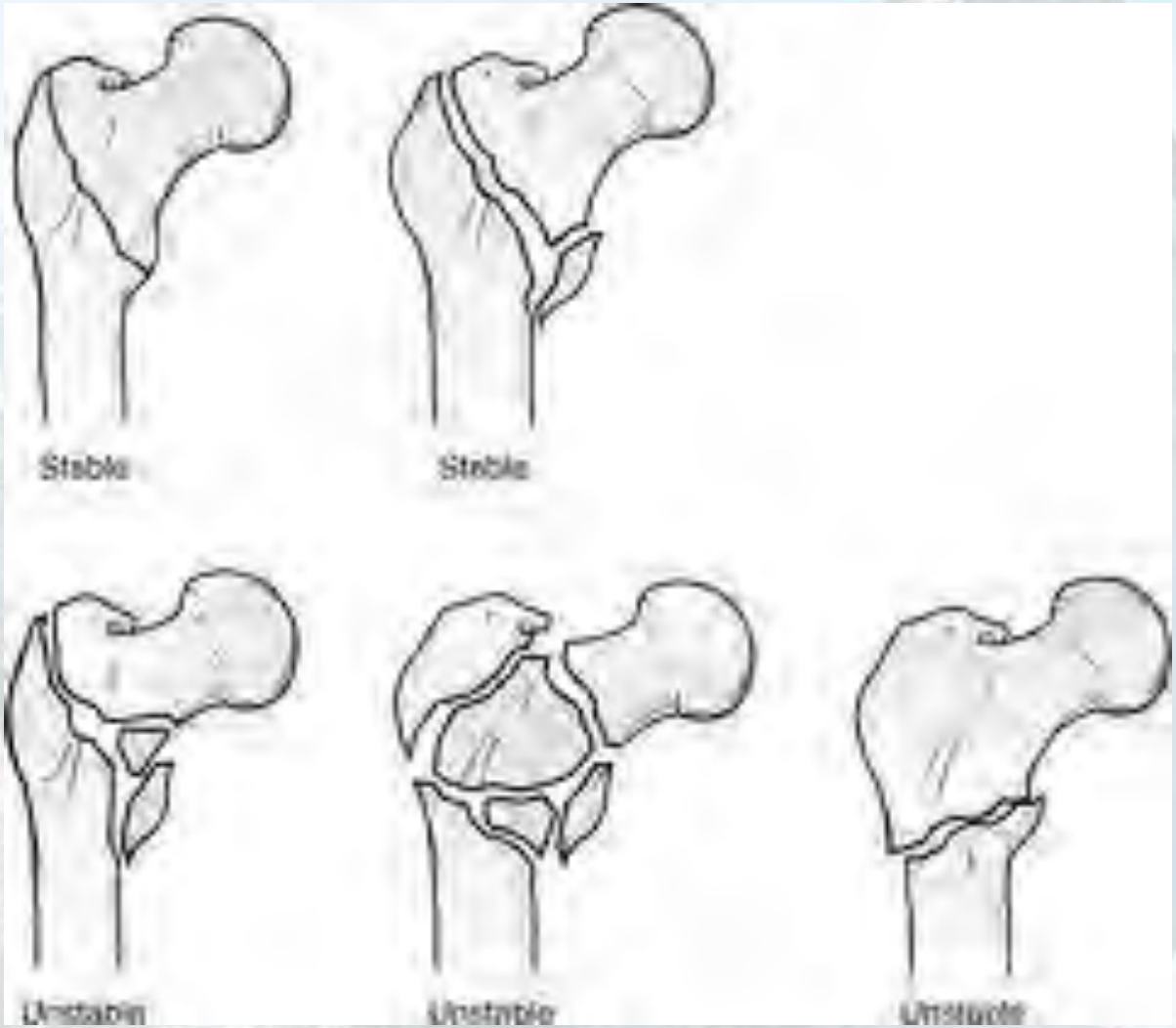
"Load sharing" implants share stress with bone, allowing bone to work while the fracture is protected.

Examples include partial weight-bearing crutches, IM nails, and external fixation.

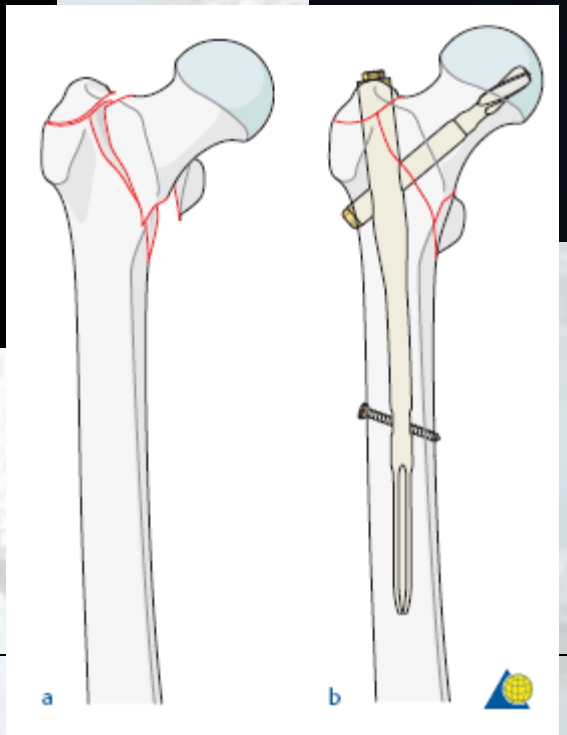
Cephalomedullary Nail

Proximal Hip Fractures

Cephalomedullary Nail



Cephalomedullary Nail (TFN)



4 Stages of Nailing

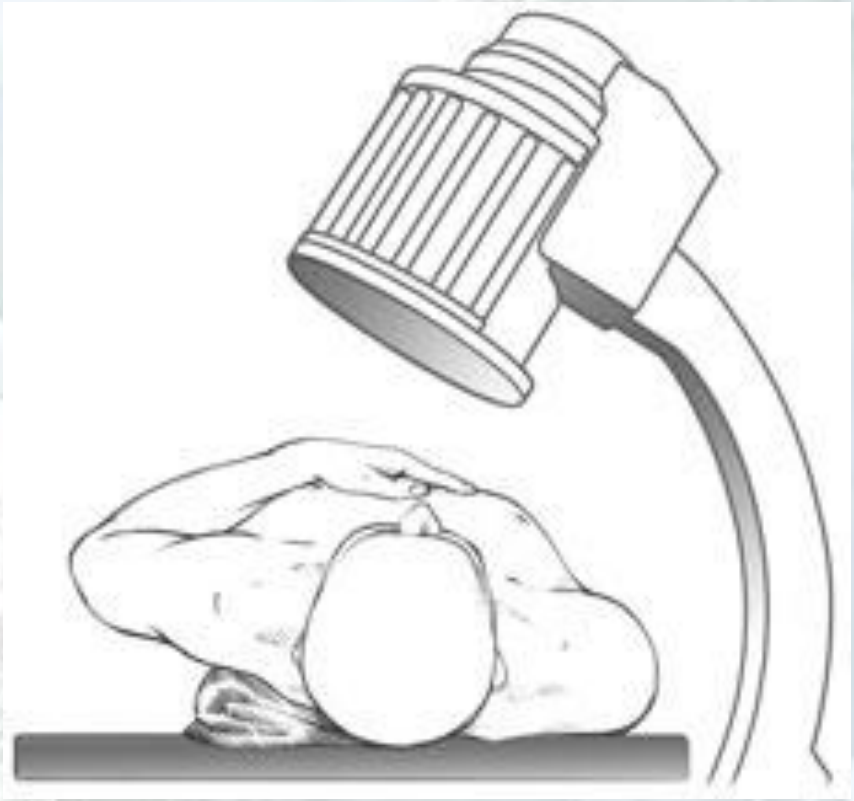
For all long bones, the same basic steps must be completed in order to insert and remove a nail.

***O**pen*

***R**eduction*

***I**nsertion*

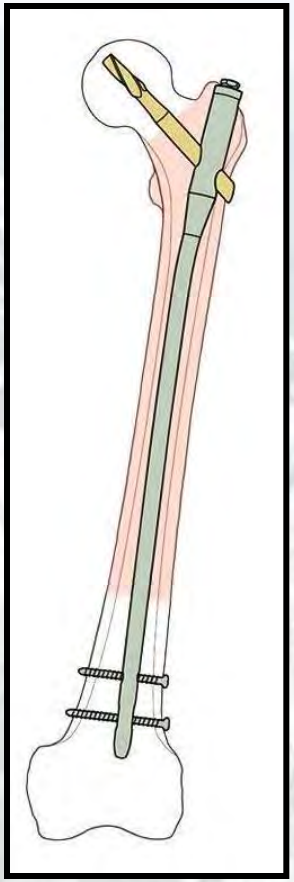
***F**ix*



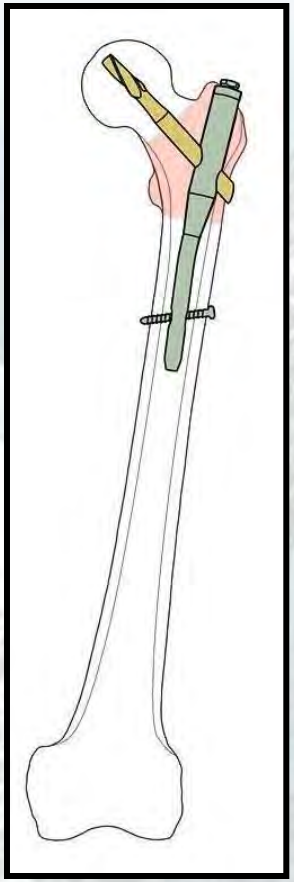
Trochanteric Fixation Nail

TFN Implants

Long Nails



Short Nails



Helical Blades

Locking Bolts or Screws

End Caps

Technique

Open proximal femur

Ream if necessary

Insert nail

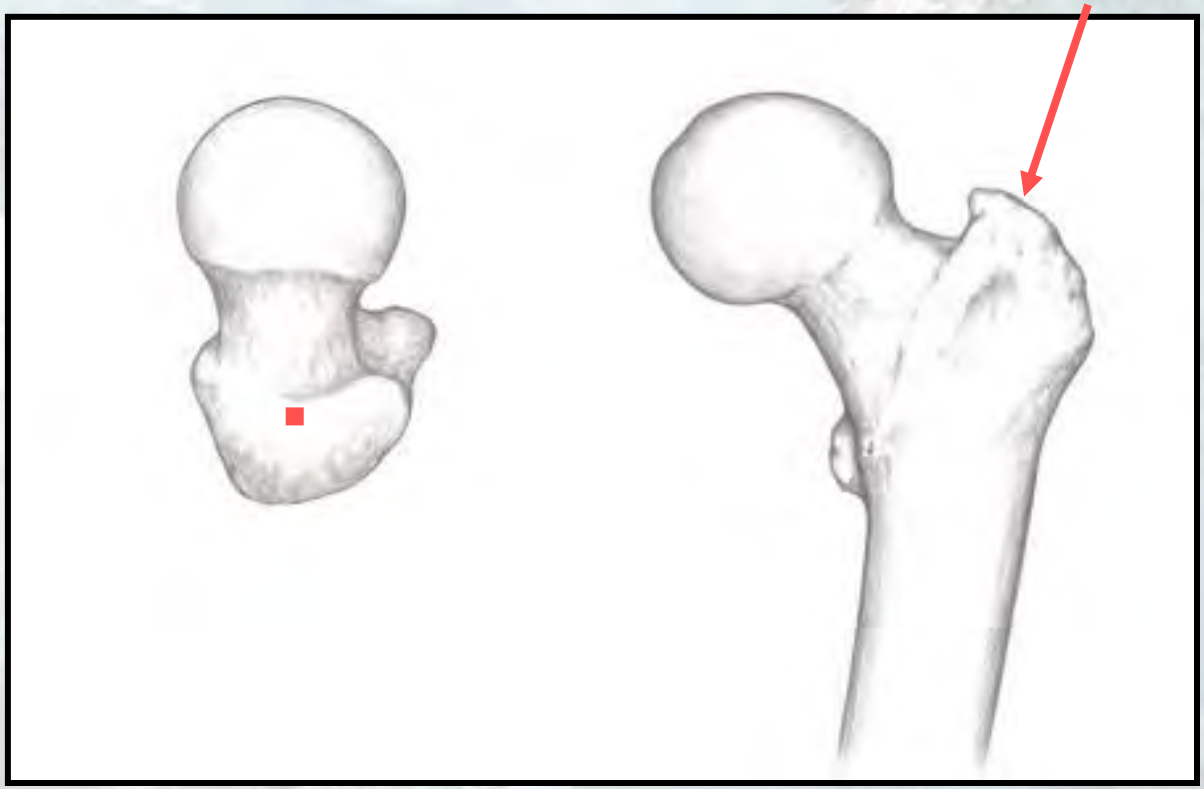
Fix proximal, then distal

Open

Identify nail entry point:

Lateral view: In line with canal

AP view: Slightly lateral to tip of greater trochanter



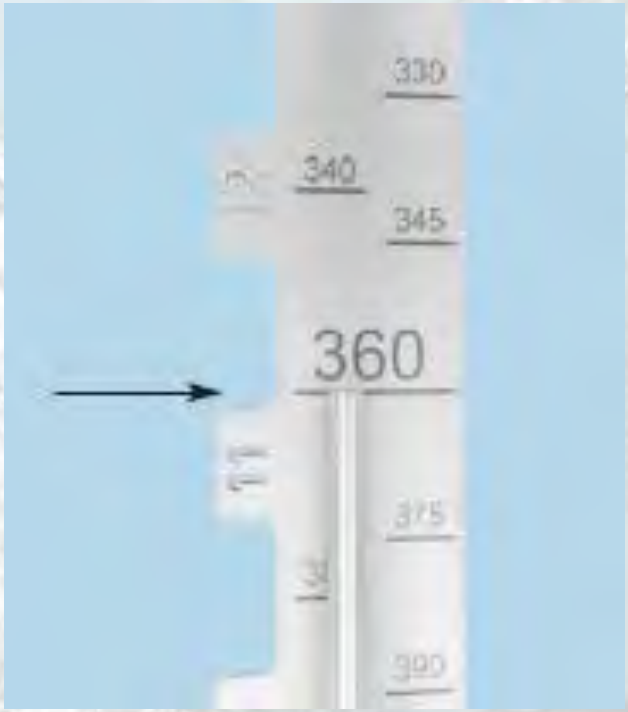
Opening Proximal Femur

Open Canal

Drill to stop on drill bit inside protection sleeve

Measuring the Femur

- Over the reaming rod
- Direct read measurement



Reaming the Femur

Push down and turn

Reaming the Femur

- Safely remove reamer head
- SHARP – do not touch
  - can cut glove

Technique

Assemble nail to handle using Connecting Screw and Ball Hex Screwdriver

Important: Connecting screw must be tight!

Inserting the Nail

Insert nail

- Short nails, orient handle laterally
- Long nails, first orient handle anteriorly, advance, then turn handle laterally

For lab, advance nail with Driving Cap and Mallet

Locking the Nail

Insert Blade Guide Sleeve with Buttress/Compression Nut

Insert wire drill guide & trocar (yellow)

Turn nut to advance sleeve to bone

Technique

Drill for Helical Blade with two drills:

Tapered Drill Bit (Cannulated)

Stepped Drill Bit (Cannulated)

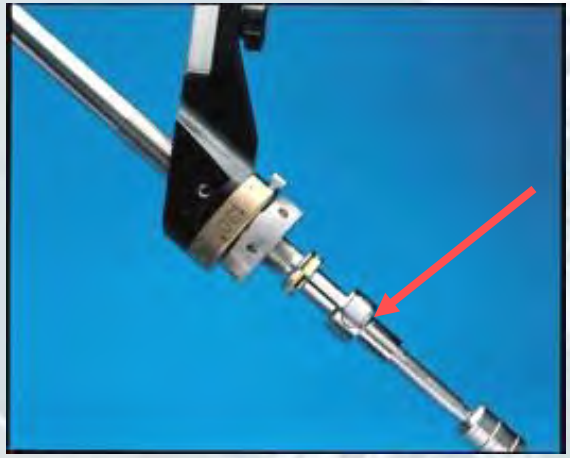
Technique

Tapered Drill Bit

- Opens lateral cortex

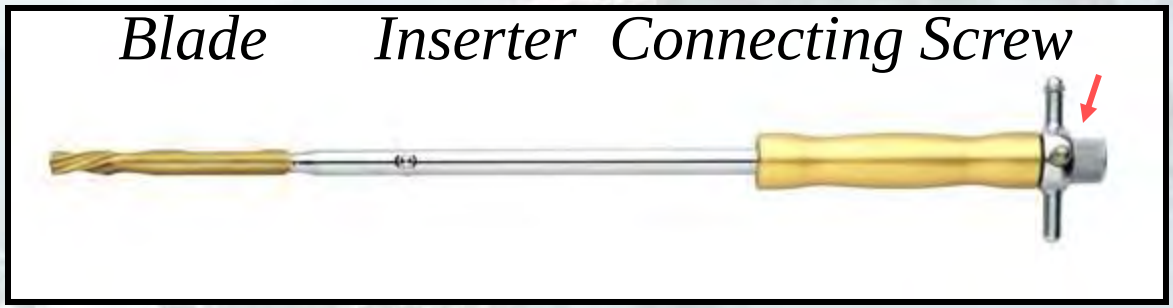
Stepped Drill Bit

- For dense bone and lab bone
- Prepares path for helical blade
- Place drill stop over end of drill & tighten at measured blade length



Technique

Assemble Helical Blade:



Locking the Nail

Lab:

Retract Guide Wire

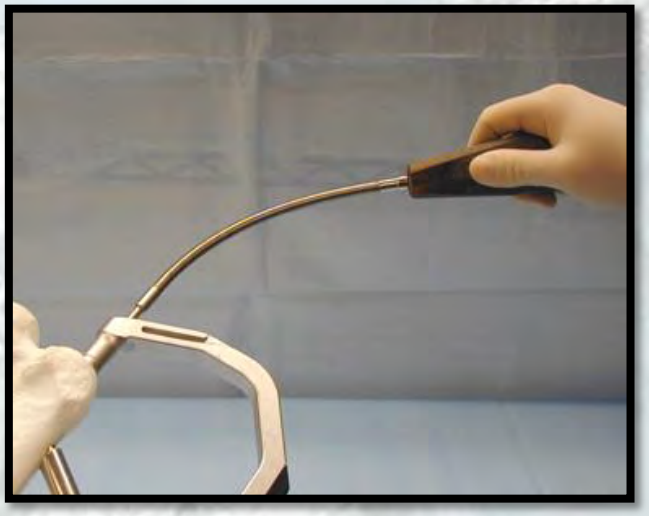
Insert Helical Blade

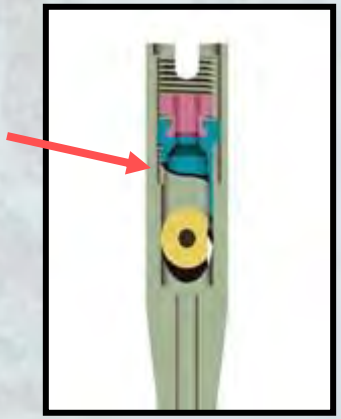
Align the three silver ball bearings on inserter with grooves inside Blade Guide Sleeve (will align only one way)

Locking the Nail

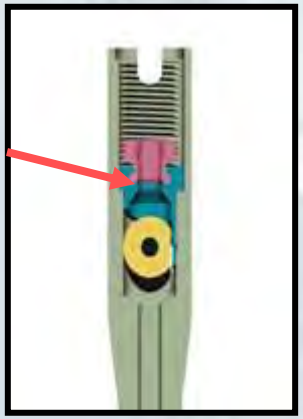
Engage locking mechanism w/Flexible Hex Screwdriver

Locks Helical Blade & stops blade from rotating





Not Engaged



Engaged

Note: If locking mechanism is not advanced, use of end cap is not possible

Removal Technique

1. Remove nail end cap with Flexible SD
2. Disengage internal locking mechanism with Flexible SD through Nail Extraction Screw
3. Remove Helical Blade with Helical Blade Extractor
4. Remove distal screws/bolts with regular SD
5. Remove nail with Nail Extraction Screw, Hammer Guide & Slide Hammer

Skeletal Simulations

The Skeletal Simulations program offers animated interactive learning for operating room personnel.

Learners can explore and test their knowledge of orthopaedic instrument and implant sets with simulated hands-on technology.

The courses offered give operating room staff the opportunity to familiarize themselves with set contents and to actively step through procedures, all while earning RN and Surgical Technologist Continuing Education credits. More information is available on the site.

This program is funded through an educational grant provided by Synthes.

http://www.skeletalsimulations.com/

Workshop Feedback Forms

Anonymity Optional

Greatly Appreciated

Place inside manilla-coloured envelope


Thank you!