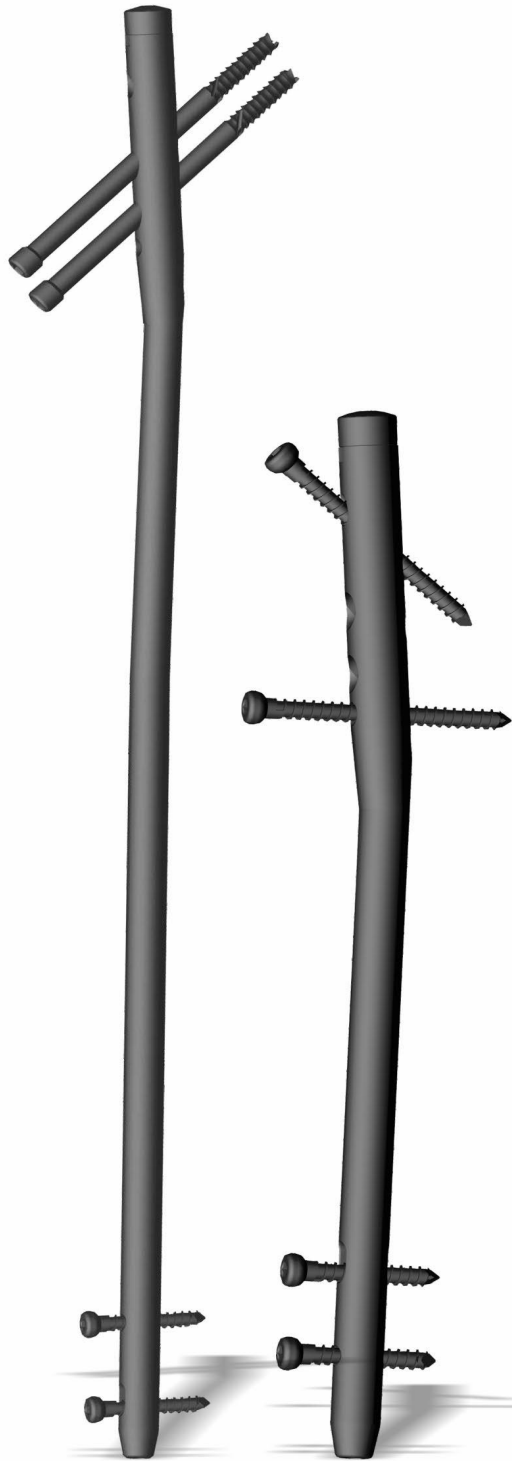


SURGICAL TECHNIQUE

NEW ANTEGRADE FEMUR NAIL



NEW ANTEGRADE FEMUR NAIL

Technique Guide



Introduction

NEW ANTIGRADE FEMUR NAIL

SPCPL Principles

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Introduction

NEW ANTIGRADE FEMUR NAIL

Enter Point

Greater Trochanter (GT)

Proximal diameter 13.5mm

7.0mm Bolt(Cannulated) Femoral Neck Screw
Lengths 50mm–120mm (Diff 5.0mm)
For true rotational stability

Degree of Nail- **125°**

Shaft/Distal Diameters of **9mm To 15mm(Diff. 1.0mm)**

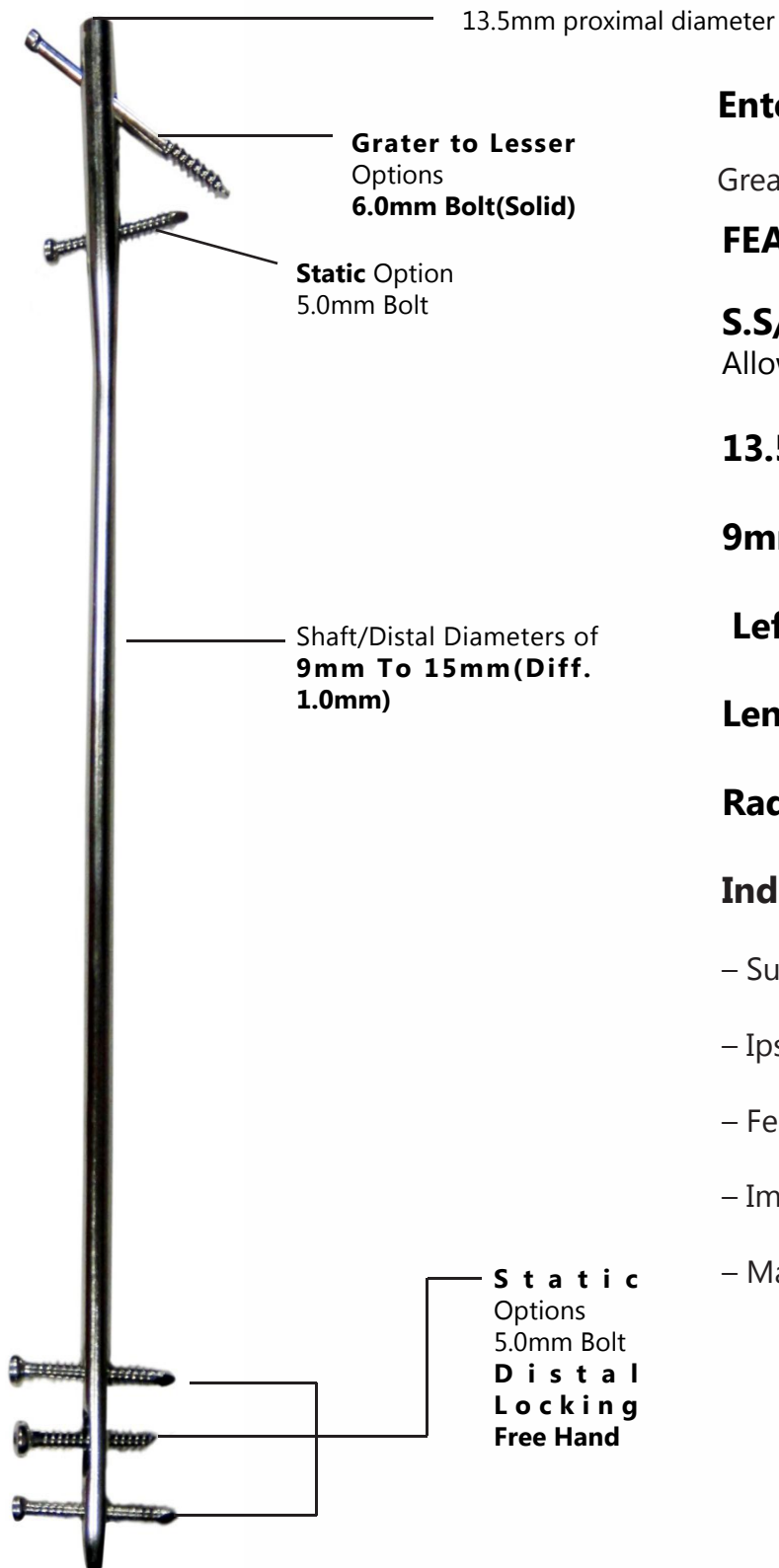
5.0mm Locking Bolt

Lengths 18mm–96mm (Diff 2mm)
A choice of static or dynamic interlocking (Dynamization: 5mm)
Distal Locking Free Hand

The NEW ANTIGRADE FEMUR NAIL is available in Titanium and Stainless Steel Total length: **30cm-48cm (Diff 2.0mm)**
Standard- **(Left & Right)**

Introduction

NEW ANTIGRADE FEMUR NAIL



Enter Point

Greater Trochanter (GT)

FEATURES AND BENEFITS

S.S/Titanium nail and locking bolt

Allows MRI investigation, if necessary

13.5mm Proximal Diameter

9mm-15mm Distal Diameter

Left and Right

Lengths -30cm-48cm (Diff 2.0cm)

Radius of curve 2 Miter

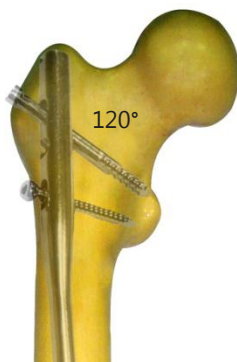
Indicated to Stabilize:

- Subtrochanteric Fractures
- Ipsilateral Neck/Shaft Fractures
- Femoral Shaft Fractures
- Impending Pathologic Fractures
- Malunions and Nonunion

Proximal locking

THREE POSSIBLE CONFIGURATIONS:

Oblique



6.0mm Bolt(Solid)

Length:- 50mm To 120mm(5.0mmDiff)

5.0mm Bolt For Proximal Locking

Length:- 18mm To 96mm

Recon



7.0 mm Bolt(cannulated)

Length:-50mm To 120mm(5.0mmDiff)

Distal Locking



5.0mm Bolt For Distal Locking

Length:- 18mm To 96mm

End Caps



SPCPL Principles

The SPCPL formulated four basic principles, which have become the guidelines for internal fixation in general, and intramedullary nailing in particular 2:

Anatomic Reduction

The Titanium Cannulated Expert Lateral Entry Femoral Recon Nail is designed to fit anatomically in the medullary canal, allowing indirect reduction.

Stable Fixation

The intramedullary nail acts as an internal splint that controls but does not prevent micro movements of the fragments. It provides relative stability that leads to an indirect healing through callus formation.

Preservation of Blood Supply

The instruments and implants in the Lateral Entry Femoral Recon Nail Expert System permit a percutaneous technique and less tissue stripping than other treatment methods. An intramedullary approach results in decreased blood loss compared to plate fixation.

Early. Active Mobilization

The S.S/Titanium Cannulated expert lateral entry femoral recon nail provides secure fixation which permits controlled, early, active rehabilitation conducive to optimal recovery.

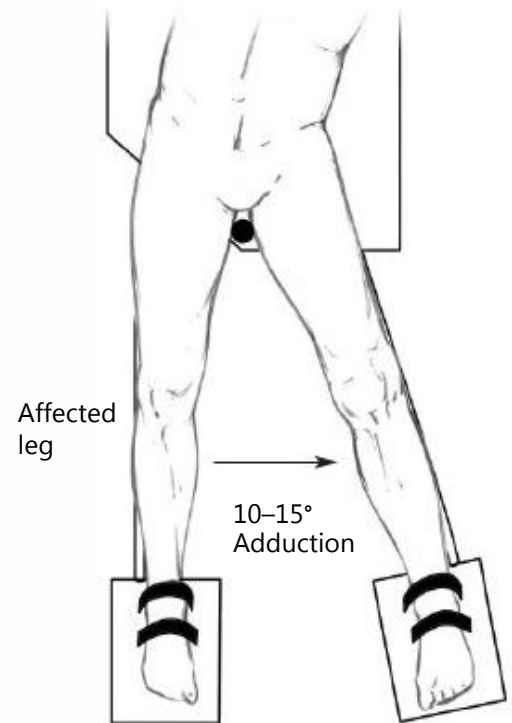
Position Patient

Position the patient in the lateral decubitus or supine position on a fracture table or radiolucent operating table. Position the C-arm to allow visualization of the proximal femur in both the AP and lateral planes.

To facilitate access to the medullary canal, abduct the upper part of the body approximately 10°–15° to the contralateral side and adduct the affected limb by 10°–15°.

Reduce Fracture

Perform closed reduction manually by axial traction under image intensifier control. The use of the large distractor may be appropriate in certain circumstances.



Confirm Nail Length

The required nail length must be determined after reduction of the femoral fracture.

Position the C-arm for an AP view of the proximal femur. With long forceps, hold the ruler alongside the lateral thigh, parallel to and at the same level as the femur. Adjust the ruler until the proximal end is at the desired nail insertion depth. Mark the skin at the proximal end of the ruler.

Move the C-arm to the distal femur. Verify fracture reduction. Align the proximal end of the radiographic ruler to the skin mark, and take an AP image of the distal femur.

Read nail length directly from the ruler image, selecting the measurement at or just proximal to the epiphyseal scar, or at the chosen insertion depth.

Notes:

It is recommended that all fractures be treated with the longest nail possible, taking into account patient anatomy or a previous implant.

Back-hammering or dynamization to close a fracture gap must be taken into account when determining the nail length. A shorter nail should be chosen when back-hammering or dynamization is planned. The dynamic slot allows 7 mm of movement.

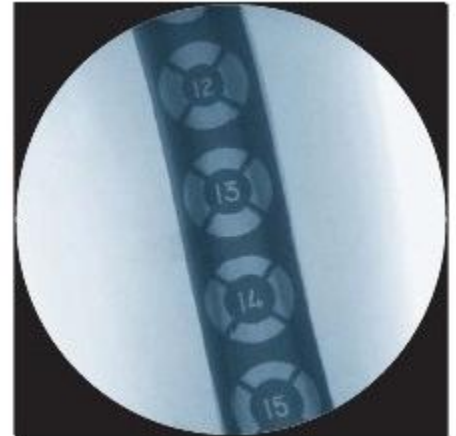


Confirm nail diameter

Position the C-arm for an AP or lateral view of the femur at the level of the isthmus. Hold the radiographic canal width estimator over the femur so that the diameter gauge is centered over the narrowest part of the medullary canal. Read the estimated diameter measurement on the circular indicator that fills the canal.

Note:

If the reamed technique is used, the diameter of the largest medullary reamer must be a minimum of 1.0mm larger than the nail diameter.



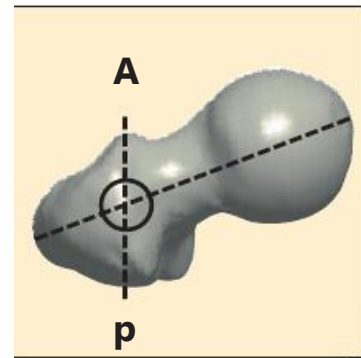
Approach

Palpate the posterior edge of the Greater Trochanter (GT).

Make a 3 cm incision in line with the central axis of the intramedullary canal in the lateral view, and depending on the anatomy of the patient, 2 cm – 5 cm proximal to the tip of the greater trochanter.

Determine entry point

The insertion point for the nail is approximately 20 mm lateral to the center of the medullary canal. The insertion point is 10° lateral to the greater trochanter, as measured from a point 40 mm distal to the lesser trochanter.



The entry point can also be described as lateral to the greater trochanter at the same level as the superior aspect of the base of the femoral neck (just above the piri formic fossa). This point can be found by extending a line horizontally from the base of the femoral neck to the lateral side of the femur.

1. Insertion of the Guide Wire

Make a longitudinal incision proximal to the greater trochanter, through the gluteus medius. Using the universal chuck insert the 3mm calibrated guide wire through the incision into the medullary canal to a depth of 10 cm. Confirm the direction and depth with AP and lateral image intensification views.



Opening of the medullary canal with the Awl and the tissue protection sleeve over the guide wire.



Insertion of the guide Wire into the medullary Canal.

2. Opening of the Medullary Canal

Slide the tissue protection sleeve (13mm) over the inlaying Guide Wire (3.0mm, length 365mm). The Cannulated awl (13mm) is pushed forward over the Guide Wire using light rotating motions until the stop on the tissue protection sleeve is Seated.

2a. Reaming of the Medullary Canal

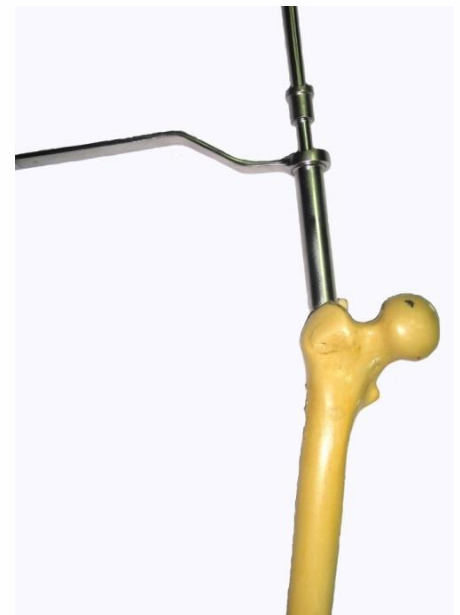
The tissue protection sleeve (13mm) used in the opening of the medullary canal is left in position. The awl or flexible shaft trochanteric reamer and the guide wire are removed. The reaming rod with ball tip (3.0mm) is inserted using the universal chuck and the image intensifier. The correct position of the tip of the reaming rod and the correct reposition of the fracture is then confirmed in both planes.

In cases of difficult reduction, the usual reduction techniques can be used. In particular the joystick technique might be a good option.

In the distal metaphyseal area of the femur, attention should be paid to place the reaming rod centrally in the medullary canal in both planes.

It is recommended to ream 1mm larger than the chosen nail diameter.

In case of dense or hard bone, the medullary canal can be opened with the Flexible Shaft Cannulated Trochanteric Reamer (13mm). The medullary canal is predrilled until the stop on the tissue protection sleeve is seated.



Insertion of the New Antegrade Femur Nail

NOTE

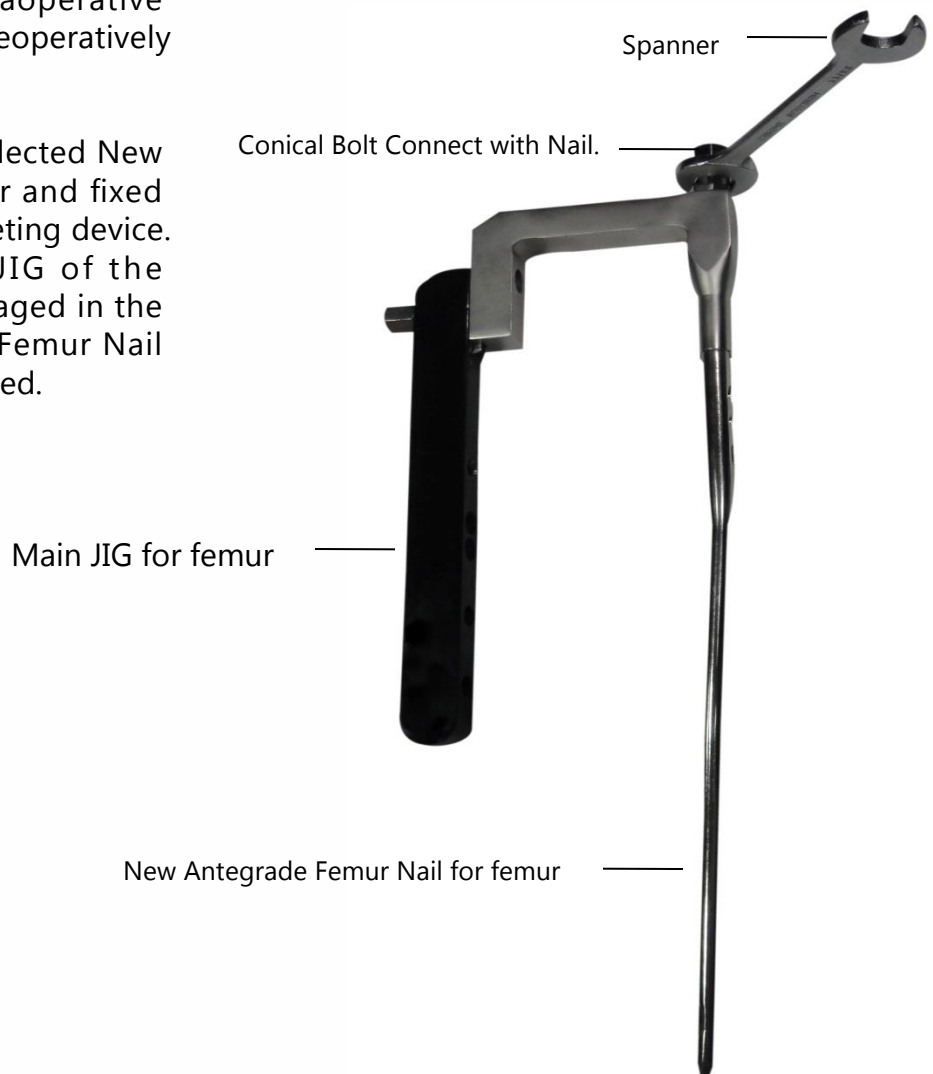
The New Antegrade Femur Nail has an anatomical shape. Therefore there are different nails for left and right. Nails marked LEFT must be used for the left femur only. Nails marked RIGHT must be used for the right femur only.

1. Attaching the Main JIG

The length and diameter of the Easy Universal Femur Nail are determined intraoperative using the measuring device or preoperatively using the X-ray templates.

The Main JIG is placed on the selected New Antegrade Femur Nail for femur and fixed with the Conical Bolt for the targeting device. When doing this, the Main JIG of the targeting device have to be engaged in the grooves of the New Antegrade Femur Nail and the Conical Bolt firmly tightened.

New Antegrade Femur Nail for femur and Main JIG



2. Insertion of the intramedullary nail for femur with the targeting device

Due to the anatomical nail shape the nail must be rotated approximately 90° during insertion. By applying this technique, stress peaks in the bone can be avoided.

The Easy Universal Femur Nail and targeting device unit is inserted over the smooth guide wire (∅ 3.0mm) into the medullary canal by hand using light pressure with the targeting device oriented anteriorly. Since the patient is in the supine position, the targeting device therefore points upwards.

After passage of the proximal metaphysis the targeting device is slowly rotated by pushing the nail further down the intramedullary canal. At the end of the insertion the targeting device is rotated by approximately 90° and lies in a lateral Direction.

2a. Insertion of the intramedullary nail for femur

If necessary, the intramedullary nail can be driven with light, controlled blows into the medullary canal. To do this, the Ram guide is screwed onto the connection screw and the Ram then mounted onto the guide. Finally the driving head is screwed onto the Ram guide.

NOTE

It is important that the nail advances into the medullary canal with each blow. If this is not the case, the impaction must be stopped and the cause determined using the image intensifier. If necessary, a nail with a smaller diameter must be used or the medullary canal reamed larger.

After nail insertion, the Ram guide assembly is removed from the connection screw. The connection screw remains firmly attached to the intramedullary nail and the targeting device.

3. Removal of the smooth guide wire (3.0mm)

4. Confirmation of the final position of the New Antegrade Femur Nail

The final position of the intramedullary nail must be checked in both planes with the image intensifier. In particular, the correct rotation of the extremity must be checked at this time.



Proximal Locking Options



Proximal locking 125° with two Recon Bolts



Proximal locking with 120° locking Bolt and dynamic locking option

Insert First Proximal Bolt

Insertion of 2.0mm Guide Pins for femur nail 7.0mm Bolt

Choose a position in the caudal area of the femur head so that both proximal Bolt can be inserted. Insert the Guide Pin 2.0mm deeper into the femoral head than the planned femoral head Bolt. The final position of the guide wire should be in the lower half of the femoral neck. In lateral view, the wire should be positioned in the centre of the femoral neck.

Make a stab incision and insert the 7.0mm Main Sleeve through the JIG to the bone. Mark the femur and remove the trocar.

Insert a 2.0mm Guide Pin through the 2.0mm Guide Sleeve, check direction and position under image intensifier in AP and lateral views.

Note:

If the nail has to be repositioned, remove Guide Pin, Guide Sleeve, Main Sleeve and drill sleeve. The nail can now be repositioned by rotation, deeper insertion or partial retraction. Then reinsert the drill sleeve system and Guide Pin.

Approx. 15–20mm shorter than the caudal Guide Pin.



Drill hole for 7.0mm Bolt(Cannulated)

Advance the Cannulated 7.0mm Drill Bit over the 2.0mm Guide Pin through 7.0mm Drill Sleeve. Drill to the stop (maximum drilling depth: 45mm). As the tip of the 7.0mm Bolt is self-tapping, usually no further drilling and tapping is needed.

In hard or young bone, further drilling and tapping with the Cannulated 7.0mm Tap is recommended up to the length of the Bolt with 7.0mm T-Handle Drill Tap.



Measure length of 7.0mm Bolt(Cannulated)

It is recommended to start with the insertion of the hip pin to prevent possible rotation of the medial fragment when inserting the femoral neck Bolt.

Bolt.

Remove the 7.0mm Drill sleeve, measure the Length of the Bolt through the Depth Gauge to the Main Sleeve and determine the length of the required Bolt. The length of this pin is indicated on the Depth Gauge and calculated to end 5.0mm before the tip of the Guide Pin.



Insertion of 7.0mm Bolt(Cannulated)

Use the 5.0mm Cannulated Hexagonal Screwdriver to insert the selected 7.0mm Bolt over the guide wire to the stop.

Remove and discard the 2.0mm Guide Pin of the hip pin.

If required more tighten/fixation of Bolt use 5.0mm solid Hexagonal Screwdriver.

Caution:

Do not insert the hip pin with undue force. Ensure that the lateral end of the hip pin clearly protrudes from the lateral cortex. Check under image intensification that hip pin is not inserted too far.



Insert Second Proximal Bolt

Insertion of 2.0mm Guide Pins for femur nail 7.0mm Bolt

Choose a position in the caudal area of the femur head so that both proximal Bolt can be inserted. Insert the Guide Pin 2.0mm deeper into the femoral head than the planned femoral head Bolt. The final position of the guide wire should be in the lower half of the femoral neck. In lateral view, the wire should be positioned in the centre of the femoral neck.

Make a stab incision and insert the 7.0mm Main Sleeve through the JIG to the bone. Mark the femur and remove the trocar.

Insert a 2.0mm Guide Pin through the 2.0mm Guide Sleeve, check direction and position under image intensifier in AP and lateral views.

Note:

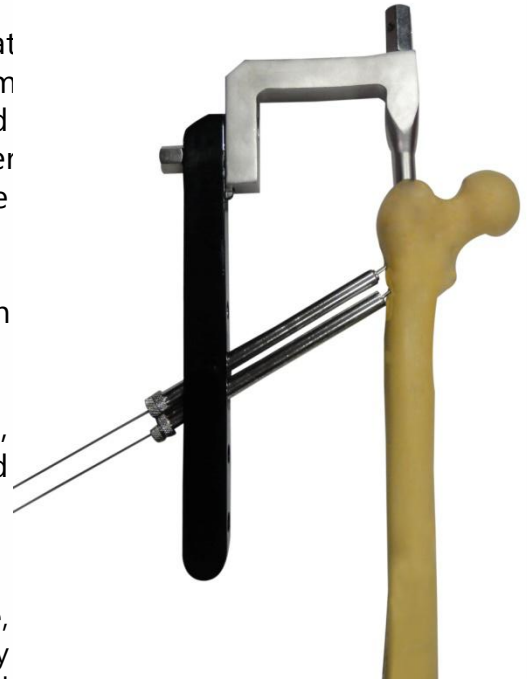
If the nail has to be repositioned, remove Guide Pin, Guide Sleeve, Main Sleeve and drill sleeve. The nail can now be repositioned by rotation, deeper insertion or partial retraction. Then reinsert the drill sleeve system and Guide Pin.

Approx. 15–20mm shorter than the caudal Guide Pin.

Drill hole for 7.0mm Bolt(Cannulated)

Advance the Cannulated 7.0mm Drill Bit over the 2.0mm Guide Pin through 7.0mm Drill Sleeve. Drill to the stop (maximum drilling depth: 45mm). As the tip of the 7.0mm Bolt is self-tapping, usually no further drilling and tapping is needed.

In hard or young bone, further drilling and tapping with the Cannulated 7.0mm Tap is recommended up to the length of the Bolt with 7.0mm T-Handle Drill Tap.



Measure length of 7.0mm Bolt(Cannulated)

It is recommended to start with the insertion of the hip pin to prevent possible rotation of the medial fragment when inserting the femoral neck Bolt.

Bolt.

Remove the 7.0mm Drill sleeve, measure the Length of the Bolt through the Depth Gauge to the Main Sleeve and determine the length of the required Bolt. The length of this pin is indicated on the Depth Gauge and calculated to end 5mm before the tip of the Guide Pin.



Insertion of 7.0mm Bolt(Cannulated)

Use the 5.0mm Cannulated Hexagonal Screwdriver to insert the selected 6.0mm Bolt over the guide wire to the stop.

Remove and discard the 2.0mm Guide Pin of the hip pin.

If required more tighten/fixation of Bolt use 5.0mm solid Hexagonal Screwdriver.

Caution:

Do not insert the hip pin with undue force. Ensure that the lateral end of the hip pin clearly protrudes from the lateral cortex. Check under image intensification that hip pin is not inserted too far.



Insert Proximal Bolt

Drill hole for 6.0mm Bolt(Cannulated)

Advance the Cannulated 6.0mm Drill Bit over trough 6.0mm Drill Sleeve. Drill to the stop (maximum drilling depth: 45mm). As the tip of the 6.0mm Bolt is self-tapping, usually no further drilling and tapping is needed.



Measure length of 6.0mm Bolt(Solid)

It is recommended to start with the insertion of the hip pin to prevent possible rotation of the medial fragment when inserting the femoral neck Bolt.

Remove the 6.0mm Drill sleeve, measure the Length of the Bolt through the Depth Gauge to the Main Sleeve and determine the length of the required Bolt. The length of this pin is indicated on the Depth Gauge.



Insertion of 6.0mm Bolt(Solid)

Use the 5.0mm Solid Hexagonal Screwdriver to insert the selected 6.0mm Bolt over the guide wire to the stop.



Insert Proximal Bolt :-

A. Lateral – Medial (LM)proximal locking:

Instrument

Main Sleeve
4.0mm Drill Sleeve
4.0mm Drill Bit
Depth Gauge
4.5mm Screw Driver

Use the Inter locking Bolt 5.0mm in combination with the **LM** locking options of New Antegrade Femur Nails with 9mm to 15mm.

The Second Two proximal Hole in MAIN JIG locked Proximal Hole of New Antegrade Femur Nail.(a)



Use Main Sleeve and 4.0mm Drill Sleeve with the 4.0mm Drill Bit, For 5.0 mm Inter Locking Bolt .



Measure the Locking Bolt length using the Depth Gauge for 5.0mm Inter locking Bolt.

Insert a 5.0mm Locking Bolt of the measured length with the 4.5mm Screw Driver through the Main Sleeve until the Locking Bolt head lies against the near cortex. The tip of the Locking Screw should project beyond the far cortex by no more than 1–2 mm.

Repeat the procedure for the second proximal locking Bolt.



Distal Locking Same For Both Options Nail

There are three distal locking options:

- Two transverse, lateral to medial holes
- One oblique locking hole for enhanced stability of distal fractures

Nail diameter

9mm To 15mm

Locking Bolts

5.0 mm

Drill bit

4.0 mm

If using the oblique locking hole, insert at least one transverse LM Bolt prior to rotating the leg for the oblique locking hole. This will maintain rotational alignment.



Insert Distal Bolt

Instrument

4.0mm Drill Bit

4.5mm Screw Driver

1. Align image intensifier

Check the reduction, correct alignment of the fragments and length before locking the New Antegrade Femur Nail.

Align the image intensifier until the nail hole appears completely round (here the lower LM hole).



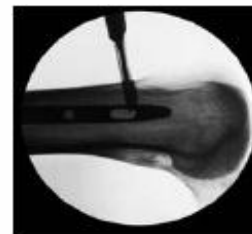
2. Drill

Instruments

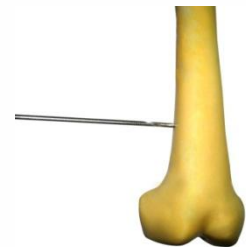
4.0mm Drill Bit

Insert desired 4.0mm Drill Bit in the radiolucent drive and push through the incision down to the bone. Incline the drive so that the tip of the 4.0mm Drill Bit is centered over the locking hole. The Drill Bit should almost completely fill the circle of the locking hole. Hold the Drill Bit in this position and drill through both cortices until the tip of the Drill Bit just breaks through the lateral cortex.

If there is no radiolucent drive available and locking is performed with the standard freehand technique use the Drill Bit 4.0 mm.



Determine incision point

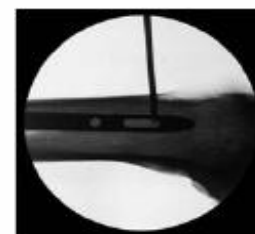


Centre drill bit in locking hole

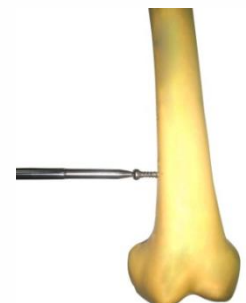
3. Insert Distal Bolt

Insert a 5.0mm Locking Bolt of the measured length with the 4.5mm Screw Driver through the Main Sleeve until the Locking Bolt head lies against the near cortex. The tip of the Locking Screw should project beyond the far cortex by no more than 1–2 mm.

Repeat the procedure for the second distal locking Bolt.



Centre drill bit in locking hole



Insert Locking Bolt

Insertion of the End Cap :-

Instrument

4.5mm Screwdriver

Remove the Conical Bolt and the MAIN JIG.

Insert the proximal end cap of nail with the 4.5mm Screwdriver. To minimize the chance of cross threading, turn the End Cap counter clockwise until the thread of the End Cap aligns with that of the nail.

By turning clockwise, screw the End Cap into the nail and tighten it familiar.

Remove the 4.5mm Screwdriver.



End Cap



Standard

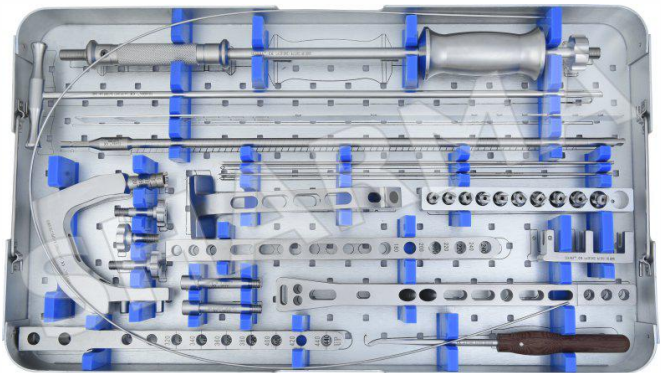
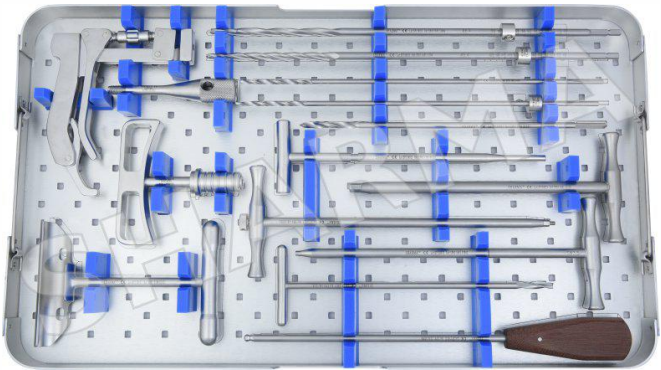
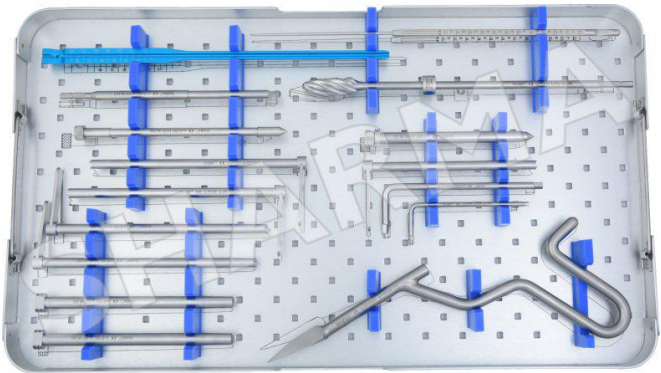
+5mm

+10mm

+15mm

+20mm

Instruments





We feel proud to introduce ourselves as a foremost manufacturer and exporter in orthopedic implants and instruments. We offer a wide & growing range of the highest quality orthopedic implants & instrumentation along with other associated products at reasonable cost.

We have got a sound and firm position in the orthopedic industry by having a sturdy **network of distributors domestically & around the globe**. We are having the most modern technologies and are one of the leading manufacturers (since 1992) with pinnacle superiority of Ortho-Implants and instrumentations. We offer a wide range of **Orthopedic Products** made up of **S.S 316L, S.S (ISO 5832-1) and Titanium Alloy (ISO 5832-3)**. We have employed Quality management System which confirms to **ISO 9001 & ISO 13485** standards.

Our all products are **CE** marked as per European Council Directive. **93/42/EEC** and are licensed by **Indian FDA** for manufacturing. Based on the principles of Quality Excellency, our product satisfies the expectations of our customers. We are associated with major medical Institutions of India for supplying the products. We continually participate in almost all major exhibitions of Orthopedics around the world to promote our products.

Our motto is to provide the **Best Quality Products** and to continue as a leading manufacturer and supplier of these products in the global market. We are growing rapidly in terms of world-wide sales because of our extensive product range, its quality & services by orthopedic surgeons.



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CIN : U33110GJ2014PTC081007 **GSTIN :** 24AAVCS0195E125