

# Interlocking Nail™ Procedure Instruction Sheet

## Preoperatively:

The proper length of nail is determined preoperatively by radiographs of the opposite bone. The nail should extend well below the fracture site. Ideally the nail fills the majority of the medullary canal, and the nail should extend nearly the full bone length. Due to caudal curvature of the femur, caution must be used distally so that the nail is not forced through the cranial cortex.

Templates are provided to help with nail selection prior to starting procedure. Templates are designed to be laid over radiographs to help determine if nail will fit properly into the medullary canal and determine its hole locations. It is important that the screws/bolts are at least 2mm away from fracture site.

The following Interlocking Nail™ sizes are available:

Model 11

- 4.0mm diameter – 3 and 4 hole version with 2.0mm screw or bolt
- 4.7mm diameter – 3 and 4 hole version with 2.0mm screw or bolt
- 6.0mm diameter – 3 and 4 hole version with 2.7mm screw or bolt
- 8.0mm diameter – 3 and 4 hole version with 3.5mm screw or bolt

Model 22

- 6.0mm diameter – 3 and 4 hole version with 3.5mm screw or bolt
- 8.0mm diameter – 3 and 4 hole version with 4.5mm screw or bolt

## Approach and Preparing Medullary Canal:

For Nail insertion by open reduction, a standard approach to the fracture site is used. To open the medullary canal for later nail insertion the reamer is manually driven retrograde or normograde. After fracture reduction is manually attained with correct rotational and axial alignment, the nail is introduced normograde until the fracture is secure. The nail may be left slightly protruding or recessed below the joint (e.g. joint) Depth indicating rings, spaced 2mm, are located on the Nail Extension.

## Assembly of Equipment:

1. After selecting the proper Interlocking Nail™ attach either the Tibial or Femoral Extension. Using the Hex Driver tighten the internal screw inside the extension to the Interlocking Nail™.
2. Attach the Insertion Tool to either Tibial/Femoral Extension. Power adapter may be used in place of Insertion Tool for insertion of Interlocking Nail™ with a power drill. Power Adapter will attach to the Tibial/Femoral Extension and then a standard three jaw chuck will attach to Power Adapter.
3. Make note of the Interlocking Nail™ that you will be inserting into medullary canal and which extension that is being used.
4. Insert Interlocking Nail™ normograde into medullary canal either manually or with power drill. Place the proximal end of the Interlocking Nail™ below the surface of the joint using the 2mm markings at the end of the Tibial/Femoral Extension to help determine depth.
5. Remove Insertion Tool or Power Adapter from Tibial or Femoral Extension and re-tightened internal screw inside the extension with your Hex Driver. *This is a very important step!* If not tight you may have difficulty hit most distal holes on the Interlocking Nail™
6. Attach Drill Jig to Tibial/Femoral Extension using the Attachment Screw.

### **Assembly of Equipment cont.**

7. Based on the information noted in step 3, find the active/open holes using the guide etched on the side of the Drill Jig. *Please note that on the Model 11 6/8mm Drill Jig, one side is marked with hole locations for Model 11 and the other side is marked with hole locations for Model 22. **VERY IMPORTANT TO NOTE!***

8. Typically the first screw is inserted in the most distal hole, since it will be the hardest active hole to locate, but know that screws may be placed in any order you feel is best.

9. Insert Guide Sleeve into Drill Jig where open or active hole is indicated.

10. Using Trocar to mark bone for a starting point for drill bit.

11. Insert Drill Guide into Guide Sleeve.

12. Place drill bit into Drill Guide. *(For use of Solid Cross Locking Bolts see below)*

Pilot Holes:

1.5mm for 2.0mm screws

2.0mm for 2.7mm screws

2.5mm for 3.5mm screws

3.2mm for 4.5mm screws

13. Drill hole through near cortex, Interlocking Nail™ hole, and then far cortex.

14. STOP and CONFIRM you have drill bit through hole in Interlocking Nail™ by trying to rotate the nail within the medullary canal. If the nail ***does not*** rotate inside bone you have proper drill bit placement. If nail ***does*** rotate you will need to re-drill new hole to make sure you have drill through hole in the Interlocking Nail™

15. Remove Drill Guide from Guide Sleeve

16. Using Depth Gauge measure the depth of the hole. Make note of the length of screw needed.

17. Insert Tap Guide into Guide Sleeve

18. Insert Tap in Tap Guide and Tap the hole completely.

19. Remove Tap Guide

20. Insert screw using screwdriver. The screw and screwdriver can be placed down the guide sleeve.

21. Repeat Steps 9-20 for the remaining active/open holes (except for step 14 – can only be confirmed on first drilled hole)

22. Remove Drill Jig for Extension.

23. Remove Extension for Nail.

#### **VERY IMPORTANT!!**

If internal screw binds as you are disengaging. STOP! Re-tighten screw to Interlocking Nail™. Pull back on Extension. Loosen internal screw one turn. Pull back on Extension. Loosen internal screw one turn. Pull back on Extension. Repeat these steps until Extension is free from the nail.

24. Closure of the Wound is routine and postoperative radio graphs are taken.

## **Use of Interlocking Nail Solid Cross Locking Bolts (SCLB)**

When using the SCLB's or a.k.a. Bolts, the tap guide becomes the drill guide in your basic Interlocking Nail™ instrumentation. You must drill the same diameter hole as the Bolt you will be using (e.g. 2.0mm drill bit for use of 2.0mm Bolt). The threads on the Bolt are self-tapping therefore no tapping is necessary and completely eliminates that step for previous instructions and the threads are larger than the hole drilled. Use the same screwdriver for Bolt as you would for a screw (e.g. 2.0mm screwdriver for 2.0mm bolt) The hex dimensions in the head of the Bolt are as follows:

- 1.5mm hex in 2.0mm Bolt
- 2.5mm hex in 2.7mm and 3.5mm Bolt
- 3.5mm hex in 4.5mm Bolt

## **Follow-up:**

Restricted exercise (leash only, no stairs, etc) is advised until 2 month recheck radiographs are obtained. After 4-6 months when the fracture has healed, if required the nail can be extracted by removing screws, and attaching the Insertion Tool to dislodge nail from osseous or fibrous ingrowth in the nail holes.

## **Cleaning and Maintenance of Equipment:**

1. Remove internal screws from Tibial/ Femoral Extension used with Hex Driver. The internal screw backs out of the Extension Knob. Clean remaining tissue from the shaft of extension. It is important that internal screws move freely within extension otherwise undue stress is applied to internal screw causing breakage of internal screw.

- *Remember the 6mm and 8mm femoral extension internal screws are the same, as well as 6mm and 8mm tibial extension internal screws, 4.0mm and 4.7mm femoral and tibial extensions. If you have an internal screw break during a procedure please use the internal screw from similar extension.*

2. Screwdriver tips may be removed from end of shaft for cleaning and then reused. They are made of a special medical grade material and can be autoclaved.

3. Depth Gauge can be disassembled for cleaning. Please following separate instructional sheet. Please note : if depth gauge is not working properly after being reassembled the key spots to recheck would be:

- the small internal cap that connects the probe shaft and probe cover within the nose piece.
- set screw in the knob of depth gauge – if to tight will not rotate. Loosen set screw ¼ of a turn.
- Probe shaft is not completely inserted into knob.

Questions ~ Comments ~ Concerns

Please feel free to call us and share your ideas



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