Nailing Stand
Instructions for Use
and
Guidance
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**Intended use**

INTELLIGENT ORTHOPAEDICS instruments consist of manual surgical instruments and devices intended for use in surgical procedures.

This instrument is a Class I reusable manual device. It is an additional item for use with the Staffordshire Orthopaedic Reduction Machine (størn) ONLY.

Instrument utilisation is determined by the user’s experience and training in surgical procedures. Do not use this instrument for any purpose outside the intended use of the device, as it may seriously affect the safety and function of the product.

**CAUTION:** Handle devices with care to prevent damage to surgical gloves.

**Recommendations for care, cleaning and sterilisation**

INTELLIGENT ORTHOPAEDICS recommends that the cleaning and decontamination of instruments and devices follow the guidelines set forth by MHRA, AORN/HIMA and AAMI. Both physical and chemical (detergent) processes are necessary to minimise the bioburden on all soiled items. Chemical (detergent) cleaners alone cannot remove all soil and debris therefore a careful manual cleaning of each item with soft sponge or cloth is essential for maximum decontamination. Carefully inspect hidden areas, such as recesses, to assure any residual materials are removed.

Once the items have been cleaned and decontaminated they should be thoroughly rinsed with clean water to remove any detergent or chemical residue before sterilisation. The use of mild enzymatic detergent with a low pH is recommended.

Materials used in INTELLIGENT ORTHOPAEDICS devices can be sterilised using steam sterilisation methods. MHRA, AORN/HIMA and AAMI guidelines for sizes, weights and mass should be followed. The device has been certified sterilisable using a Porous Load 134-137°C/3 minute cycle.

1. After sterilisation all instruments should be allowed to cool. The time of cooling is dependent on the load size and mass. Place instruments on a rack or shelf with linen cover until cooling is complete. The potential for condensation may increase if the case is not allowed to cool properly.

**CAUTION:** Hot instruments should not be handled or used as they can cause injury.

2. If condensation is observed check to ensure that cooling, as described in 1. above, has been followed. Verify that the steam being used for the sterilisation process has a quality of more than 97%. Also confirm that the sterilisers have been inspected for routine maintenance in accordance with manufacturer’s recommendations.

3. Suggested steam exposure times: (ref: HTM2010 Part 3)
   - Preferred: 134-137°C / 3 minutes
   - Alternatives: 126-129°C / 10 minutes
     - 121-124°C / 15 minutes
     - 115-118°C / 30 minutes
**Description**

The Staffordshire Orthopaedic Reduction Machine, stφrm, is a class I re-usable device. The nailing stand (Part 1-20-0) is an addition that replaces the normal proximal end to facilitate its use during Intramedullary nailing.

NOTE: stφrm is used with a variety of manufacturer’s nailing systems. If you have any queries how to use a specific IM nail with the device please contact us.

**Caution**

When used in conjunction with stφrm this device applies traction, the force can be large; care should be taken to avoid injury to the patient.

Care is recommended when used on minors or where potential damage to growth plates is expected.

**Classification of tibial fractures**

- **STABLE**: Fractures do not shorten or collapse when an axial load is applied.
- **UNSTABLE**: Fractures shorten or collapse under axial loading.
**Preparation**

1. Follow the nailing stand assembly procedure given in this document.

2. Follow the preparation and assembly instructions for stôrm.

3. Use the nailing stand proximal end (1-20-0) in place of the standard proximal brace (1-4-0). The nailing stand is at an angle to the stôrm tubes (1-0-1) to allow the stand to be upright when the proximal end of stôrm is elevated. Ensure that the nailing stand is assembled onto stôrm such that the base of the stand is distal to the fixing point (Fig 1).

**Pre-setting height**

1. Before insertion of wires it is advisable to pre-adjust the swinging arms to a desired height. This is best achieved before the procedure commences. The height may be varied at any time during the procedure using the push-pins.

   Note: the holes are spaced so that you can insert a push-pin under the swing-arm in order to obtain a temporary position. The pins can then be inserted in the actual holes for permanent location.

**Proximal Wire Insertion**

1. This procedure is identical to that when using stôrm.

2. The leg is then placed in the stôrm. An assistant holds the leg in the long axis of the stôrm while the stôrm operating kit (1-10-0) tension wire is inserted parallel to (about 20 mm below) the tibial plateau just anterior to the centre of the tibia on the lateral view and avoiding undue injury to the patient. Fig. 3

3. Use a powered driver, in the coronal plane.

4. The wire should be placed a safe distance from the lateral popliteal nerve.

5. The wire should pass through the wire tensioning components first and inserted until the end collet is in contact with the tensioners wire sleeve (1-0-4).

6. Take care not to allow the wire clamp to drop onto the floor.

   NOTE: Ensure that the position of the wire does not conflict with the selected method of treatment. For example, if access is needed to the anterior of the knee (as in IM nailing) another position for the proximal wire may be selected. In this situation, ensure that this position will not inhibit application of the selected treatment method nor should it cause undue injury to the patient.

7. Lock the wire by bending it, using the wire bender (1-6-2), into the groove in the wire-clamp (1-0-5). Fig. 4-6

8. Trim excess wire to length, place a protective sponge on the sharp end to avoid injury or damage.

9. Turn the wire tension nut (1-0-6) clockwise to tension the wire.

10. Use the torque grip (1-0-10) to achieve sufficient tension so that the wire does not sag or deform unduly.
Performing reduction

1. Follow the procedure as described in the størm surgical technique to reduce the fracture. Reduction should be performed with the leg extended and with størm in a horizontal position.

NOTE: størm enables the fracture to be reduced to near anatomical alignment, so you can expect to achieve better results than by using other methods of reduction

Performing intramedullary nailing

4. Once a satisfactory reduction has been achieved intramedullary nailing can commence.

5. Refer to the surgical technique and operating guide for the IM nail you are intending to use.

6. Flex the knee as desired (Fig 7): lifting the proximal end should cause the swinging arm to swing into place. Drop the proximal end such that it engages with the swinging arm and tighten the lock nuts. The height of the stand, and hence the flexion, can be adjusted by removing the push-pins and lifting or lowering the stand as desired and replacing the pins when the desired height is achieved. Some angulation of the swinging arm is possible, but ensure that both the lock nuts are tight and that the locating teeth are engaged.

NOTE: if the lock nuts are not tight, or the swinging arm is not engaged fully, or the location teeth have been missed or are damaged, then the stand could collapse and the limb could be injured. Make sure all lock nuts are tight before attempting to conduct an IM nail procedure.

7. To extend the knee, ensure all jigs and fixtures that may inhibit extension have been removed; do not attempt to extend the knee unless you are sure that it is safe to do so. Loosen the swinging arm locking nuts and it can by swung out of the way. The nailing stand can be lowered to rest on the operating table.

NOTE: To avoid shock loading to the knee, do not lower the stand rapidly. Manually support the knee whilst lowering the stand.
1. Ensure that you have all parts.
   - (1) 1 x proximal end 1-20-2
   - (2) 1 x swinging arm (left) 1-20-4L
   - (3) 1 x swinging arm (right) 1-204R
   - (4) 1 x swinging arm base 1-20-1
   - (5) 1 x tube clamp (left) 1-20-3L
   - (6) 1 x tube clamp (right) 1-20-3R
   - (7) 2 x lock nuts 1-0-8
   - 2 x 6mm push-pins

2. The original střem contains the additional lock nuts and wire tensioning components required.

3. Check that all components are free from damage before use.

4. Insert a push-pin into the lowest hole of the swinging arm base (closest to the base), one pin in each rod.

5. Slide one swinging arm onto each rod.

6. In a similar manner to the original proximal brace of střem attach the nailing stand proximal end to střem tubes. The stand is angled so ensure that the base of the proximal end is more distal than the location point on the tubes. Also, check that the correct tube clamp is used (match L to L and R to R).

7. The swinging arm assembly can be mounted on the swinging arm studs. Again, these are L to L and R to R. The lock nuts are put onto the studs, but not tightened. The swinging arm assembly should swing distally.