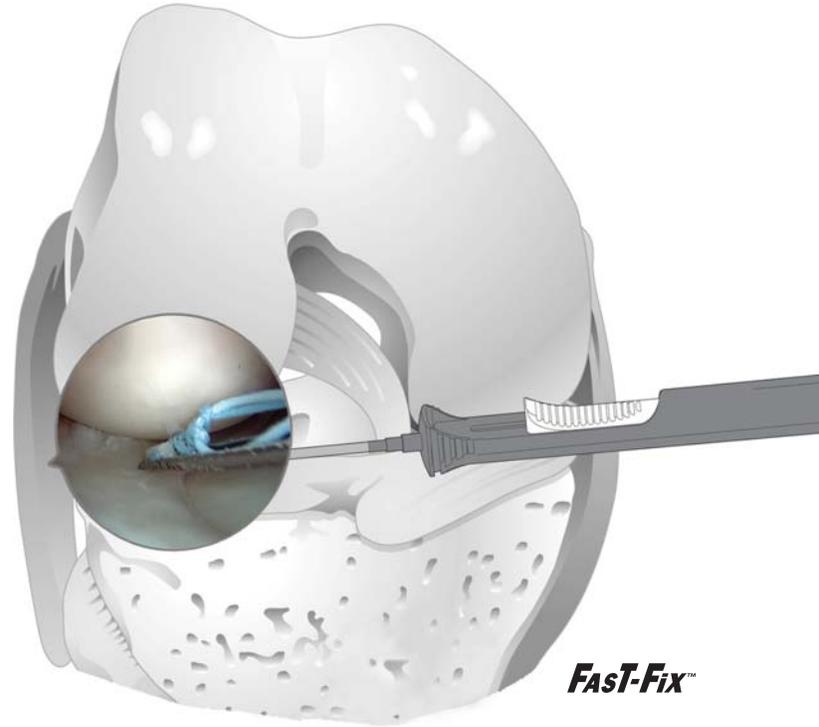


Meniscal Repair
with the
FasT-Fix™ Suture System



A Smith & Nephew Technique Plus™ Illustrated Guide

Meniscal Repair with the *FasT-Fix*™ Suture System

Repair of peripheral meniscal tears has become the standard of care as evidence accumulates supporting meniscal preservation and its role in joint nutrition, lubrication, stability, load transmission, shock absorption, neuromuscular proprioception and prevention of intra-articular chondrosis and arthrosis.

Inside-Out and Outside-In procedures require additional incisions and dissection to avoid neurovascular complications and have the potential to cause capsular tethering, neuroma formation and suboptimal repair tension secondary to knot tying over excess tissue. In addition, prolonged intraoperative and tourniquet time can cause increased morbidity and anesthesia costs.

The All-Inside approach has gained popularity because of its insertion ease and potential minimization of the aforementioned problems. However, many of these devices have demonstrated inferior biomechanical properties and have been associated with breakage, loosening, distraction of the repair, neurological injury, subcutaneous prominence and articular cartilage abrasion and damage. These complications have shown a recent trend back to the Outside-In and Inside-Out techniques, despite their inherent difficulties.

Technique described by
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Overview

The FasT-Fix All-Inside Meniscal Repair Suture System (Figure 1) was developed to provide a strong, reproducible, reliable, and time-efficient meniscal repair with equal biomechanical properties to the open vertical mattress suture technique (P=0.9913), Caborn, Borden et. al. 2000. This is achieved without the associated comorbidities of Inside-Out or Outside-In meniscal repair and without the need for intra-articular knot tying.

The FasT-Fix Suture System also gives the surgeon the versatility of placing horizontal or vertical mattress suture fixation, without risk to neurovascular structures. As with all arthroscopic procedures, good visualization of the meniscal tear and adequate arthroscopic distention are essential. To minimize the potential for damage to neurovascular structures, use of the curved delivery needle and the variable depth penetration limiter (as indicated by the meniscal tear position, especially if a vertical mattress stitch is utilized) is advised.

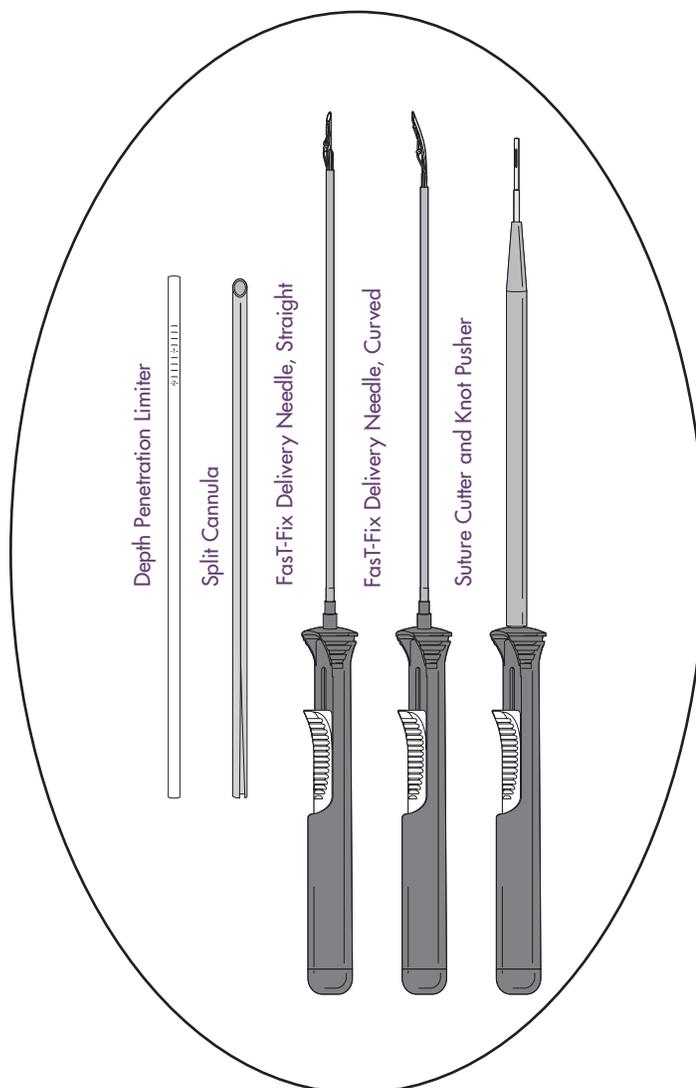


Figure 1. *FasT-Fix*™ Meniscal Repair Suture System

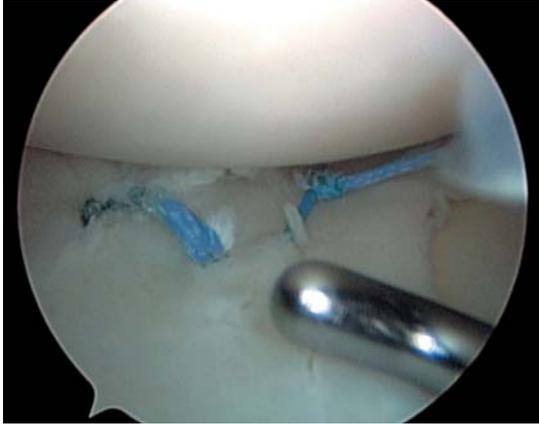


Photo 1. Completed repair - vertical and horizontal

Setup

Each FasT-Fix device contains two 5 mm polymer suture bar anchors, with a pre-tied, self-sliding knot comprised of #0, non-absorbable, U.S.P. braided, polyester suture. The anchors are placed into the meniscus sequentially and tightened in a simple manner **without** the need for arthroscopic knot tying (Photos 1 and 2).

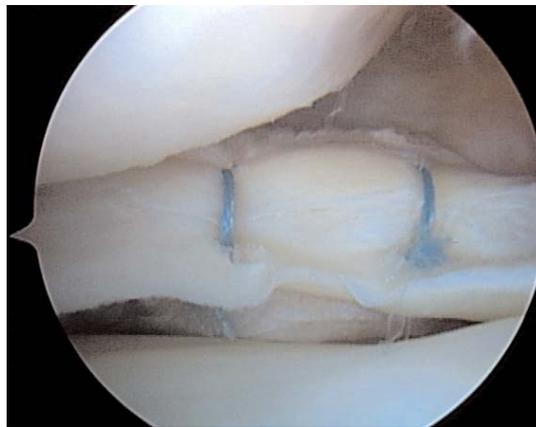


Photo 2. Completed repair - vertical x 2

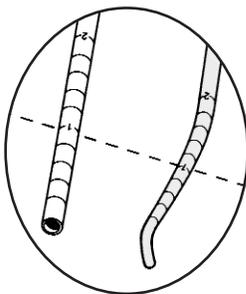


Figure 2a. Trimmable Depth Penetration Limiter and Calibrated Depth Probe

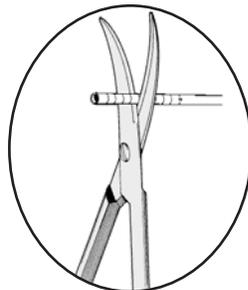


Figure 2b. Trimmable Depth Penetration Limiter

The depth penetration limiter (dark blue plastic sheath) comes preset to a depth of 25 mm from the tip of the needle and 17 mm from the back of the implant, which has been shown by the following study to avoid neurovascular injury (Coen, Caborn, Urban et. al., Arthroscopy, 1998) while allowing predictable meniscocapsular placement.

Peripheral, popliteal, hiatal, and mid-third medial meniscus tears may require penetration less than the 17 mm allowed by the fixed depth penetration limiter. Use of the meniscal depth probe in conjunction with the trimmable depth penetration limiter (white plastic sheath) will allow controlled penetration (Figures 2a and 2b).

If the trimmable depth penetration limiter is used with the split cannula, then the split cannula should be split completely before inserting it over the white depth penetration limiter, to allow for easier removal.

Procedure

The FasT-Fix™ Delivery Needle is inserted into the appropriate arthroscopy portal, through either an Acufex® 5 mm x 55 mm cannula or sheathed by the Smith & Nephew Split Cannula (Photo 3).

The split cannula obviates the need for a larger cannula incision and the need to pass the needle through a diaphragm. In addition, it can be partially or totally removed by retraction and peeling.

It is essential that the opening of the split cannula is at 90° to the curved FasT-Fix needle, to prevent the needle from slipping out as it is introduced into the knee (Figure 3).

The FasT-Fix device can be placed either through the tibial or femoral surface of the meniscus.

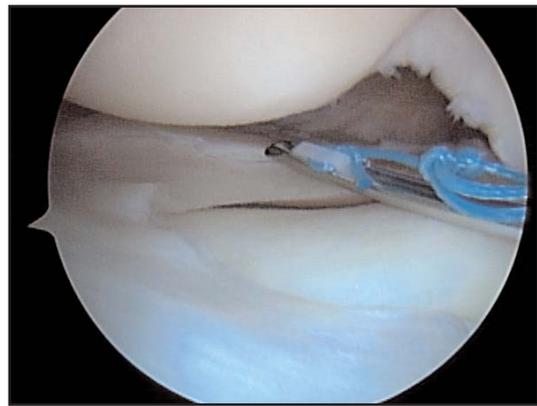


Photo 3. FasT-Fix Delivery Needle with split cannula removed

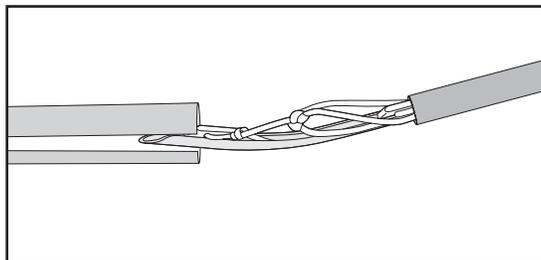


Figure 3. Split cannula positioned 90° to the curve of the delivery needle

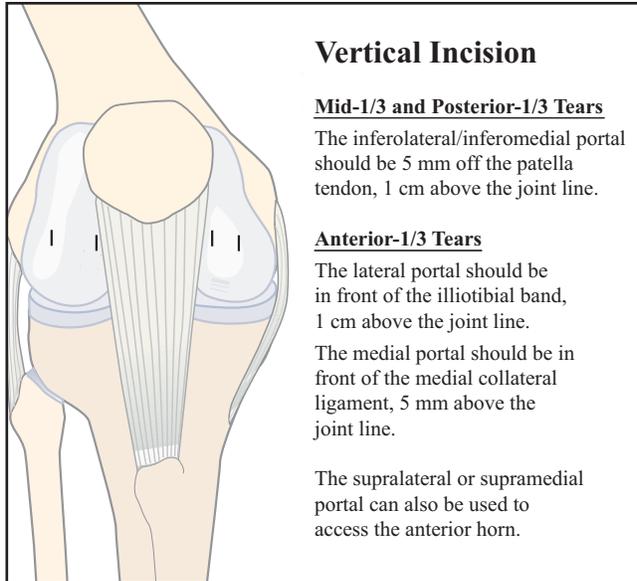


Figure 4. Contralateral approach

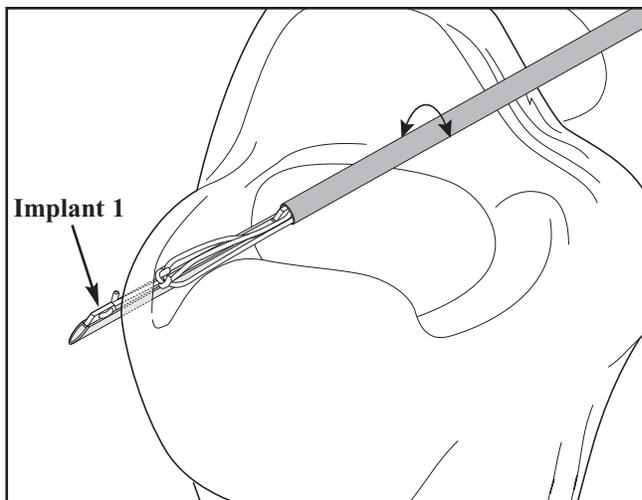


Figure 5. Placement of implant 1

The inner meniscal fragment is pierced with the delivery needle. One-hand rotation, 90°, may facilitate initial penetration. For a horizontal repair, the hand is then returned to the starting position and the needle is advanced into the outer meniscal fragment to the end of the depth limiter.

When doing a vertical repair the superior implant should be placed first. The second implant should be placed inferior, where the capsule/tissue is thickest.

Note: For easiest knot sliding and avoidance of the neurovascular bundles, the needle should be inserted perpendicular to the tear using a contralateral approach. This is facilitated by using portals placed adjacent to the patella tendon (Figure 4).

Oscillate the needle approximately 5°, then pull the needle out of the meniscus, releasing implant 1 behind the meniscus (Figure 5).

Next, slide the gold trigger forward to advance the second implant into the ready position (Photo 4 and Figure 6).

To achieve the ready position, resistance will be felt. It is important to ensure that the implant is fully seated at the end of the needle (Figures 7 and 8).

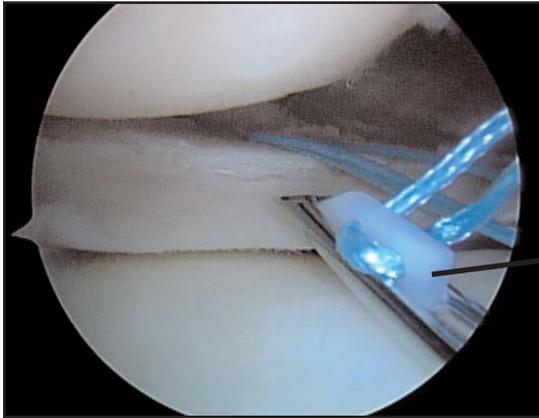


Photo 4. Implant 2 fully advanced to the ready position.

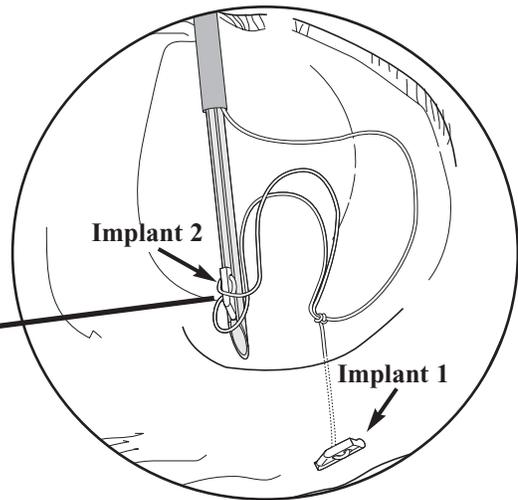


Figure 6. Implant 2 fully advanced to the ready position

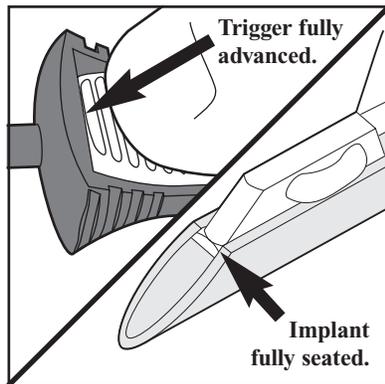


Figure 7. Proper positioning of implant 2

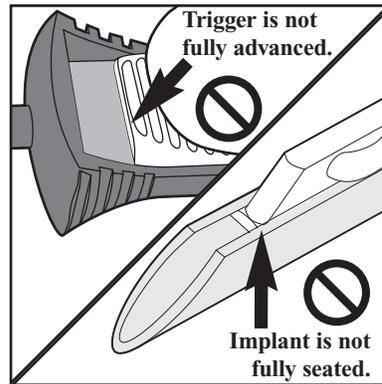


Figure 8. Improper positioning of implant 2

Insert the delivery needle into the meniscus approximately 4–5 mm from implant 1 on a vertical, horizontal, or oblique plane (Figure 9, Photos 5 and 6).

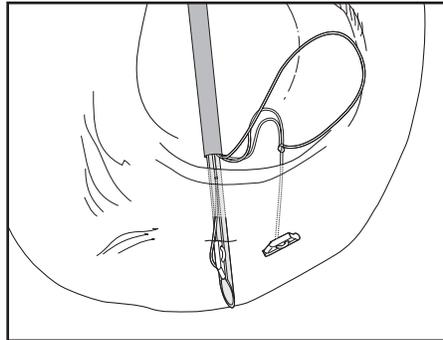


Figure 9. Implant 2 ready for release



Photo 5. Horizontal Mattress

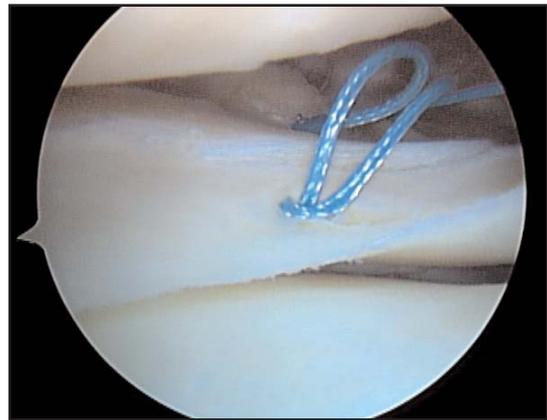


Photo 6. Vertical Mattress

Remove the delivery needle from the knee, leaving the free end of the suture. Pull the free end of the suture to advance the sliding knot and reduce meniscal tear (Figure 10, Photos 7 and 8). Considerable resistance will be felt as the knot is snugged down.

To further snug down the suture construct, thread the free end of the suture through the FasT-Fix™ Knot Pusher and Suture Cutter.

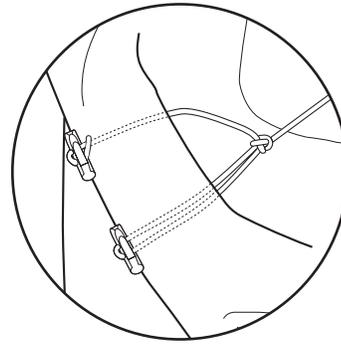


Figure 10. Prior to tightening suture construct

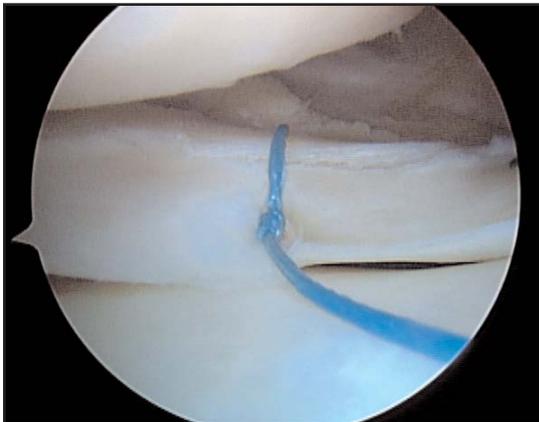


Photo 7. Hand-tightened suture construct - vertical mattress

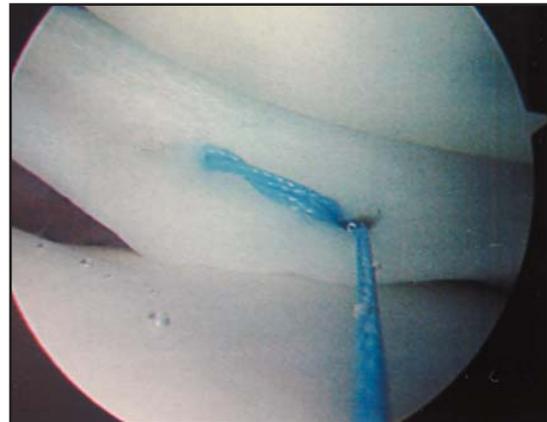


Photo 8. Hand-tightened suture construct - horizontal mattress

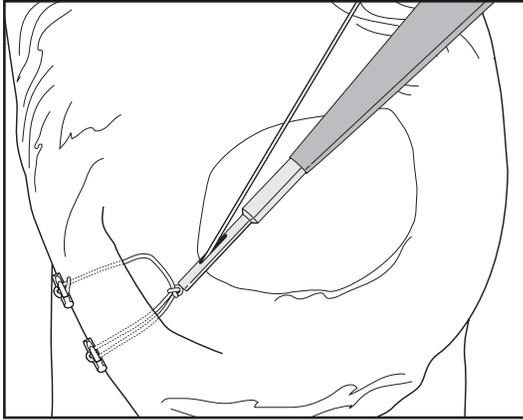


Figure 11. Suture construct tensioning

While holding the suture taut, gently slide the knot pusher to the meniscus until the desired tension is achieved. (Figure 11).

Rest the tip against the knot to allow for a 2–3 mm suture tail. Cut the suture by sliding the gold trigger forward (Photos 9 and 10, Figure 12). Alternatively, arthroscopic scissors can be used to trim the suture .



Photo 9. Suture cutting - horizontal mattress

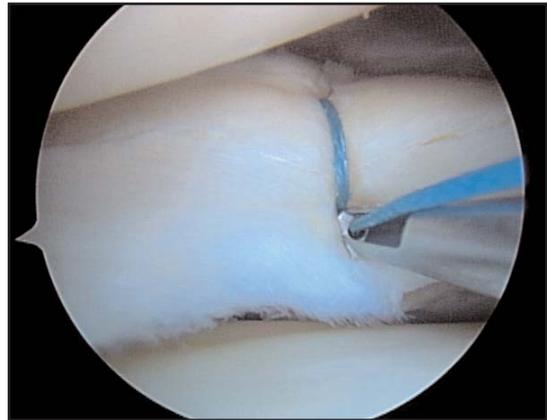


Photo 10. Suture cutting - vertical mattress

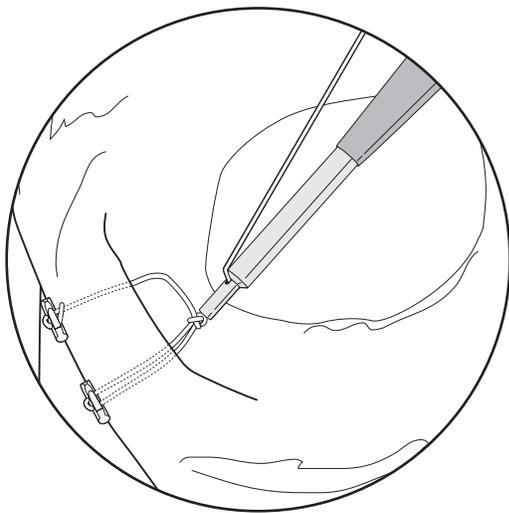


Figure 12. Suture cutting

Postoperative Care

Reestablish full extension and quadriceps activation early, along with joint kinematics and proprioception involving the entire kinetic chain progression to full weight bearing; limit flexion to 90° for three weeks and to torsion for six weeks. Running is indicated at 8-10 weeks. Cutting activities 10-12 weeks. Return to full activity at three months. Individualization is based on the stability of the tear.

Additional Instruction

Prior to performing this technique, consult the Instruction for Use documentation provided with individual components — including indications, contraindications, warnings, cautions, and instructions.

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to sale by or on the order of a physician.**