In practice, the most common orthopaedic procedure is the surgical management of cranial cruciate disease in the dog. We’re aware that there are many techniques available, from simple lateral suture placement to advanced osteotomy techniques such as TPLO and TTA. Choice of procedure is dependent on the patient, the surgeon’s training and the owner’s circumstances. Whatever procedure is chosen, Vi stock the implants and equipment.

Thinking about trying a new procedure? Then see our range of Step by Step guides to the common techniques. And check our DVD on Surgical Management of Canine Cruciate Disease containing surgical video footage of common techniques. It’s available on request. This is of course no substitute for a full training course but will provide a good introduction.

Equipment for dealing with other joint based procedures such as patellar luxation and femoral head and neck excision are also included here. As usual, for help with any of our products, just contact the Vi team.
Examination and Surgery of the Meniscus

Introduction
Menisci contribute greatly to the normal function of the stifle joint. The stifle joint is not a simple hinge as knee replacements in both man and dogs which were based on the hinge premise have discovered. The menisci are the interface between the two articular surfaces. They transmit load, absorb energy and lubricate the joint. Importantly they contribute to joint stability to both shear and rotational forces.

When the cranial cruciate ligament fails the menisci become vulnerable to damage as the femur is free to move relative to the tibia creating excessive crushing and shearing forces. The lateral meniscus is relatively securely attached to the femur so moves with it avoiding injury. The medial meniscus is, however, firmly attached to the tibia and subject to repetitive trauma. Injuries to the lateral meniscus are uncommon whereas medial injuries are common. The incidence and severity of meniscal injuries are related to the weight of the dog and the duration of the injury.

The meniscus is avascular except around the periphery and generally does not heal. Despite active research in man to find repair and replacement techniques these are not readily applicable to the canine patient.

Classification of Meniscal Injuries

The crushing and shearing forces resulting from a cruciate deficient stifle create a number of relatively specific meniscal injuries. These were classified by Bennett and May in 1991 into seven types.

1. Caudal detachment with folded caudal horn
2. Longitudinal tear
3. Multiple longitudinal tears
4. Fibrillation/tearing of the surface
5. Axial fringe tear
6. Bucket handle tear (similar to type 2 or 3 but inner concave portion, or portion between two longitudinal tears, of meniscus becomes lax and displaced from the tibial surface give the appearance of a bucket handle)
7. Transverse tear

Diagnosis
Meniscal damage may be suspected in a stifle which seems significantly more painful than might be expected with cruciate rupture alone. Some patients may exhibit an audible and palpable click on walking. This occurs as the femur rolls over a detached meniscus which has folded over. MRI in larger patients may suggest a meniscal injury.

A definitive diagnosis is provided by examination of the meniscus either by direct visualization via arthotomy or by arthroscopy.

The caudal horn is not easy to expose regardless of technique. Veterinary Instrumentation offers a substantial range of instruments designed to make exposure easier. Caudal detachments, longitudinal and bucket handle tears may be difficult to identify without detailed probing of the surface of the meniscus. The detached areas often fall back into position when not loaded.

Surgical Management of Meniscal Injuries
The poor healing characteristics of the meniscus leaves removal of the damaged area as the only real surgical option. The damaged areas are made slippery by synovial fluid and are difficult to grasp and cut without dedicated instruments. Typically, damaged areas are grasped and retracted as far as they can be and detached from their remaining attachments using knives of various designs. Arthroscopic punches may be used to ‘tidy up’ less distinct areas of damage in both open and arthroscopic approaches.

Meniscal Release
This procedure remains contentious. Recognising the important function of the meniscus anti-release surgeons seek to preserve as much intact meniscus as possible. However, all the tibial plateau levelling techniques leave the stifle unstable in certain circumstances leaving the meniscus vulnerable to injury from the resulting crushing and shearing forces.

Pro-release surgeons argue that releasing the meniscus removes it from harm by the femur and that no meniscus is better than a damaged one. It is certainly the case that meniscal release reduces the incidence of late meniscal injury which might be linked to the initial injury. Longer term outcomes in terms of the development of degenerative joint disease (DJD) are less predictable.

Ultimately the evidence is unclear so surgeons must make their own decision.

Meniscal release is performed by transecting the medial horn by a radial cut just caudal to the medial collateral ligament at ‘x’. (illustrated). The caudal horn of the medial meniscus will rotate caudally into the caudal compartment of the joint capsule. If the meniscus does not move significantly it has not been released. Alternatively the meniscus may be released by transection of the meniscocentral ligament ‘y’.

Video
Geoff Robins has created a video illustrating a number of meniscal surgery procedures. It is available free of charge on the VI cruciate DVD or as a download from www.vetinst.com
Exposure of the medial meniscus is never easy. Access is limited. The stifle levers are designed to fit the trochlea, while the atraumatic tip hooks behind the caudal tip of the tibial plateau. The levering action spreads the load over the surface of the trochlea, more effectively than a Hohman. Two sizes to cover most cases.

**STIFLE LEVER**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Size</th>
<th>Length</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>001115</td>
<td>Stifle Lever</td>
<td>&gt;20kg</td>
<td>225mm</td>
<td>£62.50</td>
</tr>
<tr>
<td>001115S</td>
<td>Stifle Lever Small</td>
<td>&lt;20kg</td>
<td>165mm</td>
<td>£57.50</td>
</tr>
</tbody>
</table>

**Meniscus Probes**

1mm – dogs up to 30kgs
2mm – dogs over 30kgs

**MENISCUS PROBE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Length</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>001408</td>
<td>Meniscus Probe 1mm Tip</td>
<td>190mm</td>
<td>£39.66</td>
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<tr>
<td>001409</td>
<td>Meniscus Probe 2mm Tip</td>
<td>220mm</td>
<td>£39.66</td>
</tr>
<tr>
<td>AR-17-10</td>
<td>Meniscus Probe 2.2mm Black Shaft for Arthroscopy</td>
<td>220mm</td>
<td>£71.59</td>
</tr>
</tbody>
</table>

The arthroscopic stifle is finer and longer than the standard version, making it more suitable for arthroscopic surgery. The good sized white Teflon handle has a useful notch which aligns with the tip orientation of the lever. Not just for arthroscopy – useful in open arthrotomies as well. Developed for stifle surgery by Ian Holsworth.

**ARTHROSCOPIC STIFLE LEVER VSTL**

AR-17-02  Arthroscopic Stifle Lever VSTL 280mm
Toothed Halsteads

Very useful for grasping the meniscus.

**TOOTHED HALSTEADS**

- **103185** Halstead Mosquito Forceps 1/2 Teeth Cof 125mm
- **103180** Halstead Mosquito Forceps 1/2 Teeth Sr 125mm

Fat Pad Retractor

A more practical alternative to a standard Senn for retracting the fat pad during examination of the medial meniscus. Available in both standard 3 prong and smaller 2 pronged versions

**FAT PAD RETRACTOR**

- **001114** Fat Pad Retractor 180mm
- **001114S** Fat Pad Retractor Small 180mm
- **833305** Senn Cats Paw Retractor 165mm

Hook Knife and Push Knife

These three hand held knives can deal with most meniscal tears. Their low profile makes them suitable for both open and arthroscopic surgeries.

**MENISCUS KNIVES**

- **AR-17-19XS** Hook Knife 150mm
- **AR-17-19X** Hook Knife 225mm
- **AR-17-11X** Push Knife 225mm

Beaver Type Scalpel Handle

Holds Beaver and Swann Morton fine blades. Ideal for delicate control without cluttering field of view.

**BEAVER TYPE SCALPEL HANDLE**

- **06054** Beaver Type Scalpel Handle (VI) 130mm
- **06051** Beaver Type Scalpel Handle 130mm
- **06052** Beaver Type Scalpel Handle 100mm
- **06053** Beaver Type Scalpel Handle 80mm

Swann Morton Beaver Type Blades

Fine blade suggested uses:

- 64 blade – meniscal release, cuts around the tip plus on ventral surface. 65 and 65a – pointed blades in 2 sizes. Good for trimming flaps in confined spaces.

**SWANN MORTON FINE BEAVER TYPE BLADES**

- **05904** No 64 Blades (25) Beaver Type
- **05905** No 65 Blades (25) Beaver Type
- **05906** No 65(a) Blades (25) Beaver Type

Meniscectomy Instruments

Purpose designed, the jaws of the Ligament Clamp have multiple small gripping teeth to combat synovial fluid slip. The T handle push knife is only sharp on the inner curve, not at the tips. Suitable for larger patients.

**MENISCETOMY INSTRUMENTS**

- **001100** Meniscectomy Instrument Set
- **001107** Meniscectomy Knife 165mm
- **001110** Ligament/ Cartilage Clamp 140mm
Management of meniscal injuries has three phases all of which will require special instrumentation.

- Exposure of the meniscus, particularly the caudal horn of the medial meniscus. This will require that the tibia is advanced and distracted relative to the femur.
- Examination of the meniscus for lesions. A visual examination is not enough. The surface of the meniscus should be probed for defects and tears. The circumferential attachments should be checked for security.
- Lesions discovered must be managed by debridement or meniscal release.

The Meniscus Surgery Set includes all the essential instruments for the examination and management of meniscal injuries in a stainless steel autoclave case. Purchased as a set there are significant savings.

Large Stifle Distractor
Hohman Retractor 8mm
Meniscus Probe 1mm
MicroToothed Halsteads
Beaver Type Scalpel Handle
25 x No 65 Blade (mini no 11)
Stainless Case
Silicone Protective Insert
Small Balloon Cloth Drape

The Enhanced Meniscus Surgery Kit contains all the instruments in the standard kit, plus a small Stifle Joint Distractor (001113), a Push knife (AR-17-11X) and a Pull Knife (AR-17-19X).

The small Stifle Joint Distractor is also useful as small local muscle and tissue retractors in and around canine joints e.g. elbow exploration. Extends the use of the kit to smaller patients.

MENISCUS SURGERY SET
001116 Meniscus Surgery Set

Meniscus Surgery Set - Enhanced

The damaged segment of meniscus is removed from the joint.

The abaxial attachments are also sectioned.

Case: Geoff Robins

The tear is grasped mid section and sectioned from its axial attachments.
Small Stifle Ronguers

Small rongeurs with angled slim jaws, useful for work within the stifle to remove CrCL remnants or to apply tension to meniscal tissue prior to sharp resection.

**SMALL STIFLE RONGUER**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Length</th>
<th>Tips</th>
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<tbody>
<tr>
<td>001301</td>
<td>Small Stifle Ronguer 1.75mm Bite 140mm Long</td>
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Coughlan Soft Tissue Mangeurs

Use to rapidly remove soft tissues eg. fat pad which can obscure the operative field. Also suitable for removing remnants of ruptured CrCL. Developed by Andrew Couglan.

**COUGHLAN SOFT TISSUE MANGEURS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Shaft</th>
<th>Length</th>
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<tr>
<td>001108S</td>
<td>Coughlan Soft Tissue Mangeur - Very Small 2mm x 8mm Shaft</td>
<td>115mm</td>
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<tr>
<td>001108</td>
<td>Coughlan Soft Tissue Mangeur - Small 2.5mm x 10mm Shaft</td>
<td>160mm</td>
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</tr>
<tr>
<td>001109</td>
<td>Coughlan Soft Tissue Mangeur - Large 5mm x 12mm Shaft</td>
<td>180mm</td>
<td></td>
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</table>

Small & Mini Gelpi Retractors for Arthrotomy

Used with or without orthogonally placed stifle distractors help to improve exposure significantly when working through a mini stifle arthrotomy.

Short sharp tips give easy access and holding power. Alternative blunt tip version is less secure but also less traumatic to tissue.

**SMALL & MINI GELPI FOR ARTHROTOMY**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Spread</th>
<th>Length</th>
<th>Tips</th>
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<tbody>
<tr>
<td>0013302</td>
<td>Gelpi Mini Curved (45mm Spread) 90mm Long Sharp Tips</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0013303</td>
<td>Gelpi Mini Curved (45mm Spread) 90mm Long Blunt Tips</td>
<td></td>
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</table>
**Stifle Distractors**

Medial meniscal damage is commonly associated with rupture of the Cranial Cruciate Ligament. Failure to deal with meniscal damage is a serious omission in CCL repair. For more information see our website or request our free DVD ‘Surgical management of Canine Cruciate Disease’

### WHICH DISTRACTER?

<table>
<thead>
<tr>
<th>Weight Range</th>
<th>Code</th>
<th>Size</th>
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<tbody>
<tr>
<td>&gt;5kg</td>
<td>001113YSX</td>
<td>Miniature</td>
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<tr>
<td>5kg</td>
<td>001113VS</td>
<td>Very Small</td>
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<tr>
<td>5-15kg</td>
<td>001113</td>
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<tr>
<td>15-50kg</td>
<td>001112</td>
<td>Standard</td>
</tr>
<tr>
<td>50kg</td>
<td>001112/L</td>
<td>Large</td>
</tr>
</tbody>
</table>

001112 the original stifle distractor remains the most useful

### Stifle Distractor

Designed to separate the femoral component of the stifle from the tibia. For the best exposure joint surfaces should move away from each other in a parallel fashion exposing the meniscus in its natural state and minimally distorted by the examination.

**Positioning:**

- One tip is placed in the intercondylar notch
- The other on the cranial intercondylar area.
- Neither tip should involve articular cartilage.
- Test distractions (by squeezing the handles) to find the exact point at which a full distraction will expose the meniscus.
- Engage the spinlock to open the joint.

Distractor is self-retaining. When closed the tips overlap making the points atraumatic as they enter the joint and reduce their profile for insertion into the joint.

**STIFLE DISTRACTER**

- 001112/L Large Stifle Distractor min spread 10mm max spread 40mm 210mm Long
- 001112 Stifle Distractor min spread 8mm max spread 30mm 190mm Long

### Small Stifle Joint Distractor

The Small Distractor is also useful as small local muscle and tissue retractors in and around canine joints e.g. elbow exploration. Total length 130mm.

**SMALL JOINT DISTRACTER/ RETRACTOR 6MM WIDE TIPS**

- 001113 Small Joint Distractor/ Retractor 6mm Wide Tips

### Very Small Stifle Joint Distractor

The Very Small Distractor is extremely useful as a small joint retractor during the meniscal release procedure. It is used to open a small window, caudal to the medial collateral. Total length 140mm.

**VERY SMALL JOINT DISTRACTER/ RETRACTOR 3MM WIDE TIPS**

- 001113VS Small Joint Distractor/ Retractor 3mm Wide Tips

### Miniature Stifle Distractor

Scaled down version of the Very Small Stifle Distractor for use in small and miniature breeds. Same overlapping tip pattern shown in all Vi stifle distractors.

**MINIATURE STIFLE DISTRACTER**

- 001113YSX Miniature Stifle Distractor 100mm
Spinlock Stifle Distractor

Alternative spinlock version of the ratcheted stifle distractors. Spinlocks avoid the slippage which can occur with ratchets, and allow incremental opening of the joint which is not dependant on the tooth pitch of a ratchet.

**SPINLOCK STIFLE DISTRACTORS**

- 001113SL Spinlock Small Stifle Distractor 140mm 6mm Tips
- 001113VSSL Spinlock Very Small Stifle Distractor 140mm 3mm Tips

**JOINT SURGERY PRACTICAL DVD**

The University of Sydney’s Centre for Veterinary Education produces a range of excellent teaching DVDs. Veterinary Instrumentation is pleased to have been appointed a distributor:

- Surgical Approaches to the Bones and Joints of the Dog
  - Dr. Wing Tip Wong

This DVD includes all the common approaches to the shoulder, elbow, hip, stifle and hock joints as well as the humerus and ilial shaft. Bone models are included to highlight the approach. The DVD is suitable for general practitioners contemplating any surgical procedure involving canine joints.

- **Procedures include:**
  - Caudal approach to shoulder
  - Distal humerus via olecranon
  - Lateral approach to humerus
  - Lateral approach to elbow
  - Medial approach to elbow
  - Dorsal approach to hip
  - Lateral approach to stifle
  - Medial approach to hock
  - Approach to ilial shaft

- **Duration:** 40 minutes

**SURGICAL APPROACHES DVD DR WING TIP WONG**

- **DVDSAW** Surgical Approaches DVD Dr Wing Tip Wong

Small & Mini Gelpi Retractors for Arthrotomy

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- Short sharp tips give easy access and holding power. Alternative blunt tip version is less secure but also less traumatic to tissue.

**SMALL & MINI GELPI FOR ARTHROTOMY**

- 0013302 Gelpi Mini Curved (45mm Spread) 90mm Long Sharp Tips
- 0013303 Gelpi Mini Curved (45mm Spread) 90mm Long Blunt Tips

Extra Articular Joint Distraction

External Stifle Distractor

Developed original for arthroscopic use but also useful in open surgery on very tight osteoarthritic stifles. Improves visibility in the joint by reducing clutter. Pins (2.5mm) placed above and below the stifle in line with the medial collateral ligament. Turn the thumbscrew to distract the joint and expose the medial meniscus. The pins may be twisted relative to one another to bring the tibial plateau forwards.

- **Version with 3.2mm pins** is suitable for use with TPLO jig pins – the proximal pin can then be re-used.

**EXTRA ARTICULAR STIFLE DISTRACTOR**

- **AR-17-01** Extra Articular Stifle Distractor 2.5mm Pins 80mm
- **AR-17-01/TPLO** Extra Articular Stifle Distractor 3.2mm Pins 80mm
Management of Cranial Cruciate Disease

Rupture of the Canine Cruciate Ligament (CrCL) remains, by a significant margin, the most commonly encountered veterinary orthopaedic condition in both general and referral practice. It is now generally agreed that most ruptures of the Cranial Cruciate Ligament (CrCL) in the dog are part of a degenerative process rather than a purely traumatic condition. Trauma may be involved at the point of rupture but the ligament is largely degenerate at this stage. This is particularly true of young, large and giant breeds. This is a very different situation to cruciate ligament rupture in man and how things used to be in veterinary surgery 30 years ago when a cruciate rupture was something which occurred when a dog caught its hind leg in a hole whilst running. This change in circumstance makes it difficult for us to compare outcomes of the various techniques which have been practiced for the past 50 years. The choice of techniques is huge, suggesting that none are perfect. They may be divided broadly into two groups. Those which attempt to replace the anatomy or function of the original ligament and those which seek to moderate the effects of a cruciate deficient stifle. Techniques which replace either the physical ligament or its function include:

- Patssama
- Over the Top Technique
- DeAngelis lateral suture and derivatives
- TightRope and similar techniques.

All of the above attempt to stabilise the stifle by replacing the ligament or its function.

Techniques which moderate the effects of the cruciate deficient stiffe by altering the dynamics of the forces acting on it include:

- Tibial Plateau Levelling Osteotomy (TPLO) Radial cut
- Tibial Plateau Levelling Osteotomy (TPLO) Wedge cut
- Tibial Tubercle Advancement (TTA)
- Triple Tibial Osteotomy (TTO)
- MMT
- TTA Rapid.

All of the above alter the forces acting on the stifle to make it stable under load. Normal canine activity creates a huge variety of loads and these techniques do not create stability in all circumstances, leaving the meniscus vulnerable.

Which is the best?

On the basis of published work to date, there are few scientific grounds, in terms of outcome, to choose between any of the available techniques. In the hands of a competent surgeon the likely outcome is ‘good’. It seems that the differences between surgeons is as great as the difference between techniques. However, there are many differences between the various techniques in terms of expertise required, necessary equipment and cost. Without the relevant data many surgeons elect to have ‘faith with the theory’ pending definitive results.

Some small dogs appear to respond well to extra-capsular techniques whereas some kind of tibial geometry altering technique is perhaps preferable to a lateral suture in large and working dogs.

Having said that, the techniques are not mutually exclusive. An indication for a tibial plateau technique is a failed lateral suture. The reverse is not true. A failed tibial plateau technique is unlikely to respond to a lateral suture. Currently there are no published techniques which combine a tibial plateau altering procedure with one which stabilises the stifle. Late meniscal injuries are always a risk in an unstable stifle.

Ultimately it will be a decision for the individual surgeon as to which techniques will be offered to the client. The client will make their choice based on their own circumstances.

We have taken the view that until there is evidence to the contrary we will support all the available techniques by the provision of training materials, instrumentation and implants.

Cruciate Training

The best training in any of the available techniques is by attending an organised training course ideally involving hands on training in the company of an experienced surgeon. Veterinary Instrumentation run some labs as do our training partners. Please check our training page on the website www.vetinst.com for available courses. BSAVA, ECVS, ESVOT and other bodies also run cruciate labs.

However, we do appreciate that access to courses is not always possible and we therefore offer a training DVD free of cost to provide guidance. Included on each technique is:

- Video.
- A colour pictoral Step by Step Guide.
- Frequently asked questions on the technique.
- Instrument and implant check lists.

All are very much a personal view but may be of interest. In addition hard paper copy guides are also available for most techniques. Again see below for availability. Most videos are also available via the web at www.vetinst.com but the quality will be lower than the disc version.

It is recommended that cadaver work or further observation is carried out prior to performing any new technique on clinical cases.

When we have updates they will be posted on www.vetinst.com
Cranial Cruciate Ligament
Lateral Suture System

Monofilament line used as a lateral suture (De Angelis style) is an accepted CCL treatment method. Crimping is strongly recommended as the knots formed tend to be large, often causing seroma reactions and pain due to soft tissue irritation.

Packs are supplied sterile. Autoclaving is not recommended as this reduces the strength and increases the elasticity of the material.

Double sutures are supplied swaged on as a loop for use of the self-locking McKee/Miller knot (VCOT 1999;12:78-80) or with 2 crimps. One needle pass around the fabella allows two lines to be placed with less peri-fabellar damage.

For procedure details see www.vetinst.com or request our free DVD ‘Surgical Management of Canine Cranial Cruciate Disease’.

Lateral Suture
Lateral Suture Step by Step

A step by step guide for the technique, from which the images below are taken, is available online at www.vetinst.com or in hard copy on request.

Which Suture?

<table>
<thead>
<tr>
<th>STRENGTH</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50lb</td>
<td>10 - 15kg</td>
</tr>
<tr>
<td>80lb</td>
<td>15 - 20kg</td>
</tr>
<tr>
<td>100lb</td>
<td>20+kg</td>
</tr>
<tr>
<td>100lb x 2</td>
<td>40kg</td>
</tr>
</tbody>
</table>

These are guidelines only

VI Starter Kits

VI Lateral Suture Starter Kits

If you are new to the lateral suture system our kits represent the most economical means. All kits include a procedural DVD.

VI Starter Kits

VI Starter Kits

091154 CCL Suture System (Swaged on) Basic Kit Crimping Forceps
2 x each size nylon/needle/crimp sterile packs

091150 CCL Suture System (Swaged on) Compound Action Kit
2 x each size nylon/needle/crimp sterile packs

091151 CCL Suture System (Swaged on) Basic Kit Plus
Forceps 2 x each size nylon/needle/crimp sterile packs
plus Heavy Duty Needleholders

Cranial Cruciate Ligament
Lateral Suture System

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2 x each size nylon/needle/crimp sterile packs

091151 CCL Suture System (Swaged on) Basic Kit Plus
Forceps 2 x each size nylon/needle/crimp sterile packs
plus Heavy Duty Needleholders
## Sterile CCL Packs

### Sterile Leader Line + Crimp + Needle
Procedure packs containing suture, swaged on needle & crimp. Multipacks offer a good cost saving.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
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<tr>
<td>091156</td>
<td>80lb nylon line x 800mm on swaged-on small fabella needle + 12mm crimp (sterile)</td>
</tr>
<tr>
<td>091157</td>
<td>100lb nylon line x 800mm on swaged-on medium fabella needle + 12mm crimp (sterile)</td>
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<tr>
<td>091155/5</td>
<td>50lb nylon line x 500mm on swaged-on v. small fabella needle + 10mm crimp (sterile) 5 Pack</td>
</tr>
<tr>
<td>091156/5</td>
<td>80lb nylon line x 800mm on swaged-on small fabella needle + 12mm crimp (sterile) 5 Pack</td>
</tr>
<tr>
<td>091157/5</td>
<td>100lb nylon line x 800mm on swaged-on medium fabella needle + 12mm crimp (sterile) 5 Pack</td>
</tr>
<tr>
<td>091159</td>
<td>5 of each sterile CCL pack (50lb, 80lb and 100lb.) 15 in total</td>
</tr>
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### Double Leader Line + Needle + Crimps
For the application of double lines with the single pass of a needle

<table>
<thead>
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<th>Item Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>091165</td>
<td>50lb Double line (500mm x 2 as loop) on v small fabella needle plus 2 x 10mm crimps (sterile)</td>
</tr>
<tr>
<td>091166</td>
<td>80lb Double line (800mm x 2 as loop) on small fabella needle plus 2 x 12mm crimps (sterile)</td>
</tr>
<tr>
<td>091167</td>
<td>100lb Double line (800mm x 2 as loop) on medium fabella needle plus 2 x 12mm crimps (sterile)</td>
</tr>
<tr>
<td>091165/5</td>
<td>50lb Double line (500mm x 2 as loop) on v small fabella needle plus 2 x 10mm crimps 5 Pack (sterile)</td>
</tr>
<tr>
<td>091166/5</td>
<td>80lb Double line (800mm x 2 as loop) on small fabella needle plus 2 x 12mm crimps 5 Pack (sterile)</td>
</tr>
<tr>
<td>091167/5</td>
<td>100lb Double line (800mm x 2 as loop) on medium fabella needle plus 2 x 12mm crimps 5 Pack (sterile)</td>
</tr>
<tr>
<td>091169</td>
<td>5 of each sterile Double line CCL pack (50lb, 80lb and 100lb.) 15 in total (sterile)</td>
</tr>
</tbody>
</table>

### Double Leader Line Loop on Needle

For use with McKee/Miller knot

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>091160</td>
<td>50lb Double Line (500mm x 2 as loop) on v small fabella needle</td>
</tr>
<tr>
<td>091161</td>
<td>80lb Double Line (800mm x 2 as loop) on small fabella needle</td>
</tr>
<tr>
<td>091162</td>
<td>100lb Double Line (800mm x 2 as loop) on medium fabella needle</td>
</tr>
</tbody>
</table>

### Sterile Leader Line + Crimp
For use with separate Fabella (Cruciate) Needles

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>091144</td>
<td>10mm Tube Crimp + 500mm x 50lb Nylon (Sterile Pack)</td>
</tr>
<tr>
<td>091137</td>
<td>12mm Tube Crimp + 800mm x 80lb Nylon (Sterile Pack)</td>
</tr>
<tr>
<td>091147</td>
<td>12mm Tube Crimp + 800mm x 100lb Nylon (Sterile Pack)</td>
</tr>
</tbody>
</table>

### Sterile Nylon Leader Line
Also useful for other ligament replacement procedures, e.g. hip toggle, collateral ligament repair.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>091141</td>
<td>500mm x 50lb Nylon (Sterile Pack)</td>
</tr>
<tr>
<td>091139</td>
<td>800mm x 80lb Nylon (Sterile Pack)</td>
</tr>
<tr>
<td>091148</td>
<td>800mm x 100lb Nylon (Sterile Pack)</td>
</tr>
</tbody>
</table>

### Fabella (Cruciate) Needles
Most surgeons now use our sterile procedure packs which include swaged on needle and appropriate crimps. However, if you wish to sterilise your own nylon we offer appropriate needles. They are shown below approximately actual size. Bear in mind that leader line passed through a regular needle creates more damage as it passes through the femoro-fabella ligament. It is this ligament which is relied on for the holding power of the suture. Cruciate needles will pass through a hole created with a 2.7mm bone tunnel borer into the tibial crest.

### Crimps

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>091140</td>
<td>10mm Tube Crimp for 50lb Line (Non Sterile)</td>
</tr>
<tr>
<td>091136</td>
<td>12mm Tube Crimp for 80lb + 100lb Line (Non Sterile)</td>
</tr>
<tr>
<td>091133</td>
<td>14mm Tube Crimp (Non Sterile) Suitable for Nylon over 100lb</td>
</tr>
<tr>
<td>091140/10</td>
<td>10mm Tube Crimp for 50lb Line (Non Sterile) 10 Pack</td>
</tr>
<tr>
<td>091136/10</td>
<td>12mm Tube Crimp for 80lb + 100lb Line (Non Sterile) 10 Pack</td>
</tr>
<tr>
<td>091133/10</td>
<td>14mm Tube Crimp (Non Sterile) Suitable for Nylon over 100lb 10 Pack</td>
</tr>
</tbody>
</table>

### Correct Crimping

- **Correct.** Three evenly spaced crimps
- **Incorrect.** Not enough crimps
- **Incorrect.** Crimps too close to end of tube

### Sterile CCL Packs Multipacks

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<tr>
<td>£252.35</td>
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<td>£18.49</td>
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</tbody>
</table>

---

**Dental Equipment & Instrumentation 15**

Tel 0845 130 9596  info@vetinst.com

**Joint Surgery 5**

Tel 0845 130 9596  info@vetinst.com

---

**Correct Crimping**

- **Correct.** Three evenly spaced crimps
- **Incorrect.** Not enough crimps
- **Incorrect.** Crimps too close to end of tube

---

**Sterile Nylon Leader Line**

Also useful for other ligament replacement procedures, e.g. hip toggle, collateral ligament repair.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>091141</td>
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<td>800mm x 80lb Nylon (Sterile Pack)</td>
</tr>
<tr>
<td>091148</td>
<td>800mm x 100lb Nylon (Sterile Pack)</td>
</tr>
</tbody>
</table>

---

**Fabella (Cruciate) Needles**

Most surgeons now use our sterile procedure packs which include swaged on needle and appropriate crimps. However, if you wish to sterilise your own nylon we offer appropriate needles. They are shown below approximately actual size. Bear in mind that leader line passed through a regular needle creates more damage as it passes through the femoro-fabella ligament. It is this ligament which is relied on for the holding power of the suture. Cruciate needles will pass through a hole created with a 2.7mm bone tunnel borer into the tibial crest.
Instruments

Crimping Forceps

Basic simple action crimper for monofilament line only.

CRIMPING FORCEPS
091135 Crimping Forceps 195mm Long

Compound Action Crimper

Compound action crimper for monofilament line only, for both 10 and 12mm crimps. Delivers a more powerful crimp than the standard crimper. Although the angled head gives better visibility, this reduces the power of the action versus a straight crimper. See Ligafiba page for a straight compound crimper for 12mm crimps.

COMPOUND ACTION CRIMPER
091135C Compound Action Crimper 230mm Long

Heavy Duty Needle Driver

The large needles used for cruciate lateral suture placement along with the force needed to pass them will damage standard needleholders. A dedicated heavy duty TC needle driver kept with the cruciate kit will prove more cost effective, and improve grip on the needle.

HEAVY DUTY NEEDLE DRIVER
091153 Heavy Duty Needle Driver with Tungsten Jaws 195mm Long
Bone Tunnel Borer

A simple unfussy instrument used to create bone tunnels without setting up the power drill. Useful where single holes are required, for example tension band procedures.

**BONE TUNNEL BORER**

- 001070 Bone Tunnel Borer 2mm 160mm Long
- 001073 Bone Tunnel Borer 2.5mm 165mm Long
- 001071 Bone Tunnel Borer 2.7mm 165mm Long
- 001072 Bone Tunnel Borer 3.5mm 180mm Long

Countersinking Bone Tunnel Borer

In order to minimise the stress and abrasion of the nylon as it passes through the bone tunnel, countersinking the hole is advisable. To reduce time and instrumentation the self-countersinking instrument incorporates a countersink on the shaft.

**COUNTERSINKING BONE TUNNEL BORER**

- 001075 Bone Tunnel Borer with Countersink 2.5mm 165mm

Loop Tension Devices

Prior to crimping it is suggested that the loop be tensioned sufficiently to eliminate the anterior draw, but not enough to create an outward rotation. This may be achieved by a number of methods:

a) Partial crimp - see video, does not require additional instrumentation
b) Simple tension device requiring a pair of gelpis 091132
c) A dedicated loop tensioner 091132A

CCL Tensioning Device

**CCL LOOP TENSIONER**

- 091132 CCL Tensioning Device (Pair - Gelpis not included)

CCL Loop Tensioning

Leader line gripped by thumbscrew.

Does not require use of extra crimps - less wasteful.
Speed lock type action gives more ‘feel’ than ratchet type.
Jaws designed specifically for crimping system.
The literature tells us little about the correct tension. We recommend that the anterior draw is eliminated but that an outward rotation of the tibia is not created.
Remember over tensioning is as big a technical error as under tensioning!

Instructions on use on www.vetinst.com

**CCL LOOP TENSIONER**

- 091132A CCL Loop Tensioner 175mm
Nylon Lateral Button Suture

Mono-filament nylon remains the most commonly used material for lateral suture techniques.

Although less strong and more prone to premature failure than the braids, many surgeons prefer its handling characteristics. Its mono-filament nature makes it more forgiving to aseptic technique and its ability to stretch allows it to also be more forgiving to isometric placement. These can be very distinct advantages.

Despite this, maximising isometry should always be the aim as it will help limit the joint becoming excessively tight or excessively loose during flexion/extension, prolonging the cycle life of the prosthesis and its attachments as well as providing better mechanical function through a greater range of motion.

Isometry for lateral suture techniques is improved by using tibial anchorage points more caudal and more proximal than originally described. The most isometric anchorage points on the tibia are in the region of the Tubercle of Gerdy or Gerdy’s Sister (the two prominences either side of the long digital extensor groove – see fig 1.). Although Gerdy’s sister may provide the more isometric anchorage point of the two, the Tubercle of Gerdy itself may provide a more mechanically advantageous anchorage point in resisting cranial tibial thrust.

Using the most frequent method whereby the suture is placed through a tibial bone tunnel and then back in a loop under the patella ligament (see lateral suture technique) becomes progressively problematic as the tibial bone tunnel is placed more caudally. The suture assumes a more unpredictable path under the patella ligament on its return loop, which may then start to impinge on intra-articular structures including the lateral femoral condyle. If there are osteophytes present on the margin of the lateral trochlea ridge, the suture may rub over these during flexion/extension resulting in abrasion, bruising and pain.

Lateral button techniques solve this problem as both ends of the line pass through the same bone tunnel emerging from the same hole on the lateral aspect of the tibia in the region of the Tubercle of Gerdy. This change in path makes the prosthesis less liable to rub against the lateral femoral condyle and the whole loop is kept more reliably extra-capsular. For a caudally positioned tibial bone tunnel, many surgeons find lateral button techniques easier to perform well compared with the standard lateral suture technique.

As with the more traditional lateral suture techniques, the anchorage position on the femoral aspect of the joint is the lateral fabella/fabello-tibial ligament. Where the lateral fabella/fabello-tibial ligament offers insufficient security, a second bone tunnel (a femoral bone tunnel) or a suture anchor may be used instead, providing a femoral anchorage point just cranial and just distal to the lateral fabella. The LigaFiba® Isotoggle (page 171 and the Arthrex Tightrope page 173) are examples of techniques designed to specifically take advantage of combined tibial and femoral bone tunnels. Because of the increase in suture working length, low stretch braids are recommended for techniques involving two bone tunnels.

Suture anchors pins (page 176), suture screws (page 176), Arthrex Corkscrews, FASTak anchors (page 173), devices such as interference screws (page 168) and the Arthrex SwiveLock (page 175) are examples of some of the devices available for achieving suitable anchorage in the femoral condyle. For techniques using any of these anchors, the high strength braided materials are again recommended because of their increased abrasion resistance against the anchor.
Nylon Lateral Button Suture Step by Step Summary

1. Pass around lateral fabella

2. Drill hole from Tubercle of Gerdy – Anti-Skid drill advisable.

3. Pass line both ways to create a loop medially

4. Hold the slotted button in forceps or needle-holders and position button so that as the prosthesis tightens, the button becomes captive. Ensure button is seated down onto bone surface with no soft-tissue entrapment.

5. Tension and crimp (or tie, if preferred).

Which Suture?

<table>
<thead>
<tr>
<th>STRENGTH</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50lb</td>
<td>4 - 10kg</td>
</tr>
<tr>
<td>80lb</td>
<td>10 - 20kg</td>
</tr>
<tr>
<td>100lb</td>
<td>20 - 50kg</td>
</tr>
</tbody>
</table>

These are guidelines only

NYLON LATERAL BUTTON SUTURE

NLBS50 50lb Nylon Lateral Button Suture
NLBS80 80lb Nylon Lateral Button Suture
NLBS100 100lb Nylon Lateral Button Suture
NLBS50/5 50lb Nylon Lateral Button Suture - Pack of 5
NLBS80/5 80lb Nylon Lateral Button Suture - Pack of 5
NLBS100/5 100lb Nylon Lateral Button Suture - Pack of 5
H090102AS Anti-Skid Drill 2.0mm 100mm Long
H090112AS Anti-Skid Drill 2.5mm 115mm Long
H090106AS/L Anti-Skid Drill 3.5mm 180mm Long
NLBSKIT Nylon Lateral Button Suture Starter Kit contains 2 of each 50lb/ 80lb/ 100lb Nylon Lateral Button plus Crimping Forceps, Heavy Duty Needle Drivers, + one of each Anti-Skid drill
**LigaFiba®**

LigaFiba® is a new, extremely strong surgical suture material. It is composed entirely of Ultra High Molecular Weight Polyethylene, the same hard wearing material from which we make acetabular cups. Until now it has not been possible to spin it fine enough to produce flexible strands that are easily tied.

Weight for weight it is 15 x stronger than steel and 2.5 x stronger than nylon. It has very good abrasion characteristics which is important when used in hostile environments such as lateral sutures and hip toggles.

LigaFiba® is available in four breaking strains.

- **75lb (34kg)**  <0.5mm in diameter  Dogs and cats <5kg
- **150lb (70kg)**  0.6mm in diameter  Dogs up to 15kg
- **250lb (113kg)**  1.0mm in diameter  Dogs 15 - 30kg
- **500lb (230kg)**  1.6mm in diameter  Dogs over 30kg

LigaFiba® Lateral Suture with Crimp Starter Kit

The LigaFiba® Lateral Suture With Crimp Starter Kit contains everything needed at a substantial discount.

The Kit contains the following:
- Compound Action Crimpers for LigaFiba®
- Heavy Duty Needle Driver
- 2 x 150lb LigaFiba® Lateral Suture with Crimp
- 2 x 250lb LigaFiba® Lateral Suture with Crimp
- 2 x 500lb LigaFiba® Lateral Suture with Crimp
- LigaFiba® Scissors

LIGAFIBA® LATERAL SUTURE WITH CRIMP STARTER KIT

**LFLSCRSTARTER**  LigaFiba® Lateral Suture with Crimp Starter Kit

LigaFiba® Lateral Button Suture with Crimp Starter Kit

The LigaFiba® Lateral Button Suture With Crimp Starter Kit contains everything needed at a substantial discount.

The Kit contains the following:
- Compound Action Crimpers for LigaFiba®
- Heavy Duty Needle Driver
- 2 x 150lb LigaFiba® Lateral Button Suture with Crimp
- 2 x 250lb LigaFiba® Lateral Button Suture with Crimp
- 2 x 500lb LigaFiba® Lateral Suture Button with Crimp
- LigaFiba® Scissors

LIGAFIBA® LATERAL BUTTON SUTURE WITH CRIMP STARTER KIT

**LFLBSSTARTER**  LigaFiba® Lateral Button Suture with Crimp Starter Kit

**Picture Jean-Benoit Lefebvre**

LigaFiba® as a medial collateral repair using suture screw

LigaFiba® has a number of applications in veterinary orthopaedics and is available in a range of sterile presentations.

- Ligament and Tendon Repairs
- Cruciate Lateral Sutures
- Bone Tunnel Cruciate Procedures
- Hip Toggle Procedure

As a braided material the use of LigaFiba® requires strict attention to aseptic technique during implantation.

Rose et al in Veterinary Surgery 41 (2012) 266-272 found that LigaFiba® outperformed Fiber tape, FiberWire, Xgen Orthofiber and Mason Leader Line with respect to tensile strength, stiffness at failure, loading at elongation and resistance to cyclic elongation.

It is our experience that abrasion plays a significant part in most lateral suture failures but we do not have, as yet, comparable data on abrasion resistance.

We are confident that the Ultra High Molecular Weight Polyethylene composition of LigaFiba® gives it excellent abrasion resistance also.
LigaFiba® Lateral Sutures with Crimp

LigaFiba® does knot securely but for maximum security requires 6 throws which creates a rather bulky knot. Crimping creates a secure, low profile, radio-dense join between the free ends of LigaFiba®. To make passing the LigaFiba® through the crimp a simple process the 25mm of LigaFiba® nearest the needle has been processed to minimise fraying. Always cut the lateral suture near the needle. Supplied sterile.

**LIGAFIBA® LATERAL SUTURES WITH CRIMP**

- **LFLSCR75** 75lb LigaFiba® Lateral Suture (300mm) + Crimp
- **LFLSCR150** 150lb LigaFiba® Lateral Suture (500mm) + Crimp
- **LFLSCR250** 250lb LigaFiba® Lateral Suture (500mm) + Crimp
- **LFLSCR500** 500lb LigaFiba® Lateral Suture (600mm) + Crimp
- **LFLSCR250/5** 250lb LigaFiba® Lateral Suture (500mm) + Crimp Pack of 5
- **LFLSCR500/5** 500lb LigaFiba® Lateral Suture (600mm) + Crimp Pack of 5
- **LFLSCRSET** 5 of each LigaFiba® Lateral Suture + Crimp Pack (150, 250, 500lb) 15 in total

Double LigaFiba® Lateral Sutures

Extreme strength, minimal stretch and good abrasion characteristics make LigaFiba® an ideal material for lateral sutures. The loop may be either tied or crimped at the end of the procedure. LigaFiba® for any given diameter is more than twice as strong as monofilament nylon. Lateral sutures are supplied sterile with size appropriate cruciate needle on one end and a straight round bodied needle at the other. Supplied Sterile.

**LIGAFIBA® LATERAL SUTURES**

- **LFLS75** 75lb LigaFiba® Lateral Suture (300mm)
- **LFLS150** 150lb LigaFiba® Lateral Suture (500mm)
- **LFLS250** 250lb LigaFiba® Lateral Suture (500mm)
- **LFLS500** 500lb LigaFiba® Lateral Suture (600mm)
- **LFLS150/5** 150lb LigaFiba® Lateral Suture (500mm) - Pack of 5
- **LFLS250/5** 250lb LigaFiba® Lateral Suture (500mm) - Pack of 5
- **LFLS500/5** 500lb LigaFiba® Lateral Suture (600mm) - Pack of 5

Double LigaFiba® Lateral Sutures with Crimp

Double strand presentation with no crimps. Supplied sterile

**DOUBLE LIGAFIBA® LATERAL SUTURES**

- **LFLS250D** Double 250lb LigaFiba® Lateral Suture (500mm)
- **LFLS250D/5** Double 250lb LigaFiba® Lateral Suture (500mm) - Pack of 5

LigaFiba® Crimps

Spare crimps for LigaFiba®. Please note that only the LigaFiba® Crimper is powerful enough for LigaFiba® Crimps

**LIGAFIBA® CRIMPS**

- **LFCRIMP75** Crimp for 75lb LigaFiba®
- **LFCRIMP150** Crimp for 150lb LigaFiba®
- **LFCRIMP250** Crimp for 250lb LigaFiba®
- **LFCRIMP500** Crimp for 500lb LigaFiba®
- **091135M** LigaFiba® Compound Action Crimpers 245mm
LigaFiba® Tendon and Ligament Sutures

LigaFiba® is available in sterile single lengths for use in conjunction with any suitable suture anchor system. LigaFiba® is so tough it is difficult to cut and will damage standard scissors. Use our special T.C. Scissors with a custom cutting edge.

LIGAFIBA®

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Strength</th>
<th>Length</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>LF1S0500</td>
<td>150lb LigaFiba® x 500mm &lt;15kg</td>
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<td>LF250600</td>
<td>250lb LigaFiba® x 600mm 15 - 30kg</td>
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<td>LFS140TC</td>
<td>LigaFiba® Scissors T.C. 145mm</td>
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<td>£87.50</td>
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</tbody>
</table>

A tendon repair suture is also available with a round bodied needle at either end.

LIGAFIBA®

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>LFTSR5150</td>
<td>150lb LigaFiba® Tendon Repair Suture</td>
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<tr>
<td>LFS140TC</td>
<td>LigaFiba® Scissors T.C. 145mm</td>
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<td></td>
<td>£87.50</td>
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</tbody>
</table>

75lb (34kg) LigaFiba® Lateral Sutures

At less than 0.5mm in diameter the 75lb LigaFiba® is as strong as nylon 2.5 x as thick. Suitable for small dogs and cats weighing less than 5kg. LigaFiba® ties very well with minimal creep and a small soft knot. Alternatively a dedicated crimp may be used with our standard LigaFiba® Crimper 091135M.

75LB (34KG) LIGAFIBA® LATERAL SUTURES

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>LFLS75</td>
<td>75lb LigaFiba® Lateral Suture (300mm)</td>
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<tr>
<td>LFLSCR75</td>
<td>75lb LigaFiba® Lateral Suture (300mm) with Crimp</td>
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<tr>
<td>LFLBS75</td>
<td>75lb LigaFiba® Lateral Button Suture (300mm) with Button &amp; Crimp</td>
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<td>£30.39</td>
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</table>

Compound Action Crimpers for LigaFiba®

The Compound Action Crimper delivers a pre-measured crimp with minimal effort. The jaw cuts out prevent over crimping. These Crimpers require the least effort of any VI Crimper available. The Compound Action Crimper is suitable for all crimps apart from the thin walled 10mm crimp for 50lb Nylon which suits the Standard Simple Action Crimper.

LIGAFIBA® COMPOUND ACTION CRIMPERS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tr>
<td>091135M</td>
<td>LigaFiba® Compound Action Crimpers 245mm</td>
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</tbody>
</table>

LigaFiba® Scissors

LigaFiba® is so tough it is difficult to cut and will damage standard scissors. Use our special T.C. Scissors with a custom cutting edge.

LIGAFIBA® SCISSORS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tr>
<td>LFS140TC</td>
<td>LigaFiba® Scissors T.C. 145mm</td>
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LigaFiba® IsoToggle Locking Interference Screw

The Iso Toggle suture is an extra-capsular suture placed isometrically through bone tunnels. Placement of the tunnels is illustrated on a free CD. The LigaFiba® knots very well but there is now an alternative.

The Locking Interference Screw offers an alternative to tying over a button. The Screw has a tapered, soft profile thread which jams the LigaFiba® into the bone tunnel. The Screw may be partially introduced as a temporary measure to assess joint stability and range of movement. Once the surgeon is satisfied, the screw is driven home to lock the suture.

LIGAFIBA® ISO TOGGLE INTERFERENCE LOCKING SCREWS

<table>
<thead>
<tr>
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<td>Interference Screw 3.5 Stainless 18mm</td>
<td></td>
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<tr>
<td>LFIS2551ST1</td>
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<td>LFIS4552ST1</td>
<td>Interference Screw 4.5 Titanium 23mm</td>
<td></td>
<td></td>
<td>£27.50</td>
</tr>
</tbody>
</table>
Instruments

Lateral Suture Tension Device

This is the Standard Lateral Suture Tension Device in the USA. Ratchet based, it relies on the jaws pulling against crimps attached to the free ends of the loop. It is simple and effective but does require two extra crimps which are ultimately discarded. Remember, over tensioning loops creates as many problems as under tensioning.

LATERAL SUTURE TENSIONER
091158  Lateral Suture Tensioner 170mm

Cannulated Drills

Place a fine guide wire through the bone to accurately identify the position of a required bone tunnel or screw. Repositioning if necessary will not cause undue trauma to the bone. When the position is correct, drive the drill over the guidewire to create the hole.

CANNULATED DRILLS
H090112CAN  2.5mm 130mm Long 1.1mm Cannulation
H090104CAN  2.7mm 130mm Long 1.1mm Cannulation
H090106CAN  3.5mm 130mm Long 1.1mm Cannulation
S090112CAN  2.5mm 130mm Long 1.1mm Cannulation AO Quickfit
S090104CAN  2.7mm 130mm Long 1.1mm Cannulation AO Quickfit
S090106CAN  3.5mm 130mm Long 1.1mm Cannulation AO Quickfit
090065  Guide Wire 1.1mm x 178mm - Pack of 10

PushPull Suture Passer

Suture passer for either pushing or pulling soft suture material through a bone tunnel. Diameter 2mm.

Minimum tunnel diameters required:
• Pulling - 2mm
• Pushing - 2mm plus 2 x suture diameter

PUSHPULL SUTURE PASSER
001050PP  PushPull Suture Passer 235mm

LigaFiba® Accessories

Ormrod Buttons

Use to prevent sutures from ‘cheese wiring’ through bone, e.g. at hip toggle. Made from 1020 Medical Grade UHMWPE (Ultra High Molecular Weight Polyethylene).

ORMROD BUTTONS
090166/E  Ormrod Button 6mm Diameter (sterile) 2 Holes
090166/F  Ormrod Button 6mm Diameter (sterile) 2 Slots
090166/A  Ormrod Button 9mm Diameter (sterile) 2 Holes
090166/B  Ormrod Button 9mm Diameter (sterile) 2 Slots
090166/C  Ormrod Button 11mm Diameter (sterile) 2 Holes
090166/D  Ormrod Button 11mm Diameter (sterile) 2 Slots

Titanium Buttons

Titanium alternatives to the UHMWPE Ormrod buttons.
• Better resistance to peak loading
• Biocompatible
• Diameter maintained to limit pressure osteolysis & subsidence seen with smaller buttons
• Smooth edges to reduce suture wear
• Use wherever a suture need to be tied over a button.

TITANIUM BUTTONS
TIBUT6H  Titanium Button 6mm 2 Holes
TIBUT6S  Titanium Button 6mm 2 Slots
TIBUT9H  Titanium Button 9mm 2 Holes
TIBUT9S  Titanium Button 9mm 2 Slots
TIBUT11H Titanium Button 11mm 2 Holes
TIBUT11S Titanium Button 11mm 2 Slots

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TITANIUM BUTTONS
TIBUT6H  Titanium Button 6mm 2 Holes
TIBUT6S  Titanium Button 6mm 2 Slots
TIBUT9H  Titanium Button 9mm 2 Holes
TIBUT9S  Titanium Button 9mm 2 Slots
TIBUT11H Titanium Button 11mm 2 Holes
TIBUT11S Titanium Button 11mm 2 Slots
During the placement of standard lateral sutures there is a tendency for the proximal strand of the suture to drift up the straight patella ligament. This reduces the isometry of the suture and the suture can become intra-articular which is undesirable. Use of a toggle button at the proximal tibia bone tunnel keeps both strands of suture at the hole. Application is straight forward. The suture is passed around the fabella using the swaged on curved cruciate needle. The suture is then passed through the hole from lateral to medial and then back through the hole from medial to lateral. The toggle button is placed into the loop on the medial surface and retained into position by pulling the loop tight from the lateral side. The button prevents the suture from pulling through. The LigaFiba® suture is then tensioned and cramped in the usual way. Each pack includes the lateral suture, the correct number and size of crimp plus an appropriate button. Available with titanium or UHMWPE buttons.

LigaFiba® Lateral Button Suture

LATERAL MEDIAL

Lateral Button Suture Step by Step Summary

Detailed step by step guides of both the original lateral suture technique and the lateral button suture technique are available free of charge on request from Veterinary Instrumentation or may be downloaded free of charge from www.vetinst.com. Some of the simple modifications to the standard lateral suture technique are illustrated below.

Special thanks to Geoff Robins for the images.

Create the bone tunnel in the proximal tibia in an isometric a position as possible. It is important that as the knee flexes and extends, the LigaFiba® loop is not repeatedly loaded and unloaded against the bone. Suture is placed around the fabella as usual.

Pass the straight needle back from medial to lateral to create a loop of LigaFiba® on the medial side.

The slotted button is placed within the loop and the slack within the loop is drawn through to the lateral side so that the button sits on bone at the medial side. Both strands of LigaFiba® exit the lateral tibia at the isometric point. Tension and crimp or knot as usual.

LIGAFIBA® LATERAL BUTTON SUTURE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>LFLBS75</td>
<td>75lb LigaFiba® Lateral Button Suture</td>
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<tr>
<td>LFLBS150</td>
<td>150lb LigaFiba® Lateral Button Suture</td>
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<tr>
<td>LFLBS250</td>
<td>250lb LigaFiba® Lateral Button Suture</td>
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<tr>
<td>LFLBS250D</td>
<td>250lb LigaFiba® Lateral Button Suture Double</td>
</tr>
<tr>
<td>LFLBS500</td>
<td>500lb LigaFiba® Lateral Button Suture</td>
</tr>
<tr>
<td>LFLBSSTARTER</td>
<td>LigaFiba® Lateral Button Suture Starter Kit</td>
</tr>
<tr>
<td>LFLBS150TI</td>
<td>150lb LigaFiba® Lateral Button Suture Ti Button</td>
</tr>
<tr>
<td>LFLBS250TI</td>
<td>250lb LigaFiba® Lateral Button Suture Ti Button</td>
</tr>
<tr>
<td>LFLBS250DTI</td>
<td>250lb LigaFiba® Lateral Button Suture Double/Ti Button</td>
</tr>
<tr>
<td>LFLBS500TI</td>
<td>500lb LigaFiba® Lateral Button Suture Ti Button</td>
</tr>
</tbody>
</table>
LigaFiba® Iso Toggle Sutures

The Iso Toggle suture is placed via bone tunnels across the stifle at isometric points. The use of isometric points maximises the range of movement of the stifle and protects the suture from repeated stretching and abrasion. The suture is anchored over buttons on the medial side.

Available in all three sizes of LigaFiba®

150lb Dogs up to 15kg
250lb Dogs 15-30kg
500lb Dogs over 30kg

Free DVD available showing the placement of the Iso Toggle Suture.

The Starter Kit comprises 2 x 250lb sutures, 2 x 500lb sutures and the required 2.5mm and 3.5mm Antiskid Drills.

LIGAFIBA® ISO TOGGLE SUTURES

LFITS150 150lb Iso Toggle Suture Set
LFITS250 250lb Iso Toggle Suture Set
LFITS500 500lb Iso Toggle Suture Set
LFISOKIT Iso Toggle Starter Kit (250 & 500lb) x 2 of each
DVDALL Free Procedure DVD
BRLIGAISO Step by Step Guide to LigaFiba® Iso Toggle Suture

LigaFiba® IsoToggle Suture Step by Step Summary

The full IsoToggle Step by Step guide is available on request from Veterinary Instrumentation or by download from www.vetinst.com. Brief highlights are shown below. Please refer to the full guide before attempting the procedure – many steps have been omitted below.

Placement of femoral bone tunnel

Start – just cranial to and just distal to lateral fabella
Exit through cortical bone avoiding medial trochlea ridge and a breakout through caudal aspect of femur.

Placement of tibial bone tunnel

Start - Tubercle of Gerdy on lateral aspect of the tibial plateau. Exit – middle of medial proximal tibia

Pass the suture through the tibial bone tunnel

Pass the suture through the tibial bone tunnel from medial to lateral, then the femoral tunnel from lateral to medial, using the guide needle. Tensioning should be sufficient to eliminate the anterior drawer but not enough to rotate the tibia on the femur. Ensure the button sits down on clean bone.

Iso Toggle Aiming Device

Useful for the placement of the femoral bone tunnel which can be more challenging than the tibial tunnel. Adjustable Drill Guide (ADJDG2035) with an appropriately sized drill slider may be used to pre-determine the line of the tunnel and offer protection of the soft tissues. The arms of the guide have sufficient ‘spring’ in them so if pre-stressed the guide is self-retaining.

ADJUSTABLE DRILL GUIDE
ADJDG2035 Adjustable Drill Guide 175mm

Iso Toggle Consumables

ISO TOGGLE CONSUMABLES

H090102AS 2.0mm Antiskid Drill (150lb) 100mm
H090112AS 2.5mm Antiskid Drill (250lb) 115mm
H090106ASIL 3.5mm Antiskid Drill (500lb) 180mm
090166/E Ormrod Button 6mm Diameter Sterile 2 Holes (150lb)
090166/F Ormrod Button 6mm Diameter Sterile 2 Slots (150lb)
090166/A Ormrod Button 9mm Diameter Sterile 2 Holes (250lb)
090166/B Ormrod Button 9mm Diameter Sterile 2 Slots (250lb)
090166/C Ormrod Button 11mm Diameter Sterile 2 Holes (500lb)
090166/D Ormrod Button 11mm Diameter Sterile 2 Slots (500lb)
TIBUT6H Titanium Button 6mm 2 Holes
TIBUT9H Titanium Button 9mm 2 Holes
TIBUT9S Titanium Button 9mm 2 Slots
TIBUT11H Titanium Button 11mm 2 Holes
TIBUT11S Titanium Button 11mm 2 Slots
Arthrex is a highly innovative global surgical company specialising in joint surgery and arthroscopy products. Their veterinary division Arthrex Vet Systems introduces the most appropriate of the human products to the veterinary market. In addition Arthrex Vet Systems is working with leading veterinary surgeons, to develop innovative solutions to veterinary joint surgery problems.

Veterinary Instrumentation is pleased to be the UK distributor for Arthrex joint surgery products.

**FiberWire™**

Many Arthrex products are based around FiberWire™, a composite material consisting of a multi-stranded long chain ultra high molecular weight polyethylene core with a polyester braided jacket. Compared to monofilament nylon, FiberWire™ is stronger, and does not stretch. In addition and very importantly FiberWire™ has much better wear characteristics. Most lateral suture loops fail by abrasion, usually at the fabella. Use of FibreWire™ extends the working life of the lateral suture. FiberWire™ is five times more resistant to abrasion than standard polyester suture. FiberWire™ ties very well with a creep free soft knot which again compares very well with nylon.

FiberWire™ is available in various presentations, such as free strands, swaged onto needles or attached to suture anchors. FiberTape™ is as the name suggests a broader, immensely strong version of FiberWire™ and forms the basis of the TightRope cruciate technique.

**FIBERWIRE™**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR-7200</td>
<td>#2 (M5) FiberWire™ with Tapered Needle (12)</td>
<td>£190.55</td>
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<tr>
<td>AR-7201</td>
<td>#2 (M5) FiberWire™ without Needles (12)</td>
<td>£190.55</td>
</tr>
<tr>
<td>AR-7202</td>
<td>#2 (M5) FiberWire™ with Reverse Cut Needles (12)</td>
<td>£190.55</td>
</tr>
<tr>
<td>AR-7205</td>
<td>#2 (M5) FiberWire™ with two Tapered Needles (12)</td>
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<tr>
<td>AR-7206</td>
<td>#2 (M5) FiberWire™ with 1/2 Circle Needles (12)</td>
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<tr>
<td>AR-7210</td>
<td>#5 (M7) FiberWire™ without Needles (12)</td>
<td>£216.30</td>
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<tr>
<td>AR-7211</td>
<td>#5 (M7) FiberWire™ with Needles (12)</td>
<td>£216.30</td>
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<td>AR-7220</td>
<td>2-0 FiberWire™ with Tapered Needles (12)</td>
<td>£195.70</td>
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<tr>
<td>AR-7237</td>
<td>FiberTape (6)</td>
<td>£643.75</td>
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**Nitinol Looped Needles**

Nitinol is a highly sprung material used in stents and other intravascular structures. Attached to a needle the loop springs open making threading very easy and when pulled through causes less damage to the soft tissues than regular eyed needles.

**Nitinol Flexible Suture Passer**

Passing soft flexible sutures through bone tunnels can be a challenge. The Arthrex suture passer is 200 or 600mm long stiff yet flexible with a nitinol loop at the tip which expands for easy passage of the suture c.f. suture wire loops.

**NITINOL SUTURE PASSERS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tr>
<td>VAR-5000</td>
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<td>VAR-1255-08</td>
<td>Nitinol Flexible Suture Passer (200mm)</td>
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<tr>
<td>VAR-1255-18</td>
<td>Nitinol Flexible Suture Passer (600mm)</td>
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**Arthrex FiberWire™ Canine Cruciate Lateral Suture**

A special FiberWire™ lateral suture has been developed by Arthrex in conjunction with James L. Cook, DVM, PhD, at the Comparativen Orthopaedic Laboratory, University of Missouri, consisting of a swaged on curved needle for fabella placement and a straight needle at the other end for easy passage through the proximal tibia. The #5 FiberWire™ (7 metric) is for use in dogs 15kg to 50kg. The #2 FiberWire (5 metric) is used for smaller patients.

A Step by Step Guide on how to use the suture can be viewed or downloaded as a pdf by visiting our web site www.vetinst.com. A video of the technique may also be viewed on the web site.

**FIBERWIRE™ CANINE CRUCIATE LATERAL SUTURE**

<table>
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<tr>
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<tr>
<td>VAR-2000</td>
<td>#5 (M7) FiberWire™ Lateral Suture (10)</td>
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<tr>
<td>VAR-2002</td>
<td>#2 (M5) FiberWire™ Lateral Suture (10)</td>
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<tr>
<td>BRCCLS</td>
<td>FiberWire™ Lateral Suture Step by Step Guide</td>
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<tr>
<td>DVDARTHREX</td>
<td>Arthrex Multi DVD (contains all Arthrex Brochures)</td>
<td></td>
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</table>
Arthrex Isometric Lateral Suture Anchor System

The lateral fabella and the proximal tibial crest are not the ideal isometric points to substitute for the cranial cruciate ligament. They are used because they are the nearest convenient points to pass a suture using a needle. Using Arthrex FiberWire™ and Arthrex suture anchors it is possible to place a lateral suture at the most isometric points. As the stifle flexes and extends the distance between the isometric points does not change. 

F1 (lateral fabella) is isometric with T3 (posterior wall of LDE sulcus).

F2 (posteroventral femoral condyle) is isometric with T2.

In large dogs a suture may be placed at both pairs of positions.

A step by step guide is available by post or can be downloaded from www.vetinst.com from the documents download page. A video is also available on the website.

Arthrex Suture Anchors

Corkscrew anchors are designed for cancellous bone and are supplied pre-loaded and sterile on a disposable screwdriver type applicator. Pre-drilling is not required. The Corkscrew anchor is supplied pre-loaded with either a strand of #5 FiberWire or two strands of #2 FiberWire. Additional, non sterile stand alone Corkscrew anchors are also available which may be inserted using the same applicator. Should pre-drilling be necessary use a 2.5mm drill.

FASTak II suture anchors are designed for cortical bone. They are supplied sterile pre-loaded with #2 (5 Metric) FiberWire and are used in the Isometric Procedure. The anchor requires no pre-drilling and is inserted directly using the disposable screwdriver handle applicator. Additional FASTak anchors are available which may be inserted using the same applicator.

The applicator of both anchors is laser marked with an insertion line.

When inserted to this line the eyelet of the anchor is below the bone surface.

**ARTHERX SUTURE ANCHORS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<td>VAR-2100</td>
<td>Corkscrew Suture Anchor 5x15mm</td>
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<tr>
<td>VAR-2100S</td>
<td>Corkscrew Suture Anchor 5x15mm Screwdriver type with one #5 (Metric 7) FiberWire™ (5 pack)</td>
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<tr>
<td>VAR-2102</td>
<td>Corkscrew Suture Anchor 5x15mm Screwdriver type with one #2 (Metric 5) FiberWire™ and one #2 (Metric 5) TigerWire™(5 pack)</td>
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<tr>
<td>VAR-2102S</td>
<td>Corkscrew Suture Anchor 5x15mm Screwdriver type with one #2 (Metric 5) FiberWire™ and one #2 (Metric 5) TigerWire™(5 pack)</td>
<td>5</td>
</tr>
<tr>
<td>VAR-2200</td>
<td>FASTak II with #2 (5 Metric) FiberWire™ in Screwdriver Applicator (5 pack)</td>
<td>5</td>
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<tr>
<td>VAR-2200S</td>
<td>FASTak II with #2 (5 Metric) FiberWire™ in Screwdriver Applicator (5 pack)</td>
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<tr>
<td>VAR-2201</td>
<td>FASTak II Anchor only (5 pack)</td>
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<tr>
<td>BRCCLS</td>
<td>Arthrex CCL Literature</td>
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</table>

Arthrex TightRope for CrCCL Repair

The TightRope technique for CrCCL repair takes the best aspects of the lateral suture but adds the benefits of isometric positioning and the use of the immensely strong Arthrex FiberTape. The isometric points are accessed by use of bone tunnels which create very secure fixation points c.f. the lateral fabella.

A full free step by step guide of the TightRope technique is available from Veterinary Instrumentation or as a download from www.vetinst.com. The technique is summarised here.

**ARTHERX TIGHTROPE**

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>VAR-2800</td>
<td>TightRope CCL</td>
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<tr>
<td>VAR-8920DC</td>
<td>Cannulated Drill Bit 3.5mm</td>
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<tr>
<td>VAR-8920P</td>
<td>Guidewire for TightRope (Pack of 6) 1.2mm</td>
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<tr>
<td>VAR-11796</td>
<td>FiberWire™ Scissors</td>
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<tr>
<td>VAR-2800-MULTI</td>
<td>TightRope CCL 5 Pack + Free Cannulated Drill Bit</td>
</tr>
<tr>
<td>BRTIGHT</td>
<td>TightRope Training Pack (Guide + DVD)</td>
</tr>
</tbody>
</table>

Please note Veterinary Instrumentation cannot supply Arthrex products outside of the UK.
Arthrex have produced a smaller version of the TightRope for dogs less than 18kg. The technique is the same as for the standard TightRope CCL but the guide wire and 2.7mm cannulated drills are smaller. Some users report that the Tensioner is more useful with the Mini TightRope (VAR-1529). The MiniTightRope also has an application in the management of coxofemoral luxations, see next page.

**ARTHREX MINI TIGHTROPE**

- **VAR-2801** Mini TightRope Single Set
- **VAR-891|DC** Cannulated Drill Bit 2.7mm (use with VAR-8920P)
- **VAR-1529** Tensioner with Tensiometer
- **VAR-8920P** 1.2mm (0.049") Guidewire (Pack of 6)

**Arthrex SwiveLock Anchor Knotless CrCL Technique**

Don Hulse has developed the knotless SwiveLock technique of CrCL repair based on his work on isometric points for the anchorage of lateral sutures. The system involves drilling a bone tunnel in the proximal tibia drilled from point T3 (caudal to the LDE). A double strand of FiberTape is secured on the medial tibia using a toggle. The FiberTape is tensioned and secured at point F2 just distal to the lateral fabella using the new SwiveLock anchor.

Step by Step guide and brochure is available free of charge BRSWIV

**ASSOCIATED PRODUCTS**

- **VAR-1927CTB** Tap for SwiveLock
- **VAR-1530G-2S** Cannulated Drill 2.5mm
- **VAR-1255-08** Nitinol Flexible Suture Passer (200mm)
- **VAR-1927D** Spade Tip Drill for 5.5 SwiveLock
- **VAR-1530K** Guide Wire 1.04mm (0.041") pack of x 4
- **BRSWIV** SwiveLock Lateral Suture Step by Step Guide

**BRSWIV**

SwiveLock Kit includes VAR-2323PSLC, AR-7237 and VAR-8920G

**VAR-2323PSLC** SwiveLock 5.5mm x 19.1mm Single

**AR-7237** FibreTape (6)

**VAR-8920G** Suture Button

**SWIVELOCK ANCHOR SYSTEM**

**VAR-2323PSLG** SwiveLock Kit includes VAR-2323PSLC, AR-7237 and VAR-8920G

**VAR-2323PSLC** SwiveLock 5.5mm x 19.1mm Single

**AR-7237** FibreTape (6)

**VAR-8920G** Suture Button

The F2 site is drilled with the Spade Tip Drill creating a blind tunnel of fixed depth. Aim towards trochlea

**Tap the tunnel to the full depth indicated by black mark on tap**

The fiber is tensioned and secured at point F2 just distal to the lateral fabella using the new SwiveLock anchor.

**Pass a guide wire from site T3 just caudal to LDE sulcus. The wire should exit on caudomedial aspect of tibia. Follow through with the cannulated drill**

**Pass both strands of FiberTape through the SwiveLock and mark at black laser line**

**Move the eyelet to the mark and insert into blind tunnel until edge of anchor is at the tunnel entrance.**

**The Fiber Tape is locked into position by screwing in the anchor. When a 1/4 of the way in test for tension and range of motion. Reposition eyelet if necessary and re-screw.**

**PASS THE NITINOL SUTURE PASSING WIRE THROUGH THE TUNNEL TO RETRIEVE THE FIBER TAP THREADED ONTO THE SUTURE BUTTON.**

**PULL BUTTON TIGHT ONTO BONE. NO SOFT TISSUE SHOULD BE BETWEEN BUTTON AND BONE.**

**Pass the nitinol suture passing wire through the tunnel to retrieve the FiberTape threaded onto the suture button.**

**The Fiber Tape is locked into position by screwing in the anchor. When a 1/4 of the way in test for tension and range of motion. Reposition eyelet if necessary and re-screw.**

**Move the eyelet to the mark and insert into blind tunnel until edge of anchor is at the tunnel entrance.**

**The Fiber Tape is locked into position by screwing in the anchor. When a 1/4 of the way in test for tension and range of motion. Reposition eyelet if necessary and re-screw.**
Tying a loop of FiberWire is straightforward in the lateral suture technique. Where the FiberWire/FiberTape runs through bone tunnels, ‘taking up the slack’ can be more problematic. This is particularly true in the new TightRope where two separate loops must be adjusted to the same tension before tying. This calibrated tension device deals with this problem.

**ARThREX SUTURE TENSIONER WITH TENSIOMETER**

VAR-1529  Suture Tensioner with Tensiometer  
£509.85

**Arthrex SwiveLock**

![Arthrex SwiveLock](image)

The Arthrex SwiveLock can be used in a number of different locations for ligamentous replacement and/or augmentation. The primary veterinary application is in the treatment of patients with cranial cruciate ligament insufficiency. Smaller SwiveLock sizes have recently been made available, permitting this knotless augmentation technique to be used down to a patient weight of around 7kg.

Kits are also available and include FiberTape, a suture button, SwiveLock anchor and sterile marker.

**MINI SWIVELOCK**

VAR-2324PSLC  Suture Anchor PEEK SwiveLock C 4.75 x 19.1mm  
VET - 5 Pieces  
£540.75

VAR-2324PSLC-I  Suture Anchor PEEK SwiveLock C 4.75 x 19.1mm  
VET - Single  
£108.15

VAR-2325PSLC  Suture Anchor PEEK SwiveLock C 3.5 x 14.8mm  
VET - 5 Pieces  
£540.75

VAR-2325PSLC-I  Suture Anchor PEEK SwiveLock C 3.5 x 14.8mm  
VET - Single  
£108.15

VAR-2324PSLG  Suture Anchor Kit 4.75mm  
£159.65

VAR-2325PSLG  Suture Anchor Kit 3.5mm  
£159.65

**Arthrex Stifle Distractor**

![Arthrex Stifle Distractor](image)

Available in three sizes, the sigmoid shape of these arthroscopic stifle distractors permits both stifle distraction and subluxation for optimal meniscal examination. The shaft fits nicely in the femoral notch and the tip is anatomically contoured to avoid slipping off the caudal edge of the tibial plateau.

Placing the tip between the caudal medial meniscotibial ligament and the caudal cruciate ligament allows assessment of both menisci at the same time without repositioning. Tip diameter on all three sizes is 4mm. Can also be used for open arthrotomy.

**ARTHREX STIFLE DISTRACTOR**

VAR-4010-13  Arthrex Canine Stifle Distractor 13mm  
£257.50

VAR-4010-20  Arthrex Canine Stifle Distractor 20mm  
£257.50

VAR-4010-27  Arthrex Canine Stifle Distractor 27mm  
£257.50

**Arthrex Meniscal Probe Cutter**

![Arthrex Meniscal Probe Cutter](image)

The arthroscopic probe cutter consists of a re-usable handle and replaceable blades. The tip of the tubular handle incorporates a hook for meniscal probing and a spring loaded cutter is advanced by means of a slider in the main body of the handle. Tubular shaft diameter 4.4mm.

**ARTHREX MENISCAL PROBE CUTTER**

VAR-4000  Canine Meniscal Probe Cutter Blades Pack of 5  
£257.50

VAR-4001  Canine Meniscal Probe Cutter  
£643.75

**Arthrex Suture Tensioner**

![Arthrex Suture Tensioner](image)

Tying a loop of FiberWire is straightforward in the lateral suture technique. Where the FiberWire/FiberTape runs through bone tunnels, ‘taking up the slack’ can be more problematic. This is particularly true in the new TightRope where two separate loops must be adjusted to the same tension before tying. This calibrated tension device deals with this problem.

**ARTHREX SUTURE TENSIONER WITH TENSIOMETER**

VAR-1529  Suture Tensioner with Tensiometer  
£509.85
Suture Screws
Suture Screws & Set

Suture screws are a self-tapping screw with an eyed head, designed to be used as a versatile, economic suture anchor. The thread pattern is the same as the equivalent type of cortical or cancellous screw.

Sizes range from 2.0mm cortical to 4.0mm cancellous to cover a wide range of patients.

Pre drill with the standard pilot for the screw size selected, screw in with the dedicated insertion tool.

Also available as a boxed kit consisting of a set of 2 of each size screw plus 1 of each of 3 sizes of Ligafiba® in a stainless steel case.

**SUTURE SCREWS & SET**
- **SS2006** 2.0mm Diameter 6mm Long 1.0mm Hole Cortical
- **SS2010** 2.0mm Diameter 10mm Long 1.0mm Hole Cortical
- **SS2708** 2.7mm Diameter 8mm Long 1.5mm Hole Cortical
- **SS2714** 2.7mm Diameter 14mm Long 1.5mm Hole Cortical
- **SS3512** 3.5mm Diameter 12mm Long 2.0mm Hole Cortical
- **SS3520** 3.5mm Diameter 20mm Long 2.0mm Hole Cortical
- **SS4016** 4.0mm Diameter 16mm Long 2.0mm Hole Cancellous
- **SS4024** 4.0mm Diameter 24mm Long 2.0mm Hole Cancellous
- **SSITKIT** Suture Screw Set
  - (16 Screws + Introducer + 3 Suture Packs)
- **SSITUN** Universal Insertion Tool for all Suture Screws

**SUTURE ANCHOR PIN**
- **SAP2.5** Suture Anchor Pin 2.5mm Diameter 1.0mm Hole
  - 17mm Suture Anchor Length 125mm Overall Length
- **SAP3** Suture Anchor Pin 3mm Diameter 1.0mm Hole
  - 21mm Suture Anchor Length 127mm Overall Length
- **SAP4** Suture Anchor Pin 4mm Diameter 2.0mm Hole
  - 26mm Suture Anchor Length 136mm Overall Length

Suture Anchor Materials
Ideally the material selected should be strong with a high resistance to abrasion. FiberWire™ and braided polyethylene have these qualities but are braided and must, therefore, be used with care. Monofilament materials cause less problems in infected areas (e.g. shearing injuries). Make sure that the material selected fits the anchor you have in mind.

**SUTURE ANCHOR MATERIALS**
- **091141** 500mm x 50lb Nylon (Sterile Pack)
- **091139** 800mm x 80lb Nylon (Sterile Pack)
- **LF150500** Ligafib® 500lb (68kg) 0.6mm x 600mm
- **LF250600** Ligafib® 500lb (113kg) 1mm x 600mm
- **LF500600** Ligafib® 500lb (226kg) 1.5mm x 600mm
- **AR-7201** FiberWire™ No 2 (12)
- **AR-7210** FiberWire™ No 5 (12)
- **BRFIBER** FiberWire™ Literature
Over The Top (OTT)

Curved Graft Passer

The repair of the cranial cruciate ligament (CCL) by the ‘Over the Top’ technique requires a curved graft passer to pull the graft through the stifle joint. This design of graft passer has been developed over many years to:
1. minimise damage to intra-articular structures.
2. feel right in use. The handle is comfortable.
3. for graft insertion anterior to posterior or vice versa.

This design is usually used by those still using this technique. Please see our free DVD ‘Surgical Management of Canine Cranial Cruciate Disease’ (Code: DVDALL) for details and video of the technique. The small eyed graft passers are appropriate for placement of lateral suture wire or monofilament nylon as described by M.L. Olmstead.

CURVED GRAFT PASSER

<table>
<thead>
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<th>Code</th>
<th>Description</th>
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<tr>
<td>001051</td>
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<td>Small Curved Graft Passer 3cm 175mm</td>
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<td>Very Large Curved Graft Passer 6cm 205mm</td>
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<tr>
<td>001057AR</td>
<td>Aneurism Needle 3cm Angled Right Small Eye</td>
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Straight Graft Passer

Designed to pass through a 2.7mm hole, the straight graft passer is useful for pulling graft and nylon through bone tunnels.

STRAIGHT GRAFT PASSER

<table>
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<tr>
<th>Code</th>
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<tr>
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<td>Straight Graft Passer</td>
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Aneurism Needles

The sharp tip of the angled graft passer is passed around the fabella by rotating the wrist. The eye is small and accepts all suture materials. Total length 210mm.

ANEURISM NEEDLES

<table>
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<td>001058AR</td>
<td>Aneurism Needle 4.5cm Angled Right Small Eye</td>
<td>£61.29</td>
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</table>

CCL Staples

The attachment of the fascia lata graft to the distal femur is the weakest part of the OTT repair. The small spikes under the head of the staple are designed to engage the graft and firmly fix it to the periosteum. Also useful for re-attaching avulsed ligaments and transfixing the biceps tendon. Made from cobalt chrome.

CCL STAPLES

<table>
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<tr>
<td>090128</td>
<td>16mm Wide CCL Staple</td>
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CCL Staple Introducer

The Staple Introducer holds the staple to facilitate the initial insertion and alignment whilst being struck by a mallet. In case of difficulty starting the staple, pre-drill with 2.0mm pin or drill bit. Accepts all sizes of CCL Staple.

CCL STAPLE INTRODUCER

<table>
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<td>090129</td>
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<td>091130</td>
<td>CCL Kit in Stainless Box (Introducer with 8 Staples)</td>
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Tibial Tuberosity Advancement (TTA)

The TTA procedure developed by Topic and Montavon is designed to bring the tibial plateau to sit at 90° to the straight patella ligament. This effectively neutralises the shear forces within the stifle under loading, making the stifle stable.

This is achieved by advancing the tibial tubercle and stabilising the created defect using a titanium cage and plate. The cage is selected for both thickness and width. The implants are secured using titanium screws. Titanium is very osteoconductive resulting in rapid healing. The use of stainless steel implants is not recommended.

TTA Procedure

The TTA procedure is best learnt by attending a recognised training course and Veterinary Instrumentation supports numerous training providers with equipment and implants.

Before attending a course it is useful to review the Veterinary Instrumentation step by step guide and DVD. The free DVD includes both video footage, a step by step guide and some frequently asked questions on the TTA procedure.

TTA Starter Kit

TTA Starter Kit in a Premium Aluminium Box

The Starter Kit contains the following:

**Instruments**
- TTA Drill Guide (4 Hole)
- TTA Drill Guide (8 Hole)
- TTA Fork Holder
- TTA Spreader + Inserts
- TTA Plate Bender
- TTA 2.4 Cross Head Screwdriver
- TTA Plate and Fork Overlay
- TTA Mallet
- Depth Gauge
- TTA Cage Forceps
- Block End Serrated Dissecting Forceps
- 2.5 Hex Head Screwdriver and Sleeve
- Premium Equipment Box
- 1.8mm, 2.0mm, 2.5mm Drill Bits - Hard

**Implants**
- One of each Cage (3, 4.5, 6, 7.5, 9, 10.5 & 12),
- One of each Fork
- One of each Plate
- 2.4mm Self Tapping Screws
  - 12mm – 38mm 4 of each
- 2.7mm Self Tapping Screws
  - 12mm – 28mm 3 of each
- 3.5mm Self Tapping Screws
  - 16mm – 36mm 3 of each

The TTA Starter Kit gives a good saving over component price.

**TTA PROCEDURE**

**DVDALL** TTA Procedural DVD
**BRTTA** TTA Step by Step Guide

Call or email for a copy to be sent or download at [www.vetinst.com](http://www.vetinst.com)
The TTA procedure does require some essential instruments. Positioning of the fork and cage is impossible without the following instruments. The set is less expensive than buying the instruments individually.

**TTA INSTRUMENTATION**

- **TTA554** TTA Drill Guide (4 Hole)
- **TTA555** TTA Drill Guide (8 Hole)
- **TTA666** TTA Fork Holder
- **TTA444** TTA Spreader and 3, 6, 9, 12 & 15mm Inserts
- **TTA44S** 4.5, 7.5 &10.5mm Insert Set
- **TTA333** TTA Plate Bender
- **TTA777** 1.9mm Pins (Set of two)
- **TTA24** TTA 24 Cross Head Screwdriver
- **TTAPFO** TTA Plate and Fork Overlay
- **TTATAN** Common Tangent TTA/MMT Advancement Overlay
- **001323** TTA Mallet (140g)
- **TTAFCP** TTA Cage Forceps
- **SDHS35F** 2.5mm Hex Screwdriver and Sleeve
- **H090208** 1.8mm Drill Bit Hard
- **H090102** 2.0mm Drill Bit Hard
- **H090112** 2.5mm Drill Bit Hard
- **DG242735** Depth Gauge for 2.4, 2.7 & 3.5 Screws

**TTA SAW GUIDE**

- **TTA999** TTA Saw Guide

Manipulating the TTA cage into the correct position can be an awkward part of the procedure, particularly the smaller sizes. The TTA Cage Forceps grasp the cage firmly along the spine allowing it to be extracted from the case and placed into the tibial crest ostectomy.

**TTA CAGE FORCEPS**

- **TTAFCP** TTA Cage Forceps

**TTA Mallet**

The TTA Fork needs to be gently tapped home for maximum stability. The 140 gram Mallet is the ideal weight.

**TTA MALLET**

- **001323** TTA Mallet 140g 155mm

**Premium TTA Case**

Storage and autoclave case for TTA equipment and implants. Dedicated trays fitted for standard TTA equipment, with spaces for other useful items such as a small mallet, implants, and including a screw rack with space for 2.4, 2.7 and 3.5mm screws. The outer box is constructed of aluminium, with removable filters top and bottom. Internal racks are stainless steel. See Premium Boxes accessories in General Surgery for filters.

Please note the box is supplied empty – contents for illustration only.

**PREMIUM TTA CASE**

- **TTABOX** Premium TTA Case (Box and Insert only)
# TTA Implants

**TTA Cages**

See page 500 for TTA implant profiles

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**TTA Plates**

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<td>TTA4</td>
<td>Plate 4 Hole Titanium Screw 2.4 + 2.7mm</td>
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<td>Plate 5 Hole Titanium Screw 2.7mm</td>
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<td>Plate 6 Hole Titanium Screw 2.7 + 3.5mm</td>
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<td>Plate 7 Hole Titanium Screw 3.5mm</td>
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<td>Plate 8 Hole Titanium Screw 3.5mm</td>
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**TTA Forks**

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<tr>
<td>TTA8</td>
<td>Fork 8 Prong Titanium</td>
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Titanium Screws
Titanium screws and plates are very commonly used in man particularly for facio maxillary repairs. The most important benefit in this application is that Titanium does not interfere with MRI scans. Compared to stainless steel, Titanium is lighter and much more osteo compatible. The major application in veterinary orthopaedics is in conjunction with the TTA cruciate procedure.

TITANIUM SCREWS - STAINLESS STEEL 420 HARD
TICS2410  Titanium 2.4mm Self Tapping Cortical Screw 10mm
TICS2412  Titanium 2.4mm Self Tapping Cortical Screw 12mm
TICS2414  Titanium 2.4mm Self Tapping Cortical Screw 14mm
TICS2416  Titanium 2.4mm Self Tapping Cortical Screw 16mm
TICS2418  Titanium 2.4mm Self Tapping Cortical Screw 18mm
TICS2420  Titanium 2.4mm Self Tapping Cortical Screw 20mm
TICS2422  Titanium 2.4mm Self Tapping Cortical Screw 22mm
TICS2424  Titanium 2.4mm Self Tapping Cortical Screw 24mm
TICS2426  Titanium 2.4mm Self Tapping Cortical Screw 26mm
TICS2428  Titanium 2.4mm Self Tapping Cortical Screw 28mm
TICS2430  Titanium 2.4mm Self Tapping Cortical Screw 30mm
TICS2432  Titanium 2.4mm Self Tapping Cortical Screw 32mm
TICS2434  Titanium 2.4mm Self Tapping Cortical Screw 34mm
TICS2436  Titanium 2.4mm Self Tapping Cortical Screw 36mm
TICS2438  Titanium 2.4mm Self Tapping Cortical Screw 38mm
TICS2440  Titanium 2.4mm Self Tapping Cortical Screw 40mm

An alternative to the traditional forked plates. Secured using 2.4mm screws in the tibial crest; after the osteotomy and advancement have been made. Distal screws are secured using screws as appropriate. The rest of the technique is as per standard TTA.

Advantages:
• Position of the plate on the tibial crest and tibial diaphysis not fixed until after the osteotomy and advancement have been made – avoids difficult diaphyseal screw placement where the distal screws are too caudal on the tibia. Problem in small breeds and if this is missed in planning.
• Tibial crest screws can be angled if needed
• Screw length of tibial crest screws can be individual selected for better fit.
• Less screw holes in tibial crest than fork holes, helping reduce risk of tibial crest fracture.

A starter set of forkless plates (one of each) is available at a good discount over component costs.

FORKLESS TTA PLATES
TTAX42  Forkless TTA Plate (same length as TTAP3) 2.4+2.7 screw
TTAX52  Forkless TTA Plate (same length as TTAP4) 2.4+2.7 screw
TTAX65  Forkless TTA Plate (same length as TTAP5) 2.7 screw
TTAX78  Forkless TTA Plate (same length as TTAP6) 2.7+3.5 screw
TTAX91  Forkless TTA Plate (same length as TTAP7) 3.5 screw
TTAX104 Forkless TTA Plate (same length as TTAP8) 3.5 screw
TTAXSET  Forkless TTA Plate Set - one of each size

Titanium 2.7mm Self Tapping Cortical Screw 40mm

Forkless Plate Forceps
Variant of the plate holding drill guide forceps design developed for thin TTA plates. Hold the plate in position allowing the pilot hole to be drilled through the guide in the correct position, even after the osteotomy has been made.

FORKLESS TTA PLATE FORCEPS
TTAXFCP  Forkless TTA Plate Forceps (1x45mm)

Forkless TTA Plates

Titanium Screws 2.7MM HEX HEAD 2.0MM PILOT
TICS2706  Titanium 2.7mm Self Tapping Cortical Screw 6mm
TICS2708  Titanium 2.7mm Self Tapping Cortical Screw 8mm
TICS2710  Titanium 2.7mm Self Tapping Cortical Screw 10mm
TICS2712  Titanium 2.7mm Self Tapping Cortical Screw 12mm
TICS2714  Titanium 2.7mm Self Tapping Cortical Screw 14mm
TICS2716  Titanium 2.7mm Self Tapping Cortical Screw 16mm
TICS2718  Titanium 2.7mm Self Tapping Cortical Screw 18mm
TICS2720  Titanium 2.7mm Self Tapping Cortical Screw 20mm
TICS2722  Titanium 2.7mm Self Tapping Cortical Screw 22mm
TICS2724  Titanium 2.7mm Self Tapping Cortical Screw 24mm
TICS2726  Titanium 2.7mm Self Tapping Cortical Screw 26mm
TICS2728  Titanium 2.7mm Self Tapping Cortical Screw 28mm
TICS2730  Titanium 2.7mm Self Tapping Cortical Screw 30mm
TICS2732  Titanium 2.7mm Self Tapping Cortical Screw 32mm

Titanium Screws 3.5MM HEX HEAD 2.5MM PILOT
TICS3516  Titanium 3.5mm Self Tapping Cortical Screw 16mm
TICS3518  Titanium 3.5mm Self Tapping Cortical Screw 18mm
TICS3520  Titanium 3.5mm Self Tapping Cortical Screw 20mm
TICS3522  Titanium 3.5mm Self Tapping Cortical Screw 22mm
TICS3524  Titanium 3.5mm Self Tapping Cortical Screw 24mm
TICS3526  Titanium 3.5mm Self Tapping Cortical Screw 26mm
TICS3528  Titanium 3.5mm Self Tapping Cortical Screw 28mm
TICS3530  Titanium 3.5mm Self Tapping Cortical Screw 30mm
TICS3532  Titanium 3.5mm Self Tapping Cortical Screw 32mm
TICS3534  Titanium 3.5mm Self Tapping Cortical Screw 34mm
TICS3536  Titanium 3.5mm Self Tapping Cortical Screw 36mm

Titanium Screws 2.4MM CRUCIATE HEAD 1.8MM PILOT
TICS3530  Titanium 2.4mm Self Tapping Cortical Screw 30mm
TICS3532  Titanium 2.4mm Self Tapping Cortical Screw 32mm
TICS3534  Titanium 2.4mm Self Tapping Cortical Screw 34mm
TICS3536  Titanium 2.4mm Self Tapping Cortical Screw 36mm

DRILL BITS - STAINLESS STEEL 420 HARD
H090208  1.8 (dia mm)  80 (length mm)
H090102  2.0                  100
H090112  2.5                  115

Forkless TTA Plate Forceps
Variant of the plate holding drill guide forceps design developed for thin TTA plates. Hold the plate in position allowing the pilot hole to be drilled through the guide in the correct position, even after the osteotomy has been made.

FORKLESS TTA PLATE FORCEPS
TTAXFCP  Forkless TTA Plate Forceps (1x45mm)
Increasing repair stability and reducing healing times can be achieved by compression of the distal tibial tubercle to the tibial shaft. The Spinlock Reduction Forceps are the right size and have the correct degree of spread for most TTA procedures.

**TTA SPINLOCK REDUCTION FORCEPS**

- **001245SL**  
  TTA Spinlock Reduction Forceps 180mm

**TTA Cuttable Cages**

Cuttable cages can be trimmed in 3mm increments, to cover a larger range of patients with a reduced inventory. Also available as a set of cages (one of each size) with a free cutter.

**TTA CUTTABLE CAGES**

- **TTACUT316**  
  Cuttable Cage 3 x 16mm
- **TTACUT4518**  
  Cuttable Cage 4.5 x 18mm
- **TTACUT622**  
  Cuttable Cage 6 x 22mm
- **TTACUT7522**  
  Cuttable Cage 7.5 x 22mm
- **TTACUT926**  
  Cuttable Cage 9 x 26mm
- **TTACUT10526**  
  Cuttable Cage 10.5 x 26mm
- **TTACUT1228**  
  Cuttable Cage 12 x 28mm
- **TTACUT13528**  
  Cuttable Cage 13.5 x 28mm
- **TTACUT1532**  
  Cuttable Cage 15 x 32mm
- **TTACUTI**  
  Cuttable Cage Set (9) with FREE Cage Cutters

TTA cage cutters, which have narrow jaws designed to fit between the fins of cuttable cages. These cutters are only for TTA cages – not suitable for other implants due to the specially designed slim jaws.

**TTA CUTTABLE CAGE CUTTERS**

- **TTACACUT**  
  TTA Cuttable Cage Cutter

**TTA Spacers**

Placed under either cranial or caudal cage lugs to help re-align the quadriceps mechanism in cases of concurrent patellar luxation while performing the TTA procedure. Suggested maximum tibial tuberosity movement is 50%.

Although more expensive individually than washers, spacers may result in a more stable construct.

**TTA SPACERS TITANIUM**

- **TTASP2**  
  TTA Spacer Titanium 2mm
- **TTASP4**  
  TTA Spacer Titanium 4mm
- **TTASP6**  
  TTA Spacer Titanium 6mm
- **TTASP8**  
  TTA Spacer Titanium 8mm

**TTA Washers**

Stackable titanium washers. Permit adjustments in 1mm increments.

**TTA WASHERS - TITANIUM**

- **PW24TI**  
  2.4mm TTA Washer - Titanium
Tibial Tuberosity Advancement (TTA) as a technique for the surgical management of cranial cruciate ligament insufficiency has gained increasing acceptance and popularity in recent years. As we learn more, efforts are being made to simplify the technique, to make it more user-friendly and overcome some of the pitfalls of the original technique.

Developed in collaboration with Rita Leibinger Medical and Dr Yves Samoy, University of Ghent, TTA Rapid is one of the newer developments in both implant technology and technique.

The Implants

The manufacture of TTA Rapid cages has only been made possible with advances in materials and manufacturing technology. The cages are made by an additive manufacturing (AM) 3D printing process known as selective laser sintering (SLS). The process is interesting to watch. Although other materials can be used in the process, TTA Rapid cages start life as a very fine, commercially pure titanium powder. A very thin layer of titanium powder is deposited on the working bed of the SLS machine and a modified print head carrying a high-intensity laser is used to selectively melt the powder to bond (sinter) regions together. As further layers of powder are applied and the laser sintering process repeated, a solid three-dimensional structure begins to form within the ‘sand-pit’ of metal powder. Electron beam melting (EBM) is a similar procedure that uses an electron beam instead of a laser.

Once the full structure has been created, the cages are separated from the powder and various chemical and other finishing processes are performed to leave the cages in their final, implantable state.

Through this process, shapes can be created that would either be impossible to produce using more conventional technologies or cost prohibitive. In the case of TTA Rapid, a very porous honeycomb titanium lattice with a modulus similar to that of cancellous bone is generated permitting very rapid bony ingrowth to occur. Titanium is also very biocompatible, MRI compatible and typically needs to be inoculated with 10 times as many infectious units for an implant-associated infection to develop when compared to stainless steel.

The lattice found in the TTA Rapid cages is bound on 4 sides by an anatomically shaped, rigid shell of the same material with one side carrying lugs with screw holes in them. With the lattice, cage and screw lugs being one piece, the cages are very stable in situ. The constructs are so stable that auxiliary implants such as plates, wires, forks and staples are rarely indicated. This has a number of benefits:

• Reduced morbidity and biological cost that may be associated with the dissection and placement of additional implants.
• Reduced potential for cold conduction with superficially sited metallic implants.
• Fewer additional holes created in the tibial diaphysis which may contribute to crack propagation and failure of the tibial shaft.
• Metals of different electro-potentials are avoided in the same construct. Theoretically this reduces the potential for galvanic corrosion to occur (all components are titanium).
• Simplified inventory management.
• Potential time savings in the placement of implants.

Caution: TTA Rapid patients are often subjectively more comfortable in their early post-operative recovery than many patients undergoing other osteotomy surgeries. TTA Rapid still involves a major osteotomy and both appropriate patient selection and appropriate client education for post-operative management are indicated.
TTA Rapid Technique

Advancement Calculations
Calculation of the advancement is performed using the surgeon’s technique of choice – classic TTA, common tangent, etc. Using the TTA Rapid template provided, a visual check is performed to confirm cage selection. The template is adjusted so that one of the lines extending proximally from the cage represents the chosen line of the osteotomy. The template is positioned so that the top of the cage sits approximately 3mm below the proximal extent of the tibia along this line and that the Maquet hole marker on the template just touches the cranial cortex. The calculated advancement and the thickness of the cranial cortex in the region of the simulated Maquet hole are recorded for later use. Note that each cage width requires a unique osteotomy length. The final length of implant is determined intra-operatively. The approach is through a medial skin incision.

Using the L-Shaped Saw Guide
With the limb placed lateral side down, a 2.5mm pin is placed vertically through the joint capsule at, or just cranial to the Tubercle of Gerdy so as to be just touching the proximal tibia.

The L-shaped saw guide is dropped over the 'Gerdy pin' using the hole in the vertical arm of the saw guide that corresponds to the advancement.

The thumb-pin is placed through the hole in the horizontal arm of the saw guide corresponding to the thickness of the cranial cortex (as measured from the pre-operative radiographs). Typically this is around 3mm for a smaller dog and around 5mm for a large dog.

The guide is pushed caudally at its distal extent so that the thumb pin sits firmly against the cranial cortex.

A saw is driven along the saw-guide creating the osteotomy. Cut the cranio-proximal trans-cortex last to hold the osteotomy open until the cut is almost completed. The osteotomy terminates in the distal hole of the saw-guide slot. Opening the osteotomy and fitting the cage are undertaken as described.

Opening the Osteotomy
This is a critical part of the procedure, and should be performed slowly and carefully allowing the bone time to adjust. This will make hinge failure unlikely.

Start with the smallest Spreader inserted as shown in the most proximal section of the osteotomy. The handle is rotated downwards to minimise forces on the fragment, gently. A second Spreader can be used to maintain displacement but should NEVER be used to advance displacement as a hinge fracture will result. Work up through the Spacers until the correct advancement is achieved. Details of this part of the procedure should be viewed on the video either online or from the free DVD.

The depth of the osteotomy is measured with a Drill Depth Gauge at the proximal extent of the osteotomy. This measurement is rounded up to select the correct cage length.

The cage ears should be contoured slightly up on the tibia side, slightly down on the cranial (crista tibiae) side. Elevate the periosteum in the cage area, and insert the cage into the osteotomy.

Fitting the Cage
2.4mm Screws are used in the cage. The screws are directed to avoid the articular surfaces and the osteotomy. Start with the most cranial proximal screw, then the most distal caudal. Screw orientation is medio-proximal to latero-distal in the tibial crest mimicking the angle of the forks in the original TTA. The tibial screws are placed cranio-medio-proximal to caudo-latero-distal. Remove all forceps and re-tighten all screws.
TTA Rapid Patellar Luxation Spacers

Dedicated spacers designed to work with TTA Rapid cages. Fit beneath cranial or caudal cage screw holes to create a lateral or medial displacement of the tibial tuberosity in the correction of concurrent patellar luxation. When planning, allow for the greater cage length required to ensure support to the lateral cortices on both sides of the osteotomy.

A surgical guide is available on request.

TTA Rapid Petite

Petite is aimed as smaller patients such as cats and smaller dogs, where 3mm advancement is sufficient but 2.4 screws in the tibial tubercle are not appropriate. Petite uses 2mm screws, and has dedicated instrumentation including saw guide. Note the saw guide only accepts thin blades.

TTA Rapid Cages - ‘Petite’
For use with 2.0mm TTA Rapid Screws.

TTA Rapid 2.0mm Titanium Screws - 1.5 mm Hex Head

TTA Rapid Petite Drill Sleeve Guide

Used to position pilot holes for 2.0mm screws.

TTA Rapid L-Shaped ‘Petite’ Saw Guide

Using the modified technique without a Maquet hole, this guide is used for the TTA Rapid ‘Petite’ system for advancements of 3mm.

TTA Rapid Patellar Luxation Spacers

TTAR132802002 TTA Rapid Patellar Luxation Spacer 2 Holes 2mm Height
TTAR132802003 TTA Rapid Patellar Luxation Spacer 2 Holes 3mm Height
TTAR132802004 TTA Rapid Patellar Luxation Spacer 2 Holes 4mm Height
TTAR132801002 TTA Rapid Patellar Luxation Spacer 3 Holes 2mm Height
TTAR132801004 TTA Rapid Patellar Luxation Spacer 3 Holes 4mm Height
TTARSPACERSET TTA Rapid Patellar Luxation Spacer Set
(One of each of the above sizes = 5 Spacers in total)

TTAR132801006 TTA Rapid Patellar Luxation Spacer 3 Holes 6mm Height

TTA Rapid Cage Titanium 3/08
TTAR132002308 £180.25
TTA Rapid Cage Titanium 3/10
TTAR132002310 £180.25
TTA Rapid Cage Titanium 3/13
TTAR132002313 £180.25

TTA Rapid 2.0mm Screwdriver, Insert and Sleeve
TTAR20DRIVER £169.95

TTA Rapid L-Shaped ‘Petite’ Saw Guide

Using the modified technique without a Maquet hole, this guide is used for the TTA Rapid ‘Petite’ system for advancements of 3mm.

TTAR132404100 TTA Rapid L-shaped ‘Petite’ Saw Guide £283.25

TTARSPACERSET TTA Rapid Patellar Luxation Spacer Set
(One of each of the above sizes = 5 Spacers in total)

TTAR132801006 TTA Rapid Patellar Luxation Spacer 3 Holes 6mm Height £400.80
TTA Rapid Implants

TTA Rapid Cages - Standard

For use with 2.4mm TTA Rapid Screws. See Cage profile on page 501.

TTA RAPID CAGES TITANIUM

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NanoPaste Bone Substitutes

Hydroxyapatite paste. 2.5ml is adequate for cages up to 10.5mm. To completely fill the osteotomy and lattice of larger cages, a 5ml size is also available.

NANOPASTE

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<tr>
<td>PASS</td>
<td>NanoPaste Syringe 5ml</td>
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TTA Rapid Starter Kit

Instrument and selected implant set, supplied in basket type containers with dedicated racks. Implant set contains commonly used sizes as listed below.

The Kit contains:

**Instrument Tray** - Complete with new L-Shaped Saw guide.

**Implant Tray containing**

- 6mm x 16mm Cage x 1
- 7.5mm x 16mm Cage x 1
- 7.5mm x 19mm Cage x 1
- 9mm x 19mm Cage x 1
- 9mm x 22mm Cage x 1

**Screws**

- 1 x 8mm
- 2 x 10mm
- 4 x 12mm
- 4 x 14mm
- 4 x 16mm
- 4 x 20mm
- 2 x 2.5ml Nanopaste

Starter Kit price is discounted by over 10% compared to component price.

**TTA RAPID STARTER KIT**

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**TTA RAPID PREMIUM INSTRUMENT AND IMPLANT KIT**

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**TTA RAPID SCREW RACK**

TTAR2103624 | TTA Rapid Screw Rack - Standard for 2.4mm Screws for 6 - 40mm in length | £87.55  |
| TTAR1500520 | TTA Rapid Screw Rack - ‘Petite’ for 2.0mm Screws for 6mm to 20mm in length | £87.55  |

**TTA RAPID CONVERSION KIT**

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<td>TTA Rapid Conversion Kit - New Technique</td>
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TTA Rapid Screw Rack designed for holding TTA Rapid Standard 2.4mm Titanium Screws from 6mm to 40mm in length or TTA Rapid ‘Petite’ 2.0mm Titanium Screws from 6mm in length.

Please note supplied empty.

**TTA RAPID ACCESSORIES**

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TTA Rapid Bending Iron

This is used for contouring the cage ears for accurate placement and is common to the original and modified techniques. The use of other devices to create this contour is likely to result in damage to the cage ears.

TTA RAPID BENDING IRON
TTAR132402000  TTA Rapid Bending Iron

TTA Rapid L-Shaped Saw Guide

L shaped saw guide for the TTA Rapid technique. Guide pin supplied – replacement pins are also available.

TTA RAPID L-SHAPED SAW GUIDE
TTAR132400000  TTA Rapid L-shaped Saw Guide
TTAR1324030010  TTA Rapid Drill Guide Pin (replacement only)
TTAR132404000  TTA Rapid L-shaped ‘Petite’ Saw Guide

TTA Rapid Lever Spreader

These are used to open the osteotomy incrementally to the required width. Available in two double-ended sizes. The spreaders measure 1mm wider than their stated size to permit insertion of a cage beneath them.

TTA RAPID LEVER SPREADER
TTAR132400113  TTA Rapid Lever Spreader Double-ended 3mm & 9mm Broad
TTAR132401013  TTA Rapid Lever Spreader Double-ended 6mm & 12mm Broad
TTAR132401513  TTA Rapid Lever Spreader Double-ended 13.5mm & 15mm Broad

Instrumentation for the Maquet Hole TTA Rapid technique are still available whilst stocks lasts. Please call our Vet Tech Team on 0845 130 9596 to check availability or email info@vetinst.com

TTA Rapid Universal Spreader

Permits incremental opening of the osteotomy in a very controlled manner. 160mm length.

TTA RAPID UNIVERSAL SPREADER
TTAR132408016  TTA Rapid Universal Spreader

TTA Rapid Screwdriver Handle – AO Coupling

A high quality modular screw-driver with a familiar coupling and rotating base-cap.

TTA RAPID SCREWDRIVER HANDLE - AO COUPLING
TTAR103863000  TTA Rapid Screwdriver Handle - AO Coupling

TTA Rapid Screwdriver Inserts

TTA RAPID SCREWDRIVER INSERTS
TTAR20342420  TTA Rapid Screwdriver Insert for 2.4mm Hex Screws AO Fitting 100mm Long
TTAR20346424  TTA Rapid Screw Holding Sleeve for 2.4mm Hex Screws
Additional useful instruments for TTA Rapid

**Adjustable Bone Saw**

Used for completing/ squaring off the osteotomy, this saw comes complete with five, fine chrome plated blades. Blade length is adjustable from 40mm to 100mm. Handle length 130mm. Blade length 155mm.

**Adjustable Bone Saw**

001000  
Adjustable Bone Saw c/w 5 Fine Blades

**Reduction Forceps with Spinlock**

**Plate Holding/ Drill Guide Forceps**

Used to snug the TTA Rapid cage ears against the medial cortex prior to drilling pilot holes.
Tibial Plateau Levelling Operation by Wedge Osteotomy

TPLO closing wedge or Closing Wedge Osteotomy Tibial Plateau Levelling Osteotomy (CWO-TPLO) was the original version of TPLO surgery that preceded the curved osteotomy Slocum TPLO procedure; the latter has since gained widespread use worldwide. CWO-TPLO was originally popular in some territories where availability of the Slocum TPLO procedure training courses, equipment and implants was limited and difficult to access. CWO-TPLO surgery offers advantages and disadvantages compared to TPLO surgery.

Advantages of CWO-TPLO surgery compared to TPLO surgery:
- CWO-TPLO is simpler to perform, there is more room for error in terms of osteotomy positioning, it requires less specialised equipment and there is arguably less risk of damage to the popliteal artery.
- CWO-TPLO can be performed in any dog, regardless of Tibial Plateau Angle (TPA). Conversely, for TPLO surgery the higher the TPA, the higher the required rotation of the tibial plateau segment for TPLO surgery therefore the less contact at the osteotomy site post rotation and reduction, and the larger the amount of tibial tuberosity that is left exposed that could potentially fracture. CWO-TPLO is arguably simpler, safer and more appropriate in dogs with high TPAs.

However, disadvantages of CWO-TPLO surgery include:
- Post-reduction, the transverse CWO-TPLO osteotomy appears to be inherently less stable than the curved CWO-TPLO osteotomy.
- CWO-TPLO moves the distal tibia relative to the entire proximal tibia i.e. the plateau is not disassociated from the tibial tuberosity. Therefore with the greater stifle flexion that is assumed following CWO-TPLO, the tibial tuberosity assumes a more distal / flexed position relative to the femoral trochlear sulcus. In turn, the patella seems to have a more distal position in the trochlear sulcus that could approach patella baja, although this does not seem to be a clinically significant problem. Arguably this could be a positive feature as the patella may engage the femoral trochlear sulcus more reliably, making patellar luxation less likely, although this is unproven.
- It is not possible to correct concurrent cruciate ligament disease and patellar luxation with CWO-TPLO surgery as the relationship between the tibial tuberosity and the tibial plateau is not changed. In contrast, TPLO surgery separates the plateau from the tuberosity therefore it is possible to treat concurrent patellar luxation and cranial cruciate disease; the plate is rotated to reduce the TPA and concurrently the tibial tuberosity is rotated medially, or rarely laterally.

Tips and tricks for CWO-TPLO surgery.

There are many different ways to perform this operation with subtle differences in technique. Here are some tips to make it as straightforward as possible:
- When planning the wedge, the angle of the wedge is calculated from the TPA but the size of the wedge should be smaller than a full crano-caudal wedge of bone from he proximal tibia. This is to preserve as much bone stock as possible, and to minimise size discrepancies of the osteotomised surfaces of the proximal and distal tibia.
- Use a cranial K-wire and tension band to make osteotomy reduction easier and more stable.
- Plan and pre-place the holes for the distal K-wire and proximal tension band prior to making the osteotomy. This will make implant placement and osteotomy reduction simpler later.
- Once the osteotomy is complete, place the K-wire in the cranial cortex of the distal fragment, aim into the proximal segment, hold the osteotomy in reduction and drive the K-wire into the proximal segment. This will stabilise the reduction.
- Ensure that reduction and alignment are good, particularly that there is no axial malalignment of the tibia. Then place the cranial tension band, placing it through the hole in the tibial tuberosity proximally and the K-wire distally.
- Place the medial plate; various options are possible including a DCP plate, TPLO plate and locking plate. Remember that this is an inherently unstable osteotomy in the cranial to caudal plane. Coupled with a short proximal tibial segment, this makes stable fixation more of a challenge. Using locking screws proximally and/or as long a plate as possible should help to stabilise the osteotomy as good as possible.

Images and Case courtesy of Gareth Arthurs.

TPLO BY WEDGE OSTEOTOMY PLATES

<table>
<thead>
<tr>
<th>Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPL0202026</td>
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<tr>
<td>TPL0202031</td>
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<td>45659045</td>
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<tr>
<td>TPL00</td>
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</table>
**TPLO Wedge Kit**

Kit includes: multisaw, stainless converter, shroud, wedge osteotomy set, blade 70mm x 12mm, blade 70mm x 25mm, 1 x TPLO027239, 1 x TPLO353555, 1 x TPLO353579 and DVD on the technique. Gives a good discount over individual purchases. (Also required: 2.7/3.5mm AO type bone plate benders).

**TPLO WEDGE KIT**

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>001493</td>
<td>Wedge Osteotomy Gauge Set 9° to 30°</td>
</tr>
</tbody>
</table>

**Wedge Osteotomy Gauge Set 9° to 30°**

Wedge gauges simplify the marking and cutting of the appropriate wedge. Using the parallel marking allows the surgeon to mark and cut a wedge with equal length borders, creating a better closure.

**VERY LARGE FRAGMENT FORCEPS**

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>001202</td>
<td>Very Large Fragment Forceps 205mm Long</td>
</tr>
<tr>
<td>001203</td>
<td>Very Large Fragment Forceps with Spinlock 215mm Long</td>
</tr>
</tbody>
</table>

**Bone Scribe**

A very sharp marking point with an easy to hold handle enables the surgeon to mark bone prior to cutting or rotating (Slocum procedure). One end is pointed and the other is sharpened as a blade.

**Bone Scribe**

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>001494</td>
<td>Bone Scribe (Double Ended) 200mm Long</td>
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</tbody>
</table>

**Plate Holding/ Drill Guide Forceps**

Temporary fixation of the head of TPLO plates aids in positioning, while screws are placed. The spherical ball tip of these forceps seats well in the round holes of the head plate, as well as in conventional DCP holes, whilst allowing drilling through the hole. Also very useful for plate osteosynthesis in fracture repair.

**PLATE HOLDING/ DRILL GUIDE FORCEPS**

<table>
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<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>001225</td>
<td>1.5/2.0 Plate Holding/ Drill Guide Forceps 140mm Long</td>
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<tr>
<td>001226</td>
<td>2.4/2.7 Plate Holding/ Drill Guide Forceps 145mm Long</td>
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<tr>
<td>001227</td>
<td>3.5 Plate Holding/ Drill Guide Forceps 150mm Long</td>
</tr>
<tr>
<td>0012SET</td>
<td>Plate Holding/ Drill Guide Forceps Set (one of each size)</td>
</tr>
</tbody>
</table>

**Extra Long Bending Levers**

Longer plate benders (240mm) with 4mm and 6mm slots are designed with TPLO plates in mind to make bending and twisting much easier.

**EXTRA LENGTH BONE PLATE BENDING LEVERS**

<table>
<thead>
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<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>001288L</td>
<td>3.5/4.5 AO TPLO Bending Levers 240mm Long</td>
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</table>
TPLO Plates with Locking Screw Holes

Since the beginning of the millennium, the advent of locking plate technology has revolutionised TPLO surgery arguably more than any other surgical procedure. Locking TPLO plates have made the procedure quicker and simpler with less dissection and therefore biological trauma required, and post-operative osteotomy stability is better.

- TPLO locking plates use locking screws in the proximal tibial plateau segment and the plate is pre-contoured to match the shape of the proximal tibia.

This means that the plate does not need to be contoured to the shape of the proximal tibia during surgery, which saves time and avoids potential plate weakening by doing so.

- The position and direction of the locking screws in the tibial plateau segment of the plate is designed so that the screws are positioned adjacent to, but reliably angled and directed away from the joint. This means that so long as the plate is placed correctly, intra-articular screw placement should be impossible. This is a significant advantage as the potential for intra-articular screw placement is a potential complication when TPLO is performed without locking screws; because if this happens, the surgery has to be revised to re-direct the intra-articular screw.

- Given the specific position and direction of the locking screws in the tibial plateau section, the plate should not be contoured. This is because contouring the plate may result in inappropriate direction of the locking screws into the stifle joint.

- As locking plates do not rely on friction generated between the plate and the bone for stability, it is not necessary to elevate soft tissues beneath the locking part of the plate. For locking TPLO application, this means that elevation of the soft tissues medial to the tibial plateau i.e. the medial buttress is no longer required. This saves time as removing the medial buttress can be time consuming; it can bleed; it minimises iatrogenic trauma, and minimises chance of medial collateral ligament damage that could occur with over-exuberant removal of the medial buttress.

- As locking screws are angle stable, placement of locking screws in the tibial plateau segment means maximal stability of the tibial plateau. In other words, the chances of post-operative instability of the tibial plateau segment developing should be minimised. Post-op instability can lead to loss of osteotomy reduction, post-operative increase in tibial plateau angle, and a complication known as “rock-back”.

- Locking screws rely on locking of the screw head into the plate for security instead of screwing the screw very tightly into the bone so as to generate high frictional forces between the screw head, plate hole and bone. This means that for locking screws, the risk of stripping a screw in the bone is longer a possible complication, compared to non-locking screw where screw thread striping in the bone is a real complication, particularly in the cancellous metaphyseal bone of the tibial plateau.

The disadvantage of locking plates for TPLO surgery is that a slightly expanded inventory of implants and equipment is needed. Equipment needed includes a locking plate, locking drill guide, drill bit appropriate to the core diameter of the locking screws (e.g. for a 3.5mm locking screw, a 2.8mm drill bit rather than a 2.5mm drill bit is used), and locking screws. Use of locking plates for TPLO surgery is strongly recommended over non-locking plates.

Tips and tricks for locking TPLO plating.
- The TPLO procedure is performed in the normal way, except that soft tissue elevation in the proximal tibial plateau segment is not necessary.
- Once the tibial plateau is rotated and the osteotomy is stabilised, the TPLO locking plate is applied to the tibia and positioned appropriately. Use a K-wire or needle to ensure that the plate is correctly positioned and is over bone at all points, particularly the proximal screw hole adjacent to the joint and the caudal proximal locking screw hole if the bone is not visible because of overlying soft tissue.
- In the distal tibial diaphyseal segment, a single non-locking screws is placed to secure the plate to the bone.
- Using the locking drill guide, all the proximal locking screws are placed in the tibial plateau segment.
- In the distal tibial diaphyseal segment, a non-locking screw is placed in compression using the compression guide; this is to compress the osteotomy.
- The remaining distal screws are placed; these may be either locking or non-locking screws at the surgeon’s preference, and depending on the plate configuration.

NB before placement of locking screws in the distal tibial diaphysis segment, all non-locking screws must be fully tightened.

VI Locking TPLO Plates

VI-Lock TPLO plates are available in 2.7mm, 3.5mm and 3.5mmm broad, covering the vast majority of TPLO patients. The head section is both wider and shallower than any other locking design maximising the area of bone spanned to give very even force distribution across the whole of the proximal segment whilst also permitting a very proximal osteotomy. The locking holes are both convergent and divergent to maximise pull-out resistance and angled to avoid articular surfaces.

**TPLO PLATES WITH LOCKING SCREW TECHNOLOGY**

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<thead>
<tr>
<th>Plate Code</th>
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<tr>
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<td>TPLO Plate Locking 3.5 Left</td>
</tr>
<tr>
<td>TPLO35LPCR</td>
<td>TPLO Plate Locking 3.5 Right</td>
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<tr>
<td>TPLO35BLPCR</td>
<td>TPLO Plate Broad Locking 3.5 Left</td>
</tr>
<tr>
<td>TPLO27LPCR</td>
<td>TPLO Plate Broad Locking 2.7</td>
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<tr>
<td>LSDG2724</td>
<td>Locking Screw Drill Guide for small 2.7</td>
</tr>
<tr>
<td>LSDG35</td>
<td>3.5 Locking Screw Drill Guide</td>
</tr>
</tbody>
</table>

For plate profiles see page 499.
TPLO Narrow Head Broad Locking Plate

Intermediate 3.5mm locking TPLO plate. This plate has similar strength in the shaft and midsection to the 3.5mm broad, but only three screw-holes in the headsection for use with smaller proximal segments.
See page 499 for profiles

TPLO NARROW HEAD BROAD 3.5 LOCKING PLATES
TPLO35MLPCR  TPLO Narrow Head Broad Locking Plate Right 3.5
TPLO35MLPCL  TPLO Narrow Head Broad Locking Plate Left 3.5

TPLO3555S Locking Plates

Right and left pre-contoured locking versions of the original TPLO3535S clover leaf plate developed by Phil Moses (Brisbane). All the screws are set to avoid the joint space and allow for optimal load sharing. Locking holes are all stacked so will accept a cortical screw if necessary, and there are 2 compression holes in the plate shaft.

TPLO 3535S LOCKING PLATES
TPLO3535SRL  3.5mm DCP 55mm Length Locking Right
TPLO3535SSL LL 3.5mm DCP 55mm Length Locking Left

For plate profiles see page 498.

Locking TPLO Starter Set

The ViLock TPLO system is available as a start up kit offering substantial discounts over regular pricing. The kit includes all that you will need to offer locking TPLO to your clients.

The ViLock TPLO Starter Kit includes the following:
TPLO Saw and Hose
18, 24 & 30mm VI Pattern TPLO Blades
TPLO Basic Jig
TPLO Rotation Chart
Slocum Rotation Gauges
Bone Scribe
8 VI Lock TPLO Plates (2 x 2.7, 4 x 3.5, 2 x 3.5 Broad)
DVD Step by Step Gguide
Plate Acetates

VILOCK TPLO STARTER KIT
TPLOVILOCKKIT  ViLock TPLO Starter Kit with Air Power
Tibial Plateau Levelling Osteotomy - Standard

Tibial Plateau Levelling Osteotomy (TPLO) was originally developed by Barclay Slocum in the 1980s. Slocum realised that given the standing angle of the dog’s knee, the cranial cruciate ligament deficient stifle had a tendency to subluxate cranially because of the opposing forces generated between the tibial plateau and the femoral condyles. He speculated that making a corrective osteotomy and changing (flattening) the tibial plateau angle should neutralise cranial tibial thrust and therefore the instability resulting from cranial cruciate ligament rupture. The osteotomy was originally designed as a wedge osteotomy, which still exists as a separate procedure for cranial cruciate ligament rupture and has its own advantages and disadvantages. See other section on CWO-TPLO on page 192. The wedge osteotomy then evolved into the curved / crescentic osteotomy that differs by separating the tibial plateau from both the tibial metaphysis and the tibial tuberosity. A radial saw blade with a TPLO specific oscillating saw is used that makes the crescentic osteotomy (see page 197 for saws and blades). Once the tibial osteotomy is made, it is rotated by a calculated amount by inserting a rotation pin (tables are available to determine the correct amount of rotation for each blade size, see page 195). The aim is to achieve a Tibial Plateau Angle (TPA) of 5 to 7 degrees. Once rotated, the tibial plateau segment is temporarily held in position by a single K-wire, or fracture reduction forceps. Then the plate and screws are applied for definitive stabilisation.

TPLO was originally developed with many claims, including complete return of function, re-gaining full muscle mass, and the halting of progression of degenerative joint disease. Nowadays it is accepted that whilst TPLO does not achieve all these goals as it does not restore completely normal stifle biomechanics, it is arguably the best surgical procedure available for addressing the cranial cruciate ligament deficient stifle. For this reason, it is very popular amongst specialist surgeons, and evidence is starting to emerge that it offers the best outcome compared to other surgical techniques, including other osteotomies, to address cranial cruciate ligament rupture such as TTA or extra-capsular stabilisation.

The TPLO surgical technique was very specific, and surgeons all followed a very similar protocol. With the passage of time, surgeons have evolved individual variations on the original technique. For example, use of a jig is no longer universal, many surgeons have adopted a minimal soft tissue elevation technique as compared to the original extensive soft tissue elevation and packing technique, and stabilisation of the rotated tibial plateau can be achieved using pointed fracture reduction forceps rather than placement of a temporary stabilising K-wire.

The procedure can also be modified to address concurrent patellar luxation with cranial cruciate ligament disease, by axially rotating the tibial tuberosity and diaphysis relative to the tibial plateau, although this may cause a concurrent internal / external rotational deformity of the distal limb.

The TPLO procedure can be performed in almost any dog. For many surgeons, TPLO is the procedure of choice for the majority of patients with cranial cruciate ligament disease. The higher the TPA, the greater the rotation required to achieve a TPA of 5 to 7 degrees. It has been suggested that when the TPA exceeds 30 degrees, the amount of rotation required becomes excessive, and this could lead to fracture of the tibial tuberosity. This has lead to some surgeons to choose the CWO-TPLO procedure for such dogs. Also a double osteotomy comprising a combination of wedge osteotomy and crescentic osteotomy has been described, but this is not for the faint hearted.

Reasons not to choose a TPLO would include inexperience or lack of familiarity with the technique, uncontrollable skin disease or pyoderma that increases the risk of surgical site infection, inability of the owner to restrict the patient appropriately post-operatively that could lead to implant failure and failure of reduction, or ability of the owner to accept the list of potential complications associated with an osteotomy procedure, or the associated cost.

Tibial Plateau Levelling by Radial Osteotomy Slocum

Slocum Style Plates

Slocum style TPLO plates. Not pre-contoured. Plate profiles on page 499.

SLOCUM STYLE TPLO PLATES

TPLOS35BL TPLO Plate Broad Slocum Style 3.5mm Left
TPLOS35BR TPLO Plate Broad Slocum Style 3.5mm Right
TPLOS35L TPLO Plate Slocum Style 3.5mm Left
TPLOS35R TPLO Plate Slocum Style 3.5mm Right
TPLOS27BL TPLO Plate Broad Slocum Style 2.7mm Left
TPLOS27BR TPLO Plate Broad Slocum Style 2.7mm Right
TPLOS27L TPLO Plate Slocum Style 2.7mm Left
TPLOS27R TPLO Plate Slocum Style 2.7mm Right
TPLOS24L TPLO Plate Slocum Style 2.4mm Left
TPLOS24R TPLO Plate Slocum Style 2.4mm Right
TPLOS20L TPLO Plate Slocum Style 2.0mm Left
TPLOS20R TPLO Plate Slocum Style 2.0mm Right
BRTPLO TPLO Radial Cut Step by Step Guide

Pre-Contoured Slocum Style TPLO plates

Pre-contoured version of the standard 3.5mm Slocum Style plate. Pre-bent and polished to leave no stress riser. May need a final intra-operative tweak in some cases.

PRE-CONTOURED TPLO PLATES

TPLOS35RPC 3.5 Right Slocum Style Pre-contoured Plate
TPLOS35LPC 3.5 Left Slocum Style Pre-contoured Plate

Delta Style TPLO Plates - Contoured

Delta Style Plates

Plate profiles on page 497.

Available in all standard sizes. All supplied pre-contoured as contouring these plates is difficult– may require final clinical ‘tweak’

DELTA STYLE TPLO PLATES

TPLODEL35BL 3.5 Broad Delta Plate Left
TPLODEL35BR 3.5 Broad Delta Plate Right
TPLODEL35L 3.5 Delta Plate Left
TPLODEL35R 3.5 Delta Plate Right
TPLODEL27BL 2.7 Broad Delta Plate Left
TPLODEL27BR 2.7 Broad Delta Plate Right
TPLODEL27L 2.7 Delta Plate Left
TPLODEL27R 2.7 Delta Plate Right
TPLODEL24L 2.4 Delta Plate Left
TPLODEL24R 2.4 Delta Plate Right
XS TPLO Jig

Smallest TPLO jig available from Vi. Design allows greater range of arm movement without causing intra-operative obstruction, with a single hinge to remove bulk. Accepts 1.6 and 2mm pins. 2.0mm Allen key included. Main body 60mm long.

XS TPLO JIG
TPLOJIGXS  XS TPLO Jig 60mm

TPLO Jig

Once the radial cut is made in the proximal tibia the two parts are essentially unstable. The proximal segment has to be rotated while maintaining alignment. The jig is placed prior to the cut and keeps the two segments under control until the rotation is complete and the two parts fixed internally. Supplied with a 2.5mm Allen Key.

TPLO JIG
TPLOJIG  TPLO Jig 120mm
TPLO32  Slocum Guide Pin 3.2mm Thread 25mm

Standard Slocum Style TPLO Jig

Standard pattern TPLO Jig. Pair of Alignment Bars and Allen key included. Large Jig takes 3.2 pins, small Jig take 2.4 pins. Pins not included.

SLOCUM STYLE TPLO JIG
TPLOJIG/S  Slocum Style Jig Standard (3.2 Pin)
TPLO32  Slocum Guide Pin 3.2mm Thread 25mm
TPLOJIG/SS  Slocum Style Jig Small (2.4 Pin)
TPLO24  Slocum Guide Pin 2.4mm, Thread 20mm
TPLOJIG/ROD35  Replacement Alignment Bars (Set of 2) Standard
TPLOJIG/ROD27  Replacement Alignment Bars (Set of 2) Small

Slocum Rotation Gauges

The Rotation Gauges simplify the rotation procedure. The correct measurement, in millimetres, is read from the table and the appropriate gauge selected. The bone is marked using the scribe or an osteotome.

SLOCUM TPLO ROTATION GAUGES 5 TO 15MM
001492  Slocum Rotation Gauges

TPLO Rotation Gauge Divider Type

Alternative to the feeler gauge type measuring system. Spring loaded, adjusting the set screw fixes the points at any predetermined distance from 0-20 mm as read from the scale.

The tibial plateau may then be rotated the distance between the points.

TPLO ROTATION GAUGE DIVIDER TYPE
001499  TPLO Rotation Gauge Divider Type 90mm

TPLO Rotation Chart

The rotation data for blades 12mm, 15mm, 18mm, 21mm, 24mm, 27mm, 30mm & 34mm are displayed on this double sided, laser marked, stainless steel gauge.

Incorporates also a drill gauge and a ruler for measuring screws and rotation.

TPLO ROTATION CHART
TPLOROT  TPLO Rotation Chart
Slocum TPLO Guide Pin
End threaded negative pin. Drive directly into the tibia for jig attachment.

SLOCUM TPLO GUIDE PIN 3.2MM
TPLO32  Slocum Guide Pin 3.2mm Thread 25mm
TPLO24  Slocum Guide Pin 2.4mm Thread 20mm

For screws see Chapter 3.
For power tools and saw blades see Chapter 9.

Delta TPLO Plate Benders with Curved Slots

Plate benders with slots tend to distort the Delta plate. The curved slots help grip and support the plate during the bending process. In addition, the plate is much less likely to end up on the floor.

DELTA TPLO PLATE BENDERS WITH CURVED SLOTS
TPLODELBEND  Delta TPLO Plate Benders (Pair) 230mm Long

TPLO Starter Kit

TPLO Starter kit
2 versions of the TPLO Starter Kit are available, with either Slocum Style or Delta Style Plates.
The Delta TPLO Starter Kit includes the following:
TPLO Saw and Hose or TPLO Saw - Battery Power
18, 24 & 30mm VI Pattern TPLO Blades
TPLO Basic Jig
TPLO Rotation Chart
Slocum Rotation Gauges
Bone Scribe
10 Delta Style TPLO Plates (2 x 2.7, 2 x 2.7 Broad, 4 x 3.5, 2 x 3.5 Broad)
DVD Step by Step Guide
Plate Acetates

The Slocum TPLO Starter Kit is the same except 10 TPLO Slocum Style Plates are included rather than the Delta Plates.
All Starter Kits carry a good discount over component prices.

TPLO STARTER KIT
TPLODKIT  TPLO Starter Kit with Delta Style Plates
           Air Power
TPLOSKIT  TPLO Starter Kit with Slocum Style Plates
           Air Power
Ligaclip Re-usable Clip Appliers & Titanium Clips

In TPLO, severe haemorrhage from the popliteal artery is difficult to ligate in the standard way. Ligaclips offer simple and effective ligation for difficult to access areas. Medium-large is the most useful size.

For further information regarding the Ligaclip range and pricing see page 301.

TPLO Wire Guide and Reduction Forceps

TPLO reduction forceps are designed to stabilise and compress across the osteotomy site. At the tip is a wire guide tube which allows a stabilising wire to be driven across the osteotomy at exactly the correct position without skidding or slippage at start up.

The action is spinlock allowing the surgeon full flexibility on positioning and compression.

The forceps are handed and significantly cheaper when purchased as a set.

TPLO REDUCTION FORCEPS WITH WIRE GUIDE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
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</thead>
<tbody>
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<td>TPLORFR</td>
<td>TPLO Reduction Forceps with Wire Guide Right 215mm</td>
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<tr>
<td>TPLORFL</td>
<td>TPLO Reduction Forceps with Wire Guide Left 215mm</td>
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<tr>
<td>TPLORFSET</td>
<td>TPLO Reduction Forceps with Wire Guide Right &amp; Left</td>
<td>£226.60</td>
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</table>

TPLO Saws

Slocum TPLO blades create a patented bi radial cut which means that the tibial plateau segment fits the distal tibia section exactly with maximum bone contact. While this is a good thing, the design of the blade does not cut very efficiently and needs regular hand sharpening if excess heat is not to be produced. Veterinary Instrumentation has been looking at TPLO blades for a number of years and is introducing a range of radial blades which cut better and are cheaper to replace than the Slocum original. They have the same triangular Stryker connection.

TPLO SAWS

<table>
<thead>
<tr>
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<td>HALLHOSERI</td>
<td>VI Hose – Halls Fitting</td>
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</tr>
</tbody>
</table>

TPLO Saw Blades VI Pattern

VI TPLO blades are designed to reduce friction during the cutting procedure, therefore reducing the incidence of thermal necrosis along the osteotomy. This is achieved by the full bilateral set of the saw teeth, creating a slot for the blade in the bone which is slightly wider than the blade. The lengths of the blades have been designed to better fulfil clinical requirements.

TPLO SAW BLADES VI PATTERN

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<td>TPLOVI34</td>
<td>TPLO Saw Blades VI Pattern 34mm</td>
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Triple Tibial Osteotomy

A cruciate management technique combining tibial plateau levelling and tibial tubercle advancement.

Based on the work of Slocum, Tepic and Montavon, the Triple Tibial Osteotomy has been developed by Dr Warrick Bruce to overcome some of the problems encountered in the Slocum TPLO technique, the Montavon TTA (Tibial Tubercle Advancement) and the closing wedge TPLO technique.

Some of the problems include:

Work by Tepic suggests that the tibial plateau should be perpendicular to the patella ligament to minimise shear strain at the CrCL. The Slocum technique does not always address this issue.

The bi-radial Slocum blade is inefficient and difficult to resharpen resulting in the generation of significant amounts of heat which leads to delayed healing and other complications.

The Montavon TTA technique creates a large defect in the cranial tibia which requires an expensive titanium cage and plate to prevent collapse during the healing phase.

The closing wedge TPLO shortens the tibia and creates a defect in the tibia which has to be protected from the pull of the straight patella ligament by a figure of eight wire.

The TTO technique deals with all of these problems:

A long osteotomy is made in the tibial crest to allow the tibial tubercle to move forward. The angle correction is made by making a small wedge osteotomy in the caudal tibia which, when closed creates a small tibial tubercle advancement. A free instructional DVD is available which fully describes and explains the procedure through video, stills and text files. The DVD also includes an instrument check list.

Multi Saw

One of the advantages of the TTO (and TWO) procedure is that it uses simple flat blades which are easily replaced when they become blunt. The TTO uses a saw guide to direct the saw very accurately ensuring a ‘good fit’ once the osteotomy is complete. Surgical air or battery driven saws are ideal for the procedure but the Multi Saw with a sterile shroud and convertor works very well. Make sure that the blade selected fits through the saw guide (cut thickness less than 1.0mm).

See chapter 9 for more details on Saws and Blades.

Osteometer and Saw Guide

Three Osteotomies

TPLO + TTA

Some instrumentation is required to make the procedure easier and to minimise errors. Warrick Bruce’s original instrument Set comprises a Saw Guide, Measuring/ marking Gauge (Osteometer) and a Bone Manipulation Device (Wedgie). The Saw Guide works with flat oscillating blades with a maximum cut thickness of 1mm (thickness at the teeth). See Chapter 9. The original Set (Code TTO008) is very reasonably priced and offers the surgeon a very cost effective route to management of CrCL rupture by tibial plateau levelling surgery. Warrick’s new, more sophisticated designs are shown below. Available as a Set (Code TTO009).

TTO INSTRUMENTATION

TTO008 Basic TTO Instruments Kit (contains TTO006 TTO004 TTO002 & DVDALL)
TTO006 Basic Osteometer
TTO004 Saw Cutting Guide (Standard 62mm)
TTO002 Wedge Segment Manipulator
TTO004L Saw Cutting Guide (Long 76mm)
DVDALL DVD Illustrating the procedure
BRTTO TTO Step by Step Guide
Improved TTO Instrumentation

Warrick Bruce has designed two new instruments to make the TTO procedure easier and to eliminate some of the practical difficulties encountered using the original instrumentation.

The new combined Osteometer and Saw Guide interlock to become a single instrument which is much easier to manage than the original two separate instruments. The thumbscrew locks the Osteometer onto the Saw Guide for secure accurate osteotomies. The Osteometer still has holes for fixation to the tibia using 1.6 arthrodesis wires.

Alternatively Warrick’s second new instrument ‘the Clasper’ may be used to lock the osteometer onto the tibia prior to cutting. The ‘Clasper’ has an additional role in that it is used to replace the Kern bone holders in the original technique. The ‘Clasper’ grasps the tibia crest prior to closure and incorporates location holes for the very large fragment forceps to lock into.

The ‘Wedge’, used for manipulating the three osteotomies remains unchanged.

IMPROVED TTO INSTRUMENTATION BY WARRICK BRUCE

| TTO011 | Improved Combination Osteometer/ Sawguide |
| TTO014 | TTO Clasper                                  |
| TTO002 | Wedge Segment Manipulator                   |
| TTO009 | Enhanced TTO Instrument Set (all of above)  |

TTO Starter Kits

An Enhanced Kit with the Improved TTO Osteometer and the new Clasper is also available. Both Kits are available with or without the Multi Saw Surgical Kit. All Starter Kits are discounted by at least 10% compared to the component price.

TTO STARTER KITS

| TTOBKIT  | TTO Starter Set Basic                        |
| TTOAKIT  | TTO Starter Set Enhanced                    |
| TTOBKITPOW | TTO Starter Set Basic plus Multi Saw Kit       |
| TTOAKITPOW | TTO Starter Set Enhanced plus Multi Saw Kit    |

TTO Plates

The Standard TTO Plate is a cloverleaf TPLO Plate. Being positioned over the caudal 2/3 of the tibia the plate selected is typically a little smaller than is the case with a wedge TPLO. Use the free plate overlay for the final selection. Thicker plates are harder to contour and a selection of pre-contoured plates are available.

TPLO BY WEDGE OSTEOTOMY PLATES

| TPLO020206 | 2.0mm DCP 26mm Overall Length |
| TPLO020203 | 2.0mm DCP 31mm Overall Length |
| TPLO242434 | 2.4mm DCP 34mm Overall Length |
| TPLO242441 | 2.4mm DCP 41mm Overall Length |
| TPLO272739 | 2.7mm DCP 39mm Overall Length |
| TPLO272745 | 2.7mm DCP 45mm Overall Length |
| TPLO273539 | 2.7/3.5 DCP 39mm Overall Length |

TPLO020206 allows use of 3.5 cancellous screw in head

TPLO353545 | 3.5mm DCP 55mm Overall Length |
| TPLO353547 | 3.5mm DCP 57mm Overall Length Heavy Duty |
| TPLO353559 | 3.5mm DCP 59mm Overall Length |
| TPLO353562 | 3.5mm DCP 63mm Overall Length |
| TPLO353565 | 3.5mm DCP 65mm Overall Length |
| TPLO353577 | 3.5mm DCP 77mm Overall Length |
| TPLO353577X | 3.5mm DCP 77mm Overall Length Extra Shaft Hole |
| TPLO353579 | 3.5mm DCP 79mm Overall Length Heavy Duty |
| TPLO354579 | 3.5/4.5 DCP 79mm Overall Length Heavy Duty |

TPLO353545 allows 4.5 screws in head

TPLO353579 allows 4.5/6.5 screws in head

TPLO 3545679 allows 4.5 screws in head

TPLO 45659030 will accept 6.5 cancellous screws in head

TPLO 45659035 will accept 6.5 cancellous screws in head

TPLO 45659045 will accept 6.5 cancellous screws in head

TPLOO Angle Finder & Plate Overlay

PRE CONTOURED TTO PLATES

| TPLO353555PCR | 3.5mm Plate 55mm overall length Right |
| TPLO353555PCL | 3.5mm Plate 55mm overall length Left |
| TPLO353557PCR | 3.5mm Plate 57mm overall length Right |
| TPLO353557PCL | 3.5mm Plate 57mm overall length Left |
| TPLO353579PCR | 3.5mm Plate 79mm overall length Right |
| TPLO353579PCL | 3.5mm Plate 79mm overall length Left |

TCO Clamp

An alternative to the Kern Bone Holding Clamp the TCO Clamp is lighter with a smaller lever arm. The effect of this is to reduce the likelihood of a TCO fracture. The TCO Clamp incorporates locating holes for the tips of the Very Large Fragment Forceps.

TCO CLAMP

| TTO012 | TCO Clamp 65mm |

For all screws see chapter 3. For suitable saw blades see chapter 9.
Patellar Luxation

Patellar luxation is a common condition of the canine stifle joint whereas cats are rarely affected. Small dogs are affected more frequently than large dogs and patellar luxation tends to be medial in small dogs and lateral in large dogs, but this is not absolute. Patellar luxation is usually caused by a number of related conformational deformities of the hindlimb that results in a malalignment of the quadriceps mechanism including the patellar relative to the femoral trochlear sulcus. Deformities include bowing of the distal femur and tibia, excessive medialisation or lateralisation and torsional deformities of tibial tuberosity, insufficient depth of the trochlear sulcus and/or inadequate height of the trochlear ridge(s), and (sub)luxation of the hip. Secondary changes include excessive laxity of the joint capsule and retinaculum soft tissues opposite the direction of patellar luxation, and excessive soft tissue tension in the same direction as patellar luxation.

Patellar luxation severity is graded from 1 to 4.

- **Grade 1** is the least severe; the patella tracks normally in the trochlear sulcus unless it is manually luxated. True grade 1 cases rarely if ever cause a clinical problem and no lameness is seen; surgery is of limited benefit if any.

- **Grade 2** patellar luxation is the most common; the patella intermittently luxates and reduces to track normally in the femoral trochlear sulcus; this covers a broad range of severity i.e. the patella may luxated rarely to frequently. Grade 2 cases show an intermittent skipping lameness of variable severity; corrective surgery is beneficial to all but the least severely affected.

- **Grade 3** the patellar is permanently luxated unless it is reduced by manipulation but it immediately luxates again once released.

- **Grade 4** is the most severe and least common; the patella is permanently luxated and cannot be reduced.

- **Grade 3** and **4** cases have a more severe gait abnormality because the patella is permanently tracking in an abnormal position and the patient may not be able to extend the stifle normally. The worst affected cases have a severe gait abnormality. Corrective surgery is indicated and beneficial as it can dramatically improve limb function. However, the surgery is more challenging (particularly if corrective osteotomies are indicated), and the complication rate is higher.

Each case of patellar luxation must be assessed individually and treated on its own merit. In other words, quadriceps mechanism alignment should be carefully assessed clinically and radiographically, and the depth of the trochlear sulcus should be assessed by visual inspection; sky-line radiographs or CT imaging may also be helpful. Soft tissue tension should also be carefully assessed.

If the quadriceps mechanism is maligned it should be corrected, usually by performing a tibial tuberosity transposition. Tibial tuberosity transposition is arguably the most important and commonly performed component of patellar luxation surgery. The tuberosity should be transposed to a position that straightens the axis of the quadriceps mechanism and restores normal patellar tracking.

Performing tibial tuberosity transposition requires a saw; either a power saw with a thin blade or finger saw, K or A-wires and orthopaedic wire as a figure-of-8 tension band to stabilise the osteotomy. Rarely, corrective osteotomies of the femur and/or tibia may need necessary if significant deformity exists. Veterinary Instrumentation has developed a Corrective Osteotomy Sawguide System to assist with performing an accurate femoral osteotomy. In addition, a wide range of femoral supracondylar plates are available for stabilisation of the femur post osteotomy.

If trochlear sulcus depth is inadequate and/or femoral trochlear ridge height is insufficient, then the trochlear sulcus should be deepened. Tibial tuberosity transposition requires surgical skills and is technically the best way of performing this, but is also the most challenging. A sharp X-Acto saw and a Modular Osteotome with Ultra-thin blades is required.

Wedge recession sulcoplasty is easier to perform but does not preserve as much articular cartilage, and does not deepen the trochlea as much proximally where additional depth is usually very important. Wedge recession sulcoplasty requires a hard back or X-Acto saw. Abrasion sulcoplasty is a somewhat out-dated technique and is not recommended as it preserves no articular cartilage; however it might be performed if there is already no good articular cartilage present, or other options are not possible due to equipment or skill constraints. A trochlear rasp is ideal for abrasion sulcoplasty, or for smoothing off the exposed subchondral bone for optimal graft stability with the other sulcoplasty techniques.
If the soft tissues on one side of the patella (in the direction of luxation) are too tight, they should be released. Usually the joint capsule and retinaculum is too tight only in grade 4 and very severe grade 3 patellar luxations. The excessively tight soft tissues should be cut until normal patellar tracking is restored. Often, release in the region of and just proximal to the patella is required but occasionally, release all the way up to the proximal femur may be necessary. If the soft tissues on one side of the patella lack tension (opposite the direction of luxation), normal loose tension should be restored. The excessive soft tissue can either be resected or imbricated using a Modified-Mayo “vest-over-pants” type suture.

It is important to appreciate that these soft tissue tension abnormalities likely develop secondary to patellar luxation rather than directly causing it. Correcting the soft tissue problems alone, although easier, is unlikely to successfully correct patellar luxation. Not performing at least one of tibial tuberosity transposition or femoral sulcoplasty result in higher risk of patellar reluxation.

For further details, please ask for a copy of our free step-by-step guide for patellar luxation.

**PATELLA LUXATION STEP BY STEP GUIDE**

**BRPAT** Step by Step Guide to Patellar Luxation

**X-Acto Saw**

Fine toothed hard back saw, useful for trochleaplasty. Please note this saw is not stainless steel and will corrode badly. To keep the saw for as long as possible, clean thoroughly immediately after a procedure and store clean, dry and lubricated. Autoclave before use. Optional handle is aluminium. Alternatively see code 001004 Hard Backed Saw for a stainless version

**X-ACTO SAW**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>XACTOB/H</td>
<td>X-Acto Saw Complete 270mm</td>
<td>£29.36</td>
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<tr>
<td>XACTOHANDLE</td>
<td>X-Acto Saw Handle only 140mm</td>
<td>£22.15</td>
</tr>
<tr>
<td>XACTOBLADE</td>
<td>X-Acto Saw Blade 0.3mm cut 140mm</td>
<td>£14.94</td>
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<tr>
<td>XACTOSTERILE</td>
<td>X-Acto Saw Blade Sterile 0.3mm cut 140mm</td>
<td>£21.12</td>
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</tbody>
</table>

**Hard Backed Orthopaedic Saw**

140mm Long 23mm Deep 0.4mm Cut. In the style of the X-Acto Saw Blade but is stiffer and has slightly bigger teeth, more suitable for bone. It is made from stainless steel and can be autoclaved. The stiff back helps to guide the saw better than with hacksaw type blades which often deviate. Use for wedge sulcoplasty and osteotomies up to 23mm deep.

**HARD BACKED ORTHOPAEDIC SAW (STAINLESS)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>001004</td>
<td>Orthopaedic Hard Back Saw 0.4mm cut Stainless Steel 145mm</td>
<td>£40.69</td>
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</tbody>
</table>

**Modular Osteotome with Ultra-thin Interchangeable Blades and Diamond Rasp**

Teflon osteotome handle which accepts a good range of blades plus a diamond rasp (not included in set). Blades are very thin (1.1mm) allowing fine cuts and reducing the incidence of braking the block during block sulcoplasty procedures. Replacement T wrench and retaining screw are also available.

**MODULAR OSTEOTOME**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>001380</td>
<td>Modular Osteotome complete with 7 Blades</td>
<td>£155.75</td>
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<tr>
<td>001382</td>
<td>Modular Osteotome Replacement Blade 4mm</td>
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</tr>
<tr>
<td>001390</td>
<td>Modular Osteotome Replacement Blade 5mm</td>
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<td>001383</td>
<td>Modular Osteotome Replacement Blade 6mm</td>
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<td>Modular Osteotome Replacement Blade 8mm</td>
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<td>Modular Osteotome Replacement Blade 15mm</td>
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</tr>
<tr>
<td>001388</td>
<td>Modular Osteotome Replacement Blade 20mm</td>
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</tr>
<tr>
<td>001389</td>
<td>Modular Diamond Rasp 6mm</td>
<td>£28.33</td>
</tr>
</tbody>
</table>
Rectangular Sulcoplasty Instruments

A rectangular sulcoplasty retains the maximum articular cartilage. Most standard osteotomes are too thick, tending to break up the block. The super slim 8mm osteotome minimizes breakup. The rectangular rasp is designed to tidy up the corners of the sulcoplasty to maximize ‘fit’.

**RECTANGULAR SULCOPLASTY INSTRUMENTS**  
001017  Super Slim Osteotome 8mm 180mm  
001018  Rectangular Bone Rasp 210mm

Trochlea Rasp

Designed for deepening the trochlea groove, the trochlea rasp has a range of diameters to suit breeds from chihuahuas to bull terriers. For larger breeds perform a wedge or block trochleaplasty using a hard backed saw. An accurately contoured trochlea is essential for a successful trochleaplasty. Articular cartilage is removed to be replaced by fibrocartilage. Total length 190mm.

**TROCHLEA RASP**  
001020  Trochlea Rasp 11mm max 5mm min Diameter  
001022  Trochlea Rasp Small 8mm max 3mm min Diameter

Corrective Osteotomy Sawguide System

Corrective osteotomy is a recognised procedure in the management of patella luxation particularly in medium and large dogs. Positioning the osteotomy at the CORA (centre of rotation) can be a challenge. Creating an accurate osteotomy at the site is a further challenge. The osteotomy and sawguide system allows the surgeon to create accurate osteotomies positioned at the correct site.

The Osteometer/ Sawguide is used in the TTO technique of cruciate management to create accurate small wedge osteotomies. In the TTO technique the sawguide is located into guide holes drilled into the bone which is not an option in more cylindrical bones. The spinlock saw guide clamp incorporates an appropriate guide hole and can be clamped to virtually any bone. Once the osteotomy angle is determined the sawguide is secured into position using a 1.6mm K wire. The sawguide may then be moved very accurately from proximal to distal cuts to create the precalculated osteotomy.

**CORRECTIVE OSTEOTOMY SAWGUIDE SYSTEM**  
TTO011  Osteometer/ Sawguide  
TTO013  Saw Guide Attachment Forceps 9½” 245mm

Gordon Coronoid Osteotome

Originally developed for surgery on the medial coronoid, its thin, sharp blade and narrow widths are making this tool increasingly popular amongst surgeons for block sulcoplasty.

**GORDON CORONOID OSTEOTOME**  
AR-17-30  Gordon Coronoid Osteotome (4mm)  
AR-17-29  Gordon Coronoid Osteotome (2mm)

Osteophyte Rasp

Most stifles requiring cruciate repair will exhibit some osteophytes. In some cases they may be bulky necessitating removal. The Osteophyte Rasp is a small yet very effective rasp to keep in the cruciate set.

**OSTEOPHYTE RASP**  
001019  Osteophyte Rasp

Universal Sulcoplasty Rasp

Double ended rasp, 210mm long. Rectangular end for adjusting block sulcoplasties, triangular end for adjusting wedge sulcoplasties. Improved tooth geometry gives more efficiency over standard rasps. Cuts on pull stroke only. The rectangular end has 2 fine and 2 medium surfaces, triangular has 2 fine surfaces.

**UNIVERSAL SULCOPLASTY RASP**  
001021  Universal Sulcoplasty Rasp 210mm Long

Gordon Coronoid Osteotome

Originally developed for surgery on the medial coronoid, its thin, sharp blade and narrow widths are making this tool increasingly popular amongst surgeons for block sulcoplasty.
Hip Toggle
TightRope for Coxofemoral Luxation Repair
A good outcome using the hip toggle technique for coxofemoral luxation depends on the use of strong materials in this hostile environment, accurate placement of bone tunnels and application of the correct tension prior to closure. Arthrex offers both implants and instrumentation to address all of these issues.

Placement of a guide wire using the aiming device ensures accurate positioning of the drill and bone tunnel.

A hole large enough to accept the toggle is drilled through the fossa of the acetabulum (3.5mm TightRope, 2.7mm MiniTightRope). The lead needle is passed through the bone tunnel and the TightRope toggle is pulled through. Once the toggle is through, the lead needle is removed.

The toggle is pushed completely through the fossa hole. The slack in the FiberTape is removed from the lateral femur and the head replaced. A low tension (22-31 Newtons) is applied to each pair of FiberTape strands which are tied off with four throws.

ARTHREX COXOFEMORAL REPAIR

| VAR-2800 | TightRope Single Set |
| VAR-2801 | Mini TightRope Single Set |
| VAR-2810 | Femoral Aiming Guide |
| VAR-8933-20C | Cannulated Drill Bit 2.0mm (use with VAR-8933K) |
| VAR-8911DC | Cannulated Drill Bit 2.7mm (use with VAR-8920P) |
| VAR-8920DC | Cannulated Drill Bit 3.5mm (use with VAR-8920P) |
| VAR-8933K | 1.1mm (0.045") Guidewire (Pack of 6) |
| VAR-8920P | 1.2mm (0.049") Guidewire (Pack of 6) |
| VAR-1255-O8 | Nitinol Flexible Suture Passer (200mm) |
| VAR-1529 | Tensioner with Tensiometer |
| VAR-11796 | FiberWire Scissors |

Being the world's largest surgical company with a focus on ligamentous repair and joint reconstruction in humans, Arthrex knows a thing or two about joint stabilisation and their quality is second to none.

Other means of management should be considered when hip dysplasia is present; load sharing between structures is limited and premature implant failure or pull-through should be anticipated.
**Hip Toggle Procedure**

The hip toggle procedure is a well established technique for the management of traumatic and unstable subluxation of the the coxo-femoral joint. Although somewhat invasive it does have the advantage that by replacing the round ligament the hip has, postoperatively, a full range of movement. However, the suture is placed into a very hostile abrasive environment and historically had a high failure rate. Newer materials have, to a degree, addressed this problem. LigaFiba® is spun Ultra High Molecular Weight Polyethylene. This is the same high wear material used for acetabular cups in Total Hip Replacement. For any given weight (or diameter) LigaFiba® is 2.5 x stronger than the traditional monofilament nylon. In addition the softer more flexible nature of the material allows a relatively larger implant to be passed along bone tunnels. LigaFiba® has in addition better wear characteristics than nylon. Veterinary Instrumentation is pleased to offer an updated range of hip toggles based on LigaFiba®. The range includes the new 2.0mm and 2.5mm toggle. Use of a dedicated introducer facilitates the introduction of the toggle through the acetabulum into the pelvis.

**Notes on the use the the Hip Toggle system**

1. Expose femoral head and floor of acetabulum via a cranio-lateral approach. Perform a trochanteric osteotomy if necessary. The text 'An Atlas of Surgical Approaches to the Bones and Joints of the Dog and Cat' by Piermattei is an almost essential part of any veterinary surgeons library. Code BK02 see page 439.
2. Clear soft tissues (mostly shredded round ligament) from acetabulum and fovea of femoral head.
3. Drill a hole through the acetabular fossa (effectively the origin of the round ligament). Drill size required
   - 3mm Toggle plus 250lb LigaFiba 4.5mm drill
   - 3mm Toggle plus 80lb Nylon 4.8mm drill
   - 2.5mm Toggle plus 250lb LigaFiba 4mm drill
   - 2mm Toggle plus 150lb LigaFiba 2.7mm drill
4. Load the toggle into the insertion tool. The ‘long’ end goes into the inserter tip. The suture is retained onto the inserter shaft by sliding the silicone ring over the toggle and inserter.
5. Push projecting toggle into hole in acetabulum.
6. Insert plunger and eject toggle into pelvic canal. Toggle should ‘flip’ out preventing pull out. Check toggle security.
7. Drill a bone tunnel (2.5-3.5mm) from fovea exiting from proximal lateral femur.
   - a. Use Adjustable Drill Guide for best results. (ADJDG2035)
   - b. ‘Eyeball’ it
   - c. Drill from fovea to femur (requires severe external rotation of femur)
8. Pass free suture ends down the femoral neck tunnel from fovea to femur. LigaFiba® will require a suture puller or alternatively a folded loop of fine cerclage wire may be passed from lateral to medial to exit at the fovea. Pass the LigaFiba® through the loop and pull back. Check there are no soft tissues (usually joint capsule) interposed between head and acetabulum.
9. Pass ends of the suture through holes in Ormrod button, pull tight and tie temporarily. Check that coxo-femoral joint has a full comma of movement. Tie securely over button. Over-tightening is a technical error and will result in premature failure of the suture.

**NOTE:** The implant always breaks within a few weeks of placement regardless of technique and material. The toggle provided temporary stability only. If it becomes necessary to remove the suture, locate the Ormrod button and remove both button and suture. It is not possible to retrieve the toggle which, lying extra-articularly, does not cause a problem.

**Hip Toggle Introducer**

The Hip Toggle has an ‘eye’ to hold the suture and is made from stainless steel 316LVM. Use the adjustable drill guide to accurately place the hole in the femoral neck, (see chapter 3).

All sterile packs contain a nylon Ormrod button for secure fixation of the suture. Available with monofilament nylon or braided LigaFiba®, LigaFiba® is easier to work with, is stronger and ties better. However, it is a braided material with higher infection risks.

**LigaFiba® Hip Toggles**

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<thead>
<tr>
<th>Size</th>
<th>Description</th>
<th>Drill Pack</th>
<th>Notes</th>
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<tr>
<td>2mm</td>
<td>Hip Toggle 3.0mm + 250lb Ligafiba®</td>
<td>£26.78</td>
<td>Braided polyethylene is 2.5 x stronger than monofilament nylon and has the additional benefit of a high resistance to abrasion. These properties are ideal for a hip toggle suture. Additionally the braided material conforms better and will therefore pass through a smaller hole. The new 2mm toggle and 150lb (68kg) will pass through a 2.7mm bone tunnel.</td>
</tr>
<tr>
<td>2.5mm</td>
<td>Hip Toggle 2.5mm + 250lb Ligafiba®</td>
<td>£26.78</td>
<td></td>
</tr>
<tr>
<td>3mm</td>
<td>Hip Toggle 2.0mm + 150lb Ligafiba®</td>
<td>£26.78</td>
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<tr>
<td></td>
<td>Omrond Button (Sterile Pack) Dogs over 10kg</td>
<td>£11.85</td>
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<tr>
<td></td>
<td>Ormrod Button (Sterile Pack) Dogs under 10kg</td>
<td>£11.85</td>
<td></td>
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<tr>
<td></td>
<td>Hip Toggle 3.0mm + 80lb Nylon Omrond Button (Sterile Pack)</td>
<td>£11.85</td>
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<tr>
<td></td>
<td>Hip Toggle Introducer + Hip Toggle with 250lb LigaFiba® + Omrond Button (sterile pack)</td>
<td>£11.85</td>
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<tr>
<td></td>
<td>Hip Toggle Introducer + Hip Toggle with 250lb Nylon + Ormrod Button (sterile pack)</td>
<td>£11.85</td>
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<td>Hip Toggle Introducer + Hip Toggle with 250lb LigaFiba® + Ormrod Button</td>
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<td>Hip Toggle Introducer + Hip Toggle with 80lb Nylon + Ormrod Button (sterile pack)</td>
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<td></td>
<td>Hip Toggle Introducer + Hip Toggle with 80lb Nylon Ormrod Button</td>
<td>£26.78</td>
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<tr>
<td></td>
<td>Contains Introducer, Hip Toggle with 250lb Drill Guide 3.5 &amp; 4.5mm Drills (discounted)</td>
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<tr>
<td></td>
<td>Adjustable Drill Guide 2.0, 2.5, 3.5mm Drills</td>
<td>£26.78</td>
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<tr>
<td>TOG</td>
<td>Hip Toggle only 3.0mm (non sterile)</td>
<td>£26.78</td>
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<tr>
<td>TOGM</td>
<td>Hip Toggle only 2.5mm (non sterile)</td>
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<td>TOGS</td>
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<tr>
<td>TIBUT6H</td>
<td>Titanium Button 6mm 2 Holes (non sterile)</td>
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<tr>
<td>TIBUT9H</td>
<td>Titanium Button 9mm 2 Holes (non sterile)</td>
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<td>Titanium Button 11mm 2 Holes (non sterile)</td>
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**HIP TOGLES**

HIP TOG KITLF
- Contains Introducer, Hip Toggle with 250lb Drill Guide 3.5 & 4.5mm Drills (discounted)

HIP TOG KIT
- Contains Introducer, Hip Toggle with 80lb Nylon, Drill Guide, 3.5 & 4.8mm Drills (discounted)

ADJDG2035
- Adjustable Drill Guide 2.0, 2.5, 3.5mm Drills

TOG
- Hip Toggle only 3.0mm (non sterile)

TOGM
- Hip Toggle only 2.5mm (non sterile)

TOGS
- Hip Toggle only 2.0mm (non sterile)

TIBUT6H
- Titanium Button 6mm 2 Holes (non sterile)

TIBUT9H
- Titanium Button 9mm 2 Holes (non sterile)

TIBUT11H
- Titanium Button 11mm 2 Holes (non sterile)
Placing a hip toggle has been a popular technique for managing hip luxations for many years. Despite being very intuitive in that it attempts to replace what was broken, the technique was not without problems. Placing the toggle was difficult in that the insertion point through the fovea of the acetabulum was both deep and dark, additionally the toggle itself, even the largest versions were small and difficult to hold and insert. Another major issue was that the inside of the hip joint is a very hostile environment for the toggle retaining suture which was subject to both tension and abrasion. Early failures were common. The break-off hip toggle combined with LigaFiba addresses these problems. The toggle is supplied as a 150mm pin with a break off point just above the toggle. Positioned into the inserter, the distal half of the toggle may be pushed into the hole in the acetabulum. Rocking the pin against the inserter breaks off the toggle which is then pushed through the hole using the broken off pin as a ‘pusher’.

LigaFiba® is very strong (2.5 x as strong as monofilament nylon) with good abrasion resistance. It is easy to handle and requires a smaller acetabular hole for any given diameter of nylon. Despite being braided we have had very few reports of infection.

**HIP TOG G30BOP**
- 2.5mm Break Off Hip Toggle with 150lb LigaFiba®
- 3.0mm Break Off Hip Toggle with 250lb LigaFiba®
- 2.5mm Break Off Hip Toggle Applicator
- 3.0mm Break Off Hip Toggle Applicator

**Surgical Technique for Break Off Toggle**

Most chronic hip luxations are in the cranio-dorsal position. The initial dissection is to expose the head of the femur prior to creating the bone tunnel and to expose the acetabulum. It is important to clear the acetabulum of soft tissue prior to the toggling procedure. Preserve the joint capsule as far as is possible.

**Key points to this procedure are:**
- Careful dissection and clearing of acetabulum
- Accurate positioning of the femoral bone tunnel
- Accurate positioning of the acetabular hole
- Careful reduction and tensioning of the suture.
- Over tensioning is as great a technical error as under tensioning.
- Check for a full range of motion before final tying.

**Drill a bone tunnel from the fovea to the lateral femur. Use of a drill guide will help direct the drill. Use 2.5mm drill.**

**Load the break off toggle into the applicator from the distal end. Pull the LigaFiba® back along the shaft of the applicator to retain the toggle.**

**Place the tip of the toggle through the hole in the acetabular fossa. Pressing the applicator into position will retain the LigaFiba®.**

**Rock the shaft of the toggle pin to and fro until the shaft breaks off. Using the shaft, push the toggle through the hole in the acetabular fossa and ensure that it flips and engages.**

**Pass a suture puller or folded fine wire from lateral femur through the bone tunnel and pull the LigaFiba® strands through. See video clip on www.vetinst.com**

**The strands are pulled tight but tied loosely over the button. Check for full range of motion and complete tie. Do not over tighten which will lead to early failure.**
TRIPLE AND DOUBLE PELVIC OSTEOTOMY

Triple pelvic osteotomy (TPO) was described by Barclay Slocum in 1986 as a means to improve dorsal acetabular cover of the femoral head, reducing dorsal hip subluxation and damage to the dorsal acetabular rim. Performed early enough, TPO helps to mitigate progression of degenerative joint disease and maximises hip congruity and surgery is typically performed between five to eight months of age.

Different methods can be used to assess the amount of correction required. Candidates should ideally have no evidence of osteo-arthritis and an intact dorsal acetabular rim (DAR). The quality of clunk when performing the Ortalani test gives an impression of the quality of the dorsal acetabular rim. When testing hip instability using the Ortalani test, suitable candidates should have angle of reduction not exceeding 30-35˚.

Dorsal Acetabular Rim Skyline radiographs are used by some surgeons to better define the integrity of the DAR and to provide additional information for planning the extent of a correction.

TPO involves cutting the ilium, ischium and pubis to free the acetabular segment. The acetabular segment is rotated ventrally and the ilial osteotomy is plated to maintain rotational correction. The pubic osteotomy may be wired to improve stability; though this is not always very effective and has largely been dropped.

Recently, the procedure has been refined in an attempt to create a more stable construct with less post-operative implant failure problems. The advent of locking implants including locking TPO plates has improved construct stability and reduced complications such as implant loosening and screw pull-out.

Performing a double pelvic osteotomy (DPO) where only the ilium and pubis are cut, and the ischium remains intact, is less de-stabilising to the pelvis than TPO. The technique was first described at ESVOT in 2006 following in-vitro studies by P. Haudiquet and J. Guillou and was followed by publication of a clinical case series by Aldo Vezzoni et al in VCOT in 2010.

In contrast to TPO, DPO creates quite a lot of tension in the pelvis as the acetabular segment is twisted outwards, and achieving the correct amount of rotation can be challenging. Due to the influence of these torsional forces, it is suggested that a correction of an additional 5° on TPO be performed. Locking implants are particularly helpful in managing the increased forces of DPO.

An intermediate option is to perform a modified TPO or a 2.5 pelvic osteotomy. This is half-way between the DPO and the TPO, whereby an incomplete osteotomy of the ischium (line 3) – only the dorsal ischial cortex is cut. This reduces the torsional forces inherent in DPO without as much destabilisation of the pelvis as TPO.

Slocum Style TPO/ DPO Plates – Non-Locking and Locking

A stepped implant minimising issues relating to pelvic narrowing. The original Slocum plate was designed for 3.5mm non-locking screws with three screw-holes on either side of the iliac osteotomy and a small hole on the caudal part of the plate for the addition of a cerclage wire.
Veterinary Instrumentation Slocum style TPO/DPO plates have the same lay-out as the original Slocum plate and are available in non-locking and locking variants. The non-locking versions feature round non-locking holes and DCP holes like the original Slocum plate. The locking version features three parallel stacked locking holes caudally (will accept cortical or locking screws), one DCP hole for compression on the cranial segment permitting osteotomy compression and two parallel stacked locking screws cranially. The caudal part of both plate styles has a hole for additional cerclage wire fixation.

**VI Locking TPO/ DPO Plates**

The 2.7mm plates have three screw holes cranially and caudally. The 3.5mm plate has four holes cranially and three holes caudally.

- **VI Locking TPO & DPO Plates**
  - 09930220L 3.5 TPO/ DPO Locking Plate 20 Left
  - 09930420R 3.5 TPO/ DPO Locking Plate 20 Right
  - 09930525L 3.5 TPO/ DPO Locking Plate 25 Left
  - 09930625R 3.5 TPO/ DPO Locking Plate 25 Right
  - 09930730L 3.5 TPO/ DPO Locking Plate 30 Left
  - 09930830R 3.5 TPO/ DPO Locking Plate 30 Right
  - 09940220L 2.7 TPO/ DPO Locking Plate 20 Left
  - 09940420R 2.7 TPO/ DPO Locking Plate 20 Right
  - 09940525L 2.7 TPO/ DPO Locking Plate 25 Left
  - 09940625R 2.7 TPO/ DPO Locking Plate 25 Right
  - 09940730L 2.7 TPO/ DPO Locking Plate 30 Left
  - 09940830R 2.7 TPO/ DPO Locking Plate 30 Right
  - LSDG2724XL 2.7 Locking Screw Drill Guide Extra Long
  - LSDG35XL 3.5 Locking Screw Drill Guide Extra Long

**XL Locking Drill Guides**

Extra-long locking drill-guides simplify working in deeper spaces, especially useful for TPO/DPO.

- **XL Locking Drill Guides**
  - LSDG2724XL 2.7mm Locking Screw Drill Guide - Extra Long
  - LSDG35XL 3.5mm Locking Screw Drill Guide - Extra Long

**VI Twistable TPO/DPO Plates**

Supplied flat to be twisted prior to surgery or supplied pre-bent to 30°, these plates offer flexibility over desired rotation and are used with non-locking screws in either 3.5mm or 4mm diameter. Neither addressing pelvic narrowing or featuring locking holes, these are being superseded by other plate designs.

- **TRIPLE PELVIC OSTEOTOMY PLATE**
  - 090167 Large TPO Plate
  - 090179 Small TPO Plate
  - 090167L30 Large TPO Plate Prebent 30° Left
  - 090167R30 Large TPO Plate Prebent 30° Right
  - 090179L30 Small TPO Plate Prebent 30° Left
  - 090179R30 Small TPO Plate Prebent 30° Right
  - HDTPODVD TPO Technique DVD Hamish Denny

**Van Vooren Gigli Wire Passer**

Developed by Nick Van Vooren, this device simplifies passage of Gigli wire around the ischium and pubis for TPO and the pubis for DPO. The wire is passed down the tube, where the bend forces it back on itself for easy retrieval. Total length 160mm.

- **GIGLI WIRE PASSER**
  - 001518 Gigli Wire Passer - 160mm Long
Femoral Head and Neck Excisional Arthroplasty

Excision Arthroplasty Rasp

Designed specifically to remove any bone spurs following excision arthroplasty. Failure to remove bone spurs is the most common cause of problems with this procedure. Teeth cut on the back stroke.

EXCISION ARTHROPLASTY RASP

Disarticulator

Disarticulator designed to elevate the femoral head for excision. Notch at the tip of the instrument engages and ruptures the Teres (round) ligament, which can be very difficult. Also useful in manipulation for the humeral head in OCD lesion procedures and investigation of elbow lesions.

DISARTICULATOR

Hohman Retractors

A simple but multi-function instrument, with a wide number of variations to cover different procedures, patients and surgeons’ requirements.

Uses include:
- Bone levers as an aid to fracture reduction.
- Bone levers as an aid to elevating the site of interest, examples include exposing the femoral head and the acetabulum during hip surgery and also joint distraction during stifle surgery.
- As soft tissue distractors to improve bone visualisation and access whilst performing many joint and fracture procedures.

A scrubbed assistant to hold the retractor in place is most useful. Frequently more than one Hohman is used during a procedure, and the Hohman often accomplishes multiple functions at once, for example soft tissue retraction and protection while elevating the femoral neck.

Hatt Spoon

Alternative to the ‘chip fork’ style disarticulator, particularly for larger dogs. Spoon edge is sharp. Good-sized fibre handle with a finer shaft for better balance.

HATT SPOON

Anatomy of a Hohman Retractor
These are the archetypal Hohman Retractors often described in textbooks as ‘Hohman’.
The ‘standard’ Hohman retractor shape and size.
Larger version at 240mm long is useful in larger dogs over about 20kg where more force is required for manipulation, and there may be more depth of overlying tissue.
Smaller version, 175mm long, is scaled down and useful in slightly smaller dogs or in smaller bones where less force is needed. Good for retracting fascia lata in CRCl procedures.

**Hohman Retractors with Short Tips**

**18mm & 12mm Blades**

- **Hohman Retractor 18mm Short Narrow Tip**
  - Total Length 240mm
  - £58.20

- **Hohman Retractor 12mm Short Narrow Tip**
  - Total Length 175mm
  - £58.20

**Mini Hohman 6mm & 8mm Blade and Short Tip**

Ideal for careful retraction of soft tissue during the manipulation of smaller bones and fragments, aiding reduction of soft tissue devascularisation. Also allow delicate retraction of soft tissue for screw and wire placement.

8mm version is particularly good for long bones in the cat.

**MINI HOHMAN 6MM AND 8MM SHORT TIP**

- **Mini Hohman Retractor 6mm Short Tip 165mm Long**
  - £58.20

- **Mini Hohman Retractor 8mm Short Tip 165mm Long**
  - £58.20

**Micro Hohman 4mm with Short Narrow Tip**

The smallest Hohman Vi supply. Useful in very small procedures or patients. Also available in a version with a long narrow shaft to use with arthroscopic portals.

**MICRO HOHMAN 4MM SHORT NARROW TIP**

- **Micro Hohman Retractor 4mm Short Tip 160mm Long**
  - £58.20

- **Micro Hohman Retractor 4mm Short Tip with narrow shaft for arthroscopy 160mm Long**

**Hohman Retractor Broad with Short Narrow Tip**

Broad blade Hohman provide more effective retraction of large muscle masses than the standard version, with less focal pressure.

Suggested uses:
- 48mm blade – larger dogs for elevation of femoral head and neck
- 24mm blade – muscle retraction during plating procedures

**HOHMAN RETRACTOR BROAD WITH SHORT NARROW TIP**

- **Hohman Retractor 48mm Short Narrow Tip 260mm Long**
  - £66.44

- **Hohman Retractor 24mm Short Narrow Tip 185mm Long**
  - £66.44

**Mini Hohman Broad Blade with Narrow Tip**

Suggested uses:
- Improving visualisation of and access to mid diaphysis of can and small dog bones
- Displacing ligaments and tendons in carpus/tarsus of larger patients

**MINI HOHMAN BROAD BLADE SHORT TIP**

- **Mini Hohman 15mm Broad Blade 120mm Long**
  - £58.20

**Hohman Retractor with Long Broad Tip**

Useful in and around the shoulder joint and other retraction situations when a blunt tip is desirable.

**HOHMAN RETRACTOR WITH LONG BROAD TIP**

- **Hohman Retractor 24mm Long Broad Tip 280mm Long**
  - £61.29

- **Hohman Retractor 18mm Long Broad Tip 175mm Long**
  - £61.29

**Gutter Hohman**

The Gutter Hohman is the brain-child of Haralabos Haralabidis, DVM from Athens. The gutter profile of the blade’s top surface helps to prevent bones from slipping off sideways until reduction has been achieved. This instrument is most useful for oblique fractures of the long bones of medium size dogs.

**GUTTER HOHMAN RETRACTOR**

- **Gutter Hohman Retractor 180mm Long**
  - £69.53
Retractors designed specifically for use in and around the Hip Joint

Hohman retractors designed specifically for veterinary hip surgery, to deal with the muscle bulk involved

Swan-Neck Hohman

Used for elevation and exposure of the femoral neck and head in medium/large dogs. Cranked shape keeps the surgeon’s hand and the femur out of the surgical field.

SWAN-NECK HOHMAN

001034 Medium Swan-Neck Hohman 11mm Blade, Short Tip 220mm Long

Hip Hohman

Developed for use in total hip replacement but useful in any procedure requiring elevation of the femoral head. Multiple small teeth at the end lip of the instrument sit securely on the femoral neck outside the zone of articular cartilage.

Three sizes are available. Approximate guidelines are as follows:

<table>
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<tr>
<th>Size</th>
<th>Weight Range</th>
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<tr>
<td>Large</td>
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<tr>
<td>Medium</td>
<td>10 - 30kg</td>
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<tr>
<td>Small</td>
<td>&lt; 10kg</td>
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HOP HOHMAN

001038 Large Hip Hohman 255mm Long 25mm Wide Blade
001037 Medium Hip Hohman 175mm Long 13mm Wide Blade
001036 Small Hip Hohman 125mm Long 8mm Wide Blade
001030SET Hip Hohman Set of 3 (as above)

Hohman Retractor 20mm Wide with Short Kinked Tip

Designed for femoral neck retraction for THR after the femoral head has been removed in order to visualise the acetabulum for acetabular reaming. The bent tip of the Hohman is engaged caudoventral to the acetabulum with the osteotomised surface of the femoral neck behind it, and then the Hohnman is retracted to pull the femoral neck out of the way of the reamer.

HOHMAN RETRACTOR 20MM WIDE WITH SHORT KINKED TIP

001039 Hohman 20mm Wide with Short Kinked Tip 300mm Long

OCD Curette

Loose flaps of cartilage at the OCD lesion must be removed. The double ended OCD curette is designed to perform this task within the limited space available. Healthy fibrocartilage within the lesion should not be disturbed.

OCD CURETTE

001030 OCD Curette 215mm Long
001032 OCD Curette Small 180mm Long
Adjustable Bone Saw

Multi-purpose saw, supplied with 5 fine chrome plated blades. Blade length adjustable from 40 to 100mm.
Procedures include:
- Trochleaplasty
- Tibial Tuberosity transposition
- Amputations
- Trochanteric osteotomy
- Excision arthroplasty
- Splitting multi-root teeth for extraction
Handle length 130mm. Blade length 155mm

ADJUSTABLE BONE SAW
001000  Adjustable Bone Saw c/w 5 Fine Blades
001001  Spare Fine Blades Pack of 5 Chrome Plated
001000Ss  Adjustable Bone Saw Blade (Single) Sterile

Rhinotomy/ Plaster Saw Blade

This is a curved stainless blade with a radius of 15mm. Useful for rhinotomy, plaster cutting and osteotomies where access is limited, e.g. radius, ulna and ilium during a TPO. Total length 85mm.

RHINOTOMY/ PLASTER SAW BLADE
001003  Rhinotomy/ Plaster Saw Blade (single) 85mm Long

Coarse Stainless Blade

Very useful for larger patients. The tooth pitch is 15 teeth per inch. This blade does not clog easily.

COARSE STAINLESS BLADE
001002  Coarse Stainless Blade (single) 140mm Long

Saw Blades for Scalpel Handles

A cross-over product from model making, these blades have proven their worth over the years and remain popular for a variety of small bone cutting procedures. Although the smallest tooth saw blade does not reliably fit all #3 scalpel handles, the rest do. Blades are non stainless.

Kit consists of 3 sets of blades and a free scalpel handle

SCALPEL FIT SAW BLADES
SBLSET  Scalpel Fit Saw Blades (4 different Blade styles)
SBLKIT  Scalpel Saw Blade Kit (3 of above plus Handle)
Minimally invasive passing of Gigli wire around the ischium for TPO/ DPO can be challenging. This device, developed by Nick VanVooren simplifies this process. The wire is simply passed down the tube, where the bend forces it back on itself for easy retrieval. Total length 160mm.

**Gigli Wire Passer**

**Gigli Wire Passer - 110mm (Pair)**

£59.23

**Gigli Wire**

Gigli wire with no eyes. Used with the Gigli Wire Passer. Cut to length required, allowing an extra 10-15mm to allow attachment to handles, before autoclaving.

**Gigli Wire - 10m Spools**

**Gigli Wire - 10m Spool**

£84.98

**Vi Handles for Gigli Wire**

Attachment of non-eyed wires to these handles is achieved by means of a thumb screw. The wire is gripped more firmly if it is wrapped once around the handles before tightening the screw.

**Vi Handles for Gigli Wire 110mm (Pair)**

£71.59

**Gigli Saw**

Essentially a bone cutting wire. More useful in large dogs. Hard to persuade the saw to cut where you want it to. Can be threaded through holes to make inaccessible cuts, e.g. ulna osteotomies.

**Gigli Saw Handles (pair) 75mm**

£43.78

**Gigli Saw 30cm**

£11.33

**Gigli Saw 50cm**

£12.36
Goniometer

The Goniometer may be used for the calculation of tibial plateau angles, wedge resections, angles of anteversion etc. Also used to measure pre and post-op range of motion of joints together with the effect of physiotherapy. Clients may use to measure progress. 360° measurement.

**GONIOMETER**
- **GONIO**  Goniometer 6” 150mm (illustrated)
- **GONIO2**  Goniometer 12” 300mm

Stainless Steel Goniometers

For intra surgery use or where a more robust instrument is required. The Femoral Neck Goniometer is useful for assessing implant size in hip replacement.

**STAINLESS STEEL GONIOMETERS**
- **GONIO3**  Stainless Steel Goniometer 340mm Long
- **HE-GONIO**  Femoral Neck (Stainless Steel) Goniometer 120mm Long

Combination Bone Rasp Set

The three Interchangeable Rasp Blades offer a range of cutting surfaces, flat, round and 'putti' style. The handle has an ergonomic design which is easy to grip even when wet.

**COMBINATION BONE RASP SET**
- **001015**  Combination Bone Rasp with 3 Interchangeable Heads

NanoPaste Bone Substitutes

The sterile presentation is an aqueous paste supplied in a syringe (2.5ml or 5.0ml). The paste may be injected directly into a defect where it conforms to fill the space. The paste is readily colonised by bone cells and acts as a scaffold encouraging penetration of host bone. The putty-like consistency means that the paste may be pressed onto bone where it sticks until resorbed. NanoPaste is very similar to Ostim™ which has an established clinical record.

Applications include: joint arthrodesis, TTA Rapid, non-unions, delayed unions and filling spine cages.

NanoPaste and TTA Rapid

Use to save time harvesting autograft or when the quality of the autograft is poor. NanoPaste will extend autograft.

NanoPaste may be injected directly into the defect where it conforms to the defect shape.

Nano HA paste conforms to EN ISO 13779-1:200 and ASTM F1185-88 for medical grade HA.

NanoPaste is also available in a granule formulation 'ReproBone' (see page !!!!) which may be used alone or as an extender of natural cancellous bone graft.

**NANOPASTE**
- **PAS2.5**  NanoPaste Syringe 2.5ml
- **PAS5**  NanoPaste Syringe 5ml

NanoPaste Bone Substitutes

The sterile presentation is an aqueous paste supplied in a syringe (2.5ml or 5.0ml). The paste may be injected directly into a defect where it conforms to fill the space. The paste is readily colonised by bone cells and acts as a scaffold encouraging penetration of host bone. The putty-like consistency means that the paste may be pressed onto bone where it sticks until resorbed. NanoPaste is very similar to Ostim™ which has an established clinical record.

Applications include: joint arthrodesis, TTA Rapid, non-unions, delayed unions and filling spine cages.
Veterinary Tissue Bank

Veterinary Tissue Bank is Europe’s first tissue bank dedicated to helping companion animals. Products are available in various presentations, and have many applications from use during procedures such as TTA rapid and joint arthrodesis to dealing with the difficult non-union case.

DBM

Deminerlised Bone Matrix (DBM) is cortical bone which has been cut, milled into fine particles and washed to remove soft tissues, cells and marrow elements. Further processing removes minerals to leave collagen matrix and endogenous bone growth factors such as bone morphogenetic proteins.

DMB is used where osteoinduction is required but the graft does not require any structural properties, for example in small joint arthrodesis.

DBM Putty

Supplied as a two part product for reconstitution. DBM particulates are mixed with nanocrystalline hydroxyapatite aqueous suspension prior to use, in the syringes provided. The addition of hydroxyapatite provides a high surface area for osteoconduction, and allows the putty-like texture to form. The product sticks well to the bone surface and conforms to the defect, improving contact to bone. It can be injected into the surgical site direct from the syringe, e.g. in TTA, and will also pass through a 14g needle for non-invasive surgery such as MIPO.

Cancellous Chips

Cancellous Chips offer structure to a graft as well as providing a scaffold for osteoconduction.

This is available in canine and feline variants. Canine is available in 3 chip sizes for closer matching to defect size, and 3 pack sizes. The product consists of morcelised cancellous bone, processed to remove soft tissue, cells and marrow elements, freeze-dried and irradiated after packing for sterility.

Useful in TTA Rapid, filling corrective osteotomies, fracture repair, spinal fusions among other procedures. It is also useful for extending an autograft where harvesting has not produced sufficient material.

Graft Selection

Osteoinduction $\rightarrow$ DBM
Osteoconduction $\rightarrow$ Cancellous Chips
Osteoconduction and osteoinduction $\rightarrow$ DMB Putty

VETERINARY TISSUE BANK PRODUCTS

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<td>FL105</td>
<td>Cancellous Chips Feline &lt;2mm Chip Size Fine 1cc</td>
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</tbody>
</table>

All products are subject to availability. Feline products are often in short supply.
**Arthrex SynACART™**

SynACART™ is a new surgical treatment for OCD, developed by Noel Fitzpatrick and Arthrex. The procedure briefly involves debridement of the lesion, production of a suitable socket and implantation of a suitable size SynACART™ Resurfacing Core. Implantation requires identifying a complete ring of viable hyaline cartilage which may require extreme flexion of the joint if for example in the femur the lesion is more caudal.

For a brochure and surgical guide please call 0845 130 9596, email info@vetinst.com or see our website.

**ARTHREX SYNACART™**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAR-2500-08</td>
<td>Resurfacing Core SynACART™ 8 mm x 8 mm</td>
<td>£489.25</td>
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<tr>
<td>VAR-2500-10</td>
<td>Resurfacing Core SynACART™ 10 mm x 8 mm</td>
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<td>VAR-2500-20</td>
<td>Resurfacing Core SynACART™ 20 mm x 8 mm</td>
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<td>VAR-2500-25</td>
<td>Resurfacing Core SynACART™ 25 mm x 8 mm</td>
<td>£726.15</td>
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<td>VAR-2502-08DC</td>
<td>Drill SynACART™ Cannulated, 8 mm</td>
<td>£118.45</td>
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<td>VAR-2502-10DC</td>
<td>Drill SynACART™ Cannulated, 10 mm</td>
<td>£133.90</td>
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<tr>
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<td>Drill SynACART™ Cannulated, 20 mm</td>
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<tr>
<td>VAR-2502-25DC</td>
<td>Drill SynACART™ Cannulated, 25 mm</td>
<td>£185.40</td>
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<tr>
<td>VAR-2503-08</td>
<td>Guide SynACART™ 8 mm</td>
<td>£66.95</td>
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<td>VAR-2503-10</td>
<td>Guide SynACART™ 10 mm</td>
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<td>VAR-2503-20</td>
<td>Guide SynACART™ 20 mm</td>
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<tr>
<td>VAR-2503-25</td>
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<td>VAR-2504-08</td>
<td>Implant Holder SynACART™ 8 mm</td>
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<td>VAR-2504-10</td>
<td>Implant Holder SynACART™ 10 mm</td>
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<tr>
<td>AR-1250L</td>
<td>Drill Tip Guide 2.4mm Beath Pin (Pack of 6)</td>
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<td>VAR-2500C</td>
<td>SynACART™ Instrument Case</td>
<td>£345.05</td>
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<td>BRSYNA</td>
<td>Arthrex SynACART™ Literature</td>
<td>£FOC</td>
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</table>
ACP Autologous Conditioned Plasma

Outside the bloodstream, platelets become activated and release proliferative and morphogenic proteins relevant to healing in a variety of tissue types including bone, tendon and cartilage. Arthrex ACP significantly increases the levels of both platelets (x2) and growth factors TGF, PDGF, EGF, VEGF, IGF-1 compared to whole blood. In vitro studies using cell cultures and ACP derived plasma has demonstrated increased proliferation of tenocytes, osteoblasts and chondrocytes. Clinical studies comparing treatments using ACP with a Hyaluronic Acid and Depomedrone combination are encouraging.

An information pack on the use of ACP and ABPS which includes published studies is available free on request.

High concentrations of growth factors like those found in ACP have been shown to have regenerative and modulating effects on impaired cartilage and tendons.

The procedure requires the use of only 10ml of blood together with the Arthrex double syringe primed with ACD-A which is then spun down using a dedicated centrifuge and rotor. Depending on usage Arthrex will supply the Centrifuge and Rotor on free loan.

The Centrifuge is the same as is used with the Arthrex-ABPS system, with easily interchangeable rotors for users of both Arthrex ACP & ABPS Autologous Blood Products.

Free loan of Centrifuge and Rotor

Provided the surgeon is prepared to commit to an initial purchase of 2 boxes (40 units) of syringes (£1,843.70) and an annual purchase of 5 boxes, Arthrex is prepared to offer its Centrifuge with Rotor/ accessories (value over £3,500) on free loan.

Please call for details.

ACP CONSUMABLES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>VABS-10014-20</td>
<td>Arthrex ACP Double Syringe x 20</td>
<td>£921.85</td>
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<td>VABS-10014</td>
<td>Arthrex ACP Double Syringe x 5</td>
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ABPS CONSUMABLES

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<th>Description</th>
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<tr>
<td>VAR-1011</td>
<td>ABPS Syringe (Single)</td>
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ACP/ ABPS EQUIPMENT

<table>
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<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABS-10019</td>
<td>Arthrex Centrifuge</td>
<td>£3,115.75</td>
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<td>VAR-1021</td>
<td>Rotor for ABPS</td>
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<td>ABS-10021</td>
<td>Rotor for ACP</td>
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<tr>
<td>VAR-1040</td>
<td>Arthrex Incubator</td>
<td>£695.25</td>
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ARTHREX CUE SYSTEM

Canine Unicompartmental Elbow System for Medial Compartment Disease.

See Chapter 7 page 246 for more information.

Courses will be running periodically.

E-mail info@vetinst.com to be kept informed of dates.