An emerging surgical modality, less invasive laparoscopic spays are growing in popularity. More and more owners are looking for lap spays despite the higher cost of the procedure versus a traditional spay.

As for arthroscopy, set-up costs are high. But if you already have a light source and camera for arthroscopy or endoscopy these are usually fine for laparoscopy as well.

In addition you will need scopes, trochars, hand instruments and a ligating device such as the Ligamax 5 clip applier or a power system such as the Gen I I with a suitable handpiece. See Soft Tissue Chapter I I for these.

Alternatively it’s possible to use a good bipolar electro-surgery unit with bipolar grasping and cutting forceps.

Whatever you chose, please call us for help or suggestions.
The first canine laparoscopy was performed over 100 years ago by George Kelling in Dresden. He used a cystoscope and inflated the abdomen with filtered air, and termed the procedure ‘Celioscopy’ (Lhermette and Sorbel, 1998). While advances such as the use of carbon dioxide for insufflation, the rod lens “Hopkins” endoscope design, and glass fiber light transmission all improved the image quality and illumination, laparoscopy did not gain widespread medical acceptance, until after the development of the charged couple device and the first video-assisted laparoscopic cholecystectomy was performed by Mouret in 1987. The fact the operator no longer had to use their eye to look down the endoscope, and could instead use a video camera, led to a rapid and widespread acceptance of laparoscopy, to the stage that it is the recognised standard for many human surgical procedures in developed countries we see today.

While veterinary laparoscopic work was already active before the advent of the video camera and its widespread human acceptance (Harrison and Wildt, 1980), currently endosurgery techniques are still limited to referral centres and a minority of veterinary first-opinion practices in the UK. Laparoscopy is more widespread in first opinion practice in North America, and some European countries, such as Italy. Limited uptake appears mainly due to the initial equipment costs, but also in part to the learning curve needed by the operator. A recent study (Pope et al., 2014) suggests that as many as 80 laparoscopic ovariectomies are needed for a new operator to be judged safe and competent with this relatively simple laparoscopic technique. There is a recent increase in practices taking up laparoscopy in the UK, and this appears to be partly as a method of client retention, in the increasingly competitive veterinary marketplace, aiming to act as an indicator of the quality of services and level of skills offered by a particular veterinary practice.

Minimally invasive surgery (MIS) techniques such as laparoscopy and thoracoscopy hold numerous advantages for veterinary patients such as reduced morbidity, reduced post-operative pain, shorter hospitalisation, reduced risk of wound infections or dehiscence (Freeman, 1998; van Goethem et al., 2006; Culp et al., 2009; Hodgson-Moore and Ragni, 2012; Mayhew et al., 2012), but also have the advantages for the surgeon of providing an illuminated and magnified view, via the endoscope, of areas more difficult to visualise during open surgery, such as the chest, diaphragm, and pelvis.

The economic justification for initiating MIS in practices differs dependent on case load. In a very busy first opinion practice, the time taken to reprocess laparoscopic instruments may negate the increased fees charged for a laparoscopic ovariectomy. The benefit of these procedures may be more in building surgeon experience with MIS, to allow other procedures with a higher cost premium to be undertaken.

Laparoscopic-assisted cryptorchidectomy is an excellent addition to a practices repertoire, being a relatively simple procedure, with clear benefits to the patient, and advantages to the surgeon.

Laparoscopy
Cryopratherapy
Laparoscopic cryptorchidectomy is one of the simplest laparoscopic procedures, with clear benefits to the patient, and advantages to the surgeon.
Laparoscopy and thoracoscopy carry the advantages, not just of smaller less painful incisions and faster post-operative recovery, but also of enhanced visualisation, which combined with the more physiological nature of the surgery, allows the conscientious and careful surgeon to perform safer surgery (Piazi, 2012). For those interested www.veterinarylaparoscopy.com has videos of some common veterinary procedures, and the human MIS website www.who.int/patientsafety (Haynes et al, 2009).

Thoracoscopic pericardiectomy
Thoracoscopic sub-total pericardiectomy. Note the visualisation of the phrenic nerve, which should not be incised.

Thoracic Trocar Sleeve with Rounded Tip
FLEXIPATH Surgical Thoracic Trocar Sleeve with Rounded Tip Obsturator
Features
• Thoracic trocar sleeve.

Flexible - Box of 6
JFPK007 Flexipath Trocar 7mm Diameter 80mm Long
Flexible - Box of 6
JFPK015 Flexipath Trocar 15mm Diameter 80mm Long
Flexible - Box of 6
JFPK020 Flexipath Trocar 20mm Diameter 80mm Long
Flexible - Box of 6
JTT012 Endopath Trocar 10/12mm Diameter 80mm Long Rigid - Box of 6

Ethicon Trocar Pack
JFPK02 Trocar Pack 15mm Obutrator 3 x 15mm Flexible Sleeves

Tung biopsy
Taking a thoracoscopic lung biopsy by means of an extracorporeally tied loop ligature (Meltzer knot). Note the use of soft thoracopors (Ethicon), which don’t risk damage to ribs or the intercostal neurovascular bundle, from leveraging MIS instruments through the metal cannulas commonly used for veterinary laparoscopy.
Laparoscopes for Minimally Invasive Surgery

**Standard Laparoscopes**

Good optics are a pre-requisite for successful laparoscopy. The more you see the easier it becomes. Fritz 'scopes have a patented large image optical system taking in a wide field of vision producing a full screen, very high definition image.

All the laparoscopes are autoclavable and have standard eyepiece and light cable connectors.

**LAPAROSCOPES - STANDARD**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T281-5000</td>
<td>Wide Angle Telescope, 0˚  OD: 5mm, WL: 29cm, Standard Light Cable Connectors, Autoclavable</td>
</tr>
<tr>
<td>T281-5030</td>
<td>Wide Angle Telescope 30˚ OD: 5mm, WL: 29cm, Standard Light Cable Connectors, Autoclavable</td>
</tr>
<tr>
<td>T141-2430</td>
<td>Wide Angle Telescope 30˚ OD: 2.4mm, WL: 14cm, Large Image Technology</td>
</tr>
<tr>
<td>S140-2433</td>
<td>Examination Sheath OD: 3.2mm WL: 12cm, Compatible with T140-2430 and T141-2430</td>
</tr>
<tr>
<td>T181-4030</td>
<td>Wide Angle Telescope 30˚ Large Image Technology OD: 4mm WL: 18cm Autoclavable</td>
</tr>
<tr>
<td>S180-4033</td>
<td>Examination Sheath OD: 5.5mm WL: 17cm compatible to T181-4030 Stopcock inc. Blunt Trochar</td>
</tr>
</tbody>
</table>

**Electrocautery & Suction**

Laparoscopy will require a bipolar electrocautery generator to power the handpieces. The GIMA unit is very effective and reasonably priced. See Chapter 20 page 432.

Adequate suction is also a pre-requisite for Laparoscopy. Our new Hospivac unit with 2 x 2litre bottle capacity and foot control is a high capacity suction unit for many hospital procedures. See Chapter 20 page 430.

**ELECTROSURGERY & SUCTION**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>HF12</td>
<td>GIMA 122 Bipolar Electrosurgery Kit</td>
</tr>
<tr>
<td>185H350</td>
<td>Hospivac 350 Suction Unit*</td>
</tr>
<tr>
<td>BP2-533-10</td>
<td>Bipolar Grasping Forceps with std. handle 5mm, WL: 34cm, jaws: 13 4.5mm with hook totally dismantable</td>
</tr>
<tr>
<td>BP-05-321</td>
<td>Bipolar Grasping &amp; Cutting Forceps 5mm, WL: 320mm, disposable, Universal Connector</td>
</tr>
<tr>
<td>X-300-26</td>
<td>Silicon Tube, ID: 5mm, 3m, LLM both ends</td>
</tr>
<tr>
<td>BP-05-321</td>
<td>Bipolar Grasping &amp; Cutting Forceps 5mm, WL: 320mm, disposable, Universal Connector</td>
</tr>
<tr>
<td>BP-500-11</td>
<td>Bipolar Cable, 5m, comp.to Martin Unit to Martin/ Berchtold Instrument</td>
</tr>
</tbody>
</table>

**Laparoscopy Start Up Kit - Scope & Hand Instruments**

Instrument choice is determined by personal choice and patient selection. However, a starter kit is a useful starting point and offers a discounted approach to setting up.

The Laparoscopy kit described is discounted by 10% compared to buying the individual components.

In addition to laparoscopic hand instrumentation a suitable camera, light source, CO₂ insufflator and electrocautery generator will be required. Several options, including pre-owned units, are available please telephone or e-mail to discuss options.

**Code** | **Description**
---|---
T281-5030 | Wide Angle Telescope, 30˚ OD: 5mm, WL: 29cm, Standard Light Cable Connectors, Autoclavable
DE4680-52 | Sterilizing & Storing Tray, 460 x 80 x 52mm Perforated Stainless Steel with Silicon Bars
230-212V | Cannula only with Magnetic Valve ID: 10mm, WL: 7cm, Inflation Stopcock, 55g
230-213V | Cannula only with Magnetic Valve ID: 10 mm WL: 7cm, 45g
230-137V | Safety Trochar only compatible to Cannulas with ID: 10mm, WL: 7cm, fully dismantable, Cork Screw Handle
231-213V | Cannula only, Magnetic Valve ID: 5.5mm, WL: 7cm, Inflation Stopcock
231-212V | Cannula only, Magnetic Valve ID: 5.5mm, WL: 7cm, 30g
231-137V | Safety Trochar only compatible to Cannulas ID: 5.5mm, WL: 7cm, fully dismantable, Cork Screw Handle
230-505 | Reducer Adapter for Trocar Cannulas with ID: 10 to 5.5mm
L-19-120 | Veress Needle, D: 2mm, 12cm, LLI(f)
531.23H11V | Atraumatic Grasper, curved, 5mm 33cm insulated, rotatable, dismantable, inside ratchet, HF Connector
531.02H05V | Mini - Metzenbaum Scissors 5mm 33cm insulated, rotatable, dismantable
531.40H11V | Dissecting Forceps, (Maryland) 5mm, 31cm, insulated, dismantable, Silicon Handle, inside ratchet
X-300-26 | Silicon Tube, ID: 5mm, 3m, LLM both ends
BP-05-321 | Bipolar Grasping & Cutting Forceps 5mm, WL: 320mm, disposable, Universal Connector
BP2-533-10 | Bipolar Grasping Forceps with std. handle 5mm, WL: 34cm, jaws: 13 4.5mm with hook totally dismantable
BP-500-11 | Bipolar Cable, 5m, comp.to Martin Unit to Martin/ Berchtold Instrument

**Laparoscopy Starter Kit**

**LAPROKIT** Laparoscopy Starter Kit
Trochar Cannulas are designed with different types of valves to reduce or to avoid CO₂ loss when changing instruments and telescope during laparoscopy and thoracoscopy. Our reusable and patented magnetic valve trocar system has several advantages compared to other valve types. They are lightweight and because of the valve construction, the insertion of instruments and scopes will pass smoothly through without scratching or touching the front lens like in a so called automatic valve system. In addition there is nearly no gas loss even when changing instruments. There are no mechanical parts to clean inside except the magnetic flap itself which is a great help to your staff.

**5.5MM INNER DIAMETER CANNULAE FOR 5MM 'SCOPES**

- **231-213V** Cannula only, Magnetic Valve, ID: 5.5mm, WL: 7cm, Inflation Stopcock
- **231-212V** Cannula only, Magnetic Valve, ID: 5.5mm, WL: 7cm, 30g
- **231-137V** Safety Trochar only, comp. to cannulas ID: 5.5mm, WL: 7cm, fully dismantable
- **231-105V** Trochar only, with Sharp Tip compatible to ID: 5.5mm, WL: 7cm

**10MM INNER DIAMETER TROCHARS & CANNULAE FOR 10MM 'SCOPES**

- **230-212V** Cannula only, Magnetic Valve, ID: 10mm, WL: 7cm, Inflation Stopcock, 55g
- **230-213V** Cannula only, Magnetic Valve, ID: 10mm, WL: 7cm, 45g
- **230-137V** Safety Trochar only, compatible to Cannulas with ID: 10mm, WL: 7cm, fully dismantable, cork screw handles
- **230-105V** Trochar only with Pyramidal Tip forTrochars Cannulas ID: 10mm, WL: 7cm

**ACCESSORIES**

- **230-505** Reducer Adapter for Trochar Cannulas with ID: 10 to 5.5mm
- **231-211** Sealing Caps, for Trochar Cannula 5.5mm 10 pcs
- **230-211** Sealing Caps for Trochars and Reducer Adapters
- **231-215** Magnetic Valve Flap 5.5mm, 2 pcs.
- **230-215** Magnetic Valve Flap 8/10mm, 2 pcs.

5mm diameter, 330mm long protected interchangeable needle with outer tube. Consists of:

- L-33 Inside tube Luer lock Connector
- L-33-2 Outside Tube/Probe
- L-210 Needle 1x26mm

**PALPATION PROBE & PUNCTURE CANNULA**

- **L-33-210** Palpation Probe/ Cannula
- **L-210** Injection Cannula 1x26mm compatible to L-33/47
- **L-218** Injection Cannula 1.9x26mm compatible to L-33/47
- **L-218R** Injection Cannula 2x28mm Blunt compatible to L-33/47
Hand Instruments

Fritz hand instruments have a modular construction. The handles, the connecting tubes and the working jaw tips are interchangeable. Easily stripped down for cleaning, compatible to 5mm and 10mm trochar cannulas. All handles have a High Frequency connector.

Handles

Tubular sheaths

5mm or 10mm diameter options. Different working lengths which may be rotated through 360 degrees. Insulated or stainless steel.

5mm Instruments Complete

Scissors

Mini-Metzenbaum Scissors 531.02H05V

Hook Scissors 531.04H05V

Biopsy Forceps

Biopsy Forceps 531.60H01V

Biopsy Forceps 531.61H01V

BIOPSY FORCEPS

531.40H11V Dissecting Forceps, 5mm, 31cm, insulated, dismantleable, rotatable, consisting of: jaws insert (53 M 40), sheath (53 R 1) handle (H 01) colour code: black

531.23H11V Atraumatic Grasper, curved 5mm, 33cm insulated, rotatable, dismantleable, inside ratchet, consisting of: jaws insert (53 M 23), sheath (53 R 1) handle (H 11, HF-connector), colour code: black

531.22H21V Grasping Forceps, universal use, 5mm, 33cm, insulated, dismantleable, rotatable, outside ratchet, consisting of: jaws insert (53 M 22), sheath (53 R 1) handle (H 21, HF-connector), colour code: black

531.27H11V Babcock Grasping Forceps, 5mm, 33cm, insulated, dismantleable, rotatable, inside ratchet, consisting of: jaws insert (53 M 27), sheath (53 R 1) handle (H 11, HF-connector), colour code: black

531.23H11V Babcock Grasping Forceps, universal use, 5mm, 33cm, insulated, dismantleable, rotatable, outside ratchet, consisting of: jaws insert (53 M 23), sheath (53 R 1) handle (H 11, HF-connector), colour code: black

Biopsy Forceps 531.60H01V Biopsy Forceps

Biopsy Forceps 531.61H01V Biopsy Forceps - Double Action Jaw

Laparoscope Instrument Cleaning Kit

Laparoscope Instrument Cleaning Kit consists of:
- 3 x General Brush Nylon Bristles
- 3 x Laparoscopic Trumpet Valve Brush
- 3 x Nylon Twisted Wire Brush 3mm diameter
- 3 x Nylon Twisted Wire Brush 5mm diameter
- 3 x Nylon Twisted Wire Brush 10mm diameter

LAPAROSCOPE INSTRUMENT CLEANING KIT

LAPROCLEAN Laparoscope Instrument Cleaning Kit