Care & Handling of Laparoscopic Instruments
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Course Objectives

✓ Describe instruments used in laparoscopic procedures.
✓ Identify most common laparoscopic surgical procedures.
✓ Discuss patient safety including infection prevention and best demonstrated practices.
✓ Review cleaning processes.
✓ Examine insulation testing and its dynamic role in patient safety.
✓ Describe laparoscopic instruments inspection process.
One of the most influential developments of the 20th century was \textit{minimally invasive surgery}.

\textit{Minimally invasive} surgical techniques allow surgeons to examine and operate on internal organs through small incisions, puncture holes, or natural body openings rather than by dissection.
Endoscopy: An illuminated usually fiber-optic flexible or rigid tubular instrument for visualizing the interior of a hollow organ or part (as the bladder or esophagus) for diagnostic or therapeutic purposes that typically has one or more channels to enable passage of instruments (as forceps or scissors).

Examples: bronchoscopy, cystoscopy.

Laparoscopy: 1: visual examination of the inside of the abdomen by means of a laparoscope—called also peritoneoscopy
2: an operation (as tubal ligation or gallbladder removal) involving laparoscopy.

Examples: laparoscopic appendectomy, LAVH.

Ref. 3 and 4
Laparoscopic Cholecystectomy
Gallstones are a relatively common condition that causes severe pain in the abdomen.

Sometimes even though there are no gallstones, the gallbladder does not function normally and could cause similar symptoms as gallstones.

In these cases, a surgeon may choose to remove the gallbladder.
Care and Handling of Laparoscopic Instruments

Common Laparoscopic Procedures

Laparoscopic Appendectomy
If the appendix becomes infected it must be surgically removed before it ruptures and spreads infection to the entire abdominal space.

In the laparoscopic appendectomy, several small incisions are made in the abdomen. In one incision a laparoscope is inserted. Small instruments are inserted in the other incisions and used to remove the appendix.
LAVH
LAVH is the “in-house” term for Laparoscopic Assisted Vaginal Hysterectomy.

A hysterectomy is the surgical removal of the uterus (and sometimes additional reproductive organs). It is performed to remove uterine fibroids, treat endometriosis, remove cancer and many other conditions.

A version of LAVH can also be done with robotic assistance.
Common Laparoscopic Procedures

Pelviscopy
Pelvic laparoscopy (or pelviscopy) is surgery to examine pelvic organs using a laparoscope. A pelviscopy can be used to:

- Get tissue samples (biopsy).
- Look around and diagnose the cause of any symptoms.
- Remove scar tissue or other abnormal tissue, such as from endometriosis.
- Repair or remove part or all of the ovaries or fallopian tubes.
- Repair or remove parts of the uterus.
- Do other surgical procedures (such as appendectomy, removing lymph nodes).
Care and Handling of Laparoscopic Instruments

Common Laparoscopic Procedures

If you want to learn more about the specifics of various laparoscopic procedures, visit these websites:

www.orlive.com

www.websurg.com
Advantages of Laparoscopic Procedures

- Smaller incisions
  *Less likely to suffer wound-related complications.*

- Less post-operative pain

- Decreased hospital stay
  *Some laparoscopic procedures are performed on an outpatient basis.*

- Accelerated recovery and improved outcome
Instruments Used in Laparoscopic Procedures

- Trocars and cannula
- Insufflators & Veress needle
- Light source & light cord
- General lap. instrumentation
- Laparoscope

(scopes are discussed in a separate presentation)
Trocar & Cannula

Trocars and cannula are instruments used to access the surgical site through small incision or puncture holes (an access port). They are made in both reusable and disposable varieties.

Stainless Reusable Trocar System

Yello-Port Reusable Trocar System
The insufflator is a device that enables visualization of the internal surgical area by creation of a pneumoperitoneum. This is accomplished through pumping carbon dioxide gas into the abdomen under pressure through the Veress needle.
Laparoscopic Instrument Types

There are dozens of different types of laparoscopic instruments.

We will examine a few of the main families of laparoscopic instruments.
Laparoscopic Instrument Types

Atraumatic Graspers

Traumatic Graspers

Dissectors

Retractors

Needle Holders
Laparoscopic Instrument Types

- Biopsy Cups
- Universal Handles
- Scissors
- Cautery Instruments & Cords
Types of Rigid Scopes

Hysteroscope, Offset

Used in minimally invasive gynecological procedures such as Laparoscopic Hysterectomies.
Types of Rigid Scopes

Laparoscope, 10mm

An endoscope used to examine and visualize the peritoneal cavity in minimally invasive procedures such as:

- Laparoscopic Cholecystectomy
- Laparoscopic Banding
- Laparoscopic Nissen Fundoplication
Types of Rigid Scopes

Laparoscopes come in a variety of lengths diameters. The distal tip, which contains the objective lens, can be angled at varying degrees from 0 to 45 and so on.

- 0 degree, 10mm
- 30 degree, 10mm
- 30 degree
- 45 degree

The angle of the objective lens determines the surgeons view of the internal surgical site, whether that be inter-abdominal, urethral etc.
Identifying Parts and Components

Rigid Scopes: External

- Insertion tube
- Light Post assembly
- Eye Piece Assembly
- Eye piece Window
- Objective lens
- Eye Piece Cap
Parts and Components

Eye piece internal assembly

- Eye piece Window
- Focus Lens
Parts and Components

Internal Components

The glass light fibers are angled to correctly match the objective for the proper illumination of the field of view as in this schematic of a 30 degree lens.

A typical scope has 6-10 rod lenses
Healthcare staff who are responsible for processing laparoscopes and associated items can have a major impact on the risk for surgical site infections (SSI) during laparoscopic procedures.

Over 90% of infection outbreaks related to laparoscopic instruments can be prevented if processing of instruments and equipment is properly conducted.
Decontamination: Care & Handling

AORN recommends that individuals handling laparoscopic instruments should be competent in their care and handling.

Instruments with lumens are among the most difficult to decontaminate effectively.

Always wear personal protective equipment and follow standard precautions.
There are various styles of instrumentation. It is vital that you know which instruments can be dis-assembled for cleaning. If you don’t know, ask!

3rd Generation:
Can be completely dis-assembled for proper cleaning.

2nd Generation:
With flushport only.

1st Generation:
No dis-assembly. Very difficult to clean.
Care and Handling of Laparoscopic Instruments

Assembly: Care & Handling

It is important to remember that surgical instruments are complex and fragile. Personnel who are responsible for instrument care should:

• Be cautious when handling instruments.
• Use all instruments, tools, and equipment for their intended purpose only.
• Follow processing protocols carefully.
Care and Handling of Laparoscopic Instruments

**Inspection: Care & Handling**

- **Check for scissor functionality, smooth open and closing of jaws.**
- **Check alignment of tips when closed.**
- **Check for scissor functionality, smooth open and closing of jaws.**
- **Check jaw alignment, of all double action dissectors and forceps to ensure they open and close symmetrically.**
- **Check tips of cautery instruments for cleanliness and defects.**
- **Check alignment of tips when closed.**

Forceps with ratchets must securely lock in place and release as designed.
Laparoscopic instruments should be inspected after use, ALL instruments in set!

Evaluate equipment’s integrity, function, and cleanliness.

All insulated laparoscopic instruments should be tested with a current tester *every time* the set is assembled!

Damaged instruments should removed from service.
Equipment failures can compromise patient safety in several ways. Prior to use, all laparoscopic instruments must be tested.

- Compromised insulation can cause internal patient burns. *A video example is shown on the next slide.*
- Surgeon and scrub tech can be burned by broken insulation in instruments.
- Cracked insulation can allow bioburden to become trapped and instrument sterility is compromised.
Care and Handling of Laparoscopic Instruments

Inspection: Care & Handling

This video demonstrates the escaping energy from damaged insulation on a laparoscopic instrument, causing unintended burns.

With proper laparoscopic instrument testing each time the instrument is reprocessed, these burns can be avoided.

*The video continuously loops while this slide is shown.*
Inspection: Additional Inspection Points

Check all mono and bi-polar cords for signs of damage such as cracks and tears.

Visually inspect insulation on instruments for signs of cracking and chipping.

Check all cautery posts for damage.
# Spaulding Classification System

<table>
<thead>
<tr>
<th>Classification</th>
<th>Definition</th>
<th>Examples</th>
<th>Processing Type</th>
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| Critical        | Item contacts sterile tissue or is introduced into the bloodstream. | * Surgical instruments  
                 |                                               | * Implants              |
|                 |                                               | * Rigid Laparoscopes                         | * Cardiac and urinary catheters | Sterilization         |
| Semi-critical   | Item contacts intact mucous membranes.          | * Bronchoscopes                               |                         |
|                 |                                               | * Gastrointestinal endoscopes                 | * Anesthesia equipment  |
|                 |                                               | * Cystoscopes                                 | * Cystoscopes            | High-level disinfection|
| Non-critical    | Item contacts intact skin.                     | * Blood pressure cuffs                        |                         |
|                 |                                               | * Tourniquets                                 | * Utensils such as basins |
|                 |                                               |                                               | * Equipment and furnishings | Low-level disinfection|

Ref. 11
What gas is commonly used to inflate the abdominal cavity for a laparoscopic procedure?

A: Oxygen  B: Carbon Dioxide  C: Carbon Monoxide  D: Nitrous Oxide
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What is the medical term for making internal organs easier to visualize by inserting gas into the abdominal cavity?

A: Pneumoperitoneum  
B: Pneumothorax  
C: Pneumonisis  
D: Indigestion
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- B: Trocar & Candlestick
- C: Trocar & Cannula
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B: Decreased Hospital Stay
C: Less Pain
D: All of the above
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What part of the laparoscopic instrument inspection process contributes the most to patient safety?

A: Assuring it’s lubricated
B: Checking for faulty insulation
C: Handle feels comfortable
D: Tip protectors are secured
What is part of the laparoscopic instrument inspection process that contributes the most to patient safety?

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LAVH is an abbreviation for a surgical procedure. What does the abbreviation stand for?

A: Look Around Very Hard
B: Lap Assisted Vaginal Hysterectomy
C: Lap Assisted Vaginal Hysteroscopy
D: Laparotomy And Vaginal Hysterectomy
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Which instrument pictured above is a surgical electrocauterizing device?

- A: Photo 1
- B: Photo 2
- C: Photo 3
- D: Photo 4
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References


Congratulations!

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