



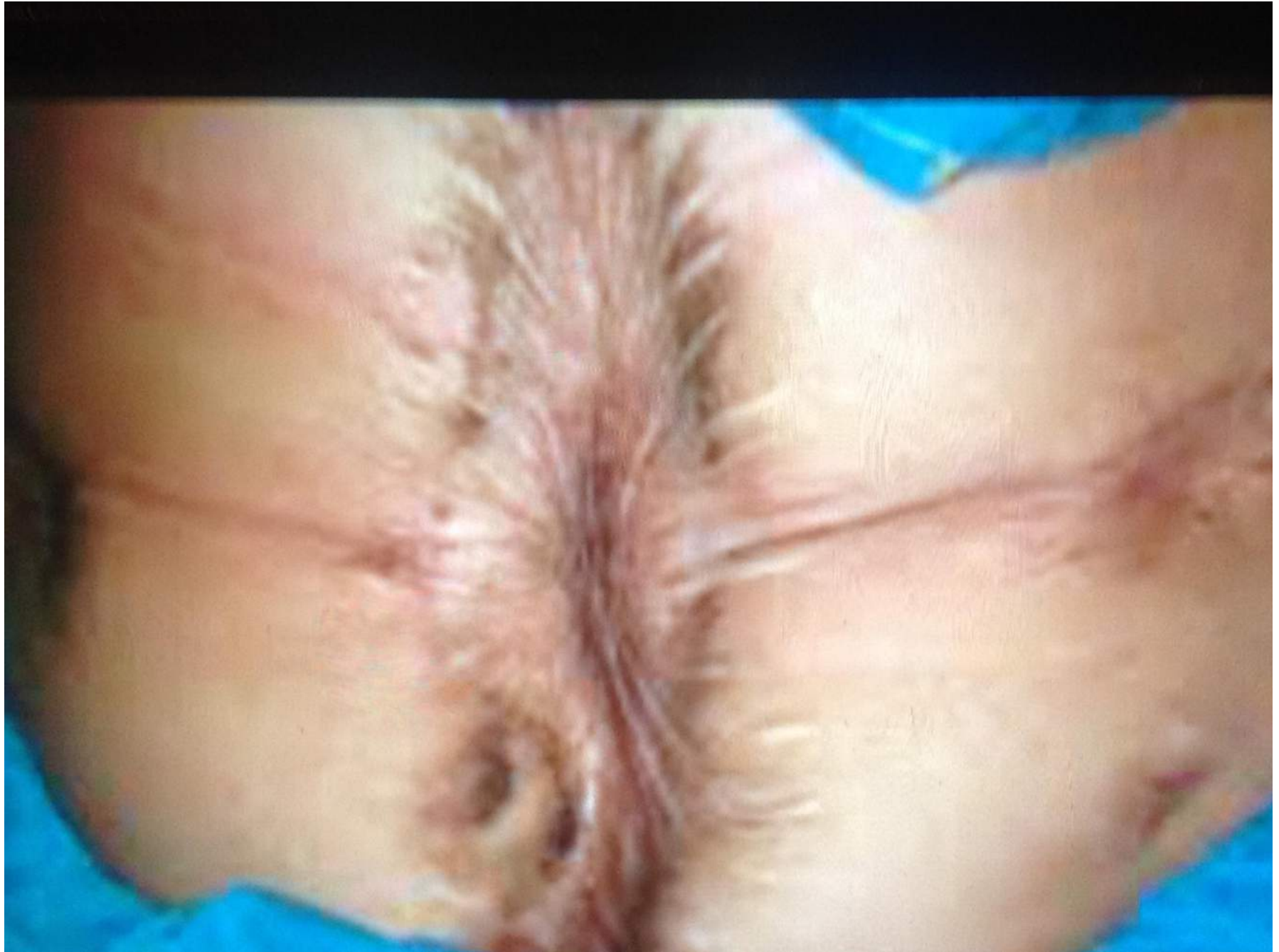
OPERATION

MEDICAL









https://youtu.be/jZG3DYeHA_M?t=4

BERTRAM BERNHEIM

- 1911 : First laparoscopy at Johns Hopkins
- 12mm proctoscope into epigastric incision on one of Halstead's patients to stage pancreatic cancer
- Bernheim called his procedure 'organoscopy'
- Findings confirmed on laparotomy



HISTORY OF LAPAROSCOPY

- 1920: Zollikofer discovered the benefit of CO₂ gas for insufflation
- 1938: Janos Veress developed a spring loaded needle for the induction of pneumoperitoneum.
- After World War II, the development of fiberoptics represented an important step forward for endoscopy
- 1966: Hopkins rod lens scope & cold light
- 1974: Dr Harrith M Hasson, MD working in Chicago, proposed a blunt mini-laparotomy which permitted direct visualization of the trocar entrance into the peritoneal cavity. It is popularly known today as Hasson's technique.

PRINCIPLE DIFFERENCES BETWEEN LAPAROSCOPIC AND OPEN SURGERY

FOR THE PATIENT

- Post operative pain related to size of incision- smaller incisions =less pain.
- Less Handling of intestines results in little or no disturbance of normal function.
- Avoidance of the trauma of abdominal wall injury by the incision allows rapid return to normal activity
- No incision allows early return to more strenuous activities: driving, lifting, sport etc.

INSTRUMENTS

- ▣ Redesign of instruments for laparoscopic use.
- ▣ Instruments for open surgery in general 6 – 10” in length built around a box joint.
- ▣ Laparoscopic instruments in general 15 – 18” in length with an articulated connecting rod between handles and scissor blades, jaws etc.

EQUIPMENT NECESSARY FOR MAS

Camera

Light Source

Insufflator

TV Monitor

Telescopes

Light Guide Cable

Apart from the insufflator the system will work better if all the components are from the same company as one piece talks to another

CAMERA

- ▣ These can be single chip or 3 chip(red,green,blue).
- ▣ CHIP: this is also called a charged coupled device in short, CCD.
- ▣ These are flat silicone wafers with a matrix, a grid of minute image sensors called pixels.
- ▣ White balance and sometimes black balance



INSUFFLATOR

- CO₂ is used because this has the same refractive index as air, so doesn't distort the image and is non combustible.
- Intraabdominal pressure run between 10 and 13 mmhg.
- Use disposable filter and tubing for each patient.
- High flow insufflators (35 litres) output determined by size of outlet.
- Ensure you know how to change a cylinder and were they are stored.



TV MONITORS

- Usually a 20" screen.
- HD is better.
- You can use a standard TV but it must be run through an isolated transformer.
- Horizontal resolution is the number of vertical lines.
- Vertical resolution is the number of horizontal lines
- More lines of resolution, better detail of picture.



INSTRUMENTATION

- Single use
- Reusable
- Need an ultrasonic washer to effectively clean them, not for telescopes.
- Don't put 5mm cannulated instruments into a bench top autoclave that does not have a vacuum: vacuum is required to remove all air from lumen of instrument.
- Ports 5 and 10mm are the most common, make sure the right trocar is in port and is it sharp.

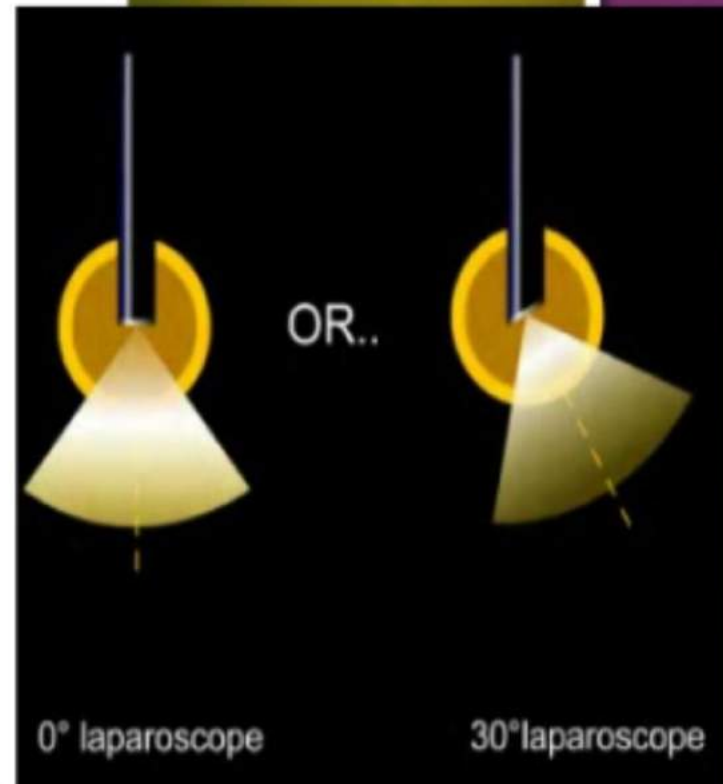
TROCAR

- The trocar has a blade with a shaft and body.
 - The body includes a pointed tip which makes the initial incision in the abdominal wall of the patient.
- (Trocar diameters range from 2mm-30 mm)



TELESCOPE

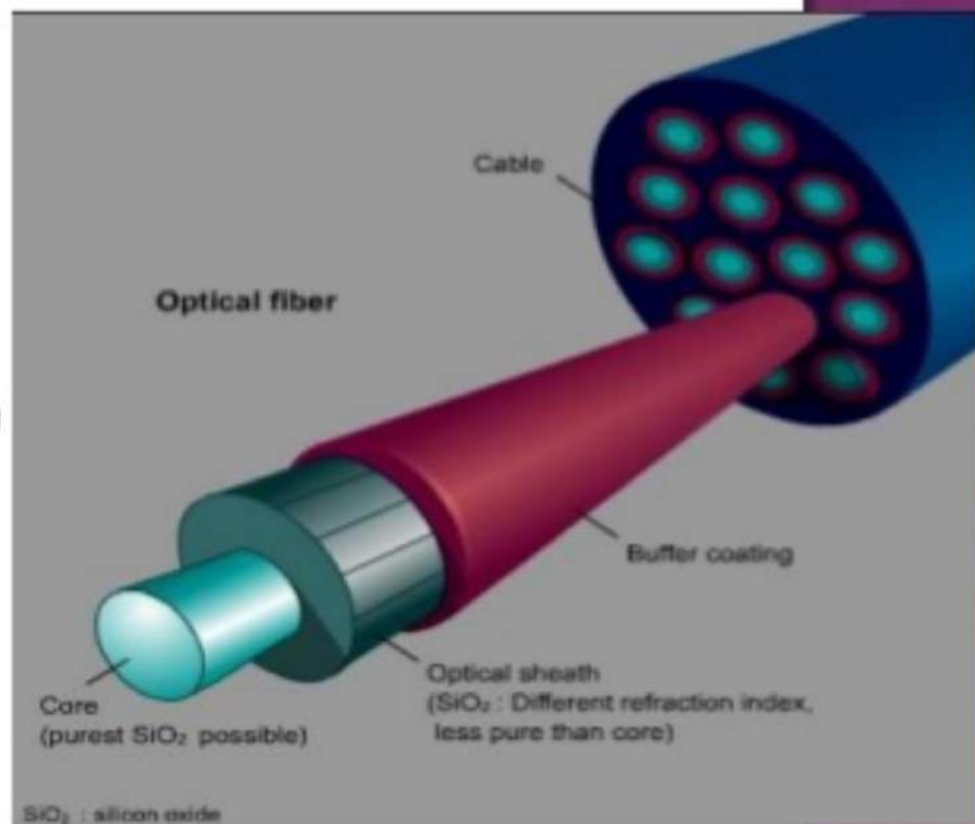
- There are three important structural differences in telescope available
 1. 6 to 18 rod lens system telescopes are available
 2. 0 to 120 degree telescopes are available
 3. 1.5 mm to 15 mm of telescopes are available



OPTIC CABLES



- These cables are made up of a bundle of optical fibers glass thread swaged at both ends.
- The fiber size used is usually between 10 to 25 mm in diameter.
- They have a very high quality of optical transmission, but are fragile.



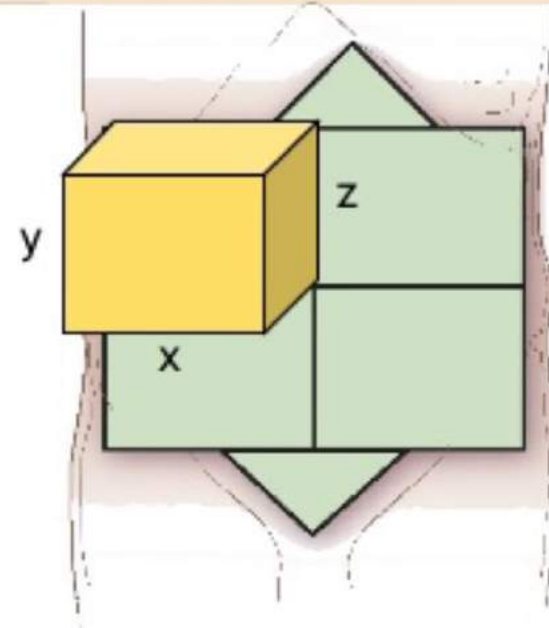
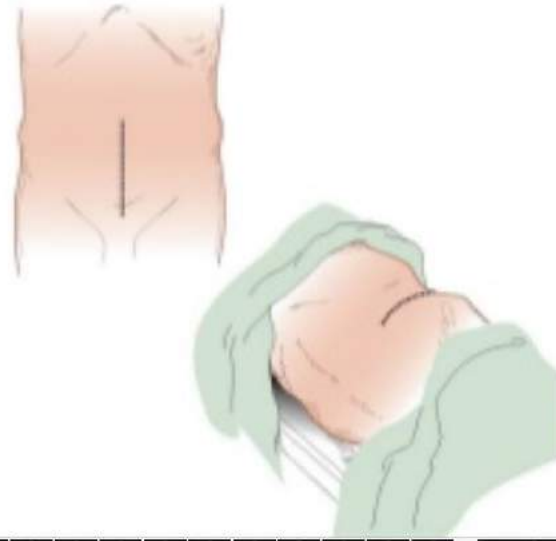
DISSECTING & GRASPING FORCEPS

- Atraumatic
- KELLY atraumatic
- Atraumatic, with hollow jaws
- MANGESHKAR Grasping Forceps, serrated



TROCAR PLACEMENT BY QUADRANT

Each quadrant must be addressed from frontal as well as lateral positions.





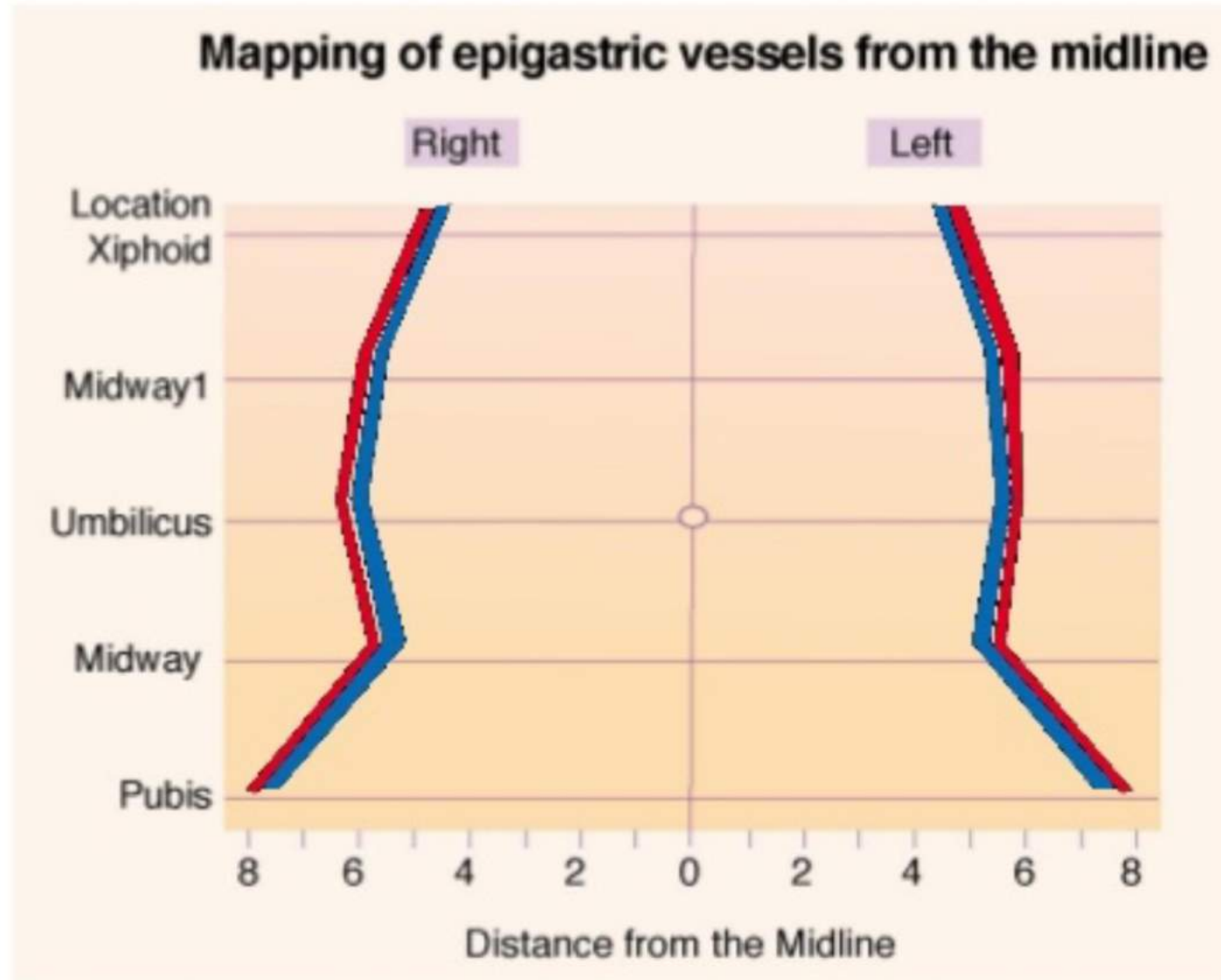
CORRECT TROCAR PLACEMENT SHOULD PROVIDE DIRECT ACCESS TO THE TARGET ORGANS, AN OPTIMAL VIEW OF THE OPERATIVE FIELD AND MINIMIZE MENTAL AND MUSCULAR FATIGUE.

NO OBSTACLE BETWEEN TROCAR ENTRY AND TARGET



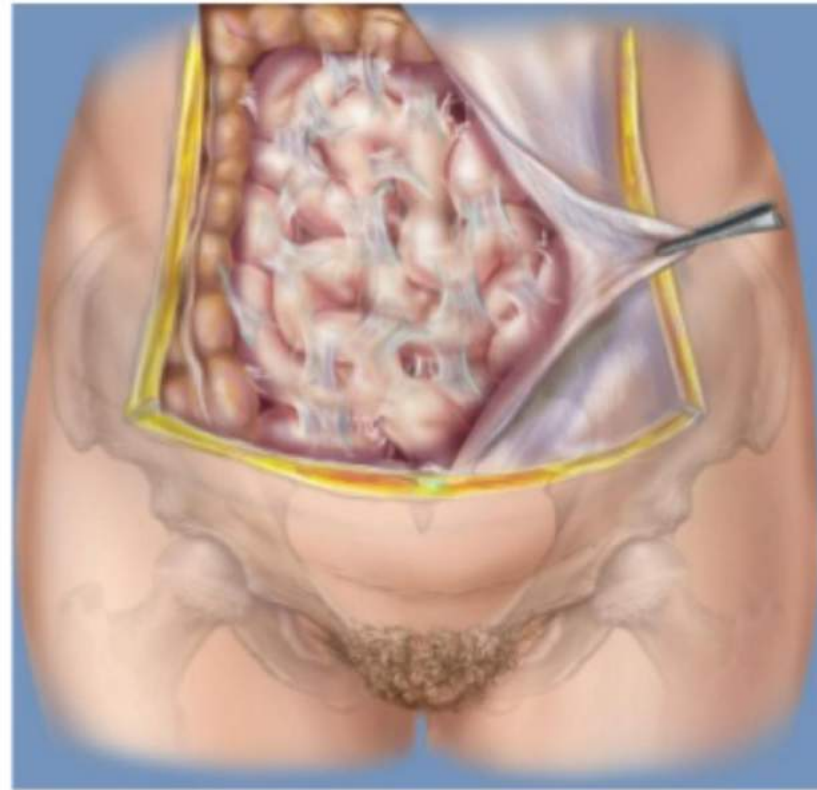
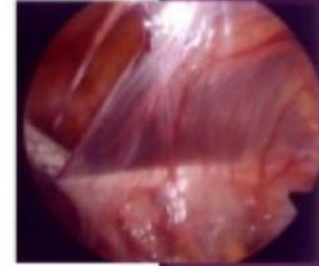
To avoid
iatrogenic
injuries.

AVOID THE EPIGASTRIC VESSELS

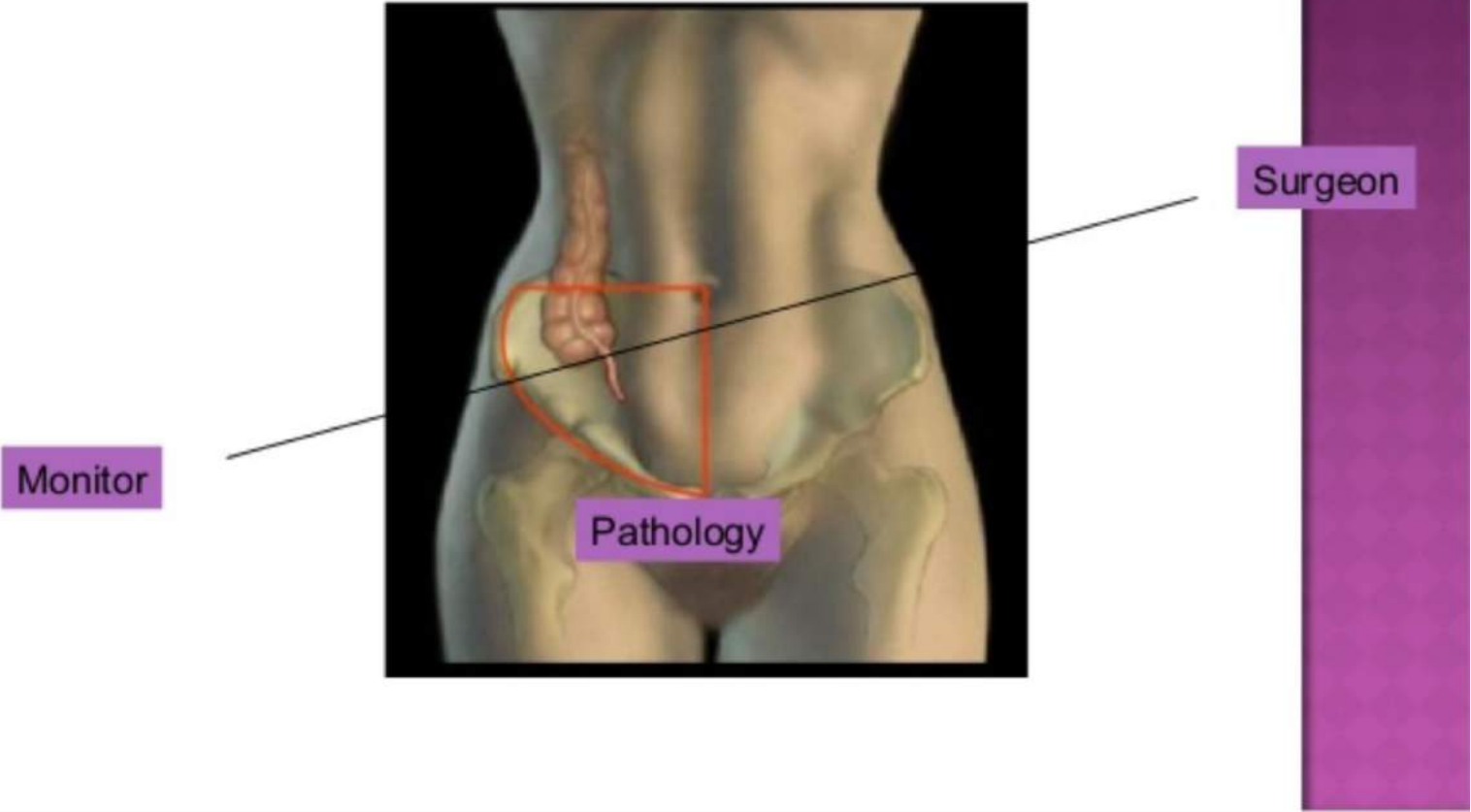


Saber et al. Safety zones for anterior abdominal wall entry during laparoscopy. Ann

AVOID AREAS OF PRIOR SURGERY



STRAIGHT LINE PRINCIPLE



MANIPULATION ANGLE

Azimuth Angle;
Angle b/n scope and working hands

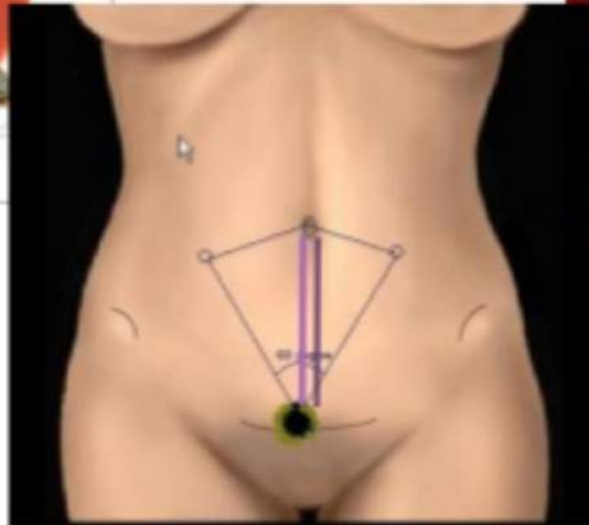


30-45 degree

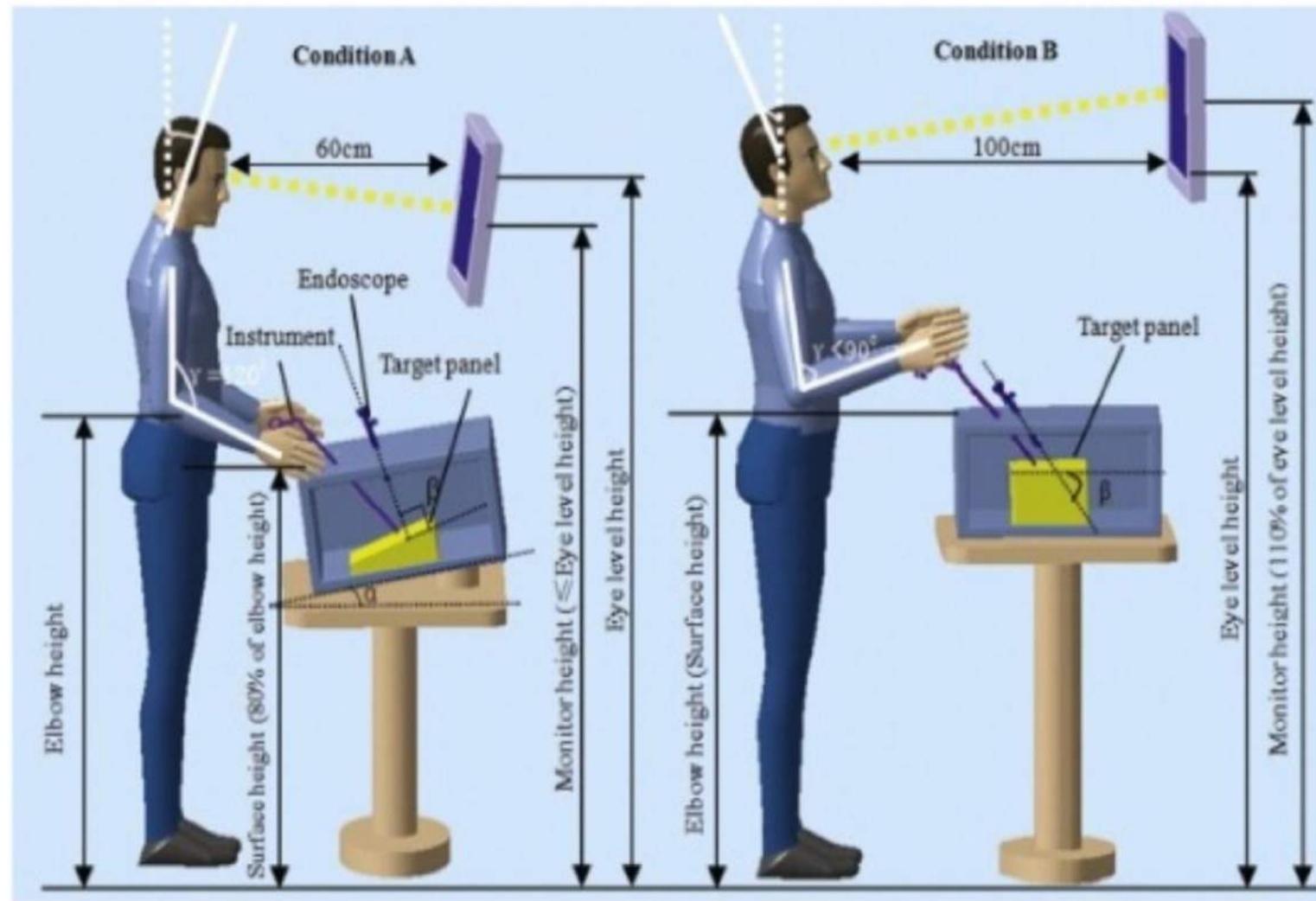
Manipulation Angle;
angle b/n working hands



60-90 degree



SURGEON'S STANCE



Ideal relaxed stature

Tiring

WHAT OPERATIONS CAN WE DO LAPAROSCOPICALLY

DIAGNOSIS

Gallstone

Appendicitis

Hernia

Adhesions

Perforated ulcer

Hiatus Hernia

OPERATION

Cholecystectomy

Appendicectomy

Hernia repair

Division of adhesions

Closure of
perforation

Hiatus hernia repair.

WHAT OPERATIONS CAN WE DO LAPAROSCOPICALLY

DIAGNOSIS

Colorectal
carcinoma

Caecal carcinoma

Colonic carcinoma

Gastric carcinoma

Oesophageal
carcinoma

OPERATION

Anterior resection/ APR

Right Hemicolectomy

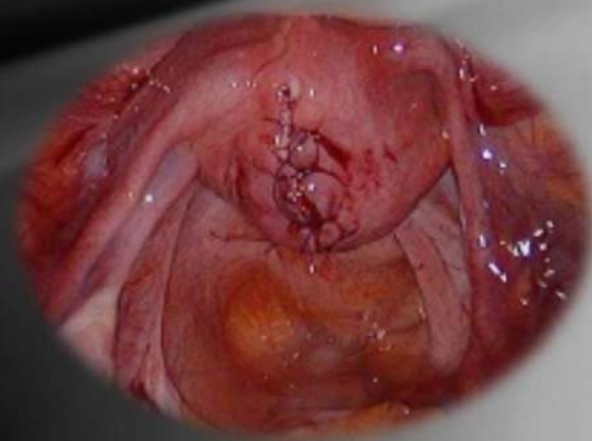
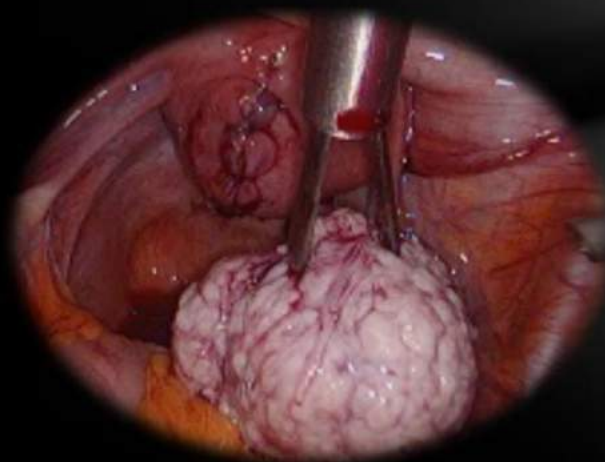
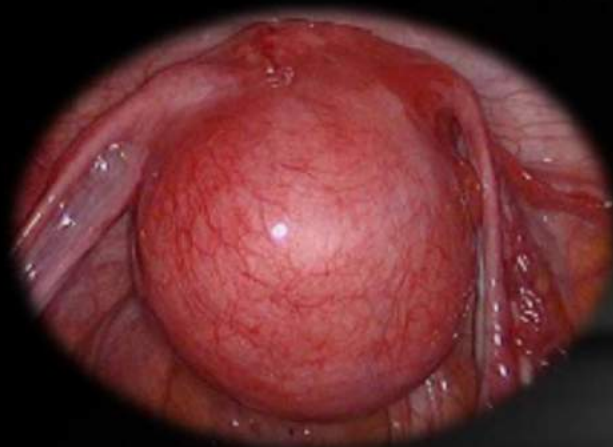
Left/Sigmoid Colectomy

Gastrectomy

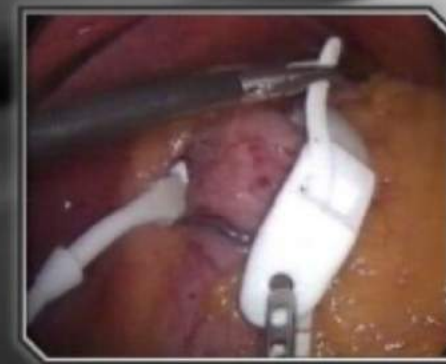
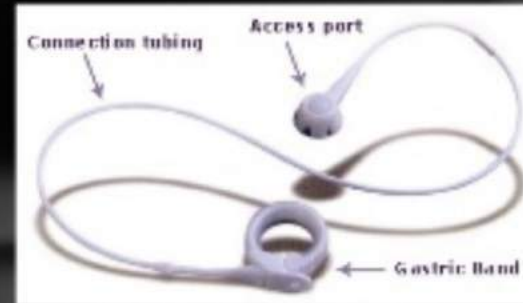
Oesophagogastrectomy

Uterine Surgery

Myomectomy by Minimal Access Surgery



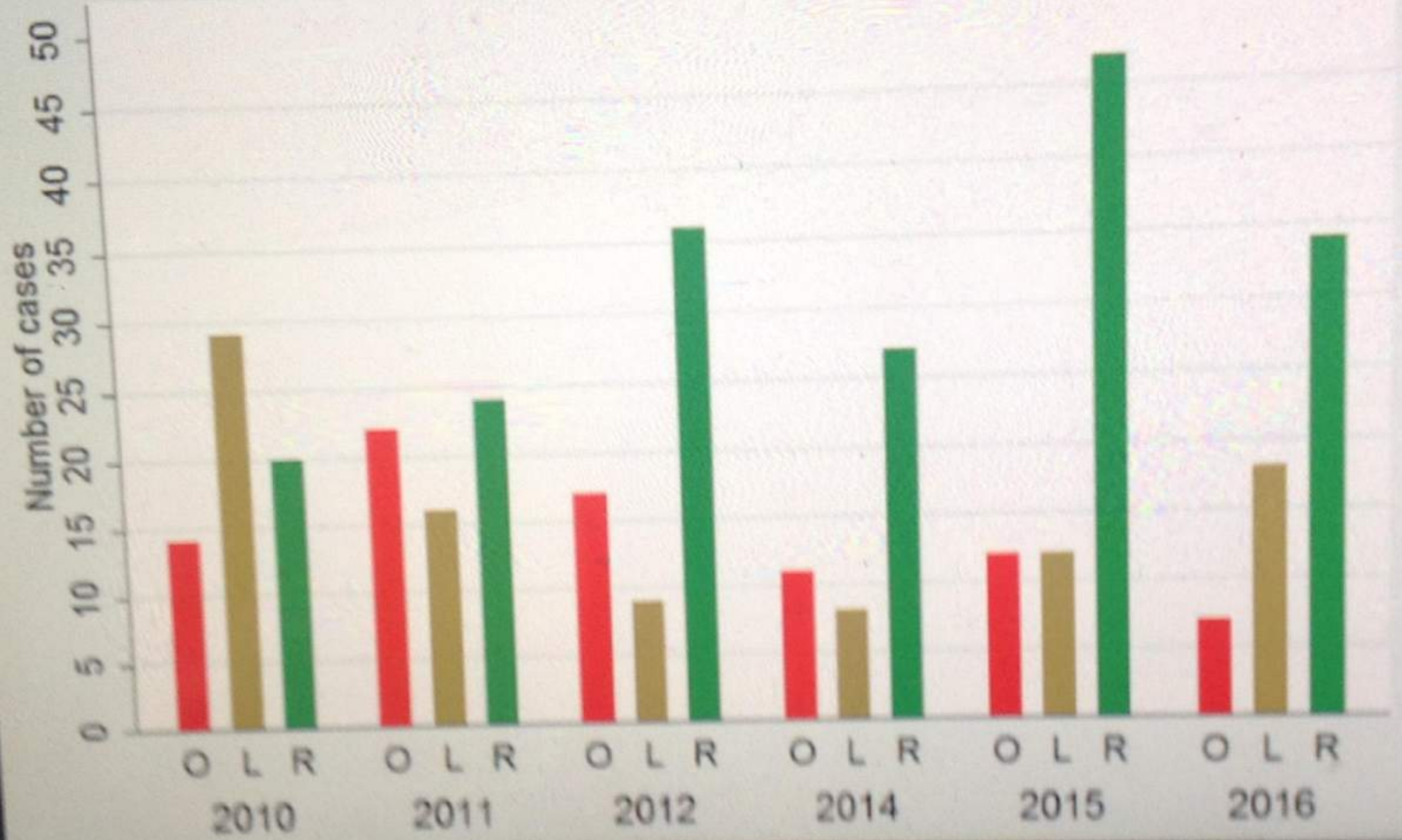
Obesity Surgery



Gastric Banding



Sum of cases by year and surgical approach
O= Open, L= Laparoscopic, R= Robotic



COMPLICATIONS OF LAPAROSCOPIC SURGERIES

- 1. Anaesthetics Complications**
- 2. Complications due to pneumoperitonium**
- 3. Surgical complications**
- 4. Diathermy related injuries**
- 5. Patients factors related complications**
- 6. Post operative complications**

COMPLICATIONS

- Insertion related
 - Major vascular injury (0.25%)
 - GI injury (0.14%)
 - Bladder injury
 - CO₂ embolism
 - Abdominal wall haemorrhage

PNEUMOPERITONEAL RELATIVE COMPLICATIONS

CO₂ embolism

Hypercarbia

Respiratory acidosis

Subcutaneous emphysema

Renal failure

Venous thrombosis

CONTRAININDICATION

- Absolute
 - Uncorrectable coagulopathy
 - Frozen abdomen
 - Intestinal obstruction with massive abdominal distension
 - Haemorrhagic shock
 - Severe cardiac dysfunction (class IV)
 - Concomitant disease requiring laprotomy



WHAT ROBOTICS AIMED TO IMPROVE IN LAPAROSCOPY

- Surgeon operates from a 2D image
- Straight, rigid instruments (limited range of motion)
- Instrument tips controlled at a distance
- Reduced dexterity, precision & control
- Unsteady camera controlled by assistant
- Dependent on assistant for surgical support through accessory port
- Greater surgeon fatigue
- Makes complex operations more difficult



WHAT IS THE DA VINCI® SURGICAL SYSTEM?

- State-of-the-art robotic technology
- Surgeon in control
- Assistant has direct access



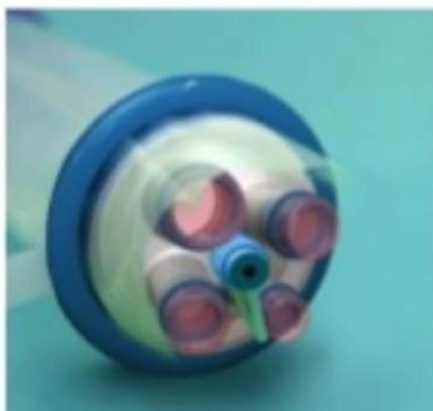
DISADVANTAGES OF *DA VINCI*® ROBOT

- Expensive
 - \$1.4 million cost for machine
 - \$120,000 annual maintenance contract
 - Disposable instruments \$2000/case

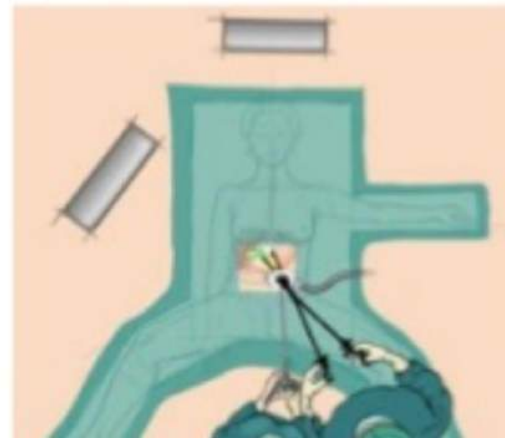
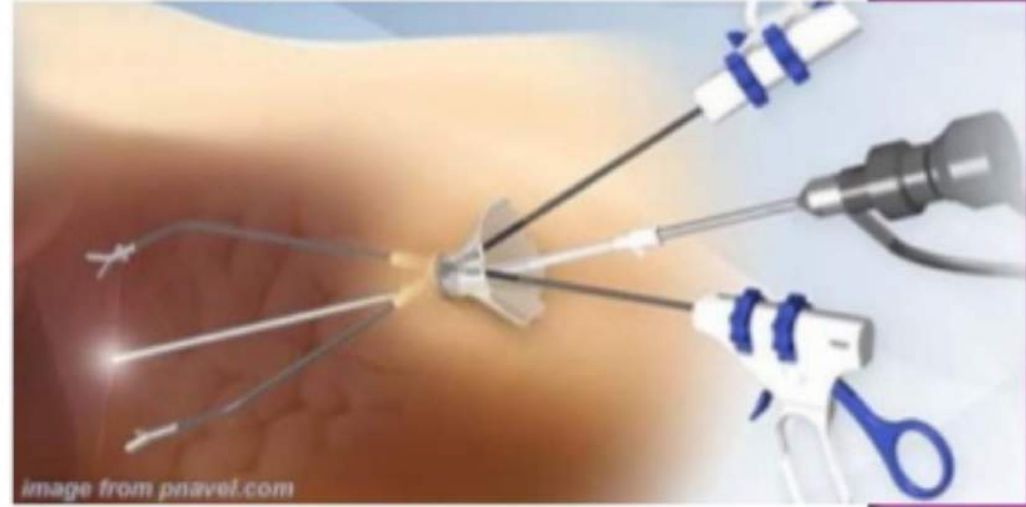
- Steep surgical learning curve
- Loss of tactile feedback
- Increased staff training/competence
- Increased OR set-up/turnover time!!

SILS

- Urology
- Renal transplant
- Cholecystectomy
- Gastric band surgery
- Colectomy

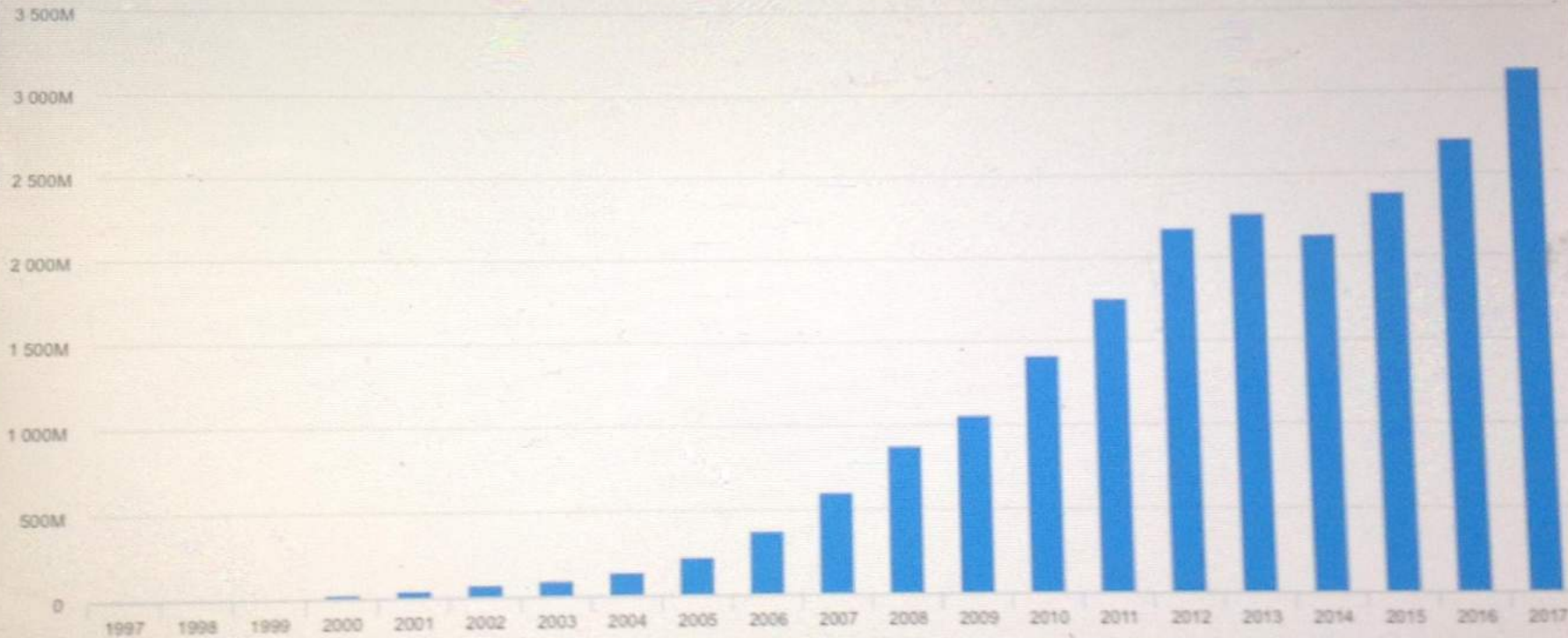


SILS



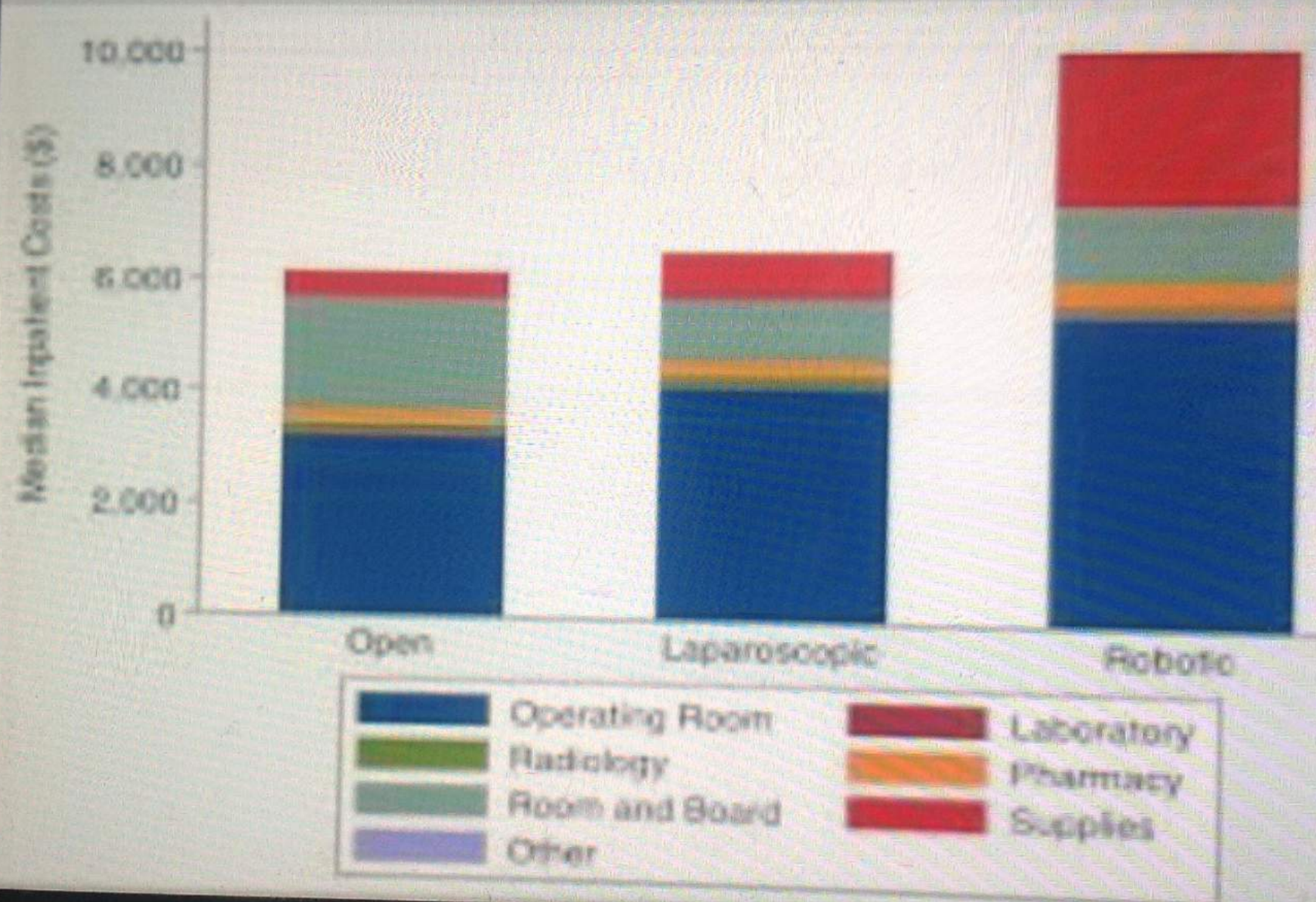
Intuitive Surgical, Inc. Revenue (yearly)

FairlyValued.com



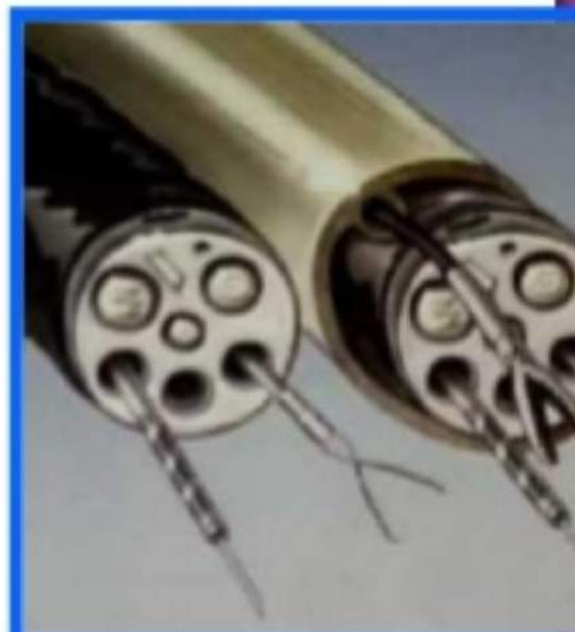
ISRG: Financial charts for Intuitive Surgical, Inc. | Fai...

Figure 1. Proportion of median cost attributable to OR, radiology, room and board, laboratory, medications and OR supply costs for each surgical modality

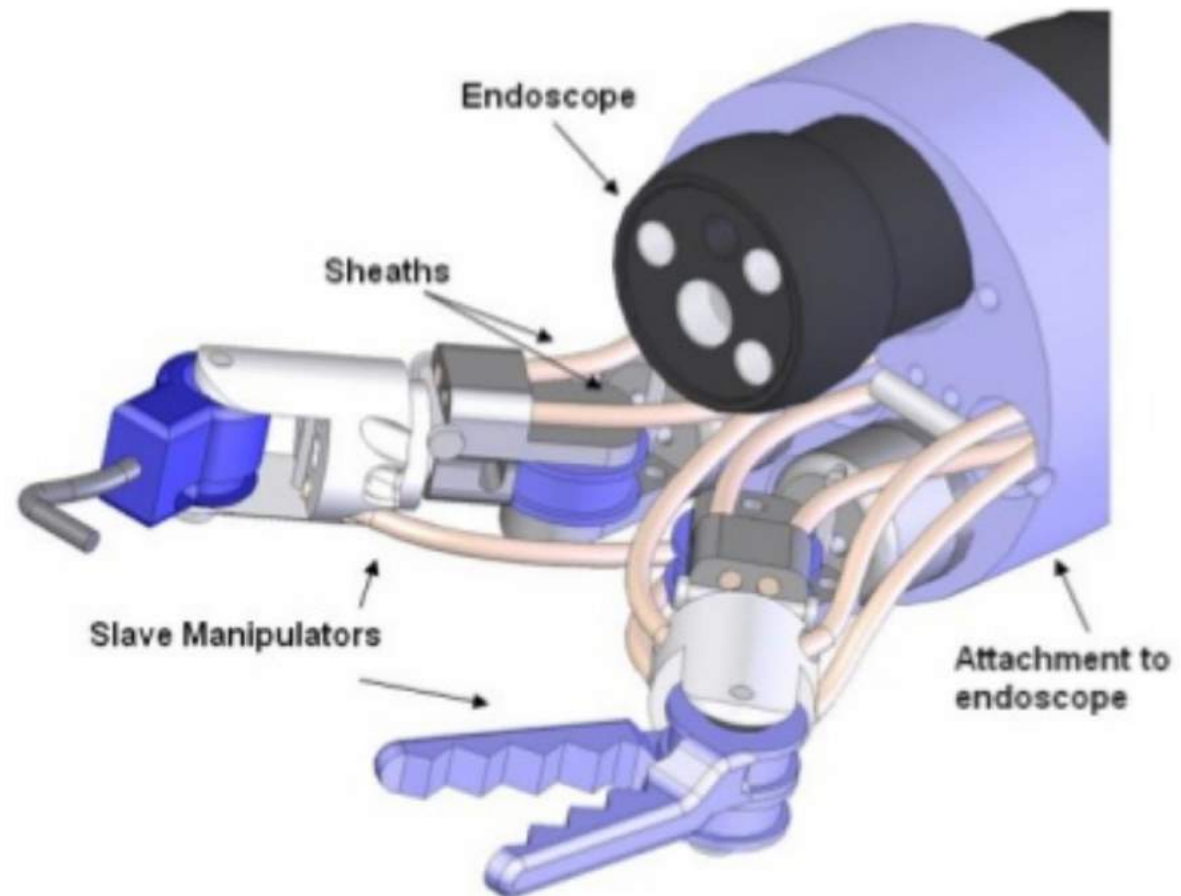


N.O.T.E.S.

NATURAL ORIFICE TRANSLUMINAL ENDOSCOPIC SURGERY



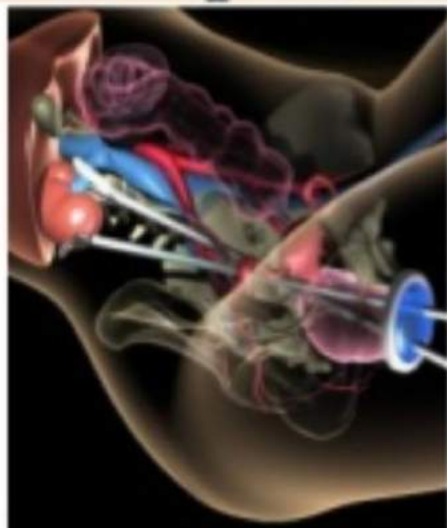
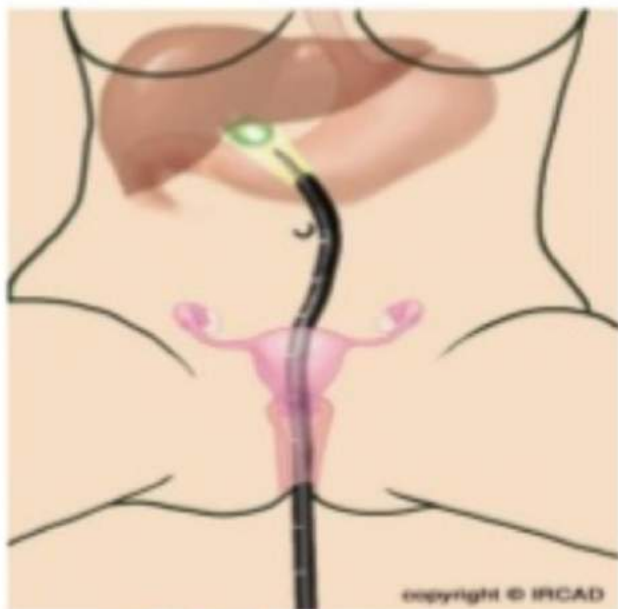
NOTES - INSTRUMENT



ALLEGED NOTES BENEFITS

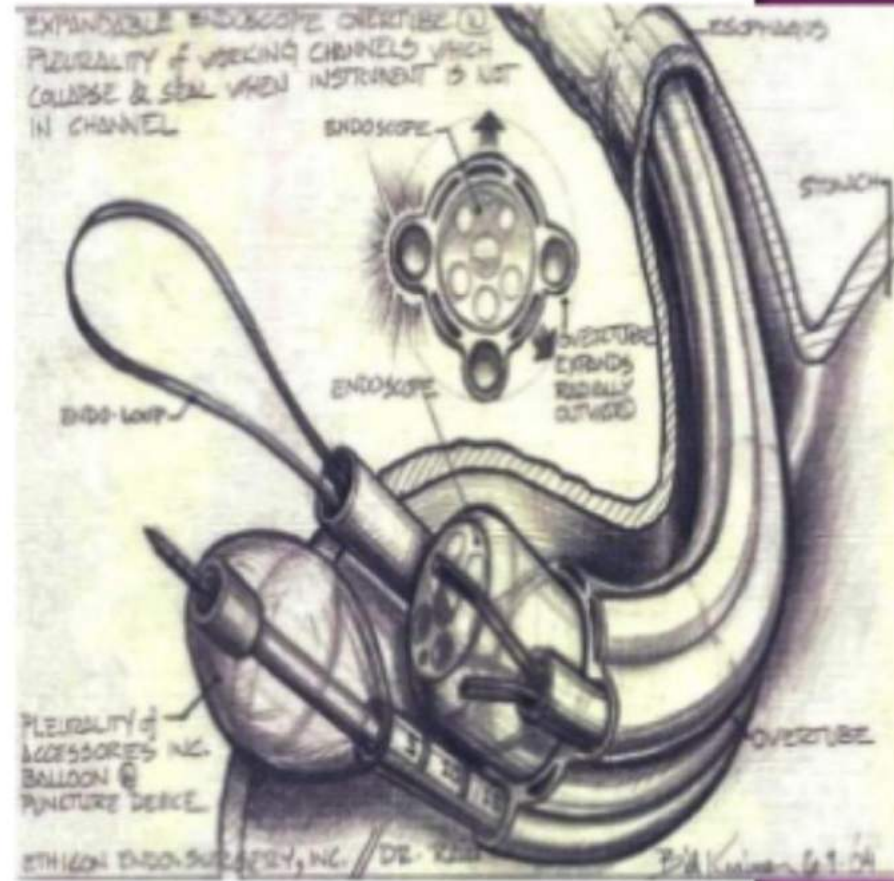
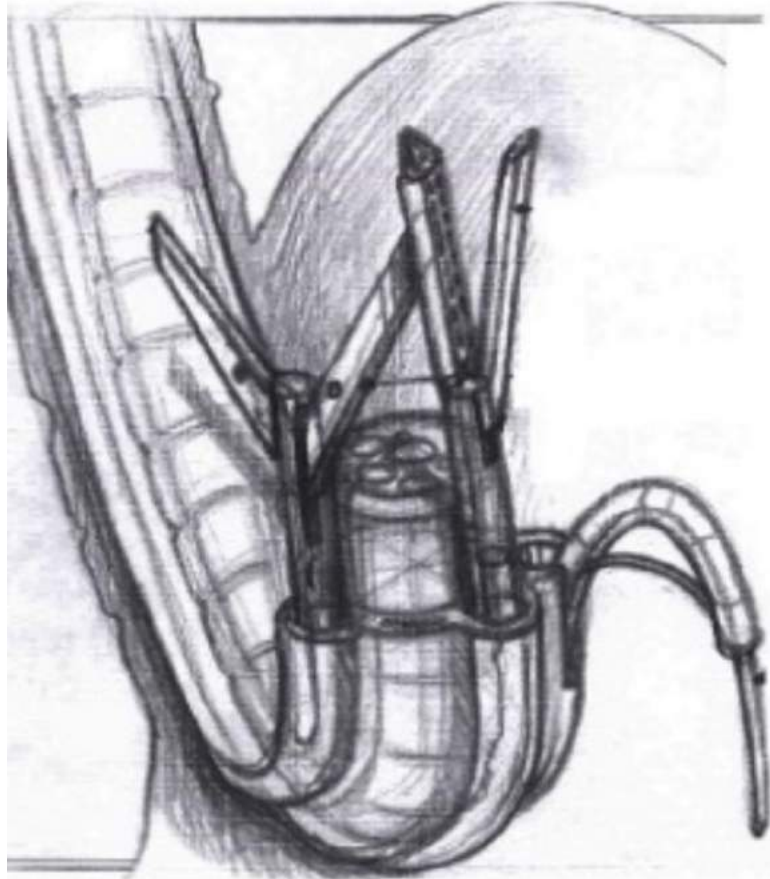
- No surface incision
- Reduced surgical site infection
- Reduced visible scarring
- Reduction in pain analgesics
- Quicker recovery time
- Reduction in hernias, adhesions
- Advantages in the morbidly obese

NOTES- TRANSVAGINAL

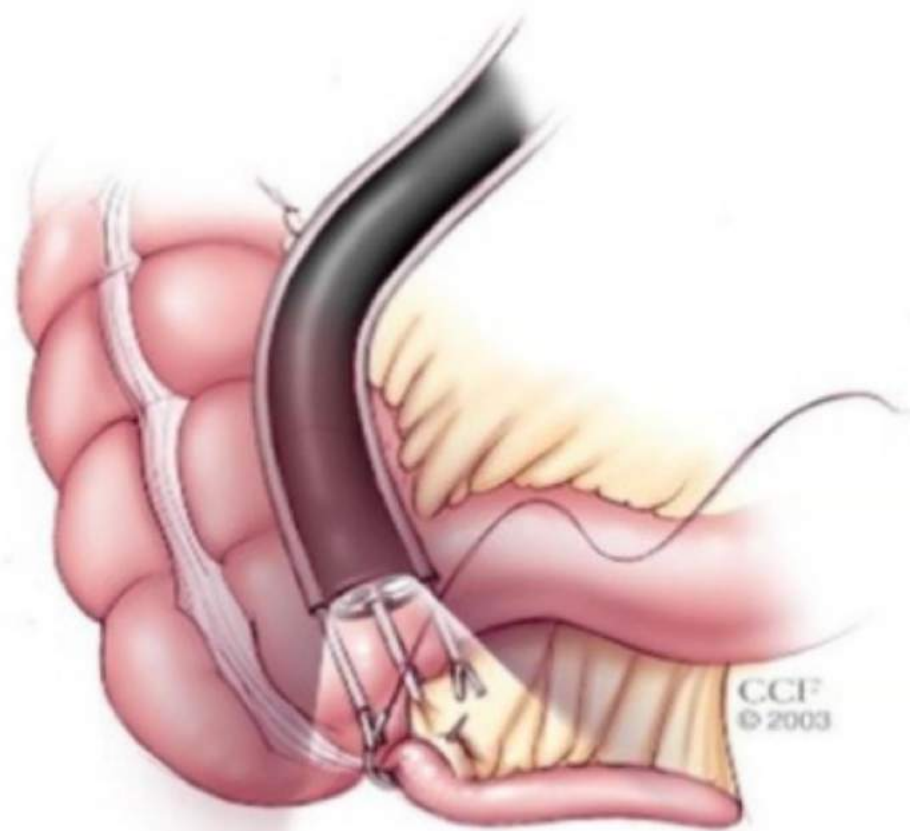


Video-endoscope entering through the posterior vaginal fornix

NOTES - Transgastric



NOTES - APPENDECTOMY

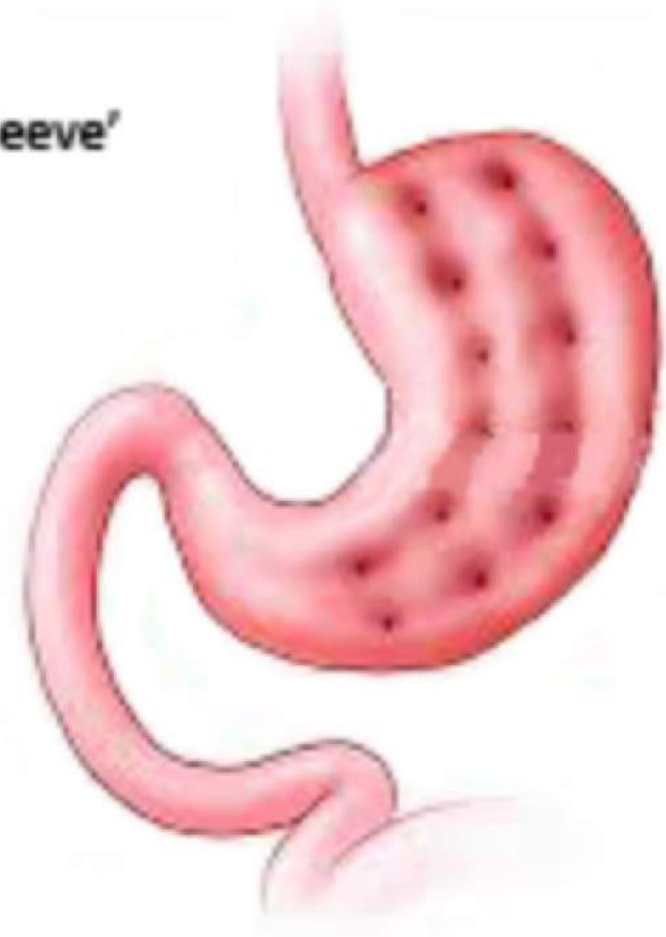
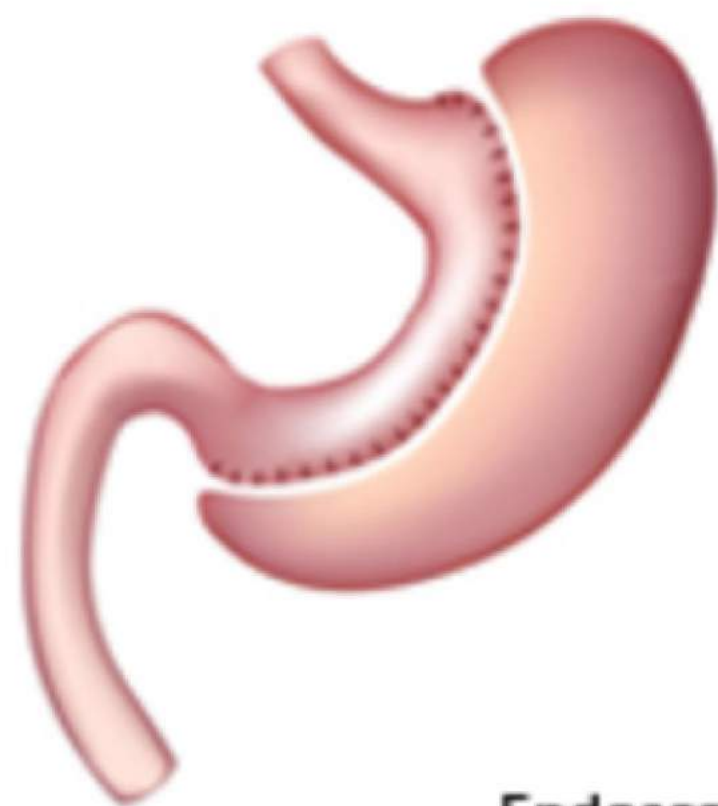


Endoscopic procedure costs less, offers faster recovery than weight-loss surgery

Posted August 16



Surgical Gastric Sleeve
80% stomach removed to leave 'sleeve'



Endoscopic Sleeve Gastroplasty (ESG)
Stomach left intact, stitched to form 'sleeve'

Impact of Laparoscopy

- Technology and techniques
- Surgical training
- Cost benefit analysis for hospitals and ORs
- Finance and profits

- **Benefits for our patients!**



OPERATION

MEDICAL