LAPAROTOMY

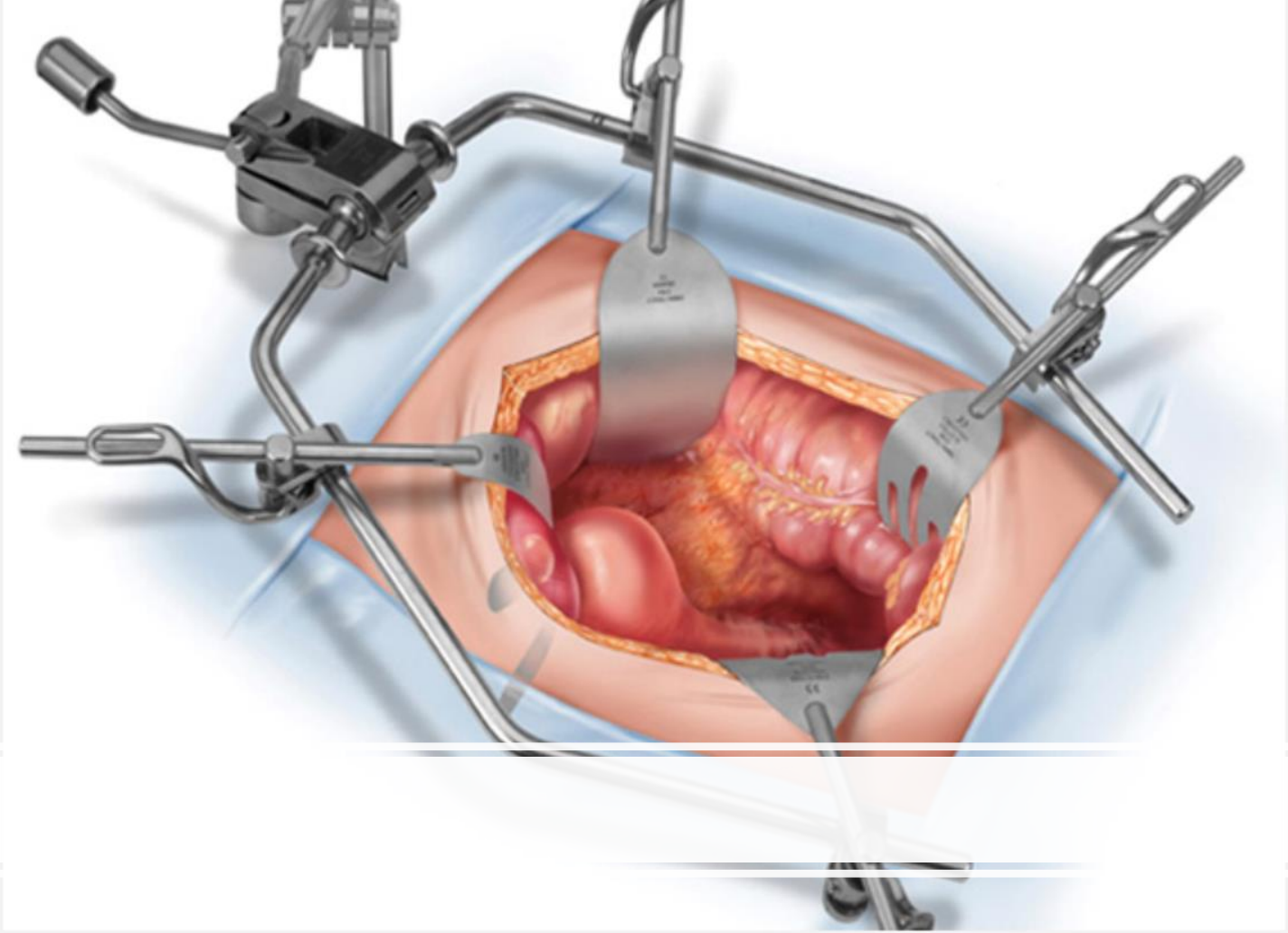
- A **laparotomy** is a surgical incision into the abdominal cavity, for the purpose of exploratory surgery.

GYNAECOLOGICAL LAPAROTOMY

*Definition:

All surgical techniques that involve an incision in the abdominal wall within the field of gynecologic laparotomy surgery,
Cutting can be trasversal, then horizontal, or longitudinal, and vertical from the pubis to the navel, and sometimes beyond.

The incision during surgery, penetrates the thickness of the abdominal wall and will be kept open using metal valves. This will allow the surgeon to use, with greater ease, both hands and the necessary tools within the abdominal cavity.



ABDOMINAL INCISION USED FOR C.S:

- A-Midline vertical incision: incision mad in the midline and extend from just below umbilicus to just above symphysis pubis and may be continued around the umbilicus if more exposure is necessary.
- B-Transverse incision :
- 1-the pfannenstiel incision :it's a transverse (smile)-like incision mad 2-3 cm above symphysis pubis at the pubic area border.
- The incision length about 15 cm , It's the most common used type with limitation of exposure to upper abdomen and latral pelvis.
- 2-modified Joel -Cohen : is a straight transverse skin incision lies about 3 cm below the level of A.S.I.S , the incision length about 12 cm , postoperative morbidity is lower (fever , pain , analgesic requirements) , less time surgery and blood loss in comparison to pfannenstiel Incision.

Comparison between Types of abdominal incisions

Transverse Vs vertical skin incision

Parameters	Transverse incision	Vertical incision
Cosmetic appeal	More	Less
Postoperative pain	Less	More
Wound dehiscence	Less	More
Incisional hernia	Less	More
Technical skill	More	Less
Time taken	More	Less
Access to upper abdomen	Less	Good, can be extended

Uterine incisions

1. Low segment uterine incisions
2. Upper segment uterine incisions

1. **Lower uterine incisions**

A. Low Transverse Uterine Incision (also called Transverse or Horizontal Incision)

B. Low Vertical Uterine Incision (also called Vertical Incision)

A. Low Transverse Uterine Incision

- **Location:** The incision is made in the lower part of the uterus, typically in the area called the lower uterine segment. This area is also known as the "low transverse" part of the uterus.
- **Orientation:** The incision is horizontal or side to side, which is parallel to the natural lines of the uterine muscle fibers.

A. Low Transverse Uterine Incision

- **The major disadvantage** of the transverse incision is that significant lateral extension is not possible without risking laceration of major blood vessels. A "J" or inverted "T" extension is often required if a larger incision is needed typically used when more access to the uterus is needed for complex procedures. For example, this type of incision may be utilized during a cesarean section to improve access for delivering a baby in specific situations, also in situations where anatomy is unexpectedly distorted or some unanticipated pathology is encountered.

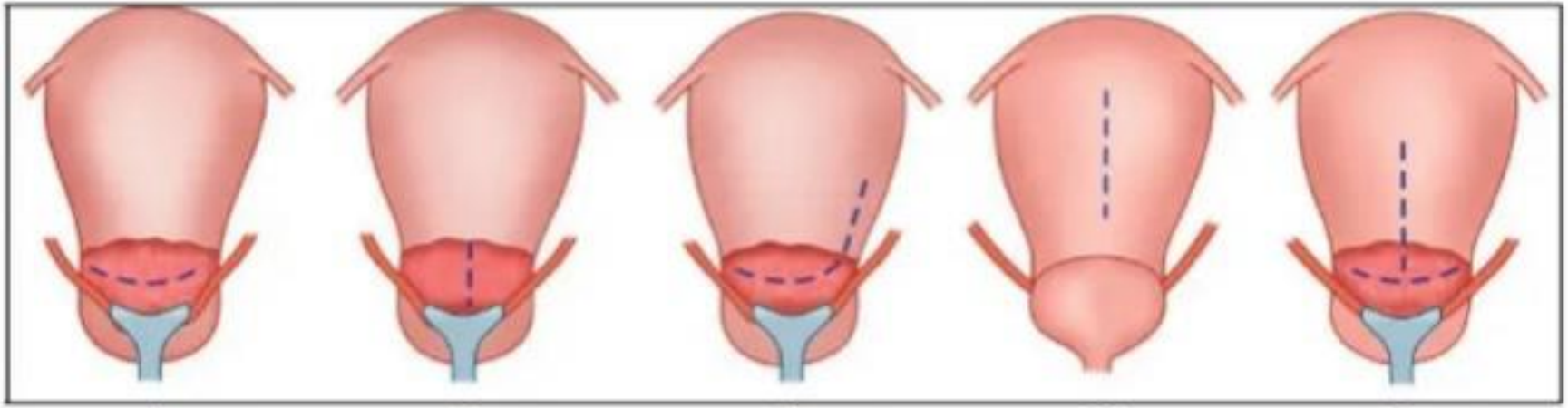
- For example, this type of incision may be utilized during a cesarean section to improve access for delivering a baby in specific situations, also in situations where anatomy is unexpectedly distorted or some unanticipated pathology is encountered.
- This can be problematic because the "J" extension goes into the lateral fundus and the angles of the inverted "T" incision are poorly vascularized. Both the J and T incisions potentially result in a weaker uterine scar, which is a concern if the patient has a subsequent pregnancy (uterine rupture)
- with increased incidence of maternal blood loss, broad ligament hematoma, and uterine artery laceration compared with low-segment transverse incisions that do not require extension

Low Vertical Uterine Incision

- **location:** The incision is made in the lower part of the uterus, typically below the level of the bladder, similar to the low transverse incision.
- **Orientation:** Unlike the low transverse incision, which is horizontal, the low vertical uterine incision is vertical, running up and down the uterus

Low Vertical Uterine Incision

- **The major disadvantage** of the low vertical incision is the possibility of extension cephalad into the uterine fundus or caudally into the bladder, cervix, or vagina. It is also difficult to determine whether the low vertical incision is truly low, as the separation between lower and upper uterine segments is not easily identifiable clinically, sonographically, or histologically.



Uterine incisions for cesarean section (A) Lower segments transverse (B) Lower segment vertical (C) "J" incision (D) Classical incision (E) Inverted T incision

Classical uterine incision

The incision is made in the upper segment of the uterus in a vertical direction, running up and down the uterus, perpendicular to the uterine muscle fibers.

Comparison between low uterine segment incision and classical incision

	Low uterine segment incisions	Classical incision
Incision location	Low uterine segment	Upper uterine segment
Technically	Slightly difficult	easier
Incision margins	The wall is thin and so apposition is perfect	The wall is thick and apposition of the margins is not perfect
Uterine scar	transverse scar on the uterus. This considered less likely to cause uterine rupture in subsequent pregnancies.	vertical scar on the uterus. This is associated with a higher risk of uterine rupture in future pregnancies
Blood loss and surgery time	associated with less blood loss and shorter surgery times compared to classical incisions.	more blood loss and a longer surgical procedure due to the need for careful hemostasis and meticulous closure.
Postoperative recovery	generally faster and less painful, and patients are often encouraged to move and ambulate sooner after surgery.	often slower, with more discomfort and a longer hospital stay due to the increased risk of complications.
Surgical indications	preferred for most elective cesarean sections and many gynecological surgeries, especially when the patient plans to have more children	reserved for specific situations, such as severe placenta previa, placenta accreta, or complex surgical procedures requiring better access, emergent surgery

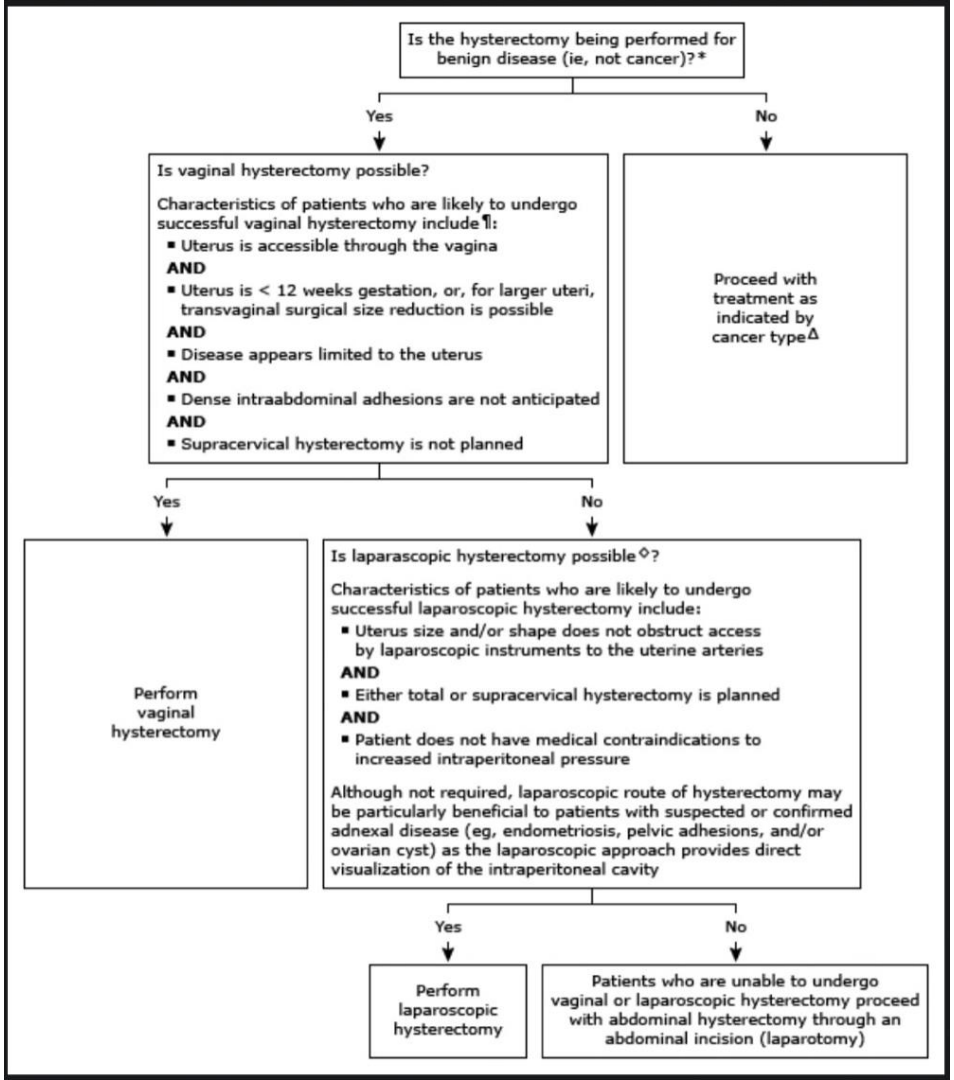
laparotomy indication

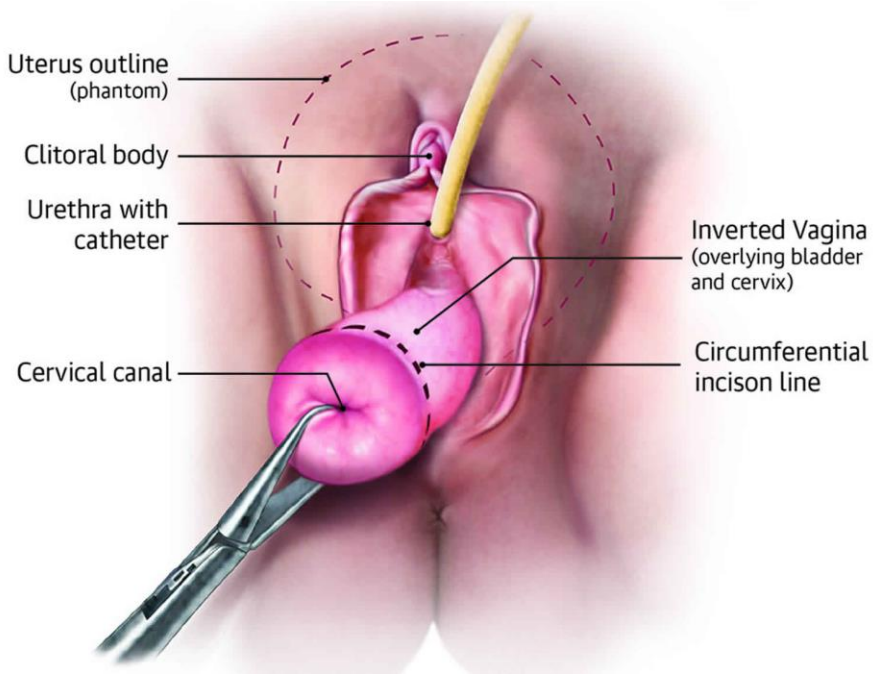
- **Complex Gynecological Conditions:** Laparotomy is preferred for complex gynecological surgeries, such as **extensive cancer staging**, **large tumor removals**, **large uterine fibroids**, **ovarian cysts and tumors**, **uterine prolapse**, **ectopic pregnancy**, or **procedures involving multiple organ systems**.
- **Cesarean section**
- **Obesity or Adhesions:** In patients with obesity or significant abdominal adhesions from previous surgeries, laparotomy may be chosen due to technical challenges associated with laparoscopy.
- **Severe Endometriosis:** In cases of severe endometriosis with extensive tissue involvement, laparotomy may be necessary for more thorough excision and tissue reconstruction.
- **Emergency Surgery:** In urgent or emergency situations, such as for the treatment of ectopic pregnancies or ruptured cysts, laparotomy is often performed due to the need for rapid intervention.
- **Extensive Tumor Dissection:** When removing large pelvic masses or tumors that are challenging to extract through small laparoscopic incisions, laparotomy provides more space for the surgeon.
- **Surgeon's Expertise:** The surgeon's familiarity and comfort with a particular approach also influence the choice.
- When it is necessary to **respect and protect the vascular and nerve structures**

Complication of laparotomy

- **Infection**
- **Hemorrhage**
- **Adhesions** can cause abdominal pain or bowel blockages
- **Internal organ (nearby) injury**
- **Deep Vein Thrombosis (DVT)** Prolonged immobility and changes in blood flow during and after surgery can increase the risk of DVT, which can lead to life-threatening pulmonary embolism
- **Urinary Complications** bladder injuries may happen during surgery. Patients may experience difficulty urinating or incontinence postoperatively.
- **Incisional Hernia**
- **Scar Tissue Formation** surgical scars can form and may cause pain or discomfort, especially if they adhere to underlying tissues or structures.

Hysterectomy


Is the hysterectomy being performed for benign disease (ie, not cancer)?*
Yes
No
Is vaginal hysterectomy possible?
Characteristics of patients who are likely to undergo successful vaginal hysterectomy include¶:
Uterus is accessible through the vagina
AND
Uterus is < 12 weeks gestation, or, for larger uteri, transvaginal surgical size reduction is possible
AND
Disease appears limited to the uterus
AND
Dense intraabdominal adhesions are not anticipated
AND
Supracervical hysterectomy is not planned
Proceed with treatment as indicated by cancer type△
Yes
No
Perform vaginal hysterectomy
Is laparascopic hysterectomy possible◇?
Characteristics of patients who are likely to undergo successful laparoscopic hysterectomy include:
Uterus size and/or shape does not obstruct access by laparoscopic instruments to the uterine arteries
AND
Either total or supracervical hysterectomy is planned
AND
Patient does not have medical contraindications to increased intraperitoneal pressure
Although not required, laparoscopic route of hysterectomy may be particularly beneficial to patients with suspected or confirmed adnexal disease (eg, endometriosis, pelvic adhesions, and/or ovarian cyst) as the laparoscopic approach provides direct visualization of the intraperitoneal cavity
Yes
No
Perform laparoscopic hysterectomy
Patients who are unable to undergo vaginal or laparoscopic hysterectomy proceed with abdominal hysterectomy through an abdominal incision (laparotomy)



Vaginal Hysterectomy

Indications

- It is the preferred route when possible
  - Minimally invasive
  - High **safety** and low **cost**

- Relative Contraindications
  - Malignancy
  - Significantly enlarged uterus
  - Dense pelvic adhesions

- Despite EBM indicating that Vaginal Hysterectomy is the preferred route, there are **fewer vaginal hysterectomies performed** compared with other routes.
    - Obstacles to performing vaginal hysterectomy include **limited training**, fewer numbers of hysterectomies being **performed by individual surgeons**, and greater **diversity of operative approaches**

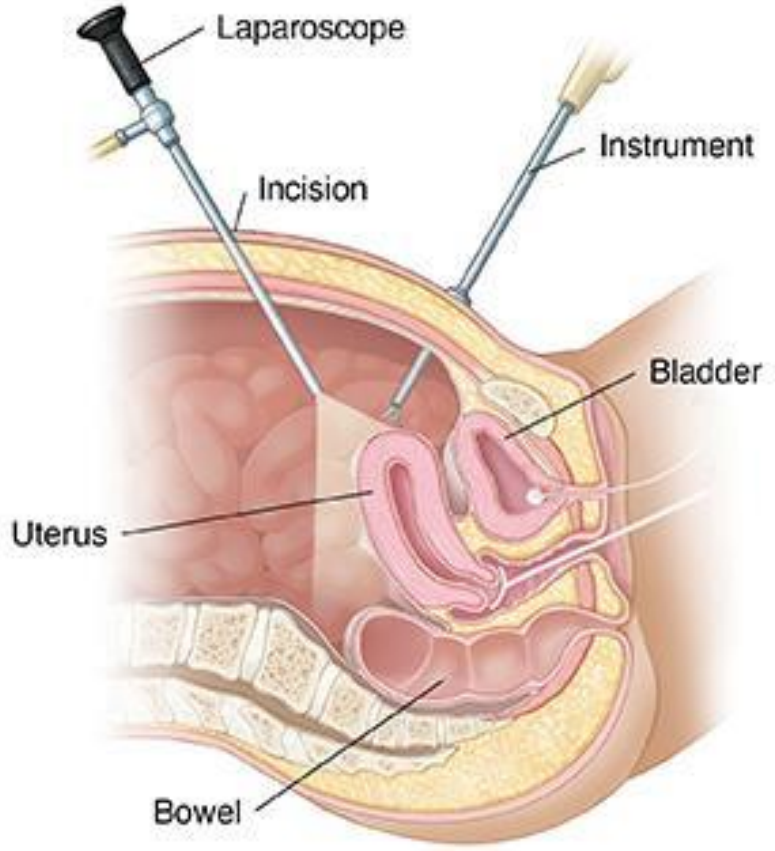
Procedure

- Anesthesia
  - GA vs Spinal
- Steps
  - Cervix incision
  - Entry into the peritoneal cavity
  - Division of the vascular pedicles and removal of the uterus
  - Adnexal surgery when indicated
  - Apical support procedures when indicated
  - Closure of the vaginal cuff

Complications

- Intraoperative
  - Hemorrhage
  - Bladder injury
  - Ureteral injury
  - Bowel injury
  - Conversion to laparotomy
- Postoperative
  - Urinary retention
  - Abscess
  - Vaginal bleeding
  - Cuff dehiscence
  - Fallopian tube prolapse

Laparoscopic Hysterectomy



Indications

- Leiomyomas
- Adenomyosis
- Idiopathic AUB
- Endometriosis
- Uterine Prolapse

- *There are no unique indications for laparoscopic hysterectomy compared with other surgical approaches to hysterectomy.*

Types

- Total Laparoscopic Hysterectomy - (TLH)
  - Both uterus and cervix are removed
  - The entire procedure is performed laparoscopically
  - The uterine specimen is typically removed through the vaginal vault

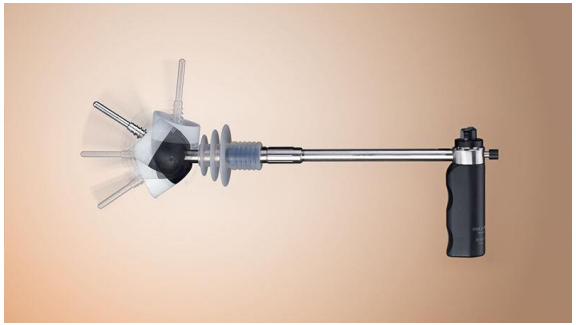
- Laparoscopic Subtotal (Supracervical) Hysterectomy - (LSH)
  - Uterus removed, verbix conserved
  - The uterine specimen is extracted via the abdominal ports or incisions

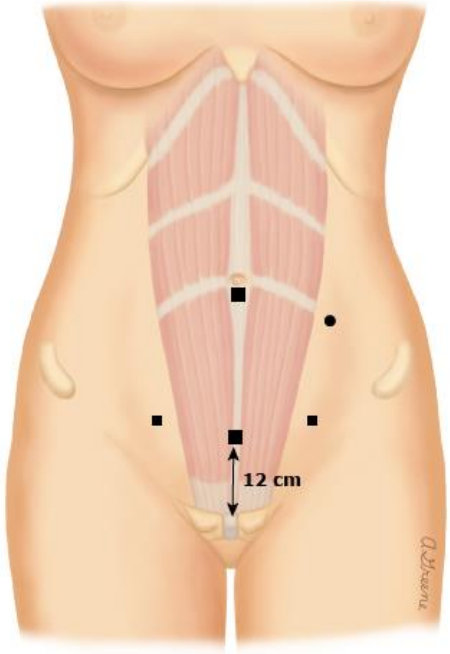
- Laparoscopic-Assisted Vaginal Hysterectomy - (LAVH)
  - Both uterus and cervix are removed
  - Laparoscopically → any needed adnexal surgery (e.g. controlling adnexal blood supply)
  - Vaginally → the rest (e.g. entry into the peritoneal cavity, ligation of uterine vessels)

Procedure

- Anesthesia
  - GA

- Instruments
  - Uterine manipulator
  - Trochar placement

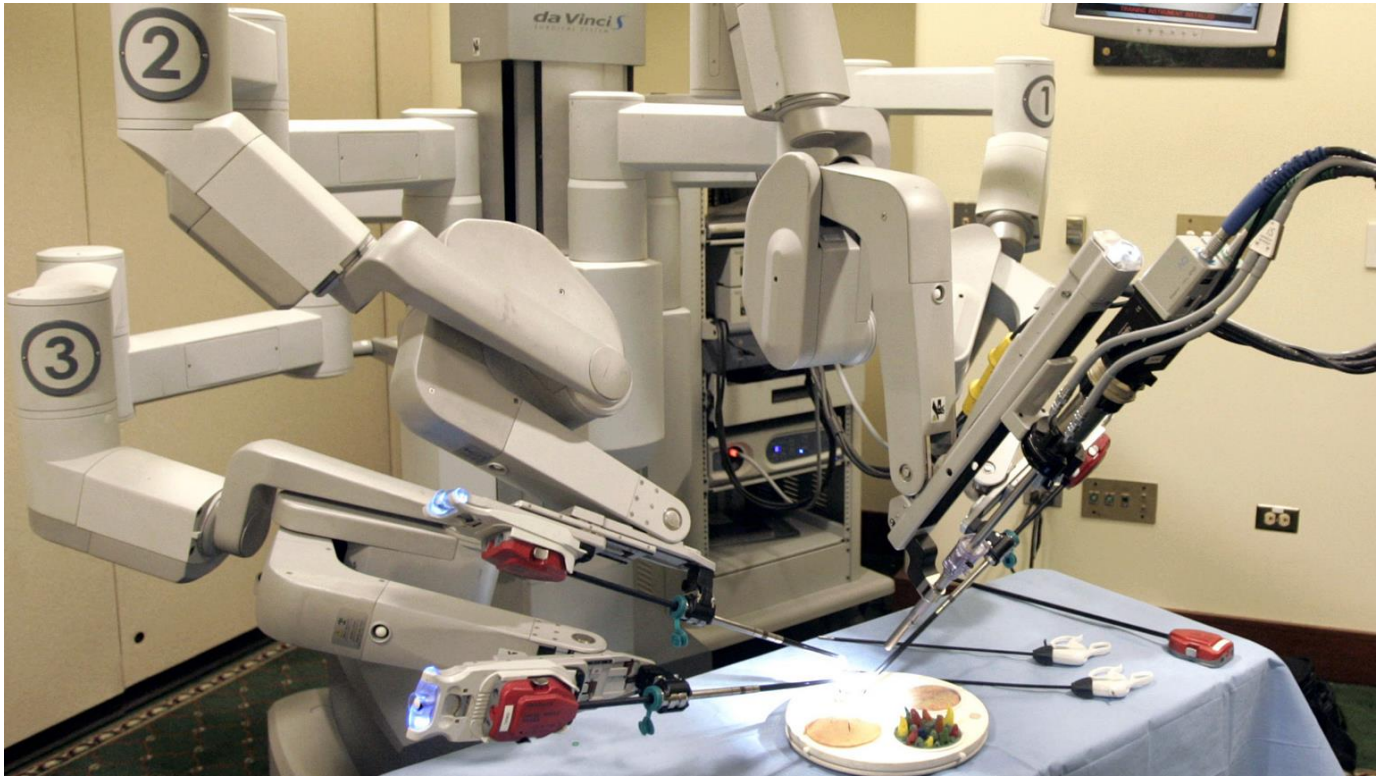




Complications

- Overall rate → 4-14%
- Specifically
  - Infection
  - Conversion to laparotomy
  - Urinary tract injury
  - Vaginal cuff dehiscence
  - Bowel injury

Robot-assisted Laparoscopic Surgery

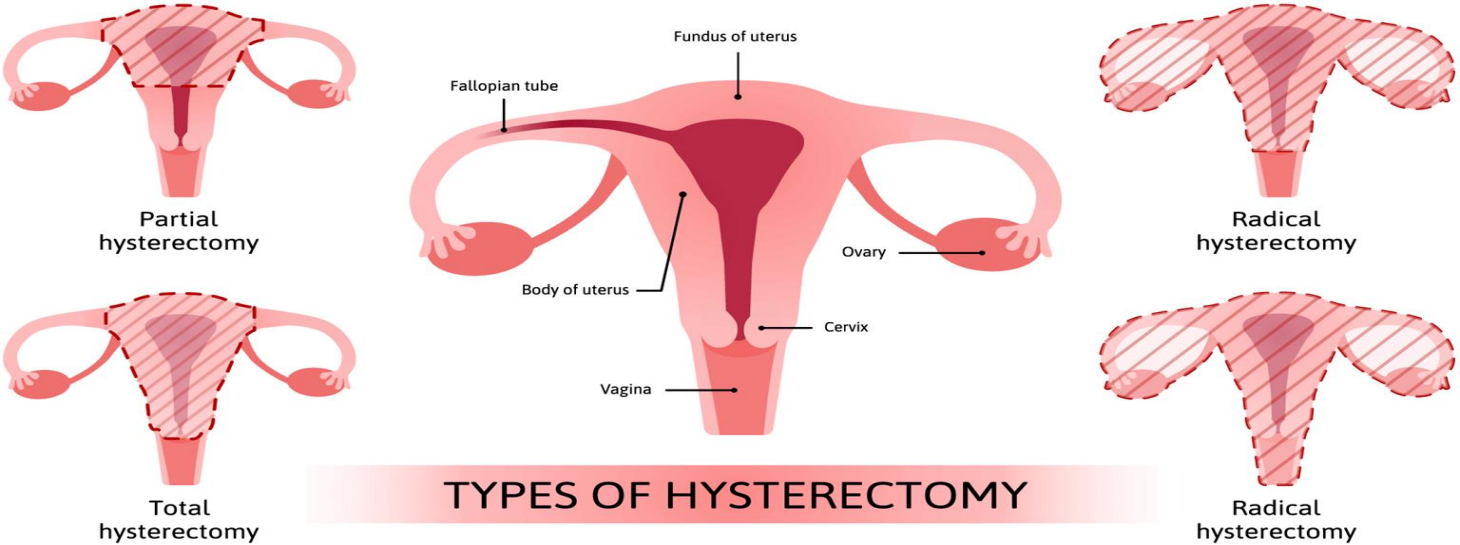


ABDOMINAL HYSTERECTOMY

- **A total abdominal hysterectomy** is the most commonly performed procedure for benign uterine disease and involves the simple excision of the uterine corpus and cervix.

- **Subtotal hysterectomy:** This surgery involves the removal of the main body of the uterus without removing the cervix.

- **Radical hysterectomy :** involves the wide excision of the parametrial tissue laterally , along with the uterosacral ligaments posteriorly.(This surgery involves the removal of the uterus, cervix, both of the ovaries, and both of fallopian tubes.)


Partial hysterectomy
Total hysterectomy
Fundus of uterus
Fallopian tube
Ovary
Body of uterus
Cervix
Vagina
Radical hysterectomy
Radical hysterectomy
TYPES OF HYSTERECTOMY

CLASSIFICATION OF RADICAL HYSTERECTOMY

- **Piver-Rutledge-Smith Classification :**

I. **Class I : Extrafascial hysterectomy.** The fascia of the cervix and lower uterine segment, which is rich in lymphatics, is removed with the uterus.

II. **Class II : Modified radical hysterectomy.** The uterine artery is ligated where it crosses over the ureter, and the uterosacral and cardinal ligaments are divided midway towards their attachment to the sacrum and pelvic sidewall, respectively. The upper one-third of the vagina is resected.

III. **Class III : Radical hysterectomy**. The uterine artery is ligated at its origin from the superior vesical or internal iliac artery. Uterosacral and cardinal ligaments are resected at their attachments to the sacrum and pelvic sidewall. The upper one-half of the vagina is resected.

IV. **Class IV : Radical hysterectomy**. The ureter is completely dissected from the vesicouterine ligament, the superior vesical artery is sacrificed, and three-fourths of the vagina is resected.

V. **Class V : Radical hysterectomy**. There is additional resection of a portion of the bladder or distal ureter with ureteral reimplantation into the bladder.

- The surgeon may remove the ovaries -- a procedure called **oophorectomy** -- or may leave them in place. When the tubes are removed that procedure is called **salpingectomy**. When the entire uterus, both tubes, and both ovaries are removed, the entire procedure is called a hysterectomy with **bilateral salpingectomy-oophorectomy.**

- In women who undergo hysterectomy at or **after menopause**, the uterine adnexa (fallopian tubes and ovaries) are usually **removed**.

- In general, the ovaries are **preserved** at hysterectomy for benign disease **before menopause**, unless there is a strong family history of breast or ovarian cancer.

- **Indications for total abdominal hysterectomy：**

1. uterine myomas .
2. endometriosis .
3. chronic PID.
4. uterine bleeding that is unresponsive to more conservative measures.

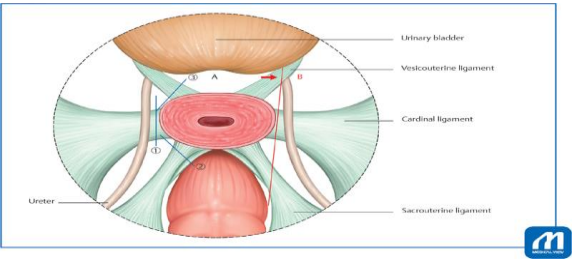
- **Contraindications** include: (1) cervical cancer (≥ Ib stage) and (2) endometrial cancer stage II. When TAH is contraindicated, semiradical hysterectomy or radical hysterectomy is performed.

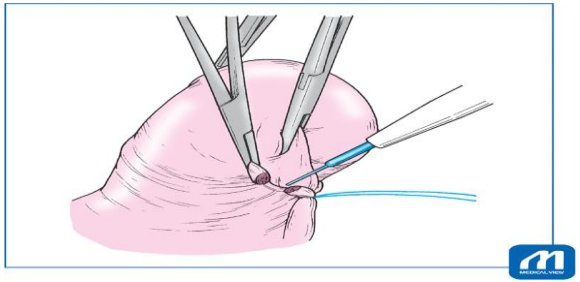
- **Indication of radical hysterectomy：**

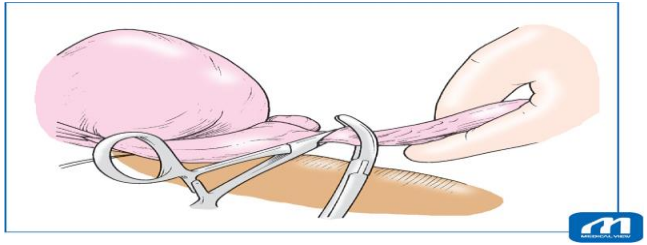
1. cervical cancer.
2. Endometrial cancer.

MAJOR STEPS OF T.A.H

1. *Laparotomy and development of the visual field*
2. *Ligate and divide the round ligament*
3. *Clamp, cut, and ligate the ovarian ligament and Fallopian tubes (or infundibulopelvic ligament)*
4. *Procedures 2. and 3. are also performed on the other side .*





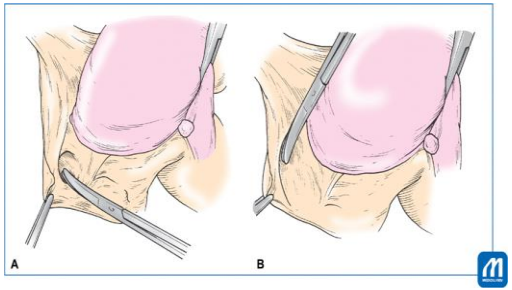


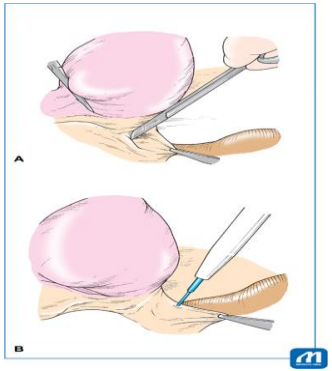
5- Mobilizing the bladder.

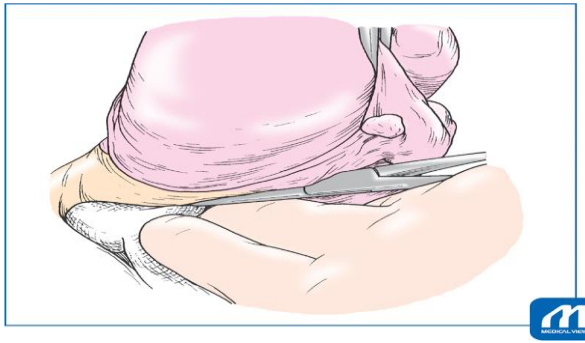
6- Clamp, cut, and ligate the uterine artery and vein/cardinal ligament (first step of parametrial tissue cutting).

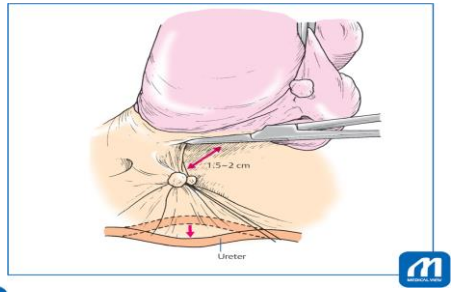
7- Push down the stump of the uterine artery and upper part of the cardinal ligament.

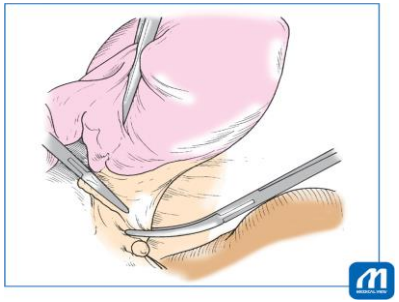
8- Clamp, cut, and ligate the sacrouterine ligament and posterior half of the cardinal ligament (second step of parametrial tissue cutting).











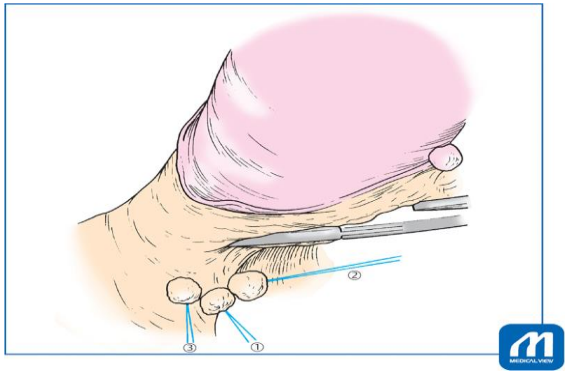
9- *Clamp, cut, and ligate the vesicouterine ligament and the anterior half of the cardinal ligament (third step of parametrial tissue cutting).*

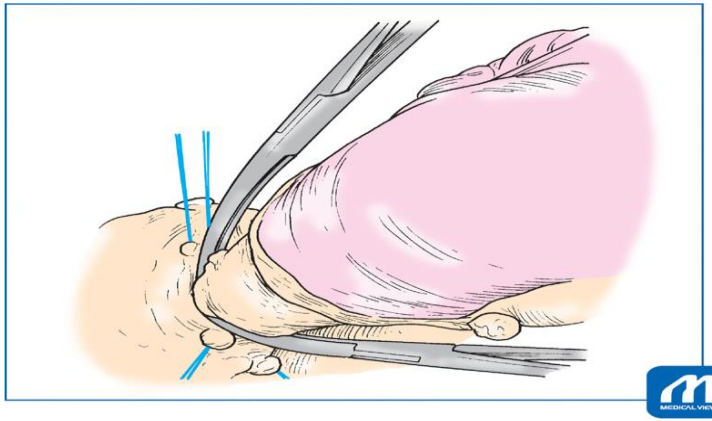
10- Clamp the vaginal wall at the cervicovaginal junction.

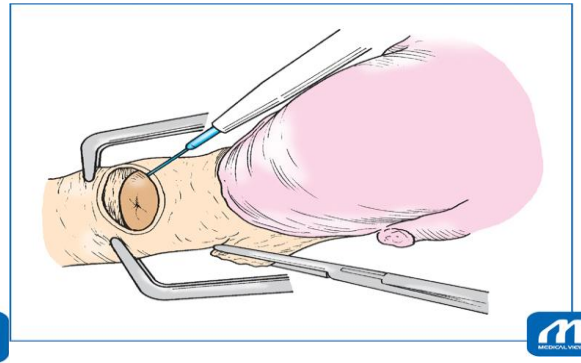
11- Opening the vagina.

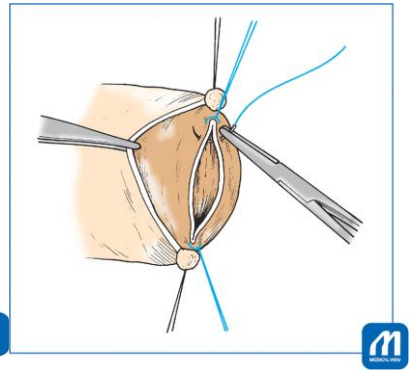
12- Closing the vaginal vault.

13- Hemostasis and closing the retroperitoneum.



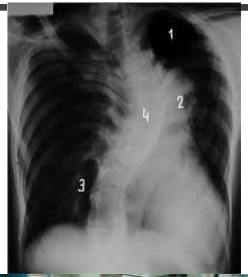






HOW TO PREPARE PATIENTS FOR OPERATION? (PRE-OPERATION)

PREOPERATIVE PREPARATIONS



IV-Nursing intervention

I- Psychological Aspect:

- Provide explanations or printed information about health care facility routines & visiting hours & meal times
- Explain the procedures involved in the upcoming surgery (Complete idea of what the • pre, intra & post operative course entails).
- Introduce the person who is to undergo a major surgical procedure to people who have successfully recovered from this operation.

❑ Helps to relieve anxiety

2. Informed Consent :

- Anyone undergoing surgery must sign an operative permit. It protects the health care facility staff from legal action

3. Physiologic Aspects

Before the day of surgery

- Correct any dietary deficiencies
- Reduce an obese person's weight.
- Correct fluid & electrolyte imbalances.
- Restore adequate blood volume with blood transfusion.
- Treat chronic disease.
- Cure infections process

Preparing the person the evening before surgery.

- Hygienic care (bathing or scrubbing)
- Skin preparation(shaving)
- Document observation of the surgical site. (note cuts or breaks)
- Restricting food & fluid eight to ten hours preop. NPO after midnight.
- intravenous infusions may receive for debilitated or malnourished patient
- Enemas not routinely ordered except for G.I.T s
- NG tube sometimes is inserted the evening before or the morning of surgery

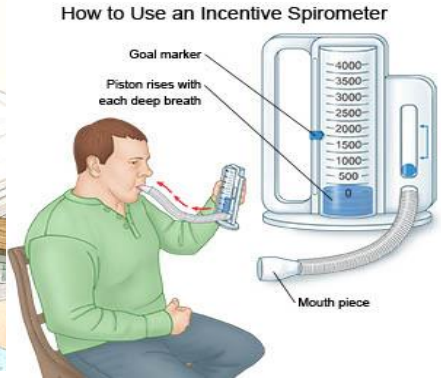
- Remove colored nail polish
- Assist the person in donning a hospital gown, cap
- Check for laboratory record
- Blood available
- Pre-anesthetic medication given e,g. 1 gram claforan

Recommendations for prophylactic antibiotics as indicated by probable infective microorganism involved:

Table 3. Recommendations for Prophylactic Antibiotics as Indicated by Probable Infective Microorganism Involved [8, 30] (Open Table in a new window)

Operation	Expected Pathogens	Recommended Antibiotic
Orthopedic surgery (including prosthesis insertion), cardiac surgery, neurosurgery, breast surgery, noncardiac thoracic procedures	*S aureus*, coagulase-negative staphylococci	Cefazolin 1-2 g
Appendectomy, biliary procedures	Gram-negative bacilli and anaerobes	Cefazolin 1-2 g
Colorectal surgery	Gram-negative bacilli and anaerobes	Cefotetan 1-2 g or cefoxitin 1-2 g plus oral neomycin 1 g and oral erythromycin 1 g (start 19 h preoperatively for 3 doses)
Gastroduodenal surgery	Gram-negative bacilli and streptococci	Cefazolin 1-2 g
Vascular surgery	*S aureus*, *Staphylococcusepidermidis*, gram-negative bacilli	Cefazolin 1-2 g
Head and neck surgery	*S aureus*, streptococci, anaerobes and streptococci present in an oropharyngeal approach	Cefazolin 1-2 g
Obstetric and gynecological procedures	Gram-negative bacilli, enterococci, anaerobes, group B streptococci	Cefazolin 1-2 g
Urology procedures	Gram-negative bacilli	Cefazolin 1-2 g

- **Pre-operative teaching:**
- Deep breathing and coughing exercises To prevent pneumonia
- Incentive spirometer
- Turning & moving, leg exercise to prevent DVT
- Getting out of bed
- Pain management



VERTICAL VERSUS TRANSVERSE ABDOMINAL WALL INCISION

Vertical abdominal wall incision :

- Advantage :

1. Quicker to perform
2. Better visualization of uterus

- Disadvantage

1. Greater chance of dehiscence and hernia formation
2. Easily visible when healed

CONT….

Transverse abdominal wall incision :

- Advantage :

1. Better cosmetically
2. Stronger than vertical
3. Less painful
4. Good access to upper GI structure

- Disadvantage :

1. Limited exposure to the organ