IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# Hysterectomy- A Comprehensive Approach

[1]Dr.VG Veeresh,[2]Dr.Parmila Malik, [3]Prof(Dr.)Mahendra Kumar Verma, [4]Prof(Dr.) Sandeep Tripathi
[1]Nursing tutor , [2]HOD, [3]Principal, [4]Professor
[1]Karnatka institute of Medical Science,School &College of Nursing ,Hubli,Karnataka,
[2]Rural institute of health and Paramedical sciences,
[3]Vivekanand Global University Jaipur,Rajasthan,
[4]Nims University Jaipur,India

## Abstract

## Introduction

Uterus is a pear shaped organ in reproductive system, it is responsible for menstruation, carrying the unfertilized and fertilized ovum to center of uterus for implantation of zygote. The uterus which act as important structure for reproduction is also at risk of developing problems which is reflected as irregular bleeding, when the problem moves beyond the medical management demands surgical intervention called hysterectomy.

Hysterectomy is the surgical removal of the uterus and cervix. These procedures may also involve removal of the ovaries (oophorectomy), fallopian tubes (salpingectomy), and other surrounding structures. Supracervical hysterectomy refers to removal of the uterus while the cervix is spared. [1]The procedure is performed by gynecologist along with surgical team. 70% of hysterectomy are performed for endometriosis, irregular bleeding, uterine fibroids. Hysterectomy is second commonly performed surgical procedure after cesarean section.[2]

## Meaning of hysterectomy

Hysterectomy is surgical removal of the uterus and cervix.

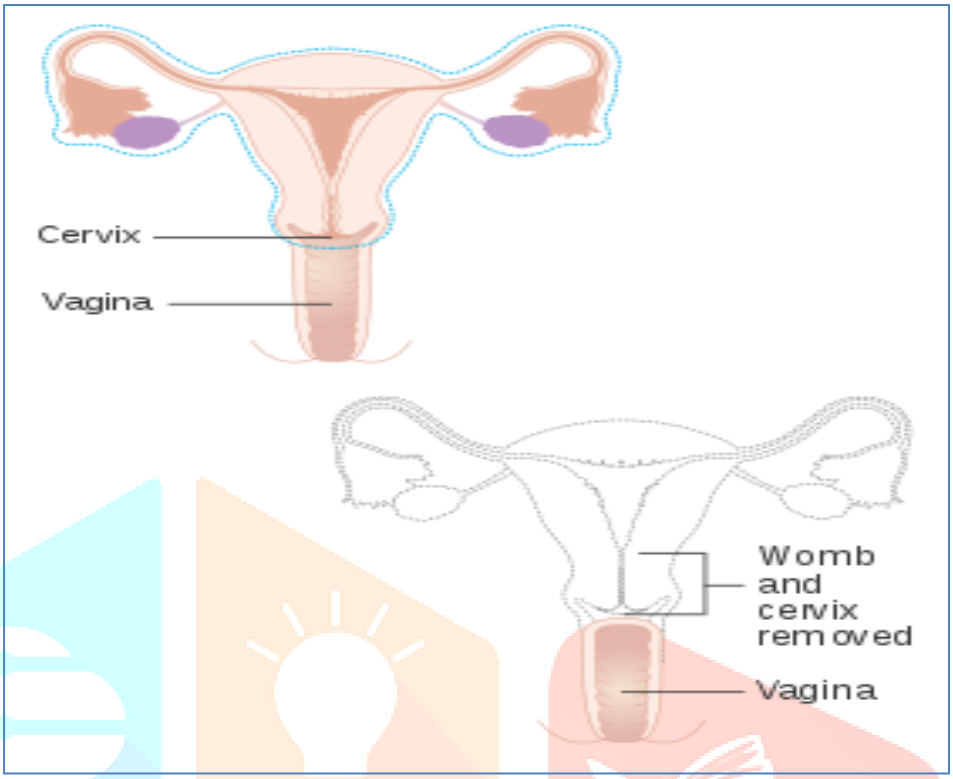



Diagram showing removal of uterus

## Epidemiology of hysterectomy

Globally, hysterectomy is commonly performed surgical procedure for variety of medical reasons. According to Natioanl Center for Health statistics, United States of America 617,000 hysterectomy performed in 2013 of these, 12% by vaginal and 17% laparoscopic procedure[3]. In United Kingdom 1 in 5 women undergo hysterectomy[4]. In Canada, 338-484 per 100000 women opt hysterectomy for fibroid and bleeding disorder of uterus[5]. In Germany women aged between 40-49 account for 50% hysterectomy and 50-59 aged account for 20% hysterectomy[6]. In Denmark 67096 women underwent Hysterectomy[7].

The prevalence of hysterectomy is 1.7 to 9.8% in different regions of the country. 20.7 per 1000 women underwent hysterectomy in Gujarat, India.

Further, 90% of global hysterectomy are benign, of these 65% are abdominal hysterectomy and 35% are vaginal hysterectomy and laparoscopic vaginal hysterectomy are about 28%.

## Indication of hysterectomy

In the absence of a life-threatening emergency (uterine hemorrhage), the decision to proceed with hysterectomy is made mutually by the woman and gynecology based upon her functional impairment,

childbearing plans, response to medical therapy, discussion of alternatives, and perception that the risks of the procedure are outweighed by the expected benefits.

**Obstetric**

- Rupture of the uterus
- Uncontrollable post partum hemorrhage, obstetric hemorrhage
- Placenta accrete, placenta previa

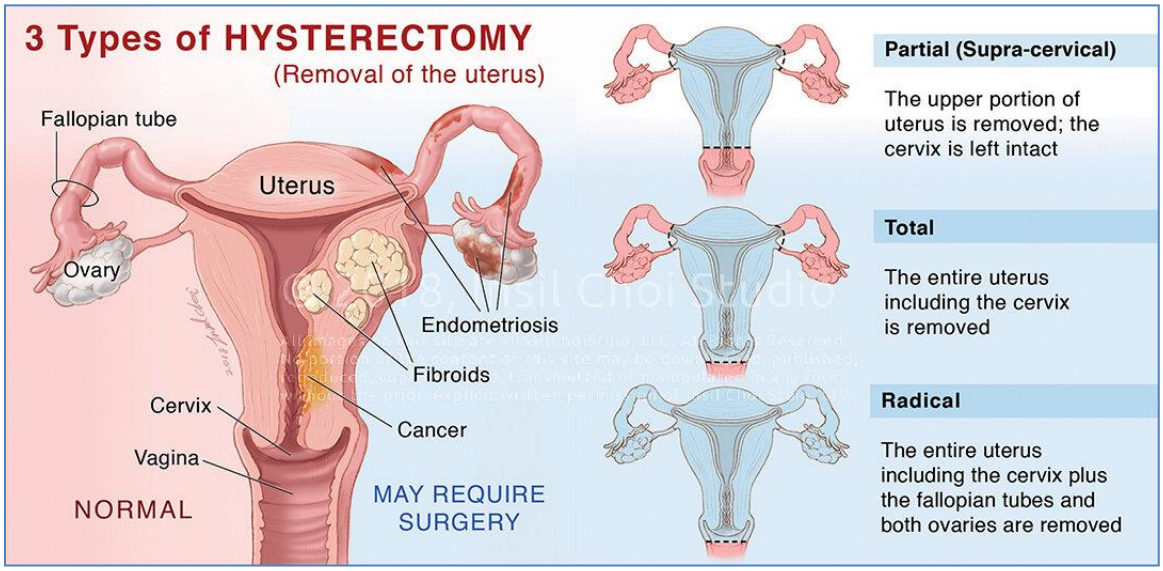
**Gynecological**

- Inflammation of genital tuberculosis
- Tumors: benign ovarian, fibroid, malignant of cervix, ovaries
- Displacement disorders, uterine prolapse (uterus sags down due to weak muscles), chronic inversion
- Dysfunctional uterine bleeding.
- Endometriosis and adenomyosis inappropriate tissue growth in uterine lining
- Cancer of reproductive prevention, the family history of breast cancer will be at risk of cervical cancer
- Cancer of endometrium, cervix, uterus
- Transgender male affirmation, helps in gender dysphoria
- Chronic pelvic pain
- Developmental disabilities of reproductive organ

## Types of hysterectomy

Hysterectomy means removal of the uterus, however the organs such as cervix, ovaries, fallopian tube can also be removed if necessary for better management of women health.

**Based on the part removed the hysterectomy is classified as**




**Total hysterectomy**, it is complete removal of uterus with cervix and with or without ovaries and fallopian tubes.

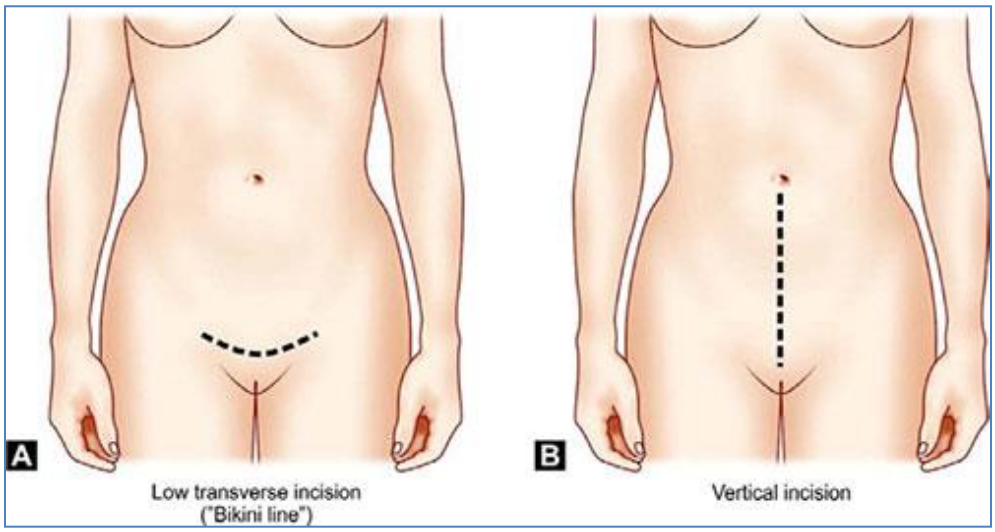
**Subtotal hysterectomy**, it is removal of uterus only by leaving cervix insitu.

**Radical hysterectomy**, it is removal of uterus, cervix, upper vagina, parametrium.

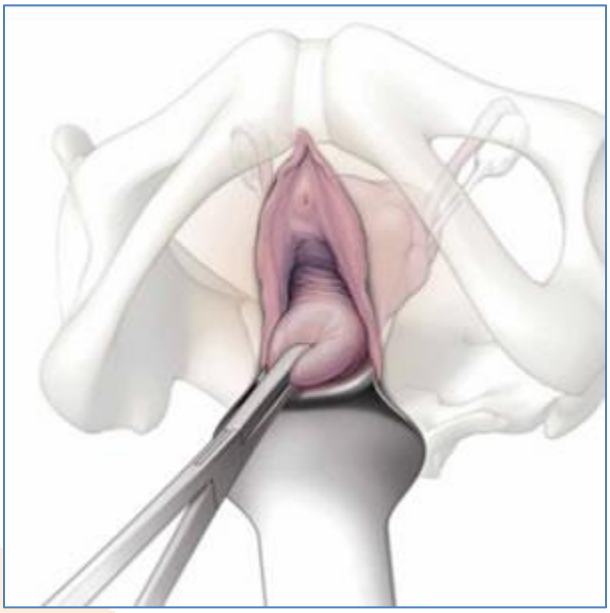
**Wertheims' hysterectomy**, it is radical hysterectomy along with lymphnodes, ovaries and fallopian tube removal.

**Based on the technique of approaching uterus the hysterectomy is classified as**

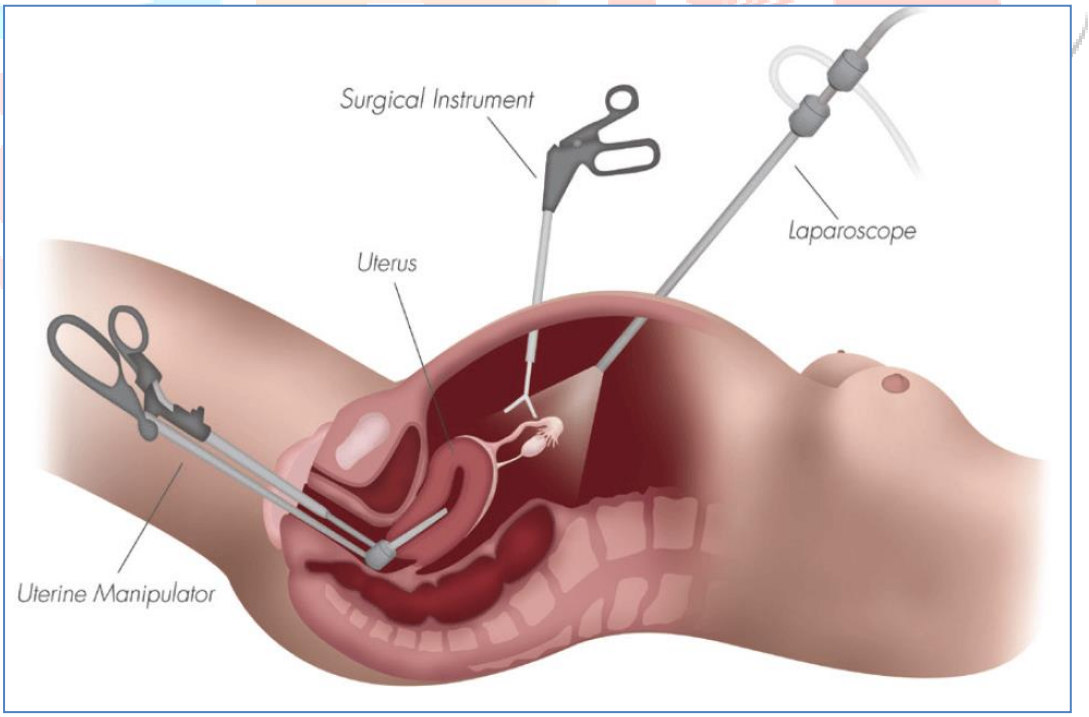
**Abdominal hysterectomy**, it is a transverse, pfannenstiel incision made through abdominal wall, above pubic bone similar incision like in caesarean section. The gynecologist will have great access to the reproductive structures however the recovery time is 4-6weeks.

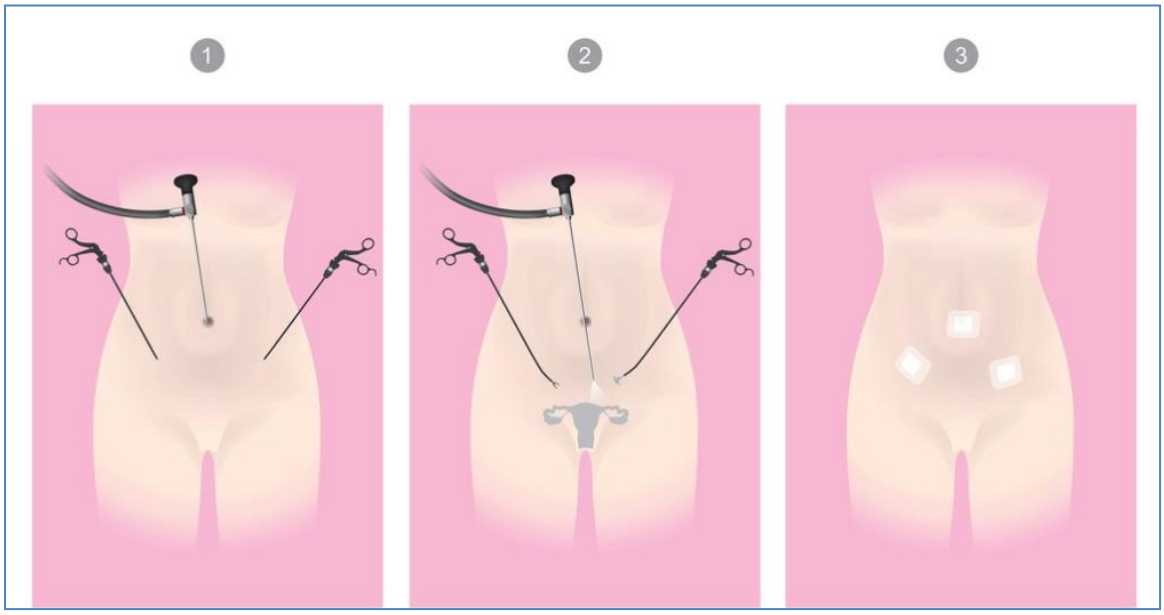


**Vaginal hysterectomy**, the surgery of removal of uterus and cervix is performed through vaginal canal.



**Laprascopic hysterectomy**, Prabhat K Ahluwalia developed laparascopic hysterectomy is less invasive procedure performed using a thin, flexible tube containing a video camera, inserted through thin incision in the abdomen near iliac and navel site, the uterus is removed by section.






**Laparoscopic assisted vaginal hysterectomy (LAVH)** is removal of uterus via vaginal canal through laparascopic, LAVH is also total hysterectomy if cervix is removed along with uterus.

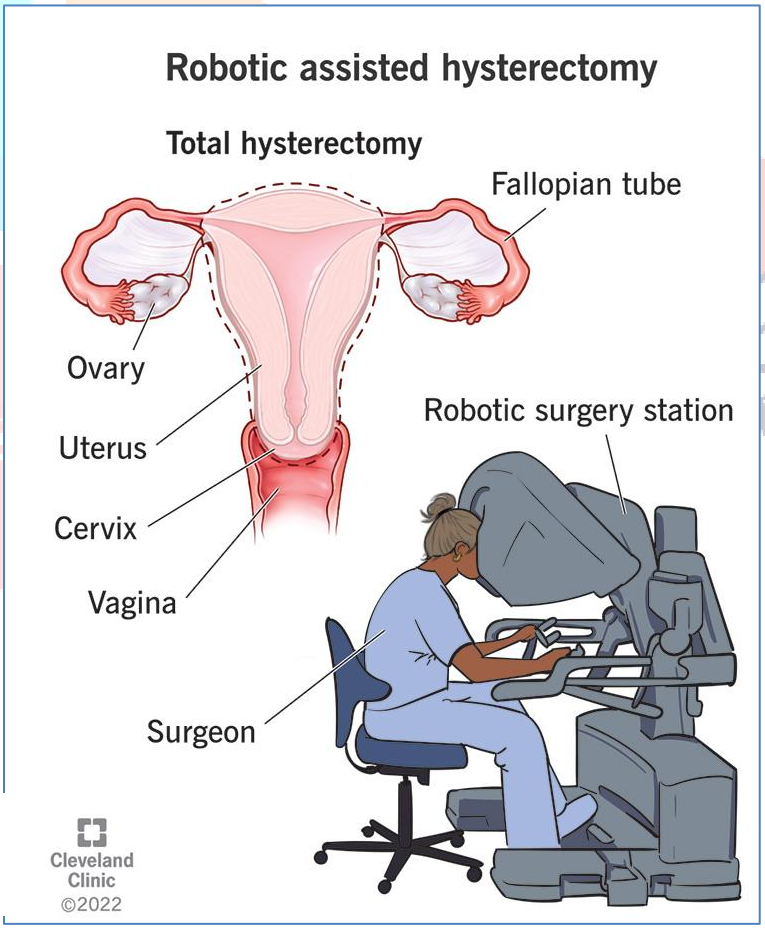
**Laparoscopic assisted supracervical hysterectomy (LASH)** is removal of uterus without cervix using morcellator in which uterus cut into small pieces so as to remove from abdominal cavity via laparoscopic ports.

**Total laparoscopic hysterectomy (TLH)** is disconnected from its attachments of uterus, through thin instruments passed via ports, then all tissues removed through small abdominal incisons.

**Supracervical laparoscopic hysterectomy (LSH)** is similar to total laparoscopic in which uterus if removed between cervix and fundus.

**Dual port laparoscopic** is 5mm midline incision, uterus is detached via two ports and removed through vagina.

**Robotic hysterectomy** is laparoscopic surgery using special remote controlled instrument allow gynecologist finer control in three dimension vision.


Robotic assisted hysterectomy
Total hysterectomy
Fallopian tube
Ovary
Uterus
Cervix
Vagina
Robotic surgery station
Surgeon
Cleveland Clinic
©2022

## Benefits and risk of hysterectomy procedure

| Type of hysterectomy | Benefits | Risks |
|---|---|---|
| Abdominal hysterectomy | ♦ No limitation by the size of the uterus.<br>♦ Combination with reduction and incontinence surgery possible.<br>♦ No increase in post-surgical complications compared with vaginal. | ♦ Longest recovery period and return to normal activities.<br>♦ May have a higher risk of bleeding compared with laparoscopic surgery.<br>♦ Vaginal or Laparoscopic technique preferred for people who are obese. |
| Vaginal hysterectomy | ♦ Shortest operation time<br>♦ Short recovery period and discharge from hospital<br>♦ Less pain medication and lower hospital costs compared with laparoscopic technique.<br>♦ Lowest cost. | ♦ Limited by the size of the uterus and previous surgery.<br>♦ Limited ability to evaluate the fallopian tubes and ovaries. |
| Laparoscopic supracervical hysterectomy (subtotal hysterectomy) | ♦ Unclear if subtotal approach leads to a reduction in pelvic organ prolapse in the long-term.<br>♦ No evidence that this technique improves sexual function or reduces operative risk of urinary or bowel damage.<br>♦ Faster return to normal activities. | ♦ Women must have regular cervical cancer screening following surgery.<br>♦ Possibility of cyclical bleeding following subtotal approach |
| Laparoscopic-assisted vaginal hysterectomy (LAVH) | ♦ Possible with a larger uterus, depending on the surgeon's skills.<br>♦ Combination with reduction operations are possible. | ♦ Higher cost than vaginal approach<br>♦ Malignancies can only be removed by this approach if they are intact<br>♦ Not suggested for people with cardiopulmonary disease |
| Total laparoscopic hysterectomy | ♦ Short inpatient treatment duration compared with abdominal.<br>♦ Allows the possibility to diagnose and treat other pelvic diseases.<br>♦ Quicker return to normal activities compared with abdominal.<br>♦ Less bleeding, fevers, infections compared with abdominal surgery. | ♦ Increased length of surgery.<br>♦ Requires a high degree of laparoscopic surgical skills.<br>♦ May have a higher risk of bladder or ureter injury. |

| | | |
|---|---|---|
| | ♦ Associated with a high quality of life in the long term, compared with abdominal. | |
| Single-port laparoscopic hysterectomy/mini laparoscopic hysterectomy | ♦ Improved cosmetic outcomes compared with conventional laparoscopic hysterectomy. | ♦ No significant clinical improvements compared with conventional laparoscopic hysterectomy |
| Robotic-assisted hysterectomy | ♦ May result in shorter hospital stays. | ♦ Similar complication rate compared with conventional laparoscopic<br>♦ Longer surgical times<br>♦ Increased cost |

## Hysterectomy procedure

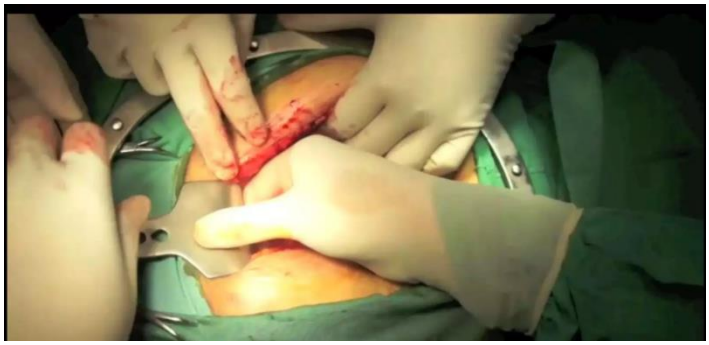
### Abdominal hysterectomy

The basic steps in abdominal hysterectomy

- ∇ patient positioning, examination under anesthesia and sterile preparation
- ∇ incision, exploration and ahesiolysis
- ∇ round ligament ligation
- ∇ broad ligament ligation
- ∇ adnexal removal
- ∇ perivesical and perirectal dissection
- ∇ cervical amputation
- ∇ treatment of the vaginal cuff
- ∇ final examination and closure

### The initial step in operation room

- ∇ position in dorsal or lithotomy position
- ∇ performance of pelvic examination and guide choice of incision
- ∇ insert foley bladder catheter
- ∇ sterile preparation of abdomen and vagina and surgical draping
- ∇ the skin incision is made midline vertical or transverse based on previous surgical scar, size and mobility of uterus, cosmetic view points, indication for abdominal exploration.
- ∇ **Exposure of uterus**, the gynecologist commonly use self retaining retractors by caution not to place lateral blades over a femoral nerve which emerge to psoas muscle failing this lead to peripheral neuropathy.



∇ **Round ligament ligation**, a large Kelly clamp is placed across uterine cornu then cut then suture, electrocauter is also used. The round ligament is divided at mid portion, then ligament is lifted to facilitate peritoneal dissection and division.

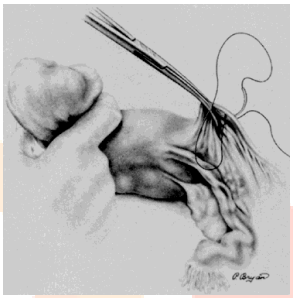


Figure: The round ligament is identified, clamped, and transfixion sutured. This procedure initiates the hysterectomy and allows entrance into the broad ligament and retroperitoneum.

∇ **Broad ligament dissection**, the incision in round ligament is then done inferiorly through peritoneum of the broad ligament to the level of uterine artery, and then medially along vesicouterine fold, separating the bladder peritoneum from the lower uterine segment.

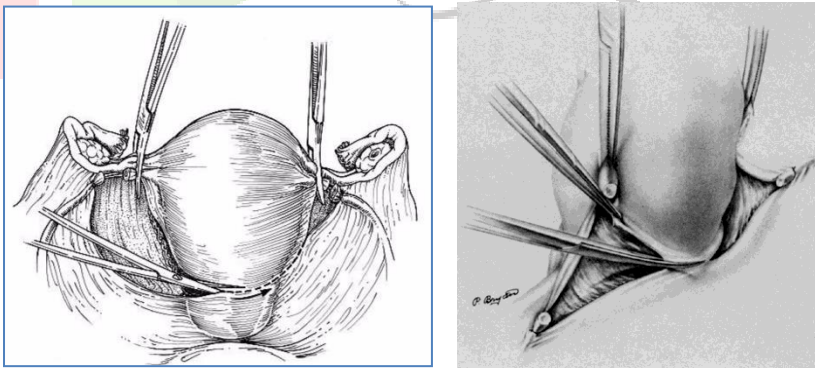


Figure: The anterior leaf of the broad ligament is incised toward the level of the internal os with Metzenbaum scissors. Bilateral incisions meet in the midline.

∇ **Identifying uterus**, the ureter is visualized on the medial leaf of the broad ligament in this space. If adhesive disease impedes visualization here, the ureter can be identified at the pelvic brim where it crosses the iliac vessels at their bifurcation. The ureter can then be followed downward through its

course to ensure that further dissection does not compromise its integrity. The ureter appears as a white, nonpulsatile tubular structure with fine blood vessels noted longitudinally on the adventitia. It is best identified by visualization of its characteristic peristaltic activity.

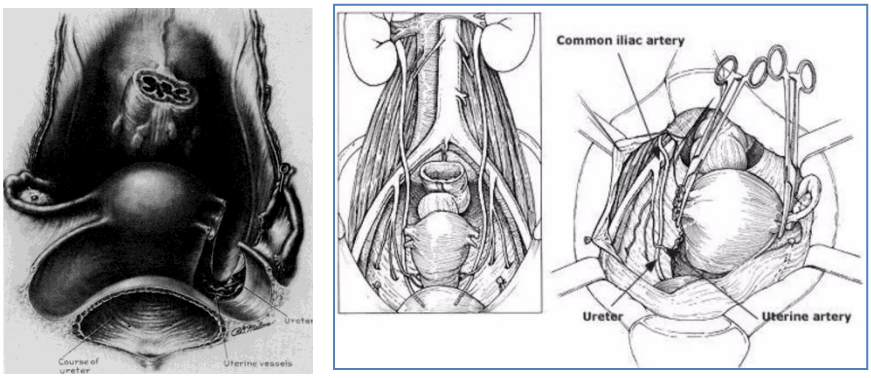
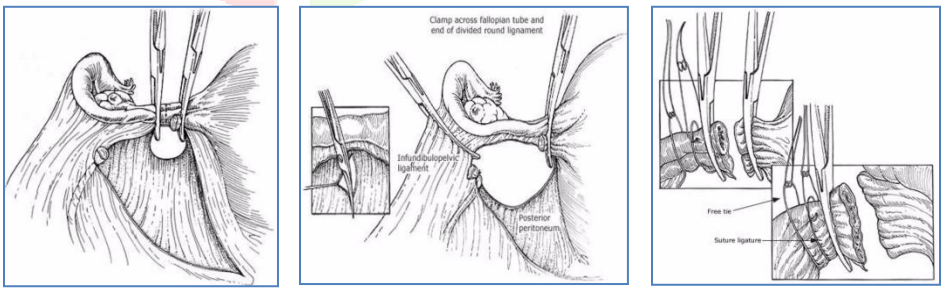


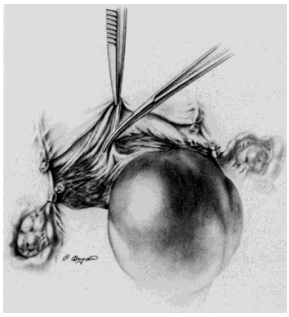

Figure: The ureter crosses the iliac vessels at their bifurcation, continues below the infundibulopelvic ligament on the posterior medial leaf of the broad ligament, and crosses under the uterine vessels before turning anterior and medially to enter the bladder.

∇ **Identification ureter**, the ureter inury prevention by better identifying ureter and bladder.

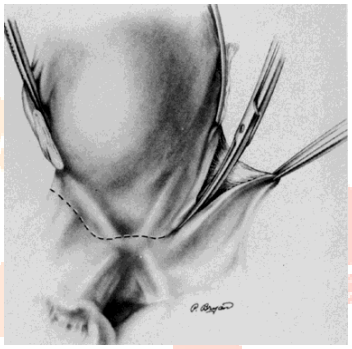
∇ **Ligation of ovarian vessels**,



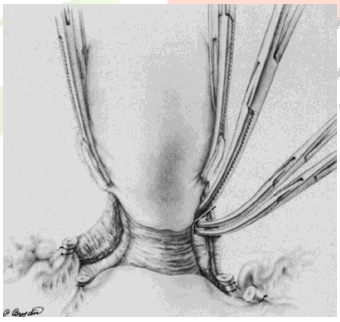

∇ **Development of bladder flap**, the bladder flap is developed by lifting the anterior peritoneum and retracting the uterus cephalad to expose the bladder reflection and enter the vesicocervical space.



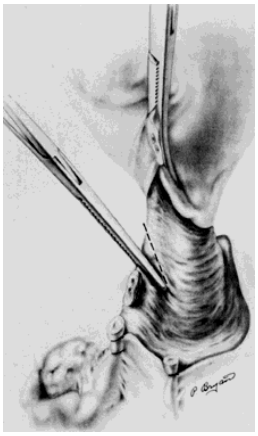
∇ **Uterine vessel ligation**, The posterior peritoneum is incised toward the posterior cervix at the level of the internal cervical os. The uterosacral ligaments join the cervix just beneath this level. Incision of the peritoneum immediately posterior to the cervix may be delayed until later to avoid extra bleeding. This peritoneum between the uterosacral ligaments may require no further mobilization if the reflection of the rectum is below the lower margin of the cervix.



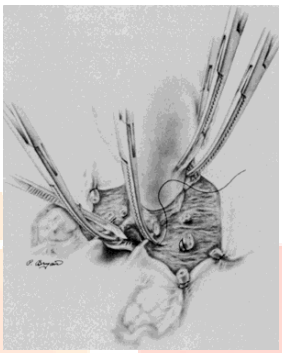
∇ The uterine vessels have been skeletonized. Three curved Heaney clamps are placed at right angles to the vessels. The lowest clamp is placed first and is at the level of the internal cervical os.



∇ A straight Heaney clamp is placed across the cardinal ligament medial to the previously ligated uterine vessels. As the clamp is closed, it is allowed to slide off the lateral surface of the cervix. Maintaining close proximity to the cervix maximizes the distance between the pedicle and the ureter.



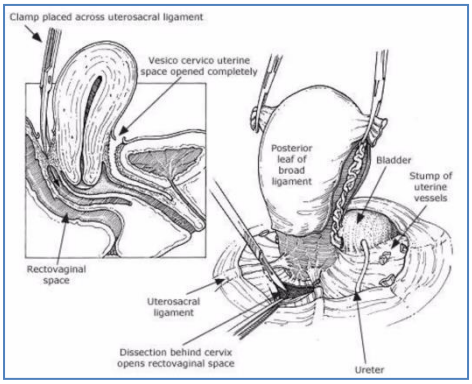
∇ The uterosacral ligament may be approached with a curved Heaney clamp from the posterolateral direction. The ligament is then cut and ligated with 0 delayed absorbable suture.

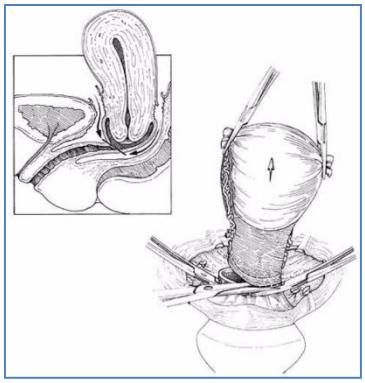


∇ **Cervical amputation**, In **Extrafascial technique**, the cervicovaginal junction at the level of the external cervical os is palpated, incision is made, entering the vaginal apex, a circumferential vaginal incision is made with scissors, ampulating the cervix and uterus.

∇ In **intrafascial technique**, a transverse incisions are made on the anterior and posterior surface of the cervix, below the level of the uterine vasculature.

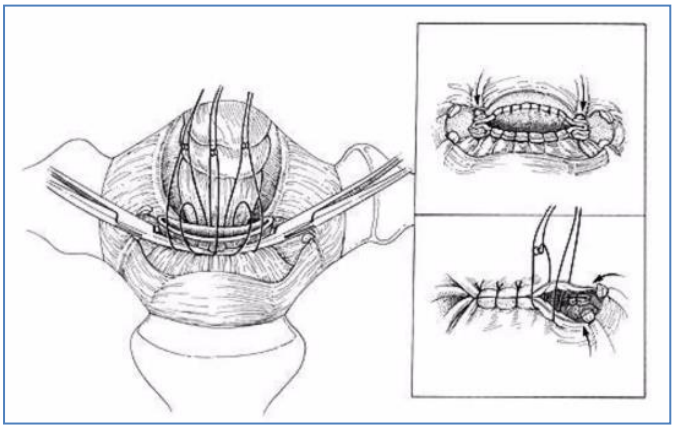
∇ The pubovesicocervical fascia is dissected off lower uterine segment and cervix with handle of the scalpel or with gauze covered index finger. Using heavy curved scissors, the vagina is incised and the cervix and uterus resected.



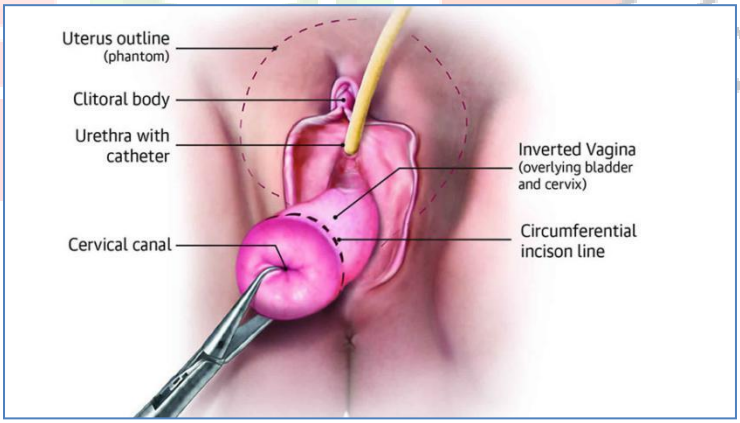
∇ **Vaginal cuff closure**, the vaginal cuff are closed by technique I, II, III where in after the amputation of the cervix, using absorbable size 0 running suture is placed from medial to lateral on each side by oversewing the curved Heaney clamp, the clamp is then removed and suture pulled tightly. In vaginal

cuff closure III, leaving the cuff open to heal, a running suture is used to hemostatis along the cuff edge and the peritoneal defect.



∇ **Final examination and closure**, the pelvis is thoroughly irrigated with warm saline, hemostatis is meticulously confirmed, the bladder and ureter are inspected, re-approximating of visceral and parietal of peritoneum is minized, the peritoneum, fascial, subcutaneous and skin are re-approximated and closed by continuous and interrupted sutures.

## Vaginal hysterectomy




The instruments required for vaginal hysterectomy are: Long, heavy Mayo scissors, Short and long weighted vaginal speculums with an extra-long blade, Heaney right-angle retractors, Jorgenson scissors, Long Allis clamps, Deaver retractors, a long needle holder, Heany clamps, Single tooth tenaculum, Single-tooth tenaculum, Bovie extender, Suction apparatus, neurosurgery headlight.

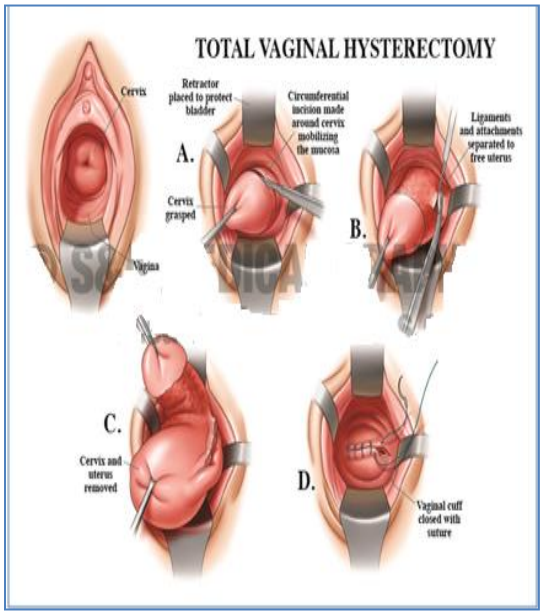

**Preparation of the patient**

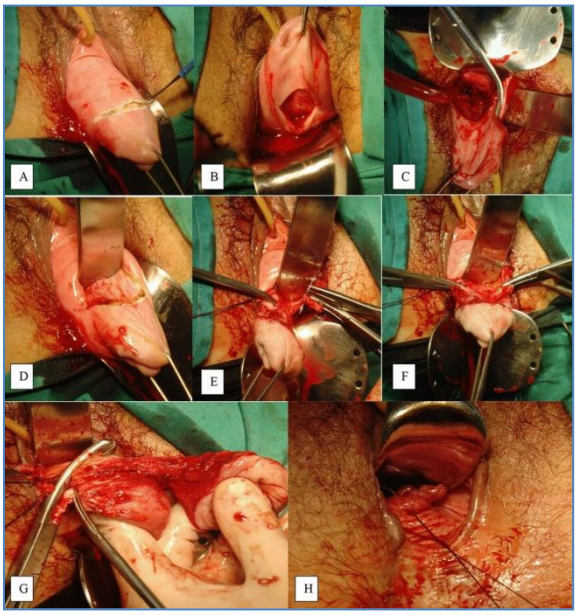
- ∇ Vaginal hysterectomy is typically performed with the patient positioned in dorsal lithotomy with the help of either candy cane or boot-type stirrups.
- ∇ Application of sequential compression devices or administration of anticoagulants for venous thromboembolism prophylaxis
- ∇ Antibiotic prophylaxis- We typically use cefazolin 1 to 2 gm IV, administered within 60 minutes of the incision.
- ∇ Time out (pre-procedure verification checklist) is always performed before the commencement of surgery to confirm the correct patient, type of the operation, equipment used, and the surgeon performing the procedure, as per the standard hospital protocol.
- ∇ The patient is examined under anesthesia for the evaluation of size, shape, mobility of the uterus, assessment of the adnexa, and other pelvic structures and the degree of descent of the uterus, vaginal wall caliber, and pelvic organ prolapse, cystocele, and rectocele are assessed.
- ∇ Povidine scrub is used for vaginal preparation before the procedure, sterile surgical drape to cover the patient to ensure the aseptic environment.

**Vaginal hysterectomy Procedure**

- ∇ **Decompression of the bladder** done by catheterizing bladder with Foleys catheter.
- ∇ The hemostasis and hydrodissection is managed by Injecting vasoconstricting agents, Dilute vasopressin (20 units in 100 ml of normal saline) is circumferentially injected into the proper planes of the cervicovaginal junction.[8,9]
- ∇ **A circumferential** incision is made around the cervix at the cervicovaginal intersection by using a scalpel or diathermy.

- **Dissection and deflection of the bladder**, **anterior colpotomy**, After the circumferential incision is made, the anterior aspect of the vaginal mucosa is grasped and tented up, sharp and blunt dissection is done to separate the vaginal mucosa from the cervical stroma.
- The peritoneum is identified, and the peritoneal cavity is entered sharply.
- A right angle or Deaver retractor is then placed into the peritoneal cavity, and the bladder is protected.[10,11]
- **Posterior cul-de-sac entry**, Posterior vaginal epithelium is grasped at the previous circumferential incision with a pair of Allis clamps and tended up.
- The peritoneum is identified and sharply entered with Mayo scissors.
- Once the peritoneal cavity is opened, the vaginal mucosa is stretched or incised laterally, and a long-weighted vaginal speculum is reinserted into the peritoneal cavity.
- **Uterosacral and cardinal ligament complex**, Uterosacral ligaments are felt by examining with the index finger.
- The right-angle retractor is placed in the medial aspect of the vagina for proper exposure of this ligament, which is then clamped with Heaney clamp and cut.
- It is then sutured, and the tail of the suture is clamped and saved for future McCall's culdoplasty.
- Similarly, the cardinal ligaments are identified, clamped, cut, and suture ligated.
- Care is taken during clamping as the ureters are very close to the uterosacral ligaments. Clamps are placed very close to the cervical stump. All clamps are incorporate both anterior and posterior peritoneum to prevent bleeding from collateral blood vessels.
- **Uterine vessels,** The Heaney clamp is widely opened and slide off the cervix, making sure all the vasculature is incorporated into the clamp, uterine vessels are cut, and suture ligated.[12,13]
- **Broad ligament,** is clamped medially, cut, and sutured.
- **Utero ovarian, round ligament complex, and cornual end of the Fallopian tube,** The upper and the final pedicle are clamped all together or separately and evaluates all pedicles in a clockwise fashion for adequate hemostasis.[14,15]
- **Closure of the cuff and McCall's culdoplasty,** As the vaginal apex is the most common site of bleeding during vaginal hysterectomy, closed with the running and locking fashion to control bleeding from the vaginal edges. Incorporate the uterosacral ligaments into the angle of the vaginal cuff at the time of cuff closure for the suspensory support of the vagina. This maneuver prevents future vaginal wall prolapsed. The vagina is not usually packed and a foley catheter is left in place until the patient is ambulatory.[16,17]



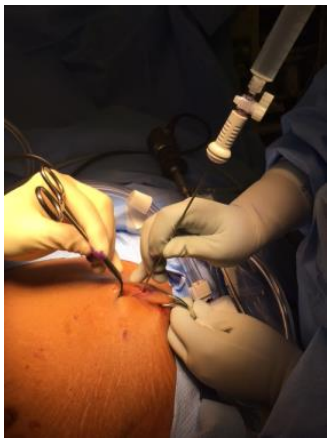
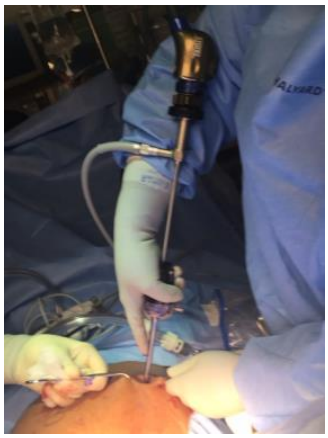

## Laparoscopic hysterectomy

### Preparation of patient

Check that equipment is available and functioning properly before starting the procedure, position the patient in low lithotomy and both arms are tuck to sides, foley catheter insertion, position dual monitors, check camera resolution.

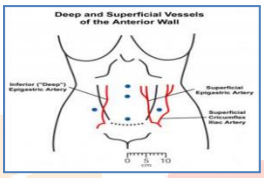
Laparoscopic hysterectomy procedure

∇ **Trocar insertion**, inserted through a hulka or veress needle or open technique.

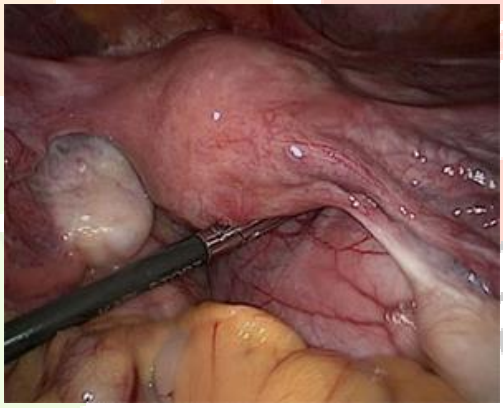




∇ Lateral ports, lateral margin of rectus muscle, beneath medial to anterior superior iliac spine

∇ Transillumination, is shining of light via abdomen to identify structures




∇ Survey the abdominal cavity, to identify uterus

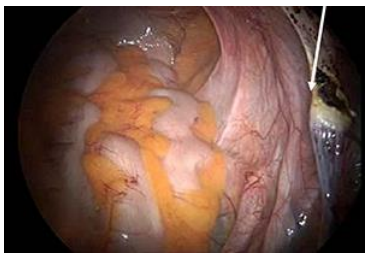


∇ ABC technique, anatomy identification, detachment of adnexa, broad ligament, bladder and blood vessels identification, cardinal ligament, colpotomy and cuff closure.[18]

∇ The procedure begins with salpingectomy, staying at level of mesosalpinx parallel to fallopian tube avoiding ovarian vessels, cauterizing and transect the infundibulopelvic liagament.[19]

∇ Inspection of location of uterus, desiccate perpendicular to the axis.



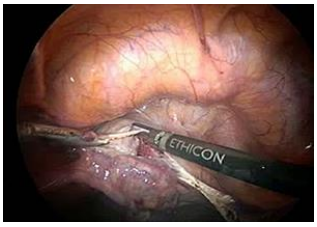


Cauterizing and transect round ligament

Cauterizing and transect infundibulopelvic ligament

Identifying uterus again

∇ Making a bladder flap dissection, then transect uterine vessels lateralize the cardinals protect uterus.[20]

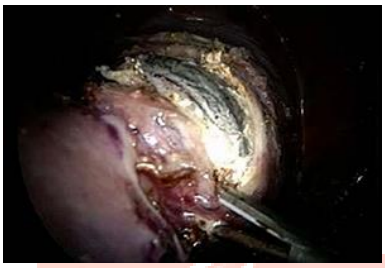



The bladder flap dissection

Cauterizing and transect uterine vessels

∇ Till then completing the same procedure to opposite side, following which completing the colpotomy incision, then the vaginal artery id cauterize and transect.

Complete colopotomy incision

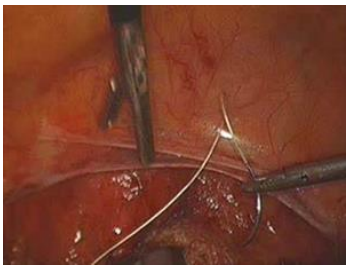


Cauterizing and transect vaginal artery

∇ Completing the posterior colpotomy preserving the uterosacral liagament support, finally removal of uterus from below or from the umbilical incision with contained in-bag morcellation.[21,22]

∇ Closing the vaginal cuff, removal of ports, close fascia defects if any larger than 10mm[23]

Complete posterior colpotomy



Closing of vaginal cuff laparoscopically

## Preoperative preparation for hysterectomy

- ∇ Assessing and correcting physiologic and psychologic problems that may increase surgical risk.
- ∇ Giving the person and significant others complete learning / teaching guidelines regarding surgery.
- ∇ Instructing and demonstrating exercises that will benefits the person during postop period.
- ∇ Planning for discharge and any projected changes in lifestyle due to surgery.
- ∇ Physiologic Assessment of the Client Undergoing Surgery
- ∇ Presence of Pain
- ∇ Nutritional & Fluid and Electrolyte Balance
- ∇ Cardiovascular / Pulmonary Function
- ∇ Renal Function
- ∇ Gastrointestinal / Liver Function
- ∇ Endocrine Function
- ∇ Neurologic Function
- ∇ Hematologic Function
- ∇ Use of Medication
- ∇ Presence of Trauma & Infection
- ∇ Routine Preoperative Screening
- ∇ Test Test Rationale CBC RBC,Hgb,Hct are important to the oxygen carrying capacity of blood.
- ∇ WBC are indicator of immune function.
- ∇ Blood grouping/ X Determined in case blood transfusion is matching required during or after surgery.
- ∇ Serum Electrolyte To evaluate fluid and electrolyte status PT,PTT Measure time required for clotting to occur.
- ∇ Fasting Blood High level may indicate undiagnosed DM Glucose
- ∇ BUN / Creatinine
- ∇ Evaluate renal function ALT/AST/LDH (alanine transaminase (ALT) and aspartate transaminase (AST), alkaline phosphatase (ALP), gamma-glutamyl transferase (GGT), serum bilirubin, prothrombin time (PT), the international normalized ratio (INR), total protein and albumin. Lactate hydogenase)
- ∇ Evaluate liver function and Bilirubin Serum albumin
- ∇ Evaluate nutritional status and total CHON Urinalysis Determine urine composition
- ∇ Chest X-ray Evaluate resp. status/ heart size ECG Identify preexisting cardiac problem.
- ∇ Psychosocial Assessment and Care Causes of Fears of the Preoperative Clients

- ∇ Fear of Unknown ( Anxiety )
- ∇ Fear of Anesthesia
- ∇ Fear of Pain
- ∇ Fear of Death
- ∇ Fear of disturbance on Body image
- ∇ Worries – loss of finances, employment, social and family roles.

## Postoperative care for hysterectomy

- ∇ Restore homeostasis and prevent complication Maintain adequate cardiovascular and tissue perfusion.
- ∇ Maintain adequate respiratory function. Maintain adequate nutrition and elimination.
- ∇ Maintain adequate fluid and electrolyte balance. Maintain adequate renal function.
- ∇ Promote adequate rest, comfort and safety. Promote adequate wound healing.
- ∇ Promote and maintain activity and mobility.
- ∇ Provide adequate psychological support.
- ∇ Walking and stair climbing are encouraged
- ∇ Tub baths or showers are advisable.
- ∇ Avoid heavy lifting (more than 20 pounds of weight from the floor) for 4-6 weeks to minimize stress on the healing fascia
- ∇ Vaginal intercourse is also discouraged 4-6 weeks to allow the vaginal cuff to heal completely
- ∇ Driving should be avoided until full mobility returns and opioid analgesia is no longer required
- ∇ May return to work as soon as women has regained sufficient stamina and mobility
- ∇ A prophylactic antibiotic agent should be given as a single dose 30 minutes prior to the first incision for vaginal hysterectomy
- ∇ Cefazolin, Cefoxitin, and Cefuroxime, Metronidazole (500 mg IV) may be used in patients with cephalosporin allergies
- ∇ A course of appropriate preoperative antibiotics in women with bacterial vaginosis can reduce the frequency of cuff infection

## Postoperative complication of hysterectomy

- ∇ Shock
- ∇ Hemorrhage
- ∇ Infection
- ∇ Intestinal complications as acute gastric dilatation
- ∇ Pulmonary complications such as bronchitis, pneumonia, pulmonary collapse
- ∇ Venous thrombosis (Deep vein thrombosis and supra ventricular trachycardia)
- ∇ Post operative anesthetic complications such as Cyanosis, vomiting
- ∇ Remote Complications such as vaginal discharge (infection), vaginal vault prolapse, low back ache
- ∇ Menopausal symptoms such as sadness, irritability

## Role of operational technologist during hysterectomy

The role of an operation technician in the operation theatre is to provide technical support for medical personnel and patients during hysterectomy operation.

Operation technician are responsible for setting up, maintaining, and cleaning the operation theatre in accordance with prescribed procedures, as well as monitoring and maintaining the equipment and supplies used in the operation theater.

Operation technician should report any malfunctions or concerns that arise during a surgical procedure to the operation theater personnel.

In addition, operation technician may be required to assist in the sterilization of equipment and supplies, and to ensure that the operation theater is in compliance with all safety protocols.

Duties and responsibilities of an operating room technician include preparing the operating room for surgery, sterilizing and setting up surgical instruments, positioning the patient on the operating table, passing instruments to the surgeon during the procedure, and ensuring that the operating room is properly stocked and maintained.

Additionally, operation room technicians are responsible for monitoring the patient's vital signs, ensuring the patient's safety, and providing assistance to the surgical team.

After the procedure, operation theater may also assist with cleaning and sterilizing the operating room and prevention of contamination by proper personal protective equipments includes protective clothing, mask, gloves, gowns.

Operation room technician responsible for maintaining the quality of operation room, equipments, organize excellent skills and work well in pressure.

Operation room technician manages the anesthesia, monitor vital signs, provide assistance to the anesthesiologist, intravenous line insertion, provides instruments to surgeon during surgery, help in positioning patients.

Finally, the best qualities of operation theater technician should possess are detail attention, excellent organizational skills and ability to work under pressure.[24]

**References**


1. Plotting the downward trend in traditional hysterectomy | Institute for Healthcare Policy & Innovation . ihpi.umich.edu. Retrieved 2019-08-06.
2. Bahamondes L, Bahamondes MV, Monteiro I (July 2008). "Levonorgestrel-releasing intrauterine system: uses and controversies". Expert Review of Medical Devices. 5 (4): 437-445. doi:10.1586/17434440.5.4.437. PMID 18573044. S2CID 659602
3. Kolata, Gina. "Rate of Hysterectomies Puzzles Experts". The New York Times. 1988-09-20
4. Khastgir G, Studd J. Hysterectomy and HRT. Taylor & Francis. p. 3. ISBN 978-1-85317-408-7. (1998).
5. Hysterectomy rates falling: report . CBC News. 2010-05-27. Retrieved 2010-05-28.
6. Wolfrum C. Vorschnelle Schnitte. Apotheken Umschau. Baierbrunn: Wort & Bild Verlag. 1 June 2008
7. Gimbel H, Settnes A, Tabor A (March 2001). "Hysterectomy on benign indication in Denmark 1988-1998. A register based trend analysis". Acta Obstetricia et Gynecologica Scandinavica. 80 (3): 267–272. doi:10.1080/j.1600-0412.2001.080003267.x. PMID 11207494
8. Wright JD, Herzog TJ, Tsui J, Ananth CV, Lewin SN, Lu YS, Neugut AI, Hershman DL. Nationwide trends in the performance of inpatient hysterectomy in the United States. Obstet Gynecol. 2013 Aug;122(2 Pt 1):233-241.
9. Dedden SJ, Geomini PMAJ, Huirne JAF, Bongers MY. Vaginal and Laparoscopic hysterectomy as an outpatient procedure: A systematic review. Eur J Obstet Gynecol Reprod Biol. 2017 Sep;216:212-223.
10. ACOG Practice Bulletin No. 195: Prevention of Infection After Gynecologic Procedures. Obstet Gynecol. 2018 Jun;131(6):e172-e189.
11. Wood C, Maher P, Hill D. Bleeding associated with vaginal hysterectomy. Aust N Z J Obstet Gynaecol. 1997 Nov;37(4):457-61.

12. Cavkaytar S, Kokanali MK, Topcu HO, Aksakal OS, Doganay M. Effects of horizontal vs vertical vaginal cuff closure techniques on vagina length after vaginal hysterectomy: a prospective randomized study. J Minim Invasive Gynecol. 2014 Sep-Oct;21(5):884-7.
13. Bright TC, Peters PC. Ureteral injuries secondary to operative procedures. Report of 24 cases. Urology. 1977 Jan;9(1):22-6.
14. Gilmour DT, Das S, Flowerdew G. Rates of urinary tract injury from gynecologic surgery and the role of intraoperative cystoscopy. Obstet Gynecol. 2006 Jun;107(6):1366-72.
15. Sorinola O, Begum R. Prevention and management of ureteric injuries. Hosp Med. 2005 Jun;66(6):329-34.
16. Aarts JW, Nieboer TE, Johnson N, Tavender E, Garry R, Mol BW, Kluivers KB. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane Database Syst Rev. 2015 Aug 12;2015(8):CD003677.
17. Humes JC, Weir L, Keyser EA, Molina MM. The Dying Art of Vaginal Hysterectomy: A Novel Simulation. Cureus. 2019 Dec 12;11(12):e6362.
18. Cheetham G, Chivers GE. (2005). Professions, competence and informal learning. Edward Elgar Publishing, p. 337.
19. Eraut M. (1994). Developing professional knowledge and competence. Psychology Press, p. 124.
20. Hoffman BL, Schorge JO, Halverson LM, Hamid CA, Corton MM, Schaffer JI. (2020) Williams Gynecology, 4e. Chapter 44: Mininally Invasive Surgery, pp. 873- 906.
21. Levine RL, Pasic RP. (2002). A practical manual of laparoscopy: a clinical cookbook. London: Parthenon. Chapter 11 Ectopic Pregnancy Roy G and Luciano A., pp. 157–171.
22. Reznick R, Regehr G, MacRae H, Martin J, McCulloch W. (1997). Testing technical skill via an innovative bench station examination. The American Journal of Surgery, 173(3), pp. 226–230.
23. Rock JA, Jones HW, Te Linde RW, Wesley R. (2008). Te Linde's operative gynecology. Chapter 34: Ectopic Pregnancy, pp. 798– 822.
24. Available at URL: https://livepariksha.com/blog/ot-technician-meaning-and-role-of-ot-technician-in-operation-theatre