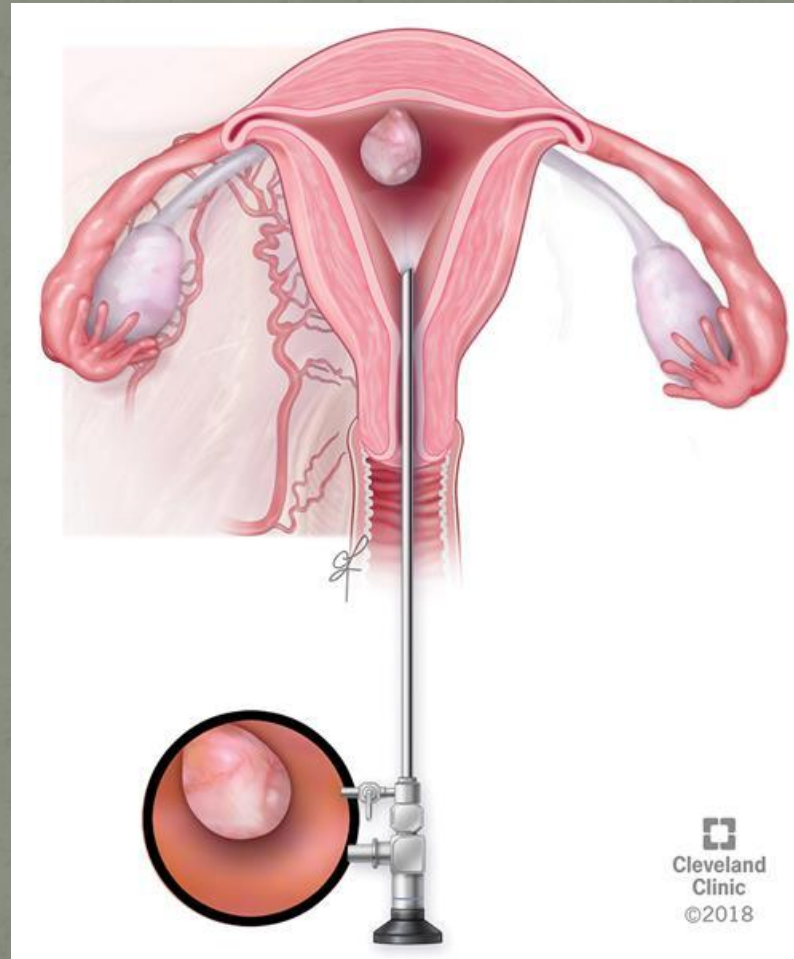


# Hysteroscopy



Derived from the Greek words

- hystera (uterus)
- skopeo (“to view”)

hysteroscopy is visual examination of the cervix and uterus with an endoscope .

Hysteroscopy can be performed for **diagnostic** or **therapeutic** indications.

# INSTRUMENTATION

- Telescopes
- Camera
- Light Generators
- Diagnostic and Operative Sheaths



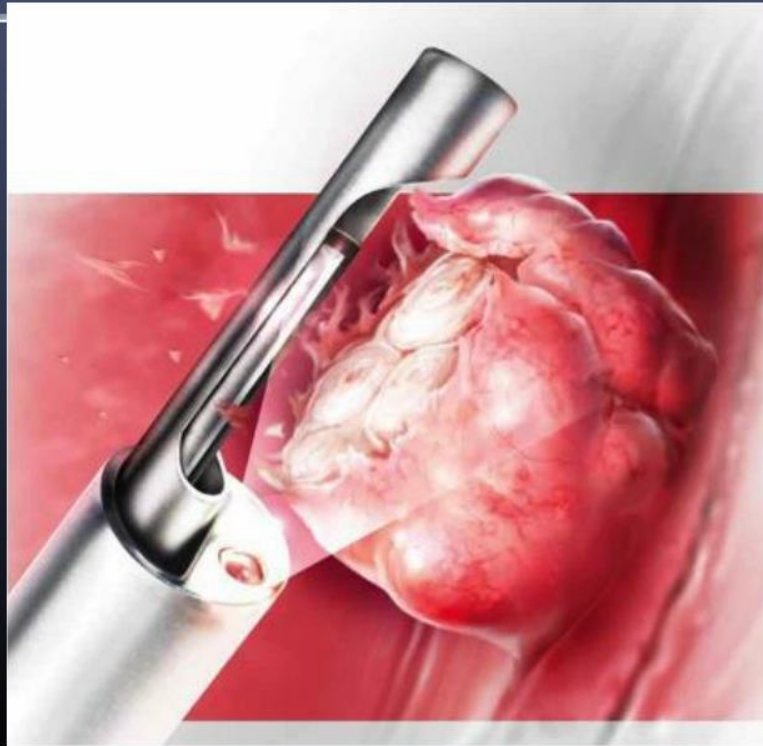
# Diagnostic and Operative Sheaths

- A **diagnostic sheath** is required to deliver distension media into the uterine cavity
- The sheath may be 4 to 5 mm in diameter, depending on the outer diameter of the telescope
- **Operative sheaths** have a larger diameter , ranging in size from 7 to 10 mm.
- an operative channel may be present to introduce scissors, graspers or biopsy instruments.

# Resectoscope

- a specialized electrosurgical (monopolar or bipolar) endoscope
- includes a double-armed electrode
- fitted to a trigger device that pushes the electrode out beyond the sheath and then pulls it back within the sheath
- Most resectoscopes are equipped with a 30-degree telescope
- Most operating sheaths measure 8 mm or more in outer diameter
- **cervical dilatation** is usually required for insertion

# Hysteroscopic Morcellator





# Hysteroscopic morcellator

- rotary blade that cuts lesions
- tissue is then aspirated through the morcellator
- Morcellators, which are inserted through the working channel of hysteroscope, exist for use with 6 mm, 7 mm, and 9 mm hysteroscopes.
- The morcellator **does not use** radiofrequency electrical energy
- **is not able to** coagulate bleeding vessels encountered during surgery

# Rigid versus flexible

## Most hysteroscopes are rigid

**Rigid hysteroscopes** cause more intraoperative pain, but offer better optical quality and are less costly and ease of insertion.

**Flexible hysteroscopy** is especially useful for diagnostic or operative procedures in women with an irregularly shaped uterus, as the distal tip can be deflected upward or downward (for tubal cannulation or lysis of adhesions near the tubal ostia)



# DISTENSION MEDIA AND FLUID MANAGEMENT

- The thick muscle of the uterine wall requires a **minimum pressure of 40 mm Hg** to distend the cavity sufficiently for visualization
- variety of distension media can be used to attain the **desired degree of distension**, it usually requires pressures approximating **70 mm Hg**
- An intrauterine pressure of **125 to 150 mm Hg** may be required if there is **uterine bleeding**.

# Distending media

- The **most commonly** used distending media are **low viscosity fluids** and **carbon dioxide**.
- Carbon dioxide is used for diagnostic procedures:
  - does not allow the clearing of blood and endometrial debris during the procedure, which could make the imaging visualization difficult.
  - Gas embolism
- These fluids must be continuously flushed through the uterine cavity to obtain a clear view

# Distending media

**Electrolytic solutions** include normal saline and lactated Ringer's solution. Current recommendation is to use the electrolytic fluids in diagnostic cases, and in operative cases in which mechanical, laser, or bipolar energy is used.

Since they conduct electricity, these fluids should not be used with monopolar electrosurgical devices.

**Non-electrolytic fluids** eliminate problems with electrical conductivity, but can increase the risk of hyponatremia.

These solutions include glucose, glycine, dextran (Hyskon), mannitol, sorbitol and a mannitol/sorbital mixture (Purisol).

- Glucose is contraindicated in patients with glucose intolerance.
- Sorbitol metabolizes to fructose in the liver and is contraindicated if a patient has fructose malabsorption.

**Water** was once used routinely, however, problems with water intoxication and hemolysis discontinued its use by 1990.



# Distending media

## High-viscous Dextran.

- It may crystallize on instruments and obstruct the valves and channels.
- Coagulation abnormalities
- ARDS

**Glycine** metabolizes into ammonia and can cross the blood brain barrier, causing agitation, vomiting and coma.

## Mannitol 5%

- should be used instead of glycine or sorbitol when using monopolar electrosurgical devices.
- has a diuretic effect and can also cause hypotension and circulatory collapse.

**The mannitol/sorbitol mixture (Purisol)** should be avoided in patients with fructose malabsorption.

# PREOPERATIVE EVALUATION AND PREPARATION

- **Informed consent** the risks, benefits, and alternatives should be obtained prior to a hysteroscopic procedure
- **Important risks** to review include risk of uterine perforation, bleeding, infection, fluid overload, and, in extremely rare circumstances, injury to the bowel, bladder, vessels, or nerves
- patients should consent to a **possible laparoscopy or laparotomy** if it becomes necessary to rule out visceral or vascular injury

# Indications

- Asherman's syndrome.
- Endometrial polyp: Polypectomy.
- Abnormal uterine bleeding
- Adenomyosis
- Endometrial ablation
- Myomectomy for uterine fibroids.
- Congenital uterine malformations : Müllerian malformations
- Evacuation of retained products of conception in selected cases.
- Removal of embedded IUDs.
- Evaluation of cesarean delivery scar defect or isthmocele
- Persistent bleeding after termination of pregnancy
- Endocervical lesions
- Vaginoscopy
- Preoperative planning
- Postoperative or postprocedure follow-up



# Contraindications to performing hysteroscopy

- acute pelvic or vaginal infection
- Pregnancy
- recent uterine perforation
- Known cervical or uterine cancer is a *relative contraindication*

# Timing and endometrial preparation

- **premenopausal women** with regular menstrual cycles, performing hysteroscopy during the **proliferative phase**
- During the **secretory phase**, the thick endometrium can mimic endometrial polyps and lead to **inaccurate diagnoses**.
- In reproductive age women with **irregular uterine bleeding**, the ideal time for the procedure is **unpredictable**.
- For **postmenopausal women**, hysteroscopy may be performed at **any time**.

# Timing and endometrial preparation

Another approach is pharmacologic thinning of the endometrium:

Thinning agents should be used only when the surgeon plans operative hysteroscopic resection of a leiomyoma or endometrial ablation.

Thinning agents should not be used when ~~diagnostic hysteroscopy~~ alone is planned, as these hormones may influence the histology of the endometrium.

The most commonly used agents are estrogen-progestin contraceptives or progestins alone (oral medroxyprogesterone acetate 10 mg daily on cycle days 15 to 26) .

Gonadotropin releasing hormone agonists and danazol are also effective, but are used infrequently due to adverse effects .

All of these agents require **at least two months of therapy** to effectively thin the endometrium.

Regimens that require a **shorter duration of therapy** have been proposed ( desogestrel and raloxifene).



# Cervical preparation and dilation

- **nearly 50 percent** of hysteroscopic complications are associated with difficult passage of the hysteroscope through the cervical canal
- premenopausal women undergoing hysteroscopy with a narrow caliber <5mm or flexible hysteroscope
- **Women benefit cervical dilation :**
  - ❖ having procedures with larger hysteroscopes ( $\geq 5$  mm)
  - ❖ cervical stenosis or cervical surgery
  - ❖ postmenopausal

# Cervical dilation :

- mechanically at the time of the procedure (dilators)
- preoperatively with cervical ripening agents :
- **misoprostol** (to facilitate an easier and uncomplicated procedure only in premenopausal women. (Pre-treat with a prostaglandin the night before the procedure ( a single dose of misoprostol, 200 to 400 mcg, taken orally or inserted into the vagina))
- **dinoprostone**
- vaginal osmotic dilators (laminaria).

**Postmenopausal patients** –pretreatment of postmenopausal women with vaginal estrogen (25 mcg daily) for two weeks before surgery.

**Preoperative dilation** is generally **preferred** because it avoids or reduces the need for mechanical dilation and the associated risks of pain, uterine perforation, and false track creation

## Evening primrose oil (EPO)

One study reported evening primrose oil (EPO) facilitated cervical ripening and dilation before operative hysteroscopy in both pre- and postmenopausal patients

Patients without a prior vaginal delivery were randomly assigned to receive two soft gels (each 500 mg) placed into the posterior vaginal fornix six to eight hours before operative hysteroscopy.

The total dilation time and the size of the first dilator used to apply force was **less** in women treated with EPO.

It is **easy** to use, **available**, **inexpensive**, and had **no serious sequelae**



### Prophylactic antibiotics :

- Antibiotics are not routinely administered

### Sterile preparation :

- Povidone iodine

### Anesthesia :

- Analgesics are not always necessary.
- Local anesthesia can be used. A paracervical block may be achieved using a lidocaine injection in the upper part of the cervix.
- under general anesthesia

# PROCEDURE

- *Entry and cervical dilation*
- dorsal lithotomy position
- placement of speculum
- use of tenaculum or mechanical dilation as needed
- The cervix should not be dilated beyond the size of the hysteroscope, since this may cause leakage of distending medium

# Evaluating the uterine cavity

- 1 to 3 percent of benign or malignant endometrial lesions are missed on hysteroscopy
- avoid missing uterine pathology, endometrial sampling (hysteroscopic biopsies or blind sampling)
- Women with focal pathology should undergo hysteroscopically directed removal of lesions



# POSTOPERATIVE CARE

- cramping
  - light bleeding
  - vaginal discomfort
  - Carbon dioxide distension can cause referred shoulder pain, but this typically resolves within 15 minutes
- Acetaminophen** or **NSAID** drugs are usually adequate.

We see patients for a follow-up visit two weeks postoperatively to assess for further complications and review pathology results.

# COMPLICATIONS

Complications from hysteroscopy are **rare**, but some are potentially life threatening.

**operative hysteroscopic** procedures reported a complication rate of **0.22 percent**.

## The most common complication :

- ❑ Hemorrhage :
  - operative sites
  - uterine perforation
  - cervical laceration
  
- ❑ perforation of the uterus (0.12 percent)
- ❑ Fluid overload (0.06 percent)
- ❑ intraoperative hemorrhage (0.03 percent)
- ❑ bladder or bowel injury (0.02 percent)
- ❑ endomyometritis (0.01 percent).
- ❑ Embolism
- ❑ Infection

# Uterine perforation :

- A uterine perforation can occur during mechanical cervical dilation or insertion of the hysteroscope.
- Such a perforation may be recognized when an instrument passes beyond depth of the uterine fundus.
  - sudden loss of visualization.
  - Bleeding
  - omentum or bowel or peritoneal structures can be visualized
  - sudden increase in the Fluid deficit.



# Excessive fluid absorption

Methods to **prevent** fluid overload include the following:

- use isotonic fluids normal saline
- monitor the fluid deficit closely
- maintain intrauterine fluid pressure at 70 to 80 mm Hg
- limit surgical operating time to 1 hour or less

# SUMMARY AND RECOMMENDATIONS

- Hysteroscopy is a procedure in which a telescope with a camera is used to evaluate or treat pathology of the endometrial cavity, tubal ostia, or endocervical canal.
- Most women will need cervical dilation to undergo hysteroscopy.
- Prophylactic antibiotics are not routinely administered during hysteroscopy
- Most diagnostic and brief or minor operative procedures can be performed without anesthetic
- Hysteroscopic complications are infrequent. Major complications include: uterine perforation, fluid overload, and gas embolism