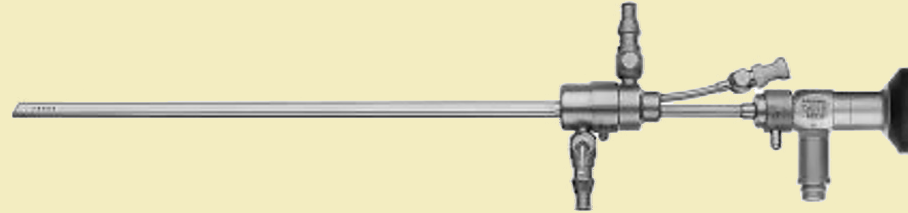


The Hysteroscope is my Stethoscope:

The Role of Hysteroscopy in 2022



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Disclosures

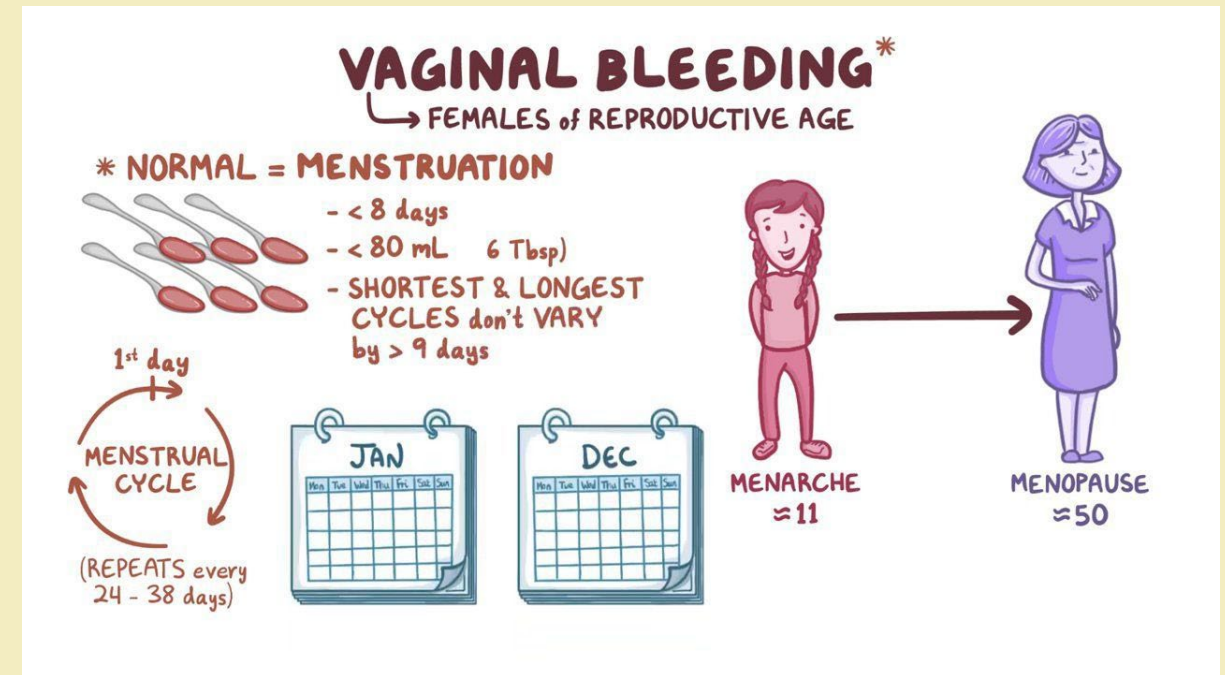
I have no financial relationships to disclose

Objectives

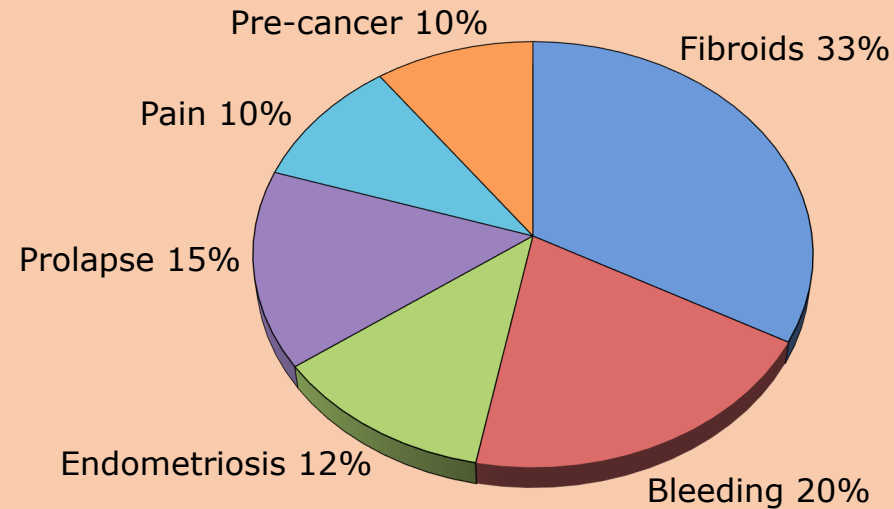
- Describe the benefit that hysteroscopy adds to accurate diagnosis
- List ergonomic and economic benefits of office hysteroscopy
- Outline safety and patient management concerns

Abnormal Uterine Bleeding

- Affects ~20% of reproductive age women worldwide
- ~35% of gynecology referrals
- ~60% of AUB referrals treated with hysterectomy within 5 years
 - Path of least resistance
 - (no uterus, no bleeding)



Hysterectomy for Benign Indications



Number of Hysterectomies in the USA

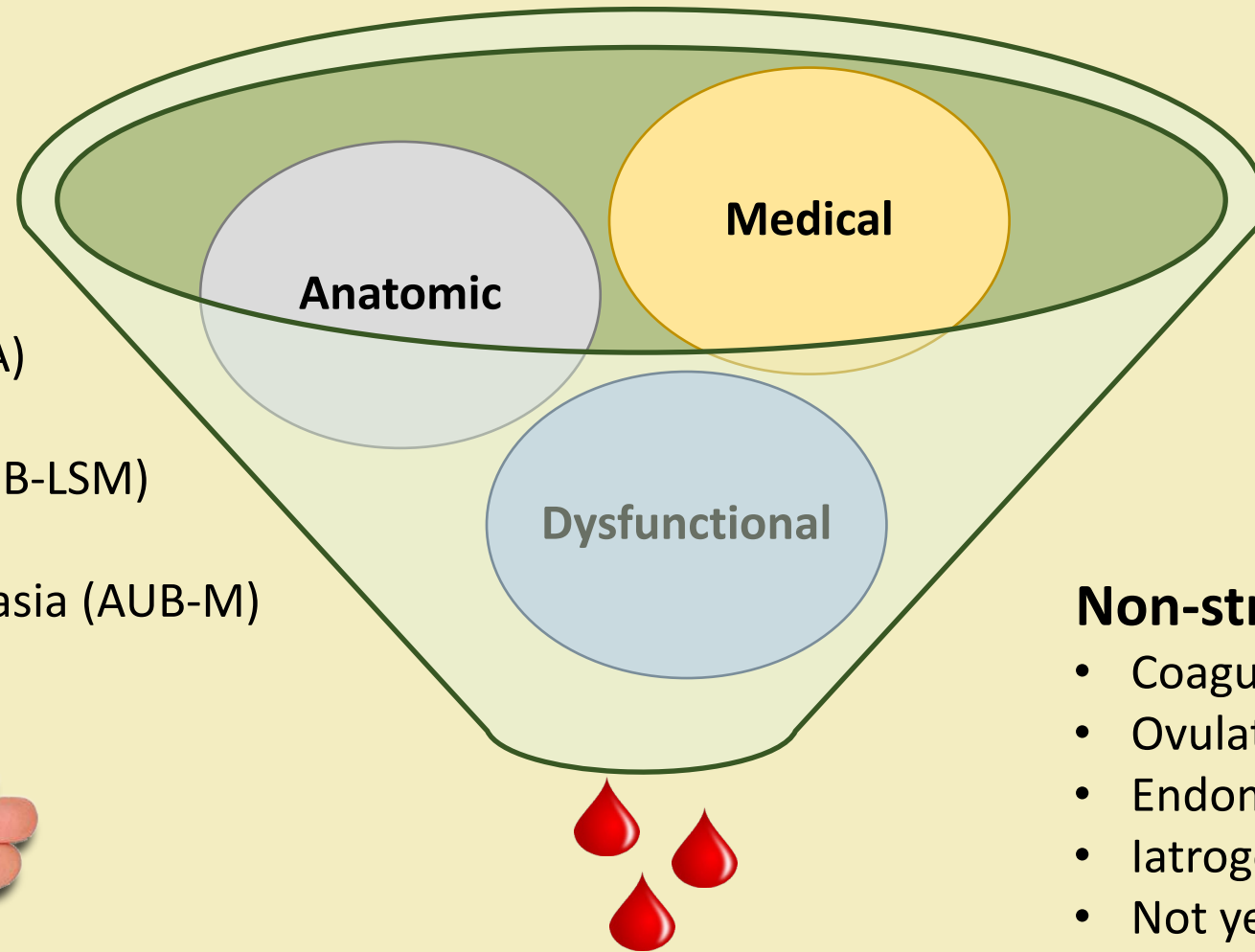
- Prior to 2000 about 600k per year
- By 2010 about 450-500k per year
- By 2020 less than 400k per year

- Significant change in medical culture
- Decreasing trend in hysterectomies
- More effective diagnostics
- More effective medical therapies
 - Hormonal (oral, injectable, implantable)
 - Progestin-eluting IUDs
 - Tranexamic acid
- Surgical alternatives to hysterectomy
 - Endometrial ablation

PALM-COEIN Classification of AUB

Structural Causes

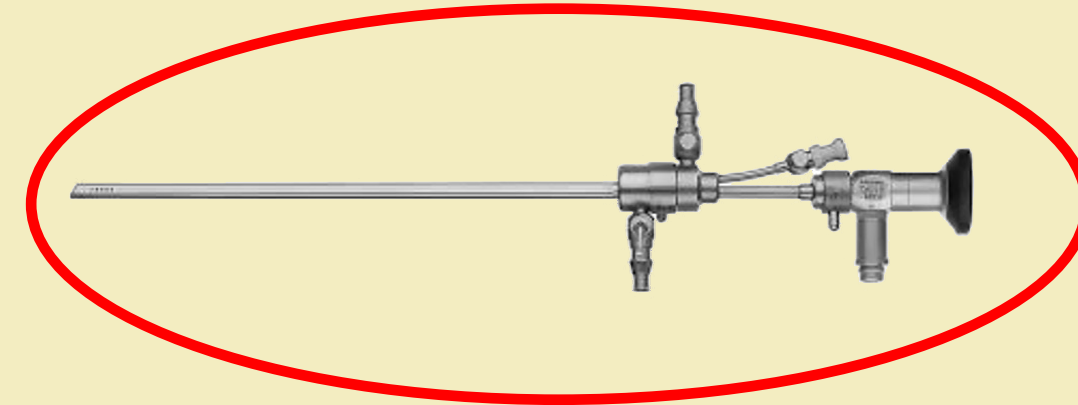
- Polyp (AUB-P)
- Adenomyosis (AUB-A)
- Leiomyoma (AUB-L)
 - Submucosal (AUB-LSM)
 - Other (AUB-LO)
- Malignancy/hyperplasia (AUB-M)



Non-structural Causes

- Coagulopathy (AUB-C)
- Ovulatory Dysfunction (AUB-O)
- Endometrial (AUB-E)
- Iatrogenic (AUB-I)
- Not yet classified (AUB-N)

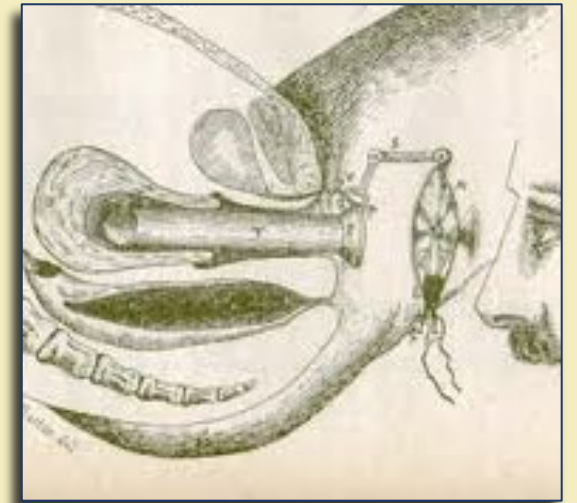
Multiple Ways to Evaluate the Endometrium



First Known Hysteroscopy

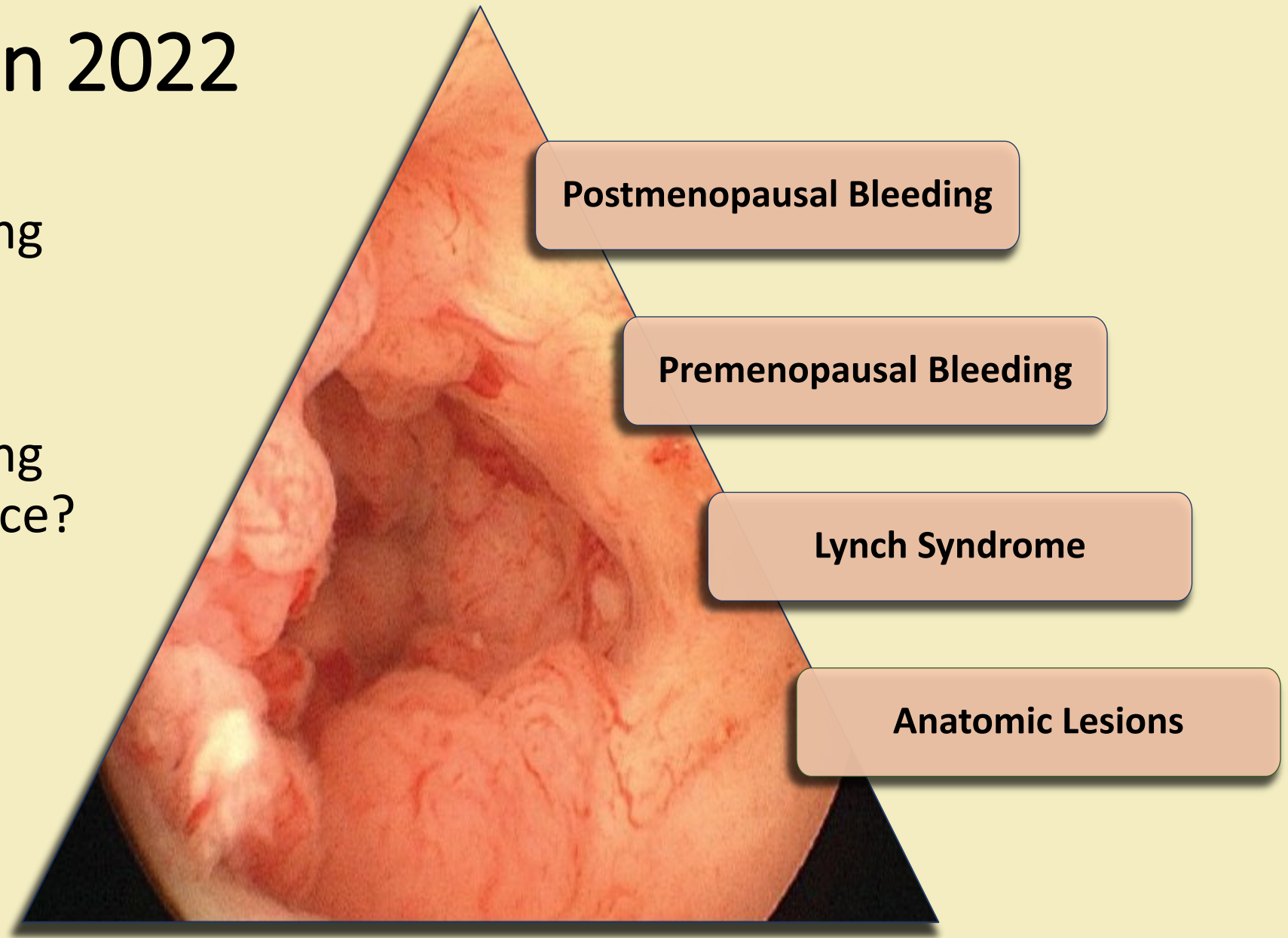
- 1869 Commander DC Pantaleoni
- 60 yo patient, “therapy resistant” menopausal bleeding
- Modified cystoscope, reflected candlelight
- Detected a polypoid growth
- Cauterized with silver nitrate

"Innovator" vs "Character"
Chastised by peers for “undue curiosity”
Paved the way for modern hysteroscopy



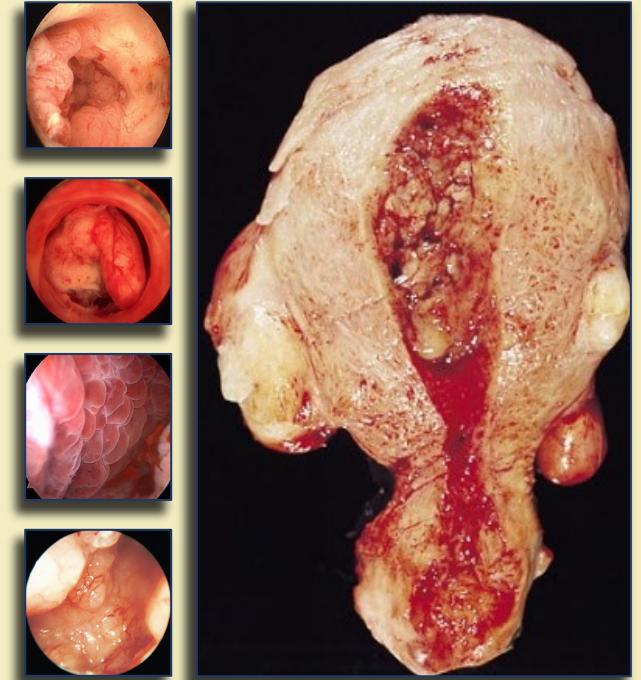
Hysteroscopy in 2022

- Why should you be doing more hysteroscopy?
- Why should you be doing hysteroscopy in the office?
 - Practical issues
 - Safety issues
 - Financial issues



Most Pressing Question – Endometrial Cancer

- The most common type of gynecological cancer
 - (2018) 61,380 new diagnoses and 10,920 deaths
 - Vaginal bleeding is presentation in >90% of cases
 - 70% diagnosed at stage I (90% 5-year survival)
- Most diagnosed at stage I (mean age 63yo)
 - 2.81% lifetime risk for Caucasian women
 - 2.48% lifetime risk for African American women
 - More likely to be type II (clear cell or serous)
 - More likely to be high grade
 - More likely to be advanced stage (III or IV) at diagnosis



All patients with postmenopausal bleeding = up to 15% chance of cancer

Who is at high risk and how do we diagnose it?

Who is a High Risk Patient?

Factors Influencing Risk	Estimated Relative Risk*
Older age	2-3
Residency in North America or Northern Europe	3-18
Higher level of education or income	1.5-2
White race	2
Nulliparity	3
History of infertility	2-3
Menstrual irregularities	1.5
Late age at natural menopause	2-3
Early age at menarche	1.5-2
Long-term use of unopposed estrogen	10-20
Tamoxifen use	2-3 [†]
Obesity	2-5
Estrogen-producing tumor	>5
History of type 2 diabetes, hypertension, gallbladder disease, or thyroid disease	1.3-3
Lynch syndrome	6-20 [‡]

Premenopause Endometrial Evaluation

- Patients >45 with AUB
- Patients <45 with AUB + risk factors
- Patients at risk for hereditary cancer syndrome
- Focal endometrial irregularity
- Persistent/recurrent bleeding despite therapy

Postmenopause Endometrial Sampling

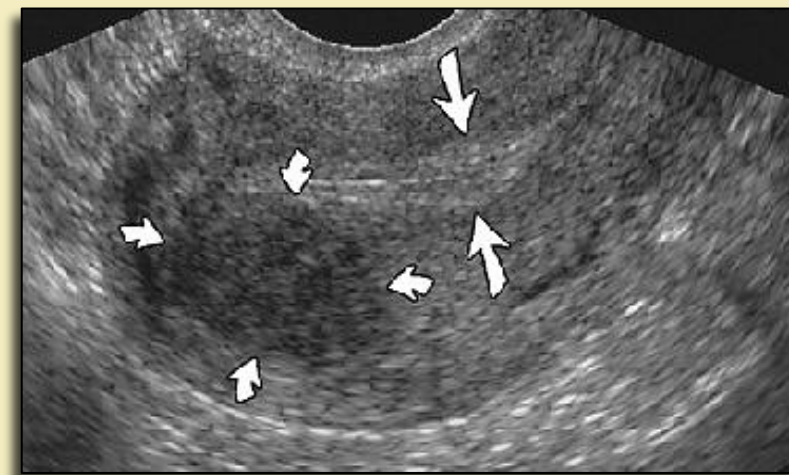
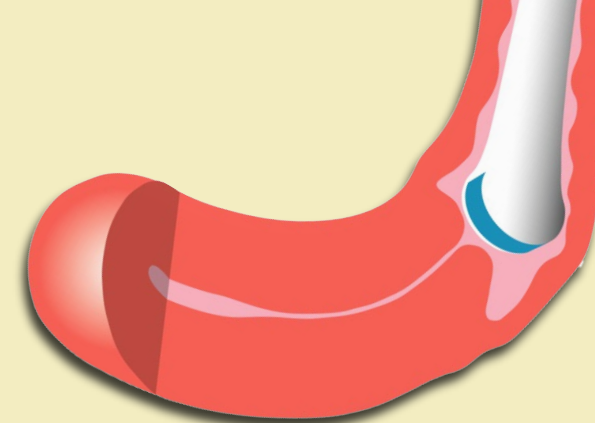
- Endometrium ≥ 5 mm by TVUS
- Patients at risk for hereditary cancer syndrome
- Endometrium not discretely discernible
- Endometrium has focal irregularities
- Persistent/recurrent bleeding
 - Independent of endometrial thickness

Evaluation Of the Uterine Cavity

- Transvaginal Pelvic Ultrasound (TVUS)

- Measure thickest part measured perpendicular to longitudinal plane
- Not always reliable for endometrial evaluation in all women
- Axial uterus, obesity, coexisting myoma, adenomyosis, prior uterine surgery
- Over 3/4 of bleeding patients have no obvious anatomic etiology

- **Measurement of endometrial thickness in premenopausal women is not helpful in the evaluation of AUB**
- *This does NOT mean ultrasound is not a valuable tool in overall endometrial evaluation*

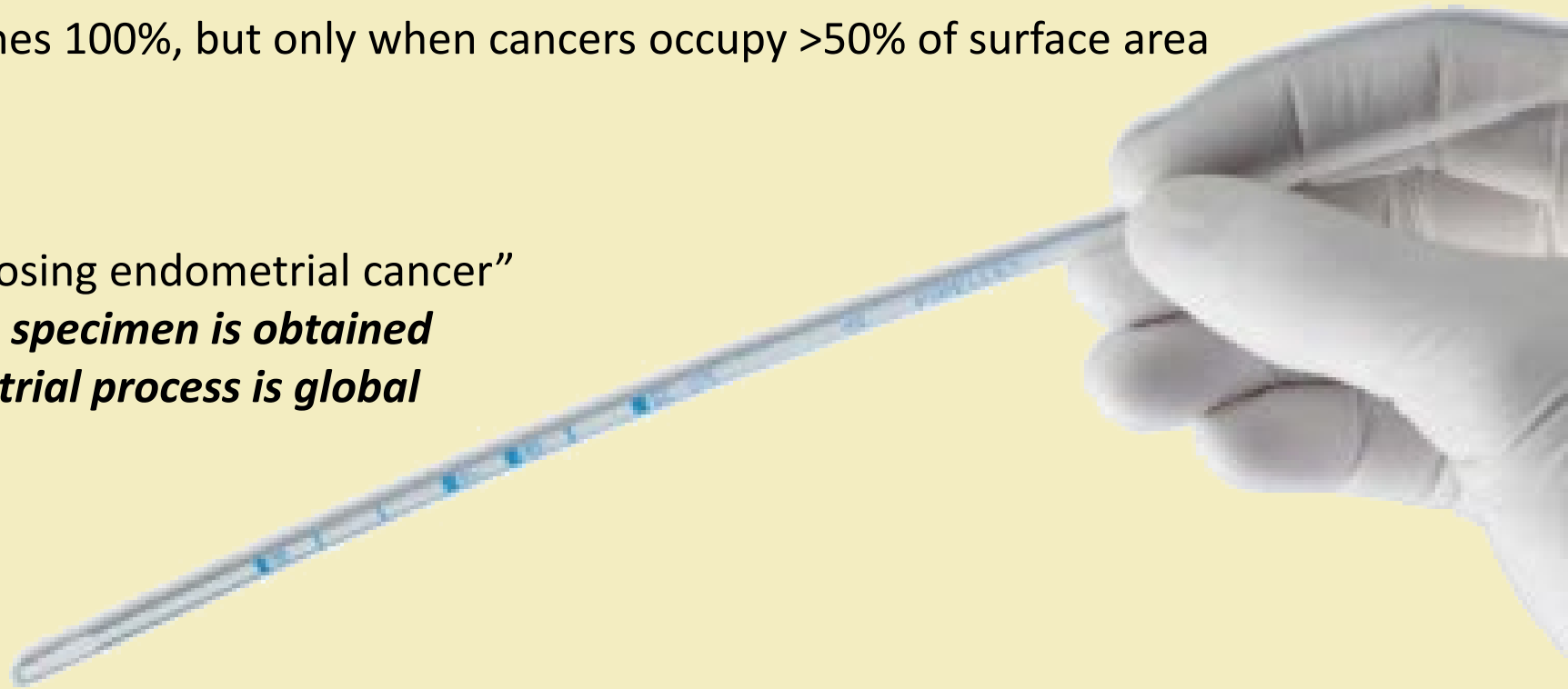


Blind Endometrial Biopsy

- Pipelle Office Blind Biopsy

- Samples an average of only 4-12% of the endometrial surface area
- Pre-hysterectomy biopsy shown to miss known diagnosis in up to 33% of cases
- Blind biopsy approaches 100%, but only when cancers occupy >50% of surface area

“high overall accuracy in diagnosing endometrial cancer”
...only when an adequate specimen is obtained
...only when the endometrial process is global



Hysteroscopy vs Blind Biopsy

- 112 consecutive PMB patients
 - 27% endometrium $\leq 5\text{mm}$
 - 3% ill-defined endometrium
- D&C
 - 25% insufficient tissue
 - 71.4% "normal"

Curettage	n (%)
Insufficient tissue	28 (25.0)
Normal EM	80 (71.4)
EM polyp	3 (2.7)
Simple HPL	0
Complex HPL	0
EM Ca	1 (0.9)
Total	112 (100)

Hysteroscopy vs Blind Biopsy

- 112 consecutive PMB patients
 - 27% endometrium $\leq 5\text{mm}$
 - 3% ill-defined endometrium
- D&C
 - 25% insufficient tissue
 - 71.4% "normal"
- Hysteroscopy after D&C
 - neoplastic lesions missed

Curettage	n (%)	Hysteroscopic biopsy	n (%)
Insufficient tissue	28 (25.0)	Normal EM	15 (53.6)
		EM polyp	10 (35.7)
		Myoma/adenomyosis	3 (10.7)
Normal EM	80 (71.4)	Normal EM	44 (55.0)
		EM polyp	26 (32.5)
		Myoma/adenomyosis	6 (7.5)
		Simple HPL	2 (2.5)
		Complex HPL	1 (1.3)
		EM cancer	1 (1.3)
EM polyp	3 (2.7)	EM polyp	3 (100)
Simple HPL	0	Complex HPL	0
Complex HPL	0		
EM Ca	1 (0.9)	EM Ca	1 (100)
Total	112 (100)		112

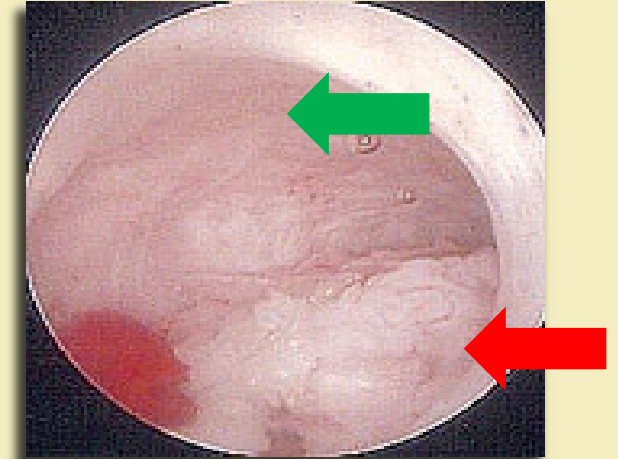
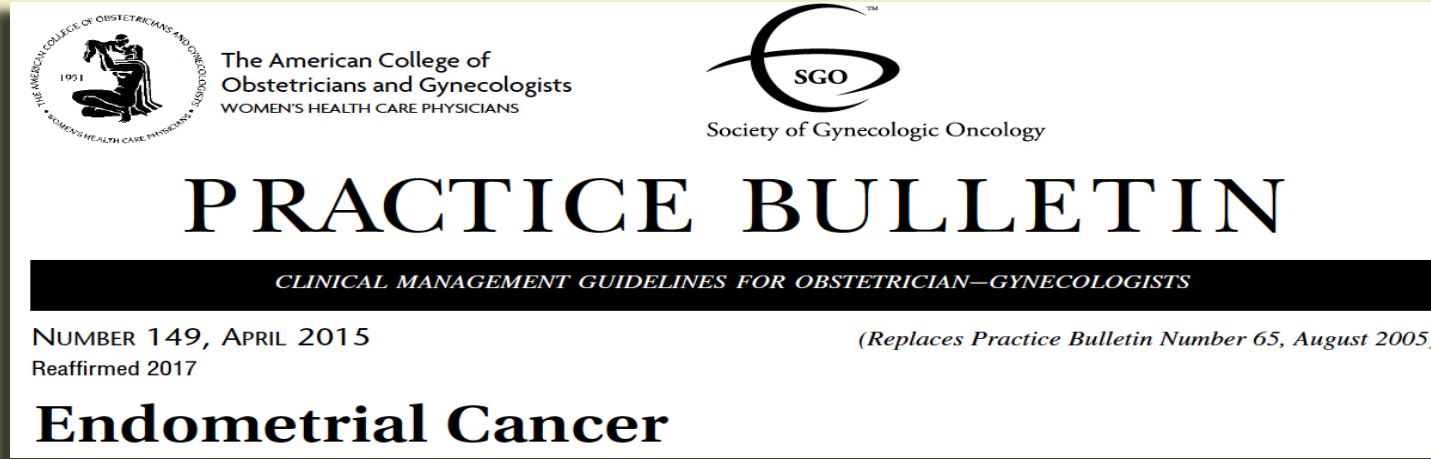
Biopsy alone may not be reliable for evaluation of endometrial pathology

Postmenopausal Bleeding

- Up to 15% of women with postmenopausal bleeding will have cancer
- 5mm (TVUS) has 99% negative predictive value
- With endometrium $\geq 5\text{mm}$ or irregular, sampling is indicated
- With endometrium $< 5\text{mm}$, biopsy alone generally not as useful
- Failure to identify a distinct endometrium should trigger evaluation
- Endometrial cancer $< 0.1\%$ in PMB women with endometrium $< 5\text{mm}$
 - More likely to be type II (non-endometrioid)
 - More likely to be focal (endometrial irregularities?)
 - Biopsy alone often misses diagnosis
- Adequate tissue sample obtained in only 25% of cases



Optimum Likelihood of Neoplasm Detection



- D&C with hysteroscopic guidance is recommended over D&C alone because it has **higher accuracy and superior diagnostic yield**.
- Hysteroscopy is recommended with directed D&C to include any **discrete lesions** as well as the **background endometrium**.
- This combination will provide the best opportunity to confirm the diagnosis of a true premalignant endometrial lesion and exclude associated endometrial carcinoma.

Lynch Syndrome-Associated Endometrial Cancer

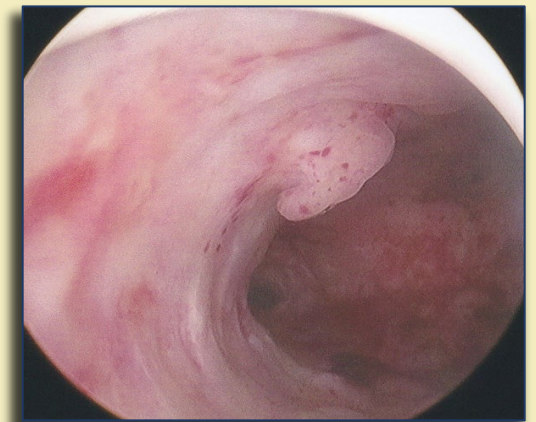


Cancer Type	Overall Cancer Risk
Colon	78%
Endometrial	60%
Stomach	19%
Biliary Tract	18%
Ovary	11%
Urinary Tract	10%
Sebaceous Gland	9%
CNS	4%

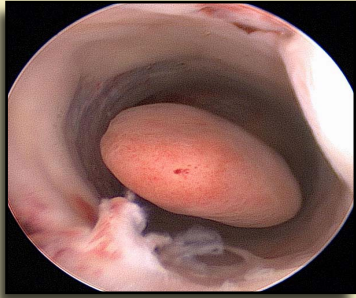
- Highly penetrant autosomal dominant USA prevalence ~ 1:600
- Defects in DNA mismatch repair genes (MLH1, MLH2, MSH6, PMS2)
- Accounts for up to 5% of endometrial cancer cases
- Disproportionate association with early onset endometrial cancer

Endometrial Cancer Risk with Lynch Syndrome	Endometrial Cancer Risk in General Population
20% risk by age 50	0.2% risk by age 50
70% risk by age 70	1.5% risk by age 70

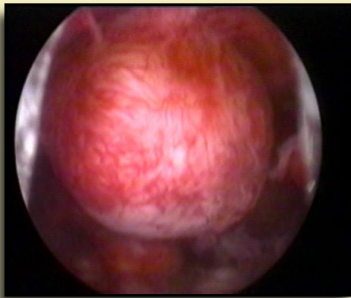
- No role for ultrasound screening in endometrial surveillance
- **Endometrial sampling every year starting at age 30**
- Mostly type I but can be type II endometrial cancer
- ***Increase in focal and lower uterine segment lesions***
- **Hysteroscopy + endometrial biopsy 89.9% sensitivity for early lesions**



Polyps



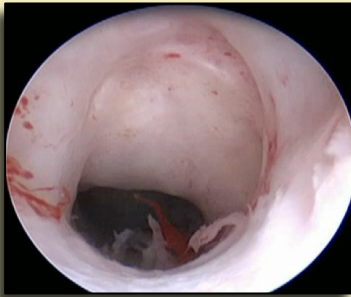
Fibroids



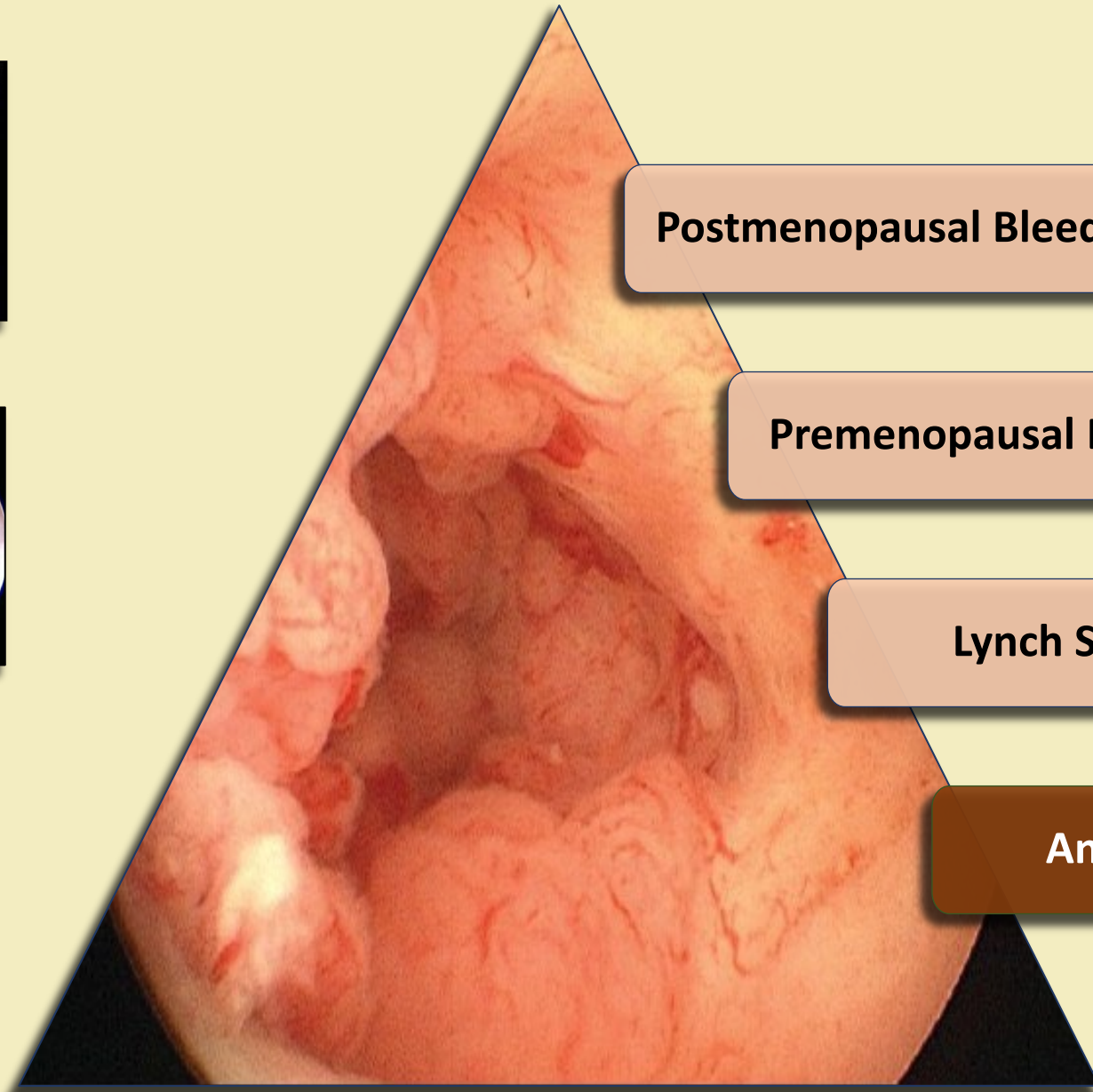
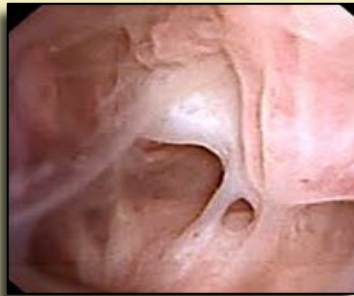
Septum



C-section scar



Asherman's



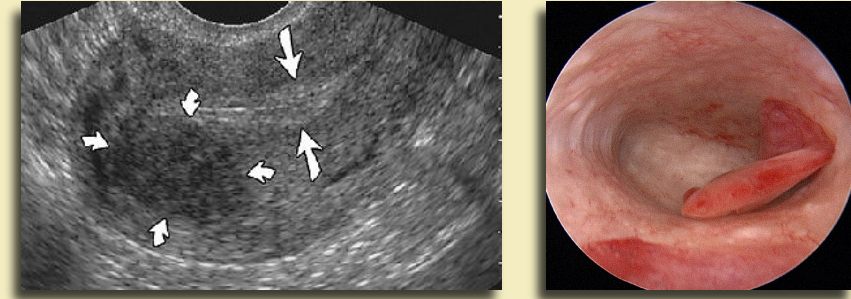
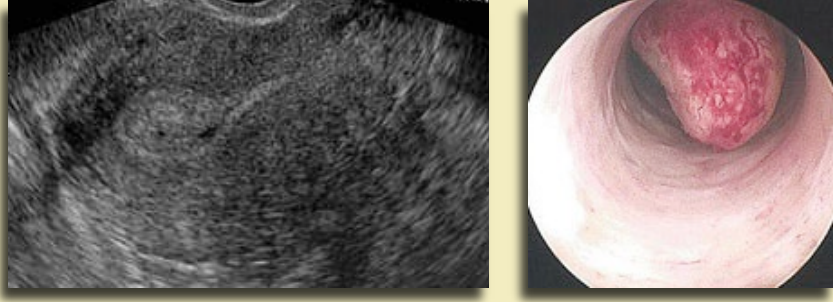
Postmenopausal Bleeding

Premenopausal Bleeding

Lynch Syndrome

Anatomic Lesions

Endometrial Polyps



- Mismatch of TVUS findings and biopsy
 - Thick / irregular endometrium, especially focal thickening
 - Minimal tissue on endometrial biopsy when unexpected
- Sources of polyps
 - Associated with increased estrogen stimulation
 - Overexpression of aromatase activity in endometrium?
 - Focal endometrial hyperplasia
 - Endometrial adenocarcinoma that had become polypoid

- Present in 10% of hysterectomies
 - 47% of polyps missed at curettage
 - Limitations of blind curettage
 - Diagnostic (sort of), not therapeutic
- Associated with increased cancer risk
- Prevalence of neoplasia in polyps 3.23%
 - 4.91% in postmenopausal women
 - 1.30% in reproductive age women
 - 4.09% in women with symptomatic bleeding
 - 2.13% in women without symptomatic bleeding

Value of Pre-operative Hysteroscopic Evaluation

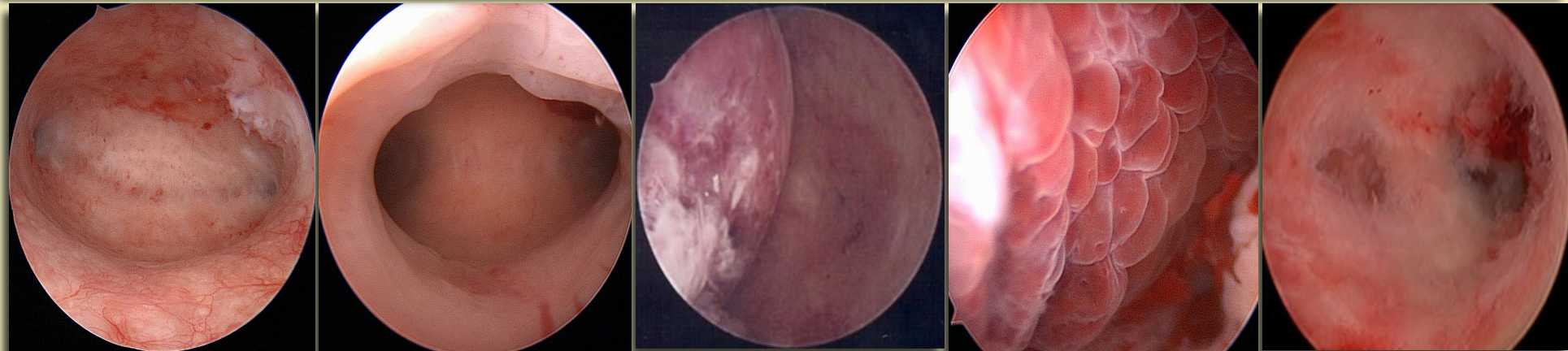


Original Article

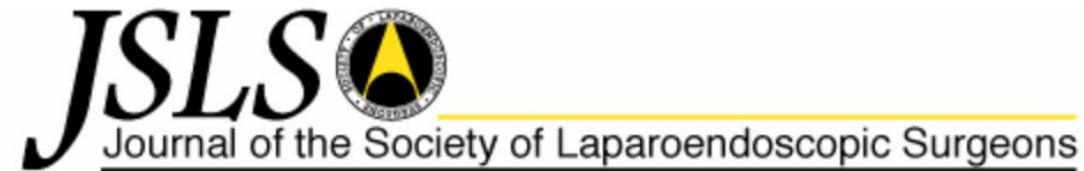
The Value of Diagnostic Hysteroscopy before Operative Hysteroscopy for Suspected Abnormal Intrauterine Findings

Shiri Shinar, MD, Guy Bibi, MD, Lili Barzilay, RN, Paula Rubens, MD, Benny Almog, MD, and Ishai Levin, MD*

From The Sarah Racine IVF Unit and the Department of Gynecology, Lis Maternity Hospital, Tel Aviv Sourasky Medical Center, Tel Aviv University, Tel Aviv, Israel (all authors).



Value of Pre-operative Hysteroscopic Evaluation



Cost-Effectiveness of Office Hysteroscopy for Abnormal Uterine Bleeding

Nash S. Moawad, MD, MS, Estefania Santamaria, BS, Megan Johnson, MD, Jonathan Shuster, PhD

Table 3.
Summary of Office Hysteroscopic Findings (n = 130)

Finding	Frequency
Normal	47 (36%)
Polyp	42 (32%)
Fibroid	20 (15%)
Thickened endometrium	10 (8%)
Polyp and fibroid	7 (5%)
Polyp vs fibroid	1 (1%)
Septum	2 (2%)
Cavity not visualized	1 (1%)

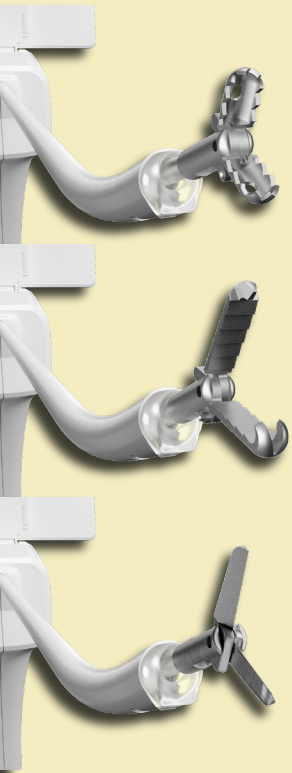
Over 50% of patients able to avoid intervention in OR suite

Table 1.
Cost Breakdown

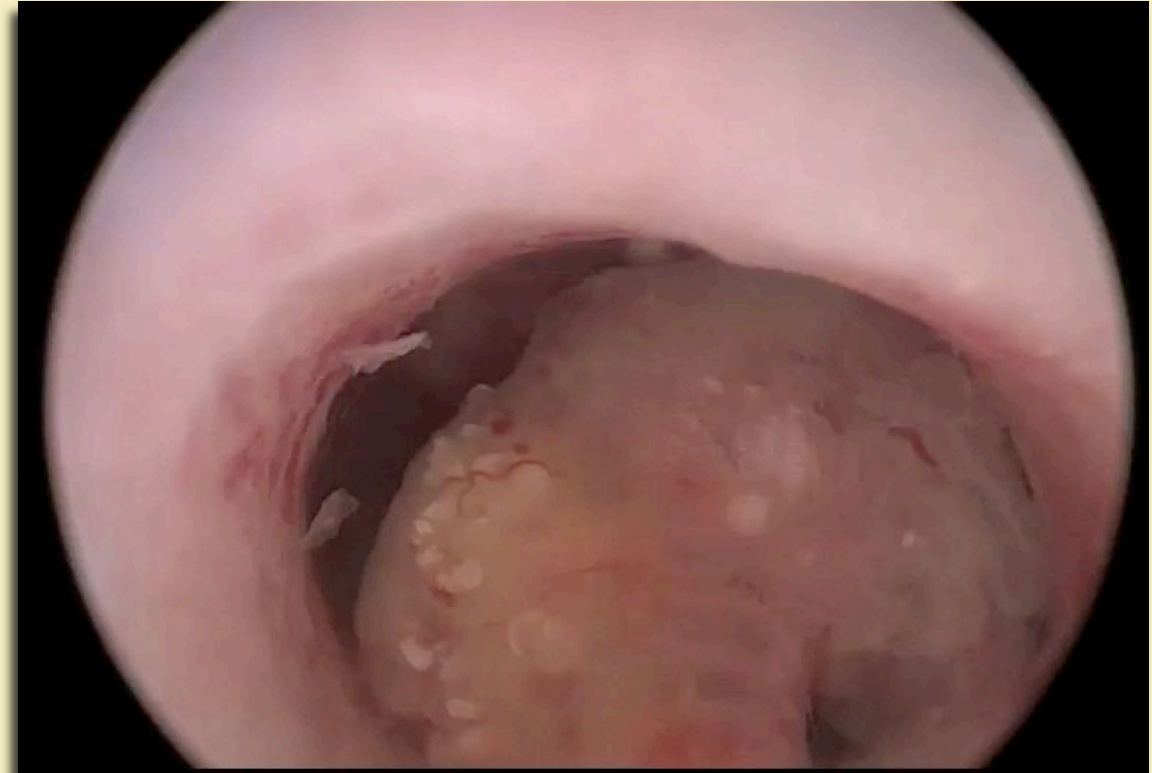
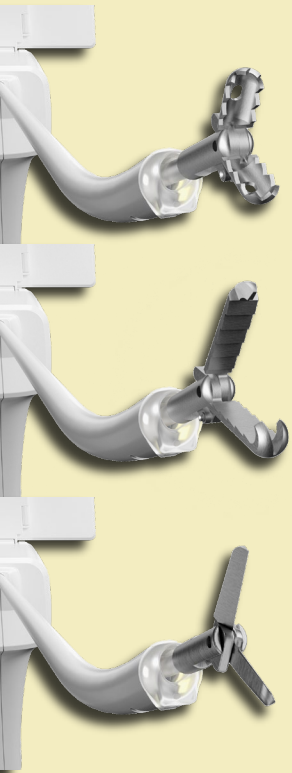
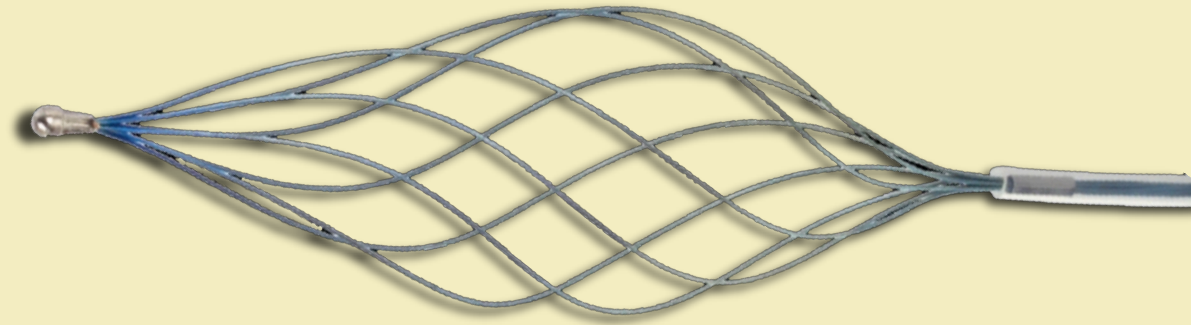
Item	Office Hysteroscopy	Operating Room Hysteroscopy
Physician fee	\$1356	\$1356
Anesthesia fee	\$0	\$1190
Hospital fee	\$0	\$2400
Total	\$1356	\$4946

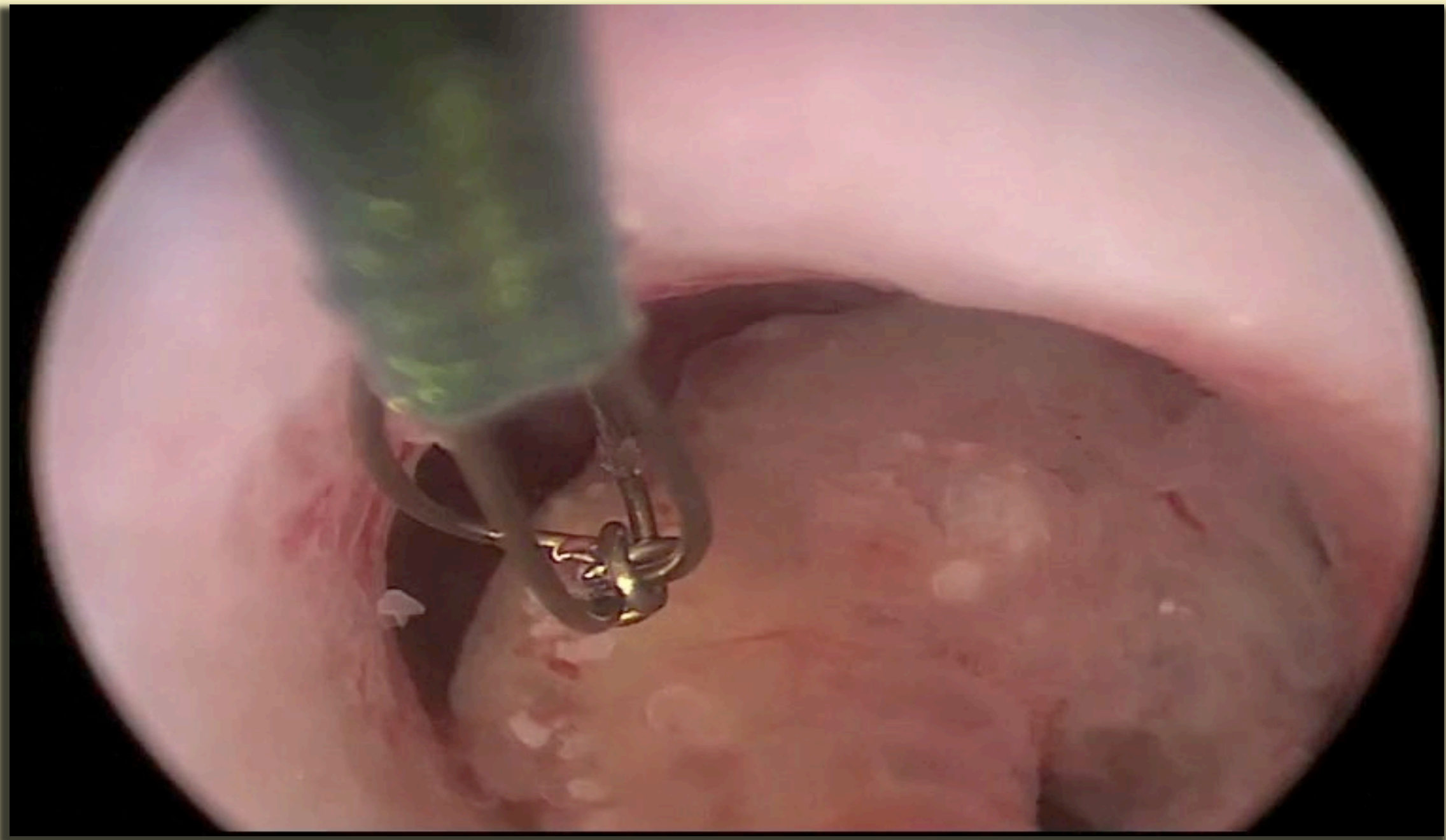
Savings of over \$3500 per patient!

Polyps - Polypectomy



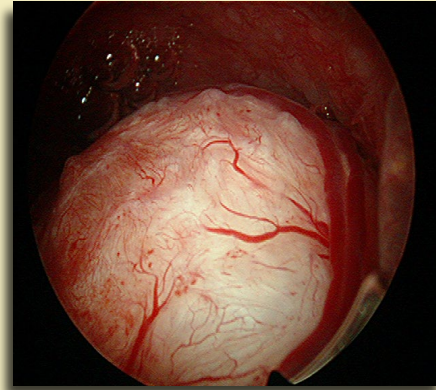
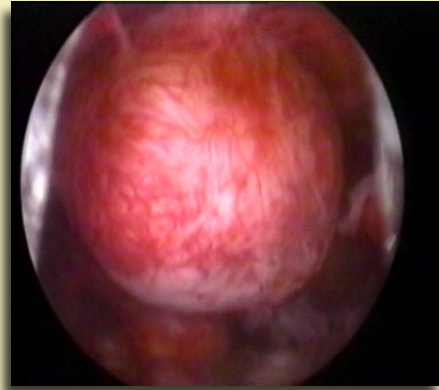
Polyps - Polypectomy



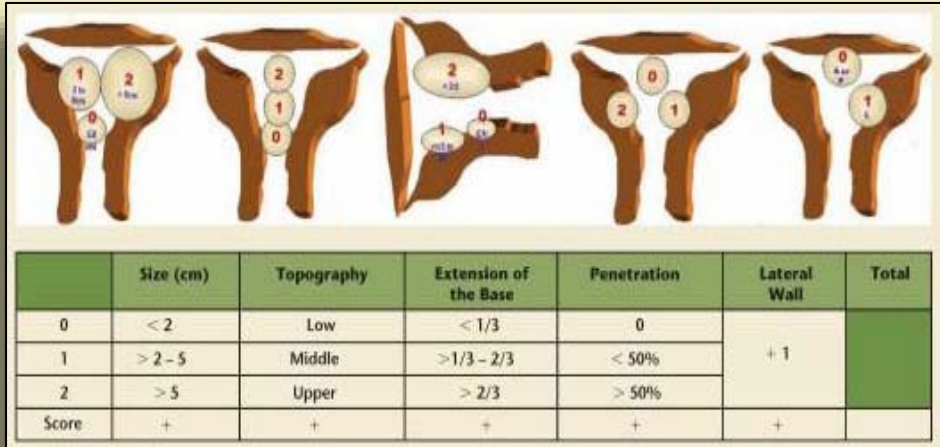


Uterine Fibroids - Myomectomy

- Fibroid mapping prior to myomectomy



STEP Assessment



Score	Group	Suggested treatment
0 to 4	I	Low complexity hysteroscopic myomectomy
5 to 6	II	Complex hysteroscopic myomectomy, consider preparing with GnRH analog and/or two-stage surgery
7 to 9	III	Recommend an alternative nonhysteroscopic technique

GnRH = gonadotropin-releasing hormone.

Need for Staged Procedures

- 57 myomectomies compared with ESGE system
- More accurately predicted differences between groups I and II with respect to:
 - completed procedures, fluid deficit, and operative time

Role of Office Hysteroscopy



Diagnostic

**With or without ultrasound
With or without biopsy**

*Can I see an abnormality?
Can I address it in the office?*

Procedures

**Performing basic procedures
Confirming effectiveness of procedures**

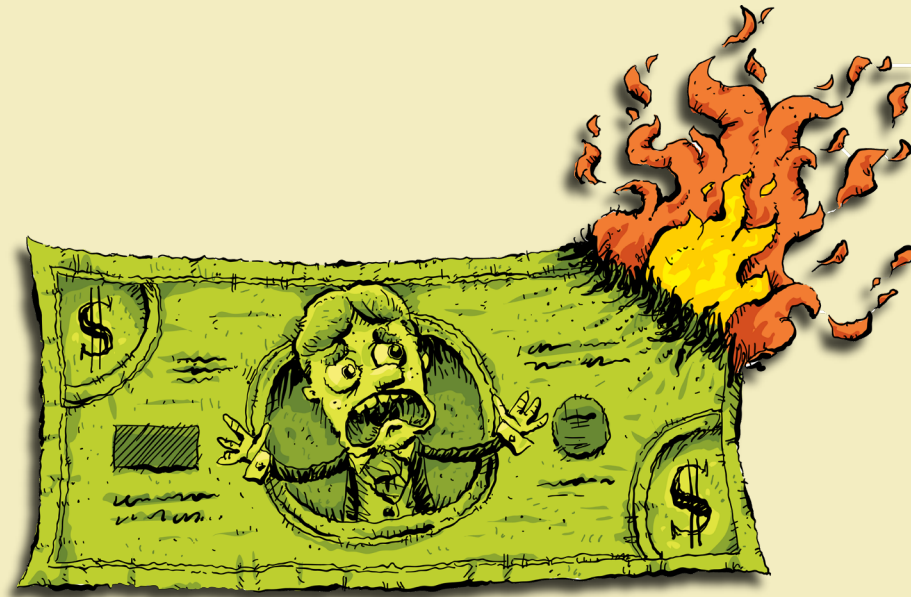
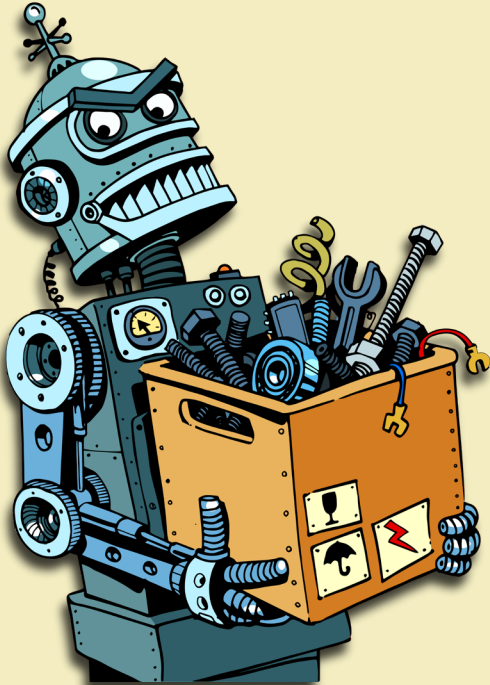
Operative Planning

**Preparation for procedure
Predicting success of procedure**

Why NOT Do Office Hysteroscopy?

Technophobia

Uncomfortable with all the “gear” required for office hysteroscopy



Econophobia

Anxiety about cost of acquiring, maintaining equipment, additional resources, ROI



Ergonophobia

Concerns regarding optimal utilization, cleaning, sterilizing, office processes

Traditional Hysteroscopy Equipment



Sterilization processing equipment

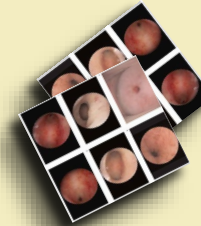
Dedicated procedure room



Monitor for viewing
(could be computer screen)

Camera system

Printer for image capture

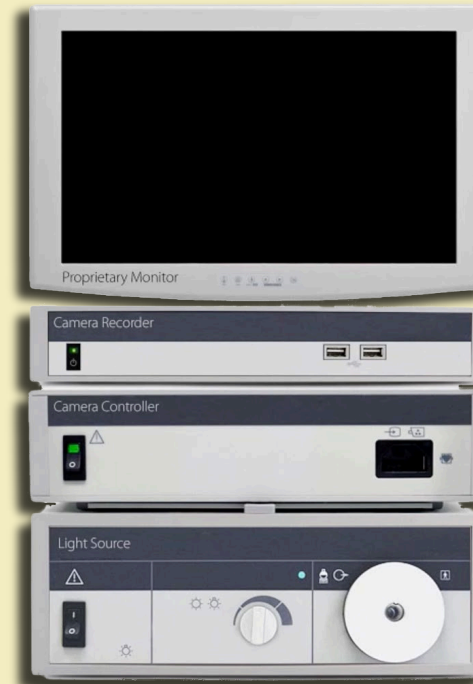


+/- Fluid management

Light cord for illumination

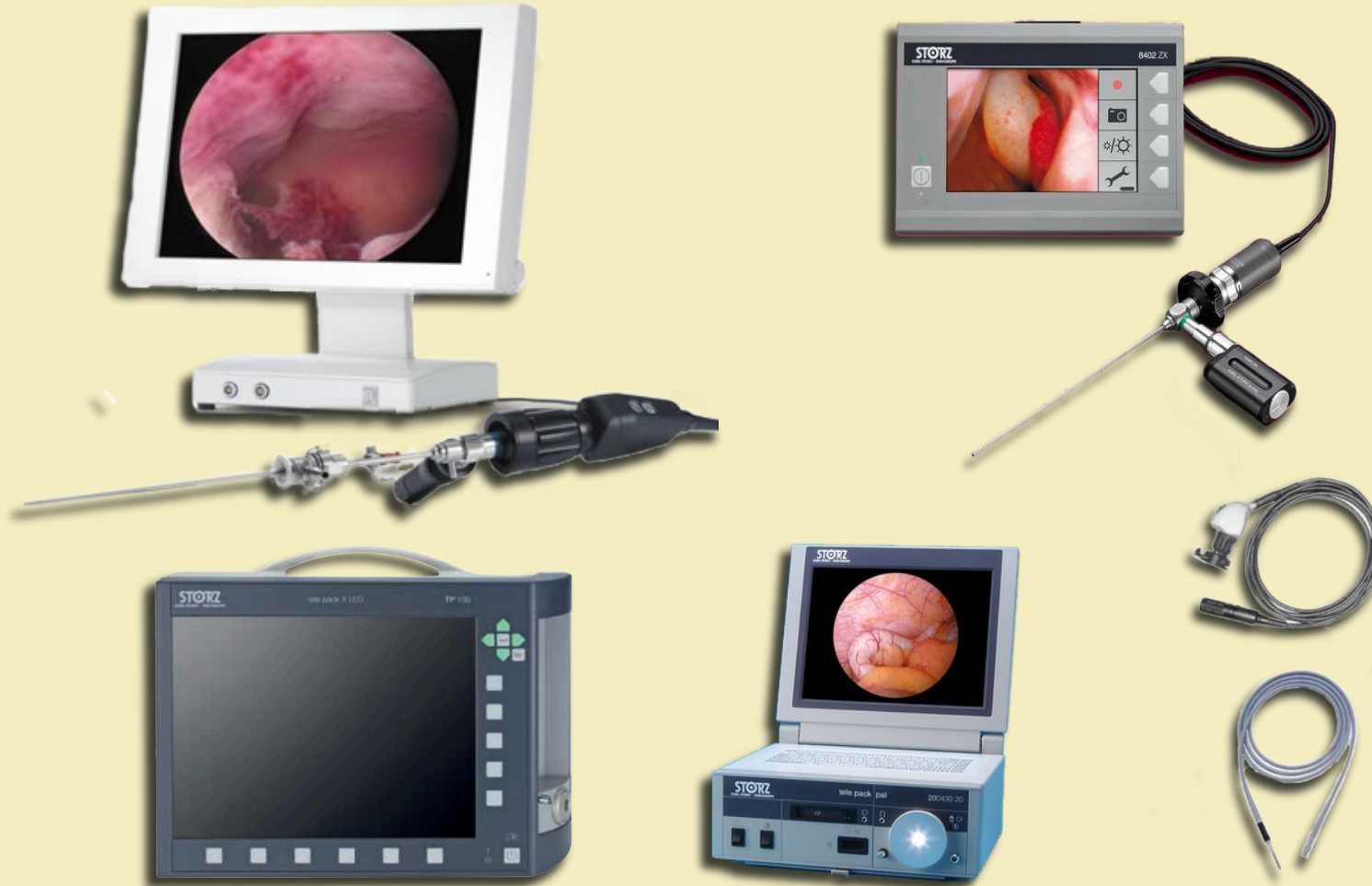


Compact Hysteroscopy Towers



Equipment is getting smaller,
more portable, less intimidating

Tabletop Hysteroscopy Configuration



Truly portable
tabletop systems

LED Light Source
eliminates a cord

Still requires
camera connection
and medium tubing

Portable Reposable Hysteroscopy System



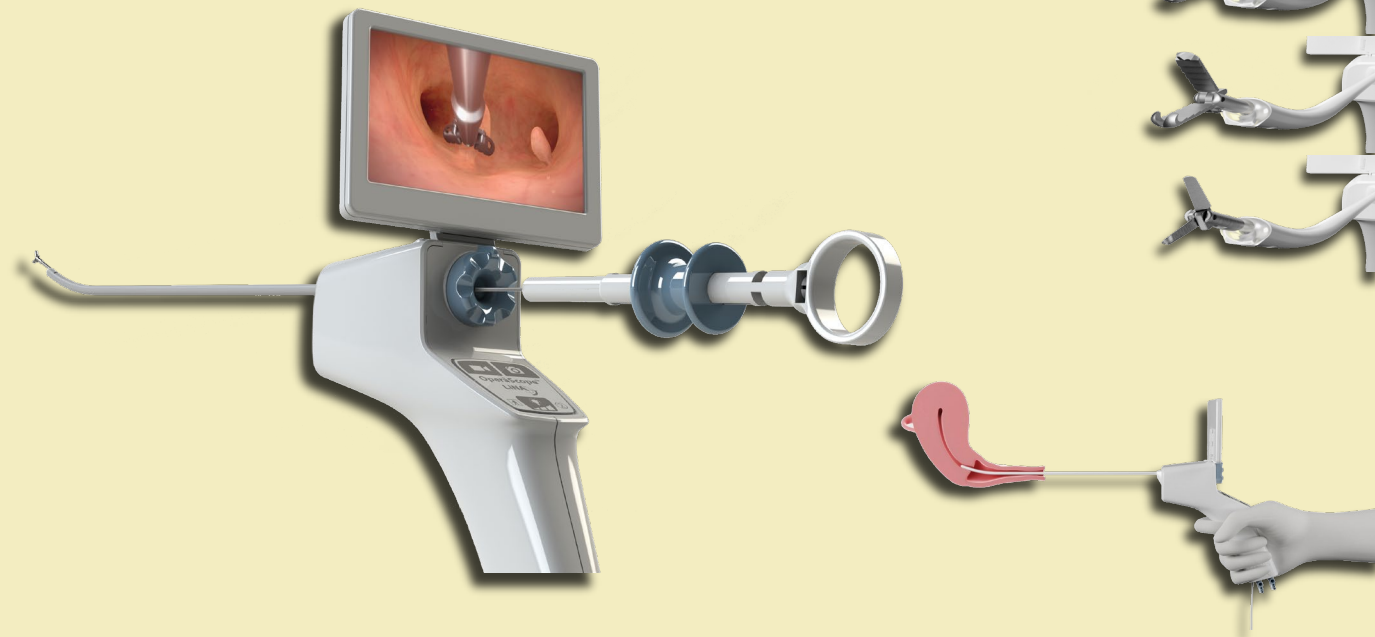
Lina OperâScope

- completely disposable
- can connect to accessory monitor
- download images/videos to USB
- inflow/outflow fluid channels
- 5 fr operative channel (standard instruments)
- disposable instruments



CooperSurgical EndoSee Advance

- Disposable handheld unit
- Rechargeable larger viewing screen
- Download images/videos to computer
- Fluid inflow only
- 5 fr operative channel – need special instruments



Office Hysteroscopic Procedures

What you **can** do does not necessarily equal:

- What you **should** do
- What you will get **paid** for doing

Patients have the right to expect:

- The same level of patient **safety**
- The same level of procedural **effectiveness**



**Right
Patient**

**Right
Procedure**

**Right
Surgeon**

**Right
Environment**

The Right Patient

- Cannot tolerate basic office procedures?
 - Prior experience with office procedures
- Psychosocial issues
 - High levels of anxiety /panic attacks
 - Realistic patient expectations
- Avoid Significant co-morbidities
 - Morbid obesity, asthma, mobility challenges
 - Limit to ASA status I or II in office
- Prescreening
 - Adverse reaction to local anesthesia (personal or FH)
 - Acute respiratory process or high-risk airway assessment
 - Substance abuse
 - Abnormal blood sugars
 - Pregnancy (unless procedure is pregnancy related)

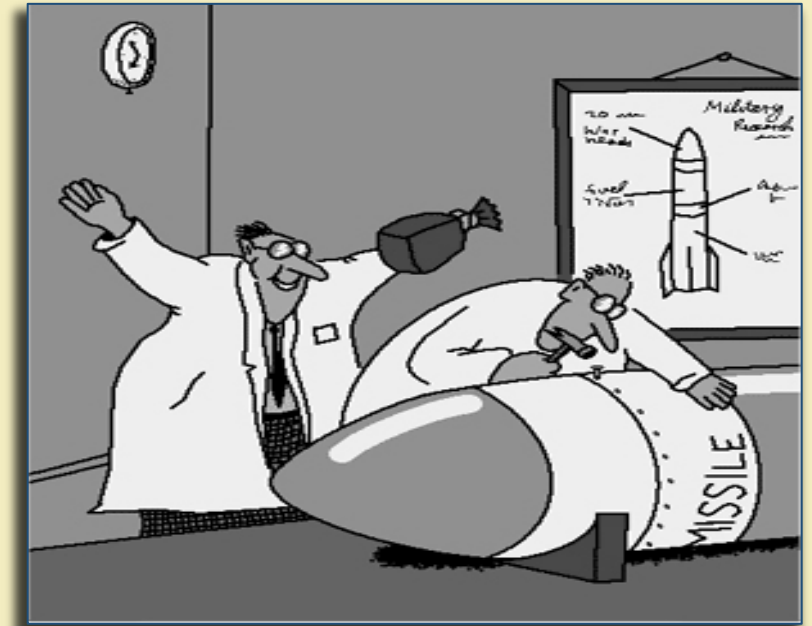
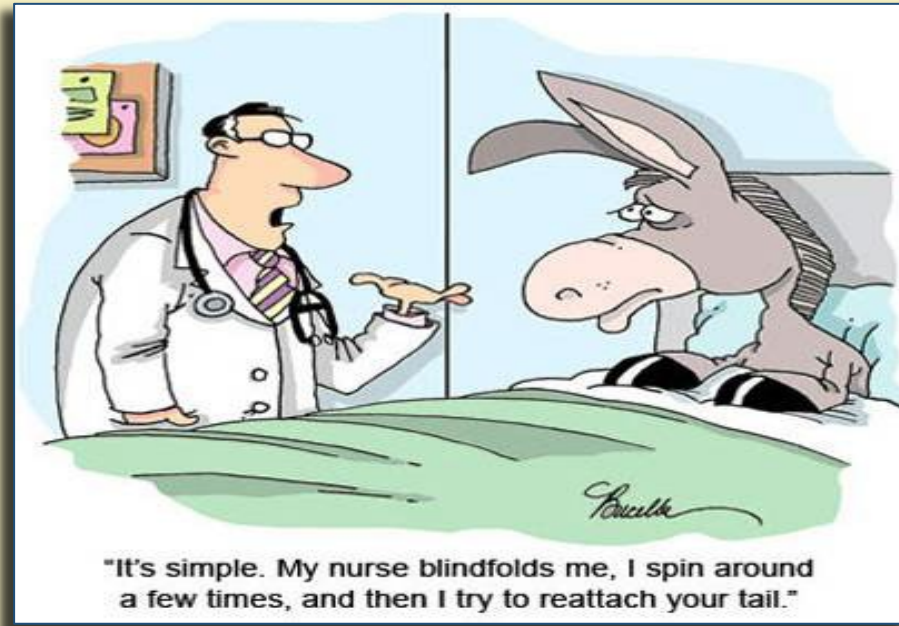


Right Procedure



- **Appropriate for office**
 - Brief and focused
 - Not overly complicated
 - Basic technological requirements
- **Anticipation of patient comfort**
 - Length of immobilization
 - Comfortable table / bed for patient
 - Adequate room / time for recovery
 - Anticipation of analgesia
- **Expectation of safety**
 - Reasonable expectation of patient safety
 - Plan for the unexpected
 - Protocols to deal with emergencies

The Right Surgeon



- Confident in abilities
- Calm under stress
- Able to filter out distractions
- Not unnerved when things do not go as planned

The Right Environment

- Process-Related

- Safety
- Comfort
- Space
- Time

- Know city / state regulations governing office procedures
- Establish and practice office protocols
- Verify adequate training of support staff
- Have adequate space(s) dedicated to intensity of procedures performed
- Leave adequate time after procedure in case needed for recovery (do not overbook or rush procedures)

- Procedure-Related

- Equipment/supplies
- Positioning
- Analgesia
- Emergencies

A Culture of Safety

(Florida Board of Medicine Review)

- **Adverse incidents**

- ASC 5.3 per 100,000 procedures
- Office 66 per 100,000 procedures
- Relative risk: Office vs ASC = 12.4

- **Death rate**

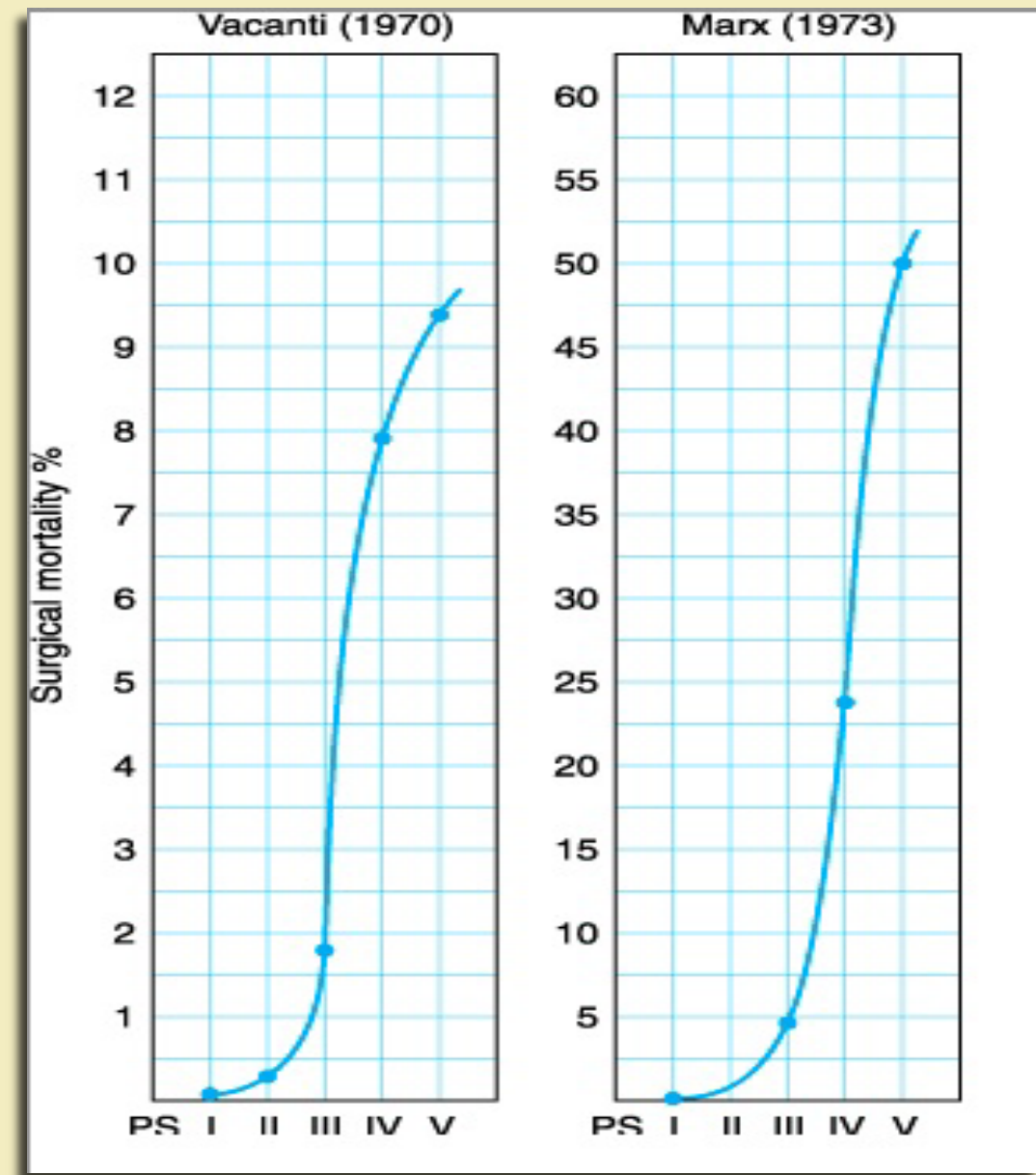
- ASC 0.78 per 100,000 procedures
- Office 9.2 per 100,000 procedures
- Relative risk: Office vs ASC 11.8



A Culture of Safety

ASA Physical Status (PS) Classification System

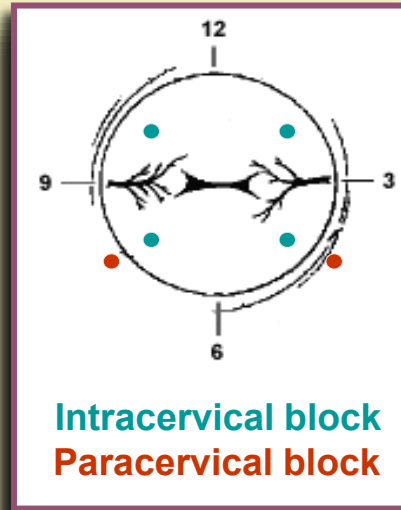
PS Class	Description
I	Normal healthy patient
II	Mild systemic disease
III	Severe systemic disease
IV	Severe systemic disease that is a constant threat to life



Analgesia / Anesthesia Choices

Minimal Sedation Oral Analgesia

- Patient comfort challenge
- Slightly less safety risk
- Fewer oversight regulation
- Use existing staff
- Cost built into billing



- Cervical Dilatation?
 - Vasopressin: 0.05 U/mL intracervical
 - Cytotec: 50 – 400 mcg oral vs vaginal
- Local Anesthesia paracervical, intracervical
 - Xylocaine or Marcaine: wait 10 minutes
 - 50:50 Lidocaine:Marcaine + 100 mcg Fentanyl
- Vocal analgesia
- Avoid anxiolytics



Conscious Sedation Monitored Anesthesia

- Greater patient comfort
- Higher patient safety risk
- More oversight regulation
- Can use CRNA to oversee
- Can bill separately

- Day Prior to procedure
 - Begin NSAIDs day before procedure
- Day of Procedure (usually in your office)
 - Toradol 30 mg iv up to 1 hr before procedure
- Light IV sedation
 - Versed 2-4 mg iv
 - Fentanyl 50-100 mcg iv
 - Propofol to effect (35-45mcg/kg/min)
- I still do a cervical block!

Analgesia-Related Challenges

- Cervico-uterine manipulation can be inherently painful
 - Cervical dilation pain (can be referred to low back)
 - Uterine distention causes contraction like pain
- Options for analgesia
 - Oral, local or regional parenteral, iv sedation
 - Allow time to become effective
- Intrauterine Analgesia
 - Lidocaine gels



2% Lidocaine topical gel
Uro-Jet NDC 0548-3013-00



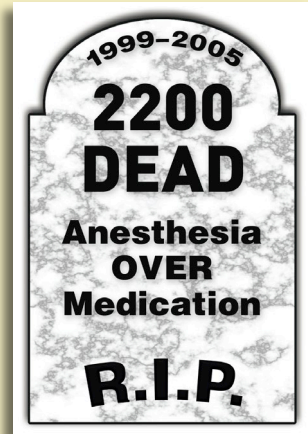
Local Analgesia Toxicity

- Sedation / Analgesia Protocols
- Know drugs you are using
 - Indications/ contraindications
 - Mechanism of action
 - Drug-drug interactions
 - Drug toxicities and treatments

Agent	Duration (min)	Maximum Dose
1% Lidocaine	30-60	4.5 mg/kg
1% Lidocaine with Epinephrine	120-360	7 mg/kg
0.25% Marcaine	120-240	2.5 mg/kg
0.25% Marcaine with Epinephrine	180-420	< 225 mg

Analgesia-Related Challenges

- Know pharmacology and toxicology
- Know potential interventions



- Lidocaine levels usually 3-5 mcg/mL
- Toxicities may be observed at 6 mcg/mL
- More commonly with levels > 10 mcg/mL

Agent	Symptoms	Intervention
Lidocaine	<ul style="list-style-type: none"> • Perioral numbness and tingling • Tingling of tongue, dysarthria • Metallic taste • Tinnitus • Lightheaded, dizziness, headache • seizures 	<ul style="list-style-type: none"> • Oxygen • Benzodiazepine if needed for seizures • Vasopressor support if needed • (small doses epinephrine prn) • IV fluids if needed
Opioids	<ul style="list-style-type: none"> • Depressed respiration • Shallow and slow breathing • Constricted pupils • Cold, clammy skin • hypotension 	<ul style="list-style-type: none"> • Naloxone • 0.4-2 mg iv/sc/ETT q 2-3 min • Oxygen • Watch for hypertensive episodes and arrhythmias

Vasovagal Episodes

- Neurocardiogenic syncope
- Neural reflex with triggers
- Vagal tone and vasodilation
- Bradycardia, pale, nausea, diaphoresis
- Supportive care
 - Stop procedure
 - Patient supine, elevated legs,
 - Oxygen, atropine if indicated
 - IV fluids if indicated



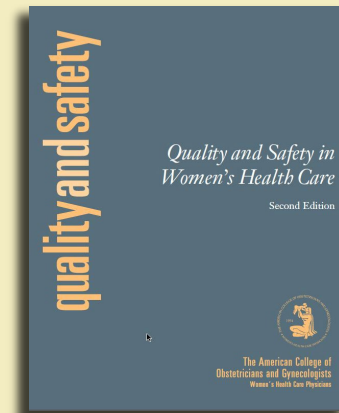
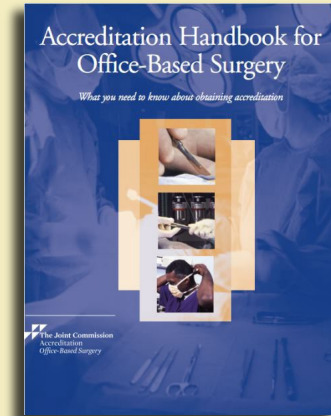
Ability to Rescue Patient in Emergency

- BLS vs ACLS training
 - Min of 2 staff
 - Physician, Assistant
 - Equipment for CPR support
 - Treatment of anaphylaxis
 - Treatment of drug reaction
 - Transport plan
- BP/ HR monitoring
 - Pulse oximeter
 - O2 source
 - Suction
 - Cardiac monitor, defibrillator
 - Auxiliary electrical power source
 - Emergency medication
 - Maintenance, testing and inspection per manufacturer's recommendation



Safety and Regulatory Resources

- ACOG monograph on ambulatory procedures
 - www.acog.org
- Joint Commission
 - www.jointcommission.org
- American College of Surgeons (ACS)
 - www.facs.org
- American Association of Anesthesiologists (ASA)
 - www.asahq.org
- Professional liability insurers
- State (governmental) regulatory agencies



Coding/Billing for Office Procedures



CPT Coding

Hysteroscopy, diagnostic (58555)	RVU in facility	2018 Medicare Allowable
In Facility	4.37	\$ 157.32
Non-Facility (In Office)	7.60*	\$ 273.60

△
reimbursement
\$116.28

*** Down from 8.8 in 2016 (-14%)**

Hysteroscopy, with biopsy or polypectomy or D&C (58558)	RVU in office	Medicare Allowable
In Facility	6.67	\$ 240.12
Non-Facility (In Office)	38.52**	\$ 1,386.70

△
reimbursement
\$1146.58

**** Up from 11.44 in 2016 (+237%)**

(From CMS Website)

CPT Coding

Procedure	RVU
Office hysteroscopy / biopsy	38.52
Office endometrial ablation	48.44

CPT Coding

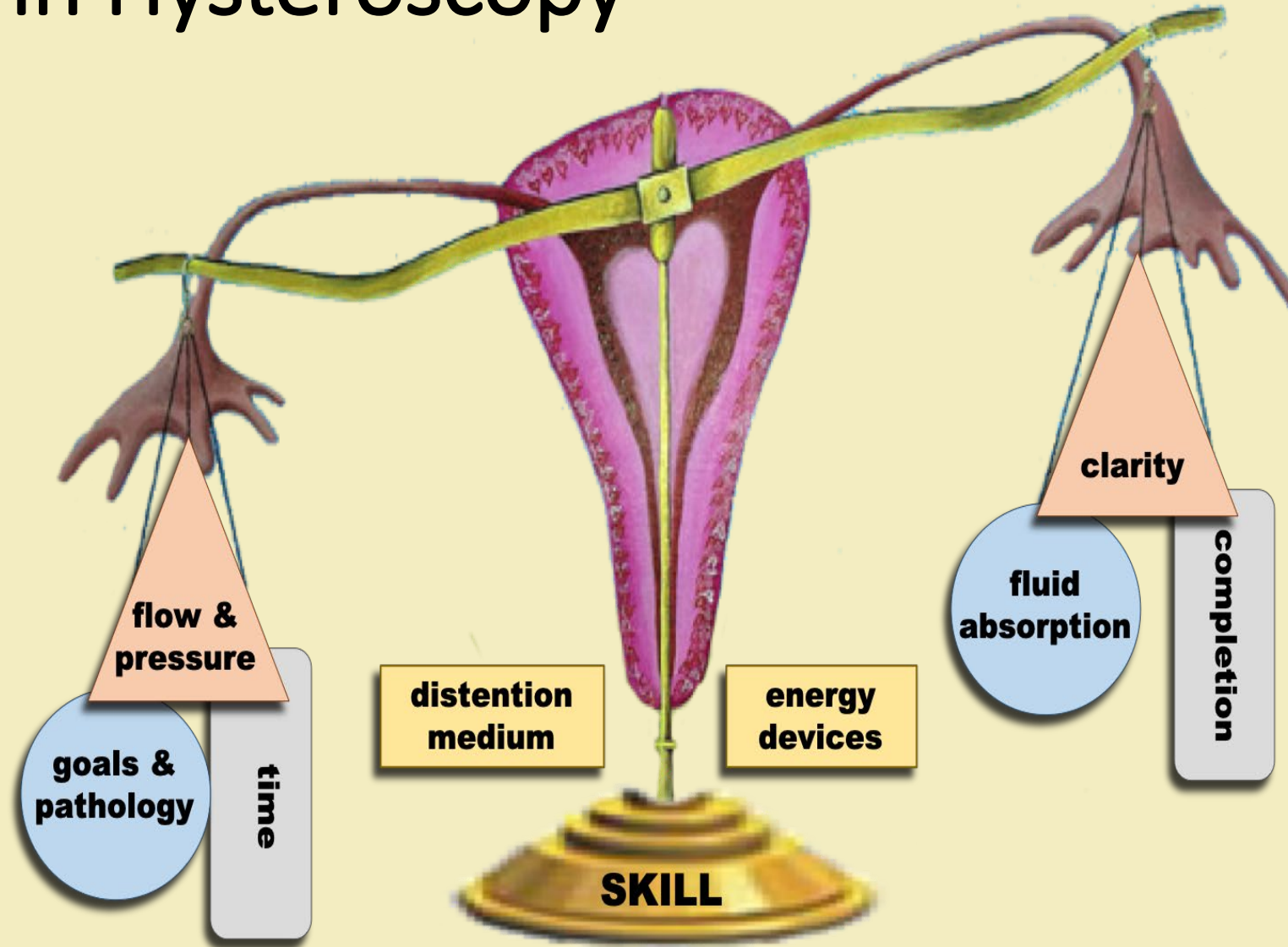
Procedure	RVU
Office hysteroscopy / biopsy	38.52
Office endometrial ablation	48.44
Total abdominal hysterectomy	26.07
Vaginal hysterectomy >250 grams	30.55

CPT Coding

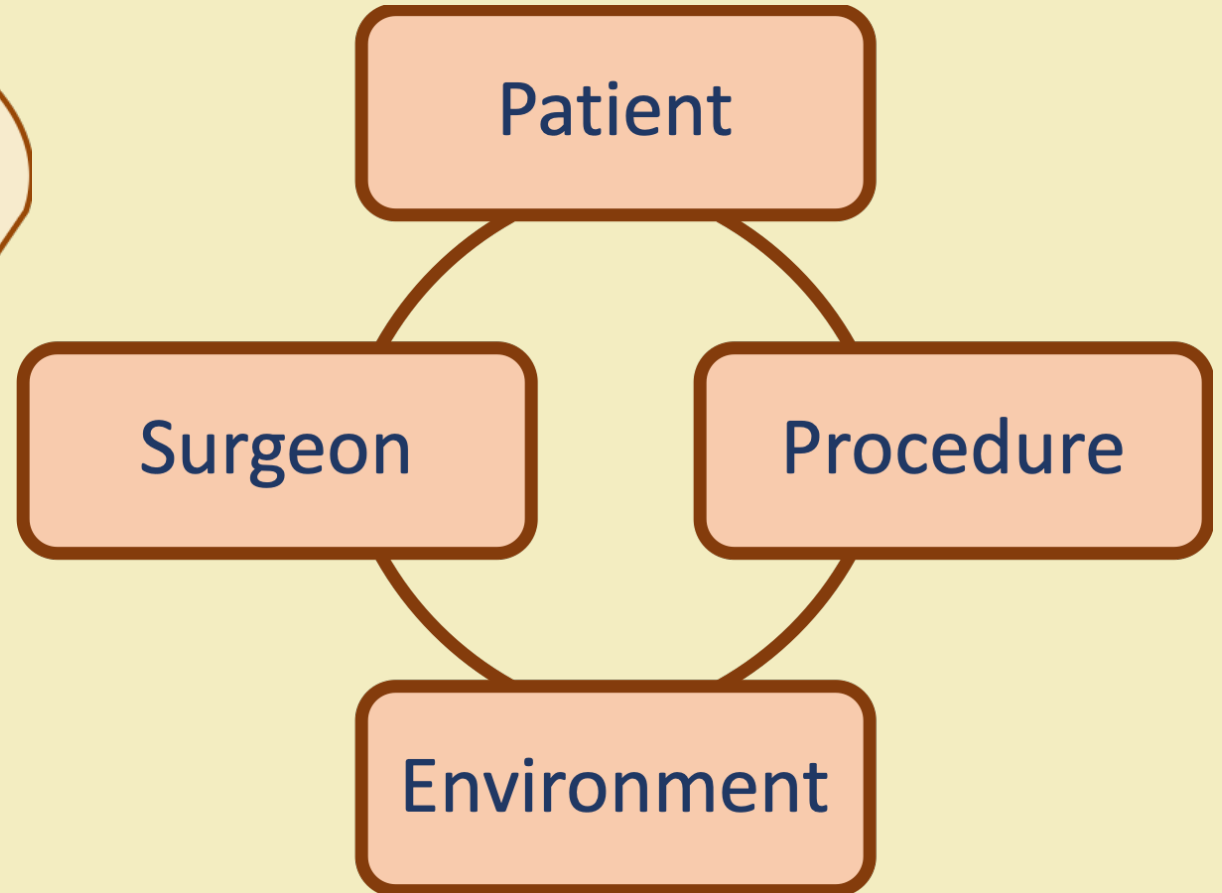
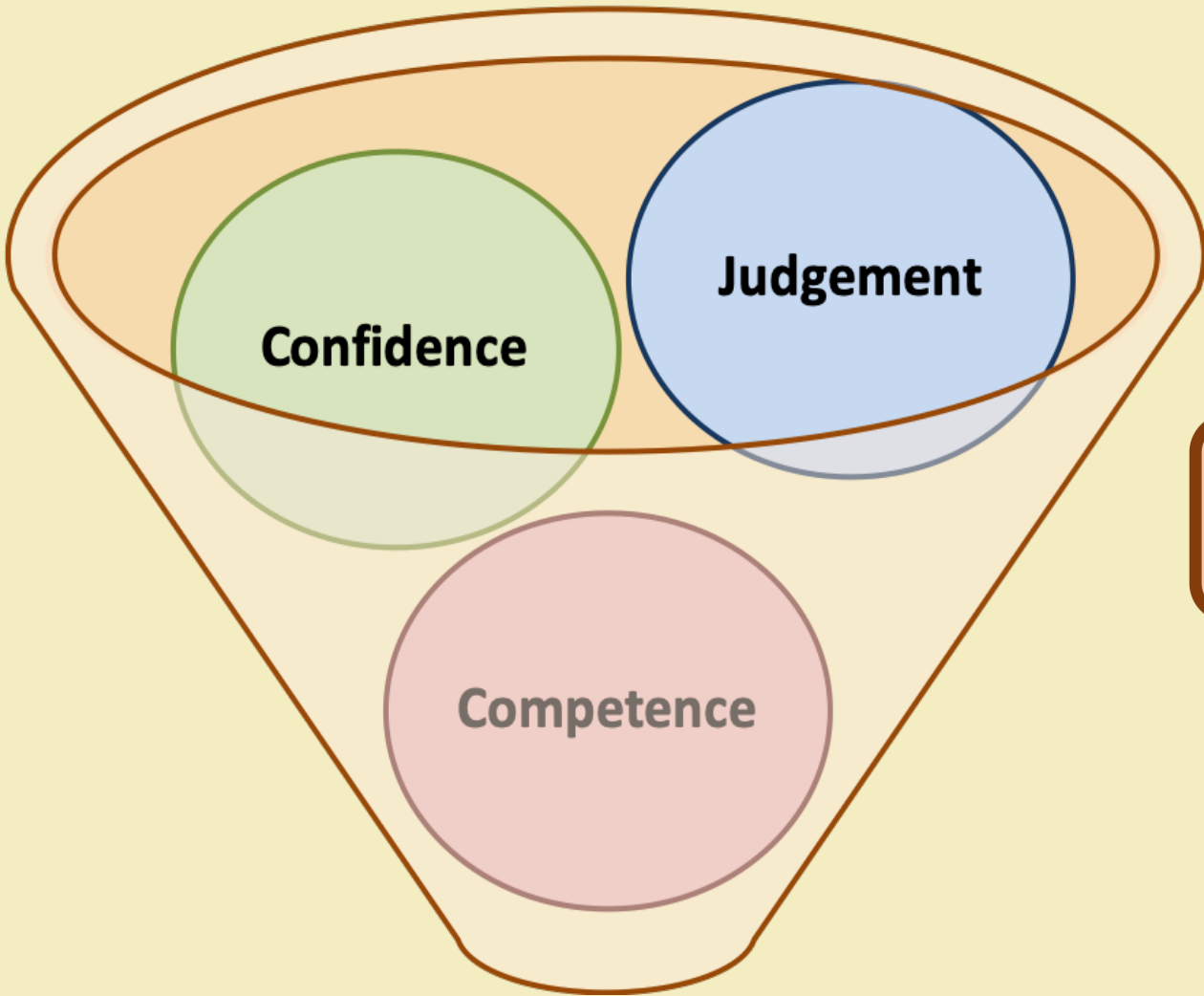
Procedure	RVU
Office hysteroscopy / biopsy	38.52
Office endometrial ablation	48.44
Total abdominal hysterectomy	26.07
Vaginal hysterectomy >250 grams	30.55
Global obstetrics care	47.01



Success in Hysteroscopy



Success in Office Hysteroscopy



Success in Office Hysteroscopy

**Good
Judgement**

Advanced Technology Does Not Compensate For Advanced Stupidity

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