Didactic:

Hysteroscopy from A-Z

PROGRAM CHAIR
Sony S. Singh, MD

PROGRAM CHAIR
Isabel C. Green, MD

Linda D. Bradley, MD
Neeraj Mehra, MD
Scott G. Chudnoff, MD, MS
James M. Shwayder, MD, JD
Amy L. Garcia, MD
Professional Education Information

Target Audience
This educational activity is developed to meet the needs of residents, fellows and new minimally invasive specialists in the field of gynecology.

Accreditation
AAGL is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

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Faculty: Linda D. Bradley, Scott G. Chudnoff, Amy L. Garcia, Neeraj Mehra, James M. Shwayder

This workshop has something for everyone practicing hysteroscopy. It is designed for the doctor ready to push the envelope in outpatient or office procedures, for those considering making the switch, or for those eager to refine their hysteroscopy and sonogram skills. After receiving instruction from expert faculty, the participant should leave the workshop prepared to start an office practice, armed with the tools to improve the quality, safety, and efficiency of hysteroscopy and ultrasound procedures.

**Learning Objectives:** At the conclusion of this course, the clinician will be able to: 1) Identify the appropriate patients and equipment for office hysteroscopic procedures; 2) describe and execute techniques of office hysteroscopy, including diagnostics, polypectomy and excision of synechiae; 3) describe the benefits of and approach to office sonogram in the evaluation of abnormal uterine bleeding; 4) recognize and manage rare procedural emergencies of office hysteroscopic procedures; and 5) describe the various options for pain control for patients undergoing hysteroscopy without general anesthesia.

**Course Outline**

7:00 Welcome, Introductions and Course Overview
7:05 OR or Office: Set Up for Success
7:30 Visualization Tips and Tricks for Hysteroscopy
8:00 Managing Pain and Anxiety for Office or Outpatient Procedures
8:30 Working With the Awake Patient – Tips and Tricks for Diagnostic and Operative Hysteroscopy
9:00 Questions & Answers
9:15 Break
9:30 An Alternative to Hysteroscopy – Transvaginal Ultrasound in the Evaluation of Abnormal Bleeding
10:00 Beyond Diagnostics – Office Sterilization, Ablation and Resection
10:30 Prepare for the Worst Case Scenario before It Happens – Complications in Office Procedures
10:50 Questions & Answers
11:00 Adjourn
PLANNER DISCLOSURE
The following members of AAGL have been involved in the educational planning of this workshop and have no conflict of interest to disclose (in alphabetical order by last name).
Art Arellano, Professional Education Manager, AAGL*
Viviane F. Connor*
Kimberly A. Kho*
Frank D. Loffer, Medical Director, AAGL*
Linda Michels, Executive Director, AAGL*
M. Jonathon Solnik*
Johnny Yi*

SCIENTIFIC PROGRAM COMMITTEE
Arnold P. Advincula
Consultant: Blue Endo, Intuitive Surgical, SurgiQuest
Other: Royalties: CooperSurgical
William M. Burke*
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Linda D. Bradley
Grants/Research: Bayer Healthcare Corp.
Speakers Bureau: Bayer Healthcare Corp., Smith & Nephew Endoscopy
Scott G. Chudnoff*
Amy L. Garcia
Speakers Bureau: Ethicon Endo-Surgery
Grants/Research: Hologic
Isabel C. Green*
Neeraj Mehra
Consultant: Actavis Pharmaceutical, Bayer Healthcare Corp., Ethicon Endo-Surgery
Other: Royalties: Cook Women’s Health
Sony S. Singh
Grants/Research: Abbott Laboratories, Bayer Healthcare Corp.
Speakers Bureau: Actavis, Abbott Laboratories, Bayer Healthcare Corp.

Asterisk (*) denotes no financial relationships to disclose.
OR or Office: Set Up for Success for Hysteroscopy

Linda D. Bradley MD
Professor of Surgery
Vice Chair Obstetrics & Gynecology
Director, Center for Menstrual Disorders, Fibroids, and Hysteroscopic Services
Cleveland Clinic

Disclosures
Consultant: Bayer Healthcare Corp., Boston
Scientific Corp. Inc., Endoceutics, Hologic, Smith & Nephew Endoscopy
Grants/Research: Bayer Healthcare Corp.
Speakers Bureau: Bayer Healthcare Corp., Smith & Nephew Endoscopy

Objectives
At the end of this lecture you will be able to:
• Identify the necessary equipment needed for office hysteroscopy
• Be knowledgeable about operative hysteroscopy equipment needed to perform ambulatory procedures
• List items on the safety check list that should not be forgotten

Avoiding Patient Complaints in Office Hysteroscopy
• Experienced Knowledgeable Physician
• Explain Procedure
• Maintain Dialogue
• Avoid Grasping Cervix
• Consider Paracervical Block
• Little or No Dilation
• Video Control
• Insert Scope Under Direct Vision
• Avoid Overdistention
• Short Procedures (<5 Minutes)

Everyone Needs Education
• Physician
  – Manual of operations
  – Periodic safety drills
• Staff
  – Periodic in-service training
  – Physician training
  – Vendor training
• Patient
  – Brochures
  – Videotape
  – Answer all questions pre and post procedure

Office: Time Out
• Identify patient
• Pregnancy test results
• Visualize cervix to exclude cervicitis
• Palpate cervix to exclude pelvic inflammatory disease
• Allergies
  – Soap
  – Anesthesia
• Right procedure
  – IUD removal
  – Hysteroscopic sterilization
  – Diagnostic
  – Brief operative procedure
**Don’t Play Peek a Boo Medicine**

- Informed Consent
- See and examine the patient before the hysteroscopy
- Order appropriate laboratory testing as part of work up
- Promptly return phone calls and exam the if patient has questions

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**Hysteroscopic Complications**

**Predisposing Factors**

- Contraindications ignored
- Improper surgical technique
- Improper use of equipment
- Incorrectly chosen patient

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**Diagnostic Office Hysteroscopy**

**Setup**
- Sterile drapes, gauze, and gloves
- Syringe, needles, and needle extender
- Povidone-iodine solution
- Local anesthetic
- Hysteroflator and insufflation tubing
- Needle holder, forceps, and suture
- Open sided speculum
- Tenaculum, polyp & ring forceps
- Sound, graduated dilator
- Emergency kit for vasovagal reaction
- Saline and IV tubing
- Buttock draping

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**Procedural Cascade With Fluid**

- Bimanual exam for position of cervix and fundus
- Light source "on"
- Hysteroflator set to 100 mm Hg and 40-60 cc/min
- Cervix on traction with tenaculum
- Endocervix engaged with hysteroscope
- For 30° scope, "black hole" kept at 6 o’clock
- Uterine cavity entered and strategically assessed
- Flow increased up to 100 cc/min for better distention
- Endocervical canal explored on withdrawal from cavity
- Hysteroscope and tenaculum removed
- Cervix and tenaculum sites assessed for bleeding

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**Carbon Dioxide as Distention Medium**

**Benefits**
- Refractory index of 1.0
- Cleared by breathing
- Very soluble in blood, low embolic potential
- Not combustible
- Simplicity in cleaning instruments

**Disadvantages**
- Need for hysteroflator
- Easy escape from cervix
- Blood and mucus obscure the view
- Shoulder and thoracic discomfort
**Diagnostic Hysteroscopy**

**Carbon Dioxide Insufflator**  
*High pressure with low flow rate*

- Maximum flow at 100 cc/min
- Maximum pressure <100 mm Hg

*Not a laparoscopic insufflator!*

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**Equipment for Office Hysteroscopy**

- Rigid or Flexible Hysteroscope
- Hysteroinsufflator CO2 or
- Fluid  
  - may use 60 cc syringe for instillation
- Printer
- Video Monitor
- Lighting
- Camera

---

**Rigid Scope with an Anteflexed Uterus**

**Tenaculum to Straighten Uterine Axis**

**Flexible Scope in an Anteflexed Uterus**

*Flexible Office Hysteroscopy - finally - EZ & convenient*
Betocchi System

Office Hysteroscopy
Flexible vs Rigid Telescopes

- Advantages
  - Available in 3.1mm and 4.9mm
  - Tapered Insertion Section
  - Facilitates Insertion
  - Flexible Tip
  - Increased Patient Comfort
  - Gas or Low Viscosity Liquids
  - Tenaculum/Cervical Dilation Rarely Necessary with 3.1mm Scope
  - Potential For:
    - Reasonable Biopsy
    - 5 French with 4.9mm Scope
  - Increased Patient Comfort

Managing Distention Media

Distention Media
Purpose
  - Create cavity by overcoming myometrial resistance
  - Create sufficient pressure to prevent bleeding

What Else Do I Want to Know On the Day of Hysteroscopic Surgery?

- Last menstrual period
- Herpes prodrome?
- Did she remember to take Cytotec?
- Does she plan on having children?
- Surgical Time Out?
  - Right patient?
  - Right procedure?
  - Instruments needed all present?
  - Informed consent and complications reviewed with patient
  - Anesthesiologist

Operative Hysteroscopy: Technical Considerations

- Operate during early proliferative phase or with endometrial thinning
- Attempt resection of Type 0 and 1 fibroids only
- Always advance the electrode towards yourself
- Visualize all landmarks throughout the case
- Restrict resection to endometrial surfaces
  - If deep intramural lesion noted—be patient!
  - Often once the pseudocapsule is breached, the uterus will contract and expel the myoma into the field
  - Intermittently decrease intra uterine pressure to prevent “disappearing phenomenon”
- Beware of progressive myometrial eversion
- End resection at capsular level
- Uterine decompression—and wait—reinspect

General Principles of Operative Hysteroscopic Myomectomy

- Deflate the endometrium as you resect
- Uterine massage
- Reinspect endometrial cavity 2-3 minutes after removing hysteroscope
- Endometrial suppression not needed, try to schedule post-menses or early proliferative phase
- Sharp curettage can be performed if copious endometrial debris, blood, or copious endometrium
- Consider post op office hysteroscopy in patients desiring fertility within 7-10 days
  - Consider estrogen therapy to aid in re-epithelialization of endometrium in patients desiring fertility
  - Or placement of a 30 mL intrauterine Foley catheter
Intrauterine Surgical Techniques

- Resectoscopic Myomectomy
  - consider oral, vaginal misoprostol or laminaria in nulliparous, multiple C/S, menopausal, or those with prior cone biopsies, since cervix must be dilated to 22F-31 F with hysteroscope
  - use concomitant laparoscopy if concerned about perforation
  - use of dilute solution of pitressin intracervically (to decrease absorption of fluid and facilitate cervical dilation) 20u/100ml saline

- Know your landmarks
- Movement
  - Move wrists
  - Move your hysteroscope
- Vary the intrauterine pressure
- Open and close outflow valve when needed
- Remove clots and debris when poor visualization occurs

Operative Hysteroscopy: Toolkit

- Ovum forceps
- Polyp forceps
- Ring forceps
- Myoma (Corson) graspers
- Suction curette
- Sharp curette
- Cutting loop

Intra-operative safety precautions

- Flat
  - Do not use Trendelenberg
- Position legs in Allen stirrup’s or Candy cane
- Collect fluids with drapes/pouches

Fluid Pumps: Use Them!!!

Fluid balance is an important issue during hysteroscopy!

But it's really difficult to track!

...especially the amount on the floor.
Tracking Glycine Irrigation Fluid Intraoperatively

• When asked to estimate amount of fluid on the floor, experienced OR nurses had a difficult time, commenting: “we are totally unable to estimate the amount of fluid on the floor.”

[Graph showing estimate of fluid on floor (cc) vs. trial number]

Puddle Vac AKA “Sucky Ducky”

Size of Intracavitary Lesion Determines Surgical Time

As diameter of myoma increases, volume increases cubically (v= 4/3 \( \pi r^3 \)), increasing operating time.

Surgeons should be aware of this dynamic and plan accordingly for overall procedure time.

* Emanuel, MH. (2005). Presentation to Smith & Nephew

Remember Volume

• 4/\( \pi r^3 \)
• 1 cm = 1/2 cubic cm tissue
• 2 cm = 4 cubic cm tissue
• 3 cm = 14 cubic cm tissue
• 4 cm = 33 cubic cm tissue

As you increase the size of the lesion for operative hysteroscopy, the volume of resected tissue dramatically increases. This affects length of surgery, amount of fluid used, and ability to complete the surgery.

Cytotec: Use It

• Misoprostol (cytotec)
  – Synthetic methyl analogous of PGE,
  – Acts on cellular matrix, dissolving collagen, increases hyaluronic acid, increased cervical water by increasing vascularity permeability
  – Interleukin-6 is affected, increasing collagenase and thus cervical softening
  – Activates smooth muscle contractions


Use Cytotec: It Works

• Options
  – Cytotec 200-400 mcg by mouth or intra-vaginally at bedtime prior to procedure
  – If very tight cervix suspected, then begin above regimen 2 days before procedure as well as at bedtime prior to procedure

Consider Vasopressin

- Preparation: 20 u/100 saline = 0.2 u/cc
- Direct intra-cervical stromal injection of 5 mL at 12, 3, 6 and 9 o’clock
  - Alert anesthesiologist
  - Aspirate before injection
  - Administer 5 cc/side = 4 units
  - Assess for cardiovascular response before second injection

Operative Hysteroscopy

**Intracervical Vasopressin**

*Effects During Operative Hysteroscopy*


<table>
<thead>
<tr>
<th>Measurement</th>
<th>p value</th>
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<tbody>
<tr>
<td>BLOOD LOSS</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>INTRAVASATION</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>OPERATING TIME</td>
<td>&lt; .05</td>
</tr>
</tbody>
</table>

Hysteroscopic Instrumentation

- Telescope
- Sheath System
  - Hysteroscope
    - Diagnostic
  - Operative
  - Resectoscope

GYNECARE VERSAPOINT Bipolar Electrodes: Utilizing Saline

- Bipolar Loop Resecting
- 0-Degree Vaporizing
- Spring
- Twizzle
- Ball

Chips: The Most Frustrating Part of the Procedure

- Removal under direct visualization with wire loop
- Polyp forceps
- Corson graspers
- Suction curette
- Consider morcellators
- Care must be taken to prevent perforation when done blindly
Smith Nephew Morcellator

- Saline environment
- Resection of polyps
- Resections of fibroids
- No electrical energy used
- Uses its own fluid management system
- Must still follow fluid management guidelines

TRUCLEAR™ Hysteroscopic Morcellator

Myoma Blade
Polyp Blade
Control Unit
Continuous Flow Hysteroscope

MyoSure® Tissue Removal System

- Fast cutting rate of 1.5 grams per minute
- Small 6.25 mm outer diameter hysteroscope
- Single foot pedal, single speed
- Simple user interface
- Cutting blade’s angle and grade of stainless steel has been tested to cut dense fibroids.
- Window opening is optimized for superior tissue contact and is effective in removing fundal fibroids.

No Energy So What About Bleeding with Morcellators?

- Typically the bleeding with hysteroscopic morcellation is similar or less
- Continuous flow during procedure keeps the image clear
- Post procedure contraction of the uterus stops most significant bleeding
- Intrauterine pressure of pump can be increased to help tamponade any oozing

Richard Wolf Chip E Vac System Components

- Very similar to current resectoscope
- Bipolar device
- For each “strip” of myoma or polyp resected, it is suctioned into hysteroscope and does not remain floating in the field
Components of Richard Wolf Chip E-Vac System

Intra Operative Surgical Techniques for Polypectomy

- If blind procedure is performed, look with hysteroscope to determine that full resection is completed
- Resect to the endometrium
- Remove and send all portions of polyp for pathology
- Determine if other pathology is present
- Final inspection to determine that full resection occurred
  - Check the endocervix and endometrial canal...don't miss co-existing lesions

Fluid Guidelines

- If Glycine or Sorbitol solutions
  - Halt procedure when deficit is 1000 mL and order stat sodium and potassium level.
  - If normal proceed and completely stop procedure with total deficit of 1500 mL, recheck electrolytes and consider empiric diuresis with Lasix 20 mg IV
  - Monitor clinical symptoms if Na < 132
- If Normal Saline is used, more latitude
  - Halt procedure when deficit is 2,500 - 3000 mL
  - Diuresis with Lasix, assess for pulmonary edema

Don't Play Peek a boo or Telephone Medicine

- See and examine the patient
- Order appropriate laboratory and imaging tests
- Don't hope the problem away
- Re-assess until the problem has resolved

Informed Consent

- Fluid Overload
- Thermal injury
- Infertility
- Adhesions
- Bleeding
- Infection
- Uterine perforation
- Symptomatic hyponatremia
- Early termination
- Incomplete resection
- Hematometria
- Conversion:
  - Laparoscopy
  - Laparotomy
- Hysterectomy
- Death
Discharge instructions

- Expect serous discharge 1-2 weeks
- Bloody discharge 7-21 days
- Cramping 24-48 hours
- No intercourse for one week
- Call if persistent pain or fever

Summary

- Excellent pre-operative evaluation is essential to determine, size, number and location of fibroids
- Excellent hysteroscopic skills with attention to fluid management is necessary
- Superb clinical outcome and minimal complications noted with operative hysteroscopy in appropriately selected patients

References

Focusing in on the Problem: Visualization in Hysteroscopy

Neeraj Mehra, MD, FRCSC
Department of Obstetrics & Gynecology
University of British Columbia
AAGL Global Congress: Hysteroscopy Course
November 18, 2014

Disclosure

Consultant: Actavis Pharmaceutical, Bayer Healthcare Corp., Ethicon Endo-Surgery

Learning Objectives

1. Understand the importance of good visualization at endoscopy
2. Identify common reasons for poor visualization at laparoscopic and hysteroscopic surgery
3. Develop specific strategies to improve visualization at laparoscopy and hysteroscopy

Why is visualization important?

1. Suboptimal view slows procedural progress
2. Increased frustration with repeated attempts to resolve the situation
3. Poor visualization increases potential for adverse events

Visualization Problems in Hysteroscopy

1. Focus & Lighting
2. Zoom
3. Blood
4. Distention
5. Bubbles
Focus & Lighting

Focus
• Adjust focus BEFORE introducing hysteroscope
• May become off focus even when set initially. Consider focus adjustment when other visualization methods are ineffective

Lighting
• White balance to reduce glare and adjust color tone
• Consider damage to fiberoptic cable or light source
• Light transmission is a function of number of fibers, size of the cable and power of light source

Visualization Tip

Make the Circle

Adjust the Zoom

Visualization Problems in Hysteroscopy:

ZOOM

Incorrect
Correct

Visualization Problems in Hysteroscopy:

POOR DISTENSION

Possible Reasons for Poor Distension

How to correct?

Low inflow of distention media
Raise height of bag
Pressure cuff / Squeeze Fluid Management System

Excess suction
Turn down suction (but NOT OFF)

Over dilated cervix
Extra tenaculum on cervix

Perforation
Consider Stopping

Visualization Problems in Hysteroscopy:

BLOOD

Visualization Problems in Hysteroscopy:

BLOOD
Visualization Problems in Hysteroscopy:

**BLOOD**
- Suction blocked at internal os
- No Flow
- Poor vision

- Scope too far
- Turbulent Flow
- Poor vision

- Suction past internal os
- Laminar Flow
- Vision Clear!

**BUBBLES**
- Byproduct of electrosurgery
- Tissue vaporization
- Oxidation of glycine
- $\text{O}_2 + \text{NH}_2\text{CH}_2\text{COOH} \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{NH}_3$
- Suction too high - Inflow from cervix

- Suction Off
- No Flow
- Poor vision

- Suction Too High
- Inflow through cervix - BUBBLES
- Poor vision

- Medium Suction
- Laminar Flow
- Vision Clear!
Visualization Problems in Hysteroscopy: BUBBLES

CONCLUSIONS
Visualization at Hysteroscopy

1. Focus and White Balance before starting
2. Make the Circle - Adjust the Zoom
3. Ensure adequate distention
   - Adjust inflow & suction
4. Clear the blood - get past the cervix
5. Clear the bubbles under the hood

Thank You
Managing Pain and Anxiety for Office or Outpatient Procedures

Scott Chudnoff, MD, MS
Associate Professor – Einstein Medical School
Director of Gynecology – Montefiore Medical Center

Disclosure
I have no financial relationships to disclose.

Objectives
• After conclusion of this lecture, the participant will be able to:
  – To explain the association of pain and anxiety
  – To recognize the sources of pain and anxiety for procedures in the office setting
  – To describe various techniques to reduce the associated pain and anxiety with outpatient hysteroscopic procedures

Fear of Pain
• One of the biggest obstacles to office procedures is physician fear of pain
  – Many patients also concerned regarding potential for pain

The Pitfalls of Office Procedures
How Painful Is Hysteroscopy?


Association with Pain

ANXIETY

The Story of Aron Rolston

Pain and Anxiety Association
DECREASING ANXIETY

Music

Waiting

Setting

Temperature

Modesty

• Lock the door when starting the procedure
• Cover the patient

PROCEDURAL FACTORS

WARNING
THIS SIGN
IS ONLY A
DISTRACTION

I would put
a picture
there,
but it
would
not
distract
you

VOCAL


Page 20
Where is the pain

• Anytime there if physical manipulation there may be pain
  – Insertion of the speculum
  – Tenaculum
  – Injection of cervix / paracervix
  – Dilation
  – Hysteroscope insertion
    • External Os
    • Internal Os
      – Vasovagal
    – Uterine distention

Case Selection / Technique

Vaginoscopy

Author’s conclusions The vaginoscopic approach to outpatient hysteroscopy is successful and significantly reduces the pain experienced by patients during the procedure, compared with traditional techniques using a vaginal speculum. Vaginoscopy should become standard practice for endoscopic instrumentation of the uterine cavity in the outpatient setting.

Misoprostol Cervical Preparation

<table>
<thead>
<tr>
<th>Study</th>
<th>Menopausal status</th>
<th>Dose (mcg)</th>
<th>Variable Assessed</th>
<th>Pain Difference</th>
<th>P-Value</th>
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<tbody>
<tr>
<td>Ayer A, et al</td>
<td>PRE / POST 400 / vaginal / 4</td>
<td>Cervical Dilation</td>
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<td>PRE / POST 400 / vaginal / 4</td>
<td>Entire Procedure</td>
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<td>Na Costa, et al</td>
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<td>Hysteroscope insertion – Dilation – Clamping Cervix – Endometrial biopsy</td>
<td>Reduced (VAS 7 - 10)</td>
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<td>Cervical Dilation</td>
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</table>

Author’s conclusions There is no evidence to recommend the routine administration of misoprostol or misoprostol to women before outpatient hysteroscopy. Cervical priming with vaginal prostaglandins may be considered in postmenopausal women if using hysteroscopic systems <3 – 5 mm in diameter.

Scope Size

<table>
<thead>
<tr>
<th>Study</th>
<th>Menopausal status</th>
<th>Sheath Size (mm)</th>
<th>Pain Difference</th>
<th>P-Value</th>
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<tr>
<td>Cerda, et al</td>
<td>POST 3.5 vs. 5</td>
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<td>Campo, et al</td>
<td>PRE / POST 3.5</td>
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<td>POST 3.5 vs. 5</td>
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<td>Raffi, et al</td>
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</table>

Author’s conclusions There is no evidence to recommend the routine administration of misoprostol or misoprostol to women before outpatient hysteroscopy. Cervical priming with vaginal prostaglandins may be considered in postmenopausal women if using hysteroscopic systems <3 – 5 mm in diameter.
Fluid Temperature

- Increase Comfort
- Increase Fluid Intravasation

ANALGESIA / ANESTHESIA

Approaches

- PO / IM Meds
  - NSAID’s / Cox 2 inhibitors
  - Opiates
  - Anxiolytics
- Blocks
  - Topical
  - Injectable
- Regional
- Conscious Sedation
- General Anesthesia

NSAID’s / COX 2 Inhibitors

NSAID’s

- Need to give before procedure
  - 15 minute
- Some will give 2 doses
  - 1 the night before
  - 2nd prior to procedure

Cochrane Review

Pain relief for outpatient hysteroscopy (Review)

Ahmad G, O’Flynn H, Atuchushi S, Duffy JMN, Watson A

Main results

- Survey of 301 participants: 75% of patients received analgesics prior to procedures
- 80% of participants felt some pain
- 70% of participants would recommend their procedure
- 40% of participants felt some pain
- 60% of participants would recommend their procedure

Further analysis:

- NSAID’s: 29% decrease in pain
- COX 2 inhibitors: 20% decrease in pain

References

Conscious Sedation

- Need to know local and state regulations
- Need to be prepared for airway, respiratory and cardiac support
- Is generally unnecessary for office hysteroscopy

### Depth of Sedation

<table>
<thead>
<tr>
<th>Patient Response</th>
<th>Minimal Sedation (Anxiolysis)</th>
<th>Moderate Sedation and Analgesia (Conscious Sedation)</th>
<th>Deep Sedation / Analgesia</th>
<th>Unarousable even with painful stimulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airway</td>
<td>Unaffected</td>
<td>Intervention may be required</td>
<td>Intervention often required</td>
<td></td>
</tr>
<tr>
<td>Spontaneous Ventilation</td>
<td>Unaffected</td>
<td>Adequate</td>
<td>Insufficient</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular Function</td>
<td>Unaffected</td>
<td>Usually maintained</td>
<td>May be required</td>
<td></td>
</tr>
</tbody>
</table>

- Can easily slip from a lighter sedation to heavier sedation
- Represents a continuum
- Doesn’t matter the route of administration included

Developed by the ASA

### Different Local Blocks

- Paracervical injection
- Intracervical injection
- Trans and Oil in uterine incision
- Topical surface application
Topical Anesthesia

• Unlikely to provide significant improvement in pain during procedure.
• May reduce pain associated with tenaculum placement.

<table>
<thead>
<tr>
<th>Type</th>
<th>Pain Reduction</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Anaesthesia</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Systemic Analgesia</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Intrauterine Anesthesia

- Recent evidence about patients with endometriosis and adenomyosis may have increased endometrial innervation.
- Presence of pelvic pain history increases the amount of pain likely to be experienced.

Endometrial Innervation

Paracervical / Cervical Block

Keys to Paracervical Block

- Time
- Dosage
### Summative Data – Raw Scores (comp)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Mean Difference</th>
<th>P-Value</th>
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</thead>
<tbody>
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<td>EINSTEIN LA</td>
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<td>1.26</td>
<td>2.00</td>
<td>0.50</td>
<td>4.00</td>
<td>-0.05</td>
<td>&gt;0.05</td>
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<tr>
<td>Walsh E</td>
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<td>1.60</td>
<td>4.00</td>
<td>2.00</td>
<td>6.00</td>
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</tr>
<tr>
<td>Novak</td>
<td>2.00</td>
<td>1.00</td>
<td>2.00</td>
<td>0.00</td>
<td>4.00</td>
<td>0.50</td>
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<td>1.35</td>
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<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Hde</td>
<td>1.27</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
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<tr>
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<td>&gt;0.05</td>
</tr>
<tr>
<td>Hde</td>
<td>1.27</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Hde</td>
<td>1.27</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
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<tr>
<td>Hde</td>
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<td>2.00</td>
<td>1.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Hde</td>
<td>2.00</td>
<td>1.00</td>
<td>2.00</td>
<td>1.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Hde</td>
<td>1.35</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Hde</td>
<td>1.63</td>
<td>1.00</td>
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<td>1.00</td>
<td>3.00</td>
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<td>Hde</td>
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<td>1.00</td>
<td>2.00</td>
<td>1.00</td>
<td>3.00</td>
<td>0.50</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

### References

Working with the Awake Patient
Tips and Tricks for Success

Sukhbir Sony Singh MD, FRCSC
Associate Professor
Vice-Chair, Gynecology
Department of Obstetrics and Gynaecology
University of Ottawa/The Ottawa Hospital
AAGL MIS Fellowship Director
University of Ottawa

Objectives
- At the conclusion of this presentation, the participant will:
  - Identify strategies to determine if patients are eligible for “awake” hysteroscopy
  - Recognize factors which may lead to successful hysteroscopy in a clinic/office setting
  - apply principles which may improve the patient experience during “awake” hysteroscopy

Introduction
- Several advantages over hysteroscopy in the OR, including:
  - reduced anesthetic risks
  - faster recovery
  - improved postoperative pain control
  - reduced cost
- Many hysteroscopic procedures suitable for outpatient clinic or office setting are currently performed in the operating room

Disclosure
Grants/Research: Abbott Laboratories, Bayer Healthcare Corp.
Speakers Bureau: Actavis, Abbott Laboratories, Bayer Healthcare Corp.

Rationale
- Despite evidence of safety and efficacy, few centers have experience with office/clinic hysteroscopy
  - The potential:
    - Cost savings to the hospital system
    - Patient safety (avoiding GA)
    - High surgeon satisfaction
    - Timely patient care
Where to do it?

• Royal College of Obstetricians and Gynecologists in the United Kingdom 2010 Guidelines:
  – All gynecology units provide a dedicated outpatient hysteroscopy service for AUB

• 90% of the procedures can be performed successfully (Cooper et al. 2010).

• What about practice in North America?

Outpatient Hysteroscopy

PROS
• Save OR Time for major cases
• Avoid General Anesthetic
• Quicker Turn Over potential
• Patient centered care
• Out of Hospital

Cons
• Equipment investment
• Surgical experience
  – Lack of educational opportunities
• Perceptions
  – Painful for patients
  – Impairs ability to “good surgery”

The Benefits of Outpatient Hysteroscopy

• The “Gold Standard” for Diagnosis of Uterine Abnormalities

• Easy to do and No Anesthesia Required

• See and Treat ➔ Patient Centered Approach

The “Office” Set Up

• Things have changed...
  – Image Quality
  – Scope size
  – Distension Media

The Space
The Modern Setup of an MIS Suite

- HD Tower and Camera
- Small Hysteroscopes (2.9mm scope)
- Saline distension fluid
- Standardized equipment trays for hysteroscopy procedures
- BP and HR monitors
- IV Sedation PRN
  - IV fentanyl, midazolam
  - Cardiac arrest cart (ACLS training)

Set Up

- sterile tray set up
- sample instruments:
  - diagnostic hysteroscope 4.1mm
  - operative hysteroscope 5.0mm
  (Karl Storz, Canada)

An Example of an MIS Suite

- VIDEO
Important Clinical Applications for Office Hysteroscopy

- Retained IUD
- “Failed Hysteroscopy” in the OR/Stenotic Cervix
- Post myomectomy
- Post uterine surgery or complications
- Uterine anomaly or abnormalities
- Primary visit for infertility

Patient factors

- Anxiety
  - Education
  - Environment
  - Support
- History of Pain
  - Dysmenorrhea
  - endometriosis

Environment matters

- Reduce anxiety and surrounding stressors
- Lighting, music and “vocal local”

Education

Surgeon experience & Instrument Size

- Protective against pain
- Time (duration) of procedure
- Instrument size matters
No Anesthesia Required!

- Less pain with:
  - Mini-hysteroscopes 3.5mm instruments versus 5mm
  - Skilled surgeon
  - Surgery in mucosa (polyps, biopsies, lysis of adhesions)

- Greater Risk of Pain with:
  - Previous C/S
  - Anxiety & CPP
  - Menopausal
  - Longer procedure (>15min)

No Touch technique

- involves introducing the hysteroscope into the vagina, cervix, and into cavity under direct vision,
- without speculum insertion
- without application of a tenaculum

Outcomes:
- Less pain versus traditional speculum/tenaculum
- Speculum is most painful
- Can avoid using any analgesia or anesthesia


Vaginoscopy

Office Hysteroscopy

Analgesia Protocols

Diagnostic and Operative
- Preop NSAIDS
- & acetaminophen
- If required:
  - Ativan SL
  - PO Narcotic
  - Paracervical block
  - IV Sedation

Procedural
- Preop NSAIDS
- & acetaminophen
- IV sedation:
  - Midazolam 2mg*
  - Fentanyl 50-100mcg*
- Paracervical block
Procedural Protocol

- Information booklet provided to patients
- NSAID & Acetaminophen PO night before and morning of the procedure
- +/- 200 mcg pv misoprostol night or am prior to procedure (physician preference)
- Light meal prior to procedure

Office Hysteroscopy works

- Approx 5000 cases by Betocchi (2004)
- No anesthetic or analgesia
  - Operative hysteroscopy
  - Polyps, lysis of adhesions, septums
  - Extremely well tolerated
  - Only those with larger polyps felt more discomfort (low to moderate pain)

Complications

- Very low rate
  - Pain not controlled with methods available (pre-procedure with cytotec, with procedure)
  - Vasovagal response
  - Allergic reaction (to local, to meds)

- Clark et al., 2002: systematic review of 25,000
  - 3/10,000 rate of serious complications (uterine perforation, pelvic infection, bladder perforation

- Di Spiezo Sardo et al., 2008
  - Complication rate of 5.4%
  - Such as pain, vasovagal, bleeding, shoulder pain, false passage and cervical trauma

  - 6000 procedures
  - 0.17% rate of vasovagal reaction, 2.08% rate of nausea, and 5.75% rate of abdominal cramps.

Table 1: Overview of Procedures Performed at the Ottawa Hospital Hysteroscopy Suite from Nov. 26, 2008 to July 13, 2012

<table>
<thead>
<tr>
<th>Procedure type</th>
<th># of cases</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic Hysteroscopy (+/- pipele biopsy)</td>
<td>84</td>
<td>31%</td>
</tr>
<tr>
<td>Failed attempts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operative Hysteroscopy</td>
<td>99</td>
<td>37%</td>
</tr>
<tr>
<td>Polypectomy, lysis of adhesions, septoplasty, removal retained IUD, directed biopsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometrial Ablations*</td>
<td>62</td>
<td>23%</td>
</tr>
<tr>
<td>Transcervical Sterilization</td>
<td>21</td>
<td>7.7%</td>
</tr>
<tr>
<td>Total # of cases</td>
<td>271**</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Indications for Hysteroscopy (possible to have multiple indications)

<table>
<thead>
<tr>
<th>Indications for hysteroscopy</th>
<th># cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal uterine bleeding</td>
<td>105</td>
</tr>
<tr>
<td>Postmenopausal bleeding</td>
<td>36</td>
</tr>
<tr>
<td>Polyp</td>
<td>23</td>
</tr>
<tr>
<td>Contraception</td>
<td>21</td>
</tr>
<tr>
<td>Fertility assessment/recurrent pregnancy loss</td>
<td>21</td>
</tr>
<tr>
<td>Thickened endometrial lining</td>
<td>19</td>
</tr>
<tr>
<td>Asherman’s/uterine synchia</td>
<td>17</td>
</tr>
<tr>
<td>Retained IUD</td>
<td>12</td>
</tr>
<tr>
<td>Assessment post myomectomy</td>
<td>10</td>
</tr>
<tr>
<td>Uterine Septum</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3: Analgesia administered during each procedure type

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Diagnostic Hysteroscopy (total = 84)*</th>
<th>Operative Hysteroscopy (total = 29)</th>
<th>Endometrial Ablation (total = 62)</th>
<th>Transcervical Sterilization (total = 21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative NSAIDs</td>
<td>64(76%)</td>
<td>76(79%)</td>
<td>62(100%)</td>
<td>16(76%)</td>
</tr>
<tr>
<td>Preoperative acetaminophen</td>
<td>8(9.5%)</td>
<td>8(8.1%)</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>1(1.2%)</td>
<td>8(8.1%)</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>IV fentanyl/midazolam</td>
<td>2(2.4%)</td>
<td>5(5.1%)</td>
<td>61(98%)</td>
<td>2(9.5%)</td>
</tr>
<tr>
<td>Paracervical block**</td>
<td>10(12%)</td>
<td>7(7.1%)</td>
<td>62(100%)</td>
<td>5(24%)</td>
</tr>
<tr>
<td>None</td>
<td>12(14%)</td>
<td>7(7.1%)</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Unspecified</td>
<td>8(9.5%)</td>
<td>8(8.1%)</td>
<td>00</td>
<td>3(14%)</td>
</tr>
</tbody>
</table>

* some patients had more than one method of analgesia
**performed as per surgeon preference – in most cases with xylocaine and epinephrine

The Ottawa Experience

- High Satisfaction
- Low pain experience
- No anesthesia for basic procedures
- IV sedation limited to patient request (mainly ablations at present)

Conclusion

- Outpatient hysteroscopy can be performed in a safe and effective manner
- Patients are highly satisfied with their procedural experience and analgesia control
- Development of new outpatient hysteroscopy clinics in Canada is strongly encouraged
Thanks

• Olga Bougie (PGY -4)
• Hassan Shenassa (PGY 20)
• Karine Lortie (PGY 10)
• Our Nurses and Team at The Ottawa Hospital

References

• Munro & Brooks. Use of Local Anesthesia for Office Diagnostic and Operative Hysteroscopy. JMIG Nov/Dec 2010. Vol 17[6].
An Alternative to Hysteroscopy-
Transvaginal Ultrasound in the
Evaluation of Abnormal Bleeding

James M. Shwayder, M.D., J.D.
Professor and Chair
Department of Obstetrics and Gynecology
University of Mississippi
Jackson, Mississippi

Disclosure
Other: Royalties: Cook Women’s Health

Learning Objectives
• Understand the relative value of different methods of evaluating the endometrium in patients with abnormal uterine bleeding
• Be able to better predict the presence of significant pathology in different age groups
• Understand the role of ultrasound and saline infusion sonography in diagnosis and management
• Be able to describe the unique capabilities of ultrasound

Outline
• Causes of AUB amenable to US diagnosis
• Age-based evaluation
• Sonohysterography (3D)
• Sonobiopsy
• Advantages of ultrasound over hysteroscopy

“Age-Related” Evaluation
• Reproductive Age Group
• Perimenopause
• Menopausal Patients

Diagnosis of Abnormal Uterine Bleeding in Reproductive-Aged Women
• Abnormal Uterine Bleeding (AUB)
• Heavy menstrual bleeding (AUB/HMB)
  • Menorrhagia
• Intermenstrual bleeding (AUB/IMB)
  • Metrorrhagia
• DUB - Eliminated
### PALM-COEIN

#### Abnormal Uterine Bleeding (AUB)
- Heavy menstrual bleeding (AUB/M)
- Intermenstrual bleeding (AUB/I)

#### PALM: Structural Causes
- Polyp (AUB-P)
- Adenomyosis (AUB-A)
- Leiomyoma (AUB-L)
- Submucosal myoma (AUB-Lm)
- Other myoma (AUB-Lt)
- Malignancy & hyperplasia (AUB-M)

#### COEIN: Nonstructural Causes
- Cervical polypathy (AUB-C)
- Cervical dysplasia (AUB-D)
- Endometrial (AUB-E)
- Uterine (AUB-U)
- Not yet classified (AUB-N)

### Endometrial Evaluation

#### Histologic Evaluation
- Options
  - Endometrial biopsy
  - Dilatation and curettage
- Diagnosis best made by tissue biopsy
  - Hormonal dysregulation
  - Endometritis
  - Endometrial hyperplasia
  - Diffuse malignancy

#### Endometrial Evaluation

##### Visual Evaluation
- Options
  - Hysteroscopy
  - Transvaginal sonography (TVS)
  - Saline-infusion sonohysterography (SIS)
  - 3D Ultrasound/SIS
- Diagnosis best made by visualizing the endometrial cavity for focal anatomic causes
  - Polyps
  - Submucous myomas
  - Focal malignancy

##### Age-Based Findings at Hysteroscopy

<table>
<thead>
<tr>
<th>Age Group (#)</th>
<th>Normal %</th>
<th>Normal #</th>
<th>Abnormal %</th>
<th>Abnormal #</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 29</td>
<td>64%</td>
<td>9</td>
<td>36%</td>
<td>5</td>
</tr>
<tr>
<td>30–39</td>
<td>45%</td>
<td>36</td>
<td>55%</td>
<td>22</td>
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<tr>
<td>40–49</td>
<td>42%</td>
<td>44</td>
<td>58%</td>
<td>61</td>
</tr>
<tr>
<td>50–59</td>
<td>28%</td>
<td>12</td>
<td>76%</td>
<td>31</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>33%</td>
<td>6</td>
<td>67%</td>
<td>12</td>
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<tr>
<td>Total</td>
<td>45%</td>
<td>107</td>
<td>55%</td>
<td>131</td>
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</tbody>
</table>


##### Age-Based Findings at SIS

<table>
<thead>
<tr>
<th>Age (#)</th>
<th>Normal %</th>
<th>Normal #</th>
<th>Abnormal %</th>
<th>Abnormal #</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 29</td>
<td>68.4%</td>
<td>26</td>
<td>31.6%</td>
<td>12</td>
</tr>
<tr>
<td>30–39</td>
<td>62.5%</td>
<td>50</td>
<td>37.5%</td>
<td>30</td>
</tr>
<tr>
<td>40–49</td>
<td>68.4%</td>
<td>104</td>
<td>31.6%</td>
<td>48</td>
</tr>
<tr>
<td>50–59</td>
<td>60.4%</td>
<td>26</td>
<td>39.6%</td>
<td>17</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>60.7%</td>
<td>17</td>
<td>39.3%</td>
<td>11</td>
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<tr>
<td>Total</td>
<td>65.4%</td>
<td>223</td>
<td>34.6%</td>
<td>118</td>
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</tbody>
</table>

Brown and Shwayder, AJUM Annual Meeting 2007
**Age-Based Findings at Surgery**

(filling defects)

<table>
<thead>
<tr>
<th>Age</th>
<th>(#)</th>
<th>Normal</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 29</td>
<td>38</td>
<td>73.7%</td>
<td>26.3%</td>
</tr>
<tr>
<td>30–39</td>
<td>80</td>
<td>67.5%</td>
<td>32.5%</td>
</tr>
<tr>
<td>40–49</td>
<td>152</td>
<td>70.4%</td>
<td>29.6%</td>
</tr>
<tr>
<td>50–59</td>
<td>43</td>
<td>67.4%</td>
<td>32.6%</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>28</td>
<td>64.3%</td>
<td>35.7%</td>
</tr>
<tr>
<td>Total</td>
<td>341</td>
<td>69.2%</td>
<td>30.8%</td>
</tr>
</tbody>
</table>

Brown and Shwayder, AIUM Annual Meeting 2007

**Timing of Studies**

**Timing**

- No suppression or irregular
  - At the end of menses
  - At the end of a withdrawal bleed
- Suppression (LARC, OBCP, Depo-P)
  - Timing of the study is not critical

**13 y.o. G0 with AUB**

- Coagulation evaluation: WNL
- Minimal response to oral contraceptives
- hCG = negative
- Referred for ultrasound

**13 y.o. with AUB**
Sonohysterography

Goldstein Catheter - 5.2-5.4 Fr.
Soules Catheter - 5.3 Fr.
Tampa Catheter - 5 French
Akrad Catheter - 5 or 7 French
H/S Elliptosphere™ Catheter 5 or 7 French
Goldstein Sonobiopsy Catheter - 7.2 Fr.
SHG Catheter - 5 or 7 French
Shepard Catheter - 5.4 Fr.

SIS Technique – Goldstein Catheter
Sonohysterography
Indications

- Thickened endometrium
- Indistinct endometrium

AUB-2D US

23 y.o. G0
Infertility and Abnormal Bleeding

Multiple Endometrial Polyps
Indistinct Endometrium

2D SIS Polyp

Endometrial Polyp

Endometrial polyp

Sonohysterography
Findings

- Endometrial polyps
  - Central blood supply or "feeder vessel"

Question
Endometrial polyp
- Is there a risk of malignancy?

Malignancy in Endometrial Polyps

- Asymptomatic: 1-2%
- Symptomatic: 2-6%
- Increased risk:
  - Larger size: > 19 mm
  - Older age: > 55 y.o.
  - Abnormal Doppler: RI < 0.5


Sonohysterogram: Polyp
Multiplaner Display

Sonohysterography
Endometrial Polyps and Fibroids

36 y.o. G2P1011

- Presents with complaints of menometrorrhagia for 8 months
- Contraception: None
- HCG: Negative
- Open myomectomy: 4/09
- Hysteroscopic myomectomy: 10/10
- Cesarean delivery: 9/11
34 y.o. G1 P1001

- Presents with menorrhagia for 14 months
- Contraception: tubal ligation

34 y.o. G2 P1011

- VSS; Weight = 145#
- Exam is normal
- hCG = negative
- Hct = 31
- PAP = Normal

Submucous Myoma

Type 0

European Society of Hysteroscopy classification of submucous myomas

- Type 0: Pedunculated without intramural extension
- Type I: Sessile in <50% intramural extension
- Type II: >50% intramural extension
- Associated with higher failure rate
- Associated with need for repeat surgical procedures
Submucous Myoma
Type I

MRI and Myomas

- MRI was more sensitive than TVS (80% vs. 40%)\(^1\)
- MRI valuable when 4 or more myomas were present\(^2\)
- MRI assists in planning surgical approach and complete removal\(^3\)

34 y.o. G0 with AUB
Desires Fertility

45 y.o. G4 P2113

- Presents with complaints of menometrorrhagia for 16 months
- Contraception: None
- HCG: Negative
- EMB = Endometrial hyperplasia

Ultrasound-based triage for perimenopausal patients with abnormal uterine bleeding

433 perimenopausal patients with AUB
- TVS day 4 - 6
- Endometrium ≤ 5 mm = DUB
  - No biopsy required
- Endometrium > 5 mm or indistinct = SIS
  - SIS ≤ 3 mm = DUB
  - SIS = Focal lesion
  - SIS = Globally thickened
    - Hysteroscopy + D&C
    - Endometrial Biopsy

Ultrasound-based triage for perimenopausal patients with abnormal uterine bleeding

**Conclusion**
Non-directed office biopsy alone without imaging would have potentially missed the diagnosis of focal lesions such as polyps, submucous myomas, and focal hyperplasia in up to 80 patients (18.5%)


Benign Endometrial Masses with Endometrial Thickness < 5 mm

- 206 premenopausal women with AUB
- Endometrial thickness in 200
- 80 had an ET < 5mm


Benign Endometrial Masses with Endometrial Thickness < 5 mm

<table>
<thead>
<tr>
<th>SIS findings</th>
<th>ET &lt; 5 mm</th>
<th></th>
<th>ET &gt; 5 mm</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>61</td>
<td>76.3</td>
<td>71</td>
<td>59.2</td>
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<tr>
<td>Endometrial polyp</td>
<td>11</td>
<td>13.8</td>
<td>23</td>
<td>19.2</td>
</tr>
<tr>
<td>Submucous myoma</td>
<td>5</td>
<td>6.2</td>
<td>22</td>
<td>18.3</td>
</tr>
<tr>
<td>Uterine septum</td>
<td>1</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Focal thickening</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>Blood clot</td>
<td>2</td>
<td>2.5</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>


Postmenopausal Bleeding

- 58 y.o G1P1001 with persistent postmenopausal bleeding
- Endometrial biopsy x 3
  - Tissue insufficient for diagnosis

Endometrial Evaluation

1. Endometrial biopsy
2. Dilatation and curettage
3. Hysteroscopy + D&C
4. Transvaginal sonography
5. Saline-infusion sonohysterography
6. 3D Ultrasound
7. Hysterectomy
Endometrial Carcinoma

Pipelle endometrial sampling. Sensitivity in the detection of endometrial cancer.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>#</th>
<th>Sens</th>
<th>Journal</th>
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<tbody>
<tr>
<td>Zorlu</td>
<td>1994</td>
<td>26</td>
<td>95%</td>
<td>Gyn Ob Invest</td>
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<tr>
<td>Stovall</td>
<td>1991</td>
<td>40</td>
<td>97.5%</td>
<td>Obstet Gyn</td>
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<tr>
<td>Guido</td>
<td>1995</td>
<td>65</td>
<td>83%</td>
<td>J Reprod Med</td>
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<tr>
<td>Van den Bosch</td>
<td>1995</td>
<td>140</td>
<td>44.6%</td>
<td>Obstet Gyn</td>
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</tbody>
</table>

Evidence: II-1

65 Patients with known endometrial cancer
- Endometrial biopsy prior to hysterectomy
- Adequate for analysis 63 of 65 97%
- Malignancy detected 54 of 65 83%
  - Missed: 5 on polyp
    3 disease < 5% of surface area
    All 11 < 50% of surface area


A comparison of Pipelle device and the Vabra aspirator

25 Patients scheduled for hysterectomy
- Percent surface area sampled
  - Pipelle 4.2% ± 0.92%
  - Vabra Aspirator 41.6% ± 5.7% (p<0.0001)
- Mean number of quadrants sampled (4 ant/4 post)
  - Pipelle 2.4 ± 0.41
  - Vabra aspirator 7.4 ± 0.42 (p = 0.0001)

(University of Chicago)

Diagnostic Options
Sensitivity

<table>
<thead>
<tr>
<th>Technique</th>
<th>#</th>
<th>Polyps &amp; Myomas</th>
<th>Hyperplasia</th>
<th>All Findings</th>
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</thead>
<tbody>
<tr>
<td>TVS</td>
<td>236</td>
<td>0.39</td>
<td>0.90</td>
<td>0.74</td>
</tr>
<tr>
<td>SIS</td>
<td>94</td>
<td>0.96</td>
<td>0.13</td>
<td>0.96</td>
</tr>
<tr>
<td>Hysteroscopy</td>
<td>273</td>
<td>0.99</td>
<td>0.27</td>
<td>1.00</td>
</tr>
<tr>
<td>Pipelle Biopsy</td>
<td>171</td>
<td>0.10</td>
<td>0.33</td>
<td>0.24</td>
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</table>

Endometrial Thickness and Postmenopausal Bleeding

<table>
<thead>
<tr>
<th>Reference</th>
<th>ET (mm)</th>
<th>#</th>
<th># CA</th>
<th>NPV (%)</th>
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<tr>
<td>Karlsson 1995</td>
<td>≤ 4</td>
<td>1168</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Ferrazzi 1996</td>
<td>≤ 4</td>
<td>930</td>
<td>2</td>
<td>99.8</td>
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<tr>
<td></td>
<td>≤ 5</td>
<td></td>
<td>4</td>
<td>99.6</td>
</tr>
<tr>
<td>Gull 2000</td>
<td>≤ 4</td>
<td>163</td>
<td>1</td>
<td>99.4</td>
</tr>
<tr>
<td>Epstein 2001</td>
<td>≤ 5</td>
<td>97</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Gull 2003</td>
<td>≤ 4</td>
<td>394</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Can Ultrasound Replace D&C?

- 394 postmenopausal women referred for PMB (1987-1990)
- Menopausal if > 1 year w/o bleeding
- Ultrasound and D&C
- 10 year follow-up (n = 339)


Recurrent PMB - None

<table>
<thead>
<tr>
<th>Endometrial Thickness</th>
<th>#</th>
<th>CA</th>
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</thead>
<tbody>
<tr>
<td>≤ 4 mm</td>
<td>134</td>
<td>0</td>
</tr>
<tr>
<td>5-7 mm</td>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td>≥ 8 mm</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Unmeasurable</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>191</td>
<td>0</td>
</tr>
</tbody>
</table>


Recurrent PMB - Yes

<table>
<thead>
<tr>
<th>Endometrial Thickness</th>
<th>#</th>
<th>CA</th>
<th>Hyper</th>
<th>CA or Hyper</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 4 mm</td>
<td>28</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5-7 mm</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>≥ 8 mm</td>
<td>28</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Unmeasurable</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>66</td>
<td>7</td>
<td>8</td>
<td>15</td>
</tr>
</tbody>
</table>

Sonobiopsy

- Endometrial biopsy performed with catheter used for SIS
- Allows one-step procedure for complete diagnosis
- Assures intracavitary sample

A comparison of Pipelle device and the Vabra aspirator

25 Patients scheduled for hysterectomy
- Percent surface area sampled
  - Pipelle 4.2% ± 0.92%
  - Vabra Aspirator 41.6% ± 5.7% (p<0.0001)
- Mean number of quadrants sampled (4 ant/4 post)
  - Pipelle 2.4 ± 0.41
  - Vabra aspirator 7.4 ± 0.42 (p < 0.0001)

Limitations of Hysteroscopy

How should we investigate women with postmenopausal bleeding?

- Pipelle in outpatient clinic
- TVS prior to outpatient hysteroscopy/D&C
  - Abnormal: Endometrial thickness > 5 mm
- Hysteroscopy and Curettage


76 Postmenopausal women
- Pipelle
- Successful: 70%
- Sensitivity: 70%
- TVS
- Sensitivity: 83%
- Specificity: 77%
- Positive predictive value: 54%
- Detected 5 ovarian tumors
  - (3 missed on pelvic exam, 2 malignant)


How should we investigate women with postmenopausal bleeding?

- 61 y.o G3P1021 with postmenopausal bleeding
- Spotting x 2 months

Postmenopausal Bleeding

- Papillary serous cystadenocarcinoma
Postmenopausal Bleeding

- 70 y.o G3P1202 with postmenopausal bleeding

Palm-Coein

32 y.o. G0 with AUB
Enlarged Uterus

- Ultrasound (limited)
- Probable myoma
- Planned for myomectomy
- Referred for complete ultrasound

Adenomyosis

- Incidence
  - 20-30% of female population
  - Up to 70% of hysterectomy specimen
- Symptoms
  - Pelvic pain
  - Dysmenorrhea
  - Menorrhagia

Adenomyosis
Ultrasound Diagnosis

- Findings
  - Inhomogeneous myometrial texture 100%
  - Globular uterus 95.7%
  - Small cystic spaces in myometrium 78.7%
  - Indistinct endometrial stripe 78.7%
- If 2 positive findings
  - Correct diagnosis by TVUS 84.3%


Bromley Criteria

Inhomogeneous myometrium
Globularly enlarged uterus
Cystic spaces (> 2 mm)
Indistinct endometriometrial border
Additional Criteria

- Asymmetry
- Increased myometrial vascularity


Adenomyosis and SIS

- Asymmetry
- Increased myometrial vascularity
- Cystic spaces (> 2 mm)


Take-home Message

**Intracavitary Lesions**

- Intracavitary lesions (polyps and submucous myomas) are relatively common in all age groups
  - < 29: 32.4%
  - 30-39: 39.0%
  - 40-49: 30.6%
  - 50-59: 35.5%
  - > 60: 42.3%
  - SIS or hysteroscopy is justifiable in patients of all ages presenting with AUB

Take-home Message

**Post-menopausal Bleeding**

- Endometrial Thickness < 4 mm
  - TVS endometrial thickness ≤ 4 mm is a reasonable threshold to avoid initial endometrial biopsy, SIS, or hysteroscopy
  - Recurrent abnormal vaginal bleeding requires further evaluation
Ultrasound in AUB

• Initial screening to determine if biopsy is necessary
  • Correlate biopsy findings with ultrasound findings
• Identify intracavitary lesions
• Planning for surgical treatment
• Candidate for more intensive medical/hematologic evaluation
• Adnexal evaluation
• Bladder evaluation

Evaluating AUB

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Level of evidence in menorrhagia in general</th>
<th>Level of evidence in menorrhagia with bleeding disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvic blood assessment chart</td>
<td>C, in favor</td>
<td>C, in favor</td>
</tr>
<tr>
<td>Full blood count</td>
<td>B, in favor</td>
<td>B, in favor</td>
</tr>
<tr>
<td>Hematologic tests</td>
<td>B, in favor</td>
<td>B, in favor</td>
</tr>
<tr>
<td>Other clinical factors</td>
<td>C, in favor</td>
<td>C, in favor</td>
</tr>
<tr>
<td>Ultrasonography</td>
<td>C, in favor</td>
<td>C, in favor</td>
</tr>
<tr>
<td>Endometrial biopsy</td>
<td>C, in favor</td>
<td>C, in favor</td>
</tr>
<tr>
<td>Pelvic and endometrial bleeding</td>
<td>B, in favor</td>
<td>B, in favor</td>
</tr>
</tbody>
</table>


References


References

17. Pasquale et al. JAKS 2000;4:201-208
Beyond Diagnostics –
Office Sterilization, Ablation and Resection
Amy Garcia, MD
AAGL/SRS Fellowship-Trained in MIG
Director, Center for Women’s Surgery
Clinical Assistant Professor, University of New Mexico
Department of Obstetrics and Gynecology
Albuquerque, New Mexico

Disclosure
Speakers Bureau: Ethicon Endo-Surgery
Grants/Research: Hologic

Objectives
* Review anesthetic protocol necessary for procedures in the office
* Utilize an operative hysteroscope and operative instruments in the office
* Discern operative hysteroscopy techniques for in-office procedures

Operative Office Hysteroscopy
* Myomectomy
* Uterine Septoplasty
* Polypectomy
* Endometrial Ablation
* Sterilization
* Retrieval of IUD
* Other

In-Office Hysteroscopy--Why
* Patient Comfort
* Patient Financial Burden Lessened
  + Office co-pay vs. outpatient co-pay/deductible
  + Co-insurance, self-pay
* Reduced Risk
  + No general anesthesia
  + EMB vs. D & C
  + See and treat
* Immediate Visual Affirmation
* Patient Convenience
* Physician Convenience

Injectable Local Anesthetics

<table>
<thead>
<tr>
<th>Anesthetic</th>
<th>Concentration</th>
<th>Onset (min)</th>
<th>Duration (hours)</th>
<th>Maximal Dose (mg / kg)</th>
<th>Maximum Dose (mL / 70 kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lidocaine</td>
<td>1%, 2%</td>
<td>&lt;2</td>
<td>1.5-2</td>
<td>4 mg/kg not to exceed 280 mg</td>
<td>28 mL (1%); 14 mL (2%)</td>
</tr>
<tr>
<td>Mepivacaine</td>
<td>1%</td>
<td>3-5</td>
<td>0.75-1.5</td>
<td>4 mg/kg not to exceed 280 mg</td>
<td>28 mL</td>
</tr>
<tr>
<td>Bupivicaine</td>
<td>0.25%</td>
<td>5-8</td>
<td>2-4</td>
<td>2.5 mg/kg not to exceed 175 mg</td>
<td>50 mL</td>
</tr>
<tr>
<td>Lidocaine with Epinephrine</td>
<td>0.5%, 1%, 2% Epinephrine 1:100,000, 1:200,000</td>
<td>&lt;2</td>
<td>2-6</td>
<td>7 mg/kg not to exceed 500 mg</td>
<td>100 mL (0.5%); 50 mL (1%); 25 mL (2%)</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>0.25%</td>
<td>5-8</td>
<td>2-4</td>
<td>2.5 mg/kg not to exceed 175 mg</td>
<td>50 mL</td>
</tr>
<tr>
<td>Lidocaine with Epinephrine</td>
<td>0.25% , 1%</td>
<td>4-6</td>
<td>2-3</td>
<td>7 mg/kg not to exceed 500 mg</td>
<td>50 mL (0.5%); 25 mL (1%)</td>
</tr>
</tbody>
</table>
### Topical Local Anesthetics

<table>
<thead>
<tr>
<th>Anesthetic Formulation</th>
<th>Onset</th>
<th>Duration</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5% Lidocaine, 1:2,000 Epinephrine, 11.8% Cocaine (TAC®)</td>
<td>10-30 min</td>
<td>Unknown</td>
<td>Rare severe toxicity including seizures and sudden cardiac death</td>
</tr>
<tr>
<td>4% Lidocaine, 1:2,000 Epinephrine, 0.5% Tetracaine (LET®)</td>
<td>20-30 min</td>
<td>Unknown</td>
<td>No severe adverse reactions reported</td>
</tr>
<tr>
<td>2.5% Lidocaine, 2.5% Prilocaine (EMLA®)</td>
<td>1 hour</td>
<td>0.5 – 2 hours</td>
<td>Contact dermatitis, methemoglobinemia (very rare)</td>
</tr>
<tr>
<td>4% Liposomal Lidocaine</td>
<td>0.5 hour</td>
<td>0.5 – 2+ hours</td>
<td>No severe adverse reactions reported</td>
</tr>
</tbody>
</table>

### Uterine Neuroanatomy Endometrial Innervation

- High density of small nerve fibres in the functional layer of the endometrium in women with endometriosis

### Uterine Local Anesthesia Sites to Consider

- Vagina
  - Topical
- Cervix
  - Intracervical
  - Topical
- Corpus
  - Paracervical
  - Topical

### Pre-procedure Medication

- **NSAID’s**
  - Ibuprofen
    - 1 hour to 48 hours prior to procedure
  - Ketorolac
    - 30 or 60 mg IM 30 min – 60 min prior to procedure
- **Narcotic** – 1 hour prior
- **Anxiolytic** – 1 hour prior
- **Consider Anti-nausea Medication** – 1 hour prior

### Post-Procedural Medication

- **NSAID**
  - Ibuprofen ATC x 24 hours
  - 600 q 6 hrs
- **Narcotic**
  - q 6 hrs ATC x 24 hours
  - Alternate q 3 hrs with NSAID
- **Anti-nausea**
### Consideration for IV Sedation

- Reduces Anxiety
- Patient
- Physician
- Reduces Patient Discomfort
- Pre-emptive Local Anesthesia
- Post-procedure Analgesia
- Lengthens Recovery Time

### Risk Factors for Polyps

- Age
- Menopause
- HTN
- Obesity

* Only AGE keeps statistical significance in univariable analysis

### Endometrial Polyps and Hyperplasia

**Endometrial Polyps and the Risk of Atypical Hyperplasia on Biopsies of Unremarkable Endometrium: A Study on 694 Patients With Benign Endometrial Polyps**

Soroush Rahimi, MD, Carla Mariani, MD, Cristina Renzi, MD, Maria Emamnoor Nazari, MD, Paolo Giovannini, MD, and Renato Zenoni, MD

*Increased risk of atypical hyperplasia in random directed biopsies*

**International Journal of Gynecological Pathology** 28;522-528. 2010

### In-Office Endometrial Ablation

- Gynesys HTA
- HerOption
- NovaSure
- ThermaChoice

### Documentation
<table>
<thead>
<tr>
<th>Procedure</th>
<th>RVU</th>
<th>Medicare CF 35.8228</th>
<th>Medicare CF 44.7785</th>
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<tbody>
<tr>
<td>Hysteroscopy with Removal Foreign Body</td>
<td>58562</td>
<td>8.42</td>
<td>301.63</td>
<td>377.03</td>
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<td>Hysteroscopy with Myomectomy</td>
<td>58561</td>
<td>15.92</td>
<td>570.30</td>
<td>712.87</td>
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*Non-Facility/Office (11)

<table>
<thead>
<tr>
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<th>Medicare CF 44.7785</th>
<th>Medicare CF 44.7785</th>
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<tr>
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</table>
Preparing for the Worst Case Scenario
Addressing Office Safety

Isabel Green
Johns Hopkins University
Nov, 2014

Disclosure
I have no financial relationships to disclose.

10/6/2014 2

What we least expect when we least expect it....

Preparing for the Worst Case Scenario

We will discuss....
• Transition from the OR: our crutch
• Emergencies & Management
• Safety in the Commonplace
• Protocols: Role and Execution

Office Emergencies
• The norm: no complications
• Estimated 5% complication rate for office procedures
  – Vasovagal episode
  – Anaphylaxis
  – Lidocaine toxicity
  – Respiratory depression
  – Hemorrhage

Kaneshiro et al Cochrane Review 2012
Lutwak et al BMJ 2013

Transition from the OR
Leaving the OR Behind.....
• Anesthesia team
• Surgical nursing
• Monitors
• Resuscitation equipment
• Rapid responders
• The asleep patient
**Transition from the OR**

Moving procedures creates unique challenges
- Nurse and provider inexperience in managing complications
- Absence of regulatory oversight and guidelines


---

**Reaction**

- Recognize symptoms
- Call for help
- Initiate treatment
- Assess and reassess
- Monitor recovery

**VASOVAGAL**

**Recognition**
- Neural reflex: vagal tone → vasodilation and self-limited hypotension, bradycardia
  - Triggers: stress, noxious stimuli, fear
  - Prodrome: nausea, pallor, diaphoresis, hyperventilation, visual disturbance
- Common in the young and healthy

*Aiden et al. World J Cardiology 2012*

**Management**
- **Restore circulation**: Supine position, legs raised
- Smelling salts/ stimulation
- +/- Volume repletion
- +/- Oxygen
- Serial vital signs until resolution
- Advanced support as needed (cardiac patient)
- Muscle tensing may help abort episodes

*Culian et al. Circulation 2002*
ANAPHYLAXIS

Anaphylaxis
Recognition
• Severe allergic reaction/hypersensitivity, IgE
• Trigger → rapid evolution then mild with spontaneous resolution or progressive
  – Hives, flushing, itching, swollen lips/tongue*
  – Sensation of choking, stridor, wheezing, shortness of breath, cough
  – Nausea, vomiting, abdominal pain
  – Tachycardia, hypotension, dizziness, syncope

Anaphylaxis
Management
Using epinephrine, halt progression to anaphylactic shock and support resolution
1st line
delay increases mortality risk
adjunct are just that, adjunct

Anaphylaxis
Management
• Remove/stop trigger
• Assess airway, circulation, mentation
• Call for help
• Administer IM epinephrine (1mg/1mL; 0.3 to 0.5)
• Recumbent position
• IV Fluids & Supplemental oxygen
• Reassess and monitor

LIDOCAINE TOXICITY

Lidocaine Toxicity
Recognition
• Systemic toxicity due to idiosyncratic response, excessive dosing or intravascular admin
  – Metallic taste, ringing in ears, tingling lips, seizures
  – Bradycardia, AV Block, ventricular arrhythmias, vasodilation, cardiac arrest
**Lidocaine Toxicity Management**

- Prevention
  - Limit dose
  - Avoid intravascular injection
  - Educate the patient
- Stop the medication
- Assess: vitals, cardiac monitor
- Call for help
- Support: supplemental oxygen, IV access
- Initiate life support algorithm
- Fat emulsion

---

**WORST CASE SCENARIO IS RARE.....**

Patient Safety Extends Beyond The Rare and Unlikely to the Routine

---

**Slices of Safety**

- Patient Selection
- Consent
- Procedural Timing – Luteal Phase Pregnancy
- Medication storage and administration
- Patient positioning
- Equipment maintenance and cleaning
- Emergency Equipment Training and Maintenance
- Documentation
- Patient Follow Up
- Provider Privileging
- Program Evaluation

---

**Medical Error**

James Reason, 1991

---

**Protocols**

1. Consider patient population & procedures
2. Review state laws & hospital guidelines
3. Outline procedure criteria & algorithms
4. Determine availability of rapid responders
5. Assess equipment
6. Assign roles
7. Build in mock codes
8. Schedule life support training & recert

---

**Making a Protocol Reality**

Office procedures should have a component of **preplanned responsiveness** for emergencies

Preplanned Responsiveness

Team simulation
- Effective tool for education in life support & medical emergency management
- Multi-disciplinary simulation effective in error reduction in OB emergencies

Ruesseler Postgrad Med J 2012
Didwania J Grad Med Educ 2011
Merien Obstet Gynecol 2010
Guise Jt Comm J Qual Patient Saf. 2010

How to Sim

- In the office = high fidelity
- Scheduled and unscheduled
- Observer role for evaluation
- Safe debrief
  - Review performance
  - What worked well
  - Identify deficiencies
  - Address challenges

Practice Safety

Protocol Design
Troubleshoot
Simulation
Debrief & Evaluation

Safety Expectations in the Office

Patients have the right to expect the same level of safety regardless of where their procedure is performed....


Safety Expectations in the Office

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It is the responsibility of the provider to ensure that a culture of patient safety is ingrained in their office practice ....

Thank you
CULTURAL AND LINGUISTIC COMPETENCY

Governor Arnold Schwarzenegger signed into law AB 1195 (eff. 7/1/06) requiring local CME providers, such as the AAGL, to assist in enhancing the cultural and linguistic competency of California’s physicians (researchers and doctors without patient contact are exempt). This mandate follows the federal Civil Rights Act of 1964, Executive Order 13166 (2000) and the Dymally-Alatorre Bilingual Services Act (1973), all of which recognize, as confirmed by the US Census Bureau, that substantial numbers of patients possess limited English proficiency (LEP).

California Business & Professions Code §2190.1(c)(3) requires a review and explanation of the laws identified above so as to fulfill AAGL’s obligations pursuant to California law. Additional guidance is provided by the Institute for Medical Quality at http://www.imq.org.

Title VI of the Civil Rights Act of 1964 prohibits recipients of federal financial assistance from discriminating against or otherwise excluding individuals on the basis of race, color, or national origin in any of their activities. In 1974, the US Supreme Court recognized LEP individuals as potential victims of national origin discrimination. In all situations, federal agencies are required to assess the number or proportion of LEP individuals in the eligible service population, the frequency with which they come into contact with the program, the importance of the services, and the resources available to the recipient, including the mix of oral and written language services. Additional details may be found in the Department of Justice Policy Guidance Document: Enforcement of Title VI of the Civil Rights Act of 1964 http://www.usdoj.gov/crt/cor/pubs.htm.

Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency”, signed by the President on August 11, 2000 http://www.usdoj.gov/crt/cor/13166.htm was the genesis of the Guidance Document mentioned above. The Executive Order requires all federal agencies, including those which provide federal financial assistance, to examine the services they provide, identify any need for services to LEP individuals, and develop and implement a system to provide those services so LEP persons can have meaningful access.

Dymally-Alatorre Bilingual Services Act (California Government Code §7290 et seq.) requires every California state agency which either provides information to, or has contact with, the public to provide bilingual interpreters as well as translated materials explaining those services whenever the local agency serves LEP members of a group whose numbers exceed 5% of the general population.

If you add staff to assist with LEP patients, confirm their translation skills, not just their language skills. A 2007 Northern California study from Sutter Health confirmed that being bilingual does not guarantee competence as a medical interpreter. http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2078538.