Female Urinary Incontinence and Pelvic Floor Dysfunction: A Gynecologists’ perspective

Hisham Khalil BSc, MD, FRCSC
Urogynecology and Pelvic Reconstructive Surgery
The Ottawa Hospital
Assistant Professor, University of Ottawa
Disclosures

• Provided consulting services to Ethicon Inc

Acknowledgements

• Urology Nurses of Canada

• AUGS (American Urogynecology Society)
Agenda

• What are pelvic floor disorders?
  – Epidemiology and definitions
  – Approach to the evaluation and treatment of stress urinary incontinence and pelvic organ prolapse
  – Case Presentations
  – Resource list
Patient Presentation

- 59 year old female with 3 prior vaginal deliveries
- Seen in emergency department with urinary retention
- Bilateral hydronephrosis
- Pelvic and lower abdominal pain
What is the Pelvic Floor?

- The pelvic floor is a set of muscles, ligaments and connective tissue in the lowest part of the pelvis that provides support for a woman’s internal organs:
  - Bowel
  - Bladder
  - Uterus
  - Vagina and rectum
What is the pelvic floor?


- **Level I**: Uterosacral ligament complex
- **Level II**: paravaginal attachments to the levator ani and arcustendineus fascia pelvis
- **Level III**: perineal body, perineal membrane, superficial and deep perineal muscles
Historic Paradigm
What are Pelvic Floor disorders (PFD’s)?

- Pelvic Organ Prolapse
- Urinary Incontinence (stress, urge, mixed)
- Voiding dysfunction (incomplete bladder emptying)
- Defecatory disorders
- Anal incontinence
Pelvic Floor Disorders

One in three women will experience a PFD in her lifetime

Pelvic Floor Disorders

• Age and life stage:
  – 1 in 3 women—risk increases with age.
  – Pregnancy and childbirth.
  – 1 in 4 younger women (20 to 39 years).

• Lifestyle and behaviors:
  – Obesity and limited physical activity.
  – Smoking.

Urinary Incontinence in women

Responsible for 10% of nursing home admissions

$ 6 Billion US cost annually

Health Care Utilization


- 41% prevalence of urinary incontinence
- 72% reported moderate to severe symptoms
- 25% sought care, 23% received it
- 12% received subspecialty care
Definition of Stress Urinary Incontinence

- ICS: Involuntary leakage of urine with effort or exertion or on sneezing or coughing

- Due to either urethrovesical hypermobility or intrinsic sphincter deficiency (MUCP < 20 cm H2O)
Definitions

• Urgency incontinence / OAB:
  – Involuntary urine lose immediately preceded by sudden compelling need to void
  – If urodynamic finding of involuntary contraction of detrusor muscle: **detrusor overactivity**
  – If neurological cause for detrusor dysfunction known: **neurogenic detrusor overactivity**
  – If unknown: **idiopathic detrusor overactivity**
Distribution of Incontinence Types

- Stress 43%
- Urge 21%
- Mixed 35%
Epidemiology and Scope

Prevalence of SUI: 10-40% of community dwelling women

Annual incidence of 2-11%

Annual cost: $20 billion per year in the U.S.

50%-75% of these costs attributable to routine care from incontinence pads, diapers, laundry, dry cleaning, odor control, bed pads, and skin care products

Epidemiology and Scope

Population 65 years and over, Canada, Historical (1971-2011) and Projected (2012-2061) (percent)

“Canadians in Context - Aging Population: Human Resources and Skills Development Canada” http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=33#foot_1
Urethral Sphincters

Coordination between urethral sphincters and detrusor musculature

**Vaginal delivery vs C/S?**


<table>
<thead>
<tr>
<th></th>
<th>Nulliparous</th>
<th>C/S</th>
<th>OR C/S Vs Nulliparity</th>
<th>Vaginal Delivery</th>
<th>OR Vag Delivery vs C/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any incontinence</td>
<td>10.1</td>
<td>15.9</td>
<td>1.5 (1.2-1.9)</td>
<td>21.0</td>
<td>1.7 (1.3-2.1)</td>
</tr>
<tr>
<td>Severe incontinence</td>
<td>3.7</td>
<td>6.2</td>
<td>1.4 (1.0-2.1)</td>
<td>8.7</td>
<td>2.2 (1.5-3.1)</td>
</tr>
<tr>
<td>SUI</td>
<td>4.7</td>
<td>6.9</td>
<td>1.4 (1.0-2.1)</td>
<td>12.2</td>
<td>2.4 (1.7-3.2)</td>
</tr>
<tr>
<td>Mixed UI</td>
<td>3.1</td>
<td>5.3</td>
<td>1.7 (1.2-2.5)</td>
<td>6.1</td>
<td>1.3 (0.9-1.9)</td>
</tr>
</tbody>
</table>
Risk factors for SUI


• Age
• Hypoestrogenism
• Obesity (2x)
• Pregnancy
• Vaginal delivery
• Diabetes mellitus
• Pelvic surgery
• Genetic factors
• Others: Medications, smoking, high-impact exercise
A 62 year old G3P3 presents to your office with a complaint of stress urinary incontinence, progressively worsening x 5 years.
Evaluation of SUI


- Complete history and physical examination
- Cough test
- Post-void residual volume
- Urine Culture
- Urinalysis
- Bimanual Examination
- Assessment of urethral mobility
  - Q-tip test > 30°
General Inspection

• Vulva:
  – Lichen sclerosis / lichen planus
  – Atrophy / lesions / cysts

• Urethra:
  – Urethral caruncle
  – Urethral mucosal prolapse
  – Urethral diverticulum

• Vagina:
  – Atrophy / estrogenization
  – Scarring / pain
Value of the cough stress test


- Cough test (provocative cough test) confirms presence of SUI.
- Ideally, bladder filled with 300 cc or to a sense of fullness
- Significant relationship between low leak point pressure and positive supine empty stress test (79% sensitivity, 62.5% specificity)
- Negative Predictive value of 90%
What about Urodynamic Testing?
Indications for Urodynamic Testing


• No definitive criteria
• 2008 SOGC Committee opinion (III-C):

  – when the diagnosis remains uncertain after an initial history and physical examination
  – when patient symptoms do not correlate with objective physical findings
  – if the patient fails to improve with treatment
  – in a clinical trial setting
Randomized Trials of Urodynamics prior to Surgery for SUI


- 630 women with demonstrable SUI randomized to undergo urodynamic testing or office evaluation only (n=315 each)

- Successful treatment:
  - 76.9% in UDS group
  - 77.2% in evaluation only group
<table>
<thead>
<tr>
<th>Question</th>
<th>None of the time</th>
<th>Rarely</th>
<th>Once in a while</th>
<th>Often</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When you cough, laugh or sneeze?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. When you bend down or lift something up?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When you walk quickly, jog, or exercise?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. While you are undressing to use the toilet?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you get such a strong and uncomfortable need to urinate that you leak urine (even small drops) or wet yourself before reaching the toilet?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Do you have to rush to the bathroom because you get a sudden, strong need to urinate?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
QUID Questionnaire

Farrell S, Bent A et al. Women’s ability to assess their urinary incontinence type using the QUID as an educational tool. Int Urogynecol J. 2013: 24; 759-762.

- Patients referred to urogynecology clinic for UI asked to complete QUID questionnaire
- Physicians blinded to QUID results
- n = 338 pts
- High degree of agreement between patient self-assessment of UI type can physician assessment
Information you get

- Urinary frequency
- Volumes voided
- Incontinence episodes
- Precipitating factors
- Fluid intake
Occult Stress Incontinence


• Urinary incontinence with valsalva maneuvers after reduction of prolapse [in the absence of detrusor contractions]

• Patients with POP have distorted anatomy and risk factors for both POP and SUI

• Severe uterovaginal prolapse can prevent urinary leakage and produce obstructive symptoms by elevating urethral resistance.

• **11-22%** of continent patients with POP > 3 stage will develop post-operative SUI after correction of apical or anterior prolapse

• **Source of much patient and clinician frustration**
Occult Stress Incontinence


• Methods to reduce prolapse:
  • Pessary
  • Rectal swabs
  • Gauze
  • Speculum blades
• Poorly studied in the literature
• Relationship between occult SUI and post-operative stress incontinence?
Relationship between OSUI and post-operative SUI?


- 79 patients evaluated for POP stage \( \geq 3 \)
- 49 patients had + pessary test

Vaginal hysterectomy, anterior and posterior repair and TVT

- Objective Postoperative SUI: 0%
- Subjective Postoperative SUI: 10%

Vaginal hysterectomy, anterior and posterior repair

- Objective Postoperative SUI: 53%
- Subjective Postoperative SUI: 64.7%
Canadian Urological Association (CUA) Treatment Algorithm

Kegel Exercises


- 14 trials (836 women)
  - 435 PFMT, 401 controls
- Mean difference in number of SUI episodes per day **-1.29** (95% CI -2.24, -0.34)
- Mean difference in number of mixed UI episodes per day **-0.77** (95% CI -1.22,-0.32)
Simplified Kegel’s Protocol

• Do two sets of exercises each day
• Do 15 exercises for each set
• Each exercise consists of two parts:
  – Part 1- Squeeze the pelvic muscles as strongly as you can and try to hold for a count of 5. Relax.
  – Part 2- Do 4 quick contractions one after the other.
• Do a total of 30 exercises each day.
• Each exercise session should take no more than 10 minutes.
What is the value of Pelvic Floor Exercises?


- 52 women with urodynamic stress urinary incontinence
- 26 randomized to intensive pelvic floor physiotherapy
- 26 randomized to home with instructions on Kegel exercises

- 15 year follow-up with 90.4% response rate
- 50% of patients in each group ultimately underwent surgery
- 28% of patients continue to do pelvic floor exercises.
Weighted vaginal cones


• 23 trials involving 1806 women
  – 717 randomized to vaginal cones
  – Superior to no active treatment
  – Not superior to pelvic floor muscle retraining
Incontinence Pessaries


- Pessaries should be considered in all women presenting with urinary stress incontinence.

- Made of medical grade silicone.

- Incontinence pessaries elevate and slightly constrict the urethra.

- If a woman develops stress incontinence after being fitted with a prolapse pessary, switching to an incontinence pessary may be beneficial.
Current Incontinence Pessaries

Ring with support and knob (SAK)  

Ring with knob
Incontinence Pessaries

Ring with support and knob (SAK)  Uresta Pessary
Pessaries?

- Initial successful fitting varies from 60-92%
- At 1 year, overall continuation rates may be as low as 16%


- 59% continence rate at 11 months
- Reasons for discontinuing: persistent incontinence, pessary falling out, pain, bleeding
Weight Loss?


- 5-10% weight loss associated with significant improvements in frequency of UI
Barriers to care?


- Survey of 95 women aged 23-51 years with UI
- Reasons for not seeking care:
  - Disorder is a minor problem
  - Coping on their own
  - Embarrassment

- Reasons for seeking care:
  - afraid of the odor of urine
  - perceived the leakage as shameful and embarrassing.
  - Pelvic floor exercises were the most commonly used management methods for all participants.
Female Pelvic Medicine and Reconstructive Surgery

- Board Certification in U.S. since 2012
- 6 fellowship programs in Canada\(^1\)
  - 22 Canadians have completed these programs
    - 5 Canadian trainees moved to U.S.
- 28 externally sponsored

- Professional society guidelines recognize need for specialized training

Subspecialty care?

Stepwise continence Care Model


- 154 patients in step-wise arm, and 78 in medical model arm.
- Both groups showed significant improvement in all measures of urinary incontinence after treatment.
- Step wise arm: education sessions and conservative therapies led by nurse continence advisor:
  - More rapid resolution of stress incontinence and irritative bladder symptoms.
  - Improved quality of life scores and treatment satisfaction.
Nurse Continence Advisors


• 157 women with stress or urge incontinence undergoing conservative therapy with urogynecologist or NCA

• No significant differences between groups in terms of pad tests, incontinence scores or quality of life scores

• Longer duration of consultation with NCA

• Labour costs lower
• Urologists, Urogynecologists
• Physiotherapists
• Nurses
• Family Physicians

• Male and Female incontinence
• Rationale:
  – Common Health Problems
  – Great impact on quality of life
  – Patients are not seeking help for their condition
Trends in Management of SUI

Midurethral Slings

Retropubic tape

Trans-obturator tape
Retropubic Midurethral Slings

• Developed by Ulmsten and Petros in 1995
• “integral theory” of placing a sling distally
• Based on theory that pubourethral ligaments support the midurethra and attach to pubis, acting as a “backboard”

• Strip of polypropylene mesh to be left loose or “tension-less” to avoid direct compression of the urethra.
Catheter guide in Foley allowing deflection of the urethra in opposite direction of the needle

TVT trocar is sandwiched between inferior pubic ramus and index finger of non-dominant hand in anterior vaginal fornix

Needle is aimed toward ipsilateral shoulder and penetrates urogenital diaphragm

Finger in vaginal wall protecting underlying urethra

Inferior pubic ramus
Long-term cure? 17 year data-TVT


• 90% objective continence rate
• 87% subjective cure rate
Pelvic Organ Prolapse

• Pelvic Organ Prolapse disorders affecting quality of life: 30% of the population (lifetime incidence of surgery 11.1%)\(^1\)

• 45% increase in demand for treatments for Pelvic Floor disorders over next 30 yrs\(^2\)

Surgical Management of POP


- 29% reoperation rate
- 44-54% anatomic failure
Symptoms of Pelvic Organ Prolapse

• Pelvic organ prolapse occurs with descent of one or more pelvic structures

• Symptoms may affect a wide range of activities including sexual function, exercise, and have a detrimental impact on body image

• Vaginal support defects occur with and without symptoms

ICS Definition of Pelvic Organ Prolapse


• Descent of one or more of the:
  – anterior vaginal wall (central, paravaginal, or combination cystocele)
  – posterior vaginal wall (rectocele)
  – the uterus (cervix)
  – the apex of the vagina (vaginal vault or cuff scar) after hysterectomy.

• The presence of any such sign should correlate with relevant POP symptoms.

• Diagnostic Criteria: symptoms and clinical examination, assisted by any relevant imaging
Definitions

• A definition of clinically significant prolapse remains elusive.

• ½ of parous women can be demonstrated to have prolapse by physical examination, most are asymptomatic.

• Pelvic examination findings do not correlate well with specific pelvic symptoms.
Prolapse Definitions

- **Anterior compartment prolapse:** cystocele

- **Apical compartment prolapse:** uterine prolapse or vaginal vault prolapse
Prolapse Definitions

- Posterior compartment: hernia of posterior vaginal wall (rectocele)
- Enterocele: hernia of the intestines through the vaginal wall.
Terminology

• Anterior prolapse vs cystocele?
• Posterior prolapse vs rectocele?
• Vaginal topography does not reliably predict location of the associated viscera.

• Half of anterior prolapse can be attributed to apical descent

What are the symptoms and clinical presentation of Pelvic Organ Prolapse?
## Symptoms of Pelvic Organ Prolapse

<table>
<thead>
<tr>
<th>Bowel:</th>
<th>Urinary:</th>
<th>Sexual:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Incontinence of flatus or solid stool</td>
<td>- Incontinence</td>
<td>- Dyspareunia</td>
</tr>
<tr>
<td>- Incomplete emptying</td>
<td>- Frequency</td>
<td>- Abstaining from intercourse</td>
</tr>
<tr>
<td>- Straining during defecation</td>
<td>- Urgency</td>
<td></td>
</tr>
<tr>
<td>- Urgency to defecate</td>
<td>- Weak or prolonged urinary stream</td>
<td></td>
</tr>
<tr>
<td>- Digital evacuation</td>
<td>- Hesitancy</td>
<td></td>
</tr>
<tr>
<td>- Splinting to start or complete defecation</td>
<td>- Incomplete emptying</td>
<td></td>
</tr>
<tr>
<td>- Feeling of blockage or obstruction during defecation</td>
<td>- Manual reduction of prolapse to start voiding</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Take home:** Severity of prolapse symptoms does not correlate well with stage of prolapse.
Splinting?

- Splinting: reporting of either a need to splint or push on or around the vagina to urinate, defecate or a feeling of a vaginal bulge
- Suggests more advanced POP

Does POP-Q stage correlate with symptoms?


- POP-Q > 2: noted among 37% of women presenting for annual gynecologic examinations.

- The only symptom predicted by anatomic prolapse severity was bulging or protrusion symptoms (vaginal descent ≥ 0.5 cm beyond the hymen).


- Vaginal bulge symptoms: sensitivity 67%, specificity 87%, for POP at or past the hymen.
What are risk factors for Pelvic Organ Prolapse?
History: Risk Factors for POP


- n= 27,342 women (16,616 had uterus)

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>OR (95% CI)</th>
<th>No Increased Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 60-69</td>
<td>1.16 (1.03 – 1.30)</td>
<td>Education</td>
</tr>
<tr>
<td>Age 70-79</td>
<td>1.36 (1.19 – 1.56)</td>
<td>Occupation</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.24 (1.01 – 1.54)</td>
<td>Hormone Therapy</td>
</tr>
<tr>
<td>BMI 25-30</td>
<td>1.31 (1.15-1.48)</td>
<td>Time since Menopause</td>
</tr>
<tr>
<td>BMI&gt; 30</td>
<td>1.40 (1.24-1.59)</td>
<td>Breastfeeding</td>
</tr>
<tr>
<td>Waist circumference&gt; 88 cm</td>
<td>1.17 (1.06-1.29)</td>
<td>Hysterectomy</td>
</tr>
<tr>
<td>Parity</td>
<td>2.13 (1.67-2.72)</td>
<td>Past Smoking</td>
</tr>
<tr>
<td>Additional Parity&gt; 1</td>
<td>1.10 (1.05-1.16)</td>
<td>Coffee consumption</td>
</tr>
<tr>
<td>Constipation</td>
<td>1.10 (1.03 – 1.16)</td>
<td>EtOH Consumption</td>
</tr>
</tbody>
</table>
Connective Tissue Disorders


• Marfan Syndrome: 33% prevalence POP
• Ehlers Danlos Syndrome: 75% prevalence POP


• Differential gene expression of MYH3 myosin related protein among patients with POP
Symptoms of Pelvic Organ Prolapse: Take Home

• Prolapse severity does not correlate well with symptoms

• Vaginal topography does not correlate well with location of associated viscera

• Asymptomatic women with pelvic organ prolapse do not require treatment

• History may help clarify cases of severe prolapse
  – Splinting, bulge symptoms

• Be alert to associated urinary and GI symptoms
Physical Examination: What are the essential elements?
Physical Examination

• Inspection
• Bimanual examination
  – Pelvic masses
• Assessment of pelvic organ prolapse
  – Location
  – Severity (grading)
• Rectovaginal examination
• Assessment of associated incontinence
• Neurological examination
• Supplementary testing ?
Quantifying Pelvic Organ Prolapse: Baden Walker System

- Grade 0: No prolapse
- Grade 1: Descent halfway to hymen
- Grade 2: Descent to hymen
- Grade 3: Descent halfway past hymen
- Grade 4: Maximal possible descent for each site
POP-Q


- 9 parameters
- Useful in research studies or for post-surgical follow-up
- Used by 59% of gynecologists in U.S.
# Kegel Strength

## Strength Grading / 5

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No contraction</td>
</tr>
<tr>
<td>1</td>
<td>Contraction &lt; 1 s</td>
</tr>
<tr>
<td>2</td>
<td>Weak contraction 1-3 s</td>
</tr>
<tr>
<td>3</td>
<td>Moderate contraction 4-6 s</td>
</tr>
<tr>
<td>4</td>
<td>Strong contraction 7-9 s repeated 3 times</td>
</tr>
<tr>
<td>5</td>
<td>Unmistakably strong</td>
</tr>
</tbody>
</table>

![Image of Kegel strength equipment and illustrations](image-url)
Physical Examination

• Sim’s speculum or lower blade of grave’s speculum retracting posterior vaginal wall
Staging based on POP-Q

- Stage 0: no prolapse demonstrated
- Stage 1: most distal prolapse > 1 cm above the hymen
- Stage 2: most distal portion of prolapse ≤ 1 cm above or below hymen
- Stage 3: most distal portion of prolapse > 1 cm below the hymen but no further than tvl – 2 cm
- Stage 4: complete eversion of the total length of the lower genital tract
U/S of upper urinary tract?


- Prospective evaluation of 233 patients with stage 3 or 4 apical or anterior prolapse

- Hydronephrosis in 10.3 %(95% CI 6-14%)

- Resolved in 95% of patients after treatment

- Value in setting of normal renal function uncertain
Pelvic Floor U/S and MRI in patients with POP


- Interesting correlations have been identified such as between childbirth, dimension of levator hiatus, avulsion of levator ani and risk of prolapse.

- Clinical benefit of pelvic floor imaging has yet to be demonstrated.
Treatments

• Symptom Based Approach:
  — POP is not life-threatening.
  — Treatments can help improve quality of life and sexual health.

• Conservative approach:
  — Pelvic floor muscle exercises.
  — Pelvic floor physical therapy.

• Pessary:
  — Support bladder, uterus and vagina.

Introduction

Surgery

Obliterative - Colpocleisis

Reconstructive
- Apex
- Anterior
- Posterior

Compensatory
- Use of graft

Goals of Surgery

• Restore normal anatomy
• No single operation is right for every patient
• Desire to retain sexual function?
• Experience and training
• Emerging controversies
Vaginal Mesh implants, and its serious side effects.

Are You Experiencing Vaginal Mesh
Talk to a Lawyer Today. Call 1.888.480.1123

Have you had to undergo further surgery due to defective Transvaginal mesh?

Click here to get WANT INFO TO GO?
Download a free brochure right now to learn about vaginal mesh lawsuits, your legal rights, and how an attorney will work to get you compensation for your injuries.

Know your rights.
Speak with an attorney 24/7
FDA Public Health Notification: Serious Complications Associated with Transvaginal Placement of Surgical Mesh in Repair of Pelvic Organ Prolapse and Stress Urinary Incontinence

Issued: October 20, 2008

• > 1000 reports of complications to 2008
  – (9 manufacturers)

• “FDA identified surgical mesh for transvaginal repair of POP as an area of continuing serious concern.”

• Jan 2008 – Dec 2010: 2,874 additional reports of complications
  – 1,503 associated with POP repairs
  – 1,371 associated with SUI repairs

• Native tissue repair remains the default or standard of care

• Nonabsorbable synthetic mesh:
  – may improve anatomic outcomes of anterior vaginal wall repair, but there are significant trade-offs in regard to the risk of adverse events (3 studies included)
Summary

• POP is a common entity affecting QOL
• Asymptomatic women do not require treatment

• Diagnosis and decision making based on clinical exam and history
• Role of ancillary testing is minimal in routine practice
• Be alert to urinary incontinence / latent SUI
Let’s Meet Some Patients…

• 43 YO G₂P₂ healthy:
  – dairy farmer, smoker
  – procidentia & SUI

  – what are surgical options?
Take Home

• Pelvic Floor disorders are common:  
  – ask about them
• Evaluation and treatment of pelvic floor disorders require a multi-disciplinary approach
• Not a normal part of aging: can be treated successfully

• Nurses and Nurse Continence Advisors constitute essential first line care
Resources

- www.voicesforpfd.org
- www.facebook.com/TakeTheFloorPFD
- www.iuga.org/?patientinfo
- www.SOGC.org
- www.CUA.org