Didactic: Chronic Pelvic Pain 2.0: Decoding Peripheral and Central Factors to Optimize Patient Outcomes

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Professional Education Information

Target Audience
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Although chronic pelvic pain (CPP) is one of the most common conditions for which women seek medical care, the evaluation and management of pelvic pain patients presents many challenges to practicing gynecologic surgeons. This course is designed to provide participants with a practical, state-of-the-art approach to the CPP patient that reviews the clinical evaluation, appropriate multidisciplinary diagnostic workup, and innovations in medical and surgical treatment options. This course will also highlight the role of surgery in the management of pelvic pain, when surgery is not likely to be helpful, and alternative options when standard medical and surgical therapies fail. The prevention and management of perioperative pain and chronic post-surgical pain, including post-hysteroscopic sterilization pain, will be discussed. Course faculty will utilize clinical vignettes and video demonstrations to enhance the interactive experience between faculty and audience.

Learning Objectives: At the conclusion of this course, the clinician will be able to: 1) Discuss the physiology and neurobiology of acute versus chronic pain; 2) formulate a comprehensive differential diagnosis for the newly encountered chronic pelvic pain patient, including possible gynecologic, urologic, gastrointestinal, musculoskeletal and neurologic sources; 3) describe the evaluation and management of painful intercourse in women; 4) describe the indications and efficacy of surgical procedures used to treat chronic pelvic pain; 5) discuss the prevention and management of perioperative and chronic postsurgical pain; 6) describe medical and behavioral therapies for pelvic pain that is refractory to usual therapies; and 7) integrate the evaluation and treatment of pelvic and abdominal musculoskeletal dysfunction in the care of chronic pelvic pain patients.
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Asterisk (*) denotes no financial relationships to disclose.
When pain persists: What every surgeon should know about the biology and treatment of chronic pelvic pain.

AAGL 45th Annual Congress on Minimally Invasive Gynecology
Orlando, Florida 2016
PELV-610: Chronic Pelvic Pain 2.0: Decoding Peripheral and Central Factors to Optimize Patient Outcomes

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I will present off-label use of medications, best evidence will be provided.

Objectives
1. Review the physiology of chronic pain, with particular emphasis on central pain disorders
2. Present evidence that endometriosis and chronic pelvic pain may be central pain disorders
3. Discuss the clinical approach to integrate treatment of central sensitization to enhance patient care

The challenges of caring for patients with chronic pain...

Who has pelvic pain?

Pain-free

5 days/month, 3/10 pain

20 days/month, 8/10 pain
Burden

- Treatment of pain costs the United States more than half a trillion dollars per year.
- Pain is one of the most common reasons people consult a physician. Yet it frequently is inappropriately treated.

Definition of Chronic Pelvic Pain (CPP)

- Non-cyclic pain
- 6 or more months’ duration
- Localizes to the anatomic pelvis, anterior abdominal wall at or below the umbilicus, the lumbosacral back, or the buttocks
- Of sufficient severity to cause functional disability or lead to medical care.

American College of Obstetricians and Gynecologists, 2004

Epidemiology

- 15 - 25% of women aged 18 to 50 years have pelvic pain lasting > 6 mo during their lifetime.
- Primary indication for:
  - 10% outpatient gynecology clinic visits
  - 12% hysterectomies
  - 40% diagnostic laparoscopies
- Only 25% of UK women surveyed had sought medical evaluation in the last year.

Chronic pelvic pain negatively impacts quality of life & physical function

- Among women with CPP:
  - Use 3x more medications
  - Have 4x more GYN surgeries
  - Are 5x more likely to have a hysterectomy
- 58% reduce normal activity >1 day/month
- 26% stay in bed >1 day/month
- 15% report lost time from work
- 48% report reduced work productivity

Challenges of endometriosis

1. Little, if any, correlation between extent of disease and severity of pain.
2. Medical therapies are non-specific & effectively treat other causes of CPP.
   - GnRH agonists are effective therapy for cyclic-IBS and CPP without endometriosis.
3. Medical and surgical therapies are inadequate for many patients.
   - 30% non-response rate.
4. Frequency of recurrent pain is high following medical and surgical therapies.
   - Pain recurs often in the absence of recurrent pathology.

Chronic Pelvic Pain

- No brain, no pain
- Endometriosis
- Adenomyosis
- Adhesions
- Chronic PID
- Uterine fibroids
- Pelvic congestion
- Ovarian remnant
- Residual ovarian syndrome
- Vaginal apex pain
Mechanistic Classification of Pain

**PAIN**
- **NOCICEPTIVE**
- **NEUROPATHIC**

**PERIPHERAL**
- **CENTRAL**

**ACUTE PAIN**
- **CHRONIC PAIN**

Central disturbance in pain processing with no ongoing peripheral stimulation

Chronic pain is not prolonged acute pain

**Acute Pain**
- Symptom of injury or disease
- Well defined, recent onset
- Expected to end with removal of peripheral injury
- Essential biological warning function

**Chronic Pain**
- Onset often insidious and not clearly associated with specific injury
- Unpredictable duration
- Often progressive
- Pain out of proportion to peripheral pathology
- No apparent biological function

Supraspinal Influences on Sensory Processing = Volume Control

**Facilitation**
- Substance P
- Glutamate and EAA
- Serotonin (5HT2a, 3a)
- Neurotensin
- Nerve growth factor
- CCK

**Inhibition**
- Descending anti-nociceptive pathways
  - Norepinephrine – serotonin
  - Opioids
  - GABA
  - Cannabinoids
  - Adenosine

Central amplification of pain processing can lead to chronic pain in the absence of peripheral pathology

Shared features of “central” pain syndromes

Typically characterized by –
- Multifocal pain
- Endorse “neuropathic” verbal descriptors of pain
- Higher current and lifetime history of pain
- Multiple somatic symptoms (fatigue, memory difficulties, sleep disturbance)
- Greater sensitivity to multiple sensory stimuli (sound, light)
- High rates of co-morbidities with other related syndromes
- Opioids do not effectively or consistently reduce pain symptoms


Shared features of “central” pain syndromes:
- 1.5 – 2X more common in females
- Strong familial/genetic underpinnings
- Triggered or exacerbated by “stressors”

Evidence of centralized pain in women with endometriosis-associated CPP

Evidence of centralized pain in dysmenorrhea, bladder pain, IBS

Most chronic pain conditions are “mixed pain” conditions, with peripheral and central contributors to pain

Pain = balance between peripheral input and central volume control

Seriously, do I look like someone who cares?
You must care, otherwise your might do more harm than good…

Identifying the underlying causes of pain should guide clinical care and decision for surgery.

Clinical implications of central changes in pain processing

1. Chronic overlapping pain conditions… suggest common underlying pathophysiology and treatment

2. Patient with central pain changes respond differently to therapy
   1. May be less likely to respond to “peripherally-directed” therapies (e.g. hormone suppression, surgery?)
   2. More likely to experience more acute and chronic pain following surgery

3. There are many overlapping pathways that lead to chronic pain

4. Treat early to prevent transition from acute to chronic pain
Proposed diagnostic approach to CPP

- Gynecologic
  - Endometriosis
  - Adenomyosis
  - Adhesions
  - Chronic PID
  - Uterine fibroids
  - Pelvic congestion
  - Ovarian remnant syndrome
  - Vaginal apex pain
- Urologic
  - Interstitial cystitis
  - Urethral syndrome
  - Chronic UTI
  - Bladder stones
- Gastrointestinal
  - IBS
  - Functional bowel disorders
  - Chronic appendicitis
  - Inflammatory bowel disease
  - Hernias
  - Diverticular disease
  - Intermittent bowel obstruction
- Musculoskeletal
  - Pelvic floor myalgia
  - Trigger points
  - Idiopathic low back pain
  - Disc disease
  - SI joint disease
  - Coccydynia
  - Nerve entrapment syndromes
- CNS
  - Central pain disorder

Comorbid pain conditions: Fibromyalgia, chronic fatigue syndrome, TMD, migraines, etc.

Comorbid psychological disease: Depression, anxiety, etc.

Cognitive and psychosocial traits: Coping, personality, maladaptive behavior

Treatment pearls

- Begin with “gold-standard” therapies for contributing factors
  - Ex. Hormonal suppression for cyclic pain or chronic pain with cyclic exacerbation
  - Ex. Physical therapy for abdominal wall and pelvic floor myofascial pain
  - Ex. Laparoscopy for excision/ablation of endometriosis

- When standard treatments fail, then reconsider the diagnosis, re-evaluate comorbid psychosocial variables

Abnormalities in pain processing are a common mechanism in many chronic pain disorders (IBS, IC, fibromyalgia, etc.)

- It is likely to be an underlying mechanism in at least some women with CPP

- Consider adding centrally-acting medication when standard “gynecology” treatments fail

- Consider using centrally-acting medication as part of first-line therapy
  - Chronic pelvic pain with negative laparoscopy
  - Pelvic nerve entrapment syndromes (ex. Pudendal neuralgia)

Pharmacological Therapies for Fibromyalgia (i.e. Centralized Pain)

- Strong Evidence
  - Dual reuptake inhibitors such as
    - Tricyclic compounds (amitriptyline, cyclobenzaprine)
    - SNRIs and NRIs (mirtazapine, duloxetine, venlafaxine?)
    - Anticonvulsants (e.g., pregabalin, gabapentin)

- Modest Evidence
  - Tramadol
  - Other less selective SSRIs or NRIs
  - Gamma hydroxybutyrate
  - Low dose naltrexone

- Weak Evidence
  - Cannabinoids: Growth hormone, 5-hydroxytryptamine, tropisetron, S-adenosyl-L-methionine (SAMe)

- No Evidence
  - Oxids, nicotinates, eurastoidal anti-inflammatory drugs, benzodiazepine and nonbenzodiazepine hypnotics, guanillemin

Treatments for Pain Based on Underlying Mechanisms

Peripheral

- Non-inflammatory
  - Opioids
- Inflammatory
  - NSAIDs/acetaminophen
- Peripheral
  - Antimigraine agents
  - Anti-inflammatories
- Centralized
  - Alpha-2-delta ligand anticonvulsants

Neuropathic

- Injections, surgical procedures less effective or ineffective for individuals with centralized pain

Relative Serotonin and Norepinephrine Re-uptake Amongst Antidepressants

- Serotonin
  - Venlafaxine
  - Duloxetine
  - Milnacipran
  - Best for pain

- Mixed
  - Amtriptyline

- Norepinephrine
  - Imipramine

- Maprotiline
  - Desipramine
  - Nortriptyline
  - Reboxetine

References:

Antidepressant with analgesic properties

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Side-effects, contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCA’s</td>
<td>Start at 5-10 mg nightly, increase by 10 mg per week up to 150 mg/day</td>
<td>Side effects: dry mouth, constipation, sedation, urinary retention, weight gain (tertiary amines have greater side effects)</td>
</tr>
<tr>
<td>Venlafaxine</td>
<td>Start at 37.5 mg per day, increase by 37.5 mg per week up to 300 mg/day (BID dosing)</td>
<td>Side effects: headache, nausea, decreased appetite, sweating, sedation, hypertension, seizures, mania, hyperosmolar/hypovolemic hyperglycemia</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>Start at 30 mg per day, increase by 20 mg per week up to 60 mg (or 120 mg) per day (30 BID, 60 QD, or 60 BID)</td>
<td>Side effects: nausea, dry mouth, constipation, dizziness, insomnia</td>
</tr>
</tbody>
</table>

Antiepileptics with analgesic properties

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Side-effects, contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurontin</td>
<td>Start 100-300mg qhs, increase 100-300mg qid Up to 2400mg daily (600mg, 600mg, 1200mg qhs)</td>
<td>Side effects: Drowsiness, dizziness, fatigue, nausea, sedation, weight gain</td>
</tr>
<tr>
<td>Pregabalin</td>
<td>Start 50 mg BID Increase to 100 mg BID-QID</td>
<td>Side effects: Drowsiness, dizziness, fatigue, nausea, sedation, weight gain</td>
</tr>
</tbody>
</table>

Titration protocols (examples)


Nonpharmacological therapies applicable to all chronic pain conditions

- **Strong Evidence**
  - Education
  - Aerobic exercise
  - Cognitive behavior therapy

- **Modest Evidence**
  - Strength training
  - Hypnotherapy, biofeedback, balneotherapy

- **Weak Evidence**
  - Acupuncture, chiropractic, manual and massage therapy, electrotherapy, ultrasound

- **No Evidence**
  - Tender (trigger) point injections, flexibility exercise

Symptoms of Pain, Fatigue, etc.

- Nociceptive processes (damage or inflammation of tissues)
- Disordered sensory processing

Dually Focused Treatment

- Pharmacological therapies to improve symptoms
- Nonpharmacological therapies to address dysfunction

Functional Consequences of Symptoms

- Increased Distress
- Decreased activity
- Isolation
- Poor sleep
- Maladaptive illness behaviors

Cognitive Behavioral Therapy for Chronic Pain

- Shown to be effective over a wide range of pain states
- Effect sizes on function (.4 - .6) are much greater than typically seen with pharmacological therapies
- Despite wide agreement that these help, barriers to implementation have been:
  - Physicians do not strongly recommend these therapies and there is no "industry" promoting these therapies
  - Not generally reimbursed by third parties
  - Not enough trained therapists to give one-on-one CBT to all chronic pain patients

Program features 10 CBT modules:
- Understanding Fibromyalgia
- Being Active
- Sleep
- Relaxation
- Time for You
- Setting Goals
- Pacing Yourself
- Thinking Differently
- Communicating
- Fibro Fog

In a RCT of 118 FM patients comparing the earlier version of this website plus usual care, to usual care alone, Williams demonstrated statistically significant improvements in pain (29% in the WEB group had 30% improvement in pain vs 8% in usual care, p<.009 and function (i.e., .51 SD improvement in SF-36 PF vs. .6% in standard care, p<.002)

Williams et. al. Pain. 2010;151(3):694-702

Exercise to Treat Chronic Pain

Fibromyalgia.

- Aerobic exercise improves global well being (SMD .49), function (SMD .66) and pain (SMD .65 but very wide CIs include 0).
- Strength training may also be effective although far fewer studies have been performed.
- Dysmenorrhea
  - 28% decrease in pelvic and back pain, 15% decrease in depression scores.

Aerobic exercise improves global well being (SMD .49), function (SMD .66) and pain (SMD .65 but very wide CIs include 0).


Patients with chronic pain have dysfunctional sleep

- Chronic pain patients have reduced slow-wave sleep and abnormal α-rhythms, suggestive of wakefulness during non-REM (rapid eye movement) sleep.
- Sleep deprivation in healthy individuals can cause symptoms of fibromyalgia, including myalgia, tenderness and fatigue.
- Sleep deprivation impairs descending pain-inhibition pathways that are important in controlling and coping with pain.


Improve sleep = improve pain

- Clinical trials of pharmacological and nonpharmacological therapies have shown that improving sleep quality can reduce pain and fatigue
- Provide instruction on sleep hygiene and limit the drugs that alter restorative sleep
  - Prevent REM sleep: long acting opioids, beta blockers, clonidine, SSRIs
  - Prevents paralysis and timing of sleep: Dopaminergic blockers
- Vitamin D deficiency (and toxicity) associated with poor sleep

Neurostimulatory Therapies

Peripheral

1. TENS (Transcutaneous electrical nerve stimulation)
   - Conventional TENS (C-TENS) is given at high stimulation frequency with low intensity, and pain relief is almost immediate but short-lived.
   - Acupuncture like TENS (AL-TENS) is given at low frequency and high intensity (which is uncomfortable to many individuals), and generally has a longer lasting analgesic effect.
   - Improvement in pain, dyspareunia and QOL in endometriosis-CPP1, and primary dysmenorrhea2

2. Percutaneous tibial nerve stimulation
   - Small RCT shows weekly Rx x12 = possible benefit up to 6 months after treatment3

Neurostimulatory Therapies

Central - New evidence suggests efficacy across a broad range of chronic pain conditions

- Applied to scalp
  - Transcranial magnetic stimulation (TMS)
  - Direct Current Stimulation (DCS)
- Implantable
  - Spinal cord stimulation
  - Vagal nerve stimulation
  - Deep brain stimulation

Summary

- Centralized pain or central sensitization can be identified in most individuals with conditions such as FM, and in sub-sets (typically at least 20 – 30%) of individuals with other chronic pain states such as CPP, RA, SLE, low back pain, osteoarthritis
- Thus all chronic pain states may be “mixed” pain states with variable peripheral and central contributions in different individuals with the same clinical label
- None of our pharmacological treatments of chronic pain have anything more than modest efficacy when used as stand-alone therapy in any chronic pain condition
- In the US in particular, opioids, NSAIDs, injections and surgical procedures are overused (easy, high reimbursement), and centrally acting analgesics, non-pharmacological therapies e.g. exercise, CBT are underused (difficult, low to no reimbursement)

One size never fits all

References

References


Evaluation Question

Which of the following therapies does not have demonstrated efficacy for the treatment of "centralized" pain?

- Aerobic exercise
- Gabapentin
- Oxycodone
- Cognitive behavioral therapy
- Education
Does This Hurt? Why Surgeons Should Learn a Musculoskeletal Exam

Objectives to Discuss:

WHY the MUSCULOSKELETAL (MSK) system matters with regard to chronic pelvic pain (CPP) conditions.

WHAT important musculoskeletal structures and findings are associated with chronic pelvic pain.

HOW a GYN surgeon can integrate MSK screening into their exam.

And... WHY this all matters....

Financial Disclosures
I have no financial relationships to disclose.

Why Surgeons Should Learn a Musculoskeletal Exam

• Your patients will feel you listened and validated concerns.
• Your differential diagnosis AND outcomes will improve.
• You’ll have better medical “team” communication and refer appropriately.
• Hero status.

“Thermogram” Pelvic Pain Patient
Why Does This Matter?
• Surgery won’t “fix” a musculoskeletal issue typically (hypertonic/overactive muscle). Symptoms can become worse or additional complications happen.
• Post-op patients may have a new-onset MSK issue or neural issue that is presumed will get better on its own, though would benefit from timely MSK treatment to prevent longer-term chronic pain issues
• MSK issue and only meds are provided only masking the underlying problem
• Patient may have multiple issues and if MSK is not addressed in addition to surgery, etc. – issue may not fully resolve
• So...Pelvic pain is complex and MSK should be screened.

Why Surgery Doesn’t Help All Pelvic Pain Patients. Examples
• Musculoskeletal source or contribution (leading to nerve compression/irritation)
• Sensitization of the nervous system (peripheral and/or central)
• Comorbidities (systemic, inflammatory, hormonal, etc)
• History of trauma
• Lack of multimodal approach to care – outcomes would improve with PT, pain management, counseling, mindfulness/meditation, etc.

What Pelvic Pain Patients Share

“I wish Gynecologists would go back and do professional development in the pelvic floor muscles and nerves.

“For years I had on and off one sided pain (that I now know was pelvic muscle pain-oburator internus and coccygeus). I had 2 laparoscopies to find the cause and of course nothing was found. Gynecologist told me to get a hysterectomy and it might cure me. (Thank God I didn’t listen)”

What Pelvic Pain Patients Share
• “Pelvic pain is a real concern and involves a whole team of doctors to help the patient and GYNs are often the first doctor that a woman seeks out for help/treatment/diagnosis.”
• “Gynecologists think all pelvic pain has to be associated with your uterus or ovaries or a psych issue! It’s as if no other anatomy is located in the pelvis- so crazy!”

How Does a Pelvic Pain Patient Present? Complex and Multiple Issues or Specific
• Painful Bladder Syndrome/IC
• Vulvodynia and all of the subtypes
• Coccydynia
• Endometriosis
• Pudendal Neuralgia
• Constipation
• Dysfunctional voiding

(Myofascial pain syndrome
• Rectal pain/Proctalgia Fugax
• Vaginismus
• Dyspareunia
• IBS
• Urethral Pain
• PGAD

(Comorbidity overlap)
Hartmann, Howard, Steece
Somatic ↔ NEURAL ↔ Visceral

Types of Musculoskeletal Findings

1. Extrapelvic Exam
   - Breathing Patterns/Diaphragmatic Excursion
   - Positions Matter – “Always hurts when I sit vs. when I change positions”
   - Bony Landmark Pain / Asymmetry
   - Muscle Tightness/Tenderness
   - Neural Sensitization/ Neural Tension
   - Spinal Mobilization Testing
   - ROM Hip/Extremities & Pelvic Floor Excursion

2. Internal Pelvic Floor – Vaginal and/or Rectal

3. sEMG /Biofeedback

Muscles – “CORE” Pressure System

Extrapelvic Exam

Palpation Matters
Palpation, Palpation, Palpation. Based on History!

Palpation is VALIDATION for patient...and you.
• Neuropathy? Neural pattern of referral? vs.
• Tender everywhere? vs
• Muscular
  • tender to palpation: “That’s my pain”
  • tightness/shortness Hypertonic/overactive
• Can possibly be reproduced with contracting the muscle or not able to relax muscle

Study (Tu 2008): CPP Musculoskeletal Findings
Women with chronic pelvic pain had more musculoskeletal dysfunction (20 control/19 cases)
• Asymmetrical iliac crests height
• Pubis symphysis height
• Positive posterior pelvic provocation test (S1J)
• Higher abdominal and pelvic muscle tender points (R Psoas, B Rectus, L Obliques)
• More difficulty relaxing pelvic floor muscles after contract/relax 2/4 and 10/10

Common Findings in Other CPP Studies
Pelvic floor muscle tenderness found more often in women with chronic pelvic pain (Fitzgerald 2011)
Myofascial pain and hypertonic pelvic floor dysfunction are present in more than 50% of patients with IC and/or CPPS. (FitzGerald MP 2009)
Men with CPPS have more abnormal pelvic floor muscular findings (Hetrick 2003)

Key findings: (King 1991)
• “Pelvic pain posture: Lumbar lordosis, anterior pelvic tilt
• + Thomas test and/or decreased spine ROM in 75%
• Loss of 15-25° hip internal rotation
• Poor sit, stand, sleep mechanics

General Extrapelvic Musculoskeletal Exam

MSK Extrapelvic Screening Helps with Differential Diagnosis
Pain Patterns
• Can be very distinct MSK source “That’s my pain” at muscle belly or tendinous (muscular/bony) area.
• Poor Discrimination in the pelvis – May think bladder, ovary. Could be diffuse
• Multiple referral patterns
• Possibly multiple sources
• Long-term can have MSK symptoms and findings from another source (hx UTIs, Endo...)

Some of the Muscles that Attach or Influence the Pelvis

• Abdominals
• Gluteals
• Hamstrings
• Piriformis
• 4 Hip Rotators
• Quadratus lumborum
• 5 Hip Adductors
• Ilioposas
• Erector Spinae
• Quadratus

Fitzgerald, Lee
Abdominal Wall – 3 Key Assessments

- Palpation – Tenderness, Tissue/muscle mobility, Trigger points with referral pattern, Reproduces Pain
- Abdominal Wall Stability – Diastasis Recti
- Scars – Mobility / Restrictions?

Scar Mobility

Near Bladder or other organs?
Reproduce pain with touch/pressure?
Sensitive to touch?

Types of Musculoskeletal Findings

- **Trigger Point** – Focal, hyperirritable spots located in a taut band of skeletal muscle. They produce pain locally and in a referred pattern and often accompany chronic musculoskeletal disorders.
- **Tender Point** – Pain at the site of palpation only
- **Spasm** – Persistent increased tension and shortness in a muscle that cannot be released voluntarily

Travell and Simons; Alvarez (2002); Rummer, E.

Types of Musculoskeletal Findings

- **Connective Tissue Restriction** -
  - Increased texture thickness with acute tenderness upon pinch-rolling in the skin and subcutaneous tissue
  - Hyperalgesia and trophic changes may be present

Prendergast and Rummer; Kotarbinski

Abdominal/Pelvic Pain – Musculoskeletal?

Prendergast and Rummer; Kotarbinski

Prendergast and Rummer; Kotarbinski

Prendergast and Rummer; Kotarbinski

Prendergast and Rummer; Kotarbinski

Prendergast and Rummer; Kotarbinski

Prendergast and Rummer; Kotarbinski
Abdominal Pain – Carnett’s Test (Screening)
(Takada, T 2011)
• 130 consecutive outpatients with abdominal tenderness. [Functional G/I/IBS excluded]
• 84% + Test: Abdominal Wall Pain
• 86% + Test: Psychogenic Abdominal Pain
• 13% + Test: Intra-Abdominal Source

External Muscles – Quadratus Lumborum

External Muscles – Psoas and Iliacus

External Muscles – Gluteals, Hamstrings

External/Internal Muscle- Obturator Internus

“Hips Don’t Lie”?: Sacroiliac Joint and Hips

HIP LABRAL TEAR?

- Basic hip mobility testing
- Research has produced NO tests with sufficient specificity to help confidently RULE IN dx of hip labral lesion.
- Negative finding for certain tests provides clinician with evidence-based confidence that a hip labral tear is ABSENT.

Lebold, RM. Labral Tears. 2008; 16(2): E24–E41. PMCID: PMC2565117

Concurrent Criterion-Related Validity of Physical Examination Tests for Hip Labral Lesions: A Systematic Review

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Pelvic Pain and Pelvic Floor Connection?

- Majority of pelvic pain conditions involve some kind of pelvic floor muscle dysfunction
- Patients with pain usually have muscle spasms/hypertonicity/shortening, NOT weakness (but can have both)
- Many unable to actively contract pelvic floor muscles
- Difficulty with release of contraction
- Poor awareness – “am I even contracting?”

Pelvic Floor – Muscle Function

Palpation
- Layers 1-3. Tender, Trp, Decreased tissue mobility
- Differential - Specific muscles or with cotton swab at vestibule only?
- Asymmetries - each side?
- Referral to another place – to bladder, abdomen, etc.?
- Does it feel tight in spasm or “shortened”?

Pelvic Floor – Muscle Function

External and Internal Observation/Palpation – Can you: Contract, Relax, Bulge? 😊

NOT just a KEGEL

Features of Pelvic Floor Muscle Dysfunction – Overactive, Hypertonicity, Shortened

- Pain with or after voiding – NOT like a UTI
- Pain with penetration vaginally – tampon, digit, intercourse.
- Urinary hesitancy/frequency Incomplete urinary voiding
- Incomplete or difficulty passing stool and constipation via outlet obstruction
- Not common to have urinary incontinence
- Usually worse with “core” strengthening
- Worse with Kegels
Pelvic Floor Muscles

Functions of Pelvic Floor Muscles
- Core stability in conjunction with the respiratory diaphragm, back and abdominal muscles
- Transfer loads generated by body wt. and gravity
- Sexual/reproductive function
- Urinary and colorectal function
  - **Superficial layer:** (pudendal nerve)
    - Bulbocavernosus
    - Ischiocavernosus
    - Superficial transverse perineal
    - External anal sphincter (EAS)

Pelvic Floor Muscles

- **Second layer - Urogenital:** pudendal nerve
  - External urethral sphincter
  - Compressor uretherae
  - Sphincter urethrovaginalis
  - Deep transverse perineal

Pelvic Floor Muscles

- **Deep layer /Pelvic diaphragm:** sacral nerve roots S3-S5
  - Levator ani: Pubococcygeus (Pubovaginalis, Puborectalis), Iliococcygeus
  - Coccygeus/ischiococcygeus
  - Piriformis
  - Obturator internus
3. Pelvic Floor sEMG / Biofeedback Testing

What Can YOU Do for MSK Evaluation?

GYNs and MSK Evaluation Connection?

Specific Evaluation for Pain Patient
- Look for tissue that doesn’t move or hurts when you move it – external or internal
- Looking for muscle spasms and “trigger points” which may be a source of pain.
- Look for muscle dysfunction – can they contract, release and elongate muscles as needed?

GYNs and MSK Evaluation Connection?

Typical Findings on Vaginal Exam
- Difficulty tolerating vaginal exam
- May only be able to use child speculum if any
- Pain with palpation of muscles – improved differential with specific muscle identification.
- Residual pain following examination
- Reproduction of abdominal pain with palpation of muscles
- Apparent weak or minimal contraction of muscles on command
- Paradoxical contraction with attempts to push out or elongate muscles.
Recommendations if Patients Have MSK Findings

• Do NOT start on Regels and send them away
• Consider holding off on surgeries planned until MSK treatment
• Refer to Pelvic Physical Therapy if possible
• Will screen to rule out Back/Hip and other differentials
• Restore Tissue mobility
• Train patient in toileting postures, muscle re-education, self help strategies
• Suggestions for self care – massage, meditation, counseling (but do not infer they are “crazy” or it is “all in your head.”

References

Butler and Mosley. Explain Pain, 2003
Autonomic Nervous System in CPP States-- Friend or Foe?

Frank F. Tu, MD, MPH
Clin Assoc Prof
Dept of Ob/Gyn

Objectives
- Identify the pertinent components of the autonomic nervous system for CPP states
- Recognize significant features of prior studies of ANS dysfunction in CPP states
- Discuss 3 potential ANS medication therapies of potential value for treating CPP

Visceral innervation is autonomic
- Sympathetic and parasympathetic
  - arise from the sympathetic trunk and the sacral spinal nerves.
  - Converge on abdominopelvic plexus extending thoracoabdominal diaphragm superiorly to the pelvic diaphragm inferiorly.
- Initially only efferent aspects described

Uterine pain and CPP need more effective treatments
- Dysmenorrhea
  - OCPs I
  - NSAIDs I – 15% of cases refractory
- CPP/endometriosis
  - Hormonal suppression (OCPs, progestins, GnRH agonists and antagonists, AIs) Ib
  - Surgical removal of endometriosis implants (Ib
  - General neuromodulator drugs (III)

Disclosures
- Consultant: AbbVie
- Contracted Research: AbbVie
- Off label use of medications will be reviewed
Sympathetic pelvic neuroanatomy

- SHP and IHP are major integrative centers
- IHP fans into middle rectal/vesical/pelvic plexi
- These supply most pelvic GU/GI/reproductive structures
- Anterior part is paracervical ganglia
- Corpora cavernosa, vagina, periurethral tissues


Key constituents

Sympathetic
- Sympathetic trunk connections to...
- Lumbar (L1-L2) and sacral splanchnic nerves to

Parasympathetic
- Pelvic splanchnics (S2-S4)
- Through IHP to target pelvic organs, ganglia in walls, the postganglionic fibers to deeper layers – smooth muscle and glands

Overview of afferent visceral pathways

1. Pelvic splanchnics – PS from IHP, anterior rami of S2-S2 (nervi erigentes) – uterus, bladder, vagina and inferior rectum
2. Sacral splanchnics – S from IHP, viaa sympath chain to L1, L2, white rami comm to SC, also uterus, vagina, rectum
3. IHP -> hypogastrics to SHP, then pre-aortic plexus, then T and L splanchnics to sympathetic chain at T7-L2
4. S and PS bypass in adnexa to thoracic splanchnics, but also vagal PS
5. Middle and superior rectal S1 along vessel to inferior mes plexus, then to lumbar splanchnics

Complexity the norm

- Vs somatic fibers, visceral fibers are
- more divergent on entering SC, contacting multiple DH neurons.
- Visceral afferent fibers ascend and descend many more levels than typical somatosensory afferent fibers.
- Almost all visceral afferent fibers are convergent on DH neurons that also receive somatic primary afferent fibers.

Understanding the big scheme

- PFC-> RM -> NTS -> vagus -> bladder
- Bladder to thalamus to PFC
- RM to DH -> bladder (symp)
- Absence of vagal tone worsens things
- Gain of function

Background on parasympathetic contribution to wellness

- Reliable individual differences in cardiac vagal tone exist (Cacioppo et al., 1994)
  - Reduction with age (Craft and Schwartz, 1995).
- Unknown if impaired vagal tone is a cause or consequence of chronic disease

**Autonomic ganglia contributions**

- Axon collaterals in an autonomic ganglion from pathologic organ afferents could excite ganglionic secretory and motor neurons innervating other organ
- Several neuropeptides exert facilitatory/inhibitory effects at autonomic ganglia


So what is going on with ANS in chronic visceral pain?

- Output is exaggerated due to chronic hyperarousal
  - Clinical treatment goal? Wipe out sympathetic efferent drive to uterus (ischemia, contraction, pain)
- DNIC is impaired

- Linked to comorbid conditions
  - Sleep impairment
  - Fatigue
  - Mood/anxiety d/o

Baseline and stress response

- Increased HR in IC (82) vs HC (63), 14 vs. 14 females (mean age 49)
- Maintained during 25 min stressor application (Δ19, p < 0.0001), but not different.
  - Speech, Stroop, and serial subtraction

Lutgendorf S et al J Urol 2004

APS-R is GOOD

- Greater capacity for context and goals to modulate emotion (output of vmPFC) vmPFC – system of systems linking conceptualization, context, emotion and response.
  - Via connection to PAG bias more caudal brainstem networks to specific modes that reflect particular behavior patterns and their autonomic accompaniments
  - ANS-R may be the “poor man’s” marker of vmPFC outflow to the PAG

Resting HF-HRV – marker for emotional regulation?

- Indicator of capacity for cognitive and affective regulation
  - Low HF-HRV reflecting reduced ability to psychologically modulate physiological responses
- BUT, if decreased autonomic outflow predisposes to the development of IC/BPS, one might consider whether the vagal anti-inflammatory pathway has a role

Williams, J Urol 2015
Causal role in CPP?

- unique ANS changes in response to stress occur in IC/BPS absent from other CPP disorders underlie the bladder dysfunction that characterizes IC/BPS
- ANS responsiveness (ANS-R) in patients with IC/BPS, both at rest and during orthostatic challenge
  - in vagal tone, measured by high-frequency heart rate variability (hHRV)
  - in sympathetic reactivity, via baroreflex sensitivity (BRS)

Is exag SNS output more a predisposing issue?

- Sympathetic activity adverse chronic influence
  - Tissue vasoconstriction
  - Facilitate pain pathways in DH (NE on a circuit is more synaptic conductance – Wolff)

HRV and functional somatic disorders

- lower PNS activity in FSD patients regardless of type of FSD (i.e., CFS, FM or IBS).
- Reliability limited by unexplained heterogeneity in effect sizes and potential publication bias.
- Key study design features
  - Appropriate controls, blinding personnel for HRV measurements, reporting adequate HRV outcomes, and adjustment for potential confounders.
  - Must consider influence of time of day, smoking, alcohol intake, caffeine intake, water or food ingestion

IBS and ANS

- 24-h recording IBS patients vs. HC
  - \[ \text{mean lnHF}; \ uparrow \text{mean square root LF/HF index} \]
  - Shift in sympathetic/parasympathetic balance toward sympathetic dominance, but due to vagal withdrawal.

Diagnostic/therapeutic blocks

- **Malignant**
  - Planzette et al. 1997
  - “vague, dull, poorly localized pain”
  - Dx ~ 159/227 with “good pain relief”
  - Tx ~ 115/227 with “good pain relief”
  - Some 2nd procedures attempted
- **Non-malignant**
  - Bosscher, 1996-2000
  - Dx - 50% pain relief > 4 hrs – 10/22
  - Tx ~ 50% relief > 1 mth ~ 4/11, only 1 with complete, long-lasting relief
  - \( \downarrow \) 43% avg opioid dosage

Pelvic pain in women Kindel 1939

- Review PSN
- 2 deaths.
Presacral neurectomy

- Italian RCT 2003
  - 162 women with >6 mths severe dysmenorrhea + dx of endometriosis
  - Tx with (A) EOE or (B) EOE + PSN
  - Outcomes (12 mths F/U)
    - Dysmenorrhea – (B) 85.7% cured vs. (A) 57.1%
    - Dyspareunia
    - Pelvic pain
  - Complications (12 mths F/U)
    - 5/63 (14%) with constipation
    - 3/63 (5%) with urinary urgency

Case studies suggest efficacy for CPP states, clinical experience says not effective

Zullo F et al, AJOG 2003

Model of dysmenorrhea to CPP progression at target organ.

- Severe menses
- Sympathetic modulation of perfusion/contractility
- Ascending pain pathways
- Regulation of pain/homeostasis
- ϑ PGs, LTs, vasopressin, PAF concentration

Add'l thoughts

- Exercise, CBT similarly?
- Benefits of autonomically focused psychosocial-behavioral interventions with respect to HTN and CHD have been demonstrated in a number of trials in adults
- Find solutions to reduce threat with reducing PFC -> PAG, RM (RM produces 80% of NE)
- β-blockade?


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When Sex Hurts
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Disclosure
I have no financial relationships to disclose.

Objectives
- Identify the diagnostic criteria for sexual pain
- Explain the impact of this very prevalent chronic pain syndrome
- Describe the benefits of both physical and psychosocial therapies

Test your knowledge

Test your knowledge

54 yo married female presents to your office for management of fibromyalgia and her pain and medications. You are done with your visit, and as you are walking out the door she says “I know you don’t have time but…” and she proceeds to report that over the last several months she has been experiencing pain during intercourse and loss of desire which is worrying her. She tells you she has no medical problems and her only medications (besides her pain meds) is her hormone pill. You perform a brief vaginal exam and you tell her you ‘see nothing wrong’. Which of the following should be your next step?

• A. You order a UA which is negative and you give her a short course of your favorite antibiotic
• B. You ask her some additional questions such as whether she has been experiencing any vaginal dryness, itching, hot flashes, insomnia
• C. You tell her you don’t see anything wrong and you recommend she go home and have more sex to see if it gets better
• D. You ask her whether she is being abused and if she denies you tell her there is nothing you can do.

Sexual Pain Terminology
- Dyspareunia – recurrent or persistent vaginal pain associated with sexual intercourse
- Vulvodynia – chronic vaginal or vulvar pain that can be unprovoked or provoked by contact such as intercourse
- Vestibulitis – pain localized to the vestibule, provoked or unprovoked.
- Both are usually symptoms of an underlying condition rather than just a diagnosis in and of itself. But technical definitions are based on the ability to exclude ‘organic’ causes such as infection, neoplasm or dermatoses
- Vaginismus – involuntary muscle spasms and fear of touch
- Hypoactive sexual desire disorder, arousal disorder - diagnoses that do not involve pain

**Dyspareunia: Additional Terminology**

- **Situational dyspareunia**: pain with intercourse that is limited to specific situations, positions or a particular partner
- **General dyspareunia**: pain that is not situational
- **Primary dyspareunia**: pain that presents with or since first intercourse
- **Secondary dyspareunia**: pain with intercourse that occurs after a period of pain-free intercourse
- **Superficial dyspareunia**: pain limited to the vulvar vestibule or vaginal introitus
- **Deep dyspareunia**: pain with deep penetration

**Vulvodynia**

- Chronic lower genital pain of “unknown etiology” that manifests as pain and occasional erythema of the vulva without obvious infectious, dermatologic, or neurologic disease
- **Generalized vulvodynia** – to the entire vulva
- **Localized vulvodynia** – to the vestibule
- **Provoked vulvodynia** – occurring with touch (tampon, sexual activity)
- **Unprovoked vulvodynia** – occurring spontaneously or continuous pain

**Epidemiology**

- Mixed populations of vulvodynia and dyspareunia
- Vulvodynia prevalence estimated at 8.3%; 14 million women will experience pain at some point
- Dyspareunia 12-21% in women and 1-5% in men in U.S.
- Dyspareunia 8-21% in women around the world

**Social and Economic Impact**

- Poor health-related quality of life, sexual dysfunction and high rates of psychological distress
- Vulvodynia patients 2-3x more likely to have one or more chronic pain conditions such as fibromyalgia, PBS, TMD and IBS.
- Vulvodynia impact on U.S. healthcare system: $31-72 Billion in direct, indirect and non-healthcare costs
Healthy Sexual Response

Masters and Johnson

- Relaxation of pelvic floor muscles
- Longer canal lengthens by 3-4 cm, widen by 6 cm
- Pelvic organs elevate ‘up and out’ of way
- Clitoral retraction under the clitoral hood
- Labia minora enlarge and become red
- Contraction of pelvic floor muscles at the vaginal entrance during ‘orgasmic’ phase

Conditions Associated with Sexual Pain

Superficial / Insertional
- Vulvar Dermatoses
  - Sudden edema
  - Lichen Planus
  - Contact dermatitis
- Vaginitis / Infections / Inflammatory
  - Conditions
  - Bacterial vaginosis
  - DIV
- Vaginal atrophy / Hormonal
- Myalgias
- Neuralgia

Deep
- Reproduction
  - Exogenous / Adrenogen
  - Visceral and reproductive (Cysts, Fibroids)
- Menopause
- Men
- Allergies
- Myalgias / Spasm
- Neuralgia
- Trauma (surgical, mesh, hysterectomy)
- Degenerative
- Infections
- Ulcers
- FIST / IBD
- Inflammatory perineum
- Sexual
- Muscle
- B12
- AD
- Contraception
- Allergies

The Biopsychosocial Model Of Pain

Psychological Factors

Chronic Pain

Social Factors

Biological Factors
**Screen for Reported Risk Factors that May Actually Impact Outcome**

- Recurrent vulvovaginal infections
- Hormonal status
- Onset of pain prior to initiating intercourse
- Presence of dysmenorrhea
- Co-morbid pain and psychiatric disorders
- Adverse life experiences

---

**Gynecologic Examination For Pain**

- Trust
- Relaxation and decrease anxiety
- Patient properly covered
- Patient should have a sense of control
- Educate patient on what is examined during the evaluation
- Explain sensory exam and pain severity scales
- Explain difference between exam and ‘what you feel at home’
- Give the option to stop and any point, may break up examination into two visits
- Give the option of deferring speculum exam if no abnormal bleeding or discharge
- Use the smallest speculum possible
- Must have a ‘chaperone’

---

**External Sensory**

- Sensory test with cotton tipped applicator to ‘soft’ and ‘pin prick’
- Anal wink reflex, allodynia, hyperalgesia in S1-T12 distribution
- Allodynia to static ‘pressure’ or dynamic ‘brushing’ touch of the vestibule

---

Single Digit Internal / Musculoskeletal

- Single well lubricated digit
- Slow insertion
- Voluntary contraction, strength and tone
- “Deep” palpation of the pelvic floor muscles
- Palpation of the cervix, uterus and adnexa

Internal Speculum

- Well lubricated speculum
- Small, clear speculum to allow full visualization with less distention
- Slow insertion
- Vaginal pH
- Wet prep
- Vaginal cultures
- Vaginal biopsy only if vulvar cancers or dermatoses are suspected

Diagnostic Tests

- Urinalysis
- Vaginal cultures / wet prep
- Pelvic imaging
  - Transvaginal ultrasound
  - Pelvic MRI
- Pelvic function imaging
  - Urodynamics
  - Defecography
  - Sitz Marker study
- Colposcopy
- Biopsy

Treatments: Treatment Plan

- Define Expectations
  - Patient expectations
  - Provider expectation
  - Derive a common ground
- Define Goals
  - Decreased pain vs. “cure” and pain-free vs. sexually active
  - Improved quality of life
- Define Treatment Duration
  - Treatment duration varies (e.g. 6-12 months)
  - “Treatment” is actually may involve a variety of therapies used at the same time
  - Educate on Patient Participation

Available treatments of Dyspareunia and Vulvodynia

- Education and vulvar care
- Topical applications (lidocaine, estradiol, steroids)
- Oral Therapy (analgesics, neuroleptics, TCA, SSRIs)
- Intravaginal therapy
- Physical Therapy
- Behavioral Therapy: Cognitive-Behavioral Therapy, Sex Therapy, Relationship Counseling
- Injections: Neuronal blocks & Trigger points
- Surgical Therapy (vestibulectomy)
- Treatment often involves multiple therapies and is often highly individualized

Treatments

- Dermatosis / Infections
- Infections / Vaginal / Genital
- Topical vs. Oral
- Vaginal or Intrarectal
- Oral antivirals
- Oral steroids for patients who fail topical therapy
- Topical or oral intrarectal approach

Clinical Pearl

- Non irritating bases and emollients: vesica balse, coconut oil, hydrophilic petrolatum - re-compound any topical that "burns"
- Use "ointments" vs. "creams"
- Additional estradiol to promote regeneration of new mucosa
- Anti-histamines to prevent scratching and itching

Assessing for Centralized Pain

- Pain body map (screen for co-morbid pain syndromes)
- Somatic symptoms (fatigue, insomnia, dizziness)
- Psychological function (anxiety, depression, catastrophizing, rumination)
- Quantitative sensory testing at extra genital sites

Vulvar Care

- Avoid over-washing and harsh cleansers
- Avoid ‘wiping’ emphasize gentle ‘pat’
- Avoid drying agents focus on lubrication during daily activities and intercourse
  - Lubricants should be water based or ‘ointment’ that are preservative free, alcohol free, non irritating
- Avoid tight clothing
- Avoid over ‘analyzing’ and examination of the vagina
- Resuming intercourse only when not pain free
Physical Therapy

• Decrease hypertonicity THEN restore normal muscle function and strength
• Focus on voluntary and involuntary pelvic floor muscle relaxation
  • Internal manipulation
  • Biofeedback with focus on relaxation
  • Pelvic floor stretches
  • Internal vaginal dilators

Sexual Cycle and ‘Fear of Intercourse’: Cognitive – Motivational

• Models explaining how patients become ‘trapped’ in a vicious circle of fear and pain that go beyond obvious physical markers:
  • Pain and resultant anticipatory anxiety leads to fearful reactions, inhibit genital arousal, vaginal dryness, and pelvic floor hypertonicity
  • Inhibition of automatic responses (outside awareness) that would lead sexually meaningful stimuli that normally lead to arousal
  • Women may ‘like’ intercourse but not necessarily ‘want’ to have intercourse due to anticipation of pain
  • Women have intercourse in spite of pain, because they want to avoid the consequence of relationship discord more than the consequence of pain


Treatment: CBT and “Desensitization”

• Before overcoming fear of pain, patients have to experience non‐painful insertion
  • Vaginal dilators, internal PT and internal examination should be non‐painful before patients can overcome ‘fear of pain’
• Address motivational factors for avoiding pain or for continuing to have intercourse in spite of pain
• Identify factors that help reduce fear but also increase arousal and desire
• Address relationship issue that result from being in chronic pain (e.g. partners that don’t ‘believe’ the pain or partners that use pain for ‘gain’

Summary

• Dyspareunia is often multifactorial
• Treatment is usually involves the multidisciplinary approach: organic and psychosocial dysfunctions must be addressed
• Resolution of pain does not ensure return to normal sexual function; psychosocial and ‘fear of intercourse’ factors must be considered
• Chronic sexual or vaginal pain does not ensure return to normal sexual function; psychosocial and ‘fear of intercourse’ factors must be considered

Test your knowledge

• A. You order a UA which is negative and you give her a short course of your favorite antibiotic
• B. You ask her some additional questions such as whether she has been experiencing any vaginal dryness, itching, hot flashes, insomnia
• C. You tell her you don’t see anything wrong and you recommend she go home and have more sex to see if it gets better
• D. You ask her whether she is being abused and if she denies you tell her there is nothing you can do.
From dysmenorrhea to chronic pelvic pain: when to perform surgery and what works.

AAGL 45th Annual Congress on Minimally Invasive Gynecology
Orlando, Florida 2016
PELV-610: Chronic Pelvic Pain 2.0: Decoding Peripheral and Central Factors to Optimize Patient Outcomes
Sawsan As-Sanie, MD, MPH
Assistant Professor
Department of Obstetrics and Gynecology
Director, Minimally Invasive GYN Surgery & Fellowship
Director, Endometriosis Center
The University of Michigan

Objectives
1. Identify the indications for laparoscopy in women with dysmenorrhea or chronic pelvic pain
2. Describe the efficacy of various surgical procedures for the treatment of chronic pelvic pain
3. Review the evidence regarding the utility of hysterectomy and/or bilateral salpingo-oophorectomy for the treatment of CPP
4. Review the incidence of and risk factors for persistent pelvic pain following hysterectomy

Case study
JD is a 24 year old G0 female who presents with complaints of progressive dysmenorrhea. She had previously been on OCPs, ages 15-22, for dysmenorrhea and cycle control. But her pain is no longer controlled on this regimen.

Clinical Scenario (continued)
- JD’s history is notable for daily pelvic pain (mid-pelvic crampy pain) that worsens shortly before and during menses. +deep dyspareunia.
- Physical exam is notable for small, retroverted tender uterus, shortening of right uterosacral ligament with nodularity, and right adnexal tenderness and fullness.

Disclosures
1. Consultant: Myriad Genetics Lab
   - I will present off-label use of medications, best evidence will be provided.

Test your knowledge
Prior to proceeding with surgery, you treat JD with 3 months of DepoLupron. Her pain improves. Does this establish the diagnosis of endometriosis?

A. yes
B. no
Does response to GnRHa diagnose endometriosis?

- RCT, n=95, Lupron vs. Placebo
  - Pain relief at 3 mo: p ≤ .001
    - 81% of GnRHa treated group
    - 39% of placebo treated group, NNT 2.3
  - After 3 mo of Lupron treatment, pain relief in:
    - 82% of women with endometriosis
    - 73% of women without endometriosis


---

Indications for laparoscopic surgery in the evaluation of dysmenorrhea or CPP

- To investigate an adnexal mass
- To establish a diagnosis of endometriosis (and surgically treat endometriosis if present)

Decision Algorithm for dysmenorrhea or CPP with cyclic exacerbation

1. Actively trying for pregnancy
2. Persistent adnexal mass
3. Pain severe, Unresponsive to NSAIDs and other eligible medical therapies
4. Pain severe, Unresponsive to medical Rx (including hormone suppression)

---

Endometriosis

- Presence of endometrial stroma and glands outside of the endometrial cavity and musculature

Variable appearance of endometriosis
Misdiagnosed as endometriosis:
- Hemangiomas
- old suture
- ovarian carcinoma
- carbon deposits
- adrenal rest
- Walthard rest
- carcinoma
- breast
- ovary
- epithelial inclusions

Reaction of oil based HSG medium
- inflammation with or without
- Psammoma bodies
- splenosis
- endosalpingiosis
- submesothelial microbleeding
- normal peritoneum

Surgical biopsy is recommended because accuracy of visual inspection is poor

Accuracy of visual inspection for the diagnosis of endometriosis

<table>
<thead>
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<th>Characteristic</th>
<th>FPV</th>
<th>Sensitivity</th>
<th>NPV</th>
<th>Specificity</th>
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<td>85</td>
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</table>

Diagnosis requires histological confirmation


Test your knowledge

You identify endometriosis at the time of laparoscopy and perform biopsy to confirm the diagnosis and fulguration of the remaining lesions. What proportion of women report improved pain after this procedure?

A. 15-20%
B. 30-50%
C. 60-80%
D. >90%

Laparoscopy for pelvic pain associated with endometriosis...RCT #1

Sutton et al. 1994
- Study design
  - RCT, double blinded
  - N=63 females, stages I-III endometriosis
  - (Laparoscopic laser ablation + LUNA) vs. expectant management
- Results
  - No difference at 3 months (48% of expectant group with improved pain) vs. laser ablation at 6 months (63% vs. 23%, p<0.01)

Laparoscopy for pelvic pain associated with endometriosis...RCT #2

RCT, blinded, crossover
- Laparoscopic excision more effective than placebo
- 30% placebo rate
- 20% not responsive to surgery

Diagnostic L/S
Operative L/S


Test your knowledge

At the time of laparoscopy, is it preferable to excise or ablate suspected endometriosis lesions?

A. excise
B. ablate
C. it depends on the location and depth of the lesion
D. it doesn’t matter
Excision vs. ablation?

**Excision**
- **Advantages:**
  - Histological confirmation
  - May be more effective?
- **Disadvantages:**
  - Requires greater surgical skill
  - More bleeding
  - More operative time

**Ablation**
- **Advantages:**
  - Surgeon comfort
  - Less bleeding
  - Less operative time
- **Disadvantages:**
  - Increase risk of thermal damage
  - May be less complete

Excision vs. ablation: Is one superior for pain symptoms?

**Wright 2005**
- RCT, double-blinded
- N=24
- Stage 1-2 endo

**Healy 2005**
- RCT, double-blinded
- N=103
- Stage 1-4 endo

Test your knowledge

JD reports that her pain is much improved at her postop visit. What is the likelihood that she will experience recurrent pelvic pain in the next year?

A. <5%
B. 25%
C. 75%
D. 90%

Pain recurrence after 1st surgery


Time to recurrent pain after 1st surgery


Test your knowledge

What if JD had a 6cm ovarian endometrioma. What is the best surgical approach?

A. Drain the endometrioma
B. Drain and ablate the endometrioma wall
C. Excise the endometrioma cyst wall
D. It doesn’t matter, all of the above are equivalent.
Endometriomas: excise or drain & ablate?

<table>
<thead>
<tr>
<th>Outcome</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrence of Pain Symptoms:</td>
<td></td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>0.15 (0.06, 0.38)</td>
</tr>
<tr>
<td>Non-menstrual pain</td>
<td>0.10 (0.02, 0.56)</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>0.08 (0.01, 0.51)</td>
</tr>
<tr>
<td>Recurrence of endometrioma</td>
<td>0.41 (0.18, 0.93)</td>
</tr>
</tbody>
</table>

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Test your knowledge

Following laparoscopic ovarian cystectomy of an endometrioma, JD wonders: will going back on OCPs prevent the development of another endometrioma?

A. No
B. Yes

Post cystectomy medical therapy reduces rate and size of recurrent endometrioma

RCT: n=239, 24 month follow-up.

In those with recurrent endometriomas, users of OCPs had smaller cysts.

Test your knowledge

Four years later, JD reports that she has recurrent dysmenorrhea and is unable to tolerate hormone suppression. She says she read about nerve ablation surgeries and wonders if it is an option for her. Is there evidence to support these procedure?

A. No
B. Yes

Presacral neurectomy & LUNA

1. Presacral neurectomy: surgical transection of presacral nerves
   - Superior hypogastric nerve in the interiliac triangle
2. Laparoscopic uterosacral nerve ablation (LUNA)
   - Sensory pain fibers from the midline pelvis
   - Do NOT receive input from ovaries or lateral structures

Indication for CENTRAL MIDLINE PAIN, especially dysmenorrhea
No evidence to support LUNA as a treatment for CPP or dysmenorrhea

Daniels 2009 (JAMA)
- Double blind RCT
- N=487
- 69 month follow-up
- No difference in:
  - Worst pain
  - Noncyclic pain
  - Dysmenorrhea
  - Dyspareunia

Presacral neurectomy associated with modest benefit and substantial risk

Zullo 2003
- Single blinded RCT
- N=141
- 1 year follow-up
- 15x adverse events:
  - 15% constipation
  - 5% urinary urgency

Test your knowledge

JD decides that nerve ablation surgery is not for her. But she is worried that “scar tissue around her uterus and ovaries” is causing her recurrent pain and requests surgery. Is there evidence to support lysis of adhesions as a therapy for CPP?

A. No
B. Yes

Pelvic & Abdominal Adhesions
- ~25% prevalence among CPP patients
- 80% of patients undergoing pain mapping reported pain when adhesions palpated
- Nerves, sensory neuron markers found in adhesions of both pain & pain-free patients

Adhesiolysis is not an effective treatment for chronic abdominal pain

RCT of laparoscopic lysis of adhesions vs. diagnostic laparoscopy
- 100 participants with chronic abdominal pain (> 6 months)
  - Participants, assessors masked
  - Outcome: overall improvement in pain, function
  - No difference in groups at one year

Is adhesiolysis an effective treatment for women with CPP?

Cheong 2014
- Double blind RCT
- N=50
- Study stopped early due to lack of enrollment
- Adhesiolysis group had more adhesions and more pain at baseline
- Results suggest decreased pain and QOL in adhesiolysis group
Twenty years after her first surgery, JD returns and requests hysterectomy for definitive management. She reports persistent daily pelvic pain despite hormone suppression, physical therapy, and various treatments for interstitial cystitis. What should you recommend?

A. Total hysterectomy  
B. Total hysterectomy + BSO  
C. Supracervical hysterectomy  
D. Supracervical hysterectomy + BSO  
E. Hysterectomy is not likely to be helpful

78-86% of all women undergoing hysterectomy report improvement after surgery  
50% report improvement in mental health, physical or social function  
60% report improvement in dyspareunia

Risk factors for persistent pain in large prospective observational study

1. Preoperative pelvic pain  
2. Pain problems elsewhere  
3. Pain is primary indication for hysterectomy  

= 3x risk of persistent pelvic pain after hysterectomy

Factors associated with persistent pelvic pain after hysterectomy

A. Pain elsewhere  
B. Younger age  
C. Lack of private insurance  
D. Depression  
E. Pain catastrophizing

Hysterectomy:
Most women are satisfied

78-86% of all women undergoing hysterectomy report improvement after surgery  
50% report improvement in mental health, physical or social function  
60% report improvement in dyspareunia

Hysterectomy:
Most women are satisfied, but there are risks

Potential for serious morbidity  
Regret over loss of fertility  
Significant risk of persistent pain

Incidence of persistent pain after hysterectomy

Persistent postop pain = ~25% (6.7 – 31.9%)  
New or increased postop pain = ~5% (1-15%)
Factors NOT associated with persistent pelvic pain after hysterectomy

- Route of hysterectomy (Brandsborg 2009)
- Preoperative dysmenorrhea (Stovall 1990)
- Preoperative uterine tenderness (Stovall 1990)
- Uterine fibroid symptom score (Brandsborg 2009)
- Uterine weight (Stovall 1990, Brandsborg 2009)
- Adenomyosis (Stovall 1990)

...i.e. clinical factors that often guide physicians to offer hysterectomy

What about the ovaries?

Preserve ovaries
- Unilateral oophorectomy
- Bilateral oophorectomy

BSO should not be taken lightly

PROS
- Relief of pelvic pain
- Prevent recurrent ovarian cysts
- Prevent recurrent endometriosis

CONS
- Hot flashes
- Vaginal dryness
- Osteoporosis
- Cardiovascular disease
- Dementia
- All cause mortality

Summary

1. Single site, retrospective, endo only
   - Favors BSO

2. Single site, retrospective, any CPP
   - No benefit of BSO

3. Multi site, prospective, any CPP
   - Favors BSO

4. Multi site, prospective, any CPP
   - BSO increases risk of CPP

5. Single site, survey, endo only
   - No benefit of BSO

6. Single site, survey, endo only
   - No benefit of BSO in age<40

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Long-Term Mortality Associated With Oophorectomy Compared With Ovarian Conservation in the Nurses’ Health Study

CONCLUSIONS: Bilateral oophorectomy is associated with increased mortality in women aged younger than 50 years who never used estrogen therapy and at no age is oophorectomy associated with increased survival.

Likelihood of Success (no reoperation) depends on age and ovarian preservation

Hysterectomy only | Hysterectomy + BSO
---|---
Age 30-39 | 89.6 (76.0–100.0) = 85.7 (70.7–100.0)
≥ 40 yrs old | 64.3 (33.0–95.7) < 96.0 (88.3–100.0)
If ovaries are removed, what is the risk of recurrent pain and recurrent endometriosis with hormone replacement therapy?


- Limited data, mostly expert opinion

Level of evidence: III

Benefits of HRT likely outweigh risk, in select populations

No reason to delay HRT after surgery, can start immediately

Consider combined estrogen-progestin methods in women with endometriosis

- Unopposed estrogen may stimulate recurrence of endometriosis and/or stimulate malignant transformation of residual endometriosis

So, before considering hysterectomy...

- Recognize that chronic pelvic pain is generally multifactorial, often with multiple organ systems involved
- Systematically treat all sources of pain before considering hysterectomy

If a patient fails medical therapy and chooses hysterectomy

- She should be well informed regarding the risk of persistent pain (Grade B)
- Retain the ovaries when possible (Grade B)
  - Suggested when ovaries are visibly normal, superficial endometriosis, or ovarian endometrioma <5 cm (?)
- If BSO is performed, patient should be fully counseled regarding risks associated with surgical menopause and persistent pain

Test your knowledge

JD undergoes TLH, BSO and was found to have extensive endometriosis and an obliterated posterior culdesac. She initially reported resolution of her pelvic pain, but then returns 3 years later with recurrent pelvic pain. Pelvic ultrasound demonstrates a 4 cm complex left ovarian mass. What do you recommend?

A. No intervention
B. Hormone suppression and repeat ultrasound
C. Laparoscopy
D. Laparotomy
Ovarian remnant syndrome

**Definition:**
- Histologically confirmed ovarian tissue in a woman who has previously undergone bilateral salpingo-oophorectomy

**Prevalence**
- Up to 18% of women with persistent pelvic pain, who previously underwent hysterectomy-BSO for endometriosis/pelvic pain

**Clinical presentation:**
- Chronic pelvic pain: 84%
- Dyspareunia: 26%
- Cyclic pelvic pain: 9%
- Dysuria: 7%
- Pain with defecation: 6%

**Risk factors are all related to history of difficult hysterectomy:**
- Endometriosis
- Pelvic adhesive disease or h/o pelvic inflammatory disease
- Multiple prior abdominal or pelvic surgeries

**Diagnosis of ovarian remnant**
- History of prior BSO
- Pelvic pain and/or pelvic mass on exam or imaging

… not all remnants are hormonally active:
- ~ 30% of patients with surgically documented remnants have postmenopausal values of serum estradiol (<35 pg/mL) and FSH (>30 IU/mL).

**Management of ovarian remnant**
- Asymptomatic, low risk of malignancy:
  - Surveillance, expectant management

- Concern for malignancy (complex appearance, increasing size, etc)
  - Surgical excision with anticipation of extensive sidewall and retroperitoneal dissection
  - Laparoscopic approach is feasible, safe and associated with lower morbidity.
Surgical excision of ovarian remnant

- Laparoscopic approach is feasible for the experienced surgeon
- Significant improvement and/or resolution of pain in ~80%
- Recurrence of remnant in 0-20%


References

Pre-operative, Post-Operative and Chronic Pain Management

Georgine Lamvu, MD, MPH, CPE
Gynecologic Surgeon and Pelvic Pain Specialist,
Orlando VA Medical Center
Associate Professor
University of Central Florida

Objectives

• Briefly review pain physiology as it relates to surgical pain
• Describe the evidence available for pain management as it applies to surgical intervention
• Describe new guidelines for pain management

WHY ARE WE DOING THIS LECTURE TODAY?

Challenges of Operative Pain Management

• 73 million surgeries done in the U.S. annually
  – 80% experience acute pain and 20% experience severe pain
• 2001 US Congress “A decade of pain control”
• APS considers pain as the “fifth vital sign”

Disclaimer

I have no financial relationships to disclose.


• Meta-analysis of 165 studies, nearly 20,000 patients
• Using VAS score for pain evaluation
  – 11% experienced severe pain
  – 30% experienced moderate to severe pain

A History of Ineffective Pain Treatment

Factors That Contribute to Inadequate Pain Management

Impact of Inadequate Pain Relief:

How Did We Contribute to the Opioid Epidemic?

Impact of Inadequate Pain Relief

Factors That Contribute to Inadequate Pain Management

Impact of Inadequate Pain Relief:

How Did We Contribute to the Opioid Epidemic?
Monotherapy

Over-reliance on single class analgesia commonly results in
• Limited efficacy
• Intolerable adverse events
• Diminished patient satisfaction
• Example of opioid monotherapy
  – Nausea, vomiting, constipation, ileus, urinary retention
  – Opioid induced hyperalgesia
  – Long term-side effects such as mood instability, insomnia, tolerance and withdrawal

Development of Chronic Pain Syndrome After Surgery

• 10-50% of patients undergoing operations later develop persistent pain
  – 14% of women after hysterectomy develop new onset pain after surgery

What Should Surgeons Do?

Neurobiology of Pain

• Peripheral nociceptors
• Signal propagation and conduction to the spinal cord
• Cortical perception: identification and localization of pain
• Descending inhibition: suppression of pain transmission by descending contacts from the brainstem, midbrain and cerebral cortex
• Supraspinal reactions: cortical responses including fear, anxiety, depression

Predictive Factors of Postoperative Pain Intensity

Predictive Factors of Postoperative Analgesic Consumption

A Model to Identify Patients at Risk for Prescription Opioid Abuse, Dependence and Misuse

- Pain Med 2012; (13)9:1162

- Key characteristics (odds ratio > 2):
  - At least one prior prescription of buprenorphine (OR = 53.75) or methadone (OR = 2.37)
  - At least one diagnosis of non-opioid drug abuse (OR = 9.89)
  - Year opioid prescriptions (OR = 2.25 for n = prior Rx; OR = 6.25 for n = prior Rx)
  - Having a family member diagnosed with opioid abuse (OR = 3.01)
  - Mental illness (OR = 2.43)
  - Hepatitis (OR = 2.36)

Four Steps to Pain Management*

1. Assess: History, Exam and Risk Assessment
2. Check: what other medications are being taken, possible interactions, opioids, benzodiazepines, high doses, obtaining medications from multiple providers
3. Discuss: Expectations, potential risks
4. Observe: Look for clinical improvement, overuse and misuse, go slow with dose increases, consult support pain management teams if needed

* A must before surgery

Guide to Pain Managment

- These recommendations are based on CDC, Va/DoD and APS pain management guidelines
- Evidence about opioid therapy
  - Benefits of long-term opioid therapy for chronic pain not well supported by evidence
  - Short term benefits small to moderate for pain, inconsistent for function
  - Insufficient evidence for long-term benefits in low back pain, headache and fibromyalgia
- Non-opioid therapies
  - May be used alone or in combination
  - Non-opioid medication, e.g. NSAIDs, TCA, SNRIs, anti-convulsants
  - Topical analgesics, injections (e.g. steroids) and blocks
  - Physical treatments, e.g. physical therapy, exercise
  - Behavioral therapy, e.g. counseling, CBT

Risk Assessment for Pain Chronicity*

- Poorly controlled pain
- Psychiatric co-morbidities
- Pre-operative anxiety
- Having surgery
- Poorly controlled post operative pain
- If the patient has multiple pain co-morbidities

* A must before surgery

Risk Assessment*

- Urine Drug Screen
  - Check to confirm presence of prescribed substances or for undisclosed prescription drug or illicit substances
- Prescription drug monitoring program
  - Check for opioids or benzodiazepines from other sources

* A must before surgery

Patient Education*

- Opioids are not first-line or routine therapy for chronic pain and for acute pain they are used only in severe pain and in short amounts
- Establish realistic goals for improvements in pain and function
- Discuss benefits and risks and availability of non-opioid therapies with patients

* A must before surgery
Key Points For Patient / Family Education*

- Analgesics will not make you pain-free, they only help alleviate some pain, most pain medications take 1-2 hours to take effect, the goal is not to cure pain but rather to improve function.
- We suggest a 24% Improvement in pain AND function for most therapies.
- Recovery from surgical or acute traumatic injury is expected to take 2-4 weeks, it is not immediate.
- Don’t take extra doses beyond what is prescribed, tell all you providers what medications you are taking.
- Don’t stop opioids suddenly, instead taper slowly as instructed by your provider.
- Do not drive or operate heavy machinery, don’t drink alcohol or take other street drugs with your pain medications.
- Protect your pain medications from damage, loss or theft.
- Report any side effects such as dizziness, confusion, constipation, itching, nausea and vomiting, difficulty breathing to your provider.
- Your prescriptions are registered in a state monitoring program that is accessible to all of your providers.
- To monitor your medication intake, your provider may recommend a urine drug screen when you are evaluated.

* A must before surgery

Surgical Pain Management

Multimodal Analgesia

- Defined as the simultaneous use of different analgesic agents or forms of analgesic delivery to suppress pain transmission in the peripheral and Central Nervous System (CNS). Regimens can be designed to:
  - Inhibit release of noxious mediators
  - Block conduction in sensory nerves
  - Suppress pain perception in the CNS

Advantages

- Addresses multiple mechanisms of pain
- Allows for use of lower non-toxic doses of medications
- It can be used in acute and chronic pain management
- In some cases can avoid use of opioids completely

Disadvantages

- Requires knowledge of multiple drugs and pain mechanisms
- Potential for interaction
- Requires skills in regional and neuraxial analgesia
- Possible post-discharge patient confusion and compliance issues

Perioperative Techniques for Pain Management Guidelines

- The literature supports the use of epidural or intrathecal opioid analgesia, PCA with systemic opioids, regional anesthetic blocks (intercostal, plexus) and peripheral anesthetic blocks (intercostal, ilioinguinal, interpleural, femoral)
- The literature supports post-incisional infiltration with local anesthetics
- The literature is equivocal on benefits of pre-incisional infiltration

Pain Management

American Society for Anesthesiology
Postoperative Pain Practice Guidelines and Recommendations
Perioperative Techniques for Pain Management Guidelines

- The literature supports the administration of two analgesic agents that act by two different mechanisms. Examples include:
  - Epidural opioids combined with epidural local anesthetics or clonidine
  - IV opioids combined with Ketorolac or Ketamine
- Unless contraindicated, all patients should receive an around-the-clock regimen of NSAIDs, COXIBs or acetaminophen, in addition regional blockade with local anesthetics should be considered.

Opioid: Higher Dose = Higher Risk

- Start with immediate release instead of extended-release
- Increase slowly and keep dose below 300MME/day. What is 300MME/day?
  - 10 mg of hydromorphone (3 tabs of 3.3 mg)
  - 10 mg of oxycodone (3 tabs of oxycodone sustained release, 3.3 mg)
  - 12 mg (half tab) (6 tabs of tramadol)
- Start with 3-7 days with a taper (by about 30% at a time)
- Prescribe exact doses and instructions, avoid “PRN”
- Avoid concurrent benzodiazepine use
- Prescribe naloxone when concerned about risk of overdose
- Have an opioid (and document) to consultation with the patient about risks, benefits and expectations for pain relief.

### Non-Opioid Treatments for Pain

| Non-Opioid Treatment | Use | Management
|----------------------|-----|------------
| Acetaminophen | PO | 50MME/day
| Celecoxib | PO | 200MME/day
| Fentanyl | IV | 3–6MME
| Hydromorphone | IM | 15MME
| Intrathecal | Epidural | Hydrocodone
| Oral
| Spinal
| Transdermal | Diclofenac
| Topical
| TENS

### Opioid: Higher Dose = Higher Risk

- Repeated or long-term use of opioids requires:
  - Periodic re-assessment
  - Urine drug screen
  - Checking that prescription drug use is ongoing
  - Start low and increase dose slowly by 10%
  - Decrease slow by 10-30%, patients can have severe withdrawal
  - Document the dose, total # of pills given and the instructions for use everyday.

### Recommendations for Post-Surgical Pain

- Acetaminophen, NSAIDs first (PO or IV)
- Preferably use oral vs. IV opioids if patients can take PO, avoid IM
- Use anesthetic epidurals or spinals for thoracic and abdominal surgery
- Use PCA without basal rate
- Pre-operative celecoxib
- Pre or Post-operative gabapentin
- Infiltrate surgical sites with anesthetic, nerve blocks or topical anesthetics
- Physical Therapy/Occupational Therapy
- Heat or cold therapy
- Acupuncture
- Chiropractic
- TENS-Nerve stimulation
- Relaxation
- Cognitive behavioral therapy

### Preemptive Analgesia

- Benefits associated with preemptive analgesia are gained only when:
  - Pre-operative dosing occurs prior to surgical incision
  - There is continued dosing during anesthesia
  - Post-surgical maintenance of therapy is maintained for 24-48 hours for outpatient surgery and 96 hours for longer more invasive procedures
- I.e. preemptive analgesia does not work without post-operative pain control

---

In Patients With Difficult-to-Manage Pain Consider

- Skeletal muscle spasm
- Visceral muscle spasm
- Inflammation
- Neuropathic pain
- Opioid induced hyperalgesia
- Anxiety
- Insomnia

For Patients With Difficult-to-Manage Post Surgical or Chronic Pain

- Start with NSAIDS, Acetaminophen unless contraindicated, then add one or more of the following:
  - Local anesthetics: lidocaine, marcaine, bupivacaine via local injection, transdermal or long acting local injection
  - Alpha 2 agonists: clonidine provides sedation, anxiolysis and analgesia, via oral, transdermal or IV or epidural, most effective when combined with opioids

For Patients With Difficult-to-Manage Post Surgical or Chronic Pain

- Anticonvulsants: Neurontin and Pregabalin oral approved for long term treatment neuralgias and also recommended for acute surgical pain management
  - Gabapentin 600mg-900mg pre-op and 600-900mg tid for 24-72 hours post op
  - Pregabalin 75-100mg preoperatively followed by 75-100mg bid for 24-72 hours

For Patients With Difficult-to-Manage Post Surgical or Chronic Pain

- NMDA receptor antagonists: Ketamine potentiates opioid-mediated analgesia and provides opioid-sparing effect. IV, PCA
  - Muscle relaxants: Methocarbamol, cyclobenzaprine, tizanidine, benzodiazepines such as diazepam and lorazepam
  - Carisoprodol ranked 14th or the 20 most abused mood-altering drugs in the US

For Patients With Difficult-to-Manage Post Surgical or Chronic Pain

- Corticosteroids: anti-inflammatory actions useful in post-surgical pain relief, comparable to NSAIDS and acetaminophen, may be useful in patients who cannot tolerate NSAIDS
  - TCAs: unclear mechanisms of pain relief, used for management of depression and chronic pain (neuropathic, fibromyalgia, neck and low back pain)
    - Lower doses needed for pain control than for management of depression
You Want Me to Do What? Physiotherapy Treatments for Chronic Pelvic Pain

Objective
Discuss physical therapy for the treatment of chronic pelvic pain.

So WHAT IS Pelvic Physical Therapy?

Financial Disclosures
I have no financial relationships to disclose.
What Patients Think We Do

Pelvic Physical Therapy / Physiotherapy
What We Actually Do * we have time 😊

Treating the Whole Person
Overlapping Conditions with Pelvic Pain

Somatic ↔ NEURAL ↔ Visceral

Treatment Umbrella - Key Points

Brain and Pain – Neural Education
Manual Therapy
Therapeutic Exercise
Integrating Downtraining / Desensitization
sEMG Biofeedback
Lifestyle Modifications – Bladder, Bowel, Hygiene, Cushions
Modalities
Motivational Interviewing, Neural Education, and “Cheerleading.” Biopsychosocial

Neuro Education - Pain Management

Conclusions: For chronic musculoskeletal disorders there is compelling evidence that an educational strategy addressing neurophysiology and neurobiology of pain can have a positive effect on pain, disability, catastrophizing, and physical performance.

Louw, Adrian. The effect of neuroscience education on pain disability, anxiety, and stress in chronic musculoskeletal pain. 2011;92.(12)

Manual Therapy

Myofascial release /
Soft tissue mobilization
Trigger point release
Connective tissue manipulation
Visceral mobilization
Joint mobilization / Manipulation
Muscle energy techniques
Strain-Counterstrain
(Dry Needling TrP)

Pelvic Physical Therapy Treatment

CMT Connective Tissue Mobilization:

- "direct effect on tissue dysfunction...muscles, fascia, and neural tissue “
- “...may also directly impact the state of the autonomic nervous system, specifically by interrupting the viscera-somatic reflex arc, which is an autonomic reflex."
- So, “treatment may have an important effect not only on local tissue dysfunction but also on the sensitized nervous system”
Manual Therapy

**Local Tissue and Peripheral Nerve:**

- “Manual therapy techniques *may unload the peripheral nerve* by increasing the space or fluid motion in the tissues around the nerve.”
- *the nerve has a better chance of moving well within the space surrounding it.*

Therapeutic Exercise

**Key Findings:**

- LBP (van Middlekoop 2010)
  - Exercise therapy improved post-treatment pain intensity and disability
  - There is no evidence that one particular type of exercise therapy is clearly more effective than others.

- Spine-Stab/LBP (Mannion 2012)
  - “The value of supervised active therapy programs...not...specific muscular deficiencies, but rather...encouragement for the patient, that movement is not harmful...”
  - Decreased catastrophizing had positive effect.
  - Authors ask: do stabilization exercises have some sort of “central” effect, unrelated to abdominal muscle function per se?

Muscles – “CORE” Pressure System

**Self-Care and Lifestyle Modifications**

If Patients Have MSK Findings as the Source or a Part of Their Pelvic Pain...

Do NOT start on Kegels and send them away
Do NOT suggest surgery will fix all of the issues
Do NOT tell them Barry White, wine or “just relaxing” will cure them

- Refer to Pelvic Physical Therapy if possible
  - Will screen to rule out Back/hip and other differentials
  - Restore Tissue mobility and improved movement (decrease kinesophobia)
  - Train patient in toileting postures, muscle re-education, self help strategies
  - Help “downregulate” nervous system

If You Have to Do This Alone

- Start patient on deep breathing, Yoga, relaxation, meditation to help relax
- Toilet posture – feet supported
- Self massage for abdomen
- Don’t just tell them to get dilators. They need more guidance (do follow-up)
- Get an Ortho PT to rule out hip/back involvement if you suspect that
Pelvic PT – Part of a Team Approach

- Best approach is a team approach. Multimodal!
- Lots of hope. Even if past failure, were they having a multimodal approach at same time?
- At the point that it is chronic, there’s likely local, central and psychological impact.

References


Butler and Mossely, Explain Pain. 2003


Hip References

Disclosure

I have no financial relationships to disclose.

Objective

Diagnosis and treatment of neuropathic pain.

Cost

- Annual cost to US economy for treating chronic pain conditions is 600 billion dollars/year
- Greater than combined treatment for diabetes, cancer and heart disease
- Neuropathic pain 0.9% to 17.9% of pain patients

Neuropathy: forgotten cause of pelvic pain

Michael Hibner, MD, PhD, FACOG, FACS
Director, Division of Surgery and Pelvic Pain
St. Joseph’s Hospital and Medical Center, Phoenix, Arizona
Professor of Obstetrics and Gynecology
Creighton University School of Medicine

Annual cost to US economy for treating chronic pain conditions is 600 billion dollars/year
Greater than combined treatment for diabetes, cancer and heart disease
Neuropathic pain 0.9% to 17.9% of pain patients
Neuropathic pain

- Pain caused by a lesion or disease of somatosensory system
- Affects 8% of population

Pathophysiology of nerve injury

- Compression
- Transection
- Contusion
- Stretch
- Crush

Etiology pelvis

- Blunt Trauma
  - Falls
  - Accidents
  - Pelvic fractures
- Obstetrical
  - Prolonged second stage of labor
  - Positioning
  - Traumatic Delivery
- Surgery
  - Incisions
  - Compression from retractors
  - Stretching from positioning
  - Mesh
- Radiation Therapy
  - Fibrosis
- Medical conditions

Symptoms

- Tingling ("pins and needles" or "prickling")
- Burning ("hot")
- Shooting ("electrical shocks")
- If motor nerve – numbness, weakness, loss of reflexes

Signs

- Hypoesthesia (abnormally reduced sensation to touch or cold)
- Hypoalgesia (abnormally reduced pain sensation to noxious stimulus)
- Hyperalgesia (abnormally increased sensation to noxious stimulus)
- Allodynia (pain sensation to a nonnoxious stimulus)

Diagnosis and treatment

- Diagnosis and treatment of neuropathic pain has to be done in timely fashion to minimize central and peripheral sensitization
History
- Description of injury
- Description of distribution of motor, sensory and autonomic changes
- Pain quality
- Additional pain generators
- Palliative and provocative positions

Exam
- Neurological exam testing sensory, motor and autonomic fibers
- Hypo and hyper sensitivity, allodynia
- Tinel’s sign – percussion tenderness over affected nerve – distal migration of axonal cone

Diagnosis

Additional studies
- Guided nerve blocks
- MRI
- EMG
- Nerve conduction studies/PNMTL

Basic principles of nerve blocks
- Pain must be present
  - Patients must have pain at the time of the injection
- Evaluate for technical success
  - Anatomical position, diffusion of solution, and achieved analgesia
- Interpretation
  - Relief of symptoms, the specificity of the block, and the possibility of placebo effect

Materials for nerve blocks
- Local anesthetic
  - Lidocaine 1 – 2% with epinephrine
  - Bupivacaine 0.5% with epinephrine
- Sodium Bicarbonate 8.4% (10:1 ratio)
- Three to five milliliters, to minimize spread
- Image guidance (ultrasound, CT, etc...)
Treatment – non surgical

- Multidisciplinary approach
- Avoidance of offending factors
- Pharmacotherapy
- Physical therapy
- Holistic treatments – acupuncture
- Psychological – counseling, biofeedback
- Botox and steroid injections

Pharmacotherapy

- Antidepressants
- Anticonvulsants
- Local anesthetics
- NMDA receptor antagonists
- Opioids
- Cannabinoids
- Botulinum toxin
- Topical capsaicin

Pharmacotherapy

<table>
<thead>
<tr>
<th>Drug</th>
<th>Total daily dose and dose regimen</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cephalin</td>
<td>100-3000 mg, or 1 divided dose</td>
<td>First line</td>
</tr>
<tr>
<td>Gabapentin extended release or enteric</td>
<td>1200-3600 mg, or 1 divided dose</td>
<td>First line</td>
</tr>
<tr>
<td>Valproate</td>
<td>500-3000 mg, or 1 divided dose</td>
<td>First line</td>
</tr>
<tr>
<td>NMDA receptor antagonist</td>
<td>20-120 mg, 3 divided doses</td>
<td>Second line (preemptive)</td>
</tr>
<tr>
<td>Local anesthetics</td>
<td>One to 3 patches in the region of pain once a day, for up to 14 days</td>
<td>Second line</td>
</tr>
<tr>
<td>Written documentation</td>
<td>100-200 mg, or 1 divided dose</td>
<td>Second line</td>
</tr>
<tr>
<td>Topical capsaicin</td>
<td>Individual testing</td>
<td>Second line</td>
</tr>
</tbody>
</table>

Surgical Treatment
Surgery

- Neurolysis
- Neurectomy
- Nerve repair/reconstruction

Points of entrapment

- Static
  - Within rigid fibro-osseus tunnel
  - Between ligaments
  - Scarring in or apart of the tunnel
- Dynamic
  - Narrowing of the nerve from muscle contractions
  - Angulation during positioning

Decompression/Neurolysis

- Freeing the nerve from:
  - Scar tissue
  - Ligaments
  - Surgical material
- Transposition of the nerve
- Prevention of re-scarring

Neurectomy

- For purely sensory nerves
- Permanent numbness - diminishes over one year as surrounding nerves take over
- Risk of stump neuroma (tangle of regenerating axons and Schwann cells without end destination)
  - Implantation into the muscle may diminish the risk

Outcomes

- Neurolysis – 70-88%
- Neurectomy – 64-75%

Pelvic nerves
**Nerves of lower extremity**

*Image of nerves of lower extremity.*

**Risk of nerve injury in gyn surgery**

- Overall any neuropathy – 1.9%
- Obturator – 39%
- Ilioinguinal/iliohypogastric – 21%
- Genitofemoral – 17%
- Femoral - 7.5%
- Lumbosacral plexus – 0.2%
- Overall recovery rate – 73%

**Pudendal nerve**

- Originates from S2-S4
- Sensory
  - Rectum
  - Perineum
  - Scrotum / Vulva
  - Penis / Clitoris
- Motor
  - Sphincters (anal, urethral)
  - Muscles of the urogenital triangle
- Autonomic

**Symptoms**

- Pain in the area of innervation of the pudendal nerve
- Pain is neuropathic in nature
  - Paresthesia – burning, tingling, prickling, numbness sensation
  - Allodynia – pain in response to non painful stimulus
  - Hyperalgesia – pain out of proportion to the stimulus
- Pain is more severe with sitting
- Pain absent or significantly less when lying down
- Pain less when sitting on the toilet vs. chair
- Sensation of foreign body in the rectum or vagina (alloesthesia) *

**Symptoms**

- Urinary symptoms – frequency, urgency, hesitancy
- Dyschesia
- Dyspareunia
- Pain with orgasm
- Pain with sexual arousal
- Persistent sexual arousal
Causes

- Surgery
  - Direct mesh injury
  - Indirect – hysterectomy, cystocele repair, prolapse repair
- Vaginal childbirth
- Trauma
  - Falls
  - Cycling
  - Intense lower extremity exercise (abductor machine)
  - Excessive masturbation
  - Excessive use of anal vibrators

Diagnosis

- Pudendal neurolysis

Outcomes 2009-2012
Do and Redo surgery combined

100 patients – 8 lost to follow up

- Cured – 13/91 (14%) 63%
- Better – 45/91 (49%) 37%
- Same – 28/91 (31%)
- Worse – 6/91 (6%)
**Ilioinguinal/iliohypogastric nerve**

- Originates from L1
- Sensory:
  - Posterior lateral glute
  - Suprapubic skin
- Motor:
  - Transverse abd.
  - Internal oblique

**Ilioinguinal/iliohypogastric neuralgia**

- Burning numbing pain in the low abdomen radiating to the labia (scrotum)
- Worsened by lumbar extension

**Causes**

- Transaction, entrapment, crush injury, neuroma formation

**Trocar placement**

- Ilioinguinal nerve
  - To ASIS
  - 3.1 cm median
  - 2.7 cm superior
  - 2.7 cm inferior
- Iliohypogastric nerve
  - To ASIS
  - 3.5 cm median
  - 0.9 cm superior
  - 5.2 cm inferior
  - 5.2 cm superior

**Treatment and Outcomes**

- Sensory sparing
  - Nerve Blocks – 25%
- Sensory non sparing
  - Alcohol Ablation – 70%
  - Neurectomy – 87%

**Genitofemoral nerve**

- Originates from L1-L2
- Divides into genital and femoral branches
- Sensory:
  - Labium majus
  - Anteromedial thigh
- Motor:
  - Cremaster
Genitofemoral neuralgia: Surgical causes

Compression from self-retaining retractor

Genitofemoral neuralgia: CT guided block

Emerges from S1-4
Sensory:
- Inferior buttocks
- Lateral perineum
- Proximal medial thigh
- Labia majora
- Clitoris
Often confused with the pudendal nerve

Genitofemoral neuralgia: Neurectomy

67 to 100% resolution of pain


Posterior femoral cutaneous nerve

Emerges from S1-4
Sensory:
- Inferior buttocks
- Lateral perineum
- Proximal medial thigh
- Labia majora
- Clitoris
Often confused with the pudendal nerve


**Obturator nerve**

- Emerges form L2-4
- Sensory
  - Medial thigh
- Motor
  - Pectineus
  - Abductor longus/brevis
  - Gracillis

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**Results of surgical decompression**

- 87% improvement
- 50% complete resolution of pain
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.

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