



IC/BPS and Pelvic Floor Dysfunction

ESSIC International School

1st Educational French Course

Paris, 13 May 2022

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Disclosures

I have had no collaboration with companies with commercial interests operating in the healthcare area , and I have not been involved in consulting assignments.

I receive annual royalties from Springer for “The Overactive Pelvic Floor” book

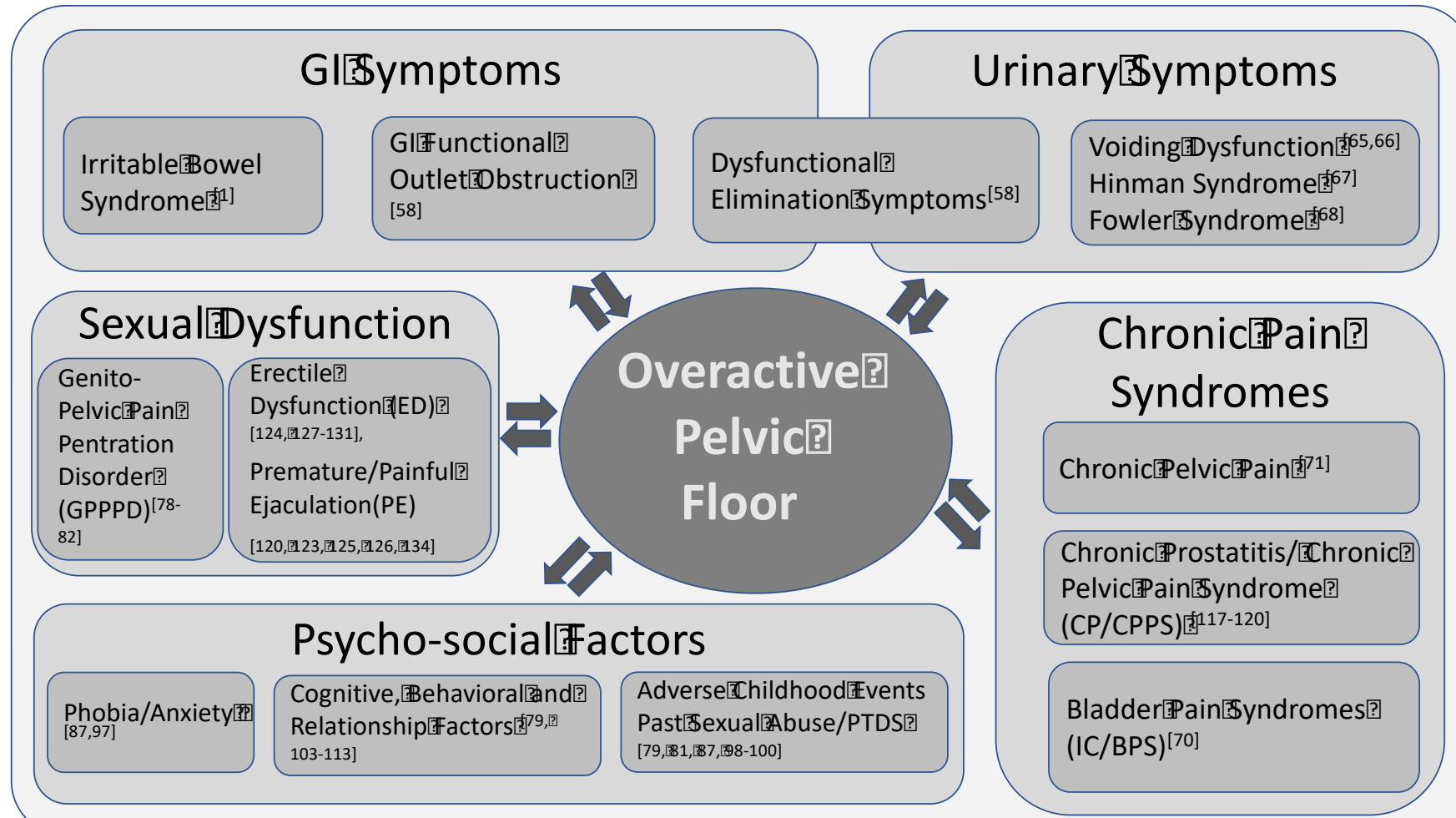
Overactive Pelvic Floor- OPF

(IUGA)/international continence society (ICS) joint report on the terminology for female pelvic floor dysfunction:

Overactive Pelvic Floor:

“A condition in which the pelvic floor muscles do not relax, or may even contract when relaxation is functionally needed, for example during micturition or defecation”.

OPF and co-morbid conditions



OPF and IC/BPS

- Peters et al., 2007:
 - *Pelvic Floor Overactivity is present in up to 85% of IC/BPS patients.*
 - *87% prevalence of levator ani pain at the ischial spine on pelvic examination in women with IC/BPS*
- Montenegro et al, 2010:
 - The frequency of clinically detected pelvic muscle tenderness was significantly higher in women with CPP than in healthy volunteers (58.3% vs 4.2%, $P < 0.001$)

Pathophysiology of OPF

■ From a biomedical perspective:

- *pelvic floor overactivity may be the result of altered voluntary activation or reflex control of the pelvic floor muscles*

■ From a psychosocial perspective:

- *overactivity may reflect anxiety, or be a learned response based on previous experiences, especially of pain or trauma*

Hampson et al, The Journal of Pain 2013

Leeuw et al, J Behav Med 2007

Benoit-Piau et al, The Clinical Journal of Pain 2018

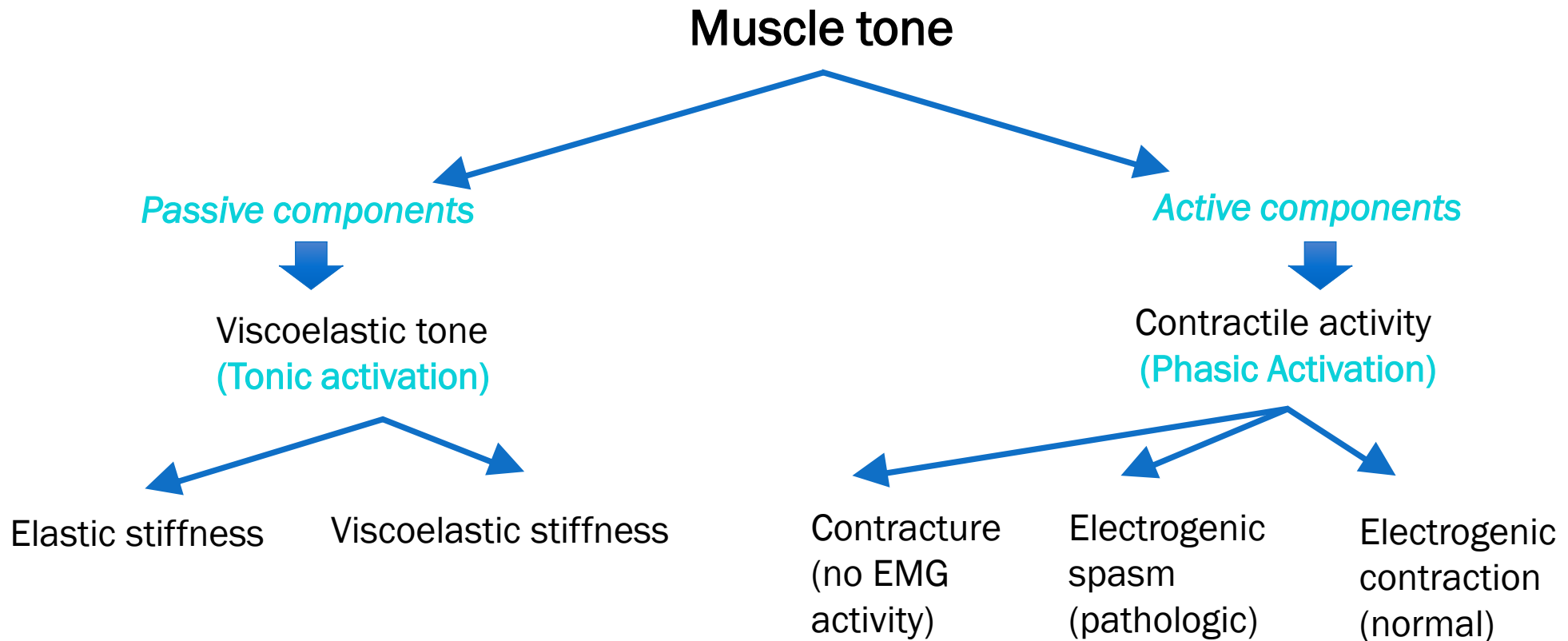
Pathophysiology of OPF in IC/BPS

- OPF is often associated with chronic, persistent, or recurrent pain
- When pain is experienced over a prolonged period, it is associated with alterations in peripheral and central pain processing:
 - *reductions in pain threshold*
 - **Hyperalgesia:** *a more widespread distribution of the pain*
 - **Allodynia:** *sensations of touch, pressure, or other normally non-painful stimuli being perceived as painful.*
- Tenderness on palpation is a key identifying feature of chronic pelvic pain in women.

Pathophysiology of OPF in IC/BPS

- Following changes in pain processing:
 1. **Protective, defensive, or withdrawal responses** seen in the pelvic floor muscles may be enhanced, and thus, pelvic floor overactivity may, in turn, become persistent.
 2. **The central nervous system is primed to support a cycle of overactivity**, where more pain leads to more dysfunction, then more anxiety, and, in turn, more overactivity.
 3. **Viscero-visceral hyperalgesia** (“cross-talk” of pelvic viscera with shared innervation), and occurrence of a **viscero-muscular reflex**, causing PFM tenderness and spasm

Types of Muscle Activation



PFM assessment tools

<p style="text-align: center;">Digital palpation</p> <ul style="list-style-type: none"> • The most common technique to appraise PFM tone in clinical practice due to its rapidity and ease. • Contested as an assessment method because of its subjectivity and lack of precision/ sensitivity 	<p style="text-align: center;">EMG</p> <ul style="list-style-type: none"> • The only tool that can directly assess PFM activity • EMG by surface electrodes may be contaminated by signals by other nearby muscles • Needle electrodes usage limited by pain • Intravaginal probes
<p style="text-align: center;">Dynamometry</p> <ul style="list-style-type: none"> • Can measure PFM strength and resistance • Mainly used in research • Mainly assess vaginal resting tone 	<p style="text-align: center;">Trans-perineal US</p> <ul style="list-style-type: none"> • Very good inter-rater and test/re-test reliability in men and women • Does not involve insertion: advantage with pelvic pain • No direct measures of PFM tone, cannot discriminate between active and passive tone

PFM activation in IC/BPS: Increased viscoelastic tone (tonic activation)

- Loving et al, 2014:
 - *Women with CPP had higher PFM resting tone compared with pain-free controls.*
- Dias et al, 2020:
 - *Twelve of fifteen women with IC/BPS (80%) demonstrated shortened PFM alignment at rest compared to two of fifteen controls (13.3%) ($p < 0.01$)*
 - *On EMG, average resting tone was found to be significantly increased in the IC/BPS group*

PFM activation in IC/BPS: Increased contractile activity (phasic activation)

- Loving, 2014:
 - Women with CPP had decreased maximal PFM strength and relaxation capacity compared with pain-free controls.
- Dias, 2020:
 - *EMG: no significant alterations were observed in average contraction amplitude between IC/BPS and controls*

PFM activation in IC/BPS: Myofascial “trigger points”

- Bassaly, 2011:
 - *Myofascial pain was identified in 78.5% of interstitial cystitis patients*
 - *67.9% of interstitial cystitis patients had six or more separately identifiable trigger points.*
- Loving et al, 2014:
 - *Enhanced PFM pressure-pain sensitivity measured by palpometry during examination was also associated to CPP.*
- Dias, 2020:
 - *Myofascial trigger points were present in thirteen of fifteen women with IC/BPS (86.7%) and two of fifteen controls (13.3%) ($p < 0.01$).*

IC/BPS and sexual abuse

Author and year	Study design	N. of subjects	Outcome measures	Results
Peters et al, 2007	cross-sectional case-control study	215 IC/BPS 464 controls 121 with history suggestive of IC/BPS	survey including more than 100 questions related to physical and psychological health	<ul style="list-style-type: none"> - A higher proportion of IC/BPS patients reported a history of abuse than controls (37% vs 22%, $p < 0.001$) - 17.7% of IC/BPS patients vs 8.2% controls reported sexual abuse ($p = 0.001$)
Goldstein et al, 2008	Cross-sectional	141 IC/BPS patients	BDI-II, Drossman Abuse Questionnaire	36% reported sexual abuse which is higher than the US average
Seth and Teichman, 2008	Retrospective case-control study	119 women with newly diagnosed IC/BPS - 30 SA history - 89 comparisons	History and PE, voiding diary, PUF, ICSI and ICPI scores, FSFI, urinalysis, office cystoscopy or cystoscopy with hydrodistention, LUTS and pain history	SA history <ul style="list-style-type: none"> • larger voided volumes, less daytime frequency and nocturia • more tenderness on palpation of the suprapubic area, vulva, posterior vaginal wall, cervical motion and rectum • lower FSFI scores for all domains
Nickel et al, 2011	Cross-sectional	207 IC/BPS patients 117 controls	CTES, ICSI and ICPI MPQ-SF, CES-D, STAI, PCS. FSFI	<ul style="list-style-type: none"> • IC/BPS cases reported higher prevalence of “raped or molested” compared to controls (24.0% vs. 14.7%; $p = 0.047$) • Cases reporting previous sexual abuse endorsed greater sensory pain, depression and poorer physical quality of life
Naliboff et al, 2015	Longitudinal cohort	<ul style="list-style-type: none"> • 233 female 191 male UCPPS patients • 235 female and 182 male healthy controls 	a comprehensive battery of symptom, psychosocial, and illness impact measures	Both male and female UCPPS patients show higher levels of current and lifetime stress
Chiu et al, 2017	Cross-sectional study	94 IC/BPS 47 patients with acute cystitis	PUF, Brief Betrayal Trauma Survey, Beck Depression inventory, Traumatic dissociation scale	Traumatizing events perpetrated by close others during childhood were the most salient features discriminating IC/BPS patients from controls

Mechanisms linking SA and IC/BPS

- Maltreatment in childhood (MC) correlates with an impaired function of the hypothalamic–pituitary– adrenal (HPA) axis and a **chronic inflammatory state**
- MC may result in **increased levels of C-reactive protein (CRP), fibrinogen, and pro-inflammatory cytokines**
- Central sensitization
- Some have hypothesized that the inability to self-regulate emotions leads to an increased perception of threat and an increase in the “fight or flight” **sympathetic response**
- **Hypocortisolism** has been described as a reaction to acute stress situations in healthy adults with a history of MC, as well as in persons with chronic pain

Abuse leads to limbic dysfunction in the anterior cingulate cortex, hippocampus, and amygdala > hypervigilance for pain sensation from pelvic organs >> descending induction of pathologic changes, typically manifest by muscle contraction

Pelvic floor overactivity as an emotional response

- In cases of actual or imminent physical or mental pain the pelvic floor muscles will involuntarily, and often unconsciously, contract
- Pelvic floor activity was found to be significantly enhanced during sexually threatening film excerpts, but also during anxiety evoking film clips without sexual content

In sexual abuse survivors, the pattern of pelvic floor activity was highest during the sexually threatening film clip and the film clip with consensual sexual content.

Psychological Assessment of OPF

- “pain is an unpleasant sensory **and** emotional experience, which is associated with actual **or** potential tissue damage...”
- a biopsychosocial framework when approaching persistent sexual pain
- Empathy and motivational interviewing skills are critical
- Several validated questionnaires are recommended in order to evaluate symptoms that correlate with:
 - **fear-avoidance** – Tampa Scale for Kinesiophobia (TSK)
 - **pain catastrophizing** - Pain Catastrophizing Scale (PCS)
 - **central sensitization** - Central Sensitization Inventory (CSI)
 - **anxiety and depression** - The Depression, Anxiety, Stress Scale (DASS)

French DJ et al, Pain 2007;127:42–51.

Quartana PJ et al, Expert Rev Neurother 2009;9:745–58.

Nijs J et al, Drug Ther Bull 2019;57:60–3.

Nilges P, Essau C. Schmerz 2015;29:649–57.



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Thank you for your attention!

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