Meeting Proceedings

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PAIN REPORTS

Abstracts from the International Pelvic Pain Society Annual Scientific Meeting on Pelvic Pain 2021

After what seemed like endless COVID-19 protocols, we were finally able to meet in person at the 24th International Pelvic Pain Society (IPPS) Annual Meeting held in the beautiful Harborbay area of Baltimore. The 2021 program featured several interesting and innovative research projects conducted by investigators around the globe, while the hybrid format allowed for both virtual and in-person collaboration. The abstracts presented here underwent a rigorous peer review process, whereby each abstract was evaluated by at least 2 members of the Scientific Program, Abstract, or Research IPPS committees. Abstracts were rejected if they were incomplete, if they had inadequate statistical analysis, or if the topic was not relevant to pain. Case reports were accepted for presentation but are excluded from this publication.

Researchers approached the dilemma of chronic pelvic pain (CPP) from various perspectives. For example, Lewis et al. focused on multimodal treatments and reported on the potentially beneficial use of trigger point injections followed by myofascial release. Novel uses for botulinum toxin and transvaginal photobiomodulation were also featured in several abstracts. Schuttert et al. presented data on the role of central sensitization in patients with pelvic pain, and Harrison Gottlich described the use of artificial intelligence to improve the efficiency of data collection from patients with CPP. For the first time, there were presentations on health care utilization among patients with CPP (Thao, V), and 2 abstracts began to focus on the effect of COVID-19 on clinic encounters for CPP (Wang, A) and the use of telerehabilitation (Starzec-proserpio, M).

The IPPS has always served as a forum for multidisciplinary education, research, and collaboration, and this year's annual meeting was an exceptional demonstration of this mission. We appreciate the efforts of everyone who attended and presented their research during such challenging times. These efforts are a true testament to those who dedicate their lives and careers to the goal of improving the lives of people living with CPP. More importantly, we appreciate the contributions of people who live with the experience of pain and yet agree to participate in research and contribute to our improved understanding of chronic pain. This invaluable collaboration between patients, researchers, clinicians, and educators, will move the field forward, even during challenging times, as we prepare to meet again at the 2022, 25th Annual Scientific meeting in Orlando, Florida.

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Using a modified e-Delphi process in the multistage development of a patient-reported outcome measure for genito-pelvic dyspareunia

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Introduction: Dyspareunia affects between 8% and 22% of women worldwide. Little is known about how deep vs superficial dyspareunia is conceptualized and communicated by patients compared with clinicians, which can lead to discrepant understandings of patient symptoms. The objective of this study was to use a modified e-Delphi process to facilitate revision and creation of items for a patient-reported outcome measure (PROM) that captures characteristics and psychosocial correlates of dyspareunia.

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Methods: This study followed PROMIS guidelines. We created potential PROM items in reference to IMMPACT recommendations. These items were iteratively reviewed by a panel of dyspareunia experts: patient partners (n = 4), gynecologists (n = 2), and a psychiatrist (n = 1). Panelists voted for inclusion, modification, or exclusion of items based on clarity and relevance. Panelists also provided suggestions for revisions or new items. Items that reached consensus (≥80% inclusion votes) were accepted into the PROM. New and modified items appeared on subsequent survey iterations alongside the associated votes and comments from the preceding survey.

Results: Panelists reviewed 163 items. Items with ≥80% inclusion votes fell into categories of pain location, intensity, quality, timing, or effect of pain on behaviors, cognitions, affect, and sexuality.

Conclusions: Items that reached consensus displayed clarity, clinical relevance, experiential relevance, and comprehensiveness about the dyspareunia experience. The e-Delphi process contributes to establishing PROM content validity by using expert opinion to reach a consensus. Future work should use qualitative and psychometric testing to further establish validity and reliability.

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Comparative self-reported sexual functioning relative to pelvic pain burden

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Introduction: The objective was to compare sexual functioning among women with isolated dysmenorrhea with and without bladder sensitivity (DYS and DYS-B), bladder pain syndrome (BPS), chronic pelvic pain (CPP), and healthy controls (HCs).

Methods: Medical histories, Female Sexual Function Index (FSFI), Genitourinary Pain Index (GUPI), Pain Catastrophizing Scale, and visual analog scores (VAS) were collected from participants in a prospective study of menstrual pain. Descriptive statistics, Fisher exact, and Wilcoxon rank sum tests were used to explore participant characteristics focusing on sexual function.

Results: Across 299 women with discrete pelvic pain phenotypes and 46 HCs (median age 22; [IQR 19.5–30]), the majority were identified as non-Hispanic White (50.3%), single (77.3%), and heterosexual (78.4%). 22.4% reported dyspareunia (GUPI), 22.7% reported anxiety, and 24.3% reported depression. Severity of dyspareunia (VAS 0–100) was higher in DYS-B (17.5), BPS (54.5), and CPP (54.0) (HC = 0, $P < 0.001$), and catastrophizing scores were higher in all pain subgroups ($P < 0.001$). Among sexually active women, total FSFI scores were significantly lower in BPS (23.3; [19.1–27.5]) and CPP (23.15; [19.52–25.15]), $P < 0.001$. While FSFI pain domain scores were significantly worse in those with DYS-B, BPS, and CPP, only BPS and CPP diagnoses were associated with avoidance of intercourse due to pain (61.5% and 47.4%, respectively, $P < 0.001$).

Conclusions: Patients with chronic pain exhibited significantly poorer overall sexual functioning than control participants. DYS-B, a potential precursor to CPP states, was associated with more sexual pain, suggesting a need to explore how dyspareunia and bladder pain collectively influence the acute to chronic pain transition.

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Disclosures or conflicts of interest: Frank Tu consults for Abbvie, Myovant, SoLá Pelvic Therapy, and Wolters Kluwer.

Altered function and structure of the left dorsolateral prefrontal cortex in men with chronic prostatitis or chronic pelvic pain syndrome

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Introduction: Chronic prostatitis or chronic pelvic pain syndrome (CP/CPPS) is considered a complex disorder, involving neuromuscular, autonomic, and brain-level systems. Here, we tested whether certain brain measures are altered in CP/CPPS.

Methods: We recruited 90 men, 42 with CP/CPPS and 48 without CP/CPPS. We measured the brain function using resting-state functional MRI and quantified it as the mean fractional amplitude of low-frequency fluctuations (fALFF, 0.01–0.027 Hz band). We measured the brain structure using T1-weighted structural MRI and quantified it as the cortical volume. We examined cohort differences and the effects of age and duration of symptoms.

Results: Whole-brain analyses resulted in a left dorsolateral prefrontal cortex (L-DLPFC) cluster where men with CP/CPPS had a higher fALFF value and a smaller cortical volume. Within this cluster: 1) fALFF and cortical volume were not correlated in the control cohort, but they were in the CP/CPPS cohort (RHO = 0.414). 2) Age had effects on fALFF and cortical volume in both cohorts. 3) Duration of symptoms did not have any effects, even after controlling for age in the CP/CPPS cohort.

Conclusions: The prefrontal cortex has been implicated in chronic pain. Our novel results underscore the importance of L-DLPFC in CP/CPPS. Because L-DLPFC activity and volume did not correlate with the duration of symptoms, we suggest that L-DLPFC may be a predisposing factor to the onset of CP/CPPS symptoms. Future longitudinal studies will likely further elucidate the role of L-DLPFC in chronic pain and determine whether it can be therapeutically targeted for pelvic pain.

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Cortical mechanisms of visual hypersensitivity in women at risk for chronic pelvic pain

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Introduction: Increased sensory sensitivity across nonnociceptive modalities is a common symptom of chronic pain conditions and has been shown in individuals with chronic pelvic pain (CPP); however, the neural mechanisms underlying this hypersensitivity are unknown. Understanding the brain–behavior relationships that explain multimodal hypersensitivity (MMH) may clarify the role of MMH in the development of chronic pain conditions such as CPP.

Methods: Visual and visceral sensitivity was experimentally quantified in a cohort of women (n = 147) at greater risk for developing CPP (ie, mild-to-severe dysmenorrhea). Scalp EEG (electroencephalography) was recorded while participants were presented with a periodic pattern-reversal checkerboard stimulus across 5 brightness intensities to measure the visual cortex activity. Visual sensitivity was assessed using visual unpleasantness ratings provided after each brightness intensity. Visceral sensitivity was assessed using our validated bladder-filling task and visual analog scale ratings of menstrual pain.

Results: Visual stimulation–induced unpleasantness was associated with bladder pain and evoked primary visual cortex activity. Furthermore, the relationship between unpleasantness and cortical activity was moderated by bladder pain when controlled for menstrual pain and somatic symptoms.

Conclusions: At the equivalent visual cortex activity, individuals with visceral hypersensitivity (bladder pain) reported more visual discomfort than those with less visceral sensitivity when controlled for menstrual pain and somatic symptoms. Therefore, we hypothesize that downstream interpretation or integration of multimodal sensation is amplified in individuals with visceral hypersensitivity.

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Postoperative pain outcomes in the setting of endometriosis and nonrelaxing pelvic floor dysfunction

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Introduction: Previous work demonstrated significantly higher preoperative pain scores in patients with endometriosis with nonrelaxing pelvic floor dysfunction (PFD). In this study, we assessed postoperative pain in patients with and without PFD after surgery for endometriosis to evaluate the impact of this condition on postoperative outcomes.

Methods: In our retrospective cohort study, we identified patients who underwent laparoscopic surgery for endometriosis between September 2015 and November 2018. Patients were included if they had pathology-positive endometriosis and completed the modified International Pelvic Pain Society Pelvic Pain Assessment at preoperative consultation and postoperative follow-up. Responses were compared between patients with and without PFD.

Results: Of 101 included patients, 48 had PFD. Similar to preoperative data, patients with PFD had significantly higher postoperative pain scores in multiple domains including overall (3.1 ± 2.6 vs 2.0 ± 2.4, $P = 0.029$), with menses (3.1 ± 3.6 vs 0.8 ± 1.7, $P = 0.007$), and with intercourse (2.2 ± 3.3 vs 0.7 ± 2.0, $P = 0.014$). Patients with PFD had a similar degree of improvement in most pain scores after surgical intervention when compared with patients without PFD, both on univariate and multivariable analysis (adjusting for age, hormone use, pain duration, deep endometriosis, and bowel surgery).

Conclusions: While patients with endometriosis and PFD had significantly higher postoperative pain scores than patients without PFD, there was similar postoperative improvement in most categories of pain. These data suggest patients with endometriosis and PFD may still benefit from surgical intervention, despite having both pain generators; however, the higher postoperative pain scores highlight the opportunity for additional treatment modalities to address multifactorial pelvic pain and further improve the quality of life.

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Descriptive analysis of clinical characteristics of patients with pudendal neuralgia

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Introduction: We aim to report on clinical history features of patients with pudendal neuralgia who were evaluated and treated at our pelvic pain referral center.

Methods: A primary retrospective investigation was performed on 297 patients with pudendal neuralgia who underwent CT-guided pudendal nerve block (CT-PNB) between January 1, 2014, and June 30, 2020. Electronic medical records were queried to obtain clinical information on each subject's pain history and clinical course before presentation to our practice. Here, we present a descriptive analysis of these findings.

Results: The most common reported pain locations were rectum in 170 (57.2%) patients, vagina in 161 (54.2%) patients, and labium in 143 (48.1%) patients. 50 (16.8%) patients identified 1 pain location, and 122 (41.1%) patients identified more than 3. Unilateral pain was reported in 85 (28.6%) patients, and midline pain was reported in 26 (8.7%) patients. Bilateral pain was reported in 172 (57.9%) patients, with 78 reporting the dominant side; 34 (11.4%) patients had bilateral pain right > left, and 44 (14.8%) patients had bilateral pain left > right. Among patients with both unilateral and bilateral pain, there was a dominance of left side pain; however, this difference was not statistically significant. The inciting trauma event was reported in 212 (71.4%) patients. The most common event was pelvic surgery, followed by pelvic surgery with mesh. 65 (21.9%) patients reported no trauma event, and the data point was unknown or unreported for the remaining. SF-36 reflected significant effect with most values below 50%. FSFI scoring demonstrated elevated risk of sexual dysfunction in this population.

Conclusions: Pudendal neuralgia (PN) is neuropathic pain which can lead to chronic pain, effecting patient function and quality of life.

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Treatment for pelvic floor myalgia and myofascial pelvic pain: a systematic review

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Introduction: Pelvic floor myalgia is characterized by muscular tension, tenderness, and trigger points of the pelvic floor muscles and connective tissue. Its prevalence varies from 14% to 78%. Our aim was to review treatment interventions for adult women with pelvic floor myalgia.

Methods: A systematic review of prospective trials was conducted in MEDLINE (Ovid or PubMed), EMBASE, Cochrane Library, Scopus, Web of Science, and ClinicalTrials.gov. Studies published until March 2020 were included. After duplicates were removed, 7,711 studies were screened and 992 full texts were reviewed for final inclusion of randomized control trials (RCTs) alone. To meet the inclusion criteria, study participants needed to have pelvic floor myalgia, hypertonicity, or pain determined by a physical examination. All interventions were included.

Results: After final data extraction, 18 studies met the inclusion criteria, which included 1043 participants. Most studied interventions were pelvic floor physical therapy (4 studies and 218 participants) and pelvic floor botulinum A toxin injections (4 studies and 281 participants). Other interventions included vaginal diazepam (3 studies and 112 participants), oral desipramine or local lidocaine (1 study and 133 participants), cognitive behavioral therapy (1 study and 117 participants), hypnotherapy (1 study and 36 participants), local anesthetic trigger point injections (1 study and 29 participants), and oxytocin nasal spray (1 study and 21 participants).

Conclusions: Many studies showed a placebo effect possibly indicating that simple acknowledgement of pain symptoms with a treatment plan can improve pain. Physical therapy showed significant improvement in pain and sexual functioning compared with controls. Botulinum toxin A was not proven to be beneficial for pelvic floor myalgia and hypertonicity.

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Impact of a pelvic floor anatomy and physical examination workshop on resident physician knowledge and confidence

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Introduction: Although over 60% of physical medicine and rehabilitation (PM&R) physicians care for women with sex-specific musculoskeletal (MSK) complaints, only 11% of PM&R

programs provide education on women's MSK health. As up to 26% of women can suffer from pelvic pain, with an average delay in diagnosis of 6 years, developing training programs to assess pelvic pain is critical. The sparse literature on pelvic floor education presents an opportunity for curricular improvement.

Methods: This is a prospective single cohort study of residents participating in a workshop involving a lecture by a women's health physiatrist, examination simulation with a gynecological teaching associate under physical therapist's supervision, and small group review of anatomy and clinical correlates using a pelvic model. The effectiveness of this workshop was measured by pretests and posttests of resident knowledge and confidence of pelvic floor anatomy and physical examination.

Results: With the workshop, PM&R residents (n = 17) improved in knowledge scores from an average baseline of 40% to 90% posttest ($P < 0.001$). Second, residents demonstrated significant improvement in confidence in obtaining consent, anatomy, physical examination, and manual muscle testing ($P < 0.001$). Linear regression showed that knowledge and confidence gains were made in all genders and prior levels of exposure, although female residents had higher pretest confidence ($P < 0.01$).

Conclusions: This study demonstrates PM&R residents' knowledge, and confidence of women's pelvic floor evaluation improved after this workshop. Integrating this workshop into residency didactics may standardize and promote effective neuromusculoskeletal evaluation of pelvic pain.

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Systematic review of diagnostic assessment tools to detect pelvic floor myofascial pain

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Introduction: Myofascial pain arising from pelvic floor muscles commonly occurs in women with persistent pelvic pain (PPP) including women with endometriosis and can affect urinary, bowel, and sexual function. The objective of this systematic review was to determine the most appropriate assessment tool to detect pelvic floor myofascial pain as compared with tenderness on palpation of pelvic muscles as the reference test.

Methods: A systematic review of the literature that was prospectively registered with PROSPERO (CRD42020183092) was conducted according to the PRISMA guidelines. Databases included Ovid Medline 1946, Embase 1957, Scopus 1960, Cochrane combined, ClinicalTrials.gov, Google Scholar (top 200 articles), Web of Science, TRIP, BIOSIS, DARE, CINHAL, EmCare, PEDro, ProQuest, and EBSCOhost. All searches were conducted from the respective database inception to July 2020.

Results: A total of 26,778 articles were screened with 177 selected for full-text review, from which 5 were selected for final inclusion and analysis. Sensitivity and specificity of the index test could be reported only from one study.

Conclusions: This systematic review did not reveal a diagnostic tool superior to the predefined reference test. Review of the literature revealed a lack in consensus for the definition and diagnosis of pelvic floor myofascial pain and, therefore, a lack in diagnostic criteria to detect this clinical condition. It is imperative that consistency in definition and diagnostic criteria for pelvic floor myofascial pain is achieved to promote meaningful research in this field.

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Disclosures or conflicts of interest: N/A.

Combination of natural substances (boron + curcumin + piperine) inhibit proliferation and induce apoptosis of endometriotic cells in vitro

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Introduction: The aim of this study is to investigate whether the combination of natural substances, boron, curcumin, and piperine, has an impact on endometrial and endometriotic cell proliferation in vitro.

Methods: This was a university-based experimental study.The primary cell cultures were obtained from 2 patients with endometriosis and 3 healthy women. For the cell proliferation assay, 5 × 103 cells/well were seeded onto a 96-well plate and treated with combination at the concentrations of 50, 100, 150, 200, and250 μg/mL for 24, 48, and 72 hours in a humidified incubator. The cell proliferation was assessed with the MTS assay. The absorbance was measured with the spectrophotometer at 540 nm. The apoptotic effect of the compound on glandular and stromal cells was investigated using the Annexin V Detection Kit.

Results: This combination decreased cell proliferation and induced apoptosis in a time-dependent and dose-dependent manner in endometriotic cells but not normal endometrial cells. The effect of combination was significant at the dose of 150 μg/

mL for 48 hours in endometriotic cells. In this dose and time period, we observed no cytotoxic effect on healthy cells. Annexin V staining for apoptosis analysis on endometriotic cell results revealed that more than 50% of the cells were apoptotic at the concentration of 150 μg/mL for 48 hours.

Conclusions: These results suggest that the combination has a selective effect on endometriotic cell proliferation and apoptosis. Taken together, our results support the further investigation of these natural substances for use in the treatment of endometriosis.

Source of financial support: Yeditepe University.

Disclosures or conflicts of interest: There are no conflict of interests.

Providers' educational preparation and attitudes toward women with chronic pelvic pain

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Introduction: The purpose of this cross-sectional study was to answer the following research question: What are the differences in the educational preparation and attitudes of primary care physicians and nurse practitioners who care for women with chronic pelvic pain (CPP)? The hypothesis for the study was that the educational preparation and attitudes toward women presenting with CPP would differ between nurse practitioners and physicians who work in primary care settings. Professional socialization served as the conceptual framework.

Methods: This study used a 2-part survey instrument that included the OBGYN Survey, which was adapted with permission from a previously published study used by Witzeman and Kopfman (2014) and the researcher-developed education questionnaire. A convenience sample of 180 physicians and 180 nurse practitioners was recruited.

Results: The hypothesis for the study was only partially supported because there was only a statistical significance in differences between nurse practitioners and physicians for 3 of the 8 themes (commonality, mentorship, and desire). An additional finding of the study was that the more education physicians and nurse practitioners perceived receiving in their basic medical and nurse practitioner programs in relation to identifying signs of CPP, assessing pain among patients with CPP, and providing treatment options to patients with CPP, the more likely they were to have positive attitudes towards patients with CPP.

Conclusions: The differences in how nurse practitioners and physicians are socialized into their professions could explain why there was a statistical difference in 3 themes: commonality, mentorship, and desire.

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Trigger point injections followed by immediate myofascial release in the treatment of pelvic floor tension myalgia

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Introduction: The aim of this study was to determine whether adding pelvic floor physical therapy (PFPT) with myofascial release immediately after pelvic floor trigger point injection (PFTPI) provides better pain relief than PFTPI alone.

Methods: This was a retrospective chart review of patients with pelvic floor tension myalgia refractive to conservative treatment who underwent PFTPI alone or PFTPI immediately followed by PFPT over a 2-year period. PFTPI were performed using 0.5% ropivacaine with or without addition of pelvic floor physical therapy with myofascial release within 1 to 2 hours after injections. Visual analogue pain scores (VAS) were recorded pretreatment and 2 weeks posttreatment.

Results: Sixty-five patients with pelvic floor tension myalgia were included in the final study analysis. Twenty-two patients underwent PFTPI alone, and 43 patients underwent PFTPI immediately followed by PFPT. PFTPI improved VAS scores for both groups of patients. The median pretreatment score was 8 for both groups of patients. The median posttreatment score was 6 for the PFTPI-only group and 4 for the PFTPI followed by the PFPT group, giving a median change in the VAS score of 2 and 4, respectively ($P = 0.057$). 74.5% of patients in the PFTPI followed by the PFPT group had a change in the VAS score greater than 2, whereas 45.4% of patients in the PFTPI -only group had a change in the VAS score greater than 2 ($P = 0.029$).

Conclusions: PFTPI immediately followed by PFPT offers better pain improvement for patients with pelvic floor tension myalgia. This may be due to tolerance of deeper physical therapy immediately after injections.

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NIH HEAL Initiative: National Institute of Neurological Disorders and Stroke's Early Phase Pain Investigation Clinical Network (EPPIC-Net)

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Introduction: The NIH Helping to End Addiction Long-term (HEAL) Initiative focuses on efforts to advance scientific solutions to eradicate the opioid crisis by improving prevention and treatment of opioid misuse or addiction and enhancing pain management.

Methods: Within the HEAL Initiative, NINDS has been tasked with identifying, developing, and testing nonaddictive pharmacologic and nonpharmacologic therapeutics ("assets") targeted to pain conditions of high unmet need. NINDS established the Early Phase Pain Investigation Clinical Network (EPPIC-Net) to accelerate and enhance pain therapeutic development by performing phase 2 clinical trials of novel, nonaddictive pain therapies. EPPIC-Net evaluates new, as well as repurposed, small molecules, biologics, drugs, natural products, and devices submitted by industry, academic, or other partners for studies across the age and pain condition spectrum. EPPIC-Net infrastructure includes a clinical coordinating center, a data coordinating center, and 12 specialized clinical sites with access to broad, inclusive patient populations to provide phase 2 clinical trials, incorporating proof-of-concept testing, biomarkers validation, novel study design, and protocol development and implementation.

Results: EPPIC-Net provides a robust and readily accessible infrastructure with a network comprised of pain experts to enhance the design, conduct, and analysis of experimental pain therapeutic phase 2 trials at no cost to the asset provider. Ultimately, EPPIC-Net will reduce reliance on opioids by accelerating development of nonaddictive pain therapeutics.

Conclusions: This presentation describes EPPIC-Net, an initiative charged with evaluating pain therapeutics in early phase clinical development. EPPIC-Net is open to researchers worldwide, with applications accepted on a rolling basis.

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Ten-year experience with onabotulinumtoxin A (Botox) injections for the treatment of myofascial pelvic pain

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Introduction: The aim of this study was to determine the impact of onobotulinumtoxin A (Botox) injections, with or without concurrent pudendal nerve block, in treating women with myofascial pelvic pain (MFPP).

Methods: This was a retrospective chart review of patients with MFPP treated with Botox injections with or without pudendal nerve block between January 2010 and May 2021. The primary outcomes were time from initial Botox injection to reintervention and number of repeat Botox injections. The secondary outcome was the number of health care encounters within 30 days of injection between cohorts.

Results: There were 185 patients who underwent Botox injections during the study period. Of these, 108 (58.4%) patients received concurrent pudendal nerve blocks and 77 (41.6%) patients did not. The mean number of Botox injections was 2.18 (range 1–11) in the pudendal group and 1.94 (range 1–12) in the nonpudendal group; $P = 0.23$. The mean time to reintervention was 8.53 months, 9.02 months in the pudendal group and 7.67 months in the nonpudendal group; $P = 0.16$. The mean number of phone calls or patient-initiated electronic messages was 0.96 and 0.89 ($P = 0.318$), respectively, and emergency room visits numbered 0.11 and 0.09 ($P = 0.282$), respectively. There were more postoperative clinic visits in the pudendal group (0.26 vs 0.17, $P = 0.042$). The mean follow-up time was 30.2 months after initial injection.

Conclusions: Botox showed efficacy in treating women with MFPP with latency periods of approximately 8.5 months before reintervention. There was low burden to the health care system after treatment. Use of a concurrent pudendal nerve block did not affect clinical outcomes.

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Characterization of chronic pelvic pain syndrome (CPPS) in men: a case series study of men treated in a pelvic pain unit in Bogota (Colombia)

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Introduction: There are few studies in the world on CPPS in men on nonurological causes of their pain, and there are none in South America about it. The aim was to characterize CPPS in men who consulted the pelvic pain unit.

Methods: This case series study included men with CPPS in a pelvic pain unit (Bienestar Pelvico) in Bogota, Colombia, from April 1, 2020, to April 30, 2021. Prostatitis syndrome was excluded. Patient characteristics were collected by electronic medical records. Analysis was performed in Excel version 16.51 and was conducted along with measures of central tendency as applicable for each level of measurement of the variables.

Results: Fourteen patients were included. The mean age was 47 years (20–72 years). The mean time from the onset of symptoms was 16.5 months. The diagnoses found were pudendal neuralgia (79%), pelvic floor muscle tension (79%), myofascial syndrome (71%), lumbar disfunction (71%), ilioinguinal and iliohypogastric neuralgia (57%), gastrointestinal cause (50%), painful bladder syndrome (43%), hernia (36%), posterior femoral cutaneous neuralgia (29%), and cluneal neuropathy (21%). Only 7.1% had a single diagnosis as the cause of CPPS

Conclusions: This is the first study conducted in South America on causes of CPPS in men. We found other non-urological causes of CPPS that need to be treated to provide a comprehensive and interdisciplinary management of CPPS.

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Central sensitization in patients with pelvic pain: factors influencing the CSI score

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Introduction: It is suggested that central sensitization (CS) may be present in patients with chronic pelvic pain, and treatment may need to be adjusted considering CS. To indicate its possible presence in patients, the Central Sensitization Inventory (CSI), a validated self-reported scale for the identification of CS, can be used. This study aims to analyze the influencing factors of the CSI score in patients with chronic pelvic pain of various origins.

Methods: In a retrospective study, 35 men and 233 women with pelvic pain at a tertiary pain center are analyzed by univariate and multivariate regression. The influencing factors on the CSI score are investigated for age, sex, body mass index (BMI), each of the central sensitivity syndromes (CSS) based on the CSI-part B and total number of CSS, pain severity, pain duration, quality of life (EQ5D-5L), and psychological symptoms (BSI).

Results: A univariate regression shows a significant effect for the number of CSS, pain severity, pain duration, quality of life, and psychological symptoms. Multivariate regression with all the CSS shows a significant effect for restless leg syndrome, temporomandibular joint disorder, irritable bowel syndrome, and depression. A backward multivariate regression with all the factors results in number of CSS, quality of life, and psychological symptoms as influencing factors.

Conclusions: This study shows that the CSI score in patients with pelvic pain is influenced by the number of CSS, quality of life scores, and psychological symptoms. Age, sex, BMI, pain severity, and pain duration did not influence the CSI score.

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Leveraging artificial intelligence for efficient chronic pelvic pain data collection

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Introduction: Manual extraction of checkboxes, like those in the International Pelvic Pain Society Assessment Form, is a time-intensive process prone to mistakes. Quality checking the extraction of these forms further increases the time investment to collect data from retrospective physical forms.

Methods: As a component of a larger effort to systematize and analyze more than 2,000 retrospective physical International Pelvic Pain Society Assessment forms, we used deep learning techniques to automate extraction and quality checking in a reproducible manner. Convolutional Neural Networks (CNNs) are a deep learning model algorithm used to classify images. By scanning the forms, aligning them to a template, and identifying the box coordinates, we were able to pass these box fields to train and validate a CNN box detection model.

Results: On a test set of 8 forms with a total 3,160 data boxes, the method had an area under the curve (AUC) of 0.99, sensitivity of 0.986, and specificity of 0.970. The false positives were examples where patients had crossed out boxes because of mistakes or to indicate not applicable.

Conclusions: Overall, this method not only saves significant amount of research time but also provides quantitative quality checking metrics to validate extraction results. Further work is being performed to extend this process to the pelvic pain body area maps to capture more patient provided information in a manner efficient to extract. This method may enable larger retrospective and multisite studies in pelvic pain using shared data collection forms.

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Health care utilization among patients with chronic pelvic pain: data from a large U.S. claims database

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Introduction: Despite growing evidence to support alternatives such as hormonal therapies and psychological interventions in the management of chronic pelvic pain (CPP), we suspect that there continues to be high utilization of surgical treatments and opioids for management.

Methods: We used deidentified administrative claims data from the OptumLabs Data Warehouse (OLDW). We included adult female patients with a medical claim for CPP between January 2016 and December 2019. Patients were required to have at least 2 years of follow-up. We used the greedy nearest neighbor matching method to identify non-CPP controls. Study outcomes included chronic overlapping pain conditions (COPCs), diagnostic tests, physician services, and CPP interventions.

Results: Patients with CPP were significantly more likely than controls to have COPCs and significantly more emergency department (ED) visits (19.7% had >5 visits). For intervention-based claims, 17% vs 5.5% had at least 1 peripheral nerve block, 35.7% vs 18% had at least 1 physical therapy visit, and 13.1% vs 10.3% had some form of psychotherapy or cognitive behavioral therapy. Nine percent of patients with CPP (1,644 vs 115)

underwent hysterectomy. Narcotics was the most used pharmacologic therapy (24.7%) and twice as common as the neuromodulator use (12%). All *P* values = < 0.0001.

Conclusions: This study confirms the increased prevalence of COPCs in patients with CPP. CPP health care utilization is significantly greater, including high-cost settings such as ED use. While interventional therapies and neuromodulators were used by this cohort, narcotics continued to be the most used pharmacotherapy.

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Chronic genitopelvic pain and pleasure: does ability to experience vulvar pleasure affect scores on the 6 dimensions of the Female Sexual Function Index?

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Introduction: Chronic genitopelvic pain is associated with decreased sexual function. It is not well understood how the ability to experience vulvar pleasure in patients with chronic genitopelvic pain affects sexual function.

Methods: To investigate this relationship, a prospective online study of 262 patients presenting to 2 urban vulvovaginal specialty clinics was conducted over the course of 6 months. Patients presenting for initial evaluation completed the Female Sexual Function Index (FSFI), as well as a researcher-developed questionnaire evaluating vulvar pleasure. The FSFI is a validated questionnaire evaluating 6 dimensions of sexual functioning. Scoring below 26.55 (cutoff score) out of a maximum score of 36 potentially indicates sexual dysfunction.

Results: Of the 192 patients (mean age: 39, SD: 14, range: 16–78) who completed questionnaires and reported current genitopelvic pain, patients able to experience vulvar pleasure since their pelvic pain began scored highest on the total FSFI score (mean: 16.26%, 89.1% below cutoff), as well as on 5 domains of the FSFI, compared with patients who had never experienced vulvar pleasure (mean: 13.7%, 84.6% below cutoff) and with patients who had not experienced vulvar pleasure since their pelvic pain began (mean: 7.79%, 100% below cutoff; this group scored highest on the €œpain € domain). There were significant differences among the 3 groups in total FSFI score and all FSFI domains except desire.

Conclusions: This novel study focuses on the intersections among chronic genitopelvic pain, vulvar pleasure, and sexual functioning, introducing the importance of incorporating vulvar pleasure in genitopelvic pain treatment approaches.

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Effect of COVID-19 on outpatient visits for pelvic pain

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Introduction: Our objective was to describe trends in clinic visits for chronic pelvic pain (CPP) before and during the COVID-19 pandemic.

Methods: We compared the number of patients and clinic visits for CPP vs nonpain before and after activation of the COVID-19 plan on March 16, 2020. ICD-10 codes were used to identify CPP conditions, including, but not limited to, endometriosis, pelvic pain, dysmenorrhea, interstitial cystitis, irritable bowel syndrome, and vulvodynia. Nonpain codes included abnormal bleeding, leiomyoma, incontinence, and prolapse.

Results: In 2019, 2,130 patients were evaluated: 62% for CPP (95% CI: 59%–64%, n = 1312) and 38% for nonpain (95% CI: 36%–40%, n = 818). In 2020, including the period after activation, patients decreased by 28.9% to 1541 compared with 2019: 60% for CPP (95% CI: 58%–62%, n = 927) and 40% for nonpain (95% CI: 38%–42%, n = 614). In the first 6 months of 2021, 1044 patients were seen: 65% for CPP (95% CI: 62%–68%, n = 683) and 35% for nonpain (95% CI: 32%–38%, n = 361). In 2019, there were 3,963 clinic visits: 61% for CPP (95% CI: 60%–63%, n = 2424) and 39% for nonpain (95%CI: 37%–40%, n = 1539). During 2020, clinic visits decreased by 38.3% to 2445: 56% for CPP (95% CI: 54%–58%, n = 1362) and 44% for nonpain (95% CI: 42%–46%, n = 1083). In the first 6 months of 2021, there were 1,443 visits: 66% for CPP (95% CI: 64%–69%, n = 953) and 34% for nonpain (95% CI: 32%–36%, n = 490).

Conclusions: The total number of patients and visits declined after activation of the pandemic plan, while the proportion of patients and visits for CPP increased.

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Treatment of chronic mesh-induced pelvic pain with botulinum toxin

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Introduction: Chronic pelvic pain (CPP) is a disabling and persistent syndrome affecting approximately 15% of women of reproductive age. Recently, there has been an increased incidence of women presenting with CPP who underwent surgical treatment of stress urinary incontinence or pelvic organ prolapse with the polypropylene mesh. Rates of chronic pelvic pain in patients who have undergone mesh implantation have been reported to be as high as 40%. There has been an increased interest in the use of botulinum toxin for the treatment of pain and pelvic floor dysfunction. Here, we report the results of the injection of local anesthetic and botulinum toxin (BONT-A) for the treatment of chronic mesh-induced pelvic pain.

Methods: Eleven patients with mesh-induced pelvic pain were enrolled in the study. Patients underwent examination and were asked to fill in the Pelvic Pain Assessment Form (PPAF). Patients then underwent injection of a mixture of 0.75% levobupivacaine and BONT-A into several points along the course of the bulbospongiosus muscle. Patients were once again asked to fill in the PPAF and were examined at 1, 3, and 6 months postprocedure.

Results: At baseline, most of the patients reported dyspareunia and pain scores of 8 to 10/10. After the procedure, 10 of the patients had >50% pain relief, with 8 patients reporting >70% relief.

Conclusions: Injection of the bulbospongiosus muscle with a mixture of BONT-A and local anesthetic may be a therapeutic option for the treatment of women with chronic mesh-induced pelvic pain. Further research may prove fruitful.

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Transvaginal photobiomodulation for vulvodynia: a pilot report from real-world clinical settings

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Introduction: This is the first research to evaluate the effectiveness of transvaginal photobiomodulation therapy (TV-PBMT) for vulvodynia in real-world clinical settings.

Methods: Observational analysis of women undergoing TV-PBMT for vulvodynia in 13 U.S. clinics. Ch2, Fisher exact test, and Wilcoxon ranked sum *t* test were used for descriptive analysis. Minimal clinically important difference (MCID) was defined as ≥ 2-point drop on a 0 to 10 scale. The effect size was measured using Cohen D coefficient, comparing treatment 1 with 9, for vulvar pain, dyspareunia severity, overall pelvic pain, and pain with sitting, standing, and exercise. Cohen D coefficient was interpreted as low effect size if $D < 0.2$, medium if $0.2 < D < 0.8$, and high if $D > 0.8$.

Results: Ninty-nine women completed at least 3 treatments and were eligible to participate; 62% completed 9 treatments. On average, women were 46.7 year old (SD ± 16.2). The mean baseline vulvar pain score was 6.5 (SD ± 2.6). 90.4% had suffered for at least 1 year. Among those who were sexually active($n = 39$), 41% reported moderate-to-severe dyspareunia. Compared with baseline, pain scores at treatment 9 changed as follows: vulvar pain from 6.5 (SD ± 2.6) to 4.5(SD ± 2.5), MCID = −2, D = 0.8; dyspareunia from 6.6 (SD ± 2.5) to 4.9 (SD ± 3.1), MCID = –1.7, D = 0.6; and overall pelvic pain 6.5 (SD ± 2.3) to 4.5 (SD ± 2.5), MCID = −2, D = 0.8.

Conclusions: In this cohort of women with vulvodynia, clinically meaningful improvements in vulvar pain, dyspareunia, and overall pelvic pain were noted after 9 TV-PBMT treatments. This is a small uncontrolled study, and additional research is needed to confirm these findings.

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Diagnosing endometriosis using artificial intelligence on ultrasound

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Introduction: Endometriosis causes severe dysmenorrhea, dyspareunia, and chronic pelvic pain. Diagnosing patients at an early stage and understanding the ultrasound image characteristics that correlate with endometriosis can improve and prevent pelvic pain. While the current gold standard diagnosis is laparoscopy with biopsy, ultrasound would provide a safer, more cost-effective diagnostic tool. Our objective is to diagnose endometriosis early by detecting features on ultrasound invisible to the naked eye.

Methods: A retrospective cohort of subjects receiving care from 2015 to 2020 at Rutgers was evaluated for inclusion from the EMR. Two groups of 50 subjects were defined. The endometriosis group included subjects <21 year old, diagnosed with

endometriosis by laparoscopy and assessed by transabdominal and transvaginal ultrasounds at Rutgers. The normal group met the same criteria except for an endometriosis diagnosis. A subset of the ultrasounds was passed through an image pipeline including a fast Fourier transform, a band-pass quadrature filter, and an inverse fast Fourier transform to identify more image features.

Results: Novel local phase image features emerged through the image pipeline were not visible to the naked eye or visible in the original B-mode ultrasound data. This suggests that a multitask approach will identify enhanced characteristics that correlate with endometriosis.

Conclusions: Diagnosing endometriosis early can improve pelvic pain. We expect to correlate novel image features to early-stage endometriosis, which would reduce the need for diagnostic laparoscopies and lead to new therapeutic pathways. Future work includes evaluating a multitask neural network on the ultrasounds and increasing the cohort size to validate results.

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Pain and quality of life after complete pelvic peritonectomy for endometriosis and chronic pelvic pain: a prospective pilot study

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Introduction: Surgical management of endometriosis reduces pain and improves quality of life, although debate continues regarding the optimal technique. Complete pelvic peritonectomy is the peritoneal stripping of the anterior and posterior cul-de-sac, but this technique is not well studied.

Methods: This was a prospective cohort study of women who underwent complete pelvic peritonectomy from November 2019 to November 2020 at a tertiary academic center. Enrolled patients completed the Endometriosis Health Profile-30 (EHP-30) and Visual Analog Scale (VAS) pain scores assessment preoperatively, 6 weeks postoperatively, and 6 months post-operatively. One-way repeated measures ANOVA was used to compare scores at each interval.

Results: Fourty-four women were enrolled, of which 31 completed the 6-month postoperative assessments (70.5% response rate). At surgery, the American Society of Reproductive Medicine endometriosis stage ranged from 0 (n = 6, 19.4%), 1 (n = 14, 45.2%), or 2 (n = 11, 35.5%). 12 women (38.7%) had prior surgery for pelvic pain. 25 patients had histologic evidence of endometriosis (80.6%). The mean EHP-30 scores decreased by more than half preoperatively to 6 months postoperatively (65 vs 28.5, $P < 0.001$). There was significant improvement in all 5 subscales (pain, 60 vs 24.4, $P < 0.001$; control and powerlessness, 82 vs 27.9, $P < 0.001$; emotional well-being, 57.5 vs 31, $P < 0.001$; social support, 63.5 vs 32, $P < 0.001$; and self-image, 64.3 vs 36.2; $P < 0.001$). Patients reported significant improvement in all VAS pain score domains at 6 months postoperatively (menstrual pain 78.7 vs 55.2, $P < 0.001$; dyspareunia (62.6 vs 39.4, $P < 0.001$; dyschezia 56.8 vs 26.9, $P < 0.001$; and nonmenstrual pain 68.1 vs 30.9, $P < 0.001$).

Conclusions: Complete pelvic peritonectomy for pelvic pain results in improved quality of life and pain symptoms.

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Effects of internal and external myofascial trigger point release techniques on the anorectal angle in women with pelvic pain

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Introduction: Pelvic floor myofascial pain is characterized by the presence of trigger points, tenderness to palpation, and local or referred pain. Trigger points cause muscle tension, and evidence suggests that the myofascial trigger point release approach is promising to normalize the muscle tone. The goal of this study is to shed light on the information deficiencies in the acute relaxation of the pelvic floor muscles by using the myofascial relaxation technique in the treatment of pelvic pain.

Methods: This is an experimental study with an assessor blind design. Patients with pelvic pain were included in the study. A standardized gynecological examination was performed by a gynecologist to confirm each participant's eligibility. All women attended 2 evaluation sessions to assess the anorectal angle at rest. Patients were randomized into 3 groups, who involved the internal myofascial therapy (n = 16), external myofascial therapy (n = 13), and control group (n = 14). The data were analyzed by using the SPSS 22.0. Repeated measures ANOVA was used to compare the data between and within the groups.

Results: Fourty-three women with pelvic pain participated in this study. Baseline characteristics were similar between groups for age, body mass index, and number of vaginal childbirths ($P = 0.261$). Internal and external myofascial release groups demonstrated significantly higher anorectal angle at rest after treatment ($P < 0.05$). There is no significant difference between internal, external, or control groups in the anorectal angle at rest ($P > 0.05$).

Conclusions: These results suggest that internal and external myofascial release may represent an effective therapeutic approach for the management of chronic pelvic pain.

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