**Pudendal Neuralgia Pathology** *(Activity pg 4)*

***Introduction:***

 One out of seven American women ages 18-50 have pelvic pain, 61% of those women have no diagnosis.1 Pudendal neuralgia is actually extremely difficult to diagnose, and is often the 'resulting symptoms' of another underlying condition causing the entrapment, inflammation, or upregulation of the nervous system.2 Pudendal neuralgia is one of the more disabling forms of persistent pelvic pain and affects about 4% of all chronic pelvic pain cases.3

The Pudendal nerve is innervated at spinal levels S2, S3, S4. Its pathway is through the greater sciatic notch, around the ischial spine, back in through the lesser sciatic notch, behind the sacrospinous ligament, then curves anterior along the medial ishial tuberosity within Alock’s canal, and then turns superior to the ischioanal fossa. It innervates the superficial perineal and perineal membrane muscles via the perineal branch, the external anal sphincter via the inferior rectal branch, and the cutaneous perineal area and clitoris in women. Trauma to the pudendal nerve can be caused by chronic constipation and straining, prolonged and difficult labor and delivery, and deep mediolateral episiotomy.4 There are five essential criteria, Nantes 5 Criteria, that must all be met to be diagnosed with pudendal neuralgia: 1) pain in the territory of the pudendal nerve, 2) pain is predominantly experienced while sitting, 3) the pain dos not wake the patient at night, 4) pain with no objective sensory impairment, and 5) pain relieved by diagnostic pudendal nerve block.5,6 Symptoms caused by pudendal neuralgia may include constant, unprovoked burning, itching, sensation of dryness, and dyspareunia. Symptoms are often unilateral, and patient may also complain of symptoms of inability to sit, bladder dysfunction, deep groin or inner thigh pain, and sexual dysfunction.

***Body Structure/Function:***

There are typically three types of etiologies for pudendal neuralgia; mechanical, infectious, and immunologic.7 The etiology most likely to be seen or treated in a physical therapy clinic would be mechanical. Mechanical causes include surgical procedure, trauma, or childbirth. Entrapment, or mechanical compression, can also cause pudendal neuralgia and may be caused by pelvic floor muscle spasm, pressure from surrounding ligaments (sacrospinous, sacrotuberous), or scar tissue formation.7 In this situation, blood supply has been compromised by compression resulting in possible demyelination injury with symptoms ranging from mild paresthesias, to motor weakness, to complete sensory and/or muscle paralysis. Trauma, such as childbirth, may incur stretch injuries, whereas mediolateral episiotomies may result in transection injuries and are far less common.7 The pain symptoms are usually generalized to the pudendal dermatome, including the vulva, vagina, clitoris, perineum, and rectum in females. Determining where the nerve has become entrapped or undergone injury will determine if the entire area innervated by the pudendal nerve is affected or one particular branch.7

***Activity Limitation:***

One of the hallmark signs of pudendal neuralgia is favoring one side while seated, as pain is often unilateral and is intensified with sitting.7 Other associated symptoms include urinary frequency and urgency, symptoms of painful bladder syndrome, and dyspareunia.7 Pain progressively worsens throughout the day, and may be triggered by defecation.7 Therefore, activities that may be affected by pudendal neuralgia may include urination, defecation, sexual activities, and sitting.

***Participation Limitation:***

Based on the activity limitations, there are a multitude of participation limitations that may follow. Due to the pain caused with sitting, the patient may not be able to participate in activities that require prolonged sitting. This may affect their ability to work at a seated desk, drive for long periods of time, travel, or any activity that does not permit short periods of sitting. Symptoms of urinary urgency or frequency may also cause participation restriction if the patient feels that they need to be within a short distance of a restroom at all times. Dyspareunia, difficult or painful intercourse, may place additional strain on participants involved in intimate relationships. Many of these participation limitations may lead to psychological involvement through symptoms of anxiety or depression.

***Interventions:***

As pundendal neuralgia can be difficult to diagnose and may be integrated in with a myriad of other disorders,2 it is important to treat the impairments found in the evaluation. Due to the pain in the pelvic area, a typical finding will be pelvic floor muscle tightness, guarding, and spasm. Thus, important interventions for pudendal neuralgia will often incorporate muscular relaxation and biofeedback for pain and symptom management. Historically surgery and medication have been the primary treatment; unfortunately it was shown that these methods were less successful due to improper diagnostic and thus, improper treatment.2 Currently Botox, physical therapy, nerve blocks, and other forms of therapy are becoming more popular and conservative measures.2

Due to the complexity of pudendal neuralgia, it is important to utilize an interdisciplinary approach to manage symptoms and relieve the primary cause. Physical therapy is one of the key players in symptom management.3 Pelvic floor physical therapists can assist in decreasing resting muscle tension, alleviating myofasical trigger points, and raising the patient’s awareness to the tension they may be holding in their pelvic floor through intra-vaginal/intra-anal manual therapy and biofeedback.2,8

***Assessment/Outcome Measures:***

 Until recently, pudendal neuralgia (entrapment) was almost exclusively treated by physicians with surgery. Now it is understood that in many cases the pudendal nerve is not actually entrapped, but aggravated by surrounding tissues. Issues such as pelvic floor muscle spasms, myofascial trigger points, and non-coordinated muscle contraction patterns in the pelvic floor can all contribute to pudendal neuralgia.9 Considering that pudendal neuraglia is defined by having a cluster of symptoms, outcome measures typically used with this population are varied and not well studied on this specific population. When utilizing outcome measures with this population it is important to address multiple levels of the ICF model and realize there are a variety of ways to document progress apart from symptoms of pain. The following outcome measures are those recommended for use by Herman & Wallace Pelvic Rehabilitation Institute (hermanwallace.org).

*Body Structure/Function*

 Muscle testing scales are an essential component to assessing and treating the pelvic floor muscles. Considering how muscle tension, tightness, and lack of coordination can play a pivotal role in pudendal neuralgia, it is important to assess the muscles themselves for trigger points and general strength. Three typical muscle strength tests used for pelvic floor muscle assessment include Laycock’s ‘Modified Oxford Scale’,10 Brink Scoring System,11 and Laycock’s PERFECT scale: Power, Endurance, Repetitions, Fast contraction.12

Pain is essentially why the patient is seeking treatment, and therefore outcome measures focusing on pain outcomes are warranted. The Numeric Pain Rating Scale13 and McGill Pain Questionnaire14 have been validated for chronic pain (which pudendal neuralgia often falls into), and the McGill scale has been validated in pelvic pain and vulvar pain populations specifically. Although these measures should not be the primary outcome for treatment, it is important to track symptoms of pain.  The Numeric Pain Rating Scale takes less than 5 minutes, requires no training, and has been validated in a multitude of patient populations.13 The McGill Pain Questionnaire is a self-report measure of pain that takes 6-30 minutes, and is validated in a multitude of populations including chronic pelvic pain and vulvar pain.14

The IPPS Pelvic Pain Assessment Form15 was recently created by the International Pelvic Pain Society, a multidisciplinary organization focused on informing and providing evidence-based research to any clinician who treats patients with pelvic pain. This form includes a section to be filled out by the patient, and a separate section to be filled out by the clinician. For clinicians who have not had much training in pelvic pain, or who are just starting out, this is a comprehensive guide to the entire evaluation. It does a complete systems review, and asks many body structure related questions, which can be compared prior to and after treatment. Although this is not a validated questionnaire, it is a helpful document for anyone seeking guidance for evaluation patients with any sort of pelvic disorder.

*Activity Limitation*

 The SF-36,16 and the Australian Pelvic Floor Questionnaire17 are all measures that act activity related questions. RAND developed the 36 Item Short Form Health Survey as part of the Medical Outcomes Study. This is a Quality of Life survey that provides information that applies to the patient's activity and participation limitations. Questions include ability to walk, climb stairs, and other questions focusing on self-perceived health.16 The Australian Pelvic Floor Questionnaire17 is an interviewer-administered pelvic floor questionnaire that integrates bladder, bowel and sexual function, pelvic organ prolapse, severity, bothersomeness and condition-specific quality of life. This scale was validated in 2009, and is recommended for use by the Herman & Wallace Institute of Pelvic Rehabilitation. The activities covered in this questionnaire include bowel, bladder, and sexual function as they apply to the patient’s quality of life and ability to functionally participate in toileting and/or sexual activities.

*Participation*

The SF-36 questionnaire was previously discussed in the activity section, however it also asks questions that are pertinent to participation as well.16 This questionnaire looks into the current issue and how it relates to work activities or other activities and how they impact the patient’s ability to participate. There are some sexual function questionnaires out in the world of literature as well, unfortunately insurance does not reimburse for sexual rehabilitation. Thus, the use of one of these questionnaires would not be beneficial to the practitioner. However, seldom are pelvic floor issues so specifically limited, indicating the use of other questionnaires to determine different participation limitations, such as inability to sit for prolonged periods of time and interfering with work.

Considering the information above, the SF-36 would be the most beneficial of the outcome measures listed as it covers items in two of the three domains. This in addition to objective progress would be sufficient in tracking the patient’s progress and applying therapy to multiple domains in the ICF model. Additional use of the Australian Pelvic Floor Questionnaire would add a more specified outcome measure that may be beneficial in goal setting for specific activity limitations.

***References:***

1. IPPS Patient Education Brochure. 2013. Accessed: March 19, 2016. Available at: [Http://www.pelvicpain.org/pdf/Patients/CPP\_Pt\_Ed\_Booklet.pdf](http://www.pelvicpain.org/pdf/Patients/CPP_Pt_Ed_Booklet.pdf)
2. How do I know if I have PN or PNE. Pelvic Health and Rehabilitation Center. Published: November 14, 2013. Accessed: March 6, 2015. Available at: http://www.pelvicpainrehab.com/pelvic-pain/726/how-do-i-know-if-i-have-pn-or-pne/
3. Perez-Lopez FR, Hita-Contreras F. Management of pudendal neuralgia. Climacteric. 2014;17(6):654-656.
4. Section on Women’s Health CAPP. Anatomy Tables: Pelvic Floor Muscles and Pelvic Nerves. Available at: <http://www.womenshealthapta.org/wp-content/uploads/2013/12/Common-Forms-09.pdf>
5. Labat JJ, Riant T, Robert R, Amarenco G, Lefaucheur JP, Rigaud J. Diagnostic criteria for pudendal neuralgia by pudendal nerve entrapment (Nantes Criteria). Neuroulol Urodynam. 2008;27:306-310.
6. Hibner M, Desai N, Robertson LJ, Nour M. Pudendal Neuralgia. Journal of Minimally Invasic Gynecology. 2010;17(2), 148-153.
7. Khoder W, Hale D. Pudendal Neuralgia. Obstet Gynecol Clin N Am. 2014;41:443-452.
8. Speer LM, Mushkbar S, Erbele T. Chronic pelvic pain in women. Am Fam Phyaician. 2016;93(5):380-7.
9. The Role of PT in Treating PN. Published: November 21, 2013. Accessed: March 28, 2015. Available at: <http://www.pelvicpainrehab.com/pelvic-pain/744/the-role-of-pt-in-treating-pn/>
10. Laycock J, Haslam J. Therapeutic management of incontinence and pelvic pain: pelvic order disorder, London: Springer- Verlag. 2002.
11. Borello-France DR, Handa VL, et al. Pelvic floor muscle function in women with pelvic organ prolapse. *Physical Therapy*. 2007;87(4):399-407.
12. Laycock J. Clinical evaluation of the pelvic floor. Chapter 2, pg 42-48 in Pelvic Floor Re-education, Principles and Practice. (Eds.) Schussler B, Laycock J, Norton P, Stanton S. Springer Verlag, London. 1994.
13. Rehabmesures.org. Rehab Measures: Numeric Pain Rating Scale. Published: January 17, 2013. Accessed: March 28, 2016. Available at: <http://www.rehabmeasures.org/Lists/RehabMeasures/PrintView.aspx?ID=891>
14. Rehabmesures.org. Rehab Measures: McGill Pain Questionnaire. Published: February 8, 2013. Accessed: March 28, 2016. Available at: <http://www.rehabmeasures.org/Lists/RehabMeasures/PrintView.aspx?ID=1111>
15. Rand Corporation. 36-Item Short Form Survey from the RAND Medical Outcomes Study: RAND 36-Item Health Survey 1.0 Questionnaire Items. Accessed: March 28, 2016. Available at: <http://www.rand.org/health/surveys_tools/mos/mos_core_36item_survey.html>
16. IPPS. Pelvic Pain Assessment Form. Published: April 2008. Accessed: March 28, 2016. Available at: <https://www.ucsfhealth.org/pdf/IPPS_english.pdf>
17. Baessler K, O’Neil SM, Maher CF, Battistutta D. Australian pelvic floor questionnaire: a validated interviewr-administered pelvic floor questionnaire for routine clinic and research. Int Urogynecol J Pelvic Floor Dysfunct. 2009;20(2):149-58.