





Slide 1


Decoding chronic pelvic pain:  
CPP diamonds

  
Follow me

  
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@paineducatorMD

  
@pelvic\_paineducatorMD

  
INTERNATIONAL  
PELVIC PAIN  
SOCIETY

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Slide 2

Disclosures – Jorge F. Carrillo, MD, FACOG

AbbVie and SoLá consultant  
The opinions expressed do not necessarily reflect those of the VA,  
U.S. Government, or any of its agencies  
IPPS Vice-President (2023-2024), Executive Board Member

  
INTERNATIONAL  
PELVIC PAIN  
SOCIETY

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Slide 3

What is your role in health professions?

Nurse

Pharmacist

Physician

Physician assistant

Physical therapist

Resident, medical student

Other

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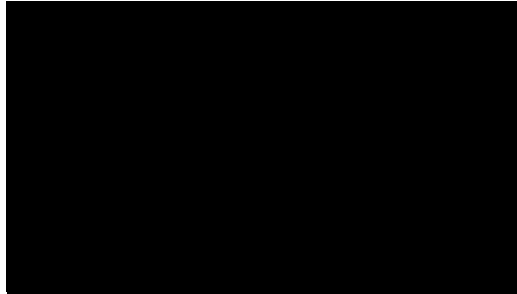
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Slide 4



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Slide 5



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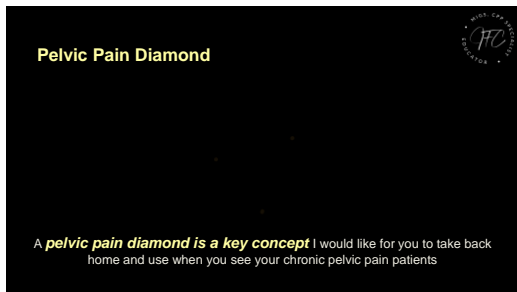
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Slide 6



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Slide 7

### Objectives

- Describe features of chronic pelvic pain (CPP)
- Discuss the importance of a trauma informed care approach
- Analyze the components of a complete history and physical exam
- Review common treatment approaches to those suffering from CPP
- Identify when to refer a patient for evaluation/management



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Slide 8


### Outline


Visceral  
Innervation

TI

History Intake

Physical  
exam

Management

Red flags / when to refer

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Slide 9


### Outline


Visceral  
Innervation

TI

History Intake

Physical  
exam

Management

Red flags / when to refer

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Slide 10



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Slide 11

**The Biopsychosocial model of chronic pain**

Pain → Biopsychosocial phenomenon (Engel's and Loeser's models)

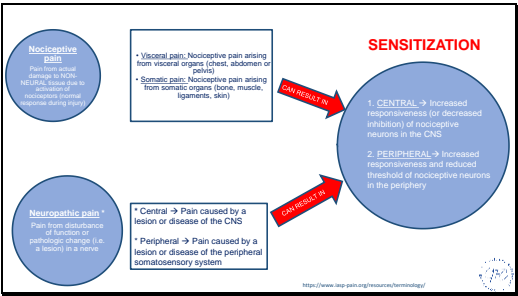
Use of effective treatments have been described to modulate factors

Other than biological factors, pain is modulated by

- Beliefs and attitudes → pain is in part cognitively mediated (could be improved by modifying inaccurate beliefs-education)
- Cultural and social factors

The Biopsychosocial model of chronic pain and disability: International Classification of Functioning, Disability and Health. WHO (Revised from Stuckert 1975). Manning, G., Burt, G. (Eds.). Chronic Pain: A Guide to Understanding Pain, The Pain Process, and Factors. 2nd ed. 2015. May 15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1026/1027/1028/1029/1030/1031/1032/1033/1034/1035/1036/1037/1038/1039/1040/1041/1042/1043/1044/1045/1046/1047/1048/1049/1050/1051/1052/1053/1054/1055/1056/1057/1058/1059/1060/1061/1062/1063/1064/1065/1066/1067/1068/1069/1070/1071/1072/1073/1074/1075/1076/1077/1078/1079/1080/1081/1082/1083/1084/1085/1086/1087/1088/1089/1090/1091/1092/1093/1094/1095/1096/1097/1098/1099/1100/1101/1102/1103/1104/1105/1106/1107/1108/1109/1110/1111/1112/1113/1114/1115/1116/1117/1118/1119/1120/1121/1122/1123/1124/1125/1126/1127/1128/1129/1130/1131/1132/1133/1134/1135/1136/1137/1138/1139/1140/1141/1142/1143/1144/1145/1146/1147/1148/1149/1150/1151/1152/1153/1154/1155/1156/1157/1158/1159/1160/1161/1162/1163/1164/1165/1166/1167/1168/1169/1170/1171/1172/1173/1174/1175/1176/1177/1178/1179/1180/1181/1182/1183/1184/1185/1186/1187/1188/1189/1190/1191/1192/1193/1194/1195/1196/1197/1198/1199/1200/1201/1202/1203/1204/1205/1206/1207/1208/1209/1210/1211/1212/1213/1214/1215/1216/1217/1218/1219/1220/1221/1222/1223/1224/1225/1226/1227/1228/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Slide 13



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Slide 14

### Chronic pelvic pain

"Pain symptoms perceived to originate from pelvic organs/structures typically lasting **more than 6 months**. It is often associated with negative cognitive, behavioral, sexual and emotional consequences as well as with symptoms suggestive of lower urinary tract, sexual, bowel, pelvic floor, myofascial, or gynecological dysfunction. Cyclical pelvic pain is considered a form of chronic pelvic pain if it has significant cognitive, behavioral, sexual, and emotional consequences."



<https://pixabay.com/en/photos/>

Chronic Pelvic Pain: ACOG Practice Bulletin, Number 218, Obstet Gynecol. 2020; doi:10.1097/AOG.0000000000003718

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Slide 15

### Chronic pelvic pain

The **six-month duration** of pelvic pain **is not** a requirement to start an evaluation or treatment

If there is the presence of **significant negative cognitive, behavioral, sexual or emotional consequences** or if **central sensitization** is present, then the pain may be regarded as chronic



IASP Classification of chronic pain, Second edition GROUP XXII: CHRONIC PELVIC PAIN SYNDROMES. <https://www.sleep-pain.org/Publication/FreeContent.aspx?termNumber=157&articleNumber=477>. Accessed April 5, 2020.

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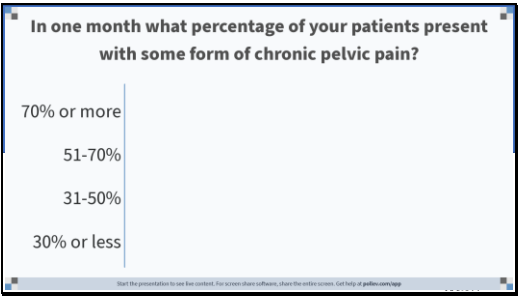
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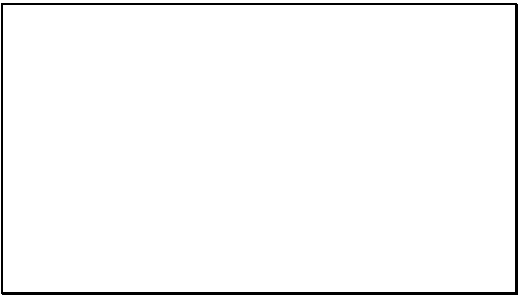
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Slide 17



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Slide 18

**Clinical characteristics visceral pain**

1. Not evoked from all viscera
2. Not always linked to visceral injury
3. Diffuse and poorly localized
4. Is referred to other locations
5. Usually accompanied with motor and autonomic reflexes (nausea, vomiting, lower back muscle tension)
6. Responses to painful visceral stimuli are much slower and longer lasting
7. Often intermittent in nature with acute episodes of intense pain inter spread with periods of less pain

Cervero F, Laird JM. Visceral pain. Lancet 1999;353:2145-8.  
Cervero F. Visceral versus somatic pain: similarities and differences. Dig Dis. 2009;27 Suppl 1:3-10.  
Laird JMA, Cervero F. Looking at visceral pain: New vistas. Scand J Pain. 2018 Jul 1;20(3):93-94.

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Slide 19

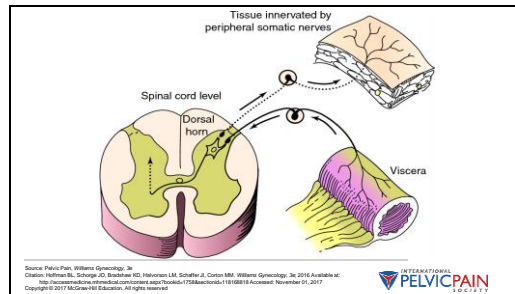
## Viscerosomatic convergence

- Underlies referred visceral pain – sending pain sensations distant to primary site
- Noxious stimulation of viscera triggers pain referred to somatic sites
- Somatic injury and visceral inflammation can alter central processing of visceral and somatic inputs

Sikandar S, Dickenson AH. Visceral pain: the ins and outs, the ups and downs. *Curr Opin Support Palliat Care*. 2012 Mar;6(1):17-26. doi: 10.1097/SPC.0b013e32834f6ec9.



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TABLE 1. Peripheral Somatic Sensory Nerve Dermatomes with Corresponding Visceral Sensory Nerve Convergence-Projection Fields

Somatic Nerve	Dermatome	Visceral Field
Iliohypogastric	T12-L1	Ovary, distal fallopian tube
Ilioinguinal	L1-2	Proximal tube, uterine fundus
Genitofemoral	L1-2	Proximal tube, uterine fundus
Lateral femoral cutaneous	L2-3	Fundus, lower uterine segment
Perineal	S2-4	Lower uterine segment, cervix, bladder, distal ureter, upper vagina, rectum

Perry CP. Peripheral neuropathies and pelvic pain: diagnosis and management. Clin Obstet Gynecol. 2003 Dec;46(4):789-96



Slide 22

Viscerovisceral convergence – “Visceral cross-sensitization”

Transmission of noxious stimulus from diseased pelvic organ to adjacent normal structure → functional changes (CPP)  
Between GI, GU and reproductive organs

Convergence occurs via both peripheral and central mechanisms

- Peripheral → DRG
- Central → Spinal cord and brain

Origeni M, et al. Neurobiological mechanisms of pelvic pain. Biomed Res Int. 2014;2014:903848.  
Willard F, et al. Neuroanatomy of Female Pelvic Pain. 17:58. Bailey A, Bernstein C. (eds.). Pain in Women: A Clinical Guide. 17 DOI: 10.1007/978-1-4419-7713-5\_2. © Springer Science Business Media New York 2013.

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Viscerovisceral convergence – “Visceral cross-sensitization”

The diagram illustrates the process of visceral cross-sensitization. It shows the Colon at the top, connected by a line to the DRG (Dorsal Root Ganglion) in the center. The DRG is connected to the Uterus at the bottom. A line also connects the Uterus to the Inflammation site, which is marked with a star. The L1-S3 spinal region is indicated on the left. The text 'Viscerovisceral convergence – “Visceral cross-sensitization”' is written to the right of the diagram.

Gelhorn GF. Physiology of Visceral Pain. Compr Physiol. 2016 Sep 15;6(4):1605-1633.  
Origeni M, et al. Neurobiological mechanisms of pelvic pain. Biomed Res Int. 2014;2014:903848.

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Viscerovisceral convergence – “Visceral cross-sensitization”

Dichotomizing axons

The diagram illustrates the process of visceral cross-sensitization, focusing on dichotomizing axons. It shows the Colon at the top, connected by a line to the DRG (Dorsal Root Ganglion) in the center. The DRG is connected to the Uterus at the bottom. A line also connects the Uterus to the Inflammation site, which is marked with a star. The L1-S3 spinal region is indicated on the left. The text 'Viscerovisceral convergence – “Visceral cross-sensitization”' is written to the right of the diagram, and 'Dichotomizing axons' is written to the left.

Gelhorn GF. Physiology of Visceral Pain. Compr Physiol. 2016 Sep 15;6(4):1605-1633.  
Origeni M, et al. Neurobiological mechanisms of pelvic pain. Biomed Res Int. 2014;2014:903848.

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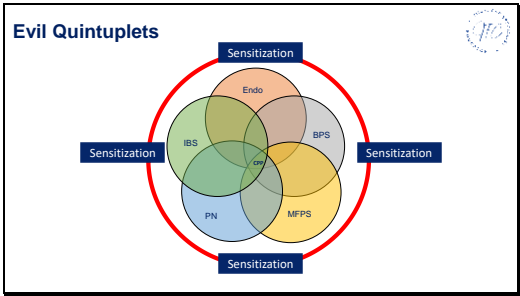
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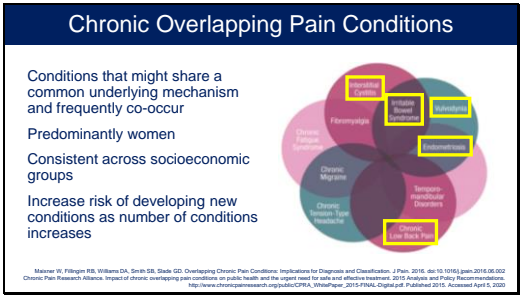
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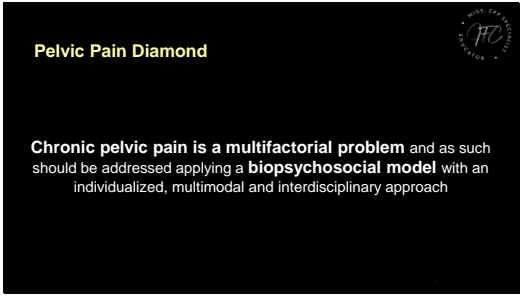
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Slide 27



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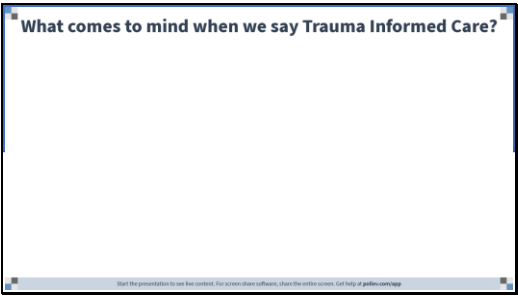
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Slide 30

**Trauma informed care**

Why? →  
Traumatic events include many experiences (from physical, sexual, emotional abuse to environmental causes)  
This leads to a physical and emotional response (anxiety, depression)  
Recognize prevalence and effect of trauma on patients/healthcare team and incorporate TIC to practices

Hopper EK, Bassuk EL, Olivet J. Shelter from the storm: trauma-informed care in homelessness services settings. Open Health Serv Policy J 2019;3:95-100.

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What is Trauma?

"Results from an **event, series of events**, or set of circumstances that is **experienced** by an individual as **physically or emotionally harmful or life threatening** and that has **lasting adverse effects** on the individual's function and mental, physical, social, emotional or spiritual well-being."

Substance Abuse and Mental Health Services Administration, SAMHSA. A Concept of Trauma and Guidance for a Trauma Informed Approach. HHS Publication No. (SMA) 14-4884. Rockville: SAMHSA; 2014. Available at: <http://www.samhsa.gov/trauma/index.cfm>



Slide 32

Examples of trauma:

Intimate partner violence	Repeated exposure to community violence
Sexual assault and rape (MST)	Refugee and immigration status
Violence perpetrated (race or sexual orientation)	Family separation
Neglect during childhood	Traumatic birth experiences - "obstetric violence"
combat and service trauma	
Natural disasters	

Caring for patients who have experienced trauma: ACOG committee opinion, number 825. Obstetrics & gynecology. 2021;137(4):99. doi:10.1097/AOG.0000000000004326



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Consequences of trauma →

Unhealthy behaviors (eating disorders, substance abuse, self-harm)  
Mental health disorders (depression, anxiety, PTSD, suicide attempts)  
Co-occurrence with chronic pain diseases  
Lead to physical and mental health problems

Parish LS, Sim LM. The Role of Trauma and Mental Health in the Treatment of Chronic Pelvic Pain: A Systematic Review of the Intervention Literature. Trauma Violence Abuse. 2020;21(5):1029-1043. doi:10.1177/1548838118819659  
Caring for patients who have experienced trauma: ACOG committee opinion, number 825. Obstetrics & gynecology. 2021;137(4):99. doi:10.1097/AOG.0000000000004326




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### Trauma informed care

**What is TIC?** → “a **strengths-based** service delivery approach that is grounded in an **understanding of and responsiveness to the impact of trauma**, that emphasizes physical, psychological, and emotional **safety for both practitioners and survivors**, and creates opportunities for survivors to **rebuild a sense of control and empowerment**.”

Hopper EK, Bassuk EL, Olivet J. Shelter from the storm: trauma-informed care in homelessness services settings. Open Health Serv Policy J 2010;3:80–100.



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### 4 R's of TIC

- **Realizes** the widespread impact of trauma and understands potential paths for recovery;
- **Recognizes** the signs and symptoms of trauma in clients, families, staff, and others involved with the system;
- **Responds** by fully integrating knowledge about trauma into policies, procedures, and practices; and
- Seeks to actively prevent **re-traumatization**.

<https://www.acf.hhs.gov/trauma-toolkit>



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Slide 36

### Signs and symptoms of Trauma

Agitation	Flashbacks—re-experiencing the trauma
Irritability, emotional swings	Difficulty concentrating
Anxiety, depression, fear	Difficulty trusting
Outbursts of anger	Self-blame, guilt or shame
Easily startled by noise or touch	Feeling disconnected or numb
Sudden sweating and/or heart palpitations	

Substance Abuse and Mental Health Services Administration. Trauma informed care in behavioral health services. Treatment Improvement Protocol (TIP) Series 57. HHS Publication No. (SMA) 13-4801. Rockville, MD: SAMHSA, 2014. Available at: <https://www.samhsa.gov/sites/default/files/tip57/tip57sm14-4801a.pdf>



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**Example (CPP patients):**

- Discussed h/o trauma
- Taking the history with the patient dressed
- Obtaining consent before starting or resuming the pelvic examination
- Teaching relaxation techniques (abdominal breathing exercise prior to exam)
- Covering patient properly
- Having chaperone present
- Educating patient about what is being examined – providing a mirror
- Giving the patient the option to ask questions or to choose what will be done
- Avoiding trigger words – “Relax, open your legs, drop your knees”
- Providing option to stop at any time
- Providing option of deferring the speculum exam

Lammi G, Carrillo J, Ouyang C, Riegler A. Chronic Pelvic Pain in Women: A Review. JAMA. 2021;325(23):2381-2391. doi:10.1001/jama.2021.3631

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**TIC for the surgical patient**

Surgery → unknown, loss of autonomy/vulnerability → triggering/traumatizing  
Leads to anxiety, triggers and subconscious feelings

Goal→  
Introduction of anesthesia and work on delegation of autonomy

Trounstein M, Chacko S, Peters L, Laidler MR. Informed Care for the Gynecologic Day Surgical Patient with a History of Sexual Trauma. J Pelvic Med Res. 2022;35(1):3-6. doi:10.1016/j.jpmg.2021.07.008

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Slide 39

**Pelvic Pain Diamond**

Applying a trauma informed care approach to chronic pelvic pain patients is a key to facilitate a safe and trustworthy clinical environment

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Slide 40



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Slide 41

**EXPECTATION**

- To be **addressed** as an individual by supportive nurses and providers
- To feel that she and her pain are taken **seriously**
- To receive an **explanation** for her condition
- To be **reassured** that CPP is **not** "all in her mind", is **common**, and is **not cancer**

**REALITY**

- Social **isolation**
- Feel **invalidated**
- Dismissive** attitudes from healthcare providers

Price et al. BJOG: Int J Obstet & Gynaecol 2006  
Nguyen RH, et. al. Psychology, health & medicine 2012;17:589-98  
Nguyen RH, et. al. J Reprod Med 2012;57:109-14  
<https://pixabay.com/en/photos/>

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**Goals**

- Characterize** pain or "pains"
  - Reveal potential **involvement of multiple systems/organs** as pain generators
  - Identify exhibition of **nociceptive pain / central sensitization**
- Explain / educate** the complexity of CPP and multiple interventions
  - Help patient **prioritizing** what is considered improvement
  - Discuss **long term** expectations

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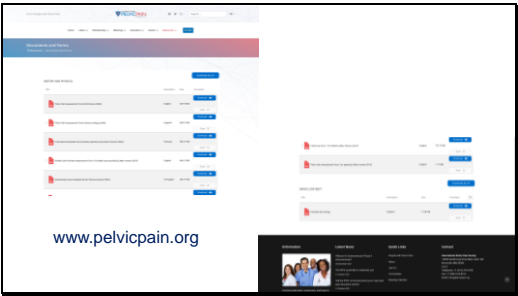
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**IPPS Pelvic health history Form**

1. Contact information	10. Pain history, description, contributing factors
2. Referring provider's name and contact information	11. Pain location, severity scales and past treatments (pain map, Short McGill questionnaire, VAS, Pain intensity scale short form, Pain catastrophizing scale, PROMIS sexual function profile -female and male-, PROMIS global health)
3. Demographic information	12. GI history (Rome IV, Bristol)
4. Medical history	13. Additional symptoms and diagnosis (Nantes criteria, COPC's)
5. Surgical history	14. Urinary history (PUF, Chronic Prostatitis Symptom index)
6. Menstrual, birth control and STI history	15. Psychosocial history (DASS-21)
7. Allergies and current medications	
8. Pregnancy / OB history	
9. Family history	

www.pelvicpain.org/IPPS/Professional/Documents/Forms/IPPS/Content/Professional/Documents\_and\_Forms.aspx?key=2017ab99-d9b3-40ee-8f0d-7bd384efed13

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**What makes your pain WORSE? (Check all that apply)**

<input checked="" type="checkbox"/> Walking	<input type="checkbox"/> Climbing stairs	<input type="checkbox"/> Urination	<input checked="" type="checkbox"/> Heavy lifting	<input type="checkbox"/> Nothing makes it worse
<input checked="" type="checkbox"/> Full bladder	<input checked="" type="checkbox"/> Stress	<input type="checkbox"/> Housework	<input type="checkbox"/> The weather	<input type="checkbox"/> Getting in/out of the car
<input checked="" type="checkbox"/> Exercise	<input checked="" type="checkbox"/> Menstrual period	<input type="checkbox"/> Contact with clothing	<input checked="" type="checkbox"/> Intercourse/ Sexual contact	
<input type="checkbox"/> Bowel movements	<input type="checkbox"/> Other:			

**What makes your pain BETTER? (Check all that apply)**

<input checked="" type="checkbox"/> Lying down/rest	<input type="checkbox"/> Emptying bladder	<input checked="" type="checkbox"/> Ice or Heating pad	<input type="checkbox"/> Nothing makes it better
<input type="checkbox"/> Meditation	<input type="checkbox"/> Laxatives/enema	<input type="checkbox"/> It goes away by itself	<input type="checkbox"/> When I feel supported
<input checked="" type="checkbox"/> Hot bath	<input type="checkbox"/> Massage	<input type="checkbox"/> Bowel movements	<input checked="" type="checkbox"/> When my stress is low
<input type="checkbox"/> Exercise	<input type="checkbox"/> Ibuprofen or Tylenol	<input type="checkbox"/> Prescription pain medications	
<input checked="" type="checkbox"/> Being distracted, when I am busy doing other things	<input type="checkbox"/> Other:		

www.pelvicpain.org

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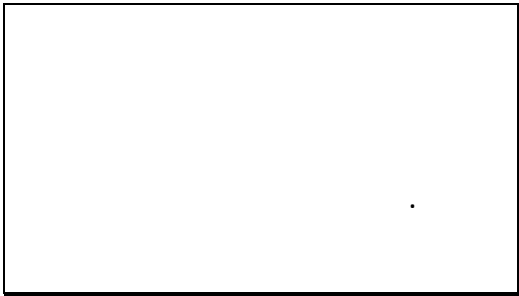
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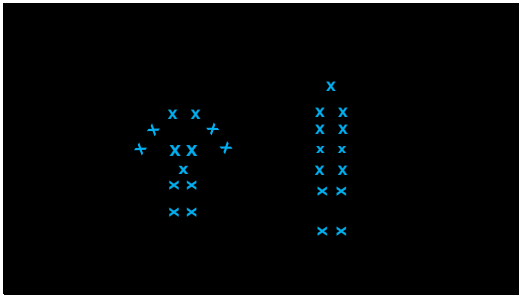
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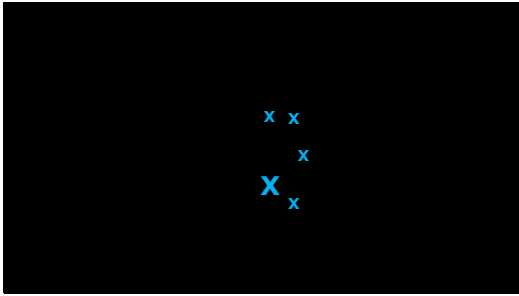
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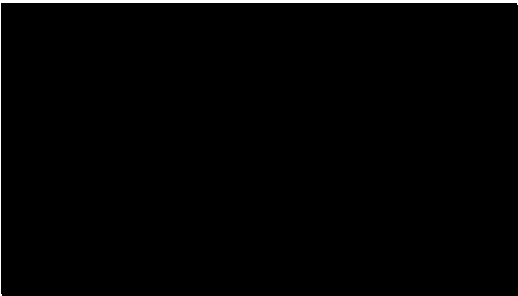
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Slide 61

# Pain



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Slide 62

## Pain

Monodimensional → **VAS**, NRS, VNRS  
Multidimensional → **MPQ**, SF-MPQ, **PROMIS**  
Onset  
Location → **Pain map – Referred?**  
Scale  
Frequency  
**Quality - descriptors**  
**Worsening / Improving factors**  
Previous treatments (helped?)  
Neuropathic pain → **Neuropathic Pain scale**, PainDETECT, Leeds Assessment of neuropathic symptoms and signs (LANSS Pain scale), Neuropathic Pain symptoms Inventory (NPSI), Neuropathic Pain Diagnostic Questionnaire (DN4), Nantes criteria



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# PAP's



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Slide 64

Associated  
organs/systems



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Slide 65

Associated  
organs/systems

**Cyclic vs Non-cyclic**  
Organ specific questionnaires → **PUF, O'Leary-Sant**, Bladder Pain/Interstitial Cystitis Symptom score, Pelvic Pain Assessment Form, NIH-CPSI, GUPI, CPPQ-Mohedo, Endopain 4D, EHP-30 (endometriosis health profile questionnaire), endometriosis impact questionnaire, UPOINT, **Vulvodynia, Rome IV criteria**



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PAP's



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Slide 67

Psycho/social  
impact



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Psycho/social  
Impact

SF-36, EQ-5D, **MPQ**, Pain disability Index, PLO-6, **Sexual functioning self-assessment**, Behavior Illness questionnaire, Hamilton Psychiatric Rating Scale for Depression, **Beck depression inventory**, HADS, **Catastrophizing**, **PEG-3 questions**, **Sexual trauma and/or PTSD**



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Slide 69

PAP'S



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Slide 70

# Sensitization



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Slide 71

# Sensitization

2011 Fibromyalgia Survey Criteria (surrogate measure for CS), Patient Health Questionnaire-4 (depression, anxiety), **Central Sensitization Inventory (CSI)**, Symptom-focused questionnaires sleep/fatigue (Pittsburgh Sleep quality index and Multidimensional Fatigue Inventory)

Dr HL Huang AL Liu YD Ngai H Bednarek MA Williams C Akana C Yang PJ Association of Central Sensitization Inventory Scores With Pain Outcomes After Endosteal Surgery. *Annals of the Royal College of Physicians*. 2022 Feb; 16(2):e2021010. doi: 10.1016/j.annrhc.2021.101010. Epub 2021 Nov 10. PMID: 34684806 PMCID: PMC8327294

Dr HL Williams AL Lumb M et al. Central sensitization inventory in endometriosis. *Pain*. 2022;163(2):245. doi: 10.1093/pain/pnab333. Epub 2021 Oct 15. PMID: 34000000 PMCID: PMC8327294

Fitzpatrick MA, Cohen SP, Chavira D, Longenecker G, Sato C, Wilson W. Reciprocity pain inventory as a validated tool of persistent pain condition. *Pain*. 2021;161(10):2088-2096. doi: 10.1093/pain/pnab333. Epub 2021 Oct 15. PMID: 34000000 PMCID: PMC8327294



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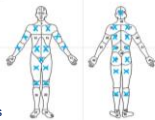
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## Suspect Central Sensitization if...

**1. Pain Location, Severity, Quality and Prior Treatment**  
Please mark all areas where you have pain on the body. Mark areas where you have pain. Please check or circle each area of pain.



- Pain at multiple sites in the body
- Multiple pain diagnoses
- Hyperalgesia / Allodynia
- Opioids not effectively reduce pain
- Pain does not respond to peripheral therapies
- Pain associated with psychiatric or emotional dysfunction

Longenecker A, Rizzo T, Phillips D, Rignall J, Jelliff J, for the Comprehensive PP Network. Clinical Criteria of Central Sensitization and Chronic Pain and Persistent Pain Consequences PP Criteria. Elaboration of a Clinical Evaluation Tool Based on Formal Expert Consensus. *Pain Med*. 2018 Mar; 19(3):589-600. doi: 10.1093/pm/pny005.



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### Pelvic Pain Diamond

The use of validated questionnaires is an efficient way to better organize information during the initial visit, which will be important to monitor clinical progress

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Slide 74

### Outline

Visceral innervation

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History intake

Physical exam

Management

Red flags / when to refer

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### PHYSICAL EXAM TO ASSESS CHRONIC PELVIC PAIN PATIENTS

<https://www.pelvicpaineducation.com/healthcare-professionals>

Lamou, C., Carrillo, J., Ouyang, C., & Rapkin, A. (2021). Chronic Pelvic Pain in Women. JAMA, 325(28), 2191. <https://doi.org/10.1001/jama.2021.2628>

Howard FM. Chronic pelvic pain. Obstet Gynaecol. 2003;101(3):594-611. doi:10.1016/S0029-7844(02)00272-9

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**PELVIC PAIN** HEALTHCARE PROVIDER ASSESSMENT FORM

FOR HEALTHCARE PROVIDER USE ONLY

**Patient Identification**

Health Care Provider Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Chief Complaint**

History of Present Illness (HPI): \_\_\_\_\_

**Physical Examination**

General: \_\_\_\_\_

Abdomen: \_\_\_\_\_

Genitourinary: \_\_\_\_\_

Rectal: \_\_\_\_\_

Neurological: \_\_\_\_\_

Other: \_\_\_\_\_

**Diagnosis**

\_\_\_\_\_

**Management**

\_\_\_\_\_

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**PELVIC PAIN** HEALTHCARE PROVIDER ASSESSMENT FORM

FOR HEALTHCARE PROVIDER USE ONLY

**Physical Examination**

General: \_\_\_\_\_

Abdomen: \_\_\_\_\_

Genitourinary: \_\_\_\_\_

Rectal: \_\_\_\_\_

Neurological: \_\_\_\_\_

Other: \_\_\_\_\_

**Diagnosis**

\_\_\_\_\_

**Management**

\_\_\_\_\_

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**PELVIC PAIN** HEALTHCARE PROVIDER ASSESSMENT FORM

FOR HEALTHCARE PROVIDER USE ONLY

**Physical Examination**

General: \_\_\_\_\_

Abdomen: \_\_\_\_\_

Genitourinary: \_\_\_\_\_

Rectal: \_\_\_\_\_

Neurological: \_\_\_\_\_

Other: \_\_\_\_\_

**Diagnosis**

\_\_\_\_\_

**Management**

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
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Slide 82




**PELVIC PAIN**


MULTIPLE CHOICE QUESTIONS

100%

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Right  
Horizontal open circle



Left  
Vertical open circle

**Answer/Correct Explanation**

<b>Answer:</b>	C	D	E	F	G
	Chronic	Chronic	Chronic	Chronic	Chronic
	Chronic pain state				
	Chronic pain	Chronic			
	Chronic	Chronic			
	Chronic	Chronic			
	Chronic	Chronic			
	Chronic	Chronic			
	Chronic	Chronic			
	Chronic	Chronic			
	Chronic	Chronic			

**Result:**

Correct	Incorrect	Incorrect	Incorrect	Incorrect	Incorrect

**Wrong Answer Explanations**

Provide explanation or message

100%

100%

100%

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Slide 83

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Slide 85



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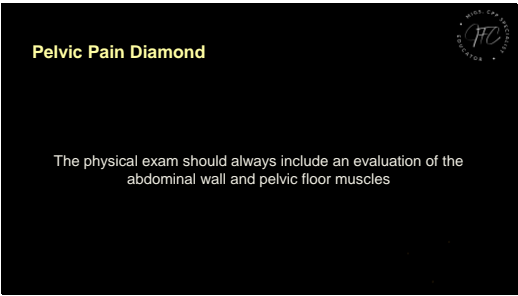
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Slide 86



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Slide 87



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Slide 88

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Slide 89

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## Slide 90

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graph TD
    A[1 Identification of pain causes and exacerbators: Gastrointestinal, urologic, gynecologic, musculoskeletal, neurological, or environmental] --> B[2 Discussion with patient: Pain education, setting expectations and goals, and establishing a plan for multimodal therapy and interdisciplinary treatment]
  
```

ACI indicates adverse childhood events; MST, military sexual trauma; and PTSD, posttraumatic stress disorder.

Slide 91

Definitions

Multimodal → combination of multiple therapeutic components  
(not necessarily provided by different operators)

Quatt E. et al. Differences in Multidisciplinary and Interdisciplinary Treatment Programs for Fibromyalgia: A Mapping Review. Pain Res Manag. 2017; 22(1):455-465.  
B. C. Choi and A. W. Pak. "Multidisciplinary, interdisciplinary and transdisciplinary in health research, services, education and policy": 1. Definitions, objectives, and evidence of effectiveness. Clinical and Investigative Medicine, vol. 28, no. 6, pp. 357-364, 2006.

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Slide 92

Definitions

Multidisciplinary → refers to the addition of the competencies of multiple professionals who stay within the boundaries of their fields

Quatt E. et al. Differences in Multidisciplinary and Interdisciplinary Treatment Programs for Fibromyalgia: A Mapping Review. Pain Res Manag. 2017; 22(1):455-465.  
B. C. Choi and A. W. Pak. "Multidisciplinary, interdisciplinary and transdisciplinary in health research, services, education and policy": 1. Definitions, objectives, and evidence of effectiveness. Clinical and Investigative Medicine, vol. 28, no. 6, pp. 357-364, 2006.

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Slide 93

Definitions

Interdisciplinary → denotes that the various disciplines are coordinated toward a common and coherent approach

Quatt E. et al. Differences in Multidisciplinary and Interdisciplinary Treatment Programs for Fibromyalgia: A Mapping Review. Pain Res Manag. 2017; 22(1):455-465.  
B. C. Choi and A. W. Pak. "Multidisciplinary, interdisciplinary and transdisciplinary in health research, services, education and policy": 1. Definitions, objectives, and evidence of effectiveness. Clinical and Investigative Medicine, vol. 28, no. 6, pp. 357-364, 2006.

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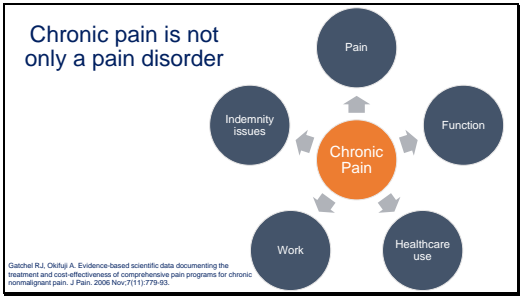
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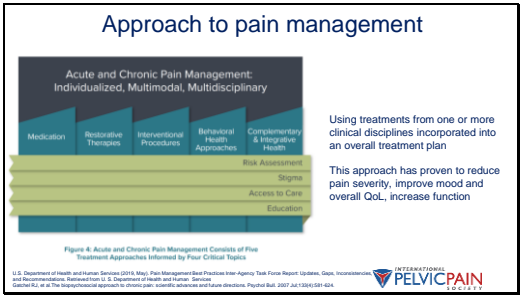
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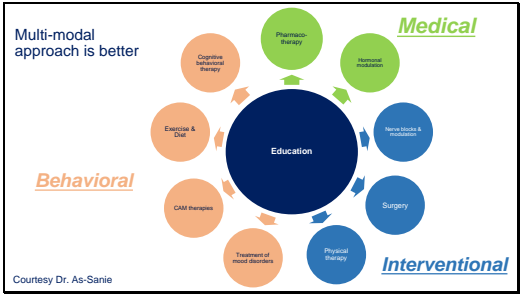
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Slide 95

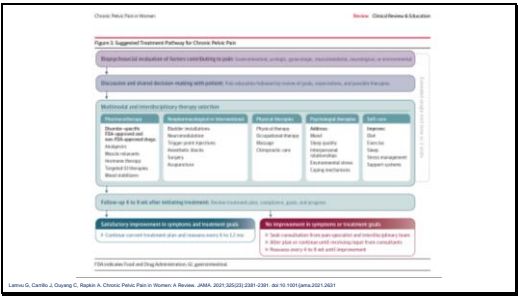


Slide 96

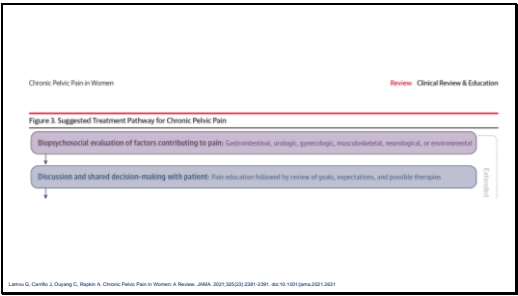




Slide 97



Slide 98



Slide 99

Pain education helps manage pain and improve quality of life

**PEP Program**

**PEP Program Description**

The PEP Program is a self-paced, online program designed to help women understand the complex nature of chronic pelvic pain (CPP) and learn effective strategies for managing their pain. The program includes a comprehensive overview of CPP, a detailed discussion of the biopsychosocial model of pain, and a series of interactive modules that explore the role of the mind, body, and emotions in the experience of pain. The program also provides information on the latest research in CPP management and offers practical advice on how to work with healthcare providers to develop a personalized treatment plan.

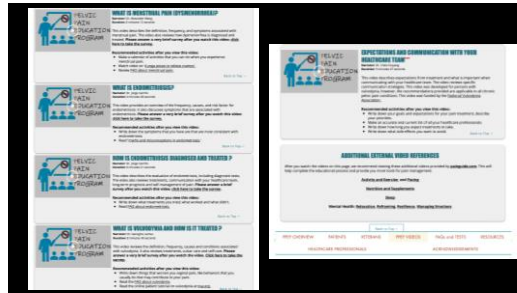
**PEP Program Objectives**

After completing the PEP Program, participants will be able to:

- Understand the complex nature of CPP and the role of the mind, body, and emotions in the experience of pain.
- Identify the various factors that can contribute to CPP, including physical, psychological, and social factors.
- Learn effective strategies for managing CPP, including behavioral, cognitive, and emotional strategies.
- Develop a personalized treatment plan that addresses the unique needs of each individual.
- Work with healthcare providers to develop a comprehensive approach to CPP management.

www.pelvicpaineducation.com

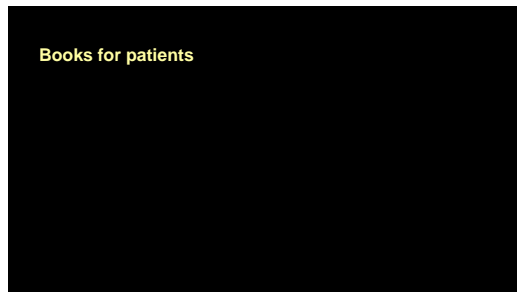
Slide 100



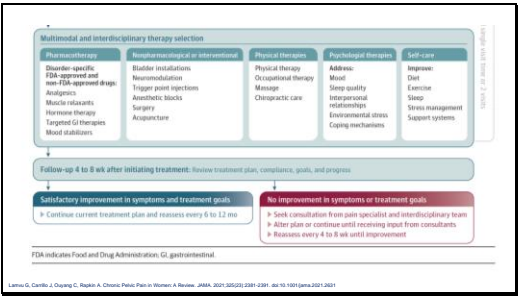
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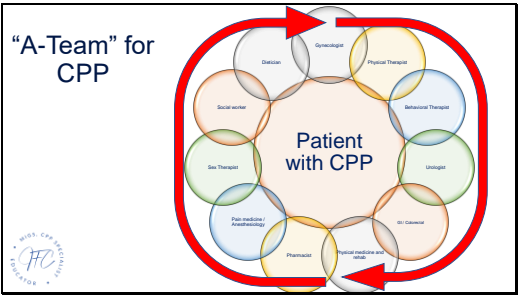
Slide 102



Slide 103



Slide 104



Slide 105

**Pelvic Pain Diamond**

Management should be multimodal and interdisciplinary, and always patient education is the first line of treatment

© 2020 American Medical Association

Slide 106

# Outline

Visceral innervation  


TI  


History intake  


Physical exam  


Management  


Red flags / when to refer  


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Slide 107

Slide 1

# Pelvic Pain from the Physical Therapy Perspective

NIKKI WOODS, PT, MS, PRPC  
PELVIC REHAB PRACTITIONER CERTIFIED  
CERTIFIED IN FUNCTIONAL DRY NEEDLING

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Slide 2

Nikki Woods, PT,  
MS, PRPC

- ▶ BS Exercise Science at the University of Alabama - 1997
- ▶ UAB, PT, MS - 2000
- ▶ State Representative APTAs SoWH 2001-2005
- ▶ Helped develop course -IPPS: Anatomical and Biomechanical Implications for the Treatment of Patients with Chronic Pelvic Pain, June 2006
- ▶ PRPC - Expert in field of Pelvic Rehab - 2014
- ▶ Director of Pelvic Rehab TherapySouth - 2015
- ▶ State Representative Section of Women's Health - 2015-2020 (Academy of Pelvic Health Physical Therapy)
- ▶ Partner TherapySouth Homewood-2016-2022
- ▶ Director of Pelvic Health TherapySouth-current
- ▶ Passionate about Mentoring young therapists

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Slide 3

## Educational Objectives

- ▶ Participant will be able to understand the role of the pelvic rehab practitioner for their patients
- ▶ Participant will be able to describe the PT evaluation and understand treatments available to and for their patients
- ▶ Participant will be able to recognize common diagnoses appropriate for conservative management of their patients utilizing pelvic physical therapy
- ▶ Participant will learn current research related to pelvic rehab, new treatment options, available training and course offerings for multidisciplinary teams
- ▶ Participant will be able to utilize PT finder with APTA's Academy of Pelvic Health and Herman and Wallace Pelvic Institute

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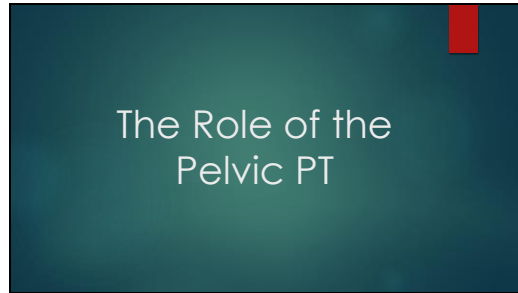
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Slide 4



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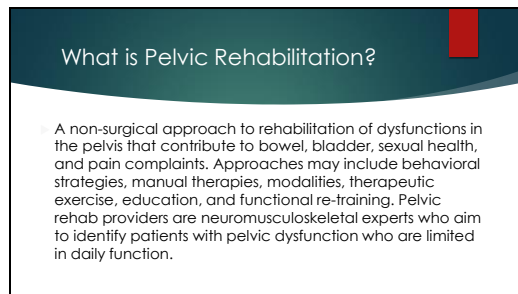
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Slide 5



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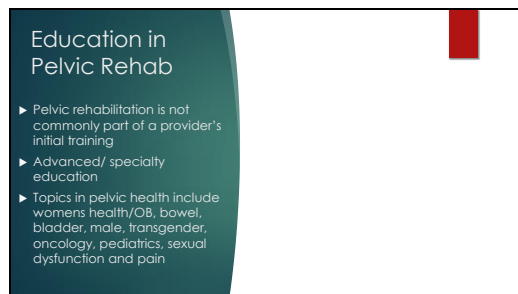
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Slide 6



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Slide 7

Requirements  
for  
Certification  
as a Specialist:  
Academy of  
Pelvic Health  
PT

- ▶ APTA Certificate of Achievement in Pelvic Health and Pregnancy/Postpartum (education, training, testing)
  - ▶ CAPP-Pelvic: Complete Course Pelvic Health Level 1, 2 and 3
  - ▶ CAPP-OB: Required courses in pregnancy and post partum
- ▶ Women's Health Clinical Specialist Certification (WCS) – Board Certification overseen by the ASPTS – proves skills exceeds that of entry level PF unique to area of women's health description of specialty practice
  - ▶ Opt A – 2,000 hours in specialty area; case reflection last 3 years
  - ▶ Opt B – Post professional Residency; case study last 3 years

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Slide 8

Herman and  
Wallace  
Pelvic  
Rehabilitation  
Institute

- ▶ Herman and Wallace Pelvic Rehabilitation Institute
- ▶ PRPC – Pelvic Rehabilitation Practitioner Certification- pass of exam, distinguished as expert in field of Pelvic Rehabilitation-2000 hours last 8 years, 500 in last 2 years

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Slide 9

Benefits of Pelvic Rehab

-  Many patients respond well to education and instruction in self-care – PFPT is a conservative first line treatment for PF Disorders
-  Most patients are already familiar with physical therapy and know that conservative care can benefit other body conditions
-  Patients and even many allied health care providers are still unaware that therapists have skills in treating pelvic conditions

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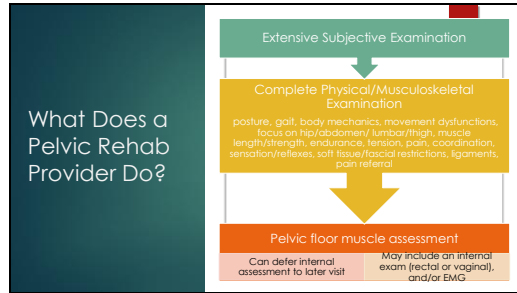
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Slide 10



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Slide 11



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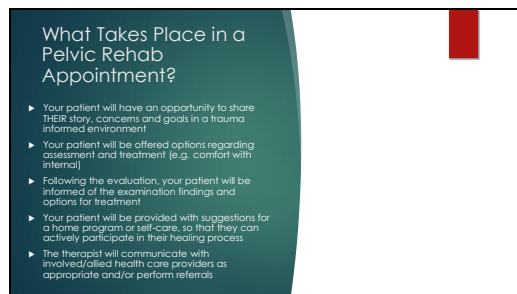
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Slide 12



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Slide 13

# The Pelvic Pain Patient

RECOGNIZING PELVIC PAIN –NOT FEARING THE PATIENT

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Slide 14

# Pain Affects Everyone Differently

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Slide 15

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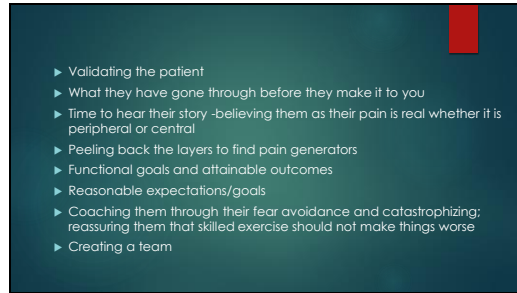
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## Slide 16

A dark teal slide with a red rectangular tab on the top right. It contains a bulleted list of seven points related to patient validation and treatment goals.

- ▶ Validating the patient
- ▶ What they have gone through before they make it to you
- ▶ Time to hear their story -believing them as their pain is real whether it is peripheral or central
- ▶ Peeling back the layers to find pain generators
- ▶ Functional goals and attainable outcomes
- ▶ Reasonable expectations/goals
- ▶ Coaching them through their fear avoidance and catastrophizing: reassuring them that skilled exercise should not make things worse
- ▶ Creating a team

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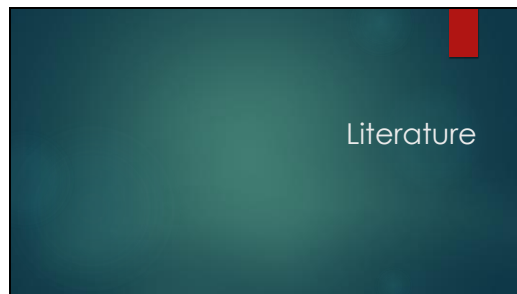
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## Slide 17

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Literature

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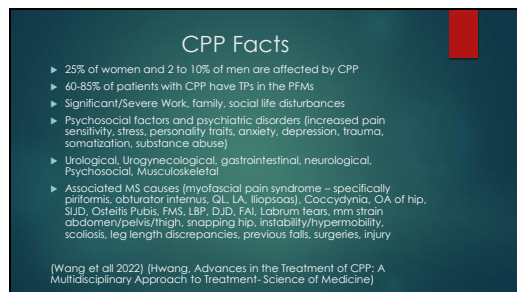
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## Slide 18

A dark teal slide with a red rectangular tab on the top right. The title "CPP Facts" is centered. Below it is a bulleted list of nine facts. At the bottom, there is a citation in small text.

CPP Facts

- ▶ 25% of women and 2 to 10% of men are affected by CPP
- ▶ 60-85% of patients with CPP have TPs in the PFMs
- ▶ Significant/Severe Work, family, social life disturbances
- ▶ Psychosocial factors and psychiatric disorders (increased pain sensitivity, stress, personality traits, anxiety, depression, trauma, somatization, substance abuse)
- ▶ Urological, Urogynecological, gastrointestinal, neurological, Psychosocial, Musculoskeletal
- ▶ Associated MS causes (myofascial pain syndrome – specifically piriformis, obturator internus, QL, LA, iliopsoas), Coccydynia, OA of hip, SJD, Osteitis Pubis, FMS, LBP, DJD, FAI, Labrum tears, mm strain abdomen/pelvis/thigh, snapping hip, instability/hypermobility, scoliosis, leg length discrepancies, previous falls, surgeries, injury

[Wang et al 2022] [Hwang, Advances in the Treatment of CPP: A Multidisciplinary Approach to Treatment- Science of Medicine]

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Slide 19

### Chronic Pelvic Pain Relatives

- ▶ Endometriosis, IC, PN, IBS, FMS, chronic fatigue adenomyosis, other pelvic myalgias (Mullebrilly -Pelviccon 2023)
- ▶ Pelvic Floor Myofascial Pain, Dyspareunia and vaginismus, Vulvodynia.

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Slide 20

### Pelvic Floor Myofascial Pain

- ▶ PFPT is considered the first line therapy of myofascial pain and spasm

Wallace et el 2019

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Slide 21

### Pain and the Brain

- ▶ Women with chronic pelvic pain and/or endometriosis demonstrate changes in brain areas involving pain perception
- ▶ Rehab approaches are increasingly following biopsychosocial models and instructing patients in behavioral modification practices to overcome chronic pain patterns

As-Sanie et al., 2012

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Slide 22

### Pelvic Rehab for IC/PBS (Interstitial Cystitis/Painful Bladder Syndrome)

- ▶ American Urological Association (AUA) updated guidelines list PT as "second line" treatment following education, behavioral modifications, and stress management
- ▶ PT components can include manual therapy and avoiding pelvic muscle strengthening

Hanno, 2011

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Slide 23

### Pelvic Rehabilitation for Pelvic Pain

- ▶ The Agency for Healthcare Research and Quality (AHRQ) has stated that because of the lack of evidence for surgery when treating pelvic pain, a referral to physical therapy is suggested

Urinary Incontinence, 2012

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Slide 24

### Pelvic Rehabilitation for Pelvic Pain

- ▶ In a multicenter feasibility study, patients treated with myofascial pelvic pain therapy reported a 57% global response assessment improvement

Fitzgerald et al., 2009

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Slide 25

### "Non-relaxing Pelvic Floor"

- ▶ From Mayo Clinic Proceedings
- ▶ Cause impaired defecation, urination, and sexual function
- ▶ Authors suggest early referral to physical therapy, a "cornerstone of management"
- ▶ Look for cluster of symptoms: voiding dysfunction, constipation, dyspareunia, low back pain, pelvic pain

Faubion, 2012

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Slide 26

### Counseling on PFPT

- ▶ Despite low risk high success rate, perception and knowledge of this option is poor
- ▶ Patients dismiss option to utilize PFPT bc of discomfort with exams
- ▶ Educating patients regarding treatment can decrease anxiety and negative perceptions surrounding PFPT
- ▶ Providing handouts and educating clinical staff on details of PT can further improve compliance
- ▶ PTs and referral sources/allied professionals should communicate openly and frequently

(Wolters Kluwer Health, Inc. Urogynecology 31:00, 2019)

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Slide 27

### If we can reproduce it....perhaps we can treat it!

IF WE CAN'T (WITH ALL OTHER PATHOLOGIES RULED OUT).....OUR FOCUS NEEDS TO BE ON RETRAINING THE BRAIN!!!

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## Slide 28

### HIGH TONE PFM

- ▶ **SYMPTOMS:** mm spasm with weakness or inability to relax, tenderness/TPs, decreased contractility and pain (back, hip, perivaginal, rectal, lower abdomen, anterior/posterior thigh, coccyx); urgency/frequency, incontinence, vulvar or clitoral burning, PGAD, referred pain, dyspareunia
- ▶ **CAUSES:** joint mal-alignment, pelvic fracture, habitual postural dysfunction, childbirth trauma, surgical trauma, sexual abuse, hemorrhoids, referred viscero-somatic pain, dyspareunia, vaginismus, vulvodynia, snapping hip, FAI
- ▶ **TREATMENT:** medical management of hyperactive ANS, manual therapies, trigger point dry needling with stim, modalities (ultrasound, iontophoresis, electrical stimulation, shockwave), biofeedback, neuromuscular re-education, EXERCISE, external supports, postural and body mechanics education, self mobilizing/corrective techniques, behavior and dietary modification, COMPREHENSIVE HEP.

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## Slide 29

### Electrotherapeutic Modalities

- ▶ *NMES – used to excite motor and sensory fibers of the pudendal nerves, producing a pelvic floor contraction -> produces a reflex inhibition of the detrusor muscle. NMES is suitable for pelvic floor relaxation, detrusor instability, and sphincter incompetence. (must have S2-4 reflex)*
- ▶ Biofeedback
- ▶ Estim for pain (IFC/TENS/HVPG)
- ▶ FDN with stim low and high frequency

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## Slide 30

### Biofeedback

- ▶ About two thirds of patients with pelvic floor dyssynergia should benefit from biofeedback training
- ▶ Biofeedback is reported to benefit more than half of patients with evidence of pelvic floor dyssynergia, but mechanisms of action are still unclear and controlled studies are lacking
- ▶ The suspicion of impaired defecation may be confirmed by the patient's inability to expel a rectal balloon.
- ▶ Sensory training, electromyographic feedback, and manometric feedback
- ▶ Literature reviews conclude that more than 70% of adult patients complaining of pelvic floor dyssynergia are likely to benefit from biofeedback training, and so this is the treatment of choice for the problem.

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Slide 31

### The GI Connection

- ▶ Constipation/rectal prolapse/dyssnergia
- ▶ Dietary Modification for inflammation
- ▶ Fecal incontinence
- ▶ Fecal urgency
- ▶ Pain with defecation
- ▶ Irritable bowel syndrome
- ▶ Anal fissures
- ▶ Hemorrhoids

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Slide 32

### Importance of Team Approach

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Slide 33

### Lifestyle Modifications and Behavioral management

- SLEEP HYGIENE, MEDITATION, STRESS MANAGEMENT, YOGA/PILATES, MINDFULNESS, PSYCHOTHERAPY, DIETARY MODIFICATIONS (ANTI-INFLAMMATORY DIET)

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Slide 34

### How do we advocate for these patients?

- Stay informed in latest evidence- based practices and treatment options. Educated in allied health care resources available for collaboration
- Decrease bias, judgement, burnout, medical trauma or language that may be a trauma trigger, refer if unable to deliver the care they deserve
- Communicate with Allied Health Care / Multidisciplinary team

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Slide 35

### Pain Science Education for CPP

► NEW PELVIC Pain Science Course: H and W - Tara Sullivan

This continuing education course is designed for the pelvic rehab specialist who wants to expand their knowledge, experience and treatment in understanding and applying pain science to the chronic pelvic pain population including endometriosis, interstitial cystitis, irritable bowel syndrome, vaginismus, vestibulodynia, primary dysmenorrhea, and prostatitis. This course provides thorough introduction to pain science concepts including classifications of pain mechanisms, peripheral pain generators, peripheral sensitization and central sensitization in listed chronic pelvic pain conditions; as well as treatment strategies including therapeutic pain neuroscience education, therapeutic alliance, and the current rehab interventions' influence on central sensitization. This evidence-based course will provide the rehab professional the understanding and tools needed to identify and treat patients with chronic pelvic pain from a pain science perspective.

Lecture topics include the history of pain, pain physiology, central and peripheral sensitization, sensitization in chronic pelvic pain conditions, therapeutic alliance, pain science and trauma-informed care, therapeutic pain neuroscience education, the influence of rehab interventions on the CNS, and specific case examples for sensitization in CPP.

~Dr. Tara Sullivan, PT, PRPC, WCS, IF

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Slide 36

### Apps Available for Patient HEPs

- Curable
- Calm
- Pelvic Sense

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Slide 37

### How to Find a Pelvic Rehab Provider

- ▶ [www.pelvicrehab.com](http://www.pelvicrehab.com)
  - ▶ "Products and Resources" tab to find the "Practitioner Directory"
  - ▶ On the website you will also find a list of therapists who are Certified Pelvic Health Practitioners, and who have demonstrated expertise and knowledge of pelvic health
- ▶ [www.optapelvichealth.org](http://www.optapelvichealth.org) – "Find a PT"
  - ▶ For the Public
  - ▶ Find a Physical Therapist – CAPP Pelvic, CAPP OB, WCS

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Slide 38

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- ▶ Medbridge Courses for Pelvic Floor
- ▶ Herman and Wallace Courses for PF
- ▶ [G. Bassotti, F. Chistolini, F. Silechiping-Nzema, G. de Roberto, A. Morelli](#), professor of [G. Chiarioni, R.M.I.](#) Biofeedback for pelvic floor dysfunction in constipation. 2004 Feb 14; 328(7436): 393–396. Biofeedback for pelvic floor dysfunction in constipation

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Slide 39

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- ▶ American College of Obstetricians and Gynecologists. Committee opinion no. 736: optimizing postpartum care. Obstet Gynecol 2018;131:140-150.
- ▶ Medbridge Education: Introduction to Caring for the Pregnant Patient. Holly Tanner, PT, MA, OCS, WCS, LMP, BCB-PMB, CCI.

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## Slide 40

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- ▶ Wallace et al. Urogynecology: Pelvic Floor Physical Therapy in the treatment of pelvic floor dysfunction in Women. 2019 31:00

## Slide 41

### Journal Articles/Organizations – Evidence in Practice

- ▶ Bo and Sherburn 2005. Evaluation of Female Pelvic-Floor Muscle Function and Strength. Physical Therapy. 2005;85: 269-281.
- ▶ Journal of the Section of Women's Health
- ▶ Journal of the American Medical Association
- ▶ International Pelvic Pain Society
- ▶ National Vulvodynia Association
- ▶ Neuroural Urodyn (International Continence Society)
- ▶ Pudendalhelp.com
- ▶ Tipna.org
- ▶ HOPE – Health Organization for Pudendal Education

## Slide 42

### Contact Information

- ▶ Nikki Woods, PT, MS, PRPC, Director of Pelvic Health TherapySouth
- ▶ [Nwoods@Therapysouth.net](mailto:Nwoods@Therapysouth.net)
- ▶ [www.therapysouth.com/homewood](http://www.therapysouth.com/homewood)

Slide 43



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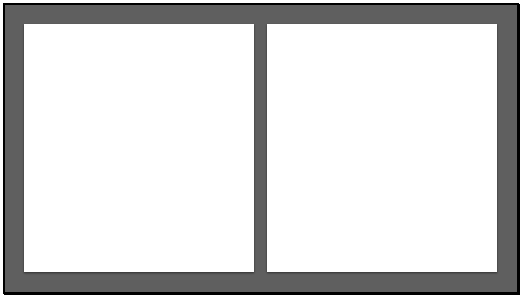
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Slide 44



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Slide 1

# How to Beat the Pain of Aging: New Understandings and Possibilities



Amber K. Brooks, MD, MS  
Vice Chair Justice, Equity, Diversity, and Inclusion  
Associate Professor of Anesthesiology  
Justice Thread Director, Wake Forest School of Medicine

Southern Pain Society's 37<sup>th</sup> Annual Meeting, New Orleans



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Slide 2

## Disclosures

- No financial disclosures or conflicts of interest related to this presentation

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Slide 3

## Objectives:

1. Provide background re: chronic pain and older adults
2. Discuss the challenges and treatment strategies for pain management in older adults
3. Summarize current research aimed at improving pain care in sedentary, obese, older adults

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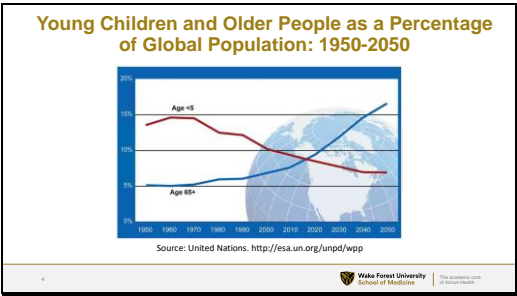
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Slide 4



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Slide 5

### Older Adults with Chronic Pain: Prevalence & Disparities

- Prevalence estimated to be as high as 75%
- Most common sites of pain: back, knee, shoulder, and hip
- Disparities in Care Exist
  - Racial/ethnic minority older adults report ↑ prevalence of pain and pain intensity
  - Minority adults less likely to receive prescription pharmacologic treatments & surgery

Abdulla et al, 2013; Lavin et al, 2014

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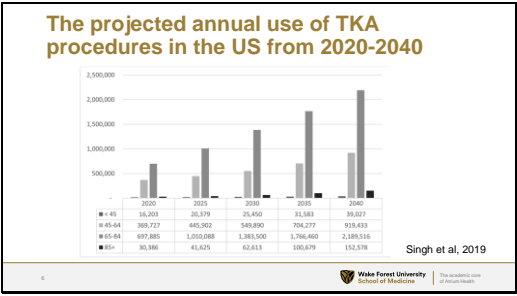
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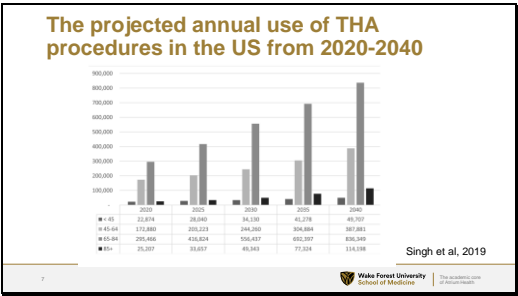
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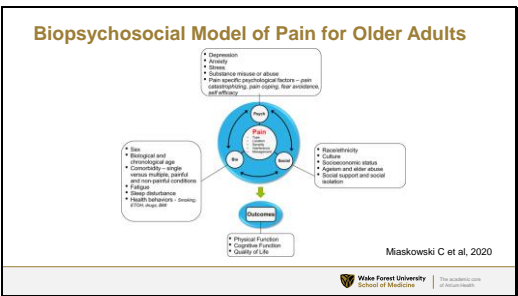
Slide 8

**Chronic Pain and Obesity**

- Obesity prevalence: 45% among adults 40-59 years old and 43% among adults aged 60 and older
- Abdominal obesity nearly doubles the risk for chronic pain in older adults
- Stronger opioid medications
- Increased pain severity
- Multisite pain

<https://www.cdc.gov/obesity/data/adult.html>; Hitt et al, 2007; Thomazeau et al, 2014; Ray et al, 2011

Slide 9



Slide 10

### AGS Guidelines for Pharmacological Management of Persistent Pain in Older Adults, 2009

*All patients with moderate to severe pain, pain-related functional impairment, or diminished quality of life due to pain should be considered for opioid therapy (low quality of evidence, strong recommendation).*

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Slide 11

### Older Adults: The Unseen Face of the Opioid Epidemic

- Among past-year prescription opioid users, **7% of adults ≥50 years old reported misuse**
- Abuse **higher among males** and **adults ages 50-64**
- **Higher prevalence of SUD** among older adults who misuse prescription opioids

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Han et al, 2019

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Slide 12

**JAG**  
GERONTOLOGICAL  
SOCIETY OF AMERICA

10th AGS Symposium in Aging  
19th AGS Symposium in Aging 2019, Nov. 1-3, 2019  
10th AGS Symposium in Aging  
19th AGS Symposium in Aging 2019, Nov. 1-3, 2019


**JAG**  
GERONTOLOGICAL  
SOCIETY OF AMERICA


Original Research Article

### Increasing Rates of Opioid Misuse Among Older Adults Visiting Emergency Departments

- ED visits for opioid misuse by adults ≥65 years old, increased 220% over 8 year study period. Opioid misuse was associated with an increased number of **chronic conditions, greater injury risk, higher rates of alcohol dependence, and mental health diagnoses.**

10/1/2019

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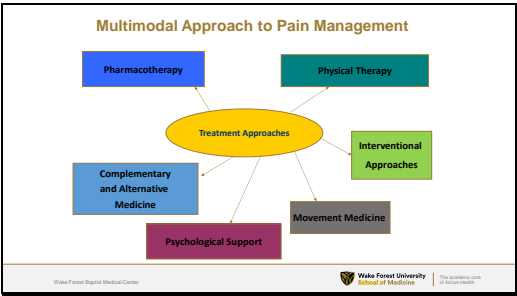
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Slide 13



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Slide 14

**Adjuvant Medications/Therapies**

- Topical preparations
  - Lidocaine patch, capsaicin
- Acetaminophen (not to exceed 3000 mg/day)
- Anticonvulsants (Gabapentin and Pregabalin)
- Antidepressants (Duloxetine and TCAs-Nortriptyline preferred over Amitriptyline in older adults due to fewer anticholinergic SEs)
- Non-pharmacologic (TENS, PT/OT)

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Slide 15

**NSAIDs**

- A study of adverse drug reactions as cause of hospitalization adults  $\geq 65$  implicated NSAIDs in 23% of cases
- Upper GI ulcers, GI bleeding, or perforation caused by NSAID occur in approximately 1% of older adults treated for 3–6 months and in ~2–4% of patients treated for 1 year

Wongrakpanich S et al, 2018

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### NSAIDS

- **Celecoxib** (Cox-2 inhibitor): higher doses associated with ↑ GI and CV side effects
- **Diclofenac** (Cox-1 and Cox-2 inhibitor): ↑ CV side effects
- **Naproxen**: may possess less CV side effects
- **Ketorolac and Indomethacin**: high potential for GI and renal toxicity
- **Take away**: Adults ≥75 at greatest risk GI bleed; use lowest dose for shortest period of time; use combo medications (PPI/misoprostol + NSAID); check renal function; follow BP

Wongrakpanich S et al, 2018

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### Physical Activity and Aging

- Preserve Mobility
- Reduce Falls
- Improve Cognition

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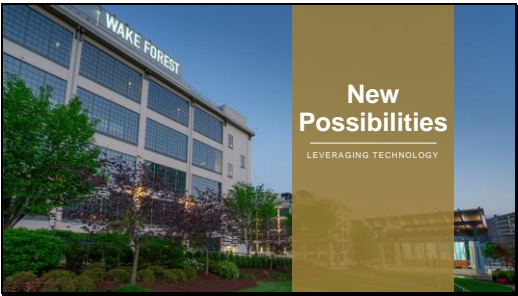
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### Movement Medicine

- Stretches in the morning
- Move for 10 mins every hour while awake
- Warm water therapy
- Small, doable goals
- Senior sneaker programs (YMCA, community centers)

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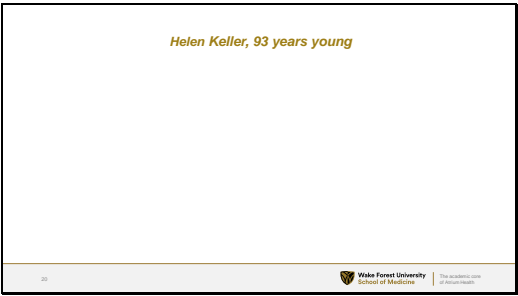
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Slide 20



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Slide 21



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Slide 22

### Bridging the Gap with Technology

In US, digital health startup investment increased to **\$38 billion in 2020**, up from \$22 billion in 2020  
<https://www.fiercehealthcare.com/digital-health/digital-health-startups-around-world-raised-57-2b-2021-up-79-from-2020>  
Gupta et al, 2017

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### Wearable Devices: Opportunities

- Provide objective data (performance-based measures)
- Monitor physiologic response e.g., heart rate variability
- Assess health behaviors e.g., sleep

Peake JM et al, Front Physiol, 2018

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### Wearable Devices: Challenges

- Older adult willingness
- Limited data/research in the field of pain
- Studies that show improvement in pain and/or physical function most often include a behavioral intervention component
- Performance data needs to be considered along side other pain related data e.g., mood, sleep, environment, medication use to increase meaningfulness



Davergne T et al, Arthritis Care Res, 2019  
Leroux A et al, Digit Biomark, 2021

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### Mobile Health (mHealth)

WHO definition: medical and public health practice supported by mobile devices (smart phones, tablets)



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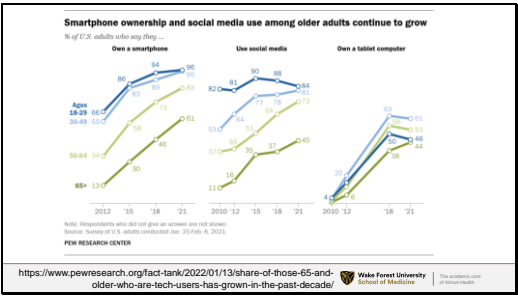
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### mHealth App Opportunities

- Track/monitor pain and pain-related symptoms and goals over time
- Deliver health interventions
- Bi-directional communication with interventionist/provider
- Enhance socialization



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Slide 28

EDITORIAL

Developing mHealth Applications for Older Adults with Pain: Seek Out the Stakeholders! Kozlov E and Reid CM, Pain Medicine, 2018

- Stakeholders not involved in development
- Lack user center design
- Dearth of knowledge re: benefits/risks

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mHealth App Barriers to Engagement/Adoption

- **Patient barriers:** data entry, perceived value, tech literacy, functional limitations, privacy, reminder "you're a sick person"
- **Provider barriers:** limited training, info overload, reimbursement, evidence of benefit lacking
- **System barriers:** integrating mhealth data (privacy and storage), lack of standards, legal issues, cost issues

Knapova et al., J Med Internet Res, 2020; Airola et al., J Med Internet Res, 2021; Ware et al., Int J Med Res 2017; Ancker et al., J Med Internet Res, 2015; Pan et al., JMIR Aging, 2012; Levine et al., Pain Med 2014; De Groot et al., J Multidiscip Healthcare, 2016; Jacob et al., JMIR Mhealth Uhealth, 2020

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A Mobile Intervention to Reduce Pain and Improve Health (MORPH) in Older Adults With Obesity




Dr. Jack Rejeski



Dr. Barb Nicklas



Dr. Edward Ip



Dr. Jason Fanning

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### MORPH

- MORPH targets weight loss and movement
- Study population: low-active 55-85 year olds with chronic multisite pain
- MORPH I: Two-phase development study (n=28)
  - Phase 1: Intensive iterative development
  - Phase II: 12-week RCT
- MORPH II: delivered 100% virtually with emphasis on movement throughout the day (n=40)

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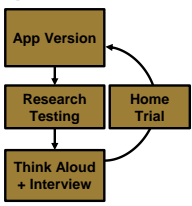
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### User Center Design

- Individual participants attend a Think aloud + interview session
- Sent home with mHealth suite, and asked to use for one week to identify usability issues
- Report system usability after one week of use



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graph TD; A[App Version] --> B[Research Testing]; B --> C[Think Aloud + Interview]; C --> D[Home Trial]; D --> A;
```

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## MORPH I Results: Lessons Learned

**Phase I (development):** technological and user interface modifications

**Phase II (RCT):**

- **Physical Function:** Improvement in short physical performance battery scores (0.63 points), moderate effect on sedentary time, moderate improvement in self-efficacy for walking, large improvements in satisfaction for physical functioning, improvement of physical functioning subscales of the SF-36
- **Pain:** moderate-to-large improvement in pre-post PROMIS pain intensity scores
- **Weight loss:** large difference in pre-post body weight (2.90 kg)

Fanning J et al, Front Digit Health, 2020  
Fanning J et al, Int J Behav Med, 2022

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## MORPH Next Steps

- Similar finding to other feasibility/pilot studies which document short-term benefits
- Plan to conduct multi-site longitudinal study to evaluate long term efficacy, benefits, and risks

Martin et al, Res Nursing Health 2021  
Morman et al, Pain Med 2019

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## Conclusion

- Chronic pain in older adults is complex and challenging to treat
- Digital technology may help bridge the treatment gap
- Research needed to address gaps:
  - What motivates patients to adopt/continue to use tools?
  - Long term benefits/risks
  - Studies needed that demonstrate value to patients, providers, and payors

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## Treatment of Post Traumatic Migraine Headaches with OnabotulinumtoxinA and Occipital Nerve Block

### Abstract:

#### Objective

A chart review of patients receiving OnabotulinumtoxinA for post-traumatic migraine was performed to determine whether any additional benefit could be derived by providing occipital nerve block simultaneously with OnabotulinumtoxinA for patients with post-traumatic migraine headaches.

#### Method

A chart review was performed of patients in our clinic whose treatment reflected the PREEMPT1 and PREEMPT2 trials in the following aspects: patients suffering chronic migraines, at least 24 weeks of evaluation, 2 treatments of OnabotulinumA toxin 10-12 weeks apart, and patients were encouraged to use headache rescue medication as needed. Patients' treatment differed from the PREEMPT1 and PREEMPT2 trials in the following aspects: all of our patients had suffered blunt trauma or electrical trauma prior to experiencing chronic migraines; patients were encouraged to continue all current headache treatments (if any), patients received 200 units of OnabotulinumtoxinA per treatment (PREEMPT1 used 155 units per treatment, and PREEMPT2 used 195 units per treatment). In addition, the patients received nerve blocks with lidocaine and bupivacaine to the greater, lesser, and third occipital nerves with each OnabotulinumtoxinA treatment.

#### Results

The PREEMPT1 and PREEMPT2 trials evaluated the effectiveness of OnabotulinumtoxinA for chronic migraine and found a reduction in migraine days of 7.8 and 9.2 days per 28 days respectively. By contrast, patients who received concurrent nerve block averaged a reduction in headache days an average of 19.86 days per 28 day period.

#### Summary

Occipital nerve block provided with OnabotulinumtoxinA treatment reduces headache days per month greater than does OnabotulinumtoxinA administration alone.

#### Key Words

Migraine, OnabotulinumtoxinA, Occipital Nerve Block

Pages: 1  
Words: 300  
References: 5  
Guarantor: Belal Alammar  
Email: balamm@lsuhsc.edu

**A Meta-Analysis of the Efficacy, Safety, and Ease of Use of Iontophoretic Transdermal Fentanyl and Intravenous Morphine Patient Controlled Analgesia**

Belal Alammar, MD<sup>1</sup>, Gerald M. Bowers, MD<sup>2</sup>, William Heidman, MD<sup>3</sup>, Samantha O'Connell, MS<sup>4</sup>, Katherine Cox, MD<sup>5</sup>

<sup>1</sup>Louisiana State University School of Medicine, 1901 Perdido Street, New Orleans, LA 70112

<sup>2-5</sup>Tulane University School of Medicine, 1430 Tulane Avenue, New Orleans, Louisiana 70112

**Keywords:** Fentanyl, morphine, transdermal iontophoresis, postoperative pain, patient-controlled analgesia, patient ease of care

Funding/COI: None

## ABSTRACT

**OBJECTIVE:** The fentanyl iontophoretic transdermal system (ITS) provides an alternative to traditional patient-controlled IV analgesia. It has been shown to have equivalent efficacy and safety to morphine IV-PCA for inpatient pain management.<sup>1</sup> Fentanyl ITS has higher favorability among patients and nursing staff<sup>1</sup>, less limitations on patient mobility<sup>2</sup>, and reduced staff time and cost compared with morphine IV-PCA.<sup>3</sup> This large-scale meta-analysis examined satisfaction ratings, efficacy, and safety of fentanyl ITS compared to morphine IV-PCA for inpatient pain management.

**METHODS:** Procedures indicated by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. After screening 181 studies, 10 studies were included in this meta-analysis. Meta-analysis primary outcomes of interest were satisfaction ratings (questionnaires), efficacy (pain scales) and safety (adverse event incidence).

**RESULTS:** Fentanyl ITS was significantly associated with a 0.209 (CI: 0.154, 0.265) greater score in patient ease of care (EOC) and a 0.573 (CI: 0.642, 0.505) greater score in nurse EOC when compared to morphine IV-PCA. Subjective assessments of analgesia using the Patient Global Assessment Scale (PGA), Numeric Rating Scales (NRS) and Visual Analogue Scale (VAS) were not significantly different between fentanyl ITS and morphine IV-PCA.

Fentanyl ITS had a significantly lower risk of pruritus (0.657, CI: 0.458, 0.942), hypotension (2.679, CI: 1.864, 3.849), and respiratory depression (0.417, CI: 0.180, 0.965) when compared to morphine IV-PCA.

**CONCLUSIONS:** Fentanyl ITS was significantly associated with favorable scores in patient ease of care (EOC) and nurse EOC when compared to morphine IV-PCA. Fentanyl ITS and morphine IV-PCA demonstrated equal efficacy for the treatment of postoperative pain.

Fentanyl ITS had a significantly lower risk of pruritus, hypotension, and respiratory depression when compared to morphine IV-PCA.

**SUMMARY:** Fentanyl ITS provides efficacious post-operative pain control with higher satisfaction ratings and a lower incidence of pruritus, hypotension and respiratory depression when compared to morphine IV-PCA.

## REFERENCES

- 1) Grond S, et al. Iontophoretic Transdermal System Using Fentanyl Compared with Patient-Controlled Intravenous Analgesia Using Morphine for Postoperative Pain Management. *Br J Anaesth.* 2007;98(6): 806–815.
- 2) Hartrick C, Bourne M, Gargiulo K, et al. Fentanyl iontophoretic transdermal system for acute-pain management after orthopedic surgery: a comparative study with morphine intravenous patient controlled analgesia. *Reg Anesth Pain Med.* 2006;31:546–554.
- 3) Viscusi E, et al. An Iontophoretic Fentanyl Patient-Activated Analgesic Delivery System for Postoperative Pain: A Double-Blind, Placebo-Controlled Trial. *Anesth Analg.* 2006;102(1):188–194.

## **Glomus Tumor: A Rare Cause of Radicular-Like Symptoms Discovered Using Ultrasound**

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LSU Pain Medicine Fellow

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Casey Murphy, M.D., F.A.A.P.M.R., D.A.A.P.M.

Program Director, LSU Pain Medicine Fellowship

**Background:** Glomus bodies are specialized arteriovenous anastomoses functioning as thermoregulators in dermal and other soft tissues. Glomus tumors are rare mesenchymal hamartomas containing cells resembling the smooth muscle of the normal glomus body<sup>1</sup>. Digital glomus tumors are most commonly seen in the subungual region with females more likely to be affected<sup>2</sup>.

**Case Presentation:** A 31-year-old female presented with a 5-year history of neuropathic pain in her right upper extremity and hand. This complaint began insidiously in 2018 and was described as a painful burning sensation radiating from her fingertips up her forearm and arm. She endorsed allodynia radiating in the same pattern when handling hot and cold substances. She first presented to the VA physical medicine and rehabilitation clinic in July 2022 having already seen primary care, neurology, and hand surgery. Her work up at that time included two nerve conduction and electromyography studies looking for evidence of cervical radiculopathy or peripheral entrapment neuropathy, which were negative. Isolated clubbing and sensitivity to palpation of the distal right third digit were noticed, prompting ultrasound evaluation of the nailbed. A well-circumscribed 0.2x0.3cm hyper-vascular mass was discovered in the subungual region, highly suspicious for a glomus tumor. MRI of the finger was ordered, and the patient was referred to dermatology. MRI was consistent with a glomus tumor. The mass was removed, and surgical pathology confirmed the diagnosis. After resection, the patient had complete resolution of symptoms and has had no recurrence one year later.

**Discussion:** This case is unique in its use of in-office ultrasound to make the diagnosis. If used earlier in our patient's course, it may have prevented years of suffering and ineffective work-up. Earlier diagnosis would have also saved money for the healthcare system.

### **Citations:**

1. Gombos Z, Zhang PJ. Glomus tumor. Arch Pathol Lab Med. 2008 Sep;132(9):1448-52. doi: 10.5858/2008-132-1448-GT. PMID: 18788860.
2. Chou T, Pan SC, Shieh SJ, Lee JW, Chiu HY, Ho CL. Glomus Tumor: Twenty-Year Experience and Literature Review. Ann Plast Surg. 2016 Mar;76 Suppl 1:S35-40. doi: 10.1097/SAP.0000000000000684. PMID: 26808758.

**Title:** Peripheral nerve stimulation of lumbar medial branch nerve for treatment of facetogenic back pain

**Authors:** Loy Daniel Strawn, Jr., M.D., Kyle Glasser, M.D., Alethia Sellers, M.D.

**Introduction:** While PNS has commonly been used for treatment of pain in upper and lower extremities, it is increasingly being utilized in the treatment of chronic low back pain, a common condition that affects approximately 7.5% of the global population (1). Treatment targets for PNS in low back pain include stimulation of multifidus muscles and lumbar medial branch nerves.

**Case Report:** A 62-year-old female was referred to our pain clinic for chronic axial low back pain. She had previously undergone facet joint injections and radiofrequency ablations with initial success, however they were no longer providing meaningful pain relief. PNS was proposed as a treatment option. Using fluoroscopic guidance, a PNS lead was placed in close proximity to the left L4 medial branch nerve and position was confirmed with paresthesias in the distribution of her normal pain. At her 60-day follow-up, she reported 80% improvement in her pain and better quality of life.

**Discussion:** Chronic low back pain affects millions of individuals worldwide, with facetogenic pain being responsible for 15-45% of cases (2). PNS has been increasingly considered as a treatment option for these individuals with relatively low risk of side effects, however evidence has been limited to level II currently (3). Further studies are needed to determine which etiologies of back pain have the best response to PNS placement (3).

**Conclusion:** Placement of PNS at the L4 medial branch nerve provided meaningful pain relief for our patient with chronic facetogenic pain resistant to previous treatment options. Although future research is needed, PNS could be considered as a relatively safe and effective treatment option for patients with chronic low back pain in the future.

#### References:

1. D'Souza, R. S., Jin, M. Y., & Abd-Elseyed, A. (2023, April 15). Peripheral Nerve Stimulation for Low Back Pain: A Systematic Review. *Current Pain and Headache Reports*, 27(5), 117–128. <https://doi.org/10.1007/s11916-023-01109-2>
2. Perolat, R., Kastler, A., Nicot, B., Pellat, J. M., Tahon, F., Attie, A., Heck, O., Boubagra, K., Grand, S., & Krainik, A. (2018, August 8). Facet joint syndrome: from diagnosis to interventional management. *Insights Into Imaging*, 9(5), 773–789. <https://doi.org/10.1007/s13244-018-0638-x>
3. Xu, J., Sun, Z., Wu, J., Rana, M., Garza, J., Zhu, AC, Chakravarthy, KV, Abd-Elseyed, A., Rosenquist, E., Basi, H., Christo, P., & Cheng, J. (2021, March 19). Peripheral Nerve Stimulation in Pain Management: A Systematic Review. *Pain Physician*, E131–E152. <https://doi.org/10.36076/ppj.2021.24.e131-e152>

## *Displacement of the Superior Interspinous Spacer: A Rare Complication*

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Casey Murphy, M.D.

LSU Pain Medicine Fellowship Director

2021 Perdido ST, Suite 4344, New Orleans, LA 70112

### Introduction:

The Vertiflex Superior Interspinous Spacer (Vertiflex) is indicated for patients with mild to moderate spinal stenosis and neurogenic claudication.<sup>1</sup> It is a percutaneous, less invasive approach which may be an option for patients who are poor surgical candidates or do not want laminectomy +/- fusion. It has been shown to provide lasting relief.<sup>2</sup> Although rare, implant displacement is a known complication.<sup>3</sup>

### Case Report:

A 62-year-old male with a remote history of bilateral L4-L5 foraminotomy presented with chronic radicular low back pain and neurogenic claudication. A lumbar MRI showed mild central canal stenosis at L3-4 and severe central canal stenosis at L4-L5. Initial management included therapy, over the counter pain medications, and caudal epidural steroid injections which did not provide lasting relief. He was referred to the neurosurgery department and was offered lumbar fusion, but he ultimately decided on the Vertiflex procedure. He had it implanted at L3-L4 and L4-L5 without complication and was discharged with restrictions of 8-pound lifting for six weeks. Unfortunately, one week later he had a fall while lifting a generator during a hurricane. He returned one week later with worsening back pain. Computed Tomography scan and plain radiography showed posterior displacement of the L4-L5 spacer. Of note, he did not have bleeding or neurological damage; displacement only caused his pre-surgical pain to return. He was given the option of neurosurgery referral or to undergo Vertiflex revision. He elected to undergo revision later this month.

### Discussion:

The Vertiflex is effective in the management of mild to moderate spinal stenosis.<sup>4</sup> Device dislodgement and migration are known complications, with reported prevalence rates at 24 months ranging from 0%<sup>4</sup>-11.1%<sup>3</sup> respectively. An inherent advantage of the Vertiflex is that it is reversible.<sup>1</sup> If the device becomes dislodged or provides insufficient relief, it can be removed with little consequence and has no bearing on the patient's ability to proceed with surgical decompression<sup>2</sup>

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## **“Percutaneous Peripheral Nerve Stimulation of the Lumbar Medial Branch Nerves for 60 Days Improves the Quality of Life for Veterans with Low Back Pain”**

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### **Abstract**

**Objectives:** Peripheral Nerve Stimulation (PNS) of the lumbar medial branch nerves is a procedure that stimulates the multifidus muscles along the vertebral column to alleviate chronic axial low back pain via neuromodulation. Stimulation of the efferent nerves with subsequent multifidus muscle contractions creates the signals in the afferent proprioceptive neurons in hopes of breaking a chronic pain cycle caused by several common inflammatory modulators that stimulate nociceptive pain fibers. The goal of our case series aims to determine if PNS of the low back innervated by the medial branch nerves for 60 days improves the quality of life for United States Veterans with chronic lower back pain.

**Methods:** The five patients currently participating in the study were administered an SF-12v2 survey to complete both pre-operatively and post-operatively. The PNS SPRINT device was implanted for a total of 60 days and the post-operative survey was administered at the time of removal to analyze the quality-of-life changes in each patient. The SF-12v2 survey measures 8 domains (physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health) to assess an individual's MCS (Mental Composite Score) and PCS (Physical Composite Score). In addition, each patient was also questioned via a secondary survey as to whether they would recommend the PNS procedure to a Veteran with a similar diagnosis based on improvement to their low back pain. The patients will then be monitored for up to a year postoperatively to assess long term benefits from the device.

**Results:** For the 5 patients entered the study, there was an average increase of 8.234 points ( $p=0.004$ ;  $p < 0.05$ ) for the patients' PCS. As for the MCS, there was an average increase of 1.674 points for the patients MCS ( $p=0.527$ ;  $p > 0.05$ ) rendering it statistically insignificant. There was also a substantial improvement in average bodily pain score of 37% ( $p = 0.032$ ;  $p < 0.05$ ) on the SF12v2 survey indicating a lower subjective perception of pain across all five patients. With regards to the secondary survey, 4 of the 5 patients in the study recommended PNS for their fellow veterans with similar diseases.

**Conclusions:** PNS increases the overall quality of life for veterans with chronic axial low back pain. A significant increase in the patients' PCS and a significant increase in the patient's bodily pain scores was observed after 60 Days indicating an overall decrease in patients' subjective perception of pain. 80% of the patients recommended the procedure to fellow U.S. Veterans with similar diseases, and there were no complications.



# Title: Peripheral Nerve Stimulation of Genicular Nerves in the Treatment of Chronic Knee Pain from Osteoarthritis

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## Introduction:

Peripheral nerve stimulation (PNS) is a procedure which has demonstrated utility in the treatment of both acute postoperative and chronic pain seen in conditions such as knee osteoarthritis. PNS involves the use of electrical currents passed through an implanted wire to target specific nerves.

## Case Report:

A 71-year-old female with a history of systemic lupus erythematosus with cutaneous and arthritic manifestations presented with chronic knee pain secondary to osteoarthritis. Prior treatments included physical therapy, intra-articular corticosteroid and hyaluronic acid injections, and genicular nerve blocks, which all provided partial or inadequate pain relief. The patient was interested in PNS treatment. Fluoroscopy guidance was used to place PNS leads in proximity to the right superior lateral and medial genicular nerves. At 30-day follow up evaluation, there was a 50% reduction of pain with increased functional capacity and tolerance of physical therapy. These benefits were continued through 60-day follow up evaluation with 60% pain reduction, at which time the PNS leads were removed per protocol. There were no adverse events or outcomes.

## Discussion:

Although originally studied as an acute postoperative treatment for pain relief, PNS has shown promise with different forms of chronic knee pain. Improved outcomes in health-related domains including pain, quality of life, function, and sleep have been demonstrated. Case reports and industry reviews have emphasized femoral, sciatic, or saphenous nerves for this indication. Our patient had clinically significant positive outcomes with stimulation of genicular nerves indicating a promising alternative approach to knee pain treatment.

## Conclusion:

PNS treatment of chronic knee pain has shown improvements in pain and function in prior reports. Here we demonstrate clinically positive outcomes through a less common approach targeting the superior medial and lateral genicular nerves.

## **Osteomyelitis from an infected dialysis catheter.**

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**Objective:** To highlight the difficulty in diagnosing early onset osteomyelitis in a septic patient, and how a high index of suspicion is essential for improving diagnostic goals and patient care.

**Case report:** This case study presents a 43-year-old African American male with a complex medical history including end-stage renal disease on hemodialysis, obesity, hypertension, diabetes, heart failure with reduced ejection fraction, and a recent interventions including a right toe amputation. Two weeks prior to his presentation to a community hospital's Emergency room, the patient's peritoneal dialysis catheter had been removed due to infection. Since that time, he had been experiencing worsening right lower back and left shoulder pain, which was accompanied by weakness and fever despite treatment for pain and his peritoneal dialysis catheter infection. An initial MRI was inconclusive, with signs of fluid collection at the left shoulder joint, but on re-admission a month later another MRI demonstrated diskitis/osteomyelitis of C5-C6 for which he received 6 weeks of intravenous antibiotics and was discharged with C-Collar immobilization. Two months later, our patient had a repeat MRI of the C-Spine which showed resolution of the cervical osteomyelitis. This case highlights the difficulty in diagnosing early onset osteomyelitis in septic patients, and how developing a high index of suspicion makes for realisable diagnostic goals.

### **Discussion:**

Our patient navigated more than three antibiotics during his course of treatment. As a hemodialysis patient, with bacteremia, our patient was a high risk for vertebral osteomyelitis. A high index of suspicion is required for these patients, and a follow up on the treatment (as in our patient) may be required to ensure proper resolution of symptoms and the medical condition.<sup>1,2,3,4</sup>

### **Conclusion:**

As medical knowledge advances, this case provides valuable insights into the intricacies of managing complex patients with overlapping medical conditions, reinforcing the critical role of collaboration and adaptability in achieving positive patient outcomes.

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Title: Nucleus Pulposus Allograft: Novel Treatment for Veterans with Lumbar Intervertebral Disc Degeneration.  
Abstract

## **Introduction**

Back pain is one of the most common afflictions among the aging population. In 2011, it was estimated that the cost to the United States due to back pain was 34 billion dollars.<sup>1</sup> It was estimated that in 2020, low back pain afflicted 619 million globally.<sup>2</sup> Among this population, veterans were shown to have a significantly higher incidence of both back pain and severe chronic pain and typically at a younger age.<sup>3</sup> There is a need for novel treatments to be available for these veterans. The New Orleans VA Medical Center performed one of the first nucleus pulposus allograft, ViaDisc, for their patients.

## **Case report:**

Patient is a 40-year-old male veteran who presents for chronic back pain which radiates down his left leg posteriorly. Patient has previously received lumbar facet injection with some relief, massage therapy, and physical therapy. Despite these treatments, the pain was still significant. Physical exam suggest pain with flexion and extension, facet loading, and Milgram's test. MRI suggest small concentric disc bulge at level L4-L5 and disc desiccation with small concentric disc bulge at L5-S1. Patient was injected with ViaDisc in the L4-L5 and L5-S1. Veteran patient had significant relief without significant MRI changes at follow-up.

## **Discussion**

After a few months, the patient was surveyed. Patient's pain was consistently reduced by half post-procedure with significant improvement to daily function and exercise. The veteran highly recommends the novel procedure to his fellow veterans due to the great improvement to his function.

## **Conclusion**

Nucleus Pulposus Allograft was shown to significantly reduce pain in the veteran. This procedure should be considered in the treatment of chronic back pain not responsive to conservative treatment.

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