Spectrum Health

Physical Therapy:

A Valuable Tool for Pain Management

Tim Phillips, PT, DPT, MTC

SEPTEMBER 22, 2020

Objectives

- Identify evidence based non-pharmacologic interventions for pain.
- Describe the ways in which Physical Therapy can skillfully deliver evidence based interventions for pain.
- Describe how physicians and allied health team members' can address common barriers to referral and participation in Physical Therapy
- Illustrate how primary care providers and allied health team members knowledge of the specific interventions employed in physical therapy can support the patient's recovery.

PT's contribution to E.R.A.S.E.

EMOTIONS
- Stress management
- Pleasant activity scheduling
- Resilience

REFLECTIONS
- Reframing
- Relaxation

ACTIONS
- Exercise
- Pacing
- Problem solving

SLEEP
- Reinforce sleep hygiene

ENVIRONMENT

Non-Pharmacological Therapies for Chronic Pain States

Spectrum Health

Strong Evidence	▪ Education ▪ Aerobic exercise ▪ Cognitive behavior therapy
Modest Evidence	▪ Strength training ▪ Hypnotherapy, biofeedback, balneotherapy
Weak Evidence	▪ Acupuncture, chiropractic, manual and massage therapy, electrotherapy, ultrasound
No Evidence	▪ Tender (trigger) point injections, flexibility exercise

Pain & PT

- **Low back pain.** A review of >60 randomized controlled trials (RCTs) evaluating exercise therapy: **decrease pain, improve function, and help people return to work.**[1]

- **Before & after surgery.** A review of 35 RCTs (~3,000 THA patients): preoperative exercise and education led to **significant reductions in pain, shorter lengths of stay postoperatively and improvements in function**.[2]

- **Arthritis.** **PT** exercise programs can **reduce pain and improve physical function** among individuals with hip and knee osteoarthritis.[3,4]

How?

Advantages:

- **Time**
  - Assessment
  - Treatment
  - Education
- **Experts** in neuromusculoskeletal assessment and treatment
- **Screen** for red flags, impact of co-morbidities, patient safety
- **Provides Experiential Learning**
- Effective **Training** regimens
- **Timing** of Care
  - Secondary Prevention: halt the progression from Acute to Chronic Pain
- Able to simultaneously treat an acute flare up in the presence of a chronic pain state.

Best Evidence: Aerobic Exercise

E.R.A.S.E: Action

Evidence Based Formats[5,6]

- High Intensity Interval Training (HIIT) vs. Continuous training
- RPE: 6-7 is the target for effort that produces ***optimal results***
- Graded Exposure
  - To foster patient engagement: may start lower… however, *too low jeopardizes results*.

Rating of Perceived Exertion scale (RPE)

1	**Very Light Activity** (anything other than complete rest)
2-3	**Light activity** (feels like you can maintain for hours, easy to breath and carry on a conversation)
4-5	**Moderate Activity** (feel like you can exercise for long periods of time, able to talk and hold short conversations)
6-7	**Vigorous Activity** (on the verge of becoming uncomfortable, short of breath, can speak a sentence)
8-9	**Very Hard Activity** (difficult to maintain exercise intensity, hard to speak more than a single word)
10	**Max Effort** (feels impossible to continue, completely out of breath, unable to talk)

Moderate Evidence: Strength Training
E.R.A.S.E: Action

Indication: Impairment with ADL's
- Transfers
- Stair climbing
- Lift / push / pull / carry.

Pro's [7,8]
- Efficient: 1-2 times a week
- Prior history of strength training
- Endogenous opiate release

Con's
- Dose/response carefully monitored and scripted to not further sensitize patient to becoming active.

Psychologically Informed Care

Screen for ***modifiable*** psychosocial targets

- Depression
- Fear Avoidance-Kinesiophobia
- Catastrophizing
- Anxiety
- Faulty Beliefs

Interventions-

1. Motivational Interviewing
2. Neuroscience of Pain
3. Behavior Modification
   - CBT
   - ACT
   - Operant Conditioning
   - Graded Exposure

Evidence Based Buffet

Traditional Physical Therapy

Physical Therapy + Psychologically Informed Care [12-16]

Behavioral Health

Psychosocial factors addressed by Placebo

Intentional Integration of Behavioral / Motivational Strategies *with* Traditional Biomechanical Treatments

Behavioral / Motivational Strategies

PIC PT vs. Traditional PT

Bodes-Pardo et. al. (2018, RCT)[18]

- ***Combining pain neurophysiology education (PNE) with exercise (TE) resulted in significantly better results for participants with CLBP, with a large effect size.***

Malfliet, et al. (2018 RCT in *JAMA Neurology*)[19]

- ***Pain neuroscience education combined with cognition-targeted motor control*** **training appears to be *more effective* than current best-evidence physiotherapy.**

Vibe-Fersum, et. al. (2013 RCT)[20]

- **The classification-based cognitive functional therapy group displayed *significantly superior outcomes* to the manual therapy and exercise group, both statistically ($p < 0.001$) and *clinically.***

Best evidence: Education

E.R.A.S.E: Reframing

Neuroscience of Pain

Nerves send messages to your brain and your brain decides how much pain you feel—a ***lot***, ***a little***, ***or none at all.***[21]

- ***Pain is always real***, but not always the result of a physical injury.
- ***The brain is constantly asking:***
  - How ***dangerous*** is this?
  - Constantly scanning the body and environment for potential threats.
  - The brain notices a threat and reacts with a pain sensation.

- Sometimes the brain continues to send a pain signal long after the injury has healed for several reasons:
  - Increased stress and anxiety from:
    - Not knowing the cause of the pain
    - Not knowing how long the pain will last
    - Unsuccessful pain treatments
    - Pain limiting normal activity

Best evidence: CBT
E.R.A.S.E: Reframing & Action

HOWEVER,

"Information is to behavioural change as spaghetti is to a brick" William Fordyce

- PIC PT intervention is mostly concerned with changing actual behavior *not necessarily cognitions*

Best evidence: Education
E.R.A.S.E: Reframing & Action

Experiential Learning Facilitated in PT

- Exercise or Activities of Daily Living Despite Pain[22]
- Pre-determined task termination:[23]
- Frequency of exposure is key to changing behavior
  - Schedule activity 3-6+ times per day.
  - Change behavior long enough and new belief emerges.

E.R.A.S.E:
Stress Management & Relaxation

- Diaphragm Breathing
  - Stop accessory muscles (limbic system activation)
  - Emphasis on slowing respiration rate through increased length of exhalation
  - “Gap” after full exhalation
  - Intentional practice
  - Habits/Mneunonics

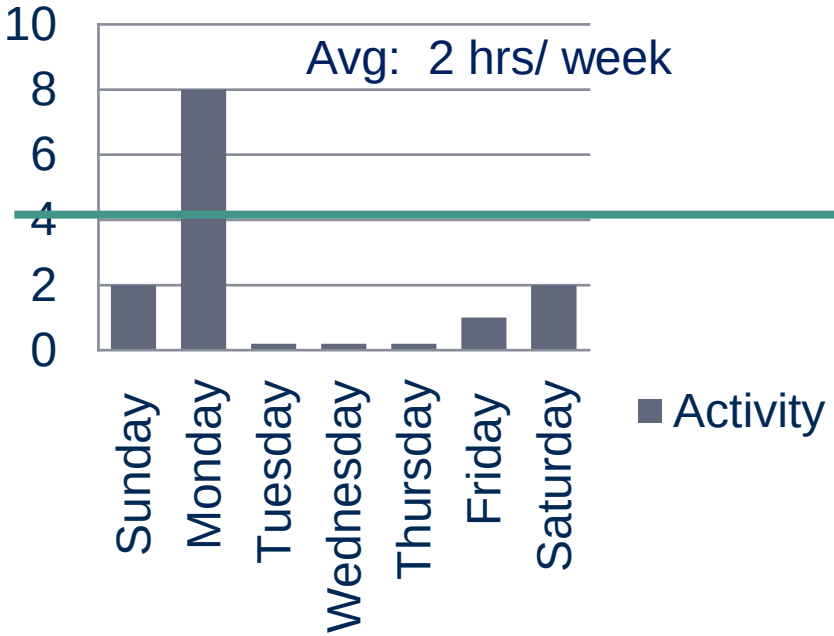
- Concept of total “stress”
  - Biopsychosocial contributions to pain (SPACE)

E.R.A.S.E:
Problem Solving & Resilience

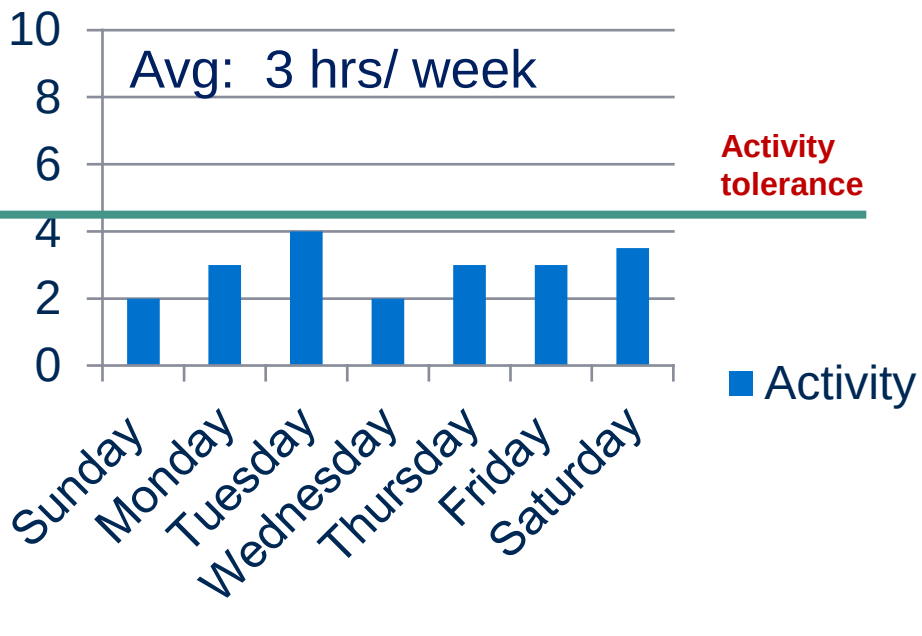
Tangible Skills
- –Alternative movement strategies
- –Adaptive equipment
- –Job Jar
- –Swipe card at the gym

Best evidence: Education
E.R.A.S.E: Action

Boom / Bust Cycle



Pacing / Graded Activity
9,10,11



Case Studies

Case Study

- 50 y.o. female
- **PROBLEM LIST**
  - Chronic right shoulder pain
  - Migraine with aura
  - Fibromyalgia
  - Bipolar disorder (HCC)
  - Posttraumatic stress disorder
  - Tobacco abuse
  - Irritable bowel syndrome
  - Optic disc drusen
  - Cataracts, bilateral
  - Dysmenorrhea

History:

- + ACE's: removed from home at 8 weeks old
  - Serially abused as infant in foster care
  - Sexually abused
- Abused as adult
- 2 children on autistic spectrum
- Married x 3
- 1 child: rare pediatric cancer @ 2 yrs old
- MVA x 3 since 2003
- Previous PT referrals with some + benefit

Case Study

Initial Eval:

- **Pain 5/10 Distress 10/10**
- Fibromyalgia Questionnaire: 15/31
- Fall risk
- Hypersensitive to touch
- Low activity levels
- Sleep disturbance
- Social Isolation
- Fatigue
- Anxiety

S.M.A.R.T. Goals: developed by patient

1. Shop without pain, without a cane or walker for more than an hour in 14 weeks
2. Sit or drive my car without intense pain for more than 20-30 min. in 14 weeks
3. Exercise 3 times a week for any length of time (yoga or something like it) in 14 weeks.
4. I would like to be hugged and not react (adversely) in 12 weeks.
5. I would like to play the piano again in 12 weeks.

Case Study

Treatment:

- Safe Environment:
  - Triggers
  - No touch
  - No pathway obstructions
- Pain science education
- Diaphragmatic breathing
- Graded Exposure:
  - Hug schedule with loved ones
- Functional Training: stairs
- Strength and Balance training

Function:

- Stairs: up/down without instability.
- Rows (48#) 2 x 10 with tactile cues for scap squeezes
- Lat pull downs: 55# 2 x12 with tactile cues for lats
- Leg press 120# 3 x 8
- This…

Case Study

15th visit:

- **Pain 2/10 Distress 3/10**
- Fibromyalgia Questionnaire: **6/31**
- Fibromyalgia Questionnaire: 15/31 IE

- Resumed yoga
- Wrestling grandkids
- **Accepting hugs**
- ***Positive self-talk***

- Weed whacking, yard work without fatigue or rebound pain.
- ***Resilient in the face of challenges***
  - (questionable findings on imaging, interpersonal conflict, anniversaries of traumatic events)
- Weaning visits to 1x/month
- Likely DC in Sept.

Application

Allied Health Teams

DO Different - to Get Different

- "I don't believe that either you or I (as a provider) is satisfied with how you are feeling." *(a change is needed).*
- “We have a resource that helps people in pain decrease the amount of suffering that pain brings”
- “Other patients (with chronic pain) report that they are better prepared to deal with pain and they are able to do more of the things in life that they need/want to do.”

Referral

Motivation

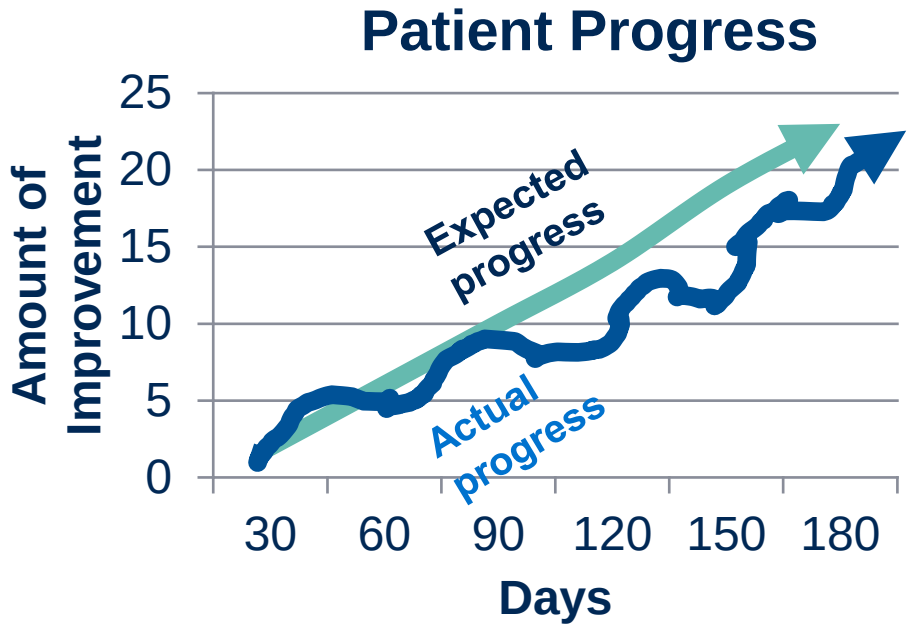
- Suffering
- Acute on chronic musculoskeletal dx
- Addition of 1 more life stressor

- Step 1.
  - A change is needed: scripting
- Step 2
  - Where do your deficits/ barriers lie? (**SPACE**)
- Step 3
  - Where do you see yourself changing?
- Step 4
  - Self Management, PT, and/or Behavioral Health: **ERASE**
- Step 5
  - PDSA

Set Proper Expectations

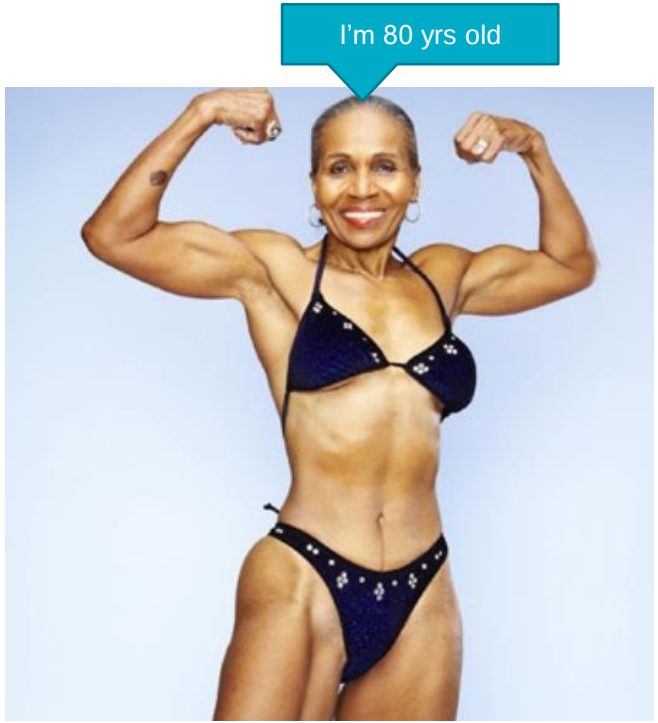
Chronic Pain

- Goal is: ***Less pain & Increased Activity***
  - –Time
    - – **6+ months,** not 6 visits
    - – Neuroplastic changes take time
  - –Setbacks are to be expected
    - –Focus is on building ***Resilience***



Optimizing Health

- Sleep Deficits
  - Sleep Hygiene: education
  - Sleep Apnea: central vs obstructive: referral
- Comorbid Conditions
  - COPD, Asthma, DM II, HTN smoking, etc.
  - Medication/Inhaler dosing and compliance
  - Psychosocial and Psychiatric health



Interdisciplinary Collaboration

- **Content**: (Evidence Based vs. non- EBP)
  - Passive Tx? Hot pack, US, e-stim, massage, Aquatics, too many patients in the room.
- **Participation:** Effective Dosage Achieved?
- **Practical skills learned?**
  - (transfers, self-soothing, positions of comfort, pacing, sleep hygiene, etc.)
- **Expectations:**
  - Mechanical pain (nociceptive & some neuropathic):
    - Quick response to treatment
  - Neuro Pain (neuropathic and central sensitization):
    - 12 weeks, +12 more weeks once control is established
  - Disruptors: weather, stress, gaps in care, adherence

PT made me worse!!

During & Post Exercise Sensations

- *Any **negative** or **unknown** experience is reason enough to stop activity*
- Please explore with your patient:
  - **Activity dosage errors:** too much, too soon, for too long.
  - **Hurt vs. Harm…**
- Post exercise hyperalgesia
  - Malaise after exercise instead of the expected endogenous opiate release
- Normalizing the experience without dismissing it.
- ***Forecasting is essential to decreasing anxiety around activity***

Reinforcement

- Failure to progress is not necessarily due to the wrong treatment:
  - Chronic/complex patients need even more reinforcement/encouragement/ reassurance of safety.
  - “I didn’t send you to PT to get fixed, I sent you to PT to get better: whatever better looks like…”

- prescribe vs. **PRESCRIBE PT**!!!
  - Follow up with the same vigor that you would regarding a medication.
  - Expect Positive outcomes

Summary

Summary

- PT can utilize evidence based treatments that are highly effective for both Acute and Chronic pain.
- Psychologically Informed Care and Neuroscience education is a growing specialty with PT.
- PT can provide valuable patient education and experiential learning in regard to activity.
- PT can address acute and chronic pain episodes, within the context of other chronic disease burden.
- Physician and Allied Health team play an important role in supporting the patient and PT plan of care through exploring activity dosage, barriers to activity, and forming accurate expectations for progress.

PIC PT

- How to refer:

  - Psychologically Informed Care (PT)
  - Therapeutic Neuroscience Education (TNE)
  - Pain Science / Neuroscience of Pain
  - Therapeutic Pain Specialist (TPS)
  - Biopsychosocial Management of Pain
  - CBT and PT
  - Pain Neuroscience Education (PNE)

References

1. Hayden JA, van TUlder MW, Malmivaara A, Koes BW. Exercise therapy for treatment of non-specific low back pain. *Cochrane Database Syst Rev*. 2005;Jul 20(3):CD000335. https://www.ncbi.nlm.nih.gov/pubmed/16034851. Accessed April 2, 2018.

2. Mover R, Ikert K, Long K, Marsh J. The value of preoperative exercise and education for patients undergoing total hip and knee arthroplasty: a systematic review and meta-analysis. *JBJS Rev*. 2017;5(12):e2. https://www.ncbi.nlm.nih.gov/pubmed/29232265. Accessed April 2, 2018.

3. Fransen M, McConnell S, Hernandez-Molina G, Reichenbach S. Exercise for osteoarthritis of the hip. *Cochrane Database Syst Rev*. 2014;22(4):CD007912. https://www.ncbi.nlm.nih.gov/pubmed/24756895. Accessed April 2, 2018.

4. Messier SP, Mihalko SL, Legault C, et al. Effects of intensive diet and exercise on knee joint loads, inflammation, and clinical outcomes among overweight and obese adults with knee osteoarthritis: the IDEA randomized clinical trial. *JAMA*. 2013;310(12):1263-73. https://www.ncbi.nlm.nih.gov/pubmed/24065013/. Accessed April 2, 2018.

5. Bidonde J, Busch AJ, Schachter CL, Overend TJ, Kim SY, Góes SM, Boden C, Foulds HJ. Aerobic exercise training for adults with fibromyalgia. Cochrane Database Syst Rev. 2017 Jun 21;6:CD012700.

6. Öte Karaca Ş, Demirsoy N, Günendi Z. Effects of aerobic exercise on pain sensitivity, heart rate recovery, and health-related quality of life in patients with chronic musculoskeletal pain. Int J Rehabil Res. 2017 Jun;40(2):164-170. doi: 10.1097/MRR.0000000000000212. PubMed PMID: 28045865.

7. Ericsson A, Palstam A, Larsson A, Löfgren M, Bileviciute-Ljungar I, Bjersing J, Gerdle B, Kosek E, Mannerkorpi K. Resistance exercise improves physical fatigue in women with fibromyalgia: a randomized controlled trial. Arthritis Res Ther. 2016 Jul 30;18:176.

8. Sosa-Reina MD, Nunez-Nagy S, Gallego-Izquierdo T, Pecos-Martín D, Monserrat J, Álvarez-Mon M. Effectiveness of Therapeutic Exercise in Fibromyalgia Syndrome: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. Biomed Res Int. 2017;2017:2356346. doi: 10.1155/2017/2356346. Epub 2017 Sep 20.

9. Scott-Dempster C, Toye F, Truman J, Barker K. Physiotherapists' experiences of activity pacing with people with chronic musculoskeletal pain: an interpretative phenomenological analysis. Physiother Theory Pract. 2014 Jul;30(5):319-28. doi: 10.3109/09593985.2013.869774. Epub 2013 Dec 30. PubMed PMID: 24377664.

10. Andrews NE, Strong J, Meredith PJ. Activity pacing, avoidance, endurance, and associations with patient functioning in chronic pain: a systematic review and meta-analysis. Arch Phys Med Rehabil. 2012 Nov;93(11):2109-2121.e7. doi: 10.1016/j.apmr.2012.05.029. Epub 2012 Jun 21. Review. PubMed PMID: 22728699.

11. Andrews NE, Strong J, Meredith PJ. Overactivity in chronic pain: is it a valid construct? Pain. 2015 Oct;156(10):1991-2000. doi: 10.1097/j.pain.0000000000000259. PubMed PMID: 26067583; PubMed Central PMCID: PMC4770331.

references

12. Hill, J C., et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. Lancet. 2011;378.9802:1560-1571.

13. Foster NE, et.al. Effect of Stratified Care for Low Back Pain in Family Practice (IMPaCT Back): A Prospective Population-Based Sequential Comparison. Ann Fam Med. March/April 2014 12:102-111.

14. Main CJ, Sowden G, Hill JC, Watson PJ, Hay EM. Integrating physical and psychological approaches to treatment in low back pain: the development and content of the STarT Back trial's 'high-risk' intervention. Physiotherapy 2012;98:(2)110-116.

15. Karlen E, McCathie B. Implementation of a Quality Improvement Process Aimed to Deliver Higher-Value Physical Therapy for Patients With Low Back Pain: Case Report. Phys Ther. 2015 Dec;95(12):1712-21.

16. Nicholas MK, George SZ. Psychologically informed interventions for low back pain: an update for physical therapists. Phys Ther. 2011 May;91(5):765-76.

17. Sullivan MJL, Adams H. Psychosocial treatment techniques to augment the impact of physiotherapy interventions for low back pain. Physiother Can. 2010;62:180–189

18. Bodes Pardo G, Lluch Girbés E, Roussel NA, Gallego Izquierdo T, Jiménez Penick V, Pecos Martín D. Pain Neurophysiology Education and Therapeutic Exercise for Patients With Chronic Low Back Pain: A Single-Blind Randomized Controlled Trial. Arch Phys Med Rehabil. 2018 Feb;99(2):338-347. doi: 10.1016/j.apmr.2017.10.016. Epub 2017 Nov 11. PubMed PMID: 29138049.

19. Malfliet A, Kregel J, Coppieters I, De Pauw R, Meeus M, Roussel N, Cagnie B,Danneels L, Nijs J. Effect of Pain Neuroscience Education Combined With Cognition-Targeted Motor Control Training on Chronic Spinal Pain: A Randomized Clinical Trial. JAMA Neurol. 2018 Apr 16. doi: 10.1001/jamaneurol.2018.0492. [Epub ahead of print] PubMed PMID: 29710099.

20. Vibe Fersum K, O'Sullivan P, Skouen JS, Smith A, Kvåle A. Efficacy of classification-based cognitive functional therapy in patients with non-specific chronic low back pain: a randomized controlled trial. Eur J Pain. 2013 Jul;17(6):916-28. doi: 10.1002/j.1532-2149.2012.00252.x. Epub 2012 Dec 4. PubMed PMID: 23208945; PubMed Central PMCID: PMC3796866

21. Louw A, Zimney K, Puentedura EJ, Diener I. The efficacy of pain neuroscience education on musculoskeletal pain: A systematic review of the literature. Physiother Theory Pract. 2016 Jul;32(5):332-55. doi: 10.1080/09593985.2016.1194646. Epub 2016 Jun 28. Review. PubMed PMID: 27351541.

22. Lehman GJ. The Role and Value of Symptom-Modification Approaches in Musculoskeletal Practice. J Orthop Sports Phys Ther. 2018 Jun;48(6):430-435.

23. Wideman TH, Sullivan MJ. Reducing catastrophic thinking associated with pain. Pain Manag. 2011 May;1(3):249-56. doi: 10.2217/pmt.11.14. PubMed PMID: 24646391.

24. APTA White Paper "Beyond Opioids: How Physical Therapy Can Transform Pain Management to Improve Health." https://www.apta.org/uploadedFiles/APTAorg/Advocacy/Federal/Legislative_Issues/Opioid/APTAOpioidWhitePaper.pdf