

Mi-CCSI

Center for Clinical
Systems Improvement

PHYSICAL THERAPY

A Valuable
Tool for Pain
Management

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**.

Non-Pharmacological Therapies for Chronic Pain States

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

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

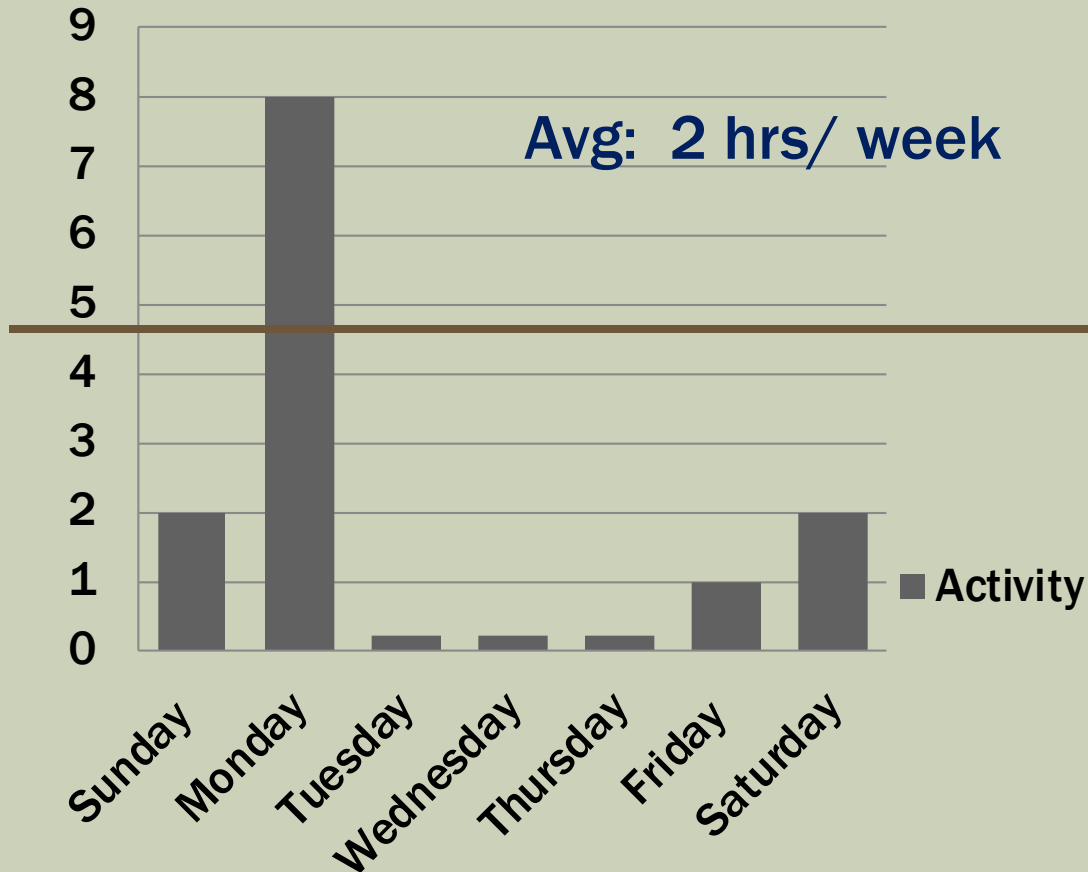
■ Con's

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

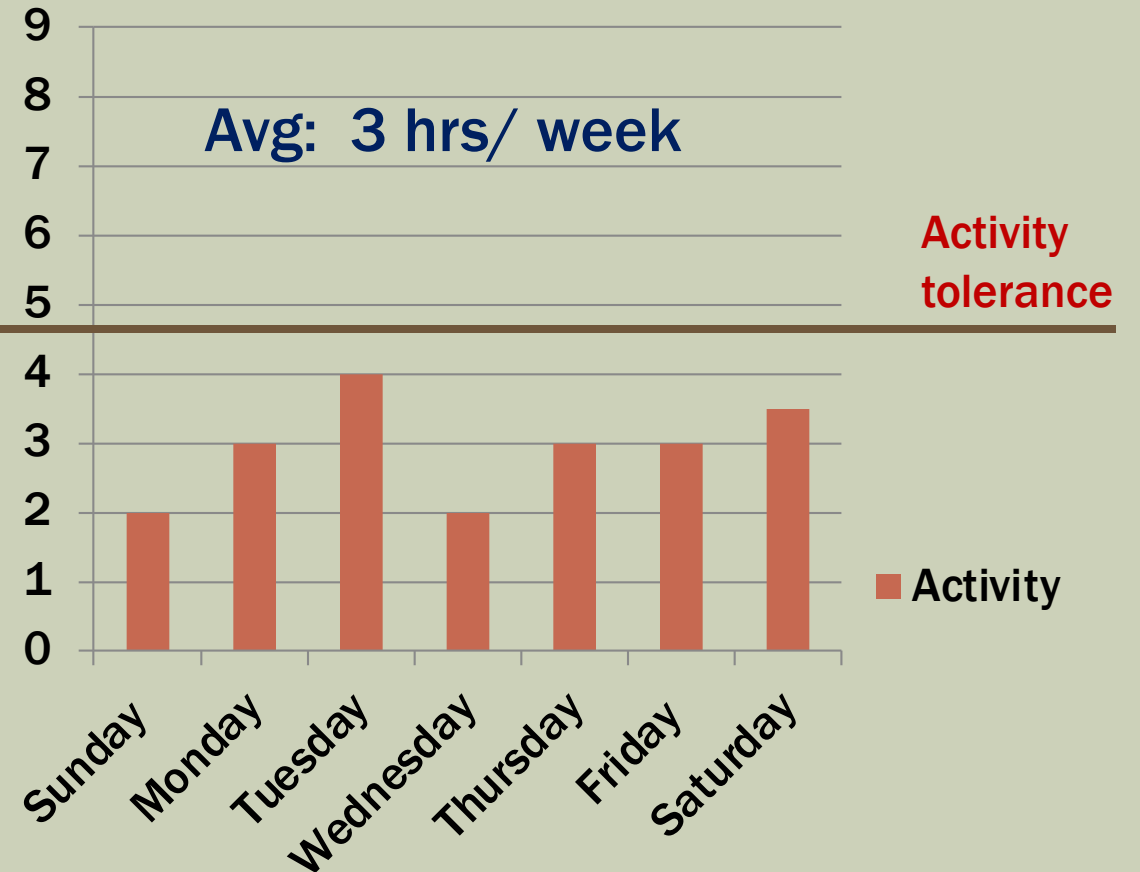
BEST EVIDENCE: EDUCATION

E.R.A.S.E: ACTION

Boom / Bust Cycle



Pacing / Graded Activity^{9,10,11}



BEST EVIDENCE: EDUCATION

E.R.A.S.E: REFRAMING

Neuroscience of Pain

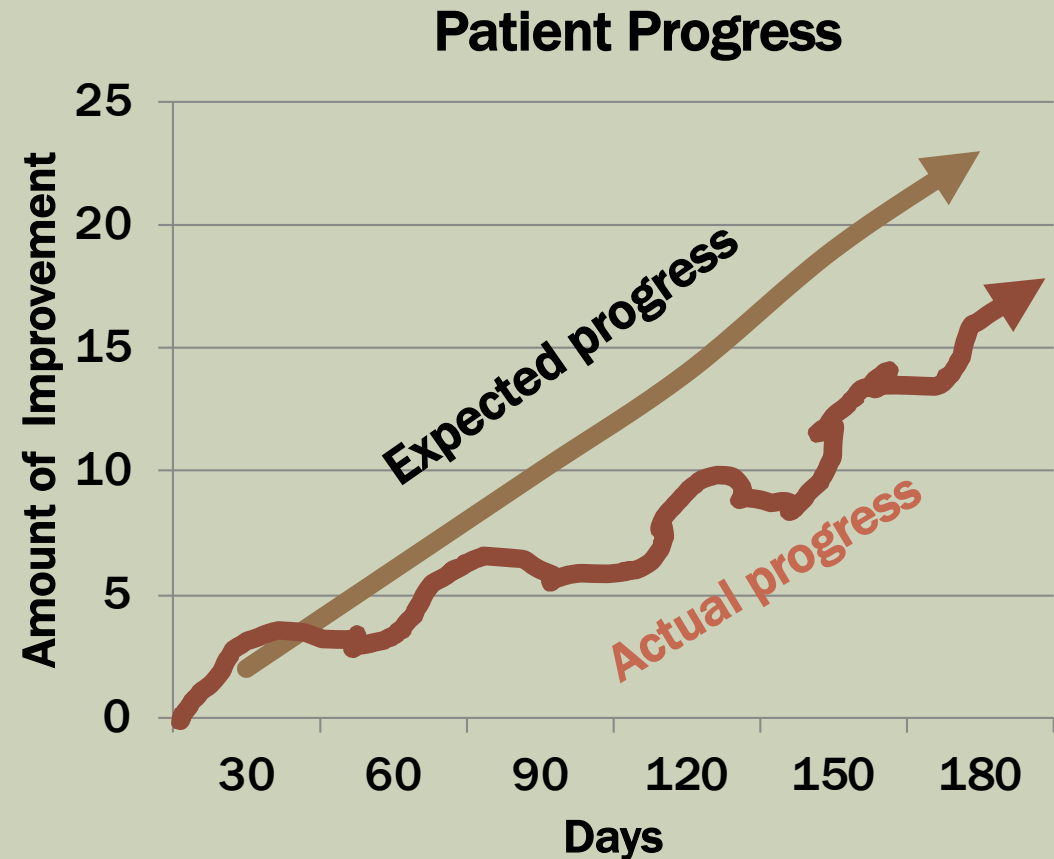
Nerves send messages to your brain and your brain decides how much pain you feel—a **lot**, **a little**, or none at all.²¹

- **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

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**



HOW TO REFER

■ PT Evaluate and Treat (central sensitization)

■ Comments:

- *Please address impaired ADL's*
- *Clinical & HEP program for aerobic activity*
- *Pacing / energy conservation / Sleep hygiene*
- *Pain science education*
- *Parasympathetic training/strategies: diaphragmatic breathing, progressive muscle relaxation, mindfulness, meditation.*
- *Graded Exposure (to painful or feared movement/activities)*
- *Graded Activity*
- *Avoid passive care / modalities*
- *Please follow for at least 90 days to establish a habit around exercise*

Please include:

- **Barriers**
 - **Past experience with PT**
 - **Psychosocial**
 - **Beliefs**
 - **Fears**

PSYCHOLOGICALLY INFORMED CARE (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

REFERENCES

- Zheng P, Kao MC, Karayannis NV, Smuck M. Stagnant Physical Therapy Referral Rates Alongside Rising Opioid Prescription Rates in Patients With Low Back Pain in the United States 1997-2010. *Spine (Phila Pa 1976)*. 2017 May 1;42(9):670-674. doi: 10.1097/BRS.0000000000001875. PubMed PMID: 28441685.
- Frogner BK, Harwood K, Andrilla CHA, Schwartz M, Pines JM. Physical Therapy as the First Point of Care to Treat Low Back Pain: An Instrumental Variables Approach to Estimate Impact on Opioid Prescription, Health Care Utilization, and Costs. *Health Serv Res*. 2018 Dec;53(6):4629-4646. doi: 10.1111/1475-6773.12984. Epub 2018 May 23. PubMed PMID: 29790166; PubMed Central PMCID: PMC6232429.
- Arnold E, La Barrie J, DaSilva L, Patti M, Goode A, Clewley D. The Effect of Timing of Physical Therapy for Acute Low Back Pain on Health Services Utilization: A Systematic Review. *Arch Phys Med Rehabil*. 2019 Jul;100(7):1324-1338. doi: 10.1016/j.apmr.2018.11.025. Epub 2019 Jan 24. Review. PubMed PMID: 30684490.
- Thackeray A, Hess R, Dorius J, Brodke D, Fritz J. Relationship of Opioid Prescriptions to Physical Therapy Referral and Participation for Medicaid Patients with New-Onset Low Back Pain. *J Am Board Fam Med*. 2017 Nov-Dec;30(6):784-794. doi: 10.3122/jabfm.2017.06.170064. PubMed PMID: 29180553.
- Sun E, Moshfegh J, Rishel CA, Cook CE, Goode AP, George SZ. Association of Early Physical Therapy With Long-term Opioid Use Among Opioid-Naive Patients With Musculoskeletal Pain. *JAMA Netw Open*. 2018 Dec 7;1(8):e185909. doi: 10.1001/jamanetworkopen.2018.5909. PubMed PMID: 30646297; PubMed Central PMCID: PMC6324326.