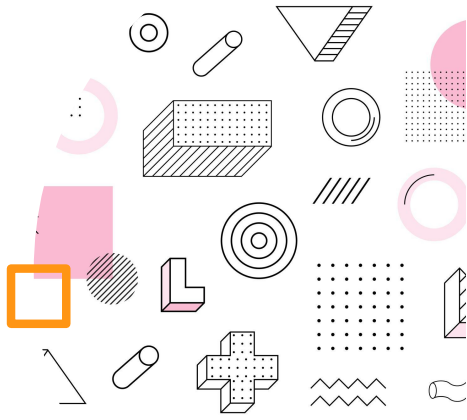


Chronic Pain Management and Aquatics

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 Certified Balance and Falls Professional
 (Developed by Cathy Maloney-Hills, PT, for the AQUATIC ACADEMY of the APTA)



Learning Objectives

- Apply the concepts of Therapeutic Pain Science education to the aquatic environment
- Identify high risk for chronic pain patients
- List the 4 pillars of Pain Neuroscience Education
- Describe why the aquatic environment may be the treatment of choice for chronic pain
- Design treatment interventions for the chronic pain patient in the pool setting

Therapeutic/ Pain Neuroscience Education (TNE/PNE)

In order to treat patients with chronic pain, we need to change cognitions, beliefs and fear, **BEFORE** re-engaging a movement-based approach of therapeutic exercise, manual therapy, pacing and graded exposure. This cognitive restructuring is done via therapeutic neuroscience education (TNE).

2016 - Louw et al. (chronic pain)



Finally...

Physical therapists should deliver pain neuroscience education alongside other physical therapy interventions, such as exercise or manual therapy, to patients with chronic LBP.

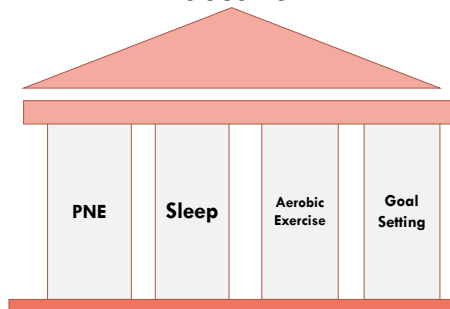
2021 - George et al. (LBP)

The Pain Experience - Key Concepts

- All Pain is REAL
- Pain is universal
- Everyone's pain experience is unique
- Pain ≠ Injury
- Pain is protective
- Pain is normal, but living in pain is NOT
- Understanding pain and retraining the "pain system" works (Luw - 2013)



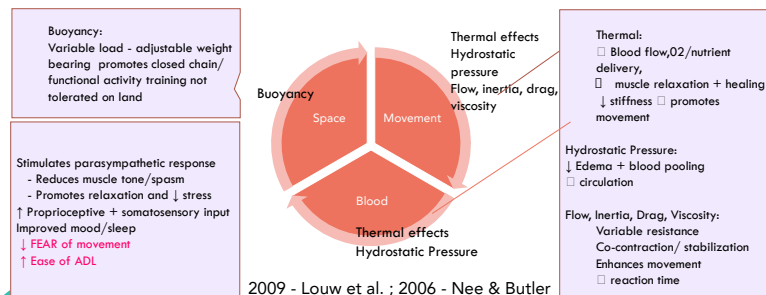
The Four Pillars of Pain Neuroscience Education



2018 - Louw et al.

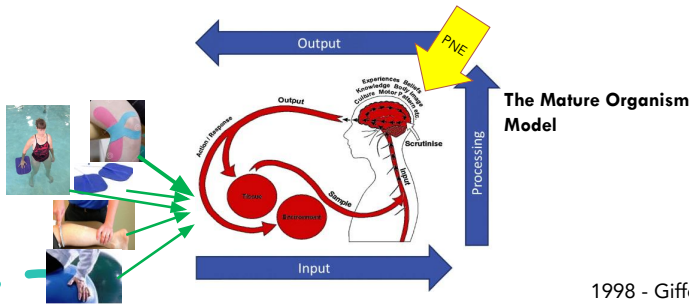
The Sensitive Nervous System:

Neural Tissue Has 3 Important Requirements from an Anatomical and Physiological Perspective

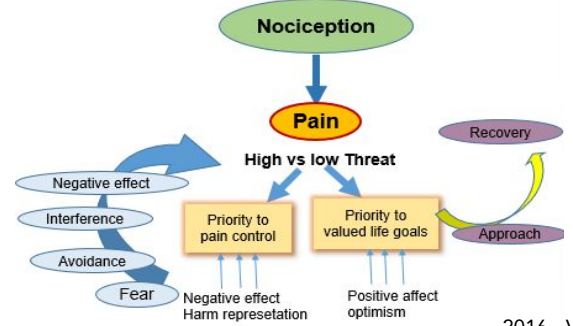


2009 - Louw et al. ; 2006 - Nee & Butler

Bottom Up or Top Down?

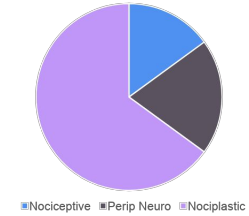


Update: Fear-Avoidance Model



Pain Mechanisms 101

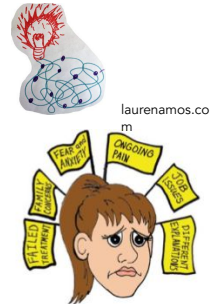
Nociceptive	Peripheral Neurogenic	Central Nociplastic
<ul style="list-style-type: none"> Proportionate pain, agg./ease Intermittent sharp, dull ache or throb at rest No night pain, dysesthesia, burning, shooting or electric 	<ul style="list-style-type: none"> Pain in dermatomal or cutaneous distribution + neurodynamic & palpation (mechanical tests) Hx of nerve pathology or compromise 	<ul style="list-style-type: none"> Disproportionate pain Disproportionate aggravating and easing factors Diffuse palpation Psychosocial



Slide used with permission of Adriaan Louw

2007, 2010, 2010, 2011, 2012 - Smart et al.

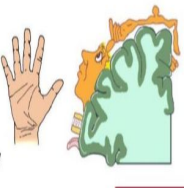
Brain Maps



ISPI - (Used with Permission)

Reorganization of body maps

- Biologically coded, but environmentally sculpted
- Braille readers
- Local anesthetic
- Rapid changes with practice
- See: *The Body has a Mind of its Own* - Blakeslee



Education
 Laterality
 Motor Imagery
 Two Point Discrimination
 Localization
 Graphesthesia
 Stereognosis
 Mirror Therapy

Reorganization of body maps

- If it is plastic in daily life, it's plastic after injury, disuse, immobilization, neglect, etc.
- Use it or lose it!
- Identified in: chronic pain, CVA, phantom pain, SCI, knee OA, whiplash, CTS, RSI, frozen shoulder, dystonia., etc.



ISPI - Used with Permission

Ways to Incorporate PNE into Aquatic PT

- Build trust /therapeutic alliance
 - Allow patients to tell their story (Watson et al., 2019)
- Introductory PNE session prior to starting aquatic PT
- Laminate pictures/ISPI Tool Kit cards or homemade pictures to use in the pool (Louw - 2013)
- Easy access for practicing graphesthesia, 2- point discrimination, localization
- Engage the brain - Right vs. left, up vs. down with exercises and manual therapy (Puentedura & Flynn - 2016)



Ways to Incorporate PNE into Aquatic PT

- Address questions, infuse PNE into aquatic activities, Assess knowledge (2013- Louw and Puentedura)
- Build on "4 pillars" + coping skills
 - Use aquatic activities for symptom relief, keeping active
- Practice positions, functional activities or exercises that are difficult/painful on land
 - Use thermodynamic and physiologic properties of water
 - May have to practice "imagining" before starting exercise/activities
 - Start with small, attainable steps, build slowly (2017 - Maloney-Hills & McGill)

PNE

Compelling evidence that PNE has a positive effect on pain, disability, catastrophization and physical performance.

2011 - Louw, et al. (chronic MSK pain)
2022 - Siddall, et al. (chronic MSK pain)

PNE reduces pain, improves patient knowledge of pain, improves function and lowers disability, reduces psychosocial factors, enhances movement, and minimizes healthcare utilization.

2016 - Louw, et al. (chronic MSK)

PNE+

May be an effective approach for improving functional status, pain-related symptoms, anxiety and depression

2022 - Saracoglu, Akin, + Aydi (FMS)

Moderate evidence that the addition of PNE to usual physiotherapy intervention in patients with CLBP improves disability in the short term.

2019 - Wood & Hedrick (chronic LBP)

Pain

For chronic low back pain, the numbers needed to treat (NNT) and Pain Neuroscience Education (PNE)

- Function 2:1
- Pain 3:1

A tx effect was maintained at 1-year follow-up.

2002 - Mosely (chronic LBP)

"Provision of pain neurophysiology education is a clinically effective addition to aquatic exercise."

2017 - Pires et al. (LBP)

"(P)NE resulted in significant behavior change. Despite a similar pain and functional trajectory during the 1-year trial, patients with LS who received NE viewed their surgical experience more favorably and used less health care facility in the form of medical tests and treatments."

2014 - Louw et al. (post lumbar surgery)

Helpful Videos on Pain Neuroscience Education

- Youtube : Mosely (TED talk; Pain Revolution, 2017); Explain Pain 5 min Youtube: https://www.youtube.com/watch?v=C_3phB93rvI
- <https://www.retrainpain.org/> (PNE info in 22 languages)

Case Discussion

- 46 yo post MVA 2 years ago – newly diagnosed with Fibromyalgia Syndrome; no significant medical hx
- Lives w/ husband and 2 kids; uses rollator walker; no longer works - previously a teacher full time.
- Cries frequently during evaluation; feels there is no hope
- Assessment: FABQ score off the charts; weakness; deconditioned (guess vs. measuring)
- How do we maximize engagement?

Case Discussion continued...

- Treatment/ Interventions:

Key Points - PNE

- All pain is real; it is produced by the brain based upon perceived threat
- PNE is best started before movement-based approaches, including aquatic PT
- The 4 pillars of PNE: Education, sleep hygiene, aerobic exercise, goal setting
- PNE+ = Education + dozens of optional treatment strategies
- Graded motor imagery can be as effective as physical activity and reduces threat/fear of movement
- Thermal, hydrodynamic, and physiologic properties of water can reduce fear of movement and pain
- With chronic pain, strengthening is better tolerated with lower resistance and higher repetitions with more gradual progression

Questions?

