Therapeutic Neuroscience Education Highlights

(adapted from TNE course taught by Adriaan Louw, PT, PhD, CSMT, co-founder of ISPI, (ispinstitute.com) with permission, by Laura Pizer Gueron, PT lgueron@gillettechildrens.com another resource: noigroup.com)

Importance of understanding pain better

Pain that is understood is not feared

Pain is normal

Pain is inconsistent by nature and flare-ups often do not mean that there is new pathology

Fear of pain can be worse than pain itself

Current best evidence shows that if health care professionals teach about pain experience from biological/physiological perspective (NOT patho-anatomical perspective) and client really understands this: they will have less pain, move better, function better, exercise more and have less pain catastrophization

Cognition and beliefs drive pain

**Role of even minor pain reduction:**

Going from 10 of 10 to 0 of 10 is often not realistic, however…..

Even minor decrease of pain can give hope, calm nervous system down enough to enable some movement/exercise

Becoming pain free may not be possible, but becoming free from the grip that pain has on you is totally realistic

Behavior change is what is needed—getting on with life **despite the pain**

The ultimate goal is to move on with life **despite the pain**, to have less focus on pain

**Importance of having a confident/empathetic health care professional**

Building trust, safety, empathy and compassion between therapist and client helps to decrease experience of pain

“I know that you are hurting and I can help you if you are willing to work with me.”

Health care team members can reassure client “You are going to be OK.”
The 4 pillars of pain reduction and functional mobility improvement

1) Sleep (quality and quantity—to allow for healing, relaxation)
2) Aerobic exercise
3) Therapeutic neuroscience education
4) Goal setting with gradual progression towards meeting goals
5) (and a 5th that many want to add is mindfulness training of any kind, such as breathing exercise, meditation, grounding, etc. etc. for receptive clients)

Sample expressions to decrease fear avoidance/pain catastrophization:

“Sore but safe”

“Hurt does not equal harm”

“Motion is lotion”

“Movement is the forgotten pain killer”

Goal setting and graded exposure

Teaches brain to decrease perception of threat by pacing, graded exposure

Key question to help with goal setting “What would you do if your pain was gone?”

Pick one goal and break into small parts with help of health care professional

As do more, gain confidence

Graded activity aims to teach healthy behaviors which in turn decreases pain behaviors

Graded activity brings down to smallest level and gradually increases

Graded activity provides a slow exposure to the threat, gradually increasing

“Tease it, touch it, nudge it” (“it” = the threat)

2-3 hours of soreness the next day are totally normal! Just means to back off a little bit.

Adaptive versus maladaptive responses to pain
Adaptive responses to pain are healthy and protective (resting injured area, stopping activity to allow for healing).

Maladaptive responses to pain do not serve a purpose and are not helpful.

Our bodies have biological reserves and are designed to protect us/adapt before we get into trouble.

**Pain stories and metaphors**

Metaphors and stories have been shown by research to be most effective in helping to increase knowledge and to change attitudes and behaviors related to pain.

Pain stories should be brief, personalized, simple but smart and at client’s level.

Use of stories are fundamental part of teaching about pain.

Culturally appropriate stories are crucial.

In some countries, a lion can be metaphor for scary, unrelenting pain, whereas in others it may be a terrorist, a wild dog, a bear, etc.

**Why pain having chronic pain for long periods of time can affect concentration, mood, memory, temperature regulation, susceptibility to illness, etc.**

When people are dealing with pain for a long time, all areas of the brain can become involved to try to help fight the pain. So, areas which would normally focus on emotions, cognition, etc. may all be focusing on the pain.

“The brain can be having a pain meeting and many areas are involved!”

All of these areas can improve with therapeutic neuroscience education.

The more that the person knows about pain, the more the other areas will stop focusing on the pain and will get back to their typical roles.

**Yellow Flag Issues**

Issues such as stress, lack of access to medical care, poverty, etc. can make perception of pain worse.
Other yellow flag issues are not understanding why pain lingers and thinking that it may be due to serious pathology

Some of these yellow flag areas can be turned to green through therapeutic neuroscience education and reassurance

**Neurogenic inflammation**

With peripheral neuropathic pain, there can be an immune response and persistent swelling and inflammation

Nerves fire in both directions (retrograde)

**Tissue injury versus central sensitization**

At times, both can be going on, such as when someone has osteoarthritis of their knees with an acute flare-up, in addition to chronic pain

Can be helpful for clients to understand that typically, tissue healing from an injury (rather than from a chronic condition) is complete within 6 months for soft tissue and bony injuries

When pain lingers long beyond this, it is typically a “pain issue” rather than a purely “tissue issue” which can be improved by the 4 pillars above and other approaches

To see if is central sensitization issue, one quick way to assess is to see if there is pain at other areas of the body than the main areas of pain (i.e. if there is pain with light palpation of arms or legs when main issue is the back or neck)

When there is a combination of a “pain” and a “tissue” issue, treat both main causes

**How to teach brain to turn down extra sensitive nerves (chronic pain from heightened sensitivity)?**

4 key pillars and whatever else is of interest to the client

(Sleep hygiene, therapeutic neuroscience education, goal setting, aerobic exercise)

Anything that can decrease stress level, including mindfulness-based approaches such as breathing, grounding, meditation, etc. will help
There is often some latency, so a delay before pain levels will come down

**Optimal coaching/supervision with clients with chronic pain issues**

For clients who are very fear avoidant of movement, it is optimal to show them how to do a movement or activity (with good body mechanics, for example) and then have them do it, make adjustments as needed by coaching them, discuss sensation that they feel when doing the activity and tie back to therapeutic neuroscience education (for example sensitivity/nociception versus actual damage to tissues)

Give home program of the activity or exercise

Upon return to therapy, ask them about home exercise program

Let them again demonstrate, then give feedback and make adjustments as needed

Repeat each session until the client is comfortable with the program and understands how to gently progress, listen to their body

Gradually use this close coaching method for both movements and activities of daily living

**What are some other means of quieting an extra sensitive nervous system in order to decrease pain and to increase overall mobility?**

Medications  Meditation  Modalities (such as TENS, heat, aquatics)  Manual therapy  Coping skills  Humor  Relaxation  Mindfulness  Ice  Meditation  Yoga  Being in nature  Spirituality  Graded motor imagery  Neurodynamics  De-clutter/De-stress life  Dry needling/trigger point therapy  Massage  Pacing  Graded exposure  Stander use  Therapeutic alliance with the health care team in setting of safety  Healthy diet

**Considerations for working with people with cerebral palsy**

Understand that many people with cerebral palsy have been through many potentially painful procedures, including surgery, Botox injections

Therapies and home programs, including stretching, have often been painful as well so may be negative associations which need to be overcome

Crucial to give people choice in treatment approaches