**Pain Therapy: The Evolution of Pain Therapy and its future role in Physical Therapy**

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**Objective** - Pain, known to most as, “an unpleasant sensory and emotional experience” is not a phenomenon very well understood. Pain must be understood and evaluated on a physical, emotional, and behavioral level. Many renown theories are known as the Specificity (or Labeled Line), Intensity, Pattern, and Gate Control Theories of Pain. Following the evolutions of these, clinicians and therapists have conjoined and showed a shift in treatment attentiveness to Pain Neuroscience Education (PNE). PNE has tapped into the psychological, psychosocial and physiological factors of all varieties of pain. It consists of educational sessions for patients describing in detail the neurobiology and neurophysiology of pain and pain processing by the nervous system. The development of PNE and the examination of its future role in Physical Therapy can greatly enrich the field of rehabilitation.

**Introduction** – The oldest ideology of pain was known as the “Aristotelian dogma” which argued strenuously against the Specificity Theory. It argued pain is a quality of all senses. When Western philosophers then shifted to a more fibrous or nerve-based focus. One of the first Western philosophers to tackle the phenomenon of pain was Rene Descartes. Through his work, *Treatise of Man* (1662), Descartes speaks of pain as a perception existent in the brain. He goes on to say that this perception was a result of sensory transductions conducted by these hollow tubules that convey both sensory and motor information. These sensory gates remained inactive until a sensory cue with a significant amount of energy passed through propelling this “tug” (Davis & Moayedi, 2012), like force which would then open the gates or bridge allowing for communication to be stimulated and the brain would be exposed to “animal spirits” (Davis & Moayedi, 2012), which later allowed for muscle movement. This sensory cue can also be found through a reactionary movement.

**Conclusion** - PNE must coincide and why manual therapy is still a central focus or incorporation in modern therapy for treating pain, when advancements in mirror therapy, graded motor imagery, and even virtual reality are rising. Pain neuroscience education has enhanced therapeutic alliance (TA), known as the relationship between a healthcare professional and a client. TA is cognitive mean in therapy is based on the social, verbal, and trustworthy skill and bond the therapist exhibits for his or her patients as well as the overall ambience of the therapeutic setting which can severely impact the overall outcomes of the rehabilitation process.

TA & PNE- overlap one another in patients with chronic pain especially. Manual therapy can enhance this relationship as well. PNE is used especially for patients: in the initial phases of an injury, strongly impacts their recovery, including efficacy of future treatments. It is known as the ‘de-educate to re-educate’ (Louw, et. al., 2017), model. The transition of how pain was once perceived to how it should be perceived. PNE should now merge with manual therapy to enable a growth in positive patient outcome growing towards an emergence for future chronic and acute pain treatments.

**Theories**

**Specificity Theory** - stimulation pertaining to the activation of perception had separate but equal capabilities throughout the mind and body modification of Descartes, the overall work of Charles Bell and Andrew Shaw

**Intensive/Summation Theory of Pain** - 4th - Plato- pain is a force that is not a sensory experience to a stimulus but an emotional response to any stimuli stronger than what is usual. Physiologists Arthur Goldstein and Bernhard Naunyn (1859), collaborated together and concluded that this theory meant “a neurophysiological model to describe this summation effect: repeated sub-threshold stimulation or suprathreshold hyper intensive stimulation could cause pain”

**Gate Theory** - by Ronald Melzack and Charles Patrick Wall in *Gate Control Theory: On the Evolution of Pain Concepts* in 1965 ; The substantia gelantinosa is a gate in this case and it allows for factors like large (the fibers that inhibit a response) and small fibers (the ones that excite a response) found within the dorsal horn of the spinal cord to be activated. When a nociceptor receives a signal of enough energy to breach a threshold, the gate is opened, and pain pathways can be inhibited/activated in the same light. Once all this is done, pain is experienced (Melzack & Wall, 1996).

**Pain Neuroscience Educations(PNE): Implications, Growth, and Future** - “PNE teaches people in pain more about the biology and physiology of their pain experience including processes such as central sensitization, peripheral sensitization, allodynia, inhibition, facilitation, neuroplasticy and more” (Louw, et. al., 2017). IPNE biologizes pain, teaching patients about the biology and physiology of a pain experience would make sense. Education-alone may not be sufficient for change. This is important as many clinicians may be under the impression that PNE is education-only intervention. There was very little to low cost needed to continuously “educate” the test participants over the one-year time period. During this time, there was also a positive/increase in results of these participants becoming more tolerable towards chronic pain symptoms.