**Abstract:**

Over 84% of adults in the US have had low back at some point in their life(Carey et al., 2009). Pain that continues for greater than 12 weeks is considered chronic pain. Millions of individuals live with chronic lower back pain and inappropriately prescribed opioids long term, a class of medications that may provide effective analgesia but can lead to opioid use disorder, opioid-related overdoses and serious adverse events, including death. It is vital to identify opioid-free treatments to assist in the management of chronic pain. This intervention was developed to give patients the illusion of body ownership with a virtual avatar. The patient will then undergo therapeutic maneuvers and virtual torso elongation to create an analgesic effect based on previous research.

**Literature behind the intervention**

Several papers were instrumental in the development of the intervention. Rosink et al. demonstrated that a projector-based VR experience could be used to help understand body perception in those with chronic lower back pain (Roosink et al., 2015). We then incorporated elongation based on inspiration from a paper from Dr. Mel Slater, which demonstrated a sense of presence with a limb three times its original size (Kilteni, Normand, Sanchez-Vives, & Slater, 2012).  Dr. Maria V. Sanchez-Vives recently published a brilliant pilot study using virtual embodiment and modifications of both size and opacification of upper extremity to treat chronic pain (Matamala-Gomez, Gonzalez, Slater, & Sanchez-Vives, 2018). Virtual embodiment is the process of causing the illusion of body ownership to a virtual avatar using visuomotor synchrony and a virtual mirror. Recently a randomized trial published in the journal Neurology demonstrating mild analgesia using virtual embodiment for neuropathic pain from a spinal injury (Pozeg et al., 2017). We also incorporated a back exercise based on several papers demonstrated benefit with VR based physical therapy (Thomas, France, Applegate, Leitkam, & Walkowski, 2016)(Trost et al., 2015).

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