

## TMR Fact Sheet

- Two million Americans living with limb loss suffer from chronic pain in the form of neuroma-related residual limb pain (RLP) and phantom limb pain (PLP).<sup>1</sup>
- More than a third (36%) of the 2 million amputees (720,000) rate their pain as chronic and debilitating.<sup>1</sup>
- Of the 185,000 new amputees each year, approximately half will experience moderate to severe chronic post-amputation nerve pain.<sup>2</sup>
- Post-amputation nerve pain is typically experienced as residual limb (stump) pain or phantom limb pain. Nerve-related residual limb pain results from the formation of a neuroma, a bundle of painful nerve endings located at the ends of severed nerves. Phantom limb pain is the result of altered nerve signals sent to the brain following limb loss that the brain interprets as pain. Painful phantom sensations may include burning, shooting, stabbing, twisting, throbbing and crushing.<sup>3</sup>
- In TMR, pain is resolved when amputated nerves are reconnected to nearby nerves and eventually muscle targets. TMR gives the nerve somewhere to go and something to do, restoring normal signals to the brain.<sup>1,2,4</sup>
- TMR may be an option for non-amputee patients experiencing nerve pain, including trauma, mastectomy, and hernia repair patients.<sup>5,6</sup>
- A growing body of clinical evidence supports the case for TMR as a long-term, non-drug remedy for chronic post-amputation nerve pain.<sup>1-2,4-6</sup>

1. [Dumanian GA, Potter BK, Mioton LM, Ko JH, et al., Targeted Muscle Reinnervation Treats Neuroma and Phantom Pain in Major Limb Amputees: A Randomized Clinical Trial. Ann Surg. 2018 Oct 26.](#)
2. [Valerio IL, Dumanian GA, et al. Preemptive Treatment of Phantom and Residual Limb Pain with Targeted Muscle Reinnervation at the Time of Major Limb Amputation. J Am Coll Surg. 2019 Mar;228\(3\):217-226.](#)
3. [Ephraim PL, Wegner ST, et al. Phantom pain, residual limb pain, and back pain in amputees: results of a national survey. Arch Phys Med Rehabil. 2015 Oct;86\(10\): 1910-9.](#)
4. [Souza JM, Cheesborough JE, Ko JH, et al. Targeted muscle reinnervation: a novel approach to postamputation neuroma pain. Clin Orthop Relat Res. 2014;472:2984-2990.](#)
5. [Alexander JH, Jordan SW, et al. Targeted Muscle Reinnervation in Oncologic Amputees: Early Experience of a Novel Institutional Protocol, J Surg Oncol. 2019;120\(3\):348-358.](#)
6. [O'Brien AL, Kraft CT, Valerio IL, et al. Targeted Muscle Reinnervation following Breast Surgery: A Novel Technique. Plast Reconstr Surg Glob Open. 2020 Apr 24;8\(4\):e2782.](#)