

Peripheral Nerve Stimulation (PNS) for Chronic Joint Pain in Patients Who Are Not Candidates for Joint Replacement Surgery

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Introduction: Approximately 1 in 4 adults in the US with arthritis have severe, chronic joint pain.¹ The typical treatment algorithm includes conservative treatments like physical therapy, medications and steroid injections. Patients who fail conservative management are often presented with surgical treatment which may include joint replacement surgery (JRS). For some patients who are not candidates for surgical procedures because of comorbidities, pain treatment is limited primarily to oral analgesics. Recent advances in medical device technology and imaging have made Peripheral Nerve Stimulation (PNS) minimally invasive, fast to implant under local anesthesia, and simple to control.

Methods: A survey was conducted of US patients with chronic joint pain of the shoulder and knee who received the first FDA cleared PNS System, the StimRouter® (Bioness Inc., Valencia, CA), approved to treat chronic pain of a peripheral nerve origin excluding pain in the craniofacial region. The selection criteria for the database was the nerve stimulated corresponding to the shoulder and knee. Patients who received the implant for Hemiplegic Shoulder Pain were excluded. The PNS implant consists of a small, thin implanted lead powered by an External Pulse Transmitter and controlled with a Patient Programmer (Figure 1). The percutaneous procedure is ≈15-30 minutes long and performed using ultrasound guidance while the patient is awake. “Trial” stimulation is integrated into the permanent lead placement, combining two procedures.

Results: 10 patients responded to the survey: 5 Saphenous nerve and 5 Axillary nerve implants. Responder Rates are summarized in Table 1 and Table 2. The combined responder rate for all nerves is 60% and average pain reduction for “responders” is 68%. Responders were classified as those patients who experienced a 50% or more reduction in their pain post-implant. Average implant time was 1.2 years.

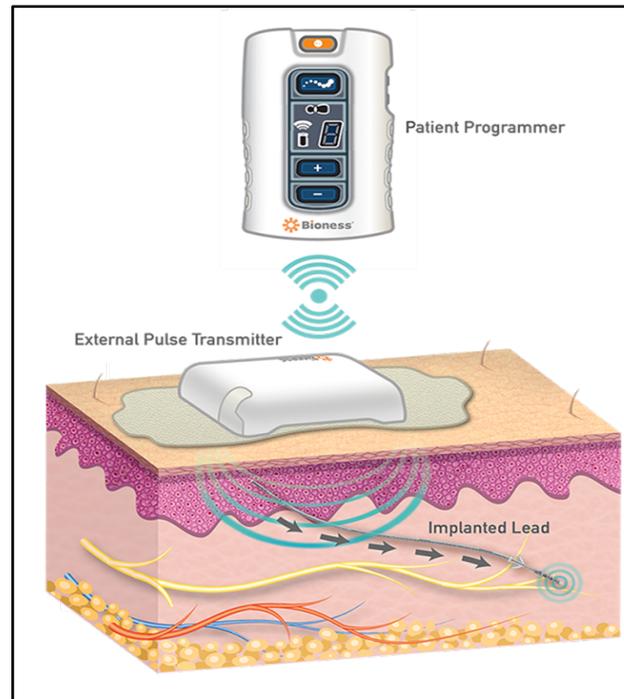


Figure 1

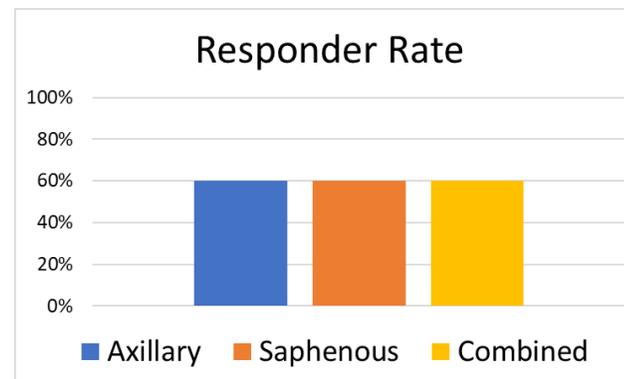


Table 1

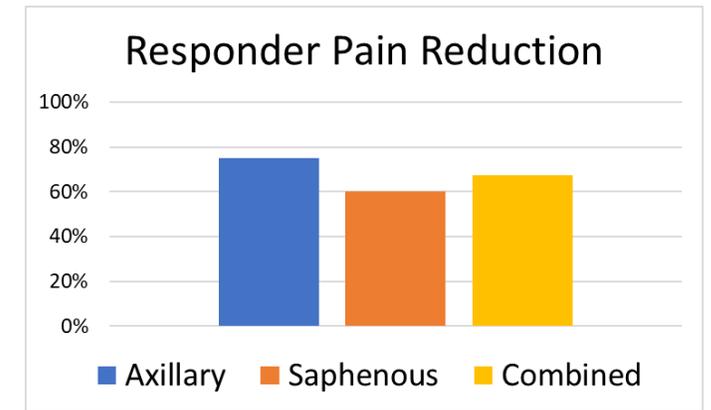


Table 2

Discussion: PNS targeting chronic joint pain is a promising therapy that has benefits for patients who are not candidates for JRS and have responded favorably to diagnostic nerve blocks without durable benefit. Visualization of the target peripheral nerve with ultrasound makes it easy to percutaneously place the small lead. Although additional data and high-quality studies are needed, complications associated with older technology including lead migration, fracture, and skin erosion are likely reduced with this system given its simplicity, ease of use, and minimally invasive implant procedure.

References:

1. Deer T, Pope J, Benyamin R, et al., *Neuromodulation*. 2016 Jan: 19(1):91-100.
2. <https://www.cdc.gov/arthritis/pain/index.htm>

Disclosures:

1. E. Ottestad, MD is on the Scientific Advisory Board for Bioness Inc.
2. Andy Veldkamp is an employee of Bioness Inc.