

Benefits of Closed-Loop Spinal Cord Stimulation for those with Upper Limb Pain

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Background

SCS is an effective treatment for chronic, neuropathic, upper limb pain (ULP).¹ However, due to the mobility of the cervical spine, patients may experience therapy side effects such as under- or overstimulation as they engage in activities of daily living. In this study, ECAPs were used to modulate stimulation amplitude on a pulse-by-pulse basis.² Here we describe the outcomes and closed-loop (CL) engagement for three subjects with ULP in the Closed-Loop SCS Study.

References: 1. White et al. NANS 2024; 2. Vallejo et al. J of Pain Res, 2021

Methods

The Closed-Loop SCS Study is a prospective, multicenter, single-arm study of the Inceptiv™ SCS system that includes assessment of patient experience with SCS therapy both in-clinic and at-home, pain reduction, and quality-of-life metrics. The primary objective of the study is to demonstrate reduction in overstimulation with the CL feature compared with open-loop (OL) at 1-month. Pain outcomes will be collected through 24 months in a single-arm design with devices programmed with waveforms tailored to individual needs with CL to ensure consistent dosing. The study is being conducted at 7 sites in Australia (NCT05177354).

Figures show overstimulation, pain VAS and examples of CL adjusting stim during activities for 3 subjects with upper limb pain. Stimulation parameters were optimized for ECAP capture for the duration of this in-clinic testing.

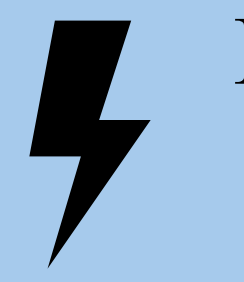
Case Study 1



49 years



Degenerative Disc, Herniated Disc, Radiculopathy



Pain Duration: 13 years



Palexia, Endone BID
Arthrexin BID
Nortryptlyline Q24H
Topiramate BID

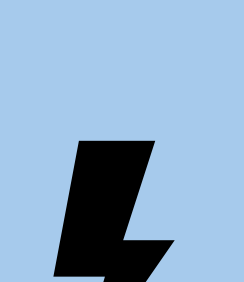
Case Study 2



52 years



CRPS
RFA+decompression

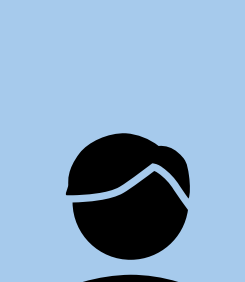


Pain Duration: 8 years

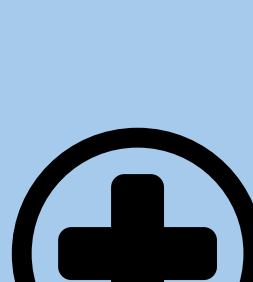


Oxycodone BID

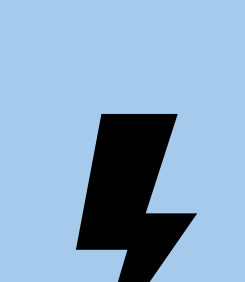
Case Study 3



33 years



Peripheral Causalgia

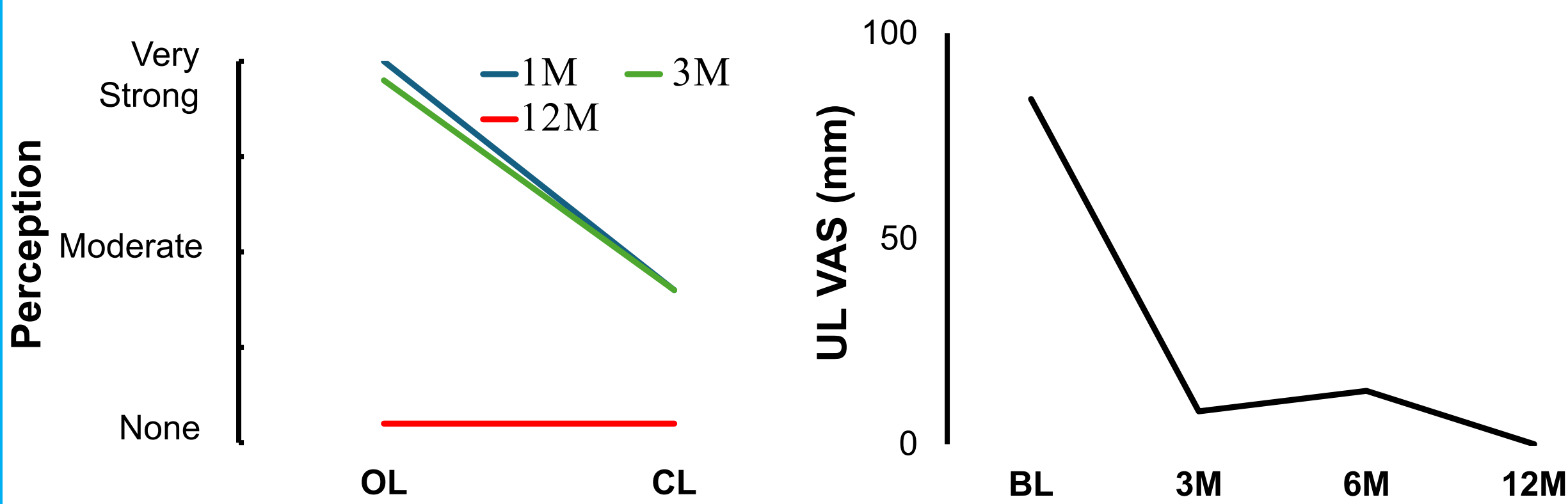


Pain duration: 4 years

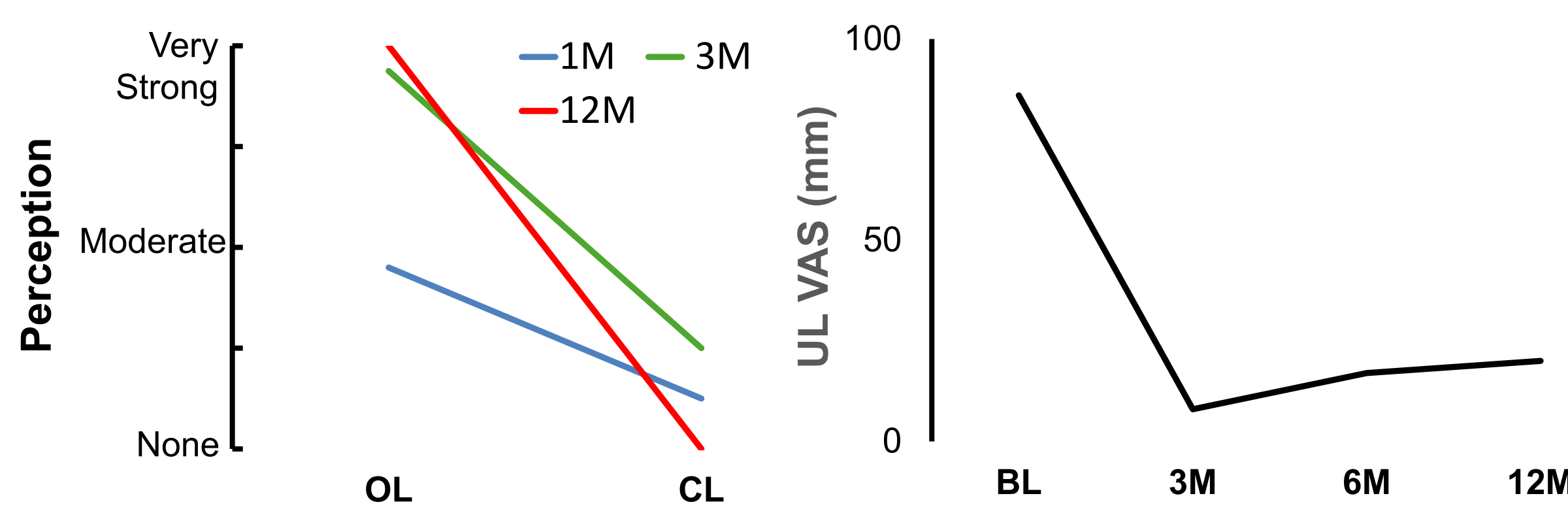
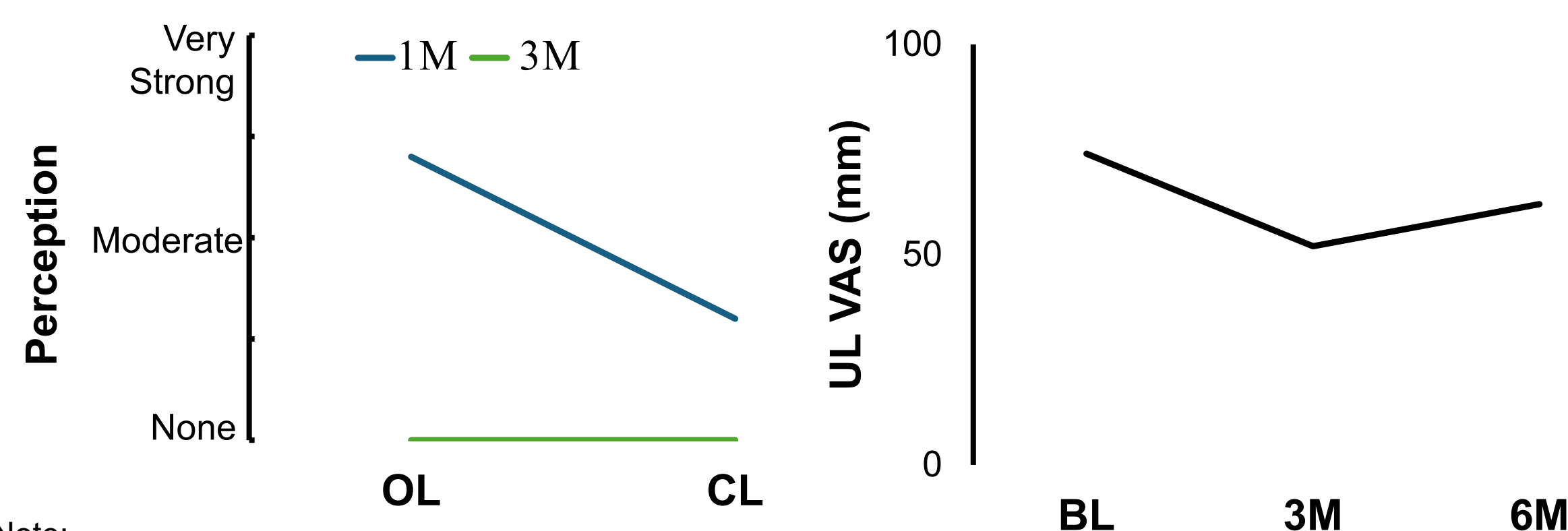


Palexia BID

1-, 3- and 12-month CLPerformance and Pain Reduction Outcomes



Perception: sensation of stimulation



ECAP streams measured in-clinic during the 3-month visits with OL-SCS and SL-SCS as the subject performed movements that occur during daily activities such as arm raise, coughing, laughing etc.

