

Occipital Nerve Stimulation for Primary Headache Disorders

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Introduction

- 3-5% of the population suffers from chronic headaches.
- For patients who are unable to take, or do not respond to conventional medical management, Occipital Nerve Stimulation (ONS) can be an alternative treatment.
- In a recently published clinical trial, ONS substantially reduced attack frequency and was safe and well tolerated¹.
- NHS England will commission Occipital Nerve Stimulation (ONS) as a treatment for adult patients with chronic migraine or chronic cluster headaches who have failed to respond to available pharmaceutical treatments².
- The AnkerStim™ lead is the only system CE mark approved for ONS for Intractable Chronic Cluster Headache (iCCH)

Methods

- A single-site, retrospective chart review was conducted on 25 patients who were implanted with an AnkerStim™ Occipital Nerve Stimulator system for the treatment of refractory headache disorders, between 2018 and 2024.
- The primary outcome was a 50% reduction in the frequency of headaches per month.
- Secondary outcomes included change in EQ-5D score, pain intensity (NRS), and Headache Impact Test (HIT-6) score.
- Headache-specific medication use, and oxygen therapy were also recorded.

Figure 1. AnkerStim™ Lead with Tines at the Proximal and Distal ends

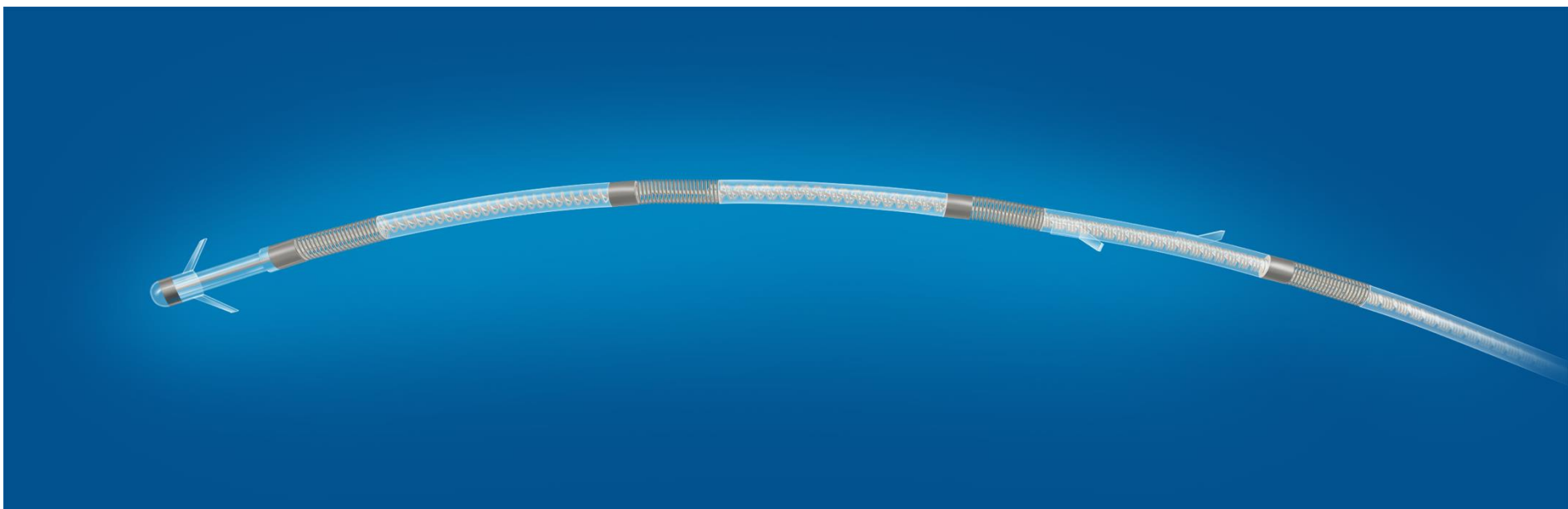


Table 1. Stimulation Parameters

Parameters	Range
Amplitude	2.5-5.5 mA
Frequency	20-60Hz
Pulse Width	200-400 µsec

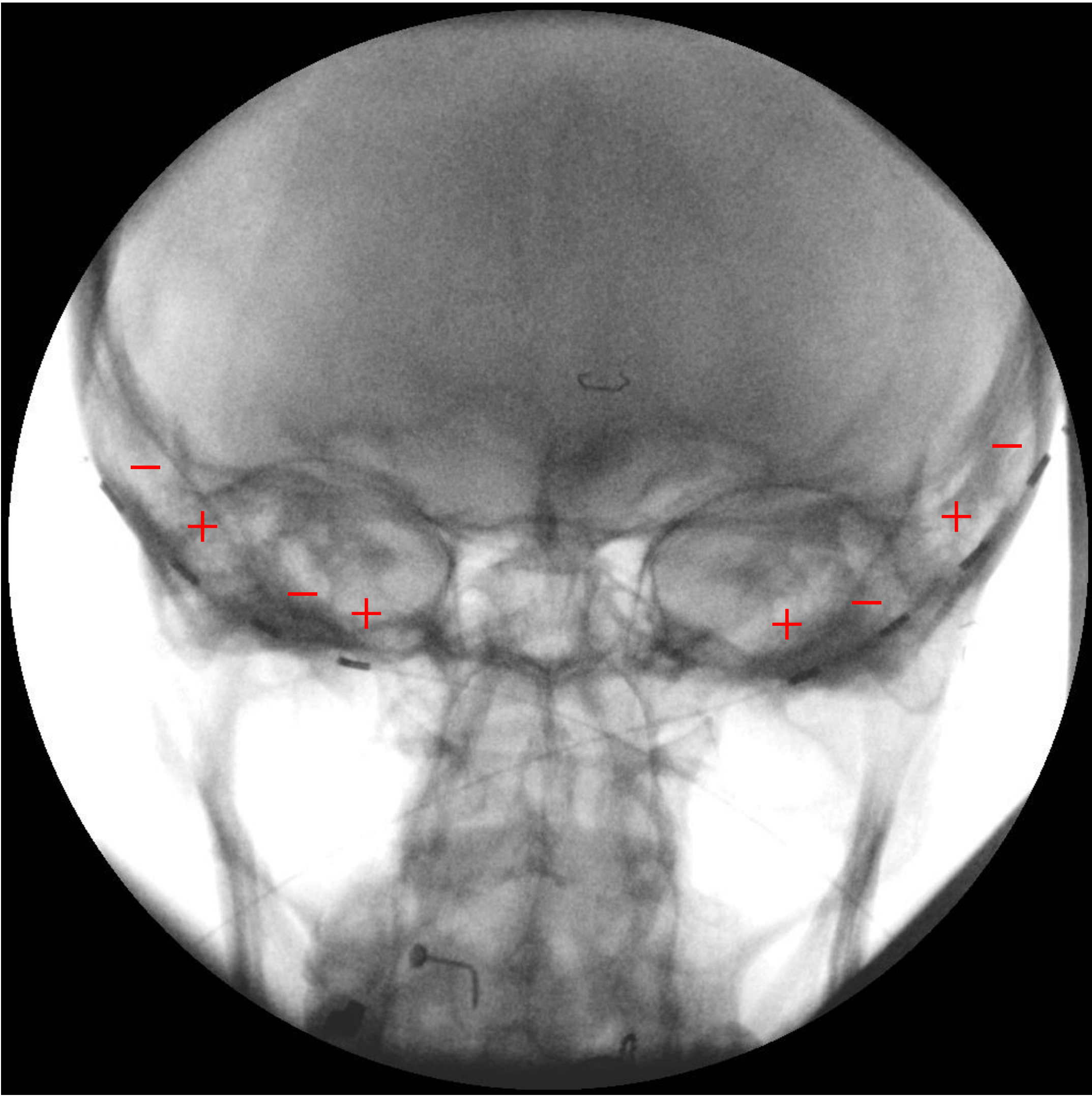
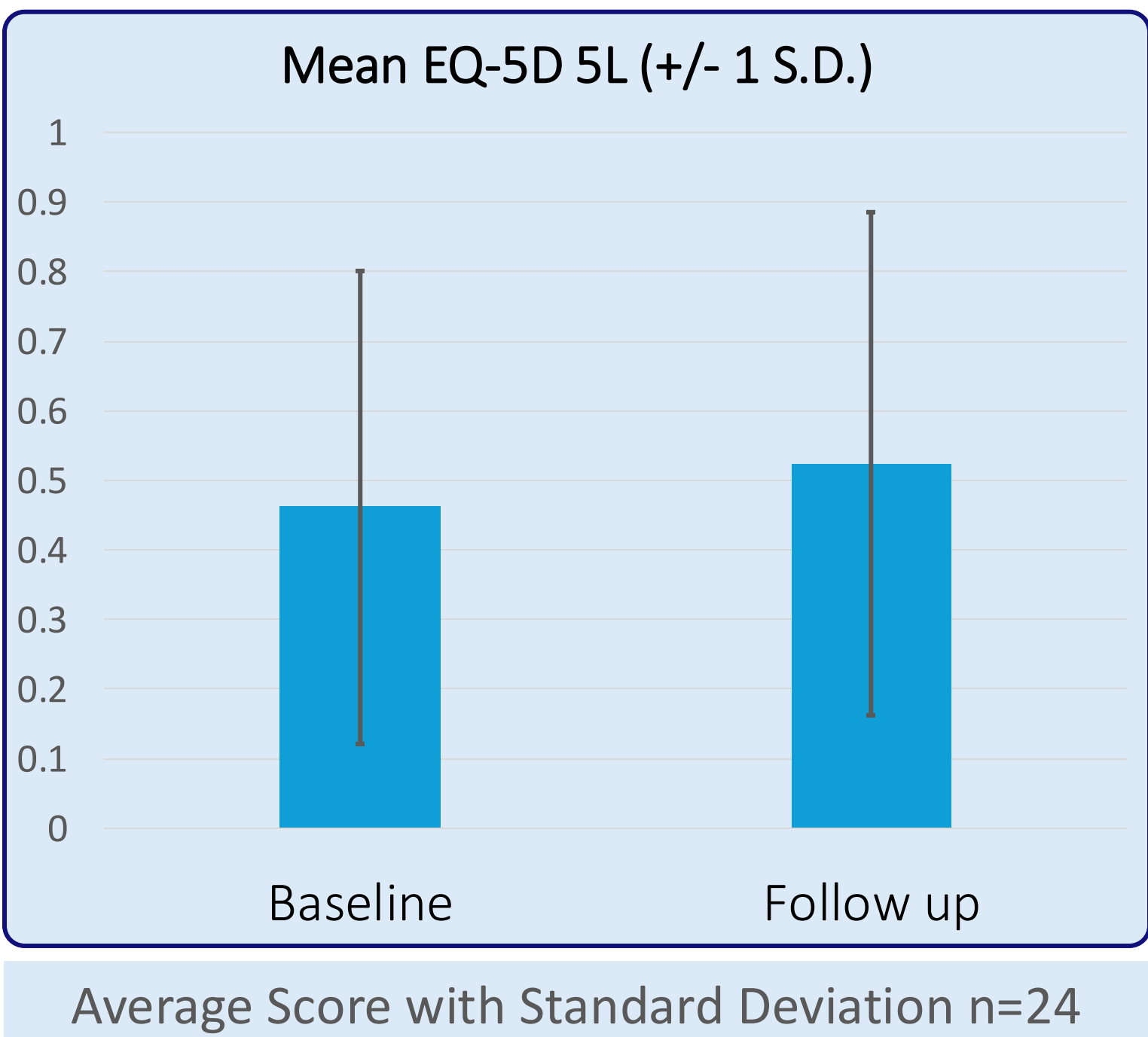
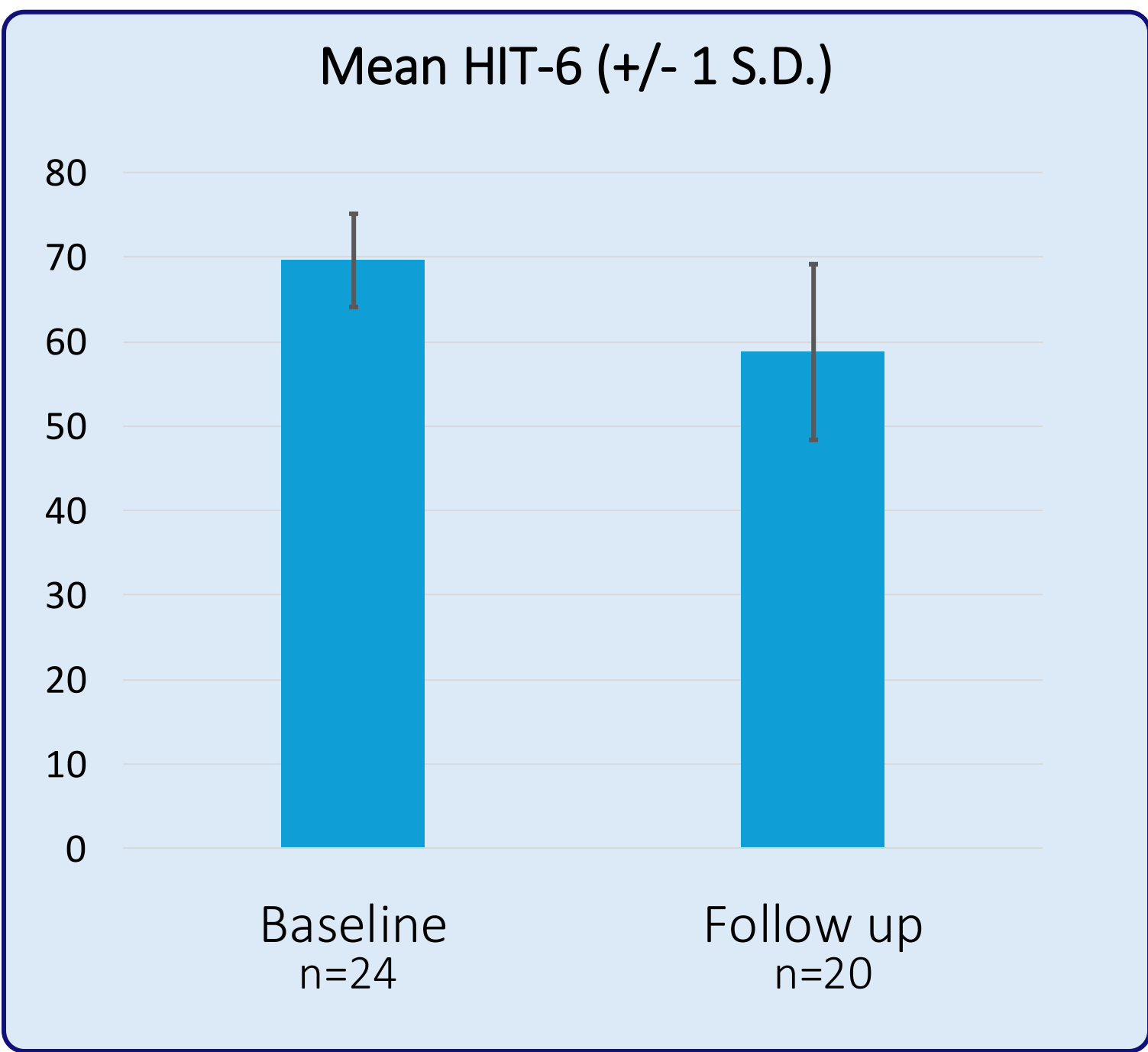
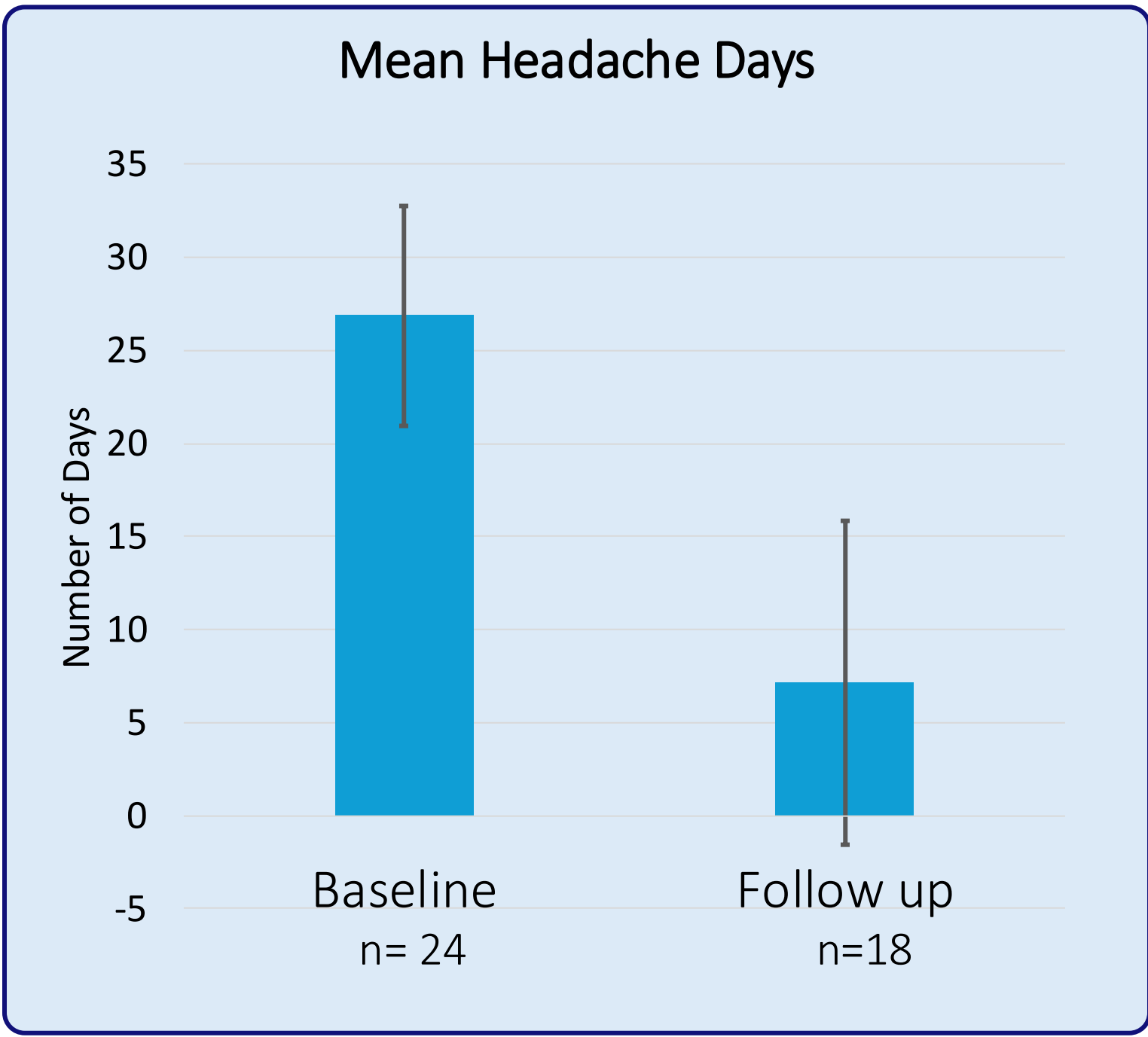
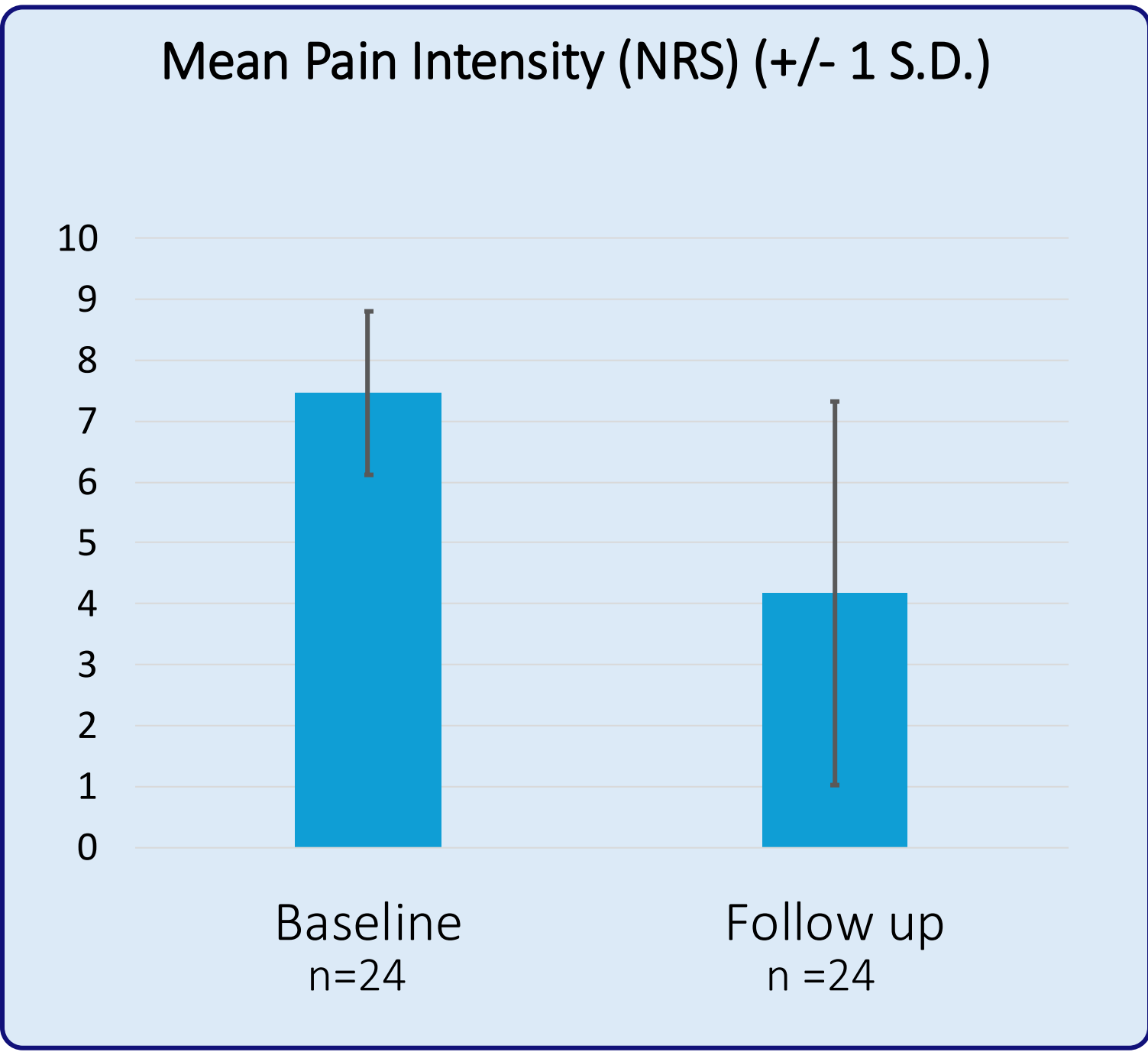
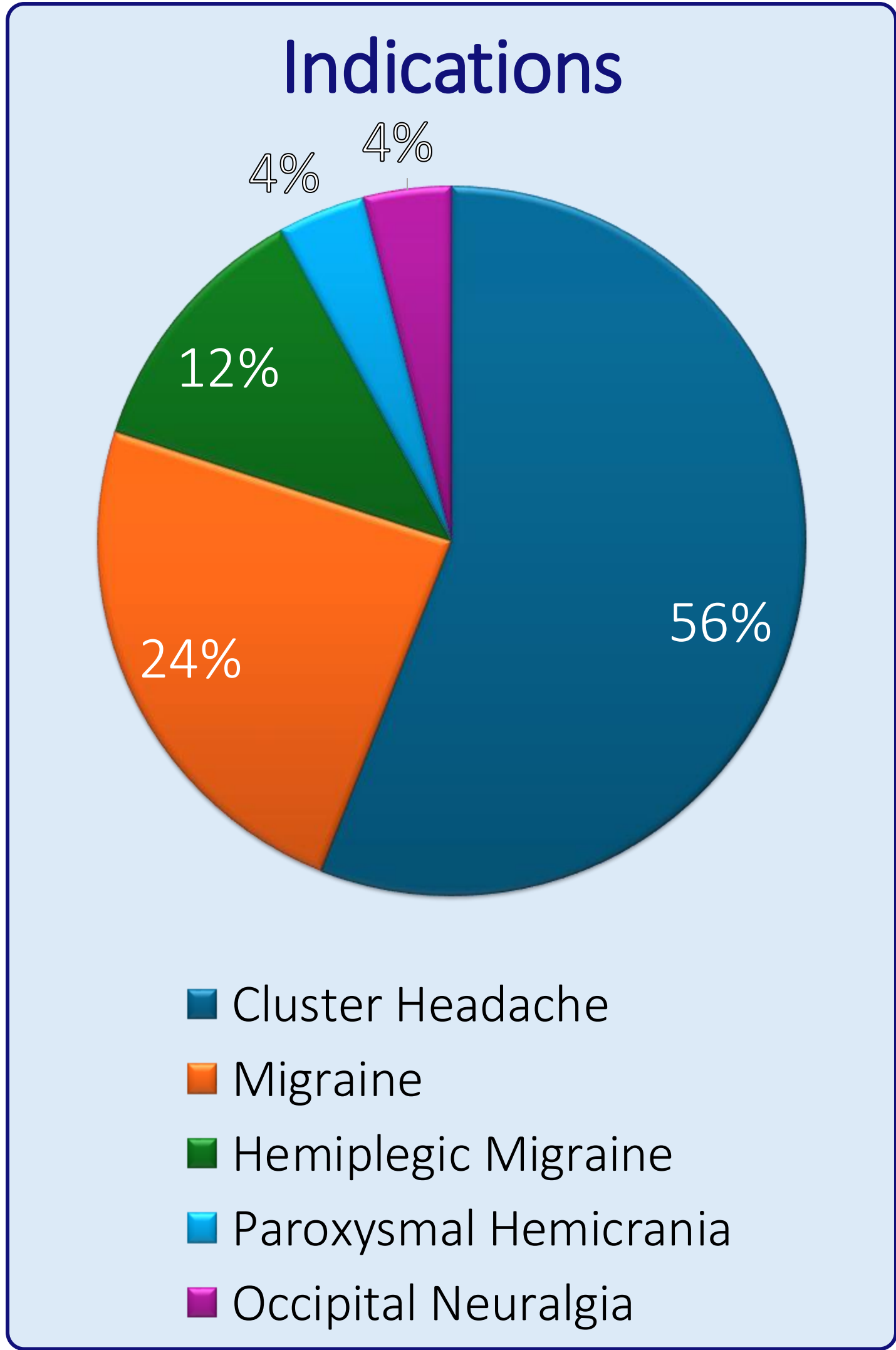


Figure 2. ONS Leads in situ & Electrode Configuration



Main Results

- Mean follow-up: 45 months (range 2-92 months)
- Patients used the ONS 24 hours per day
- 78% reported < 5 headache days per month**
- 88% reported >50% reduction in the headache days per month**
- HIT-6 had a meaningful improvement of 12.5
- 8 patients decreased, and 3 had no change in medication consumption
- Two out of three patients discontinued oxygen use for cluster headaches
- None of the patients increased the medication
- Five patients were explanted (1=Infection, 4=Lack of response)
- One patient died due to unrelated causes
- No lead migration was noted in our series**
- Bilateral Stimulation in all the patients**
- 24 hr stimulation usage in all the patients**

Table 2. Non-responders by Diagnosis

Diagnosis	Non-responders
Cluster Headache	2 out of 14
Migraines	2 out of 6
Hemiplegic Migraine	1 out of 3
Paroxysmal Hemicrania	1 out of 1

Conclusions

- Occipital Nerve Stimulation is an effective treatment to reduce number of headache days and intensity of headaches in patients with refractory headaches.
- Furthermore, ONS therapy shows benefits for these patients regarding pain scores, quality of life and impact on daily life.

References

- Wilbrink LA, de Coo IF et al. Safety and efficacy of occipital nerve stimulation for attack prevention in medically intractable chronic cluster headache (ICON): a randomised, double-blind, multicentre, phase 3, electrical dose-controlled trial. The Lancet Neurology. 2021 Jul 1;20(7):515-25.
- Clinical Commissioning Policy: Occipital Nerve Stimulation for Adults with Intractable Chronic Migraines and Medically Refractory Chronic Cluster Headaches. <https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2015/07/d08-p-c.pdf>