

# Prevention of Facial Nerve Injury in Mastoidectomies through EMG

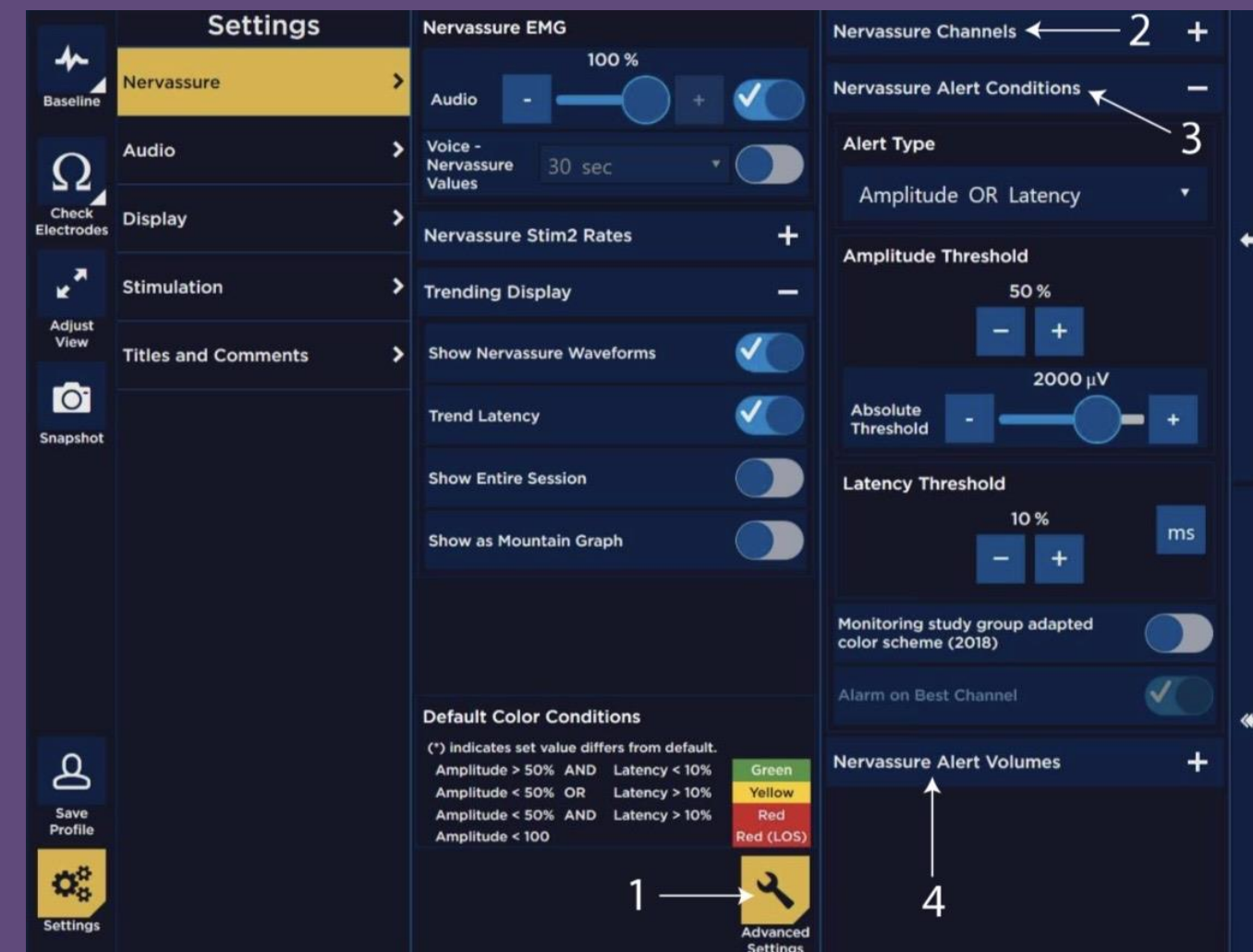
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## Introduction

Otologic surgery, particularly **mastoidectomy**, presents inherent **risks of facial nerve injury, even among experienced surgeons**. Anatomical variations, underlying pathology, and prior surgical interventions may complicate nerve identification, making iatrogenic injury a significant clinical concern. Sometimes, **minor irritation or stretching of the facial nerve can lead to temporary or permanent nerve damage symptoms**, such as facial weakness, numbness, or spasms. Facial nerve extrusion, although rare, results in facial paralysis whose clinical outcome resembles that of a cerebrovascular accident in terms of comorbidity.

## Objectives

This study aims to prevent facial nerve injury during mastoidectomy through the **use of intraoperative neurostimulation, enhancing surgical precision and patient safety**. The specific objective is to **evaluate the efficacy of neurostimulation in reducing iatrogenic complications**.



## Methodology

At **Pedro Hispano Hospital**, a **neurostimulation system was implemented for intraoperative neurophysiological monitoring** some specific cases of mastoidectomy. During surgery, **electrodes were placed on facial muscles** innervated by the facial nerve and connected to a neurostimulation device, continuously **monitoring electromyographic signals**. The system provided **real-time visual and auditory feedback** when the nerve was stimulated or at risk of manipulation.



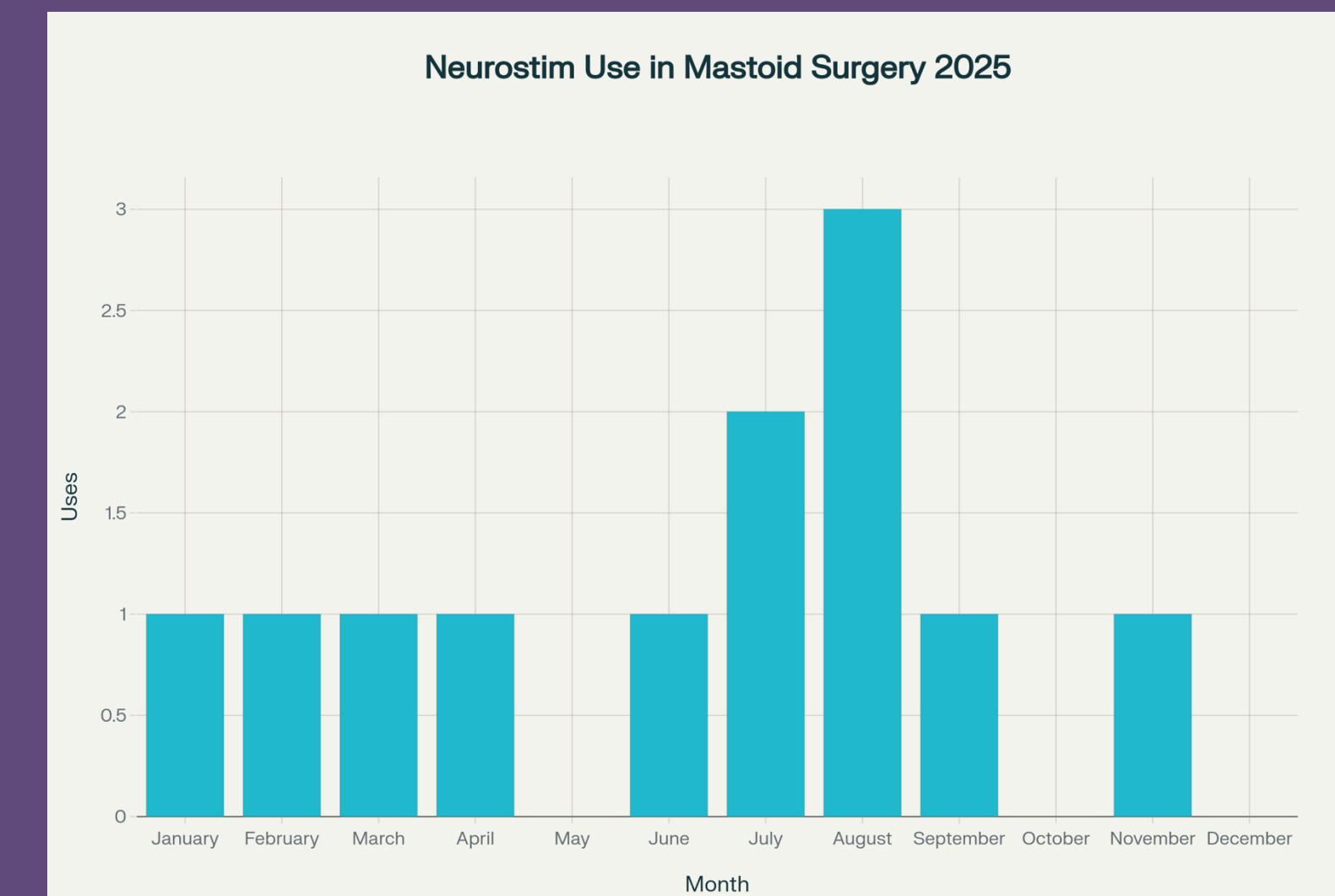
## Results

Since **2024**, the use of neurostimulation in the Otolaryngology Department **has increased progressively**. In **2025**, all mastoidectomy procedures performed under neurostimulation monitoring reported **no instances of iatrogenic facial nerve injury**.

This data indicates a **near-zero complication rate** among patients undergoing procedures with intraoperative neurostimulation.

Given the **high cost of EMG**, the team elected to **employ this technology in the following cases**, due to their elevated clinical risk of iatrogenic injury:

- **Wall Down Canal;**
- **Cases involving a dehiscent facial nerve;**
- **Surgical reinterventions of mastoidectomies.**



## Conclusion

The integration of neurostimulation technology with modern surgical techniques demonstrates **clear benefits in preventing facial nerve injury during mastoidectomy**.

This innovation significantly **improves patient safety and surgical outcomes**, emphasizing the essential role of technological advances in **elevating the quality of clinical care**.

There was an **increase in usage from 2024 to 2025**, and we anticipate that with this year's success, **although with some economic constraints, we may be able to increase usage in 2026**.

