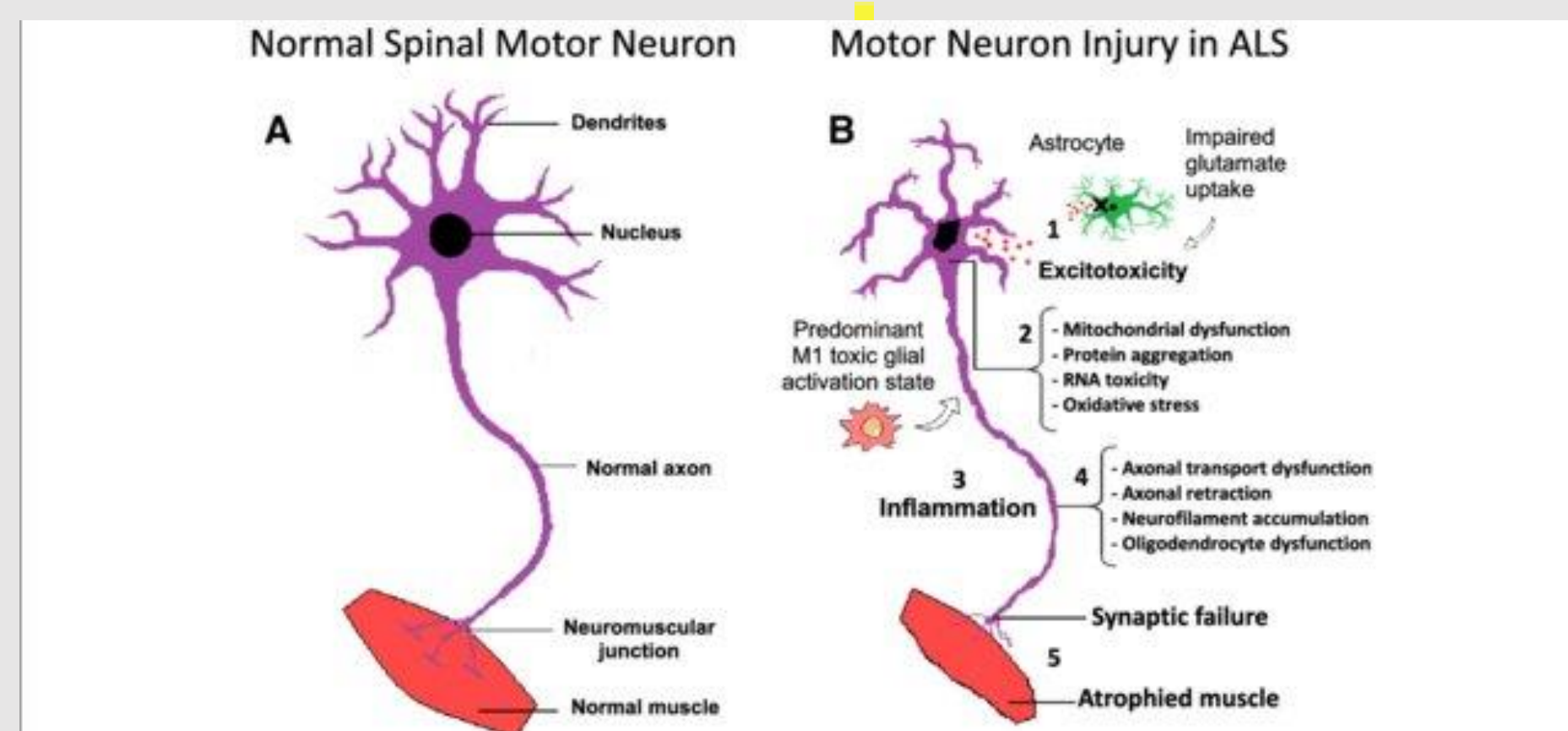


Pain in Amyotrophic Lateral Sclerosis (ALS): Sites, Intensity, and Pathophysiology

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Introduction

- Amyotrophic Lateral Sclerosis (ALS) is a rapidly progressive neurodegenerative condition, with a complex and multifocal pathophysiology, resulting in very limited therapeutics.
- While the condition is often associated with weakness, muscle atrophy, and corticobulbar symptoms, ALS patients have higher pain intensity relative to the general population, which contributes to decreased quality of life.
- Neurofilament light chain (NfL), a byproduct of neuroaxonal breakdown, has been identified as a biomarker in ALS, CMT, and chemotherapy neuropathy amongst other conditions.



(Ciervo, Y., Ning, K., Jun, X., Shaw, P. J., & Mead, R. J. (2017). Advances, challenges and future directions for stem cell therapy in amyotrophic lateral sclerosis. *Molecular neurodegeneration*, 12(1), 1-22.)

In this study we sought to characterize pain in ALS, with the following key objectives:

- Identified the most common pain sites in ALS patients
- Evaluate the association of NfL levels with pain
- Establish the most commonly used pain management therapies and the role of pain specialists

Methods

- Detailed demographic and clinical data was collected from 33 ALS patients seen at the Saint Louis University ALS Clinic.
- Statistical analysis was done using Prism Version 9.5.1 (GraphPad Software, San Diego, CA).
- Pain site data and pain therapeutics were reported as a frequency. Association between NfL and pain and ALS was evaluated using a Pearson correlation coefficient.

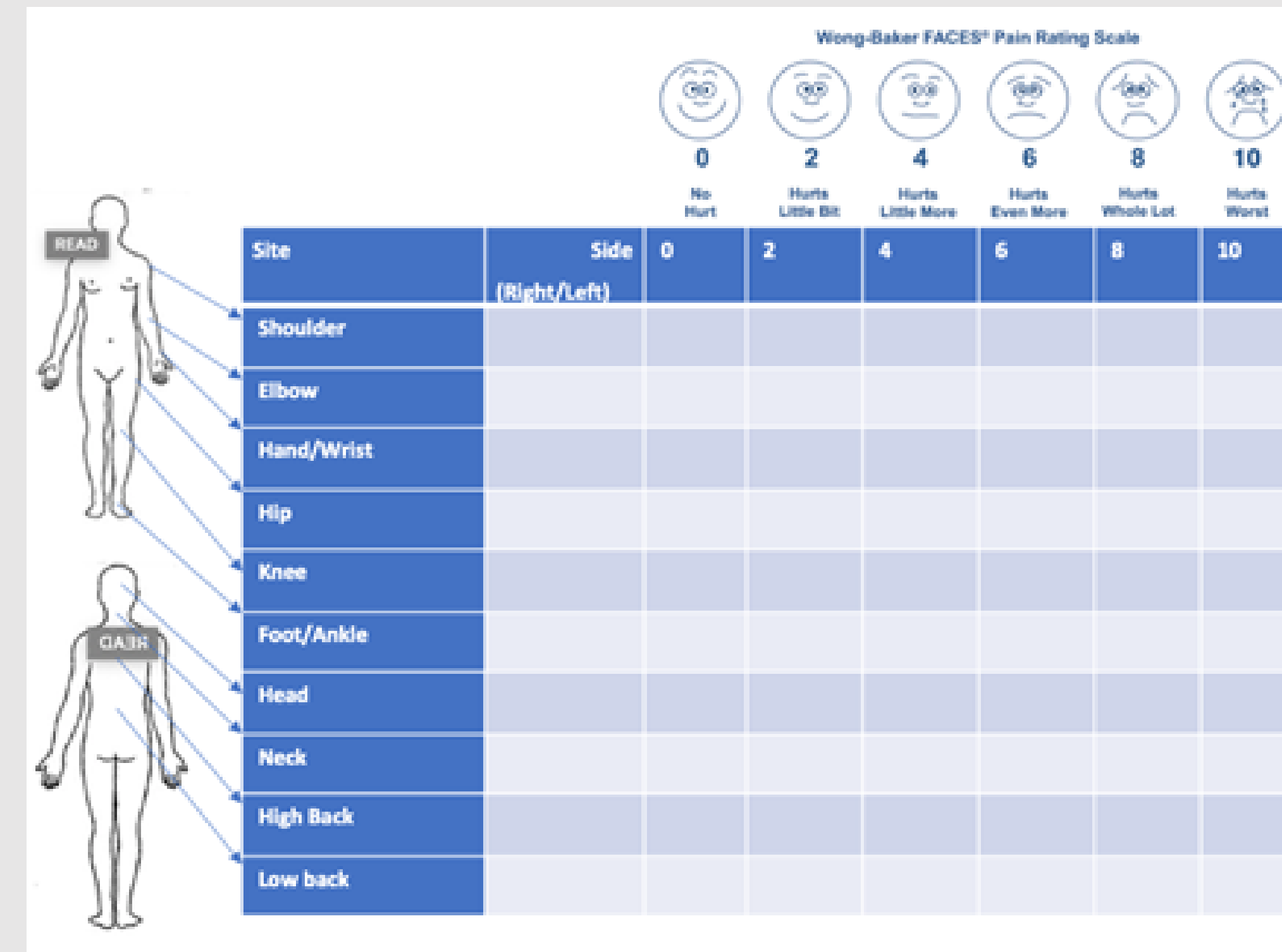


Figure 1. Pain Scale Survey

Results

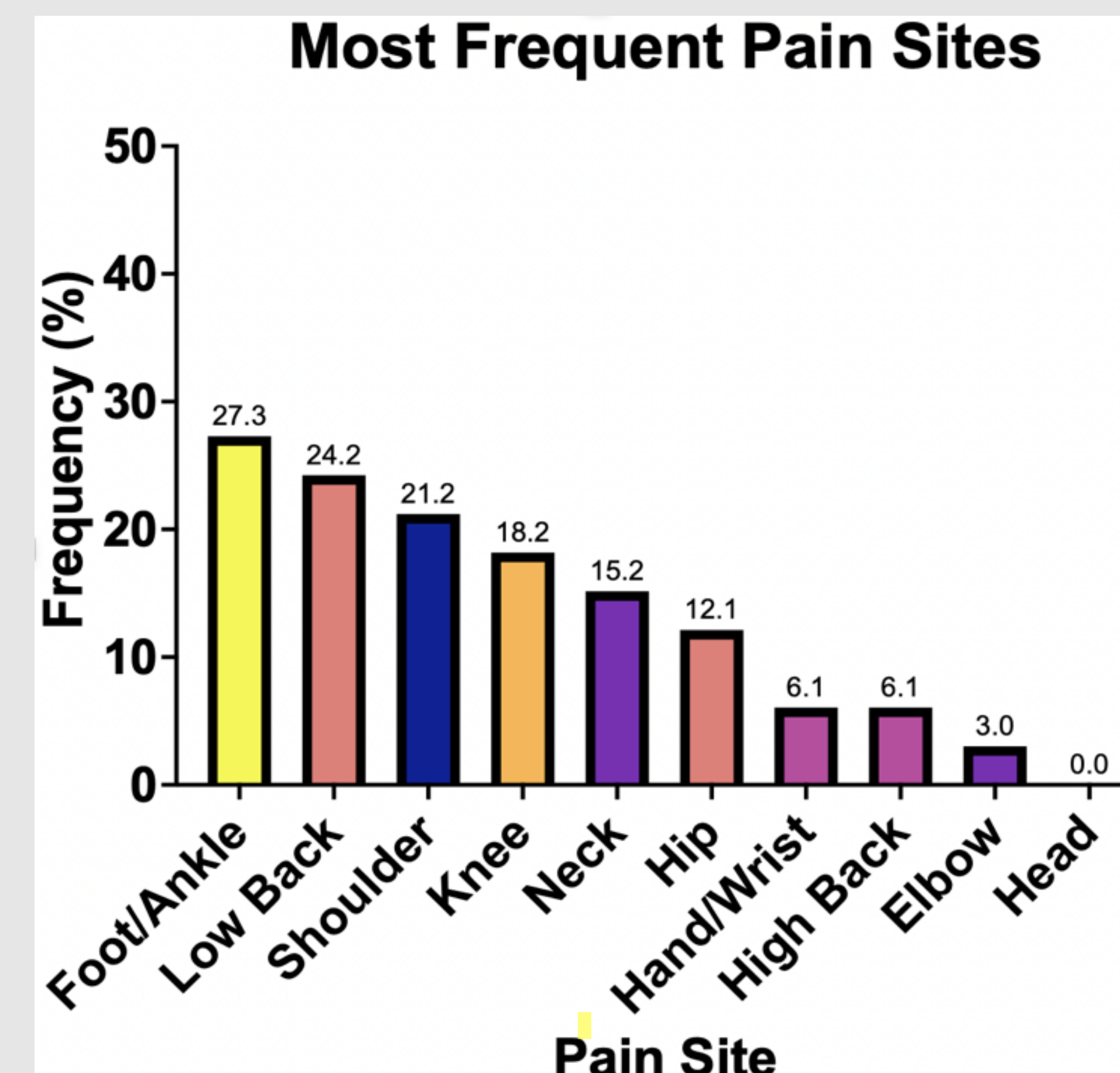


Figure 2. Pain Frequency by Location

Results

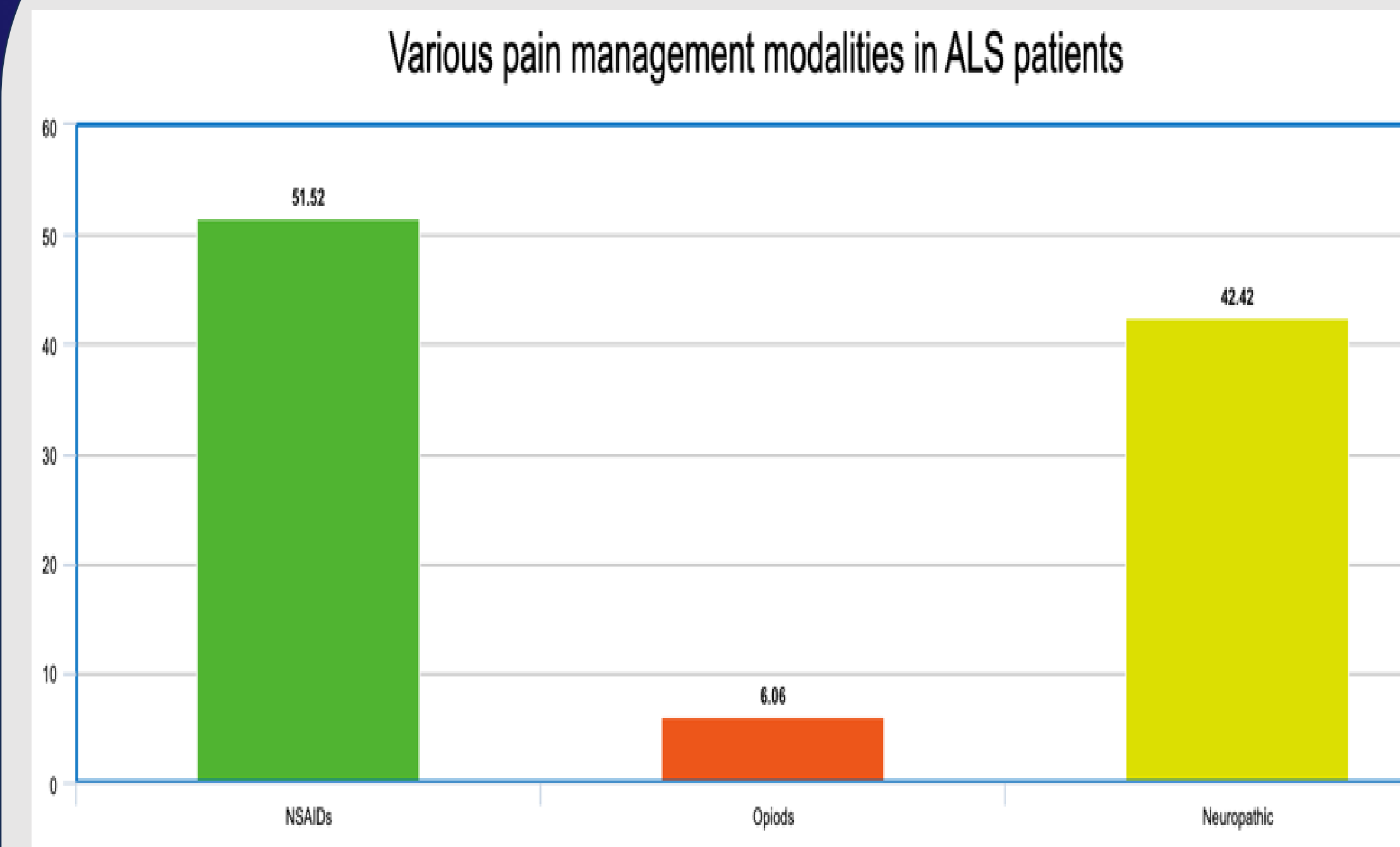


Figure 3. Pain Management Modalities

NfL Levels and Use of Neuropathic Pain Medications

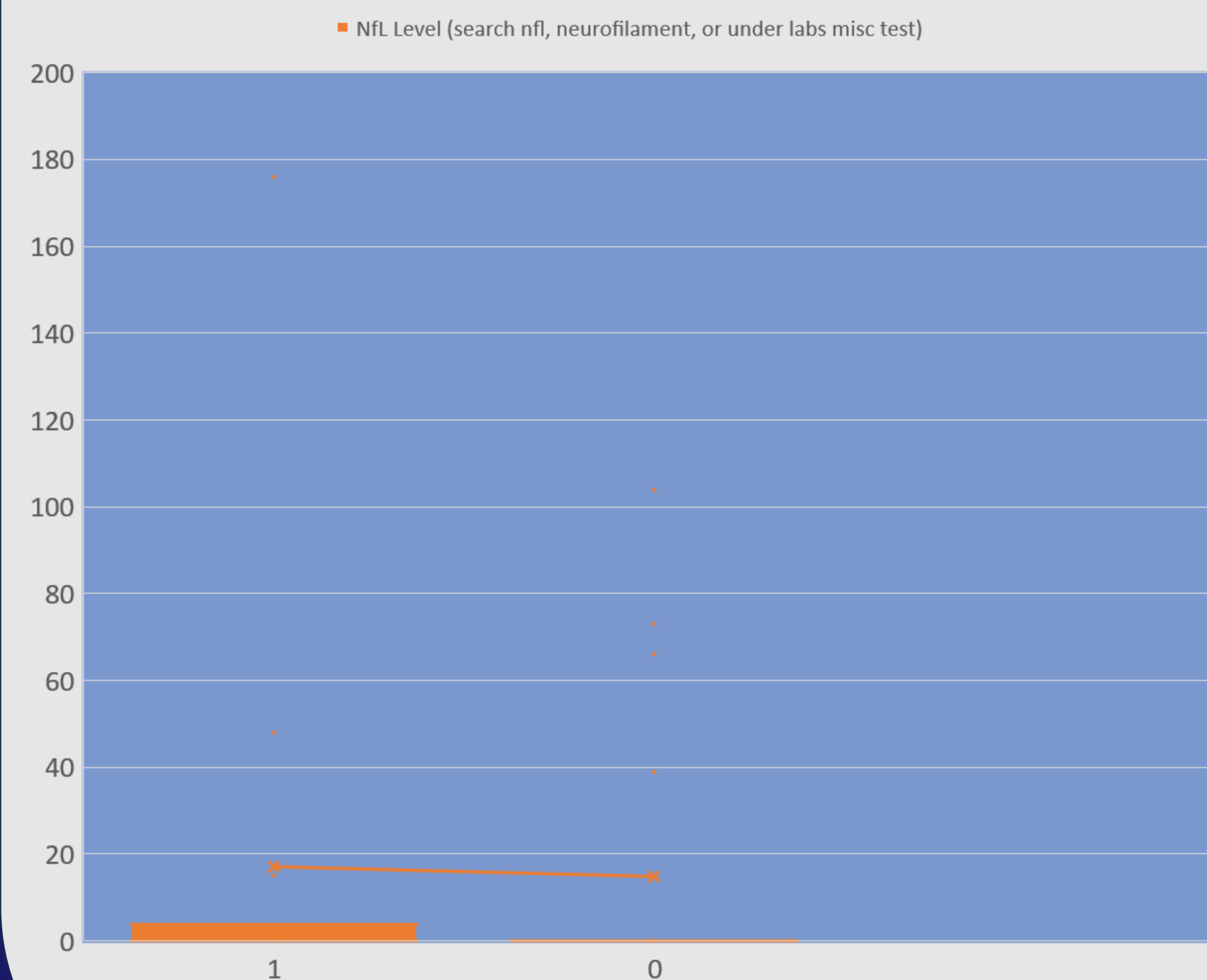


Figure 4. NfL and Neuropathic Pain Management

Discussion

- Pain in ALS showed an increased frequency within the low back and lower extremities suggesting these are important sites for clinical monitoring.
- The most common management were NSAIDs and neuropathic agents, suggesting clinicians often treat ALS pain as either musculoskeletal or neuropathic.
- NfL >0.5 had 2.7 likelihood ratio suggesting there may be a relationship between axonal degeneration (by NfL level) and the development of neuropathic pain (by use of neuropathic pain medications)

Limitations:

- Limitations of the study include the small sample size (n=33), retrospective design, and limited data available on pain type.
- Strengths of the study include robust symptom localization data, the inclusion of therapeutics, and the inclusion of NfL biomarker data

Future Directions:

- Further evaluation of the relationship of NfL levels and neuropathic pain.
- Evaluation of the relative efficacy of the various therapeutic interventions.
- Further study of what role, if any, pain specialist could play in the management of chronic pain in ALS patients

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