A novel perspective on trigeminal neuralgia progression

- Patients with trigeminal neuralgia (TN) typically experience shock-like episodes of pain.[1,2]
- With time, the character of their pain may modify in frequency and quality, with eventual development of burning or dull overtones. [3,4,5]
- Previously several subtypes of TN have been described (TN type 1, TN type 2).[1,2]

Hypothesis: TN is a syndrome with a spectrum of grades, each with different brain imaging correlates, pain characteristics and surgical outcomes.

1. *J. Olesen et al., Cephalalgia. 33, 629–808 (2013).*
2. *G. Cruccu, G. Di Stefano, A. Truini, NEJM, 383, 754–762 (2020).*
3. *W. J. Elias, K. J. Burchiel, Curr. Pain Headache Reports, 62. 6, 115–124 (2002).*
4. *K. J. Burchiel, K. V. Slavin, Neurosurgery. 46, 152–155 (2000).*
5. *M. Moayedi, M. Hodaie, Pain reports. 4 (2019).*

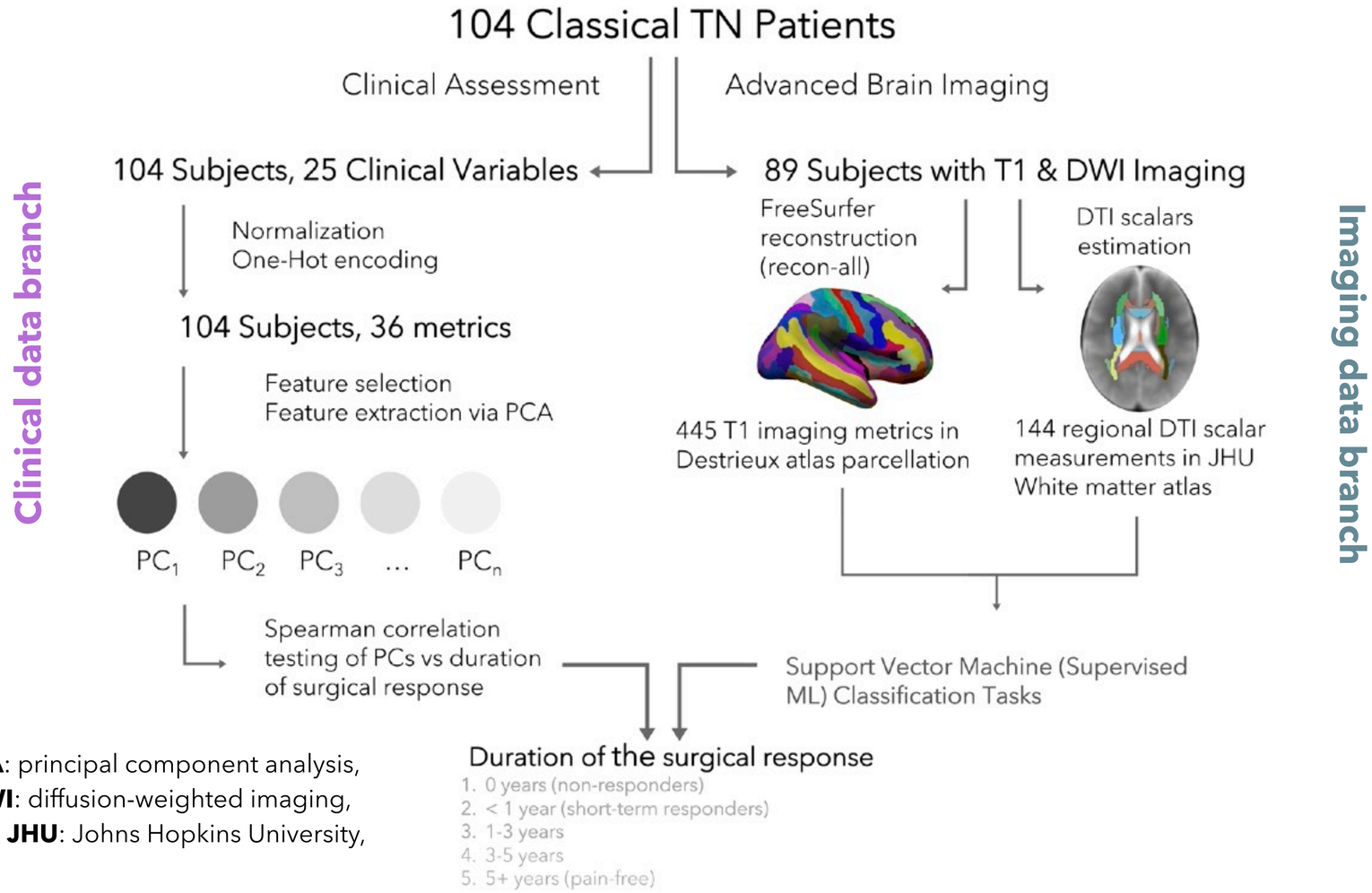
Objective: We propose a novel machine learning (ML)-driven grading system for TN based on brain imaging and clinical data. We then use this system to estimate the likelihood of long-term pain relief.

Design of study

Demographics and analysis pipeline

Dataset demographics	Initial diagnosis of Classical TN
Sample size (n)	104
Age (years)	60.3 ± 14.4
Sex (males : females)	44 : 60
Pain side (L : R)	38 : 66
Surgery (GK : MVD)	71 : 33

Patients were followed up for 5 years after the surgery or until pain recurrence



TN: trigeminal neuralgia, **PCA**: principal component analysis, **PC**: principal component, **DWI**: diffusion-weighted imaging, **DTI**: diffusion tensor imaging, **JHU**: Johns Hopkins University, **ML**: machine learning