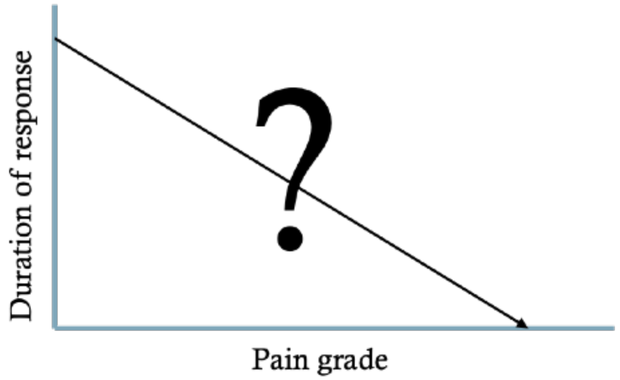
Machine-learning defines and characterizes the grades of trigeminal neuralgia

Work in progress

Project goal: to apply ML on brain imaging and clinical data to propose a novel grading system for TN pain based on patients' duration of surgical response.



Hypothesis: TN is characterized by a continuous spectrum of severity, with specific characteristics of pain, sensory functions, and surgical response.

Clinical data

Work in progress

Independent data variables

Pain Characteristics	Neurological (CN V) Function	Medical History	Surgical Response
Side	Facial muscles	Comorbidities	Pain status
Distribution	Lacrimation	Previous surgical procedures	Medication status
Duration	Corneal reflex		Pain recurrence
Triggers	Numbness		
Description			
Attack frequency			
Medication effect			
Barrow Neurological Institute (BNI) pain score			

One hot encoding and z-score normalization were used to transform clinical data

Inclusion Criteria	Exclusion Criteria
Classical TN patients treated with GK, MVD, or rhizotomy	Surgically untreated TN, MS-TN, SPL-TN, TN secondary to tumor/nerve injury/infection, bilateral TN, other neurological condition (Alzheimer's disease, brain tumors, etc.), history of rhizotomy.