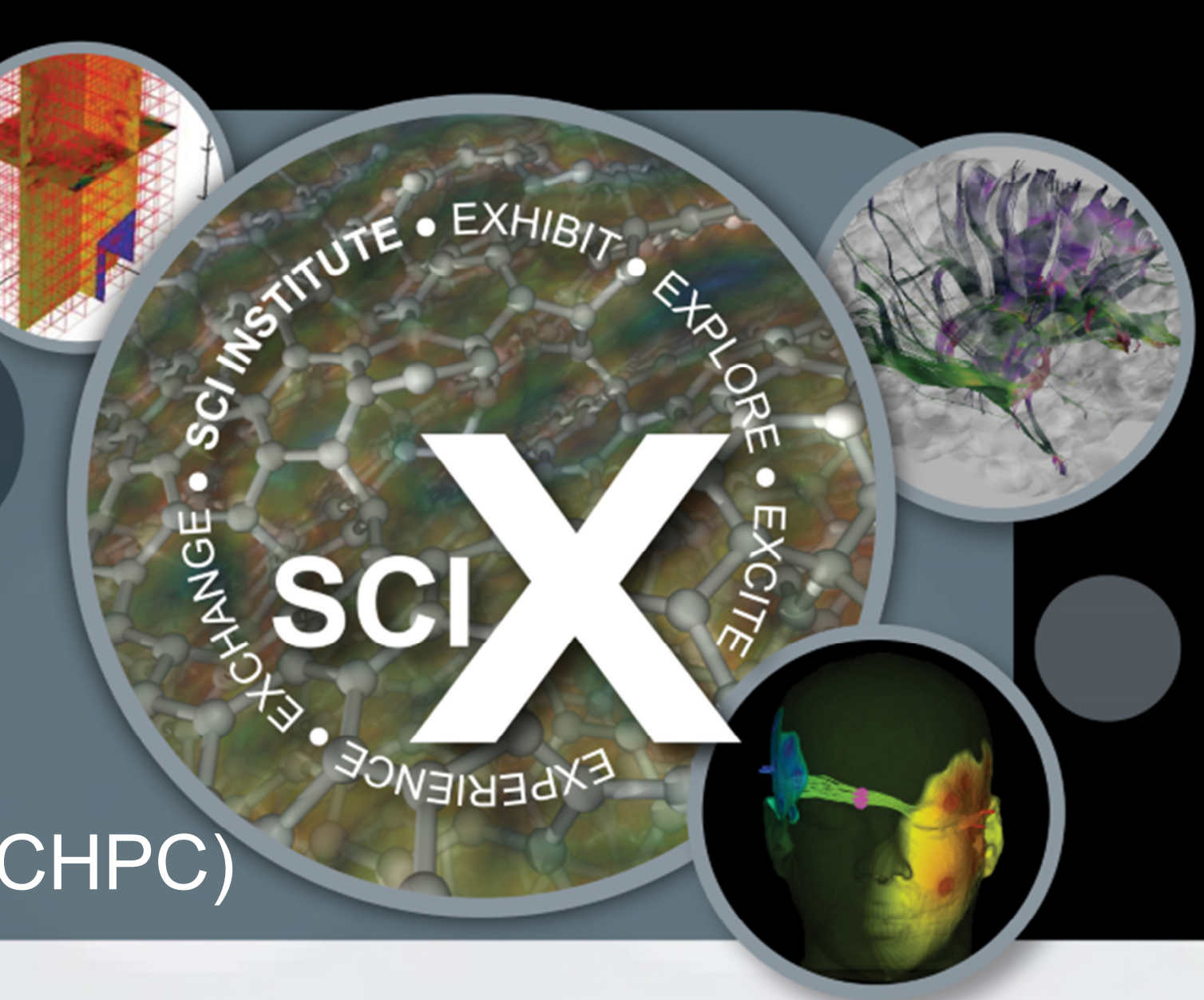


The International Neuromodulation Registry

Can we integrate medical imaging and clinical data to improve patient outcomes?

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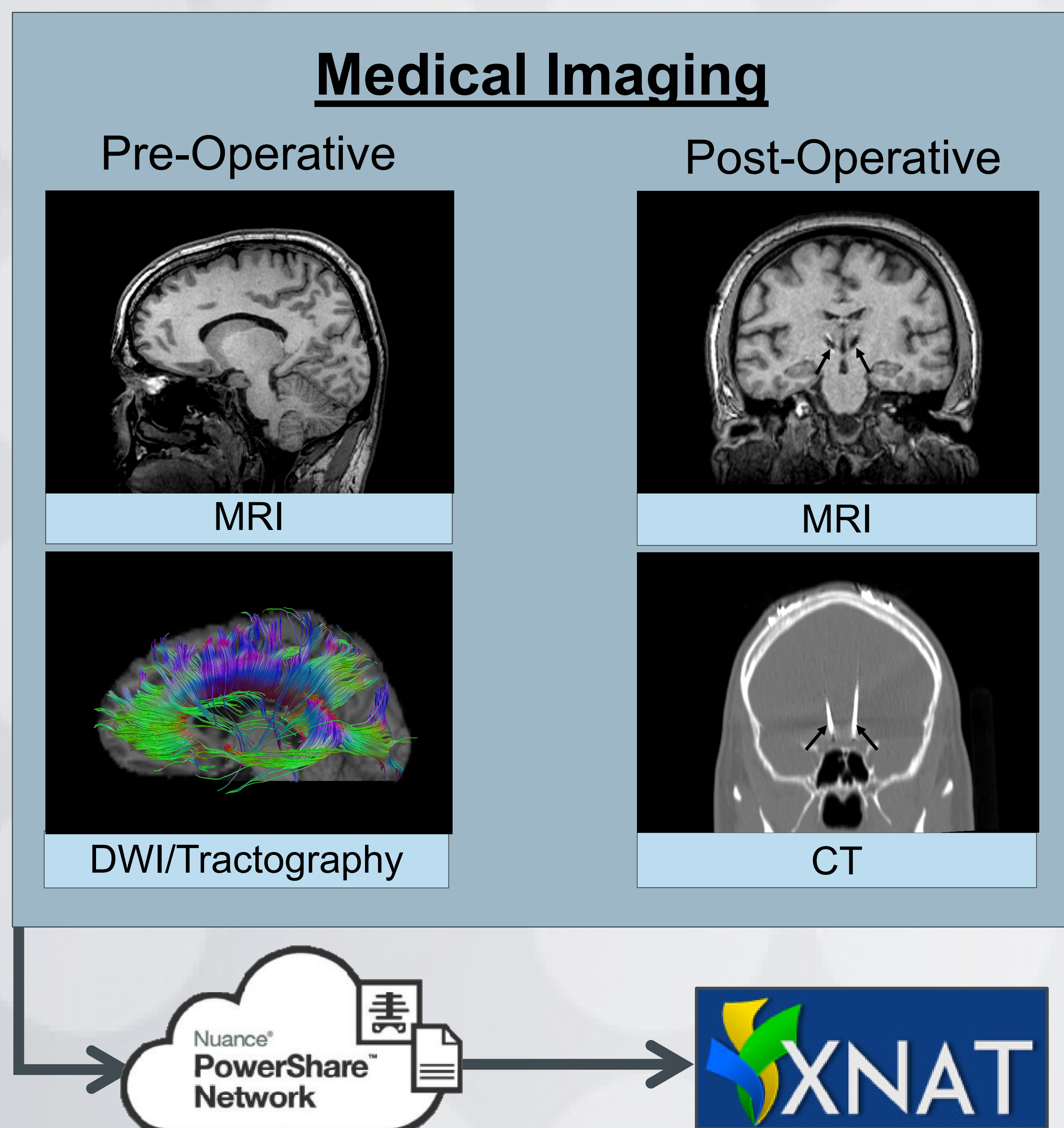
Problem: Most neuromodulation studies are either small case series at a single site or company-sponsored device trials. As a result, it can be difficult to generate new generalizable knowledge.

Goal: The broad goal of the International Neuromodulation Registry is to enable large population health studies that enable us to better predict who will respond to neuromodulation therapy and the best treatment strategy. This will be done using a novel combination of data integration and computational modeling.

Disorders: Parkinson's Disease, Essential Tremor, Dystonia, Treatment Resistant Depression, Tourette Syndrome, Obsessive-Compulsive Disorder

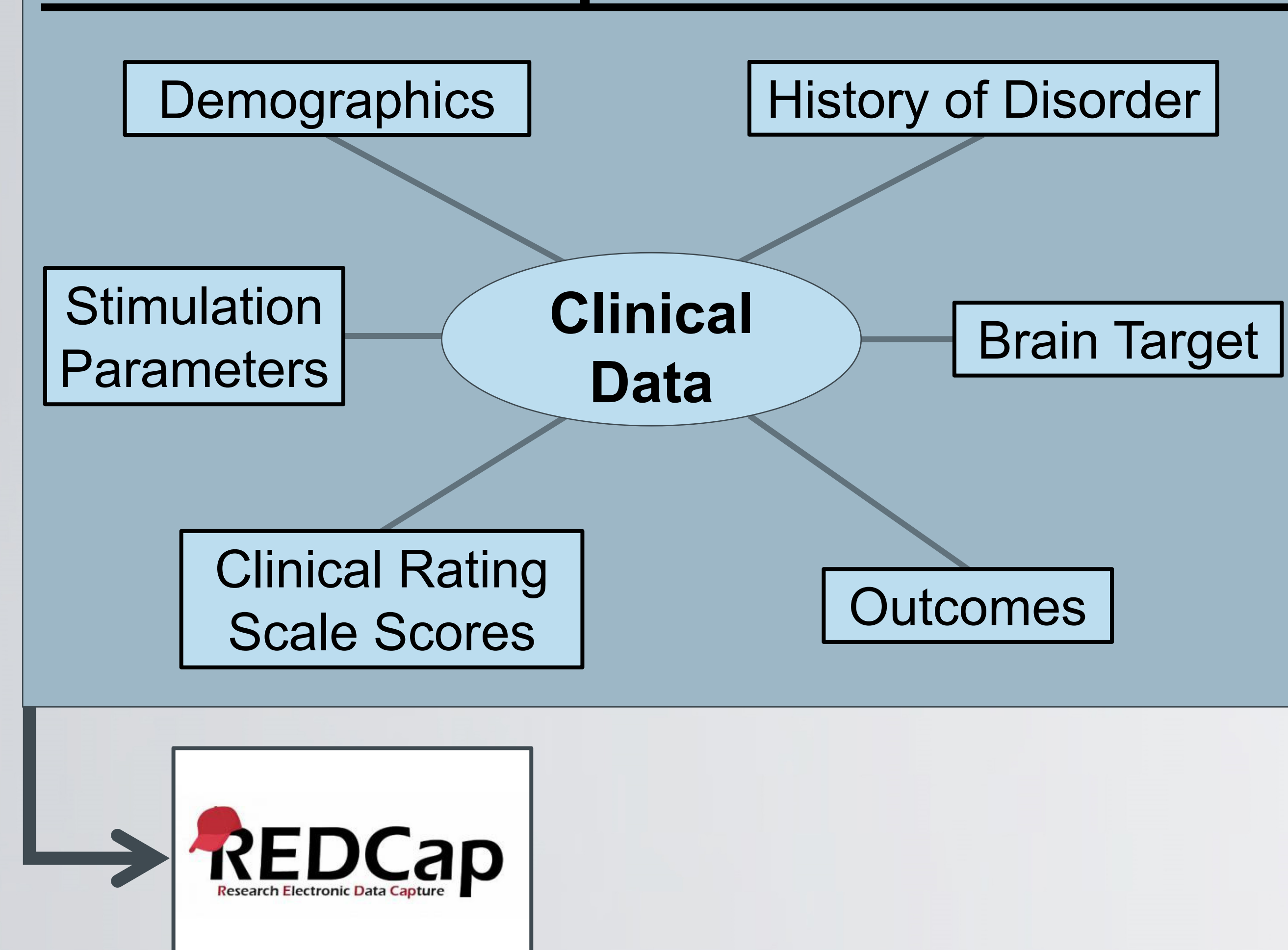
Neuromodulation Techniques: Deep brain stimulation (DBS); cortical stimulation (CS); transcranial magnetic stimulation (TMS)

Data Collected in the Neuromodulation Registry



Medical imaging, including pre- and post-operative MRI, diffusion-weighted MRI (DWI), and post-operative CT, are collected through the **Nuance PowerShare Network** and then anonymized and stored in the Extensible Neuroimaging Archive Toolkit (**XNAT**).

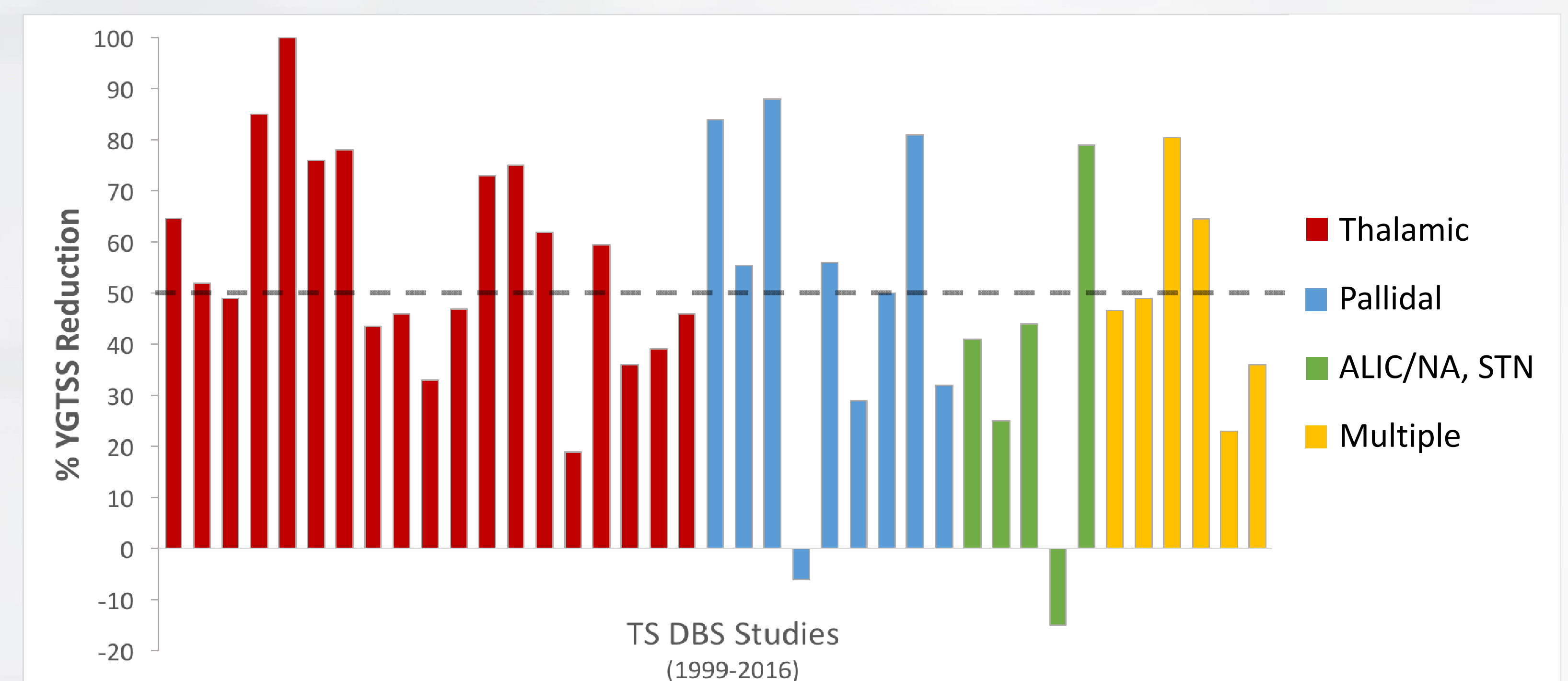
Pre- and Post-Operative Clinical Data



Patient clinical data are stored in REsearch Electronic Data Capture (**REDCap**) and can be queried and downloaded for analysis. <https://projectredcap.org/>

Example: Tourette Association of America

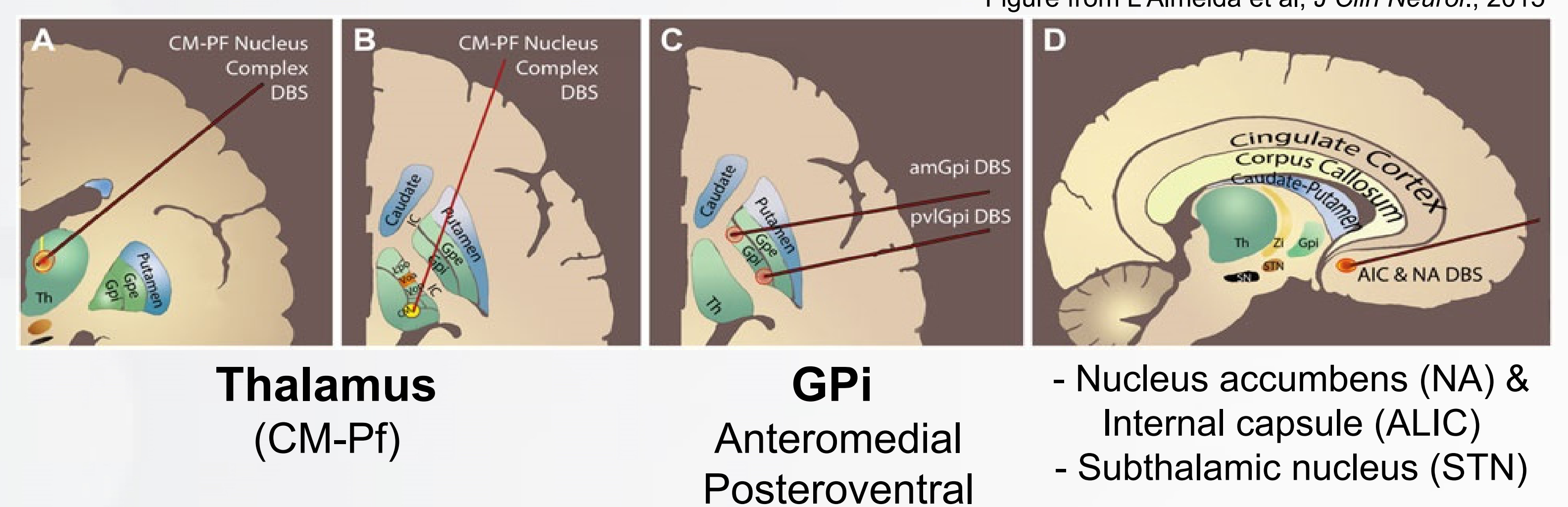
Based on outcomes from prior patients, can we predict the response of future patients based on stimulation type and location?



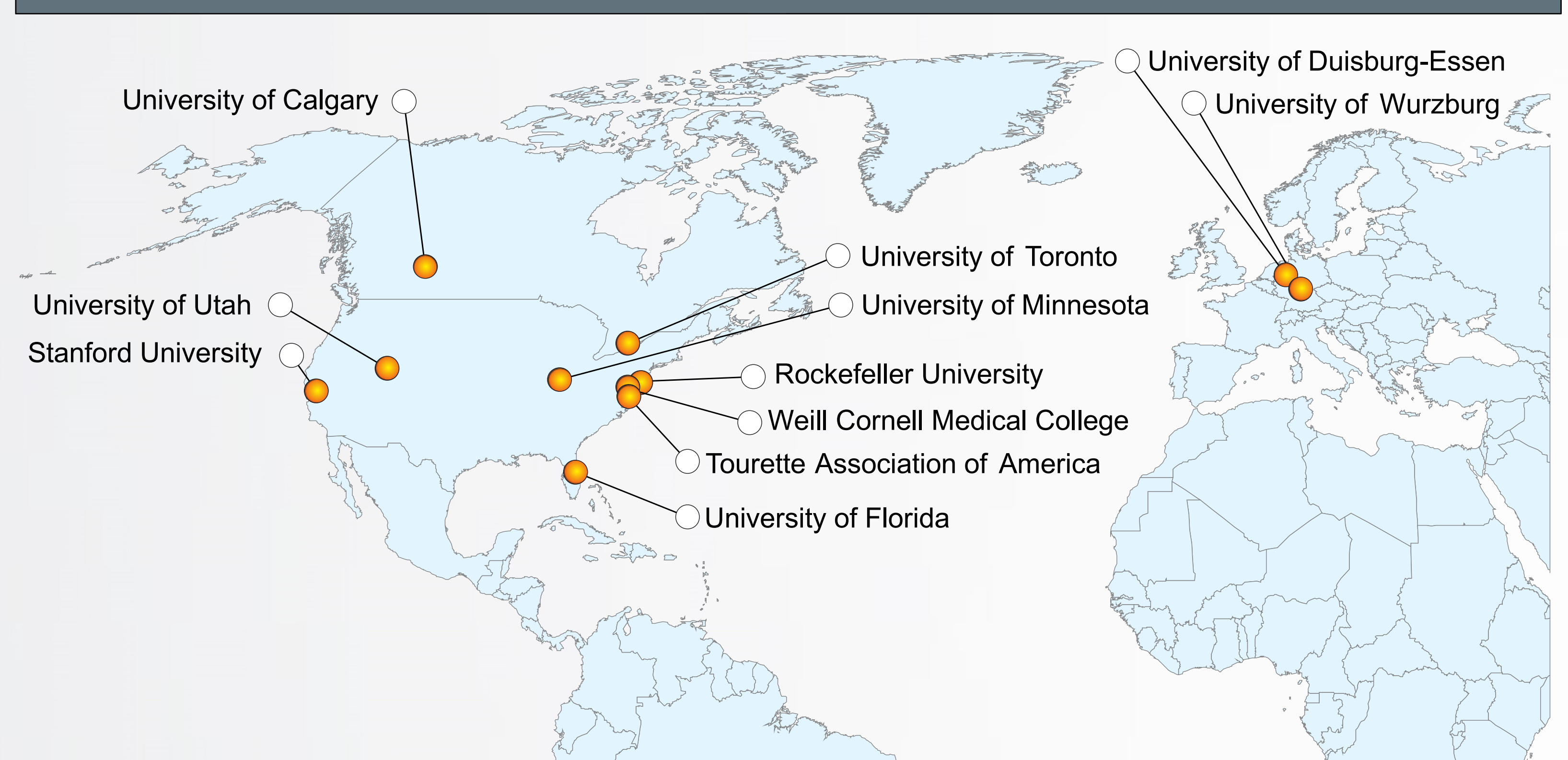
YGTSS = Yale Global Tic Severity Score, the standard clinical rating scale for assessing TS

Tourette Syndrome (TS) is a complex neuropsychiatric disorder characterized by motor and phonic tics, or repetitive movements and vocal outbursts. DBS has been used experimentally to treat TS in a limited population of patients, but outcomes are varied across targeted brain regions.

Figure from L Almeida et al, *J Clin Neurol.*, 2015



Collaborators



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