

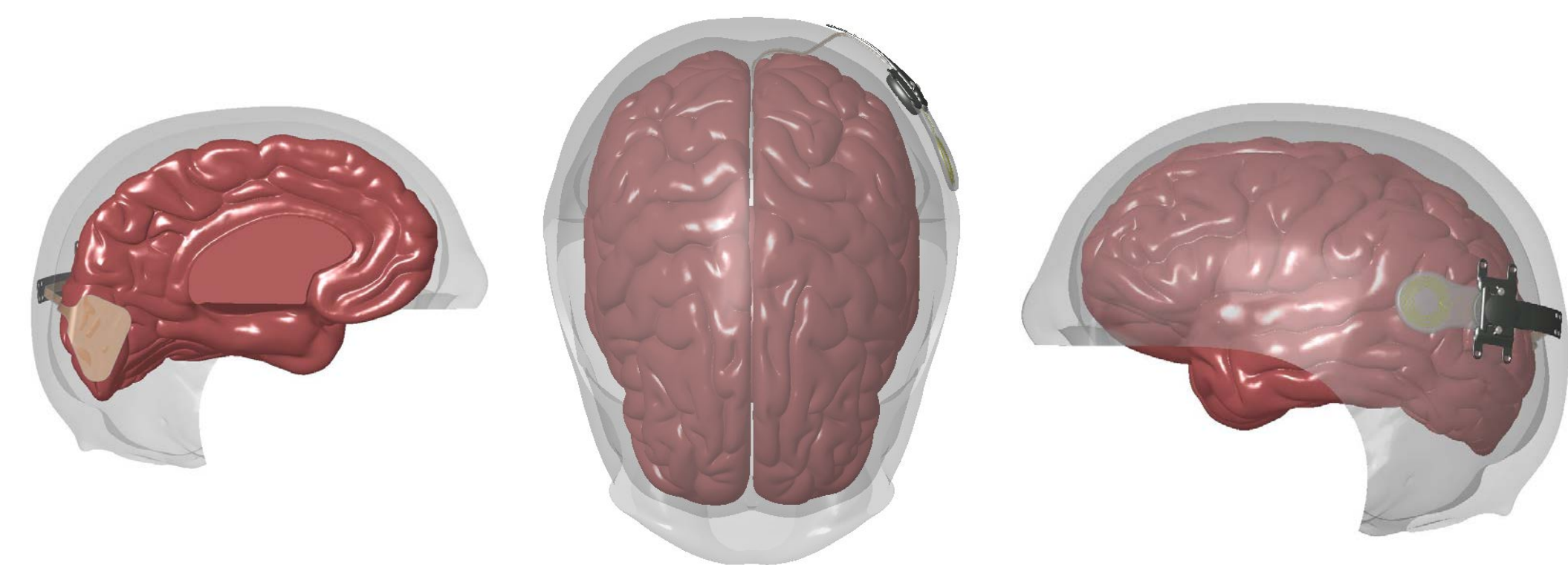
Single-electrode perceptual thresholds for the Orion™ Visual Cortical Prosthesis System

97% of active electrodes elicited perceptual thresholds across all Orion™ patients (n=6).

PRESENTER: **Vara Wuyyuru**

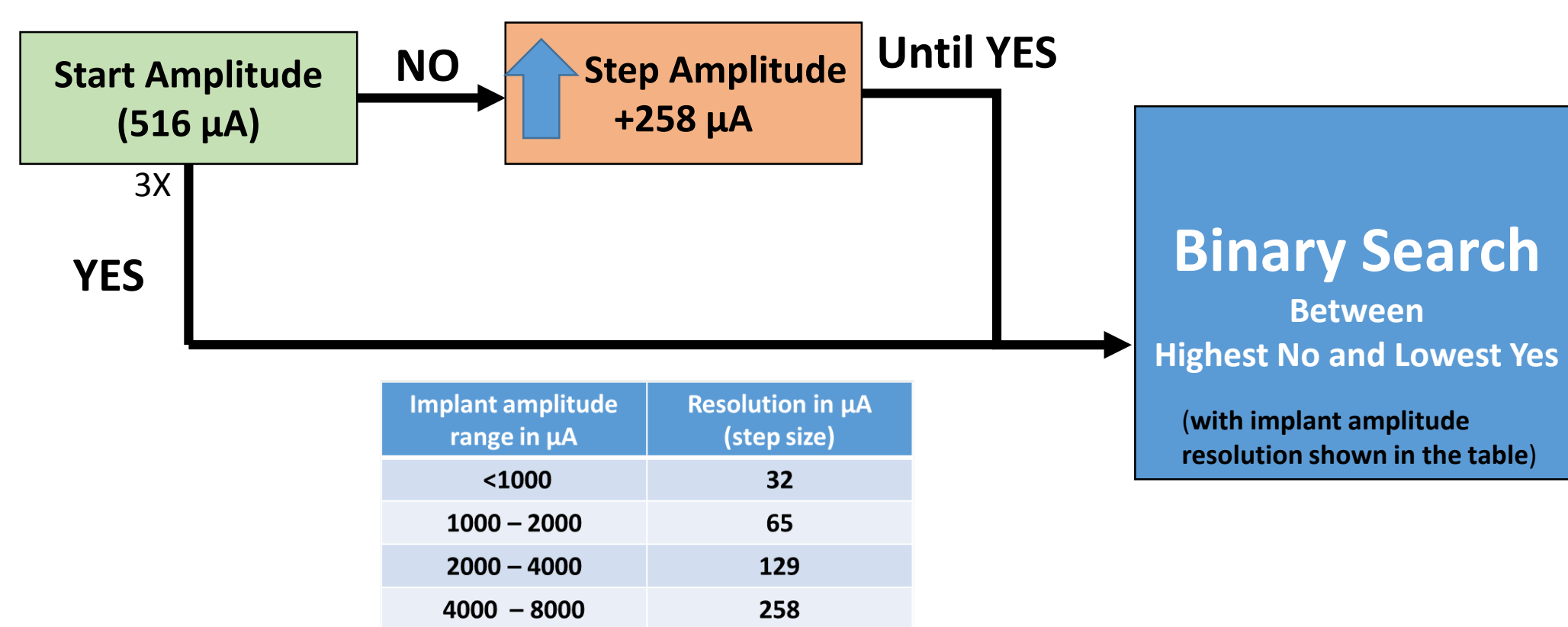
INTRO:

- Six patients were enrolled in the Orion early feasibility study at two centers, University of California, Los Angeles and Baylor College of Medicine.
- The Orion implant electrode array consists of 60 non-penetrating electrodes with 2 mm diameter separated by 3 mm center to center electrode distance.
- Thresholds, defined as the minimum current required to elicit a well-defined percept, are a fundamental measurement used for customizing each subject's program.



METHODS:

- ☐ Hybrid of a staircase and binary search
- ☐ This algorithm cautiously increases amplitudes while using some of the efficiency of binary search.



Waveform parameters:

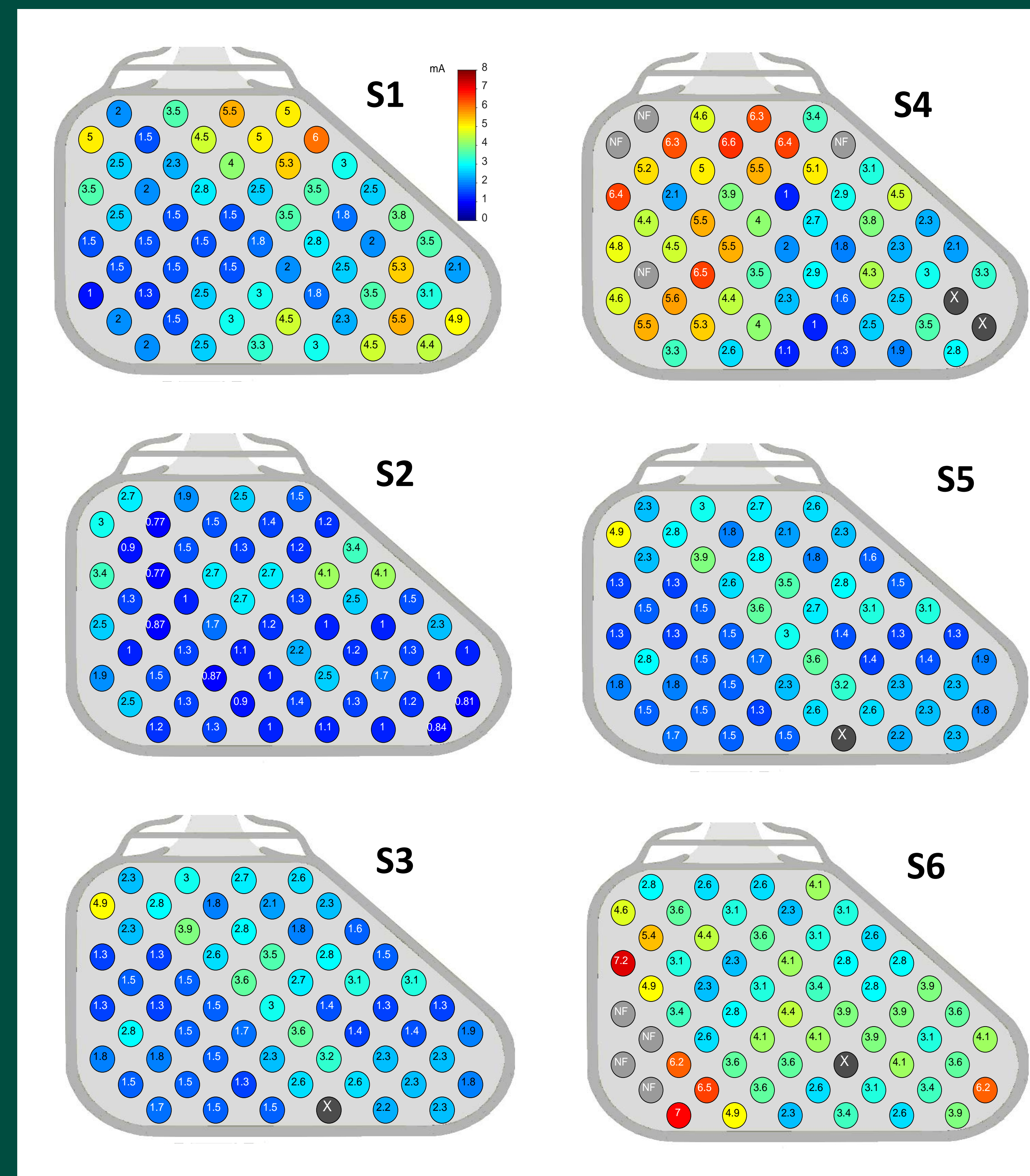
- ✓ Frequency: 20 Hz
- ✓ Duration: 250 ms
- ✓ Pulse width: 0.2 ms
- ✓ Interphase gap: 0.04 ms.
- ✓ Cathodic first

- ☐ Subset of thresholds were monitored over time

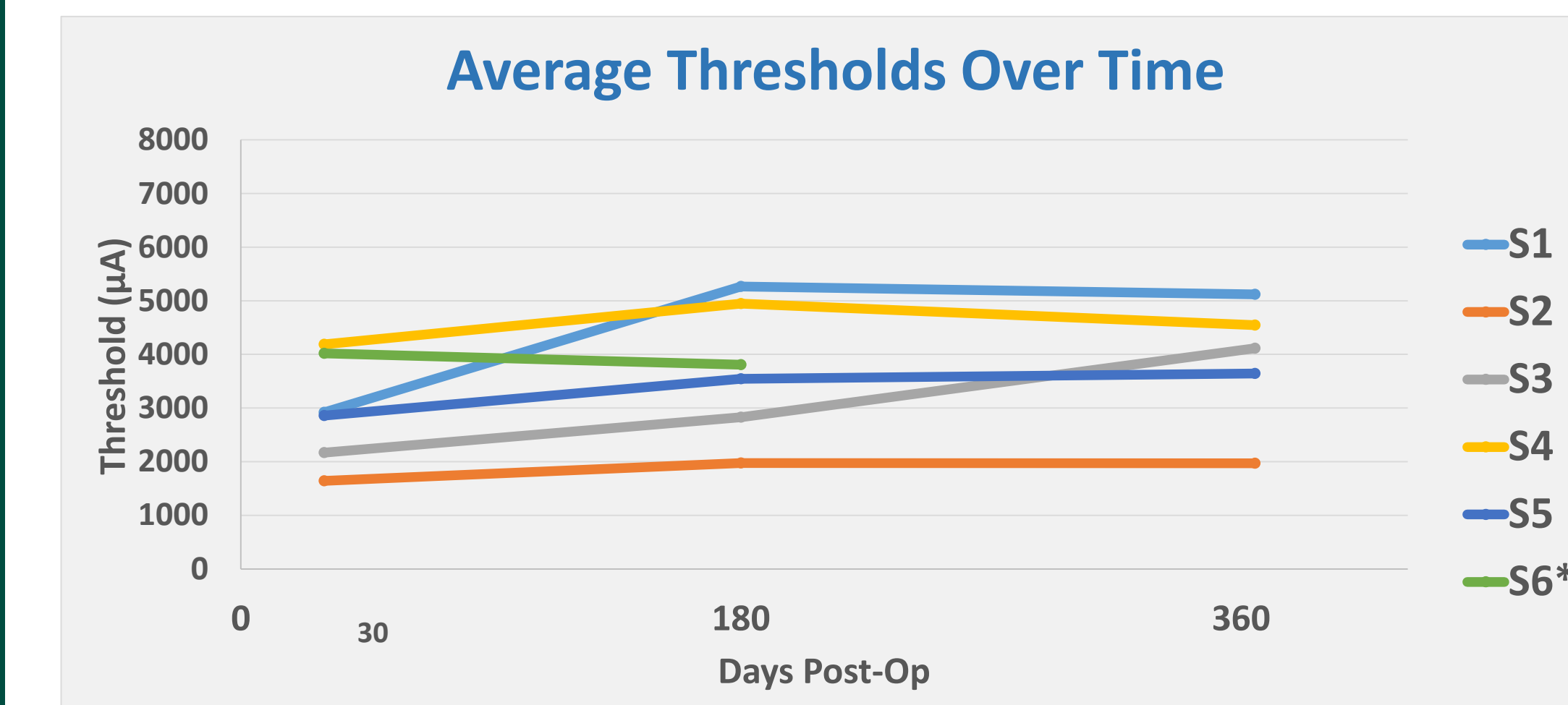
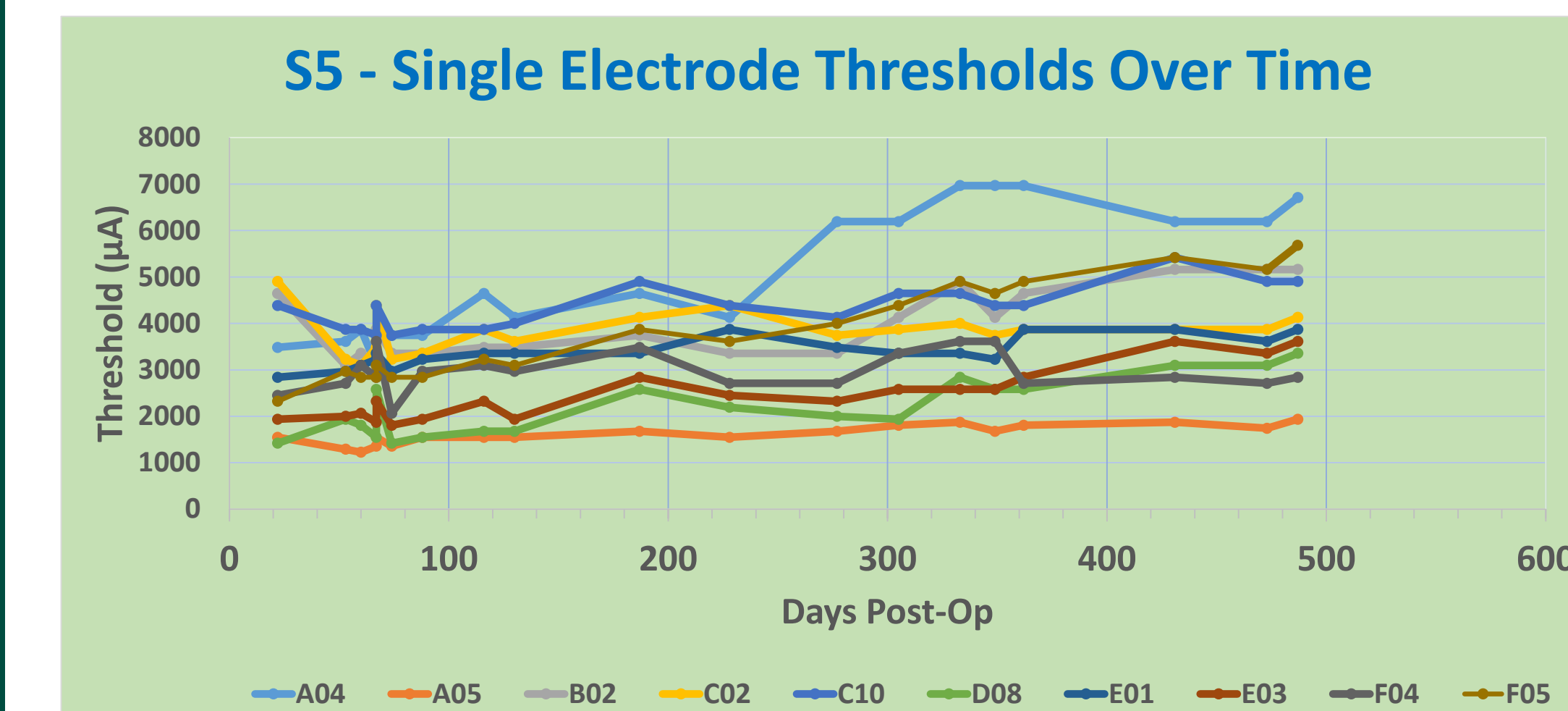
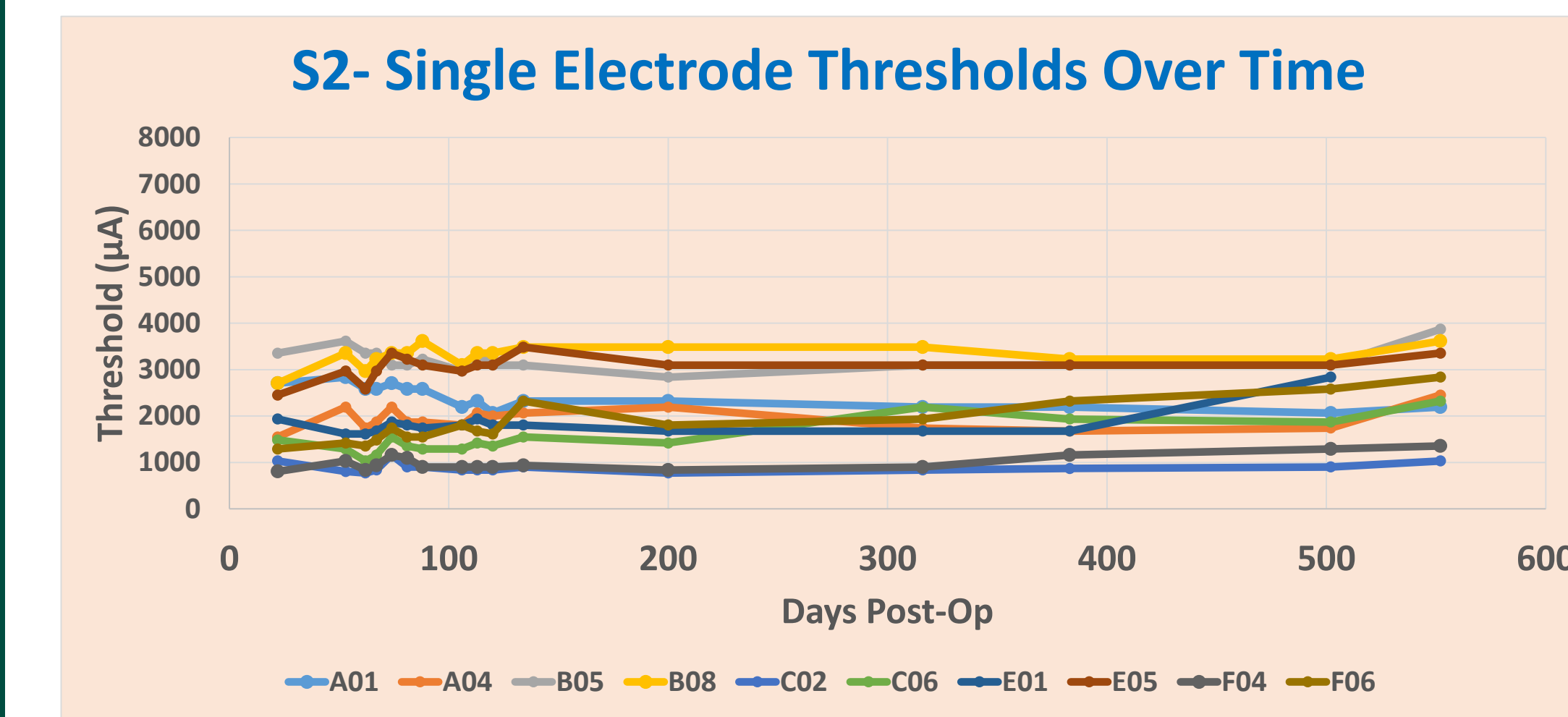
RESULTS:

| Subject | First Measurement Average Threshold (μA) | First measurement Standard Deviation (μA) | No. of Thresholds |
|---------|--|---|-------------------|
| S1 | 2893 | 1322 | 60/60 |
| S2 | 1645 | 828 | 60/60 |
| S3 | 2194 | 789 | 59/59 |
| S4* | 3765 | 1603 | 54/58 |
| S5 | 2693 | 1248 | 59/59 |
| S6 | 3730 | 1170 | 55/59 |

* Modified staircase method was used



THRESHOLDS OVERTIME:



* S6 was implanted in March 2019.

CONCLUSIONS:

- ✓ The new hybrid method (Stair case + Binary search) is an efficient method for measuring thresholds.
- ✓ Surface (sub-dural) electrodes generate reliable and consistent phosphenes at safe charge densities.
- ✓ Thresholds were relatively stable across the patients until 12 months post-op, however, a slight upward trend was noticed for some patients. We continue to monitor the thresholds to determine if any known or unknown factors that may impact them over time.

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