

Stop Waiting for the Right Time to Innovate: Transforming the Delivery of Epilepsy Care during a Critical Staffing Crisis

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OVERVIEW

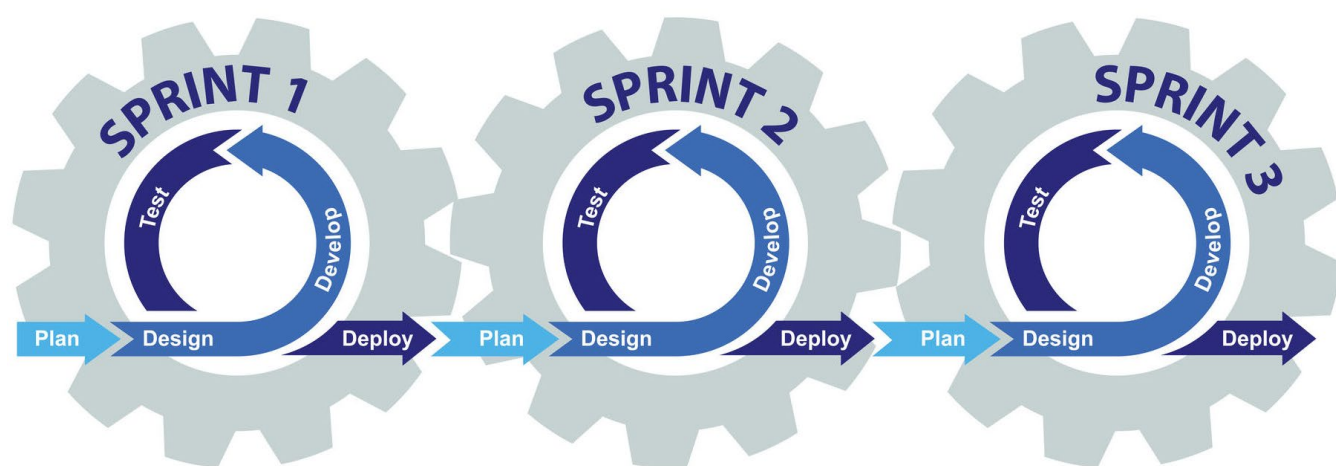
BACKGROUND

- Electroencephalography (EEG) is a test used for diagnosing brain conditions, like epilepsy.
- Current state, patients undergoing a multiday, inpatient EEG are continuously monitored by on-site neurodiagnostic technologists. A staffing ratio of one technologist per four patients is the industry standard set forth by the American Medical Association¹.
- Given the national shortage of neurodiagnostic technologists and increased competition in the labor market², staffing in the Epilepsy Monitoring Unit (EMU) at Mayo Clinic Rochester reached critical levels, as low as 50%, from 2021 to 2022.
- From 2021 – 2022, the Department of Neurology successfully deployed a series of pilots to advance the service line toward its strategic vision of building an EMU at home, while restoring technologist staffing levels to 92%.

OBJECTIVES

To connect the **right patient** to the **right provider** in the **right setting** at the **right time** through effective resource allocation. The pilots were designed to test and refine processes, procedures, and technologies across the continuum of epilepsy care and aimed to:

- Reduce unnecessary admissions and tests
- Stabilize internal technologist staffing workforce
- Improve patient experience by offering more convenient, affordable options to care
- Improve financial positioning through service line growth and a more cost-effective staffing model
- Advance toward strategic vision and expand expertise nationally



METHODS

PLANNING

Neurology leadership performed a comprehensive review of the epilepsy service line to gain an in-depth understanding of the current state and future goals. While actively working to address the immediate critical staffing need, the team prioritized key initiatives for the next three years that were deemed critical for achieving the strategic vision and would promote sustainable staffing solutions. Driven by the needs of patients and staff, the Department established relationships with third-party vendors to accelerate the timeline toward implementation and enable the team to test and measure the impact of the pilots with great agility.

IMPLEMENTATION

Patients were selected for pilots based on clinical need, location, and social determinants of health. Neurology leadership defined rigid service expectations with selected external partners and identified internal physician and allied health leaders responsible for overseeing the quality of services provided. Utilizing agile methodologies, pilots were rapidly implemented every two months; sequencing was determined based on the scope of the service provided and patient care needs.

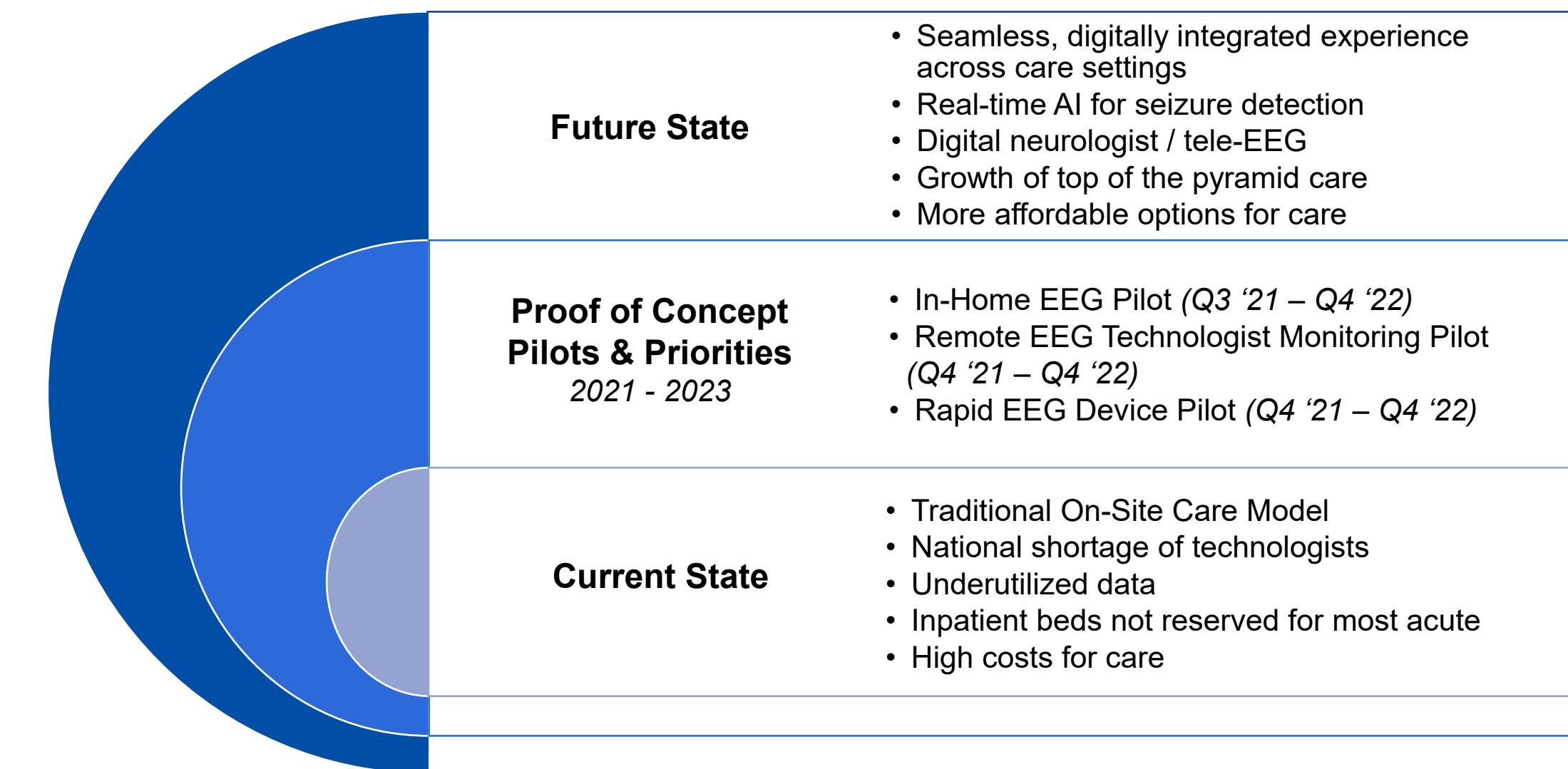
PILOT RESULTS

From September 2021 to December 2022, the Department of Neurology successfully maintained patient care volumes and financial performance while also improving staffing levels by 84% (an increase from 50% staffed to 92%). After onboarding new staff, the Department continued to leverage the three piloted services and shifted internal resources to the growth of new service lines and on-site access to diagnostic tests.

Pilot	Overview	Goal	Timeline	Pilot Results
In-Home EEGs	<ul style="list-style-type: none"> -Patients referred by Mayo provider to a third-party vendor -Vendor conducted in-home study -Mayo neurologist interpreted results and followed up with patient 	<ul style="list-style-type: none"> - Reserve inpatient beds and resources for most acute patients - Improve affordability and convenience of care - Scale epilepsy expertise nationally 	September 2021 – December 2022	<ul style="list-style-type: none"> - 122 unnecessary EMU admissions avoided - In-home tests performed in 35 different states - 350 patient days monitored in-home; 7% total annual EMU volumes - 8,375 technologist hours saved
Rapid Response EEG Device	<ul style="list-style-type: none"> - Vended device deployed in ICUs to provide a rapid, point-of-care EEG - Device is non-invasive, provides real-time results, and does not require technologist resources 	<ul style="list-style-type: none"> - Prevent unnecessary admissions and tests - Reduce time to treatment - Decrease ICU average length of stay 	November 2021 – April 2022	<ul style="list-style-type: none"> - 25 studies performed during pilot; 125 studies completed post-pilot December 2022 YTD - Improved time to treatment; 95% studies led to a clinical decision in under two hours - 71% avoided subsequent prolonged EEG monitoring
Remote EEG Technologist Monitoring Model	<ul style="list-style-type: none"> - Third-party company providing remote EEG monitoring of on-site patients - Used in compliment to internal, on-site workforce 	<ul style="list-style-type: none"> - Promote sustainable staffing solutions - Expand recruitment pipeline - Promote future opportunities for service line growth 	January 2022 – December 2022	<ul style="list-style-type: none"> - 4,550 hours remote monitored; 48% cost savings compared to an internal tech receiving overtime pay and 54% compared to an on-site contract worker - Improved staffing to workload from 50% to >90% - Technologist staff satisfaction improved 12%

LESSONS LEARNED

- Setting a strong vision can help create a unified culture within an organization, provide clarity when making difficult decisions, and ensure effective use of resources.
- Leaders must maintain a keen focus on driving the organization's vision and continuously work to find innovative solutions to meet the needs of patients and staff, both today and in the future.
- For the Department of Neurology, the staffing crisis that presented from 2021 to 2022 lent itself to driving a momentum of change across the continuum of epilepsy care and viewing strategic partnerships as an accelerant to achieving goals.
- Going forward, the Department will continue to leverage agile methodologies to rapidly implement focused pilots across the practice to advance toward strategic vision.



REFERENCES

- Summary of long-term EEG code provisions for 2020. New 2020 Long-term EEG Monitoring CPT Coding Structure and Relative Value Units. https://www.aan.com/siteassets/home-page/tools-and-resources/practicing-neurologist--administrators/billing-and-coding/cpt--em/20-eeeg-summary-final_tr.pdf. Published 2020. Accessed January 8, 2023.
- Murphey DK, Anderson ER. The past, present, and future of Tele-EEG. *Seminars in Neurology*. 2022;42(01):31-38. doi:10.1055/s-0041-1742242