

A Novel Method to Increase Surgical Volume at a Level 4 Epilepsy Center Through Mutually Beneficial Strategic Partnerships

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Introduction

While several studies have demonstrated superior outcomes associated with surgery compared to medication therapy alone in patients with medically refractory focal epilepsy, epilepsy surgery has been woefully underutilized in the United States. One possible explanation is that patients may not be referred to centers proficient in surgical treatments. University of California, Irvine (UCI) is the only adult Level 4 epilepsy center designated by the National Association of Epilepsy Centers (NAEC) in Orange County, California. Recently, UCI entered strategic partnerships with two large epilepsy centers in southern California that do not have epilepsy surgeons to surgically treat patients who have completed pre-surgical work-up.

Methods

We analyzed surgical data associated with all patients undergoing epilepsy surgery before and after institution of strategic partnerships with two large epilepsy centers in Southern California. Patients underwent all pre-surgical work-up at the referring center and were presented during epilepsy management conference by the referring neurologist. After the perioperative period, patients were then transitioned back to the care of the referring center. Number of patients and surgeries performed, types of surgeries performed, and charges and revenue were evaluated during this timeframe.

Strategic Partnership

All patients who underwent surgery as a result of the partnerships were referred (not only a subset). The entire pre-operative epilepsy work-up was performed at the referring center. Specifically, the referring center admitted the patients for video electroencephalography (vEEG), they conducted the imaging (3 tesla MRI, PET, SPECT, MEG, etc), and they managed the medications, which was important for two reasons. First, the referring center performed these studies and generated revenue. Second, the referring neurologists typically wanted to be and thus were involved in the pre-operative work-up, just like the neurologists at UCI. Moreover, we wanted them to be involved as well. Afterward, the referring neurologists presented the patient in monthly or bimonthly UCI epilepsy conferences using teleconferencing technology, which allowed them to be active participants in the discussion and decision making for their patients. Only surgery and peri-operative care were performed at UCI, where the epilepsy surgeon and neurologist cared for the patients during the peri-operative period to ensure there were no complications and that their medications were adjusted appropriately. Afterward, the patients were transitioned back to the referring center and neurologist, who managed the follow-up medication. The epilepsy surgeon followed up with the patients for routine checks.

Results

Five patients underwent nine epilepsy surgeries during the year prior to initiation of partnerships while 68 patients underwent 105 surgeries during the subsequent year (a tenfold increase in number of surgeries). The Case-Mix index increased from 2.982 to 3.058 and case complexity increased to include hemispherectomy, extratemporal resections, and stereoelectroencephalography (SEEG). The total revenue generated during this timeframe also increased from \$615,326 to \$3,111,473.

Conclusions

We describe a novel means to increase access to surgical care by creating strategic partnerships with large epilepsy centers that cannot offer epilepsy surgery treatments. We believe that these partnerships are reproducible in other centers and are can be mutually beneficial to all centers involved and ultimately improve patient care.

References

1. Kwan P, Brodie MJ. Early identification of refractory epilepsy. *N Engl J Med.* 342:314-319, 2000.
2. Jobst BC, Cascino GD. Resective epilepsy surgery for drug-resistant focal epilepsy. *J Am Med Assoc.* 313:285-293, 2015.
3. Wiebe S, Blume WT, Girvin JP, Eliasziw M. A randomized, controlled trial of surgery for temporal-lobe epilepsy. *N Engl J Med* 345:311-318, 2001.

Learning Objectives

By the conclusion of this session, participants should be able to do the following: 1) Describe how partnerships among nearby epilepsy centers can improve patient care, 2) Discuss the pros and cons of receiving additional patients from nearby epilepsy centers, and 3) Identify potential strategies to collaborate with other centers to increase surgical volume and access to care.