

Functional Seizure Clinics

A Proposed Financially Viable Solution to the Neurologist Supply and Demand Mismatch

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Abstract

Background and Objectives

Projections from recent studies suggest that by 2025, there will not be enough neurologists to meet the demand in 41 states. In this study, we investigate the financial impact and improved access to care for persons with epilepsy that is possible by implementing a multidisciplinary treatment clinic for persons with functional seizures (FS), previously referred to as psychogenic nonepileptic seizures, thus separating those patients out of an epilepsy clinic.

Methods

This observational retrospective study used real-time data of 156 patients referred to an FS clinic integrated into a tertiary care epilepsy center to simulate its effect on epilepsy division access and finances. Access was measured using simulations of the number of return patient visits (RPVs) and new patient visits (NPVs) of patients with FS to a dedicated epilepsy clinic, based on survey results inquiring about the standard of care without the FS clinic. Finances were simulated using the resultant access multiplied by respective wRVU and reimbursement per CPT code.

Results

Treatment of 156 patients with FS in a multidisciplinary FS clinic resulted in 343 newly opened NPVs, reimbursement of \$102,000, and 1,200 wRVUs in our dedicated epilepsy clinic. There were 686 RPVs, \$103,000 in reimbursement, and 1,320 wRVUs. Relative to the total number of NPVs with epilepsy clinic epileptologists, 343 NPVs represent a biennial 15.5% increase in available new patient visit slots.

Discussion

Our findings describe the financial viability of integrating a treatment clinic for persons with FS by directing them to FS-specialized treatment and thereby increasing access for patients with probable epilepsy to the dedicated epilepsy clinic. This study provides a potential solution to the national mismatch in the supply and demand of neurologists and an initial framework to use for those who wish to establish or integrate FS services in their institution.

Introduction

In 2021, the American Academy of Neurology (AAN) published a discussion on the mismatch between the demand and supply for neurologists.¹ Projections from the 2013 AAN Workforce Survey predict that by 2025, 41 states will be unable to meet the demand for neurologists, and 36 states will have 20% more demand than supply.² These survey predictions combine information from the AAN database of neurologists, AAN Member Census File, and American Medical Association Masterfile to assess present neurologist supply and project future supply using National Residency Match Program data. Demand is modeled using a representative population in each state and each person's characteristics to forecast their use of neurology services.² As such, these projections represent the national supply and demand mismatch in the United States and are not

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unique to academic or community settings. Tactics recommended to shape the demand included curtailing ineffective and inefficient services and coping better with the existing demand.¹

Functional neurologic disorder (FND), including functional seizures (FS), is the one of the most common reasons for a neurology consultation.^{3,4} Many neurologists view their role in FND as limited to diagnosis because evidence-based treatment for FND is psychiatric and not neurologic.^{5,6} It may be helpful to have a neurologist on the team to consult when a patient's symptoms change over time. However, more research is needed to investigate the optimal clinical practices for neurologists' longitudinal treatment of patients with FND.⁶

Furthermore, after diagnosis of FND, many neurologists feel ill equipped to manage these patients' care because it involves coordination of mental health services, also in severe shortage, and evaluation of any new symptoms to ensure that they also represent FND.⁷ The lack of specific FND education during the training of most neurologists results in poor diagnosis delivery. Poor delivery leads to patients' misunderstanding or unwillingness to accept the FND diagnosis and also plays an important role in maintaining patients' adherence to treatment.⁸ More efficient diagnosis and effective management of persons with FS is critically needed, as the average delay to diagnosis is 8.4 years, during which patients use health care at high rates, resulting in high health care costs.^{9,10} The FS diagnosis causes a significant financial burden to the health care system and patients, and the duration of the condition is directly correlated with higher costs.¹¹ Yet, this high utilization has been ineffective because persons with FS show elevated mortality rates similar to those found in medication-resistant epilepsy.^{12,13}

FND can include any neurologic symptom that historically is understood as a physical manifestation of acute or chronic psychological stressors.¹⁴ The most common symptom of FND is FS, also called psychogenic nonepileptic seizures (PNES).¹⁵ The exact etiology of FND is unknown. However, 80%–85% of patients with FND report significant biopsychosocial trauma including but not limited to sexual abuse, mild traumatic brain injury, and severe mental health disorders.¹⁶

FND diagnosis requires expert neurologic evaluation for both positive signs and symptoms of FND, as well as evaluating for comorbid neurologic conditions. Documented certainty of FS requires direct observation of the patient's typical seizures by a seizure specialist with concurrent video-EEG monitoring (VEM).¹⁷ After diagnosis, treatment often focuses on neurobehavioral therapy, developed by Dr. Curt LaFrance and colleagues, using a combination of psychotherapeutic approaches including cognitive-behavioral-informed therapy.¹⁸ However, VEM frequently is only available at regional and tertiary specialty centers, with fewer than 20 centers in the United States that provide specialized neurobehavioral therapy for FS.^{19,20}

The University of Colorado (CU) FS Clinic was established in 2015 as one of the first specialized FS clinics in the country and

receives more than 400 referrals annually, the majority of which come from outside the institution.²¹ The CU FS Clinic coordinates evaluation, diagnostic testing, treatment, and follow-up of all patients with possible FS. The CU Epilepsy Clinic only cares for these patients during VEM. The FS clinic maintains a wait list of 3–4 weeks, whereas the wait time for a new consult with an epileptologist in the CU Epilepsy Clinic is 4 months.

At other level 4 comprehensive epilepsy centers, these referrals for FS are diagnosed and evaluated by epileptologists and then referred for neurobehavioral therapy.¹⁹ In this traditional model of health care delivery, patients and neurologists struggle to identify behavioral health (BH) providers who are comfortable with treating FS, resulting in access and quality barriers.²² BH providers' discomfort with FS and repeat neurologic re-evaluation is reflected in key misconceptions about diagnostic certainty. Psychiatrists frequently decline FS referrals or discontinue treatment because they feel the patient has epilepsy, despite a VEM-based diagnosis.²³

A barrier to establishing more FS clinics is financial feasibility and the impact of dedicating scarce subspecialty neurology resources. For the CU FS Clinic, the initial triage of patients with possible FS to the FS clinic may improve access to epilepsy clinic epileptologists and be financially neutral. We hypothesized that the CU FS Clinic further improves both access and revenues of the epilepsy clinic. In this manuscript, we focus on the implications on neurologic care access and financial feasibility in the outpatient setting. Cost effectiveness and cost savings of a multidisciplinary FS clinic are outside the scope of this article, as it would require addressing the combination of payment models for diverse FTEs. Instead, we use real historical data to simulate the impact of the CU FS Clinic on access to epileptologists for patients with epilepsy and estimate the financial benefit of this shift from return patient visits (RPVs) for FS to new patient visits (NPVs) for epilepsy. This study provides an initial rationale for faculty wishing to implement an FS treatment service line in outpatient neurology clinics.

Methods

University of Colorado FS Clinic Team and Referral Pathway

The CU FS Clinic is a short-term multidisciplinary clinic in the Department of Neurology. The CU FS Clinic treats only patients with the primary FND symptom FS and who identify with the term “seizure” as all patient-facing materials reference “seizure.” At the time of data acquisition, the clinic employed a 0.5 full-time equivalent (FTE) epileptologist, 0.6 FTE psychiatrist, 1.0 FTE licensed clinical social worker (LCSW), and 1.0 FTE program manager. The epileptologist who is the medical director of the FS clinic was no longer seeing patients with epilepsy and therefore was not included in the equation of epileptologist access. Of note, our psychiatrist does not work full-time, and thus, 0.6 FTE is her only FTE and devoted to work in the FS clinic. The FS clinic treatment model has been

published previously.²¹ In brief, referrals to the FS clinic are screened by the program manager (M.W.). If the referral is appropriate, the patient is scheduled with the FS clinic epileptologist to confirm the certainty of the FS diagnosis based on the International League Against Epilepsy (ILAE).¹⁷ Patients with probable FS are always triaged to our epileptologist and, if necessary, referred for VEM capture of events to increase diagnostic certainty. We have also incorporated a patient care conference into our referral process to allow for discussion of the cases who need clarification and use this time for dissemination of how we evaluate referrals. We teach referring providers more about FS to help them gain an understanding about how to improve their delivery of the FS diagnosis. In addition, we lecture regionally about FS to raise awareness to assure that our referral base is setting appropriate expectations for patients about treatment and outcomes.

If the diagnostic certainty is at least probable, following the guidelines outlined by the ILAE, the patient is referred for BH intake with our psychiatrist or LCSW as to not further delay treatment. After BH intake, patients are followed by their BH provider to conduct group or individual therapy. In individual therapy, they are guaranteed 2–4 follow-up sessions with the FS clinic BH faculty and discharged to ongoing community BH. The FS clinic BH faculty, with help from social work interns, identify, educate, and connect community therapists with each discharged patient.

If a patient is nonadherent to follow-up and rereferred to the University of Colorado for neurologic care for their FS, or new FND symptoms after completion of treatment, the referral is routed directly to the FS clinic for review, and the team decides to re-engage the patient or reiterate recommended follow-up instructions. Intervention at rereferral by the FS clinic program manager prevents inappropriate engagement of persons with FS with other subspecialty neurologists (e.g., movement) outside the FS clinic, unless specifically referred to by the FS clinic.

Standard Protocol Approvals, Registrations, and Patient Consents

Regulatory approval was obtained by the Colorado Multiple Institutional Review Board (20-2012), and waiver for consent was granted on the basis that all clinical information collected was obtained as standard of care.

Cohort Selection

This retrospective study used a convenience sample of 300 adults (age ≥ 18 years) consecutively referred to the FS clinic between January 2020 and February 2022. Chart review was conducted by the FS clinic program manager, with clinical oversight from the clinic director. To ensure that the selected cohort reflected only referrals of persons who needed FS treatment, we excluded patients with epilepsy and FS (dual diagnosis), physiologic causes of seizure-like events (e.g., convulsive syncope), and those with a final diagnosis that was not FS. We excluded patients who were directly referred by a nonuniversity community epileptologist, patients who were

deceased, or those who had planned re-engagement with FS clinic services at the time of data collection (Figure 1). These exclusion criteria aimed to model standard referral practices to a tertiary care epilepsy center, most of which do not have a specialized FS clinic, to simulate the more common current state. For example, we did not include patients referred specifically for FS treatment by community epileptologists. Standard of care without access to a specialty FS clinic would be, as demonstrated in the Canadian League Against Epilepsy Survey, for the diagnosing neurologist to continue managing these patients at their institution, referral to behavioral health care, or no follow-up.²⁴ Excluding patients referred by community epileptologists ensures that our results were measuring the impact of the FS clinic on the epilepsy division, as we would not expect a community epileptologist to refer a diagnostically certain FS patient to the CU epilepsy division without our specialized FS clinic. Patients referred after initial evaluation by CU epileptologists were only included for analysis if they did not return to see them after referral to the FS clinic. We also excluded patients who were actively engaged within the FS clinic, as their duration of follow-up was to be determined.

Data Collection

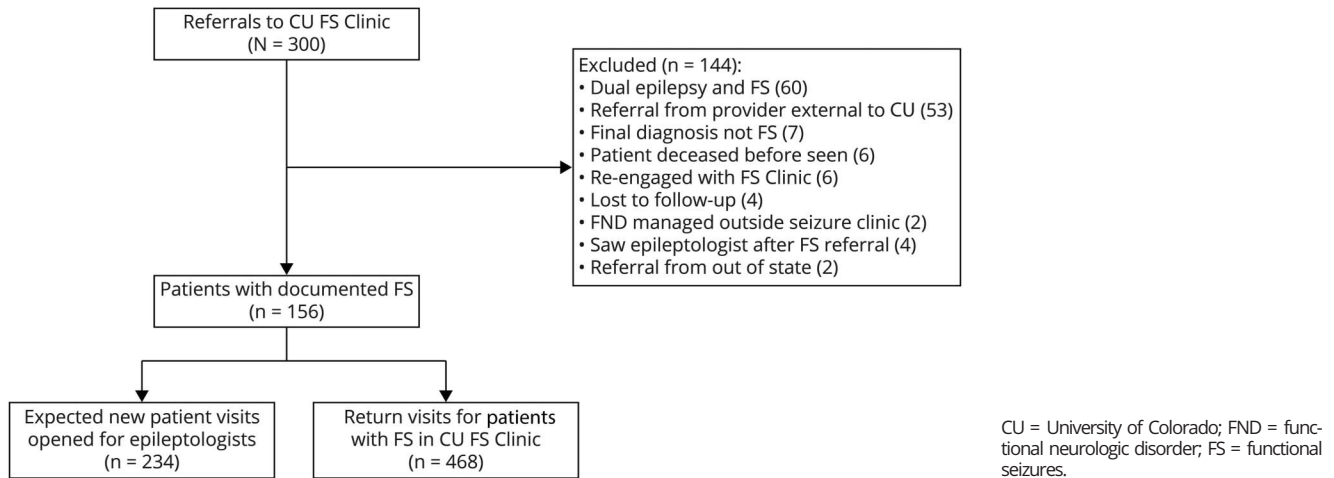
We reviewed all outpatient medical records pertaining to the patient's engagement with the CU FS Clinic and Epilepsy Clinic epileptologists employed by the CU Neurology Department. Patients' charts were reviewed from referral date through the last date engaged with the FS clinic. The last date engaged was indicated by a completed visit note, phone call, or patient message in the electronic health record (EHR) authored by one of the FS clinic's faculty or staff. Referral and visit dates abstracted from the EHR were cross referenced with the FS clinic's internal database. The referring provider was categorized by provider specialty and setting. Patients were categorized as being referred from an internal, external, or emergency setting. Internal referrals included patients referred by neurologists employed by CU. External referrals were those referred by community neurologists not employed by the CU Neurology Department. An emergency setting referral came directly from any local emergency department (ED), including but not limited to patients seen by CU neurohospitalists in consultation.

Access Simulation

We could not perform an experiment in which we temporarily removed the FS clinic to evaluate its impact on referrals to epileptologists. Instead, we determined the current local standard of care based on surveys and simulations. The FS clinic was established in 2015, so an analysis of access before and after establishing the clinic would not reflect current practice patterns.

We surveyed all CU epileptologists ($N = 9$), inquiring how often they would see patients with FS for follow-up if the FS clinic did not exist (Figure 2). Most of our epileptologists indicated that they would see the patient back every 3–6 months if not for the FS clinic.²⁵ Results allowed the estimation of how many RPVs were opened with epileptologists because of the FS clinic. At CU, outpatient clinics are scheduled as 30-minute RPVs and 60-

Figure 1 STROBE Inclusion and Exclusion Criteria Flowchart



minute NPVs. Therefore, triaging 2 RPVs with persons with FS to the FS clinic would open up 1 NPV for a patient with epilepsy. To determine the number of RPVs triaged to the FS clinic over the first 2 years for each patient, we multiplied the number of expected RPVs per month by the number of months each patient was engaged with the FS clinic. For example, each patient who spent 2 years engaged with the FS clinic was expected to open 4 RPVs (RPVs occurring every 6 months for 2 years) with epileptologists and thereby 2 NPVs biennially. The total time engaged in the FS clinic was defined as the total number of months between referral to and the last date engaged with the clinic. Active prevention of patients with FS from returning to epilepsy clinic epileptologists was included in the total months engaged. The total number of RPVs triaged to the FS clinic was the sum of the RPVs triaged for each patient.

To evaluate the proportional impact of these opened NPVs on access to epileptologists for patients with epilepsy, we compared the number of expected newly opened NPVs to the total number of NPVs completed by CU epileptologists annually and calculated the percentage increase of NPVs afforded by the FS clinic.

Financial Feasibility Simulation

To estimate the total revenue and simulate the impact of the FS clinic on the CU Epilepsy Division financials, we multiplied the

net increase in NPVs by the neurology department average reimbursement per *Current Procedural Terminology (CPT)* code and Centers for Medicare and Medicaid Services (CMS) weighted resource value units (wRVUs). As of April 2022, the average CU Neurology Department reimbursement for CPT code 99205 was \$297.04 and \$150.46 for CPT code 99214. For this analysis, we used CMS 2022 wRVU rates of 3.5 wRVUs for 99205 and 1.92 wRVUs for 99214.

Data Availability

Anonymized data not published within this article will be made available by request from any qualified investigator.

Results

During the timeframe selected for this study, the FS clinic had staffing to support 6–10 new patients per week. Figure 1 summarizes the STROBE inclusion and exclusion flowchart. Only 1% (4/300) was lost to follow-up within the EHR. After all exclusion criteria were applied, 156 patients with FS were analyzed. Demographic information for these patients is summarized in the Table. The cohort's average age was 41 years (SD = 14), White (83%), female (83%), unemployed (53%), used Medicaid insurance (53%), were on or pursuing disability (54%), obtained less than a 4-year college degree (67%), and were not driving at first appointment (51%). The average

Figure 2 Anonymous Survey Results of University of Colorado Epileptologists (N = 9)

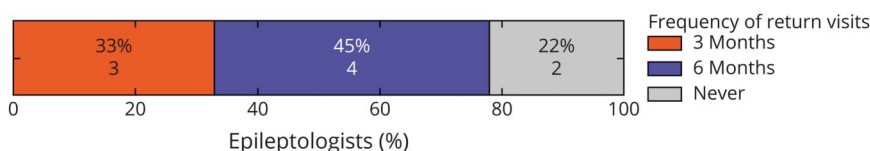


Table Cohort Demographics

Characteristic	N (%)
Age, y	
Mean (SD)	41 (14)
Gender	
Female	129 (83)
Male	23 (23)
Other/nonbinary	4 (3)
Race	
American Indian/Alaska Native	3 (2)
Black or African American	10 (6)
More than 1 race/others	14 (9)
White or Caucasian	129 (83)
Ethnicity	
Not Hispanic/Latino/a	134 (86)
Hispanic/Latino/a	12 (8)
Relationship status	
Single	81 (52)
In a relationship (e.g., married)	68 (44)
Unknown	7 (4)
Insurance status	
Medicaid	83 (53)
Medicare	31 (20)
Private	36 (23)
Government (e.g., Tricare)	6 (4)
Disability status	
On disability	35 (22)
Pursuing or interested in disability	50 (32)
Not pursuing disability	53 (35)
Retired	1 (1)
Unknown	17 (11)
Employment status	
Employed	45 (29)
Unemployed	83 (53)
Retired	5 (3)
Student	4 (3)
Unknown	19 (12)
Education level	
<High school	8 (5)
High school diploma/GED	34 (22)

Table Cohort Demographics (*continued*)

Characteristic	N (%)
Some college or 2-year degree	62 (40)
4-Year degree	16 (10)
Graduate or professional degree	9 (6)
Unknown	27 (17)
Driving status	
Driving	55 (35)
Not driving	80 (51)
Unknown	21 (13)

duration of follow-up within the first 2 years after referral was 9 months per patient (total 1,405 months). During the study period, CU epileptologists in the epilepsy clinic received referrals for an average of 2,216 NPVs annually and completed 1,160 (52%) NPVs.

CU epileptologists indicated that RPVs for the first 2 years after the diagnosis of FS would occur every 3 months for 33%, every 6 months for 45%, and never for 22% of epileptologists. Using weighted averages based on the results of the survey of epileptologists, an epilepsy practice of similar size ($N = 9$) could expect 4.4 RPVs ($SD = 2.9$). If those RPVs were avoided because of engagement in the FS clinic treatment pathway, this would correspond to 2.2 newly opened NPVs ($SD = 1.5$) per patient with FS per year, attributable to the impact of the FS clinic. The total financial impact of the resultant increased access from our cohort of 156 eligible FS clinic referrals would thus be 343 NPVs, 1,200 wRVUs, or, equivalently, \$102,000. This would result in 686 RPVs, 1,320 wRVUs, or, equivalently, \$103,000. Relative to the total 1,160 annually completed NPVs with CU epileptologists, opening 343 NPVs over 2 years represents a 15.5% increase in available new patient visit slots. This represents a net increase in productivity and revenue for the institution, compared with a revenue-neutral shifting, because the productivity and revenue from RPVs of persons with FS was also captured by the FS clinic within the institution.

Our numbers reflect the average impact based on our survey. To understand specific patterns of RPV per epileptologist, if we consider RPVs as every 3 months for our cohort of 156 FS clinic referrals, this resulted in a total of 468 newly opened RPVs and 234 newly opened NPVs for patients with probable epilepsy. Relative to the total number of NPVs with epilepsy clinic epileptologists, 234 NPVs represented a 10.6% increase in available new patient visit slots. Similarly, triage of RPVs every 6 months would result in 234 RPVs in the FS clinic and 117 NPVs for persons with epilepsy. This corresponded to a 5.3% increase in NPVs with epileptologists.

For the average epileptologist who otherwise would follow up with a person with FS every 6 months, the newly opened

234 RPVs correspond to a net revenue gain of \$35,200 and 450 wRVUs over 2 years. Converting 2 RPVs to an NPV, this would open 117 NPVs for \$35,000 total revenue and 410 wRVUs. For the case where the epileptologist would see the person with FS as an RPV every 3 months, this would correspond to 468 RPVs newly opened for epileptologists to see patients with epilepsy, \$70,000 total revenue, and 900 wRVUs over 2 years.

Discussion

This study demonstrates that an FS clinic increases patient access and metrics of work productivity and has financial benefits for a neurology department by shaping the supply and demand for neurologic services. We do this by synthesizing the actual impact of integrating an FS clinic on the access and finances of an academic-based epilepsy division, having convinced the hospital administration to fund the psychiatry FTE, using a contribution margin calculator, described in our previous publication.²¹ Our results show that a dedicated treatment pathway for patients with FS can increase access to epileptologists by 5–11%. To provide generalizability, we standardized clinical access by modeling wRVUs, which are the same irrespective of the environment where the clinical work takes place. Treating 156 patients with FS in a multidisciplinary FS clinic resulted in 400–900 newly available wRVUs for epileptologists. Although this study focused only on access to outpatient epilepsy services, we recognize the potential of additional downstream financial value through billable diagnostic, surgical, and other professional services for patients with epilepsy.

The CU FS Clinic is also financially viable because of the reimbursement of RPVs for patients with FS. Therefore, establishing more FS clinics could address the shortage in the supply of neurologists by further shaping the demand—without losing revenue. Neurologists would have the capacity to see more patients with epilepsy, whereas FS experts could coordinate the often complex neurologic and behavioral health care required to effectively treat FS.²⁶

Access to an FND specialist in neurology improves early detection but also has the potential to improve patient outcomes, as the neurologist evaluation is often considered the first stage of multidisciplinary treatment.^{27,28} In the CU FS Clinic, initial evaluation by an epileptologist is their only involvement with the patient, as evidence-based treatment for FS is psychiatric, and ongoing neurology involvement requires more research.⁶ As seen in Figure 1, 20% (60/300) of our cohort was excluded from the analysis because of dual diagnosis of both FS and epilepsy. This proportion of dual diagnosis is similar to other studies.²⁹ Although the CU FS Clinic epileptologist does not manage the patient's epilepsy, they consult on seizure characterization, further reducing inappropriate downstream health care utilization (HCU). A recent economic evaluation of patients with FND estimated that their ED and inpatient health

care costs were similar to other investigation-intensive and pharmacologically demanding neurologic disorders.⁹ Instead of ordering additional VEM, the CU FS Clinic epileptologists quickly and efficiently resolve diagnostic uncertainty using the ILAE criteria or use supportive tools such as the Functional Seizure Likelihood Score calculator.^{17,30}

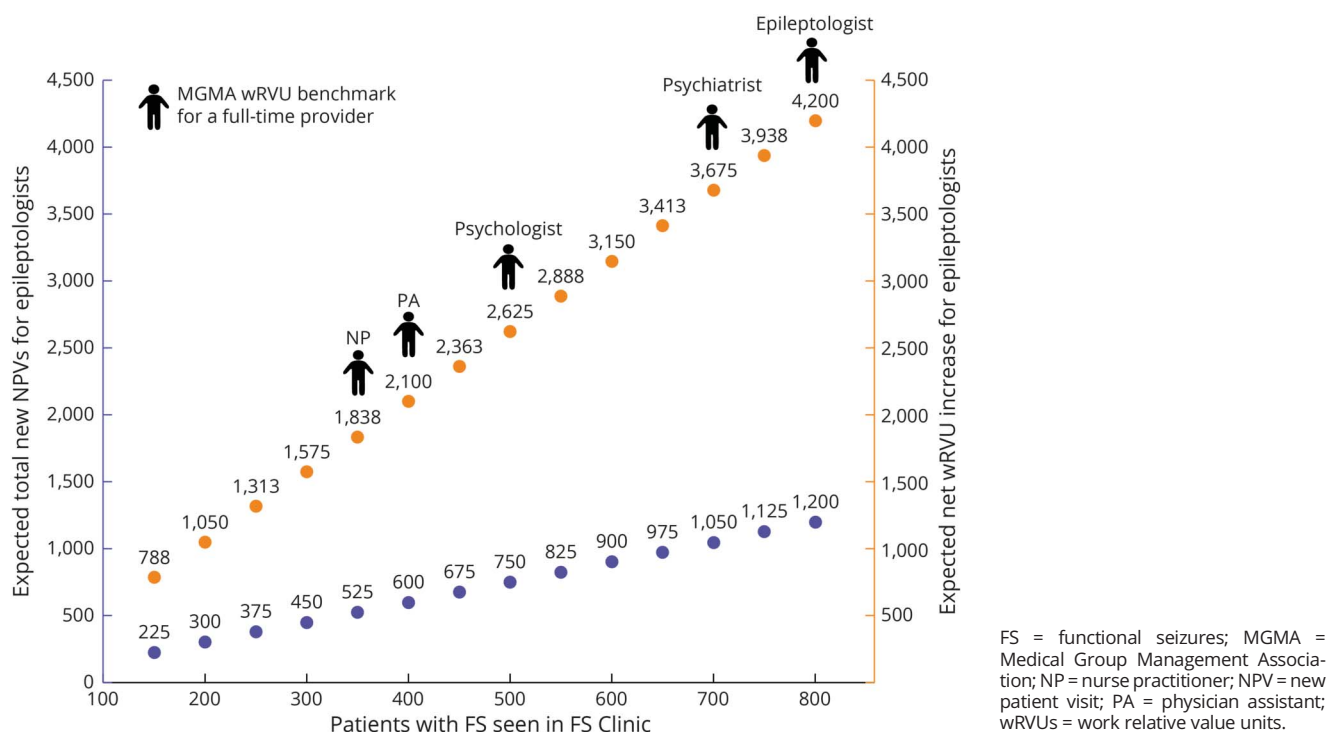
Redirection of patients with FS to an FS clinic from outpatient epilepsy clinics and the associated downstream services could be interpreted as economic cannibalization for a hospital. However, with a national microscope on inappropriate medical services, rising health care costs, and transition toward value-based care, hospitals are newly incentivized to advance the triple aim of providing better care for individuals, improving population health management strategies, and reducing health care costs.³¹ Clinics serving persons with FS also meet the quadruple aim, as neurologists have somewhere to refer the patient, improving provider satisfaction and decreasing burnout.²⁶

Access to care for both patients with FS and epilepsy is further improved by the ability to administer FS treatment through telehealth.³² Since March 16, 2020, the CU FS Clinic has conducted 99% of visits virtually, significantly increasing engagement (i.e., attended initial evaluations) with FS clinic services compared with the in-person clinic.³³ Virtual treatment has further increased access to other subspecialty neurologists by freeing up in-person clinic space previously used by the FS clinic. Using technology, community outreach and educational efforts have helped the FS clinic shape the demand. Through conversations with local neurologists and their direct access to the FS clinic program manager, patients with FS are triaged for eligibility before the formal referral is sent. Thus, the FS clinic assists with the management of patients outside our institution, further reducing the burden on our epilepsy division. This practice of extended triage aligns with recommendations by FND experts for managing patient flow.³⁴

The CU FS Clinic represents a multidisciplinary team of faculty and staff with protected time dedicated to the treatment of persons with FS. We recognize that this is unique and unlikely to be immediately replicated within other institutions. Therefore, it is important for those wishing to implement an FS clinic to right size their team. This article's scope is meant to address newly available access in wRVUs and outpatient clinic time, serving as an initial proxy for modeling the required FTE. For example, according to the Medical Group Management Association 2022 Report, the median wRVUs expected for an epileptologist, psychiatrist, psychologist, neurology physician assistant (PA), and neurology nurse practitioner (NP) across all practices were 4,169, 3,720, 2,631, 2,148, and 1,868, respectively.³⁵ Understanding wRVUs newly available by diverting patients with FS from epilepsy outpatient clinics can be applied to a specific institution's expected wRVU-to-FTE ratio.

Applying this logic, the CU FS Clinic is sustainable because our epilepsy division advanced practice providers (APPs) can support various visit types (e.g., neurology intakes and group

Figure 3 NPVs for Epileptologists and Associated wRVUs by the Number of Patients With FS Diverted From the Epilepsy Clinic



therapy). Involvement of APPs in the treatment model supports increased access to subspecialty neurologists because they are exceptionally skilled in implementing a standard protocol for evaluation, management, and follow-up for patients with FS, allowing epileptologists to focus on confirming the diagnosis through VEM. Therefore, APP involvement in the FS clinic better matches supply with demand. Furthermore, APPs can dedicate a larger proportion of their time because they require fewer wRVUs to meet benchmarks, matching productivity with demand. Using our results as an example, appropriate treatment of 156 patients with FS resulted in 400–900 newly available wRVUs, reflecting 22%–48% of a neurology NP median benchmark (Figure 3). Because evaluation and management (E/M) billing practices remain the same for a neurology NP whether they see a patient with FS or epilepsy (i.e., 99205 and 99214), a department could expect similar reimbursement per patient. If an epilepsy NP is unable to see both populations, the same argument could be made for a proportion of a psychiatrist’s time, further increasing access for subspecialty epilepsy care and maintaining the NP’s access to treat patients with epilepsy.

Our study has a limited scope because we focused on the impact of the CU FS Clinic on access, productivity, and revenue for epileptologists. A detailed analysis of all aspects of the financial feasibility of an FS clinic requires discussing differential revenues for epileptologists, psychiatrists, psychologists, social workers who

provide therapy, the other administrative needs of an FS clinic, and the impact of subspecialty care on treatment outcomes, employment, and HCU. We also focused on direct revenues from outpatient visits with epileptologists for patients with epilepsy and did not evaluate downstream revenues from the additional inpatient services. Future work will evaluate these complex downstream factors involved in both the direct and indirect financial and productivity impacts of the CU FS Clinic. Future work will also investigate the generalizability of FND treatment for all FND symptoms because a present limitation is the potential need for evaluation of other FND symptoms comorbid to FS, which can present during treatment in the FS clinic.

Our results are based on surveys and simulations because we could not perform an experiment where we temporarily removed the CU FS Clinic. The clinic was established in 2015, so an analysis of access before and after would not reflect current practice patterns. The revenues reported reflect the CU Neurology Department average reimbursement per CPT code and may not be generalizable to other institutions. Finally, we do not report total RVUs and thus are unable to comment on the financial feasibility with respect to the hospital or facility fees. Future research will investigate the cost savings and total RVUs generated by the FS clinic with respect to both outpatient and inpatient hospital settings. We recommend that researchers interested in this area use our results as a foundation for future research to determine the worth of subspecialty FND treatment in all neurology subspecialty clinics (e.g., movement and neuromuscular).

TAKE-HOME POINTS

- There is a shortage of neurologists in the United States, and FS treatment within a dedicated epilepsy clinic relieves the demand by providing efficient and effective psychiatric treatment for persons with FS.
- Our sample of 156 patients sent to an FS specialty clinic showed a 15.5% increase in new patient visits to epileptologists for patients with epilepsy.
- Embedded psychiatric treatment for persons with FS in a neurology department improved financial reimbursement for epilepsy.

Our results demonstrate the advantages of a dedicated multidisciplinary clinic for FS for the access and finances of an academic-based epilepsy division. We found that the FS clinic increased access to CU Department of Neurology epileptologists by 5%–11% and was financially positive with respect to revenues earned from wRVUs. There is an urgent need to increase access to subspecialty neurologists across the United States. Integration of a clinic specifically for persons with FS is a realistic and achievable intervention that shapes the demand to meet supply by maximizing epileptologists' time treating epilepsy, whereas the FS clinic provides subspecialty care for FS.

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Disclosure

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Laura Strom, MD	Department of Neurology, University of Colorado, Aurora	Drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; and analysis or interpretation of data

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