



Adherence to outpatient epilepsy quality indicators at a tertiary epilepsy center



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ABSTRACT

Introduction: Quality indicators for the treatment of people with epilepsy were published in 2010. This is the first report of adherence to all measures in routine care of people with epilepsy at a level 4 comprehensive epilepsy center in the US.

Methods: Two hundred patients with epilepsy were randomly selected from the clinics of our comprehensive epilepsy center, and all visits during 2011 were abstracted for documentation of adherence to the eight quality indicators. Alternative measures were constructed to evaluate failure of adherence. Detailed descriptions of all equations are provided.

Results: Objective measures (EEG, imaging) showed higher adherence than counseling measures (safety). Initial visits showed higher adherence. Variations in the interpretation of the quality measure result in different adherence values. Advanced practice providers and physicians had different adherence patterns. No patient-specific patterns of adherence were seen.

Discussion: This is the first report of adherence to all the epilepsy quality indicators for a sample of patients during routine care in a level 4 epilepsy center in the US. Overall adherence was similar to that previously reported on similar measures. Precise definitions of adherence equations are essential for accurate measurement. Complex measures result in lower adherence. Counseling measures showed low adherence, possibly highlighting a difference between practice and documentation. Adherence to the measures as written does not guarantee high quality care.

Conclusion: The current quality indicators have value in the process of improving quality of care. Future approaches may be refined to eliminate complex measures and incorporate features linked to outcomes.

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1. Introduction

There are 70 million people with epilepsy (PWE) worldwide [1]; 1/3 of those who have consistent access to appropriate and adequate doses of medications have medically refractory seizures [2]. People with epilepsy have reduced educational, employment, and financial outcomes; lower quality of life; and increased morbidity and mortality [3–5]. The 2012 report by the Institute of Medicine, *Epilepsy Across the Spectrum* [6], focused on nonseizure factors impacting people with epilepsy and also highlighted issues of access and appropriate care. Recommendations included developing better methods for assessment of quality of care and earlier referral of cases with refractory seizures to higher levels of epilepsy specialty care.

There is increasing financial pressure to improve efficiency of care. Nearly 18% of the US GDP is now directed to health care – higher than any comparable nation [7]. It is estimated that \$10 billion is devoted

to the care of PWE in the US annually [8,9], much of which is indirect costs [10]. Costs of epilepsy due to loss of employment surpass those of diabetes, anxiety, depression, and asthma combined [11]. The majority of both direct and indirect costs are accrued by people with refractory seizures [12]. Taken together, these data suggest that great benefits can be gained by improving the efficiency of care overall [13] and, specifically, by achieving seizure freedom whenever possible.

The National Association of Epilepsy Centers (NAEC) has outlined levels of care for epilepsy, from emergency settings to tertiary epilepsy surgical centers [14]. Generalist providers without epilepsy board certification necessarily manage many PWE. Improving quality of care depends upon providing guidelines for specific aspects of care, including when to refer to more specialized care. To this end, a set of performance measures for epilepsy care has been published [15].

Although CMS is using some of these measures to guide reimbursement, information is lacking regarding the best methods for assessing adherence and the typical adherence at NAEC epilepsy centers. To our knowledge, there are no publications documenting adherence levels

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to all eight measures for all patients during routine care in the US. Pugh et al. compared preliminary measures in tertiary and primary care settings [16]. There is a single report of adherence to the published measures in a pediatric setting [17], and two studies have evaluated adherence in the context of systematic changes intended to improve adherence, one of which used all eight published measures [18,19].

This study assessed adherence to the eight published epilepsy outpatient quality measures at a NAEC level 4 epilepsy center at an academic hospital. Additionally, factors affecting the quantification of adherence, as might be used for reimbursement purposes, were investigated.

2. Methods

2.1. Data collection

Two hundred subjects with epilepsy (ICD-9 345.xx) seen by epilepsy specialists at the Medical University of South Carolina (MUSC) between 1/1/2011 and 12/31/2011 were randomly selected for chart abstraction of all visits within the study time period. Measures were operationalized according to the Epilepsy Physician Performance Measurement Set https://www.aan.com/uploadedFiles/Website_Library_Assets/Documents/3.Practice_Management/2.Quality_Improvement/1.Quality_Measures/1.All_Measures/epilepsy.pdf. All nascent criteria for exclusion were noted and applied. Additional variables were abstracted as described below. The abstraction tool was constructed a priori and updated for specific issues that arose to ensure consistency moving forward. A wide variety of documentation styles were present within the clinical charts. For more subjective measures, any feature related to the measure was considered adherent (e.g., “folic acid recommended” would successfully meet measure 8). While not guaranteeing comprehensive care, this approach best represented the spirit of the performance measures, as published.

Abstractors and the principal investigator met frequently to maximize the systematic and consistent approach according to the predefined variable definitions. Physician documentation of each visit for each subject was abstracted into a REDCap database [20]. Visits were classified as initial or follow-up and abstracted identically. Results are reported for all visits and for initial visits because no measures apply strictly to follow-up visits. Each provider used their own approach, with no shared templates. This study was approved by the Internal Review Board of MUSC.

2.2. Quality measure adherence calculation

Adherence was operationalized for each quality measure according to the Epilepsy Physician Performance Measurement Set [21] as described in Table 1. Unless otherwise specified, adherence calculations for all measures used a numerator of all visits meeting criteria and the denominator of all visits. Factors impacting the measure design for this study are described in this section.

2.2.1. Measure 1: seizure type and current seizure frequency

Wide variability of documentation is possible for both type and frequency. Frequency may be provided without any types specified. When types are described, it may not be clear whether all types are included. Frequency may be relative without quantification (e.g., “better than last visit”) or may combine seizure types in one value. Alternative measures addressed these issues.

2.2.2. Measure 2: documentation of etiology of epilepsy or epilepsy syndrome

Epileptologists have long debated etiology [22,23], and lack of uniformity impacts measurement of adherence. Beyond taxonomy, for some patients, etiology is never definite, and excluding these patients from measurement is not simple. Does “cryptogenic” imply that quality care has been provided in searching for an etiology (i.e., should they be counted as etiologies)? This study considered such etiologies adherent.

2.2.3. Measure 3: EEG results reviewed, requested, or test ordered

Adherence was measured for initial and all visits. Adherence for this measure was assessed at all visits in recognition of the fact that ordering a study meets adherence criteria but does not ensure that result is integrated into future care for that patient. Continued documentation of prior results suggests that data are being considered as the care plan progresses.

2.2.4. Measure 4: MRI/CT scan reviewed, requested, or scan ordered

Adherence was measured for initial and all visits. Denominators were as follows: (4b) visits for all patients, regardless of epilepsy syndrome, and (4c) visits for patients with a documented focal syndrome.

2.2.5. Measure 5: querying and counseling about antiepileptic drug side effects

The numerator and the denominator for 5a corresponded to the definition.

2.2.6. Measure 6: surgical therapy referral consideration for intractable epilepsy

Strict adherence requires referral of patients with refractory seizures to more specialized providers, which automatically results in full adherence because all study physicians are tertiary epileptologists. This measure was, thus, operationalized using more stringent criteria (see Table 1). The numerators and denominators of the alternative measurements corresponded to their definitions. This measure is evaluated on a per-patient basis once per three years. For all patients with refractory seizures with no 2011 refractory epilepsy (surgical) conference (REC) presentation, all visits up to 3 years prior to or after their 2011 visits were evaluated, with an REC presentation in that time frame considered adherent.

2.2.7. Measure 7: counseling about epilepsy-specific safety issues

This measure is evaluated on a per-patient basis once per year. For all patients with no visits meeting this measure in 2011, visits were abstracted up to one year prior to and after the 2011 visits. Any such adherent visit rendered the subject adherent. Alternative equations included visits with documentation as follows: (7a) denominator: patients with any history of injury due to seizures and numerator: bone health education or management among that group; (7b) denominator: patients < 19 years old and numerator: safety discussion pertinent to children in that group; and (7c) denominator: patients > 15 years of age and numerator: discussion about driving safety in that group.

2.2.8. Measure 8: counseling for women of childbearing potential with epilepsy

The time frame of evaluation was identical to that of measure 7, with equations as follows: (8) denominator: all women 12–44 years of age; (8a) denominator: women 12–44 years of age taking AEDs; (8b) denominator: women 12–44 years of age on AEDs and numerator: recommendation to take folic acid in that group; and (8c) denominator: women 12–44 years of age using systemic hormonal contraception and numerator: discussion of effects of AEDs on birth control among that group.

2.3. Assessment of adherence

The proportion of adherence was calculated for both all visits and initial visits for measures 1–5. Measures 6–8 were calculated by subject. Ninety-five percent Clopper–Pearson confidence intervals were calculated for all proportions. All analyses were conducted in R v.15.3 [24].

2.3.1. Consistency of adherence

To evaluate the impact of provider on adherence, the percentage of adherent visits was calculated for all measures for providers with > 12 visits [25]. Chi-square tests and Fisher's exact test were used to compare

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