



AAN Epilepsy Quality Measures in clinical practice: A survey of neurologists

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ABSTRACT

Epilepsy Quality Measures (EQM) were developed by the American Academy of Neurology (AAN) to convey standardization and eliminate gaps and variations in the delivery of epilepsy care (Fountain et al., 2011 [1]). The aim of this study was to identify adherence to these measures and other emerging practice standards in epilepsy care. A 15-item survey was mailed to neurologists in Michigan, USA, inquiring about their practice patterns in relation to EQM. One hundred thirteen of the 792 surveyed Michigan Neurologists responded (14%). The majority (83% to 94%) addressed seizure type and frequency, reviewed EEG and MRI, and provided pregnancy counseling to women of childbearing potential. Our survey identified gaps in practice patterns such as counseling about antiepileptic drug (AED) side effects and knowledge about referral for surgical therapy of intractable epilepsy. Statistical significance in the responses on the AAN EQM was noted in relation to number of years in practice, number of epilepsy patients seen, and additional fellowship training in epilepsy. Practice patterns assessment in relation to other comorbidities revealed that although bone health and sudden unexplained death in epilepsy are addressed mainly in patients at risk, depression is infrequently discussed. The findings in this study indicate that additional educational efforts are needed to increase awareness and to improve quality of epilepsy care at various points of health care delivery.

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1. Introduction

Epilepsy is a common neurologic condition, and if under recognized and inappropriately managed would result in an increase in economic burden. Most recent data from CDC (Center of Disease Control) report that epilepsy leads to an estimated annual cost of \$15.5 billion (<http://www.cdc.gov/epilepsy>). In January 2011, the American Academy of Neurology (AAN) published a set of epilepsy care quality measures [1]. The measures were developed by the AAN Quality Measurement and Reporting Subcommittee using the American Medical Association's (AMA) Physician Consortium for Performance Improvement (PCPI) process. Similar metrics have been developed by AAN for stroke rehabilitation and Parkinson's disease [2,3]. All these metrics serve as a guide to provide evidence-based quality care and to standardize the process of delivering care [4]. Previous experience with the AAN Practice Parameter based on Class I evidence for surgical effectiveness in refractory temporal lobe epilepsy [5] and its influence on the referral patterns for epilepsy surgery has been disappointing [6]. A 2010 study showed that the referral patterns for epilepsy surgery did not significantly change following the release of the AAN recommendation, and the same delay in referring patients with refractory epilepsy for surgery was seen before and after the publication of the recommendation [6]. Furthermore, from 1990 to 2008, despite the Class I evidence and

practice guidelines, epilepsy surgery for drug-resistant epilepsy has remained largely underutilized [7,8].

The published 8 EQM [1] approved by AAN and the PCPI include determination of seizure type and frequency (measure 1), etiology or epilepsy syndrome (measure 2), review of EEG (measure 3) and MRI/CT findings (measure 4), counseling of antiepileptic drug (AED) side effects (measure 5), consideration for surgical treatment of intractable epilepsy (measure 6), epilepsy-specific safety issues (measure 7), and counseling for women of childbearing potential on contraception and pregnancy (measure 8) (Appendix A). In addition, awareness about bone health [9–11], depression [12,13], and sudden unexplained death in epilepsy (SUDEP) [14–16] is gaining increasing importance in improving delivery of epilepsy care. The aim of this study was to assess the adherence of Michigan neurologists to the AAN EQM in addition to evaluating how other common epilepsy comorbidities such as bone health, recognition of depression, and awareness of sudden unexplained death in epilepsy (SUDEP) are addressed during clinic encounters.

2. Methods

2.1. Survey methodology

A survey methodology was devised by a work group of epileptologists, a biostatistician, and research coordinators, some of whom also formulated an earlier published survey [17]. The survey questions were developed on the basis of the AAN EQM and emerging

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epilepsy comorbidities. The 15-item questionnaire (Appendix-B) covered demographics (questions 1–4), AAN EQM (question 5–12), and bone health (question 13), depression (question 14) and awareness about SUDEP (question 15).

The survey was mailed in November 2011 to all practicing neurologists in Michigan outside of the investigators' institution [18]. Names and addresses were obtained through Medical Marketing Service, Inc. (MMS) mailing list purchased by the Department of Neurology. The survey packet included an introductory letter describing our study, a survey questionnaire, a postcard to be returned with the survey, and a self-addressed stamped envelope. All surveys were anonymous, and there was no link between the participants' names/addresses and their survey responses. A \$10 gift card was offered as an incentive to the respondents upon return of the survey questionnaire [19].

2.2. Statistical methods

Descriptive statistics, such as sample sizes and percentages, were used to describe how neurologists responded to specific questions. In addition to describing the overall responses to the guidelines, we were interested in assessing whether certain physician characteristics would have an effect on the responses. The characteristics that we planned to explore with this survey were years of practice (≤ 10 vs. > 10 years), number of epilepsy patients treated within a month (≤ 20 vs. > 20 patients), distance from a comprehensive epilepsy program (< 50 vs. ≥ 50 miles), and additional neurophysiology/epilepsy training (yes vs. no). Chi-square tests were done to assess the relationship between these characteristics and responses to the guidelines. p values < 0.05 were considered statistically significant. All analyses were performed using SAS Version 9.2 [20].

3. Results

A total of 792 surveys were mailed to Michigan neurologists, 113 of which were returned with a response rate of 14%.

3.1. Demographics

The majority of the respondents (61%) had been in practice for more than 10 years. Forty-nine percent treated more than 20 epilepsy patients in a month and 75% had their practice within 50 miles of a comprehensive epilepsy program [Table 1]. Twenty-one neurologists (19%) had additional training in neurophysiology and/or epilepsy [Table 1].

3.2. AAN Epilepsy Quality Measures (EQM)

The majority of the respondents indicated adherence to the EQM related to counseling women of childbearing potential (94%), MRI/CT review (90%), EEG review (84%), and appropriate documentation of seizure type and frequency (83%) [Table 2].

Forty-nine percent of the respondents counsel patients about epilepsy-specific safety measures at every clinic visit and 21% at least once per year while the remainder (30%) provide counseling at the initial visit, once every 3 years or never [Table 2]. Only 59% of the respondents document the etiology of the epileptic syndrome of each patient at each visit. Very poor rates for appropriate responses were obtained for side effects of AEDs since only 37% of the respondents address adverse side effects of AEDs at every clinic visit and fewer (26%) consider surgical referral every 3 years in refractory cases [Table 2]. The physicians with less than 10 years in practice tend to counsel women of childbearing potential more frequently than physicians who are practicing longer than 10 years (100% vs. 90%, $p = 0.042$) [Table 2].

We detected a statistically significant difference in addressing seizure type and frequency between those neurologists who treat more

Table 1
Neurologists' demographics and responses to survey.

Variable	Response	All surveys (N = 113)
1. How many years have you been in practice?	<5	22 (19%)
	5–10	22 (19%)
	> 10	69 (61%)
2. How many epilepsy patients do you treat per month?	<10	30 (27%)
	10–19	28 (25%)
	> 20	55 (49%)
3. How far is your practice from the nearest Comprehensive Epilepsy Program?	<50 miles	85 (75%)
	50–100 miles	16 (14%)
	> 100 miles	12 (11%)
4. How would you describe your practice? (Check all that apply)	Solo	33 (29%)
	Group	32 (28%)
	Academic	38 (34%)
	Adult	30 (27%)
	Child	17 (15%)
	Additional training in clinical neurophysiology	17 (15%)
	Additional training in epilepsy	10 (9%)
5. How often do you address seizure type and current seizure frequency?	At every clinic visit	94 (83%)
	At the first clinic visit	6 (5%)
	Every 2–3 clinic visits	14 (12%)
	Never	3 (3%)
6. How often do you document the etiology of epilepsy or epilepsy syndrome?	At every clinic visit	66 (59%)
	At the first clinic visit	22 (20%)
	Every 2–3 clinic visits	23 (21%)
	Never	2 (2%)
7. How often do you consider requesting, reviewing or ordering an EEG?	Ordered at every clinic visit	2 (2%)
	Every time medications are changed	9 (8%)
	All initial evaluations with the results of at least one EEG reviewed or requested	94 (84%)
8. How often do you consider reviewing, requesting or ordering a MRI/CT?	Once every 2 years	9 (8%)
	At all initial visits with the results of at least one MRI/CT reviewed or requested.	100 (90%)
	Request/order a MRI/CT at every clinic visit	4 (4%)
9. How often do you counsel a patient about antiepileptic drug side effects?	Request/order a MRI/CT once every 3 years	10 (9%)
	Every time a new antiepileptic drug is started	73 (65%)
	At every clinic visit	42 (37%)
10. When would you consider and document this consideration of surgical therapy referral for intractable epilepsy?	Only when the patient complains of symptoms	4 (4%)
	Only if patient is on polytherapy	2 (2%)
	Never	1 (1%)
	Only after failure of several antiepileptic medications	84 (74%)
11. How often do you counsel patients about epilepsy-specific safety measures?	Every 3 years in any patient who is on 2–3 antiepileptic medications with refractory seizures	29 (26%)
	Only if the patient mentions surgery	2 (2%)
	I never consider surgery	1 (1%)
12. How often do you counsel women of child bearing potential with epilepsy (ages 12–44) about pregnancy?	At every clinic visit	55 (49%)
	At the initial visit	36 (32%)
	At least once per year	24 (21%)
	Once every 3 years	4 (4%)
12. How often do you counsel women of child bearing potential with epilepsy (ages 12–44) about pregnancy?	Never	2 (2%)
	At every clinic visit	58 (52%)
	At least once per year	41 (37%)
	Never	3 (3%)
12. How often do you counsel women of child bearing potential with epilepsy (ages 12–44) about pregnancy?	I do not treat women of child-bearing potential	7 (6%)

than 20 epilepsy patients per month and those who treat fewer (95% vs. 72% respectively, $p = 0.002$) [Table 2]. We also observed a significant difference in counseling about AED adverse effects between the two groups (49% vs. 26%, $p = 0.011$) [Table 2] and a trend for counseling about specific safety measures (78% for > 20 vs. 62% for ≤ 20 , $p = 0.062$) [Table 2]. We noted statistically significant differences between the neurologists who had neurophysiology/epilepsy

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