American Academy of Neurology

Epilepsy Update
Performance Measurement Set

Status: For Public Comment
March 4, 2014
Physician Performance Measures (Measures) and related data specifications developed by the American Academy of Neurology (AAN) are intended to facilitate quality improvement activities by physicians.

These measures are intended to assist physicians in enhancing quality of care. Measures are designed for use by any physician who manages the care of a patient for a specific condition or for prevention. The AAN encourages use of these Measures by other health care professionals, as appropriate. These Measures are not clinical guidelines and do not establish a standard of medical care, and have not been tested for all potential applications. The AAN encourages testing and evaluation of its Measures.

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### 2013 Updated Epilepsy Quality Measure Set

1A. Seizure Frequency *(2009 measure revised)*  
1B. Seizure Intervention *(2009 measure revised)*  
2. Etiology, Seizure Type and Epilepsy Syndrome *(2009 measure revised)*  
3. Querying and Intervention About Anti-Seizure Medication Side Effects *(2009 measure revised)*  
4. Personalized Epilepsy Safety Issue and Education Provided *(2009 measure revised)*  
5. Screening for Psychiatric or Behavioral Health Disorders            
6. Counseling for Women of Childbearing Potential with Epilepsy *(2009 measure with updated specifications)*  
7. Two Year Wait to Withdraw Anti-seizure Medication for Children with Epilepsy  
8. Referral to Comprehensive Epilepsy Center                            

Evidence Classification/Rating Schemes (Draft pending public comments)  
Contact Information                                                       | 11   |

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TOWARDS IMPROVING OUTCOMES FOR PATIENTS WITH EPILEPSY

In 2008-2009, the American Academy of Neurology (AAN) and the American Medical Association-convened Physicians Consortium for Performance Improvement developed eight quality measures for patients with epilepsy.

In 2013, the AAN formed a multi-disciplinary Epilepsy Work Group (Work Group) to review the existing epilepsy quality measurement set. The AAN reviews measure sets every three years or if there is a significant change in scientific evidence, testing results, or other issues noted that affect measure set integrity.

Importance of Topic

Epilepsy data is lacking. In 2012, the Institute of Medicine released Epilepsy across the Spectrum: Promoting Health and Understanding, detailing epilepsy research disparities and highlighting specific areas where further research is needed including the extent of epilepsy, consequences, comorbid conditions and outcomes of epilepsy. Brief bullets of the importance of this topic are provided, but readers should be aware these bullets only touch on the magnitude of epilepsy given lack of research and stigma associated with reporting epilepsy.

- It is estimated 150,000 new cases of epilepsy are diagnosed in the United States annually, and an estimated 2.2 million people in the United States are diagnosed with epilepsy.
- Epilepsy prevalence might be underestimated because of underreporting associated with repercussions and stigma in disclosing epilepsy.
- Common comorbidities among people with epilepsy include somatic (i.e., fractures, asthma, diabetes, and heart disease), neurological (i.e., stroke, Alzheimer’s disease, Autism spectrum disorders, chronic pain), and mental health conditions (i.e., mood disorders, attention deficit hyperactivity disorders, anxiety disorders, suicidality).
- It is estimated the number of people with epilepsy who die of sudden unexpected death in epilepsy (SUDEP) range from 1 of every 10,000 who are newly diagnosed to 9 of every 1,000 candidates for epilepsy surgery.
- People with epilepsy are more likely to be unemployed or unable to work, have low annual household incomes, be obese and physically inactive, and to smoke.
- People with epilepsy have poorer overall health status, impaired intellectual and physical functioning, a greater risk for accidents and injuries and negative side effects from seizure medications.
- It is estimated the annual direct medical cost of epilepsy in the United States is $9.6 billion. This estimate does not include community service costs or indirect costs from losses in quality of life and productivity.

Opportunities for Improvement

Additional data on opportunities for improvement and gaps in care specific to the epilepsy measures can be located in the updated epilepsy measures.

- A review of 261 patient responses using the PatientsLikeMe survey system indicated a gap remains between recommended care detailed in the 2009 epilepsy measurement set and the care delivered to patients with epilepsy.
• The Institute of Medicine noted several gaps in care and opportunities for improvement, including 1) timely referrals and access to those treatments are lacking, 2) epilepsy care and prevention could be enhanced by better data surveillance and research, 3) education of persons with epilepsy and their families should be thorough and include health literacy and cultural considerations and 4) the stigma of epilepsy must be eliminated. ²
• Surgery continues to be heavily underutilized as a treatment for epilepsy, with significant disparities by race and insurance coverage. ⁶

Clinical Evidence Base
When possible, every effort was made to support measure recommendations with Randomized Clinical Trials (RCT). Lacking sufficient RCT data, clinical practice guidelines and peer-reviewed papers served as the foundation for the development of these performance measures. Many guidelines use a less rigorous, less transparent process for guideline development than the AAN (and the Work Group) prefers. Notably, the guidelines developed by National Institute for Health and Clinical Excellence (NICE) and Pugh et al. include consensus based guidelines. These recommendations are listed as supporting several of the measures in addition to other evidence papers and peer reviewed literature.

Epilepsy Evidence Based Processes and Desired Outcomes
The Work Group identified the following evidence based processes and desired outcomes for patients with epilepsy prior to drafting the measurement set:

Desired Outcomes:
1. Freedom from seizures
2. Reduction of seizure frequency
3. Reduced risk of death associated with seizures (e.g., sudden unexpected death in epilepsy (SUDEP), accident, or suicide)
4. Reduce and address safety issues (e.g., falls, injury, etc.)
5. Increased independence
6. Reduction of mental health and behavioral health comorbidities
7. Recognition and reduction of cognitive morbidity
8. Increased patient engagement in care and self-management
9. Referral to appropriate testing and reduction of unnecessary testing (e.g., neuroimaging, EEG, etc.)
10. Reduction of Emergency Department visits and emergency services
11. Improved quality of life
12. Reduction of cost of care
13. Improved patient experience

Evidence Based Processes:
1. Timely and appropriate referrals to an epilepsy specialist for patients with refractory epilepsy
2. Early and accurate diagnosis
3. Reduction of and monitoring of anti-seizure medication side effects
4. Improved coordination of care
5. Patient centered care provided
**Intended Audiences, Care Settings, and Patient Population**

Measures are based on available clinical evidence focusing on gaps in care. The Work Group considered the development of process, outcome, individual practitioner level, and system level quality measures, where appropriate.

The AAN encourages use of the measures by physicians and other health care professionals, where appropriate, to manage the care for patients with epilepsy. These measures are intended to be used to calculate performance or reporting at the practitioner level or system level. Performance measurement may not achieve the desired goal of improving patient care by itself. Measures have their greatest impact when they are used appropriately and are linked directly to operational steps that clinicians, patients, and health plans can apply in practice to improve care.

**Epilepsy Work Group Recommendations**

The 2009 epilepsy measurement set was reviewed. The Work Group recommended three measures be retired (i.e., Electroencephalogram (EEG) Results Reviewed, Requested, or Test Ordered; Magnetic Resonance Imaging/Computed Tomography Scan (MRI/CT Scan) Results Reviewed, Requested, or Scan Ordered; Surgical Therapy Referral Consideration for Intractable Epilepsy), four measures were revised, and the Counseling for Women of Childbearing Potential with Epilepsy was affirmed.

### 2014 Updated Epilepsy Measures

1A. Seizure Frequency (Paired Measure) *(2009 measure revised)*

1B. Seizure Intervention (Paired Measure) *(2009 measure revised)*

2. Etiology, Seizure Type and Epilepsy Syndrome *(2009 measure revised)*

3. Querying and Counseling About Anti-seizure Medication Adherence and Side Effects *(2009 measure revised)*

4. Personalized Epilepsy Safety Issue and Education Provided *(2009 measure revised)*

5. Screening for Psychiatric or Behavioral Health Disorders

6. Counseling for Women of Childbearing Potential with Epilepsy *(2009 measure with updated specifications)*

7. Two Year Wait to Withdraw Anti-seizure Medication for Children with Epilepsy

8. Referral to Comprehensive Epilepsy Center

**Other Potential Measures**

The Work Group considered several other important constructs in care for people with epilepsy, including ensuring correct diagnosis for refractory epilepsy, quality of life, and self-management. The Work Group determined that the evidence was too weak, the gap in care was too small, or the opportunity for improvement from the measure was too low to continue with the development of the measure, and they were not suitable for inclusion in this measurement set at this time.

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Measure Harmonization

The Work Group reviewed the existing epilepsy quality measurement set, as well as, additional measures created by the British Medical Association (BMA). The BMA released three epilepsy measurements:

- contractor establishes and maintains a register of patients age 18 or over receiving drug treatment for epilepsy
- the percentage of patients aged 18 or over on drug treatment for epilepsy who have been seizure free for the last 12 months recorded in the preceding 12 months
- the percentage of women aged 18 or over and who have not attained the age of 55 who are taking antiepileptic drugs who have a record of information and counseling about contraception, conception and pregnancy in the preceding 12 months.

The Work Group decided to revise and pair the 2009 seizure types and seizure frequency measure into two separate measures for seizure frequency and seizure intervention to fully address the complex treatment needs for individuals with epilepsy rather than incorporate a measure that solely tracks seizure freedom similar to the BMA measure.

The Work Group voted to retain the existing AAN measure for Counseling for Women of Childbearing Potential with Epilepsy as the existing measure and did not adopt the age range specified by the BMA. (See measure description below.)

Existing Quality Improvement (QI) Initiative or Collaborative for Measure Implementation

Three out of the eight epilepsy measures created in 2009 were adopted by the Centers for Medicaid and Medicare Services (CMS) into the Physician Quality Reporting System (PQRS) pay for reporting program. Additionally, one measure (Women with Epilepsy) was endorsed by the National Quality Forum (NQF) and has been tested to meet the NQF measure testing requirements. Once published, the updated measure set will be reviewed for possible adoption by CMS and NQF endorsement for accountability programs.

The AAN has developed a performance in practice program for maintenance of certification (MOC), NeuroPI (http://tools.aan.com/practice/pip/), which meets the American Board of Psychiatry and Neurology (ABPN) requirements for MOC Performance in Practice requirements. The NeuroPI currently contains a module for epilepsy based upon the 2009 measures developed. The AAN will anticipate that NeuroPI epilepsy module will be updated to reflect the revisions to past epilepsy measures and incorporation of the new measures below.

Technical Specifications Overview

The AAN develops technical specifications for measures that may include:

- Electronic Health Record (EHR) Data
- Electronic Administrative Data (Claims)

Administrative claims specifications are provided for select epilepsy quality measures when the Work Group determined this reporting method was optimal. Current Procedural Terminology (CPT)-II codes are not provided, as the American Medical Association is no longer supporting CPT-II code development.
The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

**Measure Exceptions**

A denominator exclusion is a factor supported by the clinical evidence that removes a patient from inclusion in the measure population. For example, if the denominator indicates the measure is for all patients aged 0 to 18 years of age, a patient who is 19 years of age is excluded.

A denominator exception is a condition that should remove the patient, procedure or unit of measurement from the denominator only if the numerator criteria are not met. The AAN includes three possible types of exceptions for reasons why a patient should not be included in a measure denominator: medical, patient or system reasons.

- **Medical exceptions may address:**
  - Treatment, procedure, or measurement unit is not indicated (e.g., absence of organ/limb, already received/ performed, etc.)
  - A contraindication (e.g., patient allergic history, potential adverse drug interaction, etc.)

- **Patient exceptions may address:**
  - Patient declinations
  - Cultural or religious beliefs

- **System exception may address:**
  - Resources limitations (e.g., particular vaccine was withdrawn from the market, transportation barriers, lack of appropriate specialty provider within a 500 mile radius, etc.)
  - Inability to pay for a test or intervention (i.e., payer-related limitations)

For each measure, there must be a clear rationale to permit an exception for a medical, patient, or system reason. The Work Group provided explicit exceptions when applicable for ease of use in eMeasure development.

Although this methodology does not require the external reporting of more detailed exception or exclusion data, the AAN requests that physicians document the specific reasons for exception in patients’ medical records for purposes of optimal patient management and audit-readiness. The AAN also advocates for the systematic review and analysis of each physician’s exceptions or exclusions data to identify practice patterns and opportunities for quality improvement. Please refer to measure specifications for each individual measure for information on the acceptable exceptions to be used for reporting each individual measure.

**Testing and Implementation of the Measurement Set**

In 2012, the AAN submitted epilepsy quality measures to the National Quality Forum (NQF). The AAN received conditional endorsement of its Counseling for Women with Epilepsy measure. To receive full endorsement the AAN was required to field test the measure for feasibility, reliability, and validity prior to NQF’s review of this measure in March 2014. The AAN contracted with Minnesota Community Measurement (MNCM), a non-profit organization specializing in health care quality measurement and reporting, to collect data pertaining to this
measure from Neurology practices. MNCM concluded the rate calculation and any additional data analysis can be completed using validated and reliable data. MNCM suggested there may need to be a consideration for adding a component of indicating that the patient is sexually active or has the potential to be sexually active, and not physically handicapped. During the validation audit, it was noted on several occasions that the practices provided excellent, personalized progress notes about the counseling that was being provided, that were above and beyond a “check the box”.

The new epilepsy measures are being made available without any prior testing. The AAN encourages testing of this measurement set for feasibility and reliability by organizations or individuals positioned to do so.

Reference List

### DRAFT MEASURE #1A:
Seizure frequency (Paired Measure)

#### Measure Description
Percent of all visits for patients with epilepsy where the seizure frequency of each seizure type was documented.

#### Measure Components

<table>
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<th><strong>Numerator Statement</strong></th>
<th>Patient visits with current* seizure frequency documented for each seizure type.</th>
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<td>*Current seizure frequency: Average or typical recent seizure frequency, often expressed as the average monthly seizure frequency since the last visit.</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Denominator Statement</strong></th>
<th>All visits for patients with a diagnosis of epilepsy.</th>
</tr>
</thead>
</table>

| **Denominator Exceptions** | Caregiver is unavailable for a patient who is non-communicative or has an intellectual disability.  
Patient or caregiver declines to report seizure frequency. |

| **Supporting Guideline & Other References** | The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:  
- The seizure type(s) and epilepsy syndrome, aetiology, and comorbidity should be determined, because failure to classify the epilepsy syndrome correctly can lead to inappropriate treatment and persistence of seizures.  
- When a patient with epilepsy receives follow-up care, then an estimate of the number of seizures since the last visit and assessment of drug side-effects should be documented. (Level D 1+/ Primary)  
- If a patient is thought to have a diagnosis of epilepsy then the diagnosis should include a best estimation of seizure types. (Level C 2+/Secondary) |

**REFERENCES**


Rationale for the Measure:
The main objective in treating epilepsy is to reduce the frequency of seizures and eventually achieve seizure freedom without medication side effects. In order to know that a treatment is effective, the patient’s seizure frequency must be known before an intervention is begun so it can be compared to the seizure frequency determined during follow-up visits after an intervention is instituted. Antiepileptic drugs and devices reduce the frequency of seizures in controlled clinical trials. Seizure freedom is associated with improvement in health-related quality of life, for example after epilepsy surgery. Therefore, accurate assessment of seizure frequency is necessary to provide quality care for epilepsy.

GAP IN CARE
Knowing, and consequently documenting, the type of seizure is necessary because different forms of intervention are indicated for different seizure types. Absence seizures, for example, have relatively few drugs with demonstrated efficacy and resective surgery is offered only for refractory focal seizures. Generalized seizures are treated with different anti-seizure medications, for example ethosuximide is useful only for absence seizures, and resective surgery is not efficacious for generalized seizures.

An intervention should be considered when patients are not seizure-free. In order to determine whether a patient is seizure-free the seizure frequency must be known. Furthermore, in order to determine whether an intervention is effective, such as progressive increases in drug doses, the seizure frequency at each visit must be known to see if it is decreasing as interventions are instituted.

Evidence of gap in care with regard to capturing seizure frequency comes from studies designed to determine the rate of compliance with this epilepsy quality measure after it was published in 2009. In a survey of 113 Michigan neurologists, 83% thought they “addressed seizure type and current seizure frequency at every clinic visit”. However, in a web based survey of 221 unselected epilepsy patients performed to determine their perception of how often their doctor followed the 2009 quality measures, only 62% reported they “strongly agree” that their “epilepsy doctor asks me how many seizures I have had since the last visit”. This reinforces that physicians think they are asking patients about their seizure frequency but, in fact, are not; possibly because physicians interpret a response of “fine” to open ended questions such as, “how are you doing?” as an endorsement of being seizure free or that the current seizure frequency is acceptable.
OPPORTUNITY FOR IMPROVEMENT

After implementation of an epilepsy quality measure checklist in an epilepsy clinic without any other intervention, documentation of compliance with this measure increased from 65% to 75%, illustrating that the measure has the intended consequence of increasing compliance.4

REFERENCES


<table>
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<tr>
<th>Measure Designation</th>
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<td>Individual practitioner</td>
<td>Electronic Health Record (EHR) Data</td>
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<tr>
<td></td>
<td>Accountability</td>
<td></td>
<td></td>
<td>Electronic Administrative Data (Claims)</td>
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Technical Specifications: Electronic Health Record (EHR) Data

The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

Technical Specifications: Administrative Data (Claims)

Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or paper). Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.
### Denominator (Eligible Population) | ICD-9 and ICD-10 Diagnosis Codes:
---|---
<p>| 345.00, generalized nonconvulsive epilepsy, without mention of intractable epilepsy | G40.A09 absence epileptic syndrome, not intractable, without status epilepticus |
| 345.01, generalized nonconvulsive epilepsy, with intractable epilepsy | G40.A19 absence epileptic syndrome, intractable, without status epilepticus |
| 345.10, generalized convulsive epilepsy, without mention of intractable epilepsy | G40.309 Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus OR G40.409 Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus |
| 345.11, generalized convulsive epilepsy, with intractable epilepsy | G40.319 Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus OR G40.419 Other generalized |
| 345.40, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy | G40.209 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus |
| 345.41, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy | G40.219 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus |
| 345.50, Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, without mention of intractable epilepsy | G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus |
| 345.51, Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy | G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus |
| 345.60, Infantile spasms, without mention of intractable epilepsy | G40.822 Epileptic spasms, not intractable, without status epilepticus |
| 345.61, Infantile spasms, with intractable epilepsy | G40.824 Epileptic spasms, intractable, without status epilepticus |</p>
<table>
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<tr>
<th>Code</th>
<th>Description</th>
<th>ICD-9-CM Code</th>
<th>Diagnosis</th>
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<td>345.70</td>
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<td>G40.109</td>
<td>Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.71</td>
<td>Epilepsia partialis continua, with intractable epilepsy</td>
<td>G40.119</td>
<td>Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.90</td>
<td>Epilepsy, unspecified, without mention of intractable epilepsy</td>
<td>G40.909</td>
<td>Epilepsy, unspecified, not intractable, without status epilepticus</td>
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<tr>
<td>345.91</td>
<td>Epilepsy, unspecified, with intractable epilepsy</td>
<td>G40.919</td>
<td>Epilepsy, unspecified, intractable, without status epilepticus</td>
</tr>
</tbody>
</table>

**AND**

CPT E/M Service Code:
- 99201, 99202, 99203, 99204, 99205 (Office or other outpatient visit-New Patient);
- 99211, 99212, 99213, 99214, 99215 (Office or other outpatient visit-Established Patient);
- 99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient);
- 99281, 99282, 99283, 99284, 99285 (Emergency Department)
**DRAFT MEASURE #1B:**
Seizure intervention (Paired Measure)

**Measure Description**
Percent of patients with seizure frequency > 0 for whom an intervention to reduce seizure frequency was offered or discussed with the patient or caregiver.

**Measure Components**

<table>
<thead>
<tr>
<th>Numerator Statement</th>
<th>Patient visits where an intervention to reduce seizure frequency* was offered/discussed with patient or caregiver.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*Intervention to reduce seizure frequency: change in anti-seizure medication or dose modification, medication adherence counseling, referral for surgery, or discussion about change in therapy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Denominator Statement</th>
<th>All patients with a diagnosis of epilepsy with a seizure frequency &gt; 0.</th>
</tr>
</thead>
</table>

**Denominator Exceptions**
- Caregiver is unavailable for a patient who is non-communicative or has an intellectual disability.
- No appropriate intervention available for the patient.

**Supporting Guideline & Other References**
The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:

- “All of the new AEDs were found to be appropriate for adjunctive treatment of refractory partial seizures in adults.” “The choice of AED depends upon seizure and/or syndrome type, patient age, concomitant medications, AED tolerability, safety, and efficacy.” (Level Ia)³
- General Information about Pharmacological Treatment: Initiation of Pharmacological Treatment: The decision to initiate AED therapy should be taken between the child, young person or adult, their family and/or carers (as appropriate) and the specialist after a full discussion of the risks and benefits of treatment. This discussion should take into account details of the person’s epilepsy syndrome, prognosis and lifestyle. (Level IIb and Ia)¹
- It is recommended that combination therapy (adjunctive or 'add-on' therapy) should only be considered when attempts at monotherapy with AEDs have not resulted in seizure freedom. If trials of combination therapy do not bring about worthwhile benefits, treatment should revert to the regimen (monotherapy or combination therapy) that has proved most acceptable to the child, young person or adult, in terms of providing the best balance between effectiveness in reducing seizure frequency and tolerability of side effects. (Level III and Ia)¹
Vagus nerve stimulation is indicated for use as an adjunctive therapy in reducing the frequency of seizures in adults who are refractory to antiepileptic medication but who are not suitable for resective surgery. This includes adults whose epileptic disorder is dominated by focal seizures* (with or without secondary generalization) or generalised seizures. [2004, amended 2012] *In this recommendation, 'partial seizures' has been replaced with 'focal seizures' to reflect a change in terminology since the original guideline was published in 2004. (Level Ia)¹

Evidence exists to rank VNS for epilepsy as effective and safe, based on a preponderance of Class I evidence. (Level Ia)³

REFERENCES


Rationale for the Measure:

An intervention should be considered when patients are not seizure-free because there is class I evidence from double-blind randomized trials that interventions are efficacious including new anti-seizure medications, surgery devices, and counseling.

There is class I evidence of efficacy as adjunctive therapy in reducing seizure frequency for all FDA approved antiepileptic drugs (AEDs) because in order to be FDA approved, all AEDs must show efficacy in at least two placebo-controlled, randomized, double-blind studies. All approved drugs showed reduction of focal-onset seizure frequency compared to placebo in patients with 3-4 seizures per month when added to up to 3 AEDs or VNS. Seizure frequency in the drug treated arm of these studies typically had reductions of seizure frequency by approximately 40% compared to only approximately 20% in the placebo treated arms. This is the basis for specific monotherapy and polytherapy recommendations for the treatment of focal and generalized seizures.¹²

There is class I evidence of efficacy of epilepsy surgery for refractory epilepsy. A randomized controlled trial of temporal lobectomy for refractory epilepsy and a blinded controlled trial in patients with newly refractory epilepsy demonstrate that more than half of patients
are seizure-free one year after surgery while less than 8% are seizures-free for one year when treated with best drug therapy.\textsuperscript{3,4}

There is class I evidence of efficacy of devices to reduce seizure frequency in patients with intractable epilepsy. Vagus nerve stimulation has efficacy equal to new AEDs in reducing seizure frequency in randomized double-blind controlled trials;\textsuperscript{5} and there is Class II evidence of reducing generalized seizures in appropriately selected patients with generalized seizures.\textsuperscript{6} Responsive Neurostimulation has demonstrated efficacy for seizure reduction in a double blind randomized controlled trial.\textsuperscript{6}

**GAP IN CARE**
There is some overlap in this measure with Measure 4: Referral for consultation to a comprehensive epilepsy center for patients with uncontrolled seizures, but the measure considered here applies to all patients whether or not they satisfy the diagnosis of intractable epilepsy and whether or not they are already followed at a comprehensive epilepsy center. Patients that might not be considered to have refractory epilepsy by their neurologist include those who have not failed two antiepileptic drugs yet, have epilepsy for less than 2 years, have nondisabling seizures, or have infrequent seizures. There is likely a group of patients who have intractable epilepsy by definition\textsuperscript{7} but are not considered by their neurologist to be intractable because the seizures are considered mild or “infrequent.” Such diagnostic errors may account for the very long average duration of epilepsy before epilepsy surgery referral. All patients with epilepsy would be subject to this measure ensuring timely intervention. Furthermore, patients already followed at a comprehensive epilepsy center would be subject to this measure and this measure would allow assessment of the center’s interventions.

**OPPORTUNITY FOR IMPROVEMENT**

The opportunity for improvement is evident in many studies demonstrating that patients are not being offered efficacious interventions. Duration of epilepsy before having epilepsy surgery had not changed.\textsuperscript{8}

**REFERENCES:**


Measure Designation

Measure purpose  • Quality improvement
                • Accountability

Type of measure  • Process

Level of Measurement

• Individual practitioner

Care setting  • Outpatient visits
            • Emergency Department
            • Urgent Care

Data Sources  • Electronic Health Record (EHR) Data
               • Electronic Administrative Data (Claims)

Technical Specifications: Electronic Health Record (EHR) Data

The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

Technical Specifications: Electronic Administrative Data (Claims)

Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or
Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.

<table>
<thead>
<tr>
<th>Denominator (Eligible Population)</th>
<th>ICD-9 and ICD-10 Diagnosis Codes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICD-9 Codes</td>
</tr>
<tr>
<td>345.00, generalized nonconvulsive epilepsy, without mention of intractable epilepsy</td>
<td>G40.A09 absence epileptic syndrome, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.01, generalized nonconvulsive epilepsy, with intractable epilepsy</td>
<td>G40.A19 absence epileptic syndrome, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.10, generalized convulsive epilepsy, without mention of intractable epilepsy</td>
<td>G40.309 Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus OR G40.409 Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.11, generalized convulsive epilepsy, with intractable epilepsy</td>
<td>G40.411 Other generalized</td>
</tr>
<tr>
<td>345.40, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy</td>
<td>G40.209 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.41, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy</td>
<td>G40.219 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.50, Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, without mention of intractable epilepsy</td>
<td>G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.51, Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy</td>
<td>G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.60, Infantile spasms, without</td>
<td>G40.822 Epileptic spasms, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>CPT Code Description</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>mention of intractable epilepsy</td>
<td></td>
</tr>
<tr>
<td>345.61, Infantile spasms, with intractable epilepsy</td>
<td>G40.824 Epileptic spasms, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.70, Epilepsia partialis continua, without mention of intractable epilepsy</td>
<td>G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.71, Epilepsia partialis continua, with intractable epilepsy</td>
<td>G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.90, Epilepsy, unspecified, without mention of intractable epilepsy</td>
<td>G40.909 Epilepsy, unspecified, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.91, Epilepsy, unspecified, with intractable epilepsy</td>
<td>G40.919 Epilepsy, unspecified, intractable, without status epilepticus</td>
</tr>
</tbody>
</table>

**AND**

CPT E/M Service Code:
99201, 99202, 99203, 99204, 99205 (Office or other outpatient visit-New Patient);
99211, 99212, 99213, 99214, 99215 (Office or other outpatient visit-Established Patient);
99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient);
99281, 99282, 99283, 99284, 99285 (Emergency Department)
Draft Measure 2:
Etiology, Seizure Type, or Epilepsy Syndrome

**Measure Description**
Percent of all visits for patients with diagnosis of epilepsy with seizure type and epilepsy etiology or syndrome documented OR testing* ordered to determine etiology of epilepsy, seizure type, or epilepsy syndrome.

**Measure Components**

<table>
<thead>
<tr>
<th>Numerator Statement</th>
<th>Patient visits with seizure type and epilepsy etiology or syndrome documented OR where testing* was ordered to determine epilepsy etiology, syndrome, or seizure type.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Testing: May include, but is not limited to electroencephalogram (EEG), video EEG, magnetic resonance imaging (MRI), laboratory testing or genetic testing.</td>
<td></td>
</tr>
</tbody>
</table>

| Denominator Statement | All visits for patients with diagnosis of epilepsy. |

| Denominator Exceptions | • Patient has completed all appropriate testing and the etiology of epilepsy or epilepsy has been documented as unknown.  |
|                       | • Patient has a contraindication to undergoing any testing.  |
|                       | • Patient undergoing testing with results pending at time of visit.  |
|                       | • Patient or caregiver declines to answer questions or undergo any testing. |

<table>
<thead>
<tr>
<th>Supporting Guideline &amp; Other References</th>
<th>The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Epileptic seizures and epilepsy syndromes in children, young people and adults should be classified using a multi-axial diagnostic scheme. The axes that should be considered are: description of seizure (ictal phenomenology); seizure type; syndrome and aetiology. (Level III and IV)⁴</td>
</tr>
<tr>
<td></td>
<td>• The seizure type(s) and epilepsy syndrome, aetiology, and co-morbidity should be determined, because failure to classify the epilepsy syndrome correctly can lead to inappropriate treatment and persistence of seizures. (Level III and IV)⁴</td>
</tr>
<tr>
<td></td>
<td>• General Information about Pharmacological Treatment: Initiation of Pharmacological Treatment: When possible, choose which AED to offer on the basis of the presenting epilepsy</td>
</tr>
</tbody>
</table>
If the epilepsy syndrome is not clear at presentation, base the decision on the presenting seizure type(s). [new 2012] Recommendation was based on GDG consensus.¹

- General Information about Pharmacological Treatment: The AED treatment strategy should be individualised according to the seizure type, epilepsy syndrome, co-medication and co-morbidity, the child, young person or adult's lifestyle, and the preferences of the person and their family and/or carers as appropriate (see Appendix E in the original guideline document). (Level III and Ia)¹

- Neuroimaging may be considered for the evaluation of the child with SE if there are clinical indications or if the etiology is unknown (Level C, class III evidence).²

- If a patient is thought to have a diagnosis of epilepsy then the diagnosis should include a best estimation of seizure types. (Level C 2+/Secondary)³

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**Rationale for the Measure:**

This quality measure condenses the 2009 quality measures 2-4 into a simpler measure. Knowing why a patient has epilepsy can have a profound impact on medical or surgical management, prognosis, and outcomes. To get to a proper etiologic or syndrome diagnosis, the physician must combine clinical features of the case with electroencephalographic findings, neuroimaging results, specific laboratory studies such as genetic testing, cerebrospinal fluid analysis, tissue biopsy and a search for other systemic disorders.¹

The following are some examples where etiology would change the usual therapy for seizures. Cerebral glucose transporter deficiency is a genetic entity that should be treated with the ketogenic diet. In Dravet syndrome, sodium channel antagonists can worsen seizures. Patients with juvenile myoclonic epilepsy should not be treated with...
antiepileptic medications known to exacerbate myoclonus. Patients with post stroke epilepsy may require additional stroke evaluation, not just antiepileptic medications. Epilepsy due to brain tumors or other surgical lesions (focal cortical dysplasia, mesial temporal sclerosis) should not be managed with medications alone when surgery would increase the likelihood of seizure remission and prolong survival. There are numerous other specific examples where knowing the syndrome or etiology of epilepsy can improve the quality of care, patient safety, patient education and quality of life.

Additionally, the ICD-10 classification of seizures and epilepsies has much more specific detail about patients so this quality measure would improve diagnostic accuracy. According to the Institute of Medicine report *Epilepsy Across the Spectrum: Promoting Health and Understanding*, gaps in data collection on seizure type, etiology, and syndrome classification is necessary for early identification and proper treatment for those with epilepsy.²

**GAP IN CARE**

From a patient reported web-based survey from PatientsLikeMe, 89% of patients reported ever having an EEG.³ 86% of patients reported ever having a MRI or CT.³ 81% of patients noted strongly agreeing or agreeing they knew the type of epilepsy syndrome they had.³ This study does not show a gap in testing but rather a gap in known etiology based upon appropriate testing.³

Meyer et al., stated that an economic gradient exists in patient’s access to epilepsy specific resources.⁴ Further, a study evaluating patients with tuberous sclerosis noted that early detection of etiology, thus applying proper treatment helped improve seizure freedom rates and may decrease adverse effects of seizures.⁵ Genetic testing should be considered for adult patients suspected of having Dravet syndrome as often the diagnosis is not tested previously.⁶ Based on the Institute of Medicine report on epilepsy, Hesdorffer and Begley stated that it is necessary to validate seizure type, etiology and syndrome using multiple data sources of information.⁷

Evidence of gap in care with regard to knowing the etiology comes from studies designed to determine the rate of compliance with this epilepsy quality measure after it was published in 2009.³,⁸ In a web based survey of 221 unselected epilepsy patients to determine their perception of how often their doctor followed the 2009 quality measures, only 48% reported they “strongly agree” that “I know the name of the type of epilepsy or seizure syndrome that I have”.³ A survey of 113 Michigan neurologists found that only 59% reported they document the etiology of epilepsy or epilepsy syndrome at every visit.⁸
Electronic health record review found only 58% of 160 charts reviewed had the etiology documented.  

**OPPORTUNITY FOR IMPROVEMENT**

Determining the seizure type, etiology, and epilepsy syndrome will allow for proper data collection which is recommended based on the IOM report on epilepsy across the spectrum. Although Wicks and Fountain demonstrated that a vast majority of patients reported having an EEG, patients continued to lack confidence on the name of the seizures they experience and a known epilepsy syndrome was absent. Potentially, further elucidation and identification using other testing modality would be helpful in improving this gap. It is important for the epilepsy care provider to always document and think of gaps in etiology or syndrome classification as treatment can be tailored appropriately thus decreasing potential complications from seizures. After implementation of an epilepsy quality measure checklist in an epilepsy clinic without any other intervention, documentation of etiology increased from 66.3% to 87.5%, illustrating that the measure has the intended consequence of increasing compliance just by tracking it.

**REFERENCES**


Measure Designation

Measure purpose
- Quality improvement
- Accountability

Type of measure
- Process

Level of Measurement
- Individual practitioner

Care setting
- Outpatient visits
- Emergency Department
- Urgent Care

Data Sources
- Electronic Health Record (EHR) Data
- Electronic Administrative Data (Claims)

Technical Specifications: Electronic Health Record (EHR) Data

The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

Technical Specifications: Electronic Administrative Data (Claims)

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Denominator (Eligible Population) | ICD-9 and ICD-10 Diagnosis Codes:
---|---
345.00, generalized nonconvulsive epilepsy, without mention of intractable epilepsy | G40.A01 Absence epileptic syndrome, not intractable, with status epilepticus OR G40.A09 absence epileptic syndrome, not intractable, without status epilepticus
345.01, generalized nonconvulsive epilepsy, with intractable epilepsy | G40.A11 Absence epileptic syndrome, intractable with status epilepticus OR G40.A19 absence epileptic syndrome, intractable, without status epilepticus
345.10, generalized convulsive epilepsy, without mention of intractable epilepsy | G40.309 Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus OR G40.401 Other generalized epilepsy and epileptic syndromes, not intractable, with status epilepticus OR G40.409 Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>CPT Code Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>345.11</td>
<td>Generalized convulsive epilepsy, with intractable epilepsy</td>
<td>G40.311 Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus OR G40.411 Other generalized</td>
</tr>
<tr>
<td>345.40</td>
<td>Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy</td>
<td>G40.201 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, with status epilepticus OR G40.209 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.41</td>
<td>Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy</td>
<td>G40.211 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, with status epilepticus OR G40.219 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.50</td>
<td>Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, without mention of intractable epilepsy</td>
<td>G40.101 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, with status epilepticus OR G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.51</td>
<td>Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy</td>
<td>G40.111 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, with status epilepticus or: G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.60</td>
<td>Infantile spasms, without mention of intractable epilepsy</td>
<td>G40.821 Epileptic spasms, not intractable, with status epilepticus or: G40.822 Epileptic spasms, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.61</td>
<td>Infantile spasms, with intractable epilepsy</td>
<td>G40.823 Epileptic spasms, intractable, with status epilepticus or: G40.824 Epileptic spasms, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.70</td>
<td>Epilepsia partialis continua, without mention of intractable epilepsy</td>
<td>G40.101 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, with status epilepticus or: G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.71</td>
<td>Epilepsia partialis continua, with intractable epilepsy</td>
<td>G40.111 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, with status epilepticus or: G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.90</td>
<td>Epilepsy, unspecified, without mention of intractable epilepsy</td>
<td>G40.901 Epilepsy, unspecified, not intractable, with status epilepticus or: G40.909 Epilepsy, unspecified, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.91</td>
<td>Epilepsy, unspecified, with intractable epilepsy</td>
<td>G40.911 Epilepsy, unspecified, intractable, with status epilepticus or: G40.919 Epilepsy, unspecified, intractable, without status epilepticus</td>
</tr>
</tbody>
</table>

AND
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99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient);
99281, 99282, 99283, 99284, 99285 (Emergency Department)
DRAFT MEASURE #3
Querying and Intervention for Anti-seizure Medication Side Effects

**Measure Description**
Percent of all patients with a diagnosis of epilepsy with active anti-seizure medication side effects for whom an intervention was discussed.

**Measure Components**

| Numerator Statement | Patients with anti-seizure medication side effects noted for whom an intervention* was discussed.  
*Intervention: Discussion about significance of side effect symptom and consideration of adjustment in anti-seizure medication or dose or providing alleviating treatment. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator Statement</td>
<td>All visits for patients with a diagnosis of epilepsy and an active prescription for an anti-seizure medication.</td>
</tr>
<tr>
<td>Denominator Exceptions</td>
<td>• Patient or caregiver declines to answer questions on anti-seizure medication side effects.</td>
</tr>
</tbody>
</table>
| Supporting Guideline & Other References | The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:  
• WHEN a patient with epilepsy receives follow-up care, THEN an estimate of the number of seizures since the last visit and an assessment of drug side-effects should be documented. (Level D 1+/Primary)\(^1\)  
• If a person newly diagnosed with epilepsy is taking medications for other disorders, then the physician should minimize the risk of interactions between the newly prescribed AED and concomitant medications. (Level A 3/Primary)\(^1\)  
• Antiepileptic drug treatment strategy should be individualized according to the seizure type, epilepsy syndrome, co-medication, co-morbidity and the individuals’ lifestyle and preferences (and/or those of their family and/or carers as appropriate). (Grade A, Level 1++)\(^2\)  
• Patients with epilepsy should receive an annual review of information including topics such as: Chronic effects of epilepsy and its treatment including drug side-effects, drug-drug interactions, effect on bone health (EVIDENCE GRADE C) (Level D/Secondary)\(^1\)  
• Children, young people and adults with epilepsy and their families and/or carers should be given, and have access to sources of, information about (where appropriate): … medication and side effects.\(^3\)  
• Treatment should be reviewed at regular intervals to ensure that children, young people and adults with epilepsy are not
maintained for long periods on treatment that is ineffective or poorly tolerated and that concordance with prescribed medication is maintained.³

- Annual review should include an enquiry about side effects and a discussion of the treatment plan to ensure concordance and adherence to medication.³

REFERENCES

Rationale for the Measure:
Anti-seizure medications necessarily affect the brain in order to prevent seizures and, therefore, commonly cause neurological side effects such as sleepiness, dizziness, fatigue, and diplopia. Some seizure medications commonly cause idiosyncratic side effects such as weight loss, weight gain, irritability or gum hypertrophy, which may be subtle or not recognized by patients to be medications side effects. Therefore, the patient must be specifically queried about neurological side effects in general and the side effects that commonly accompany their specific medications rather than relying on spontaneous patient report.

Anti-seizure medication side effects are well recognized to be common and have historically been the focus of profuse study. Recently, side effects were assessed by the standardized Liverpool Adverse Event Profile in a 2012 study of 186 patients on monotherapy, 325 on polytherapy and 65 controls.¹ Scores were overall much worse in polytherapy and monotherapy than controls. For example, “tiredness was reported as always or sometimes being a problem in (polytherapy/monotherapy/controls) 82.5%/75.6%/64.6%, memory problems in 76%/63.2%/29.2% and difficulty concentrating in 68%/63.9%/30.8%.”¹

GAP IN CARE
Evidence of gap in care with regard to querying about anti-seizure medication side effects comes from several older sources but the most compelling studies are those designed to determine the rate of compliance with this epilepsy quality measure after it was published in 2009.² In a web based survey of 221 unselected epilepsy patients to
determine their perception of how often their doctor followed the 2009 quality measures, only 44% reported they “strongly agree” that “the doctor who treats my seizures asks me about the side effects of my medication at every visit”. A survey of 113 Michigan neurologists found that only 37% reported they counseled patients about anti-seizure medication side effects at every visit and only 65% did it every time a new anti-seizure medication was started. After implementation of an epilepsy quality measure checklist in an epilepsy clinic without any other intervention, documentation of compliance with this measure increased from 8% to 24%, illustrating that the measure has the intended consequence of increasing compliance but also illustrating that compliance is still deficient (Cisneros-Franco et al.). Electronic health record review found only 34% of 160 charts reviewed, had anti-seizure medication side effects documented. This is very convincing evidence that physicians are not querying patients about anti-seizure medication side effects.

OPPORTUNITY FOR IMPROVEMENT
Querying about medication side effects is perhaps the most straightforward, simple, and efficient intervention that could be provided to improve epilepsy care. Most physicians assume that patients will spontaneously report medication side effects although that is clearly not the case based on the evidence above. Simply using a quality measure check list without any other intervention improved compliance with the measure 3 fold in an epilepsy clinic in Mexico whether there was no regulatory motivation for compliance. A pharmacy database query of 31,635 patients found anti-seizure medication nonadherence was correlated with greater risk of hospital admissions, ER visits, head injuries, and fractures. Since nonadherence is often due to medication side effects, querying about them is likely to improve care. Wide recognition of this as a quality measure in the US is likely to vastly improve compliance, leading to improved care. A recent review has concluded, “questioning every patient at every visit to elicit information may be helpful when balancing benefit-to-risk of individualized therapy during everyday practice”.

REFERENCES


| Measure Designation | | | | |
|---------------------|-----------------|-----------------|-----------------|
| Measure purpose     | Quality improvement | Accountability | |
| Type of measure     | Process | | |
| Level of Measurement| Individual Practitioner | | |
| Care setting        | Outpatient visits | | |
| Data Sources        | Electronic Health Record (EHR) Data | | |

**Technical Specifications: Electronic Health Record (EHR) Data**

The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.
**DRAFT MEASURE #4**  
*Personalized Epilepsy Safety Issue and Education Provided*

### Measure Description
Percent of all patients with a diagnosis of epilepsy, or their caregivers, who were provided with personalized safety issue and epilepsy education at least once annually.

### Measure Components

<table>
<thead>
<tr>
<th><strong>Numerator Statement</strong></th>
<th>Patients or their caregivers provided personalized epilepsy safety issue* and education and resources** at least once a year.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Denominator Statement</strong></td>
<td>All patients with a diagnosis of epilepsy.</td>
</tr>
<tr>
<td><strong>Denominator Exceptions</strong></td>
<td>• Caregiver is unavailable for a patient who is non-communicative or has an intellectual disability.</td>
</tr>
</tbody>
</table>
| **Supporting Guideline & Other References** | The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:  
• At the time of initial seizure evaluation, the patient should receive information on driving restrictions, safety and injury prevention. (Level E 4/Primary)¹  
• Patients with epilepsy should receive an annual review of information including topics such as: Chronic effects of epilepsy and its treatment including drug side-effects, drug-drug interactions, effect on bone health; Contraception, family planning, and how pregnancy and menopause may affect seizures (EVIDENCE GRADE C); Screening for mood |

*Safety issues to be addressed should be appropriate to the patient’s age, seizure type(s) and frequency, occupation, and leisure activities. (e.g., injury prevention, falls, burns, appropriate driving restrictions (including state specific restrictions), or bathing)  
**Epilepsy education topics to be addressed should be appropriate to the patient’s age, seizure type(s) and frequency. (e.g., diagnosis and treatment options, medication and side effects, seizure types, triggers and seizure control, management and self-care, psychological issues, social security benefits and social services, insurance issues, education and healthcare at school, employment and independent living for adults, importance of disclosing epilepsy at work, sudden death in epilepsy (SUDEP), status epilepticus, maintaining a healthy life style, driving education, leisure and social issues (including recreational drugs, alcohol, sexual activity and dysfunction, and sleep deprivation), family planning, pregnancy and parenting concerns, and available resources including voluntary organizations and patient support associations.  

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disorders; Triggers and lifestyle issues that may affect seizures; Impact of epilepsy on other chronic and acute diseases; Driving and safety issues (Level D/Secondary)¹

- Adults should receive appropriate information and education about all aspects of epilepsy. This may be best achieved and maintained through structured self-management plans. (Level Ib)²

- Healthcare professionals should adopt a consulting style that enables the child, young person or adult with epilepsy, and their family and/or carers as appropriate, to participate as partners in all decisions about their healthcare, and take fully into account their race, culture, and any specific needs. (Level of evidence not provided).²

Children, young people and adults with epilepsy and their families and/or carers should be given, and have access to sources of, information about (where appropriate): Epilepsy in general; Diagnosis and treatment options; Medication and side effects; Seizure type(s), triggers, and seizure control; Management and self-care; Risk management; First aid, safety and injury prevention at home and at school or work; Psychological issues; Social security benefits and social services; Insurance issues; Education and healthcare at school; Employment and independent living for adults; Importance of disclosing epilepsy at work, if relevant (If further information or clarification is needed, voluntary organizations should be contacted); Road safety and driving; Prognosis; Sudden death in epilepsy (SUDEP); Status epilepticus; Life style, leisure and social issues (including recreational drugs, alcohol, sexual activity, and sleep deprivation); Family planning and pregnancy; Voluntary organizations, such as support groups and charitable organizations, and how to contact them. The time at which this information should be given will depend on the certainty of the diagnosis and the need for confirmatory investigations. (Level of evidence not provided).²

- The time at which this information should be given will depend on the certainty of the diagnosis and the need for confirmatory investigations. (Level III)²

- If children, young people and adults and families and/or carers have not already found high-quality information from voluntary organizations and other sources, healthcare professionals should inform them of different sources. (Level III)²

- Adequate time should be set aside in the consultation to provide information, which should be revisited on subsequent consultations. (Level III)²
• Checklists should be used to remind children, young people and adults, and healthcare professionals, about information that should be discussed during consultations. (Level III)²

• Everyone providing care or treatment for children, young people and adults with epilepsy should be able to provide essential information. (Level III)²

• The child, young person or adult with epilepsy and their family and/or carers as appropriate should know how to contact a named individual when information is needed. This named individual should be a member of the healthcare team and be responsible for ensuring that the information needs of the child, young person or adult and/or their family and/or carers are met. (Level III)²

• The possibility of having seizures should be discussed, and information on epilepsy should be provided before seizures occur, for children, young people and adults at high risk of developing seizures (such as after severe brain injury), with a learning disability, or who have a strong family history of epilepsy. (Level III)²

• Children, young people and adults with epilepsy should be given appropriate information before they make important decisions (for example, regarding pregnancy or employment). (Level III)²

• Information on Sudden Unexpected Death in Epilepsy (SUDEP) should be included in literature on epilepsy to show why preventing seizures is important. Tailored information on the person's relative risk of SUDEP should be part of the counselling checklist for children, young people and adults with epilepsy and their families and/or carers. (Level III)²

• Adults with well-controlled epilepsy may have specific medical or lifestyle issues (for example, pregnancy or drug cessation) that may need the advice of a specialist. (Level Ib and III)²

• Healthcare professionals have a responsibility to educate others about epilepsy so as to reduce the stigma associated with it. They should provide information about epilepsy to all people who come into contact with children, young people and adults with epilepsy, including school staff, social care professionals and others. (Level III)²

• At the [annual] review, children, young people and adults should have access to: written and visual information; counselling services; information about voluntary organizations; epilepsy specialist nurses; timely and appropriate investigations; referral to tertiary services including surgery, where appropriate. (Level Ib and III)²
### REFERENCES


### Rationale for the Measure:

Educating patients or caregivers with personalized epilepsy safety issues and education will promote self-management and improved quality of life.

### GAP IN CARE

A gap in care between the knowledge patients receive and what is needed is evident in research. Research has demonstrated that people with epilepsy do not have a solid understanding of basic information about epilepsy, including knowledge about their diagnosis, seizure precipitants or triggers, specific seizure types(s), the purpose and potential side effects of seizure medications, safety concerns, and the risks of seizures. Patients with epilepsy fail to receive or access required knowledge on their condition and safety needs. In a survey on knowledge of epilepsy, 30% of respondents believed that epilepsy is contagious or a type of mental disorder, and misinformation regarding personal safety was widespread.

Additionally, studies have consistently indicated children and adolescents with epilepsy need increasing tailored knowledge about their condition over time. Adult patients have indicated they would like more information on employment, dealing with cognitive problems, managing emotions and sleep. In a UK study, 25% of adult men with epilepsy indicated they had a low level of knowledge about the condition, while only 18% indicated they had the highest level of knowledge. The Institute of Medicine noted that people with epilepsy, their families, and caregivers wanted more information than they currently receive and that education should be provided in the best manner to meet their specific situations.

In the four years since the original safety counseling measure was released, it was noted that proportion of individuals with epilepsy who receive counseling about driving and associated risks continues to vary. Further, the majority of drivers with epilepsy do express concerns about their safety and others.

### OPPORTUNITY FOR IMPROVEMENT
The original epilepsy measure set addressed safety counseling. This measure has been revised to include patient and caregiver education specific to epilepsy to address the noted gaps in care above. Individuals with limited health literacy incur medical expenses that are up to four times greater than patients with adequate literacy skills. It has been noted patients hide their confusion because they are too ashamed or intimidated. By measuring information dissemination for patients on a yearly basis it is anticipated the number of individuals who receive the information will increase and health literacy and quality of life will improve. Providing all patients with personalized epilepsy safety issue and education, patients will receive information needed to manage their condition, address safety issues thereby improving quality of life.

REFERENCES

<table>
<thead>
<tr>
<th>Measure Designation</th>
<th>Measure purpose</th>
<th>• Quality improvement</th>
<th>• Accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type of measure</td>
<td>• Process</td>
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<td></td>
<td>Level of Measurement</td>
<td>• Individual practitioner</td>
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<td></td>
<td>Care setting</td>
<td>• Outpatient visits</td>
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<tr>
<td></td>
<td>Data Sources</td>
<td>• Electronic Health Record (EHR) Data</td>
<td>• Electronic Administrative Data (Claims)</td>
</tr>
</tbody>
</table>
Technical Specifications: Electronic Health Record (EHR) Data

The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

Technical Specifications: Electronic Administrative Data (Claims)

Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or paper). Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.

<table>
<thead>
<tr>
<th>Denominator (Eligible Population)</th>
<th>ICD-9 and ICD-10 Diagnosis Codes:</th>
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<tbody>
<tr>
<td></td>
<td>ICD-9 Codes</td>
</tr>
<tr>
<td>345.00, generalized nonconvulsive epilepsy, without mention of intractable epilepsy</td>
<td>G40.A09 absence epileptic syndrome, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.01, generalized nonconvulsive epilepsy, with intractable epilepsy</td>
<td>G40.A11 Absence epileptic syndrome, intractable, without status epilepticus; G40.A19 absence epileptic syndrome, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.10, generalized convulsive epilepsy, without mention of intractable epilepsy</td>
<td>G40.309 Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus; G40.409 Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.11, generalized convulsive epilepsy, with intractable epilepsy</td>
<td>G40.411 Other generalized</td>
</tr>
<tr>
<td>345.40, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy</td>
<td>G40.209 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.41, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy</td>
<td>G40.219 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.50, Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures,</td>
<td>G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
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<tr>
<td>Code</td>
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<tr>
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<tr>
<td>345.71</td>
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<tr>
<td>345.91</td>
<td>Epilepsy, unspecified, with intractable epilepsy</td>
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**AND**

CPT E/M Service Code:
99201, 99202, 99203, 99204, 99205 (Office or other outpatient visit-New Patient);
99211, 99212, 99213, 99214, 99215 (Office or other outpatient visit-Established Patient);
99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient)
**DRAFT MEASURE #5:**
Screening for psychiatric or behavioral health disorders

<table>
<thead>
<tr>
<th>Measure Description</th>
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<tbody>
<tr>
<td>Percent of all visits for patients with a diagnosis of epilepsy where the patient was screened for psychiatric or behavioral disorders.</td>
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</table>

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<thead>
<tr>
<th>Measure Components</th>
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</thead>
<tbody>
<tr>
<td><strong>Numerator Statement</strong></td>
</tr>
</tbody>
</table>
| Patient visits where patient was screened* for psychiatric or behavioral health disorders**  
*Screened: Questioning by the individual practitioner to identify areas of concern, may include standardized testing.  
**Psychiatric or behavioral disorders may include, but are not limited to anxiety, depression, suicidality, mood disorder, attention deficit hyperactive disorder, cognitive dysfunction, or other neurobehavioral disorders. |
| **Denominator Statement** |
| All visits for patients with diagnosis of epilepsy. |
| **Denominator Exceptions** |
| • Caregiver is unavailable for a patient who is non-communicative or has an intellectual disability.  
• Patient has a diagnosis of psychiatric disorder and is being actively treated.  
• Patient declines screening. |
| **Supporting Guideline & Other References** |
| The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:  
• If a person with epilepsy is found to have evidence of a mood disorder (e.g., depression, anxiety), then s/he should receive treatment or a referral for mental health care.\(^1\)  
• A person with epilepsy should receive screening for depression at least once each year.\(^1\)  
• It is recommended that mutual support groups for parents/families of vulnerable pediatric patients (i.e., children with intractable epilepsy) in the inpatient care setting be developed, implemented and evaluated. The evidence demonstrates that parent support groups can: improve parental attitudes, increase parental knowledge, decrease parental anxiety.\(^2\)  
• If seizures are not controlled and/or there is diagnostic uncertainty or treatment failure, children, young people and |
adults should be referred to tertiary services soon* for further assessment. Referral should be considered when one or more of the following criteria are present:

...There is psychological and/or psychiatric co-morbidity.

- Maintain a high level of vigilance for treatment-emergent adverse effects (for example, bone health issues and neuropsychiatric issues*). [new 2012] *Treatment with AEDs is associated with a small risk of suicidal thoughts and behavior; available data suggest that the increased risk applies to all AEDs and may be seen as early as 1 week after starting treatment.

- In making a care plan for a child, young person or adult with learning disabilities and epilepsy, particular attention should be paid to the possibility of adverse cognitive and behavioral effects of AED therapy.

- Neuropsychological assessment should be considered in children, young people and adults in whom it is important to evaluate learning disabilities and cognitive dysfunction, particularly in regard to language and memory. (Level IV)

- Psychological interventions (relaxation, cognitive behavior therapy, biofeedback) may be used in conjunction with AED therapy in adults where either the person or the specialist considers seizure control to be inadequate with optimal AED therapy. This approach may be associated with an improved quality of life in some people.

- Psychological interventions (relaxation, cognitive behavior therapy) may be used in children and young people with drug-resistant focal epilepsy.

- Psychological interventions may be used as adjunctive therapy.


2 Cincinnati Children's Hospital Medical Center. Best evidence statement (BEST). Inpatient support groups for families of children with intractable epilepsy. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 13:5.

**Rationale for the Measure:**
The prevalence of psychiatric and behavioral health comorbidities in patients with epilepsy is well documented and the relationship between epilepsy and psychiatric and behavioral health disorders is complex.\(^1\) A measure was created to ensure all patients, pediatric and adult, receive timely screening, thereby increasing the likelihood of early intervention and treatment which should increase patient’s quality of life.

**GAP IN CARE**
An increased prevalence of mood disorders, anxiety disorders, attention deficit hyperactivity disorder, and other psychiatric disorders in people with epilepsy is well documented.\(^2\) The neurobehavioural comorbidities associated with epilepsy are evident across the lifespan.\(^2\) A gap remains between early detection, treatment, and prevention of psychiatric, cognitive, and social comorbidities in epilepsy.\(^2\) Patients with epilepsy report dissatisfaction with life overall and perceive limitations in their social and emotional support.\(^3\)

Cognitive dysfunction is a major concern for all people with epilepsy.\(^1,3\) In a review of studies on the effects of seizures on cognition, declines in intellectual or cognitive abilities are seen in a subgroup of about 10 to 25 percent of children after the onset of epilepsy, and in adults, memory appears to be the most vulnerable cognitive function.\(^4\)

**OPPORTUNITY FOR IMPROVEMENT**
Given the psychiatric burden, routine screening should be a standard component for pediatric and adult care, and brief, uniform screening is needed to identify patients at risk and standardize their access to care.\(^2\) The Institute of Medicine has also recommended standard screening protocols to identify people with epilepsy who have mental health comorbidities.\(^1\) These recommendations support that routine screening and interventions are not currently being performed, and creation implementation of this measure may increase completion of screening.

**REFERENCES**
Measure Designation

| Measure purpose          | • Quality improvement  
|                         | • Accountability      |
| Type of measure         | • Process             |
| Level of Measurement    | • Individual practitioner |
| Care setting            | • Outpatient visits   |
| Data Sources            | • Electronic Health Record (EHR) Data  
|                         | • Electronic Administrative Data (Claims) |

Technical Specifications: Electronic Health Record (EHR) Data

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<td>G40.A01 Absence epileptic syndrome, not intractable, with status epilepticus OR G40.A09 absence epileptic syndrome, not intractable, without status epilepticus</td>
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<tr>
<td>345.01, generalized nonconvulsive epilepsy, with intractable epilepsy</td>
<td>345.01, generalized nonconvulsive epilepsy, with intractable epilepsy</td>
<td>G40.A11 Absence epileptic syndrome, intractable with status epilepticus OR G40.A19 absence epileptic syndrome, intractable, without status epilepticus</td>
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<tr>
<td>Code</td>
<td>Description</td>
<td>ICD-10-CM Code</td>
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<tr>
<td>345.10</td>
<td>Generalized convulsive epilepsy, without mention of intractable epilepsy</td>
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<tr>
<td>345.11</td>
<td>Generalized convulsive epilepsy, with intractable epilepsy</td>
<td>G40.311 Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus OR G40.411 Other generalized epilepsy and epileptic syndromes, intractable, with status epilepticus</td>
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<td>Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy</td>
<td>G40.111 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, with status epilepticus OR G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
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<td>G40.911</td>
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**AND**

CPT E/M Service Code:
- 99201, 99202, 99203, 99204, 99205 (Office or other outpatient visit-New Patient);
- 99211, 99212, 99213, 99214, 99215 (Office or other outpatient visit-Established Patient);
- 99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient)
DRAFT MEASURE #6:
Counseling for Women of Childbearing Potential with Epilepsy

Measure Description
All female patients of childbearing potential (12-44 years old) diagnosed with epilepsy who were counseled or referred for counseling for how epilepsy and its treatment may affect contraception OR pregnancy at least once a year.

Measure Components

<table>
<thead>
<tr>
<th>Numerator Statement</th>
<th>Female patients or caregivers counseled* at least once a year about how epilepsy and its treatment may affect contraception OR pregnancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Counseling should include a discussion about folic acid supplementation, contraception, potential anti-seizure medications effect(s) on pregnancy, safe pregnancies, and breastfeeding.</td>
<td></td>
</tr>
</tbody>
</table>

| Denominator Statement | All females of childbearing potential (12-44 years old) with a diagnosis of epilepsy. |

| Denominator Exceptions | None |

<table>
<thead>
<tr>
<th>Supporting Guideline &amp; Other References</th>
<th>The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- If a woman with epilepsy is of childbearing potential and receives oral contraceptives in conjunction with an enzyme inducing AED, THEN decreased effectiveness of oral contraception should be addressed. (higher doses of the oral contraceptive, alternative birth control methods, or change AED). (Level A 2++/Primary)¹</td>
<td></td>
</tr>
<tr>
<td>- Patients with epilepsy should receive an annual review of information including topics such as: - Chronic effects of epilepsy and its treatment including drug side-effects, drug-drug interactions, effect on bone health; - Contraception, family planning, and how pregnancy and menopause may affect seizures (evidence grade C); - Screening for mood disorders; - Triggers and lifestyle issues that may affect seizures; - Impact of epilepsy on other chronic and acute diseases; - Driving and safety issues (Level D/Secondary)¹</td>
<td></td>
</tr>
<tr>
<td>- Women with epilepsy (WWE) should be counseled that seizure freedom for at least 9 months prior to pregnancy is probably associated with a high rate (84%-92%) of remaining seizure-free during pregnancy. ²</td>
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</table>

• Women with epilepsy who smoke should be counseled that they possibly have a substantially increased risk of premature contractions and premature labor and delivery during pregnancy. There is possibly a substantially increased risk of premature contractions and premature labor and delivery during pregnancy for WWE who smoke. (Level C)³

• Counseling of WWE who are contemplating pregnancy should reflect that there is probably no increased risk of reduced cognition in the offspring of WWE not taking AEDs (Level B). ³

• To reduce the risk of MCMs, avoidance of the use of VPA during the first trimester of pregnancy, if possible, may be considered, compared to the use of PHT or LTG. [MCMs= major congenital malformations; VPA= valproate; PHT= phenytoin; LTG= lamotrigine] (Level C)³

• Women and Girls with Epilepsy: Information and Advice for Women and Girls with Epilepsy: In order to enable informed decisions and choice, and to reduce misunderstandings, women and girls with epilepsy and their partners, as appropriate, must be given accurate information and counselling about contraception, conception, pregnancy, caring for children and breastfeeding, and menopause. (Level III)⁴

• Women and Girls with Epilepsy: Information and Advice for Women and Girls with Epilepsy: Information about contraception, conception, pregnancy, or menopause should be given to women and girls in advance of sexual activity, pregnancy or menopause, and the information should be tailored to their individual needs. This information should also be given, as needed, to people who are closely involved with women and girls with epilepsy. These may include her family and/or carers. (Level III)⁴

• Women and Girls with Epilepsy: Information and Advice for Women and Girls with Epilepsy: All healthcare professionals who treat, care for, or support women and girls with epilepsy should be familiar with relevant information and the availability of counselling. (Level III)⁴

• Women and Girls with Epilepsy: Information and Advice for Women and Girls with Epilepsy: Discuss with women and girls of childbearing potential (including young girls who are likely to need treatment into their childbearing years), and their parents and/or carers if appropriate, the risk of AEDs causing malformations and possible neurodevelopmental impairments in an unborn child. Assess the risks and benefits of treatment with individual drugs. There are limited data on risks to the unborn child associated with newer drugs. Specifically discuss
the risk of continued use of sodium valproate to the unborn child, being aware that higher doses of sodium valproate (more than 800 mg/day) and polytherapy, particularly with sodium valproate, are associated with greater risk. (Evidence comes from three systematic reviews; one review focused on incidence of malformation and the other two on child neurodevelopmental outcomes. No individual RCTs were reviewed. This recommendation was also based on GDG consensus opinion.)

- Women and Girls with Epilepsy: Contraception: In women of childbearing potential, the possibility of interaction with oral contraceptives should be discussed and an assessment made as to the risks and benefits of treatment with individual drugs. (Level III)

- Women and Girls with Epilepsy: Contraception: In girls of childbearing potential, including young girls who are likely to need treatment into their childbearing years, the possibility of interaction with oral contraceptives should be discussed with the child and/or her carer, and an assessment made as to the risks and benefits of treatment with individual drugs. (Level III)

- Women and Girls with Epilepsy: Contraception: In women and girls of childbearing potential, the risks and benefits of different contraceptive methods, including hormone-releasing intrauterine devices (IUDs), should be discussed. (Level III)

- Women and Girls with Epilepsy: Contraception: If a woman or girl taking enzyme-inducing AEDs chooses to take the combined oral contraceptive pill, guidance about dosage should be sought from the SPC and current edition of the BNF (available at http://bnf.org External Web Site Policy). (Level III)

- Women and Girls with Epilepsy: Pregnancy: Women and girls with epilepsy need accurate information during pregnancy, and the possibility of status epilepticus and sudden death in epilepsy (SUDEP) should be discussed with all women and girls who plan to stop AED therapy (see the section 'Withdrawal of Pharmacologic Treatment' above).

REFERENCES


<table>
<thead>
<tr>
<th>Rationale for the Measure:</th>
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<tbody>
<tr>
<td>Epilepsy is associated with reduced fertility, increased pregnancy risks, and risks for malformations in the infant. Treatment of seizures with antiepileptic drugs may alter hormone levels, render oral contraceptives less effective and may interfere with embryonic and fetal development. Certain antiepileptic medications may have specific malformation risks. Folic acid supplementation, monotherapy for epilepsy, using lower doses of medication when possible, and proper obstetrical, prenatal and pre-pregnancy care all should be discussed with the patient so they understand the risks involved and how to mitigate these risks.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GAP IN CARE</th>
</tr>
</thead>
</table>
| In 2013, the AAN tested its Women with Epilepsy of Childbearing potential measure. Data from the testing project done with MN Community Measurement showed that on average less than 40% of women received counseling about epilepsy and how its treatment may affect contraception and pregnancy.  
Additionally, the QUality Indicators for Epilepsy Treatment in adults (QUIET) study demonstrates that there is substantial variation in care and a lack of concordance between recommended care and actual care. Pugh, et al. show that only 34% of female patients receive counselling on aspects of epilepsy care specific to women (neurologist alone=32.88%; shared (neurologists and primary care=44.83%; and primary care alone=11.11%). |

<table>
<thead>
<tr>
<th>OPPORTUNITY FOR IMPROVEMENT</th>
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</thead>
<tbody>
<tr>
<td>The majority of women who become pregnant while taking these anti-seizure medications deliver healthy babies; however, research shows that some anticonvulsants increase the risk of major malformations (including heart, spinal cord and cleft lip/cleft palate abnormalities)</td>
</tr>
</tbody>
</table>
and cognitive problems in children exposed to them during the mother's pregnancy. For babies whose mothers take seizure medication, the risk of birth defects is 4 to 8 percent — compared with 2 to 3 percent for all babies. Since unplanned pregnancy is common, patients need to be informed about the risks of epilepsy and antiepileptic drug therapy prior to pregnancy. Because sex hormones can affect seizure frequency, girls and women need information related to hormonal fluctuations and seizure frequency. Further, women of reproductive age need to understand how their epilepsy and its treatment could affect pregnancy. Yet, Roberts and colleagues concluded that, despite the availability of practice guidelines, knowledge about the use of seizure medications during pregnancy was low—less than half of neurologists were able to identify which medications were linked to adverse events during pregnancy.

REFERENCES

value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

### Technical Specifications: Electronic Administrative Data (Claims)

Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or paper). Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.

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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICD-9 Codes</td>
</tr>
<tr>
<td>345.00, generalized nonconvulsive epilepsy, without mention of intractable epilepsy</td>
<td>G40.A09 absence epileptic syndrome, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.01, generalized nonconvulsive epilepsy, with intractable epilepsy</td>
<td>G40.A19 absence epileptic syndrome, intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.10, generalized convulsive epilepsy, without mention of intractable epilepsy</td>
<td>G40.309 Generalized idiopathic epilepsy and epileptic syndromes, not intractable, without status epilepticus OR G40.409 Other generalized epilepsy and epileptic syndromes, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.11, generalized convulsive epilepsy, with intractable epilepsy</td>
<td>G40.411 Other generalized</td>
</tr>
<tr>
<td>345.40, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy</td>
<td>G40.209 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus</td>
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<td>345.41, Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy</td>
<td>G40.219 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus</td>
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<tr>
<td>345.50, Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, without mention of intractable epilepsy</td>
<td>G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus</td>
</tr>
<tr>
<td>345.51, Localization-related (focal) (partial) epilepsy and epileptic</td>
<td>G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus</td>
</tr>
</tbody>
</table>
syndromes with simple partial seizures, with intractable epilepsy

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>345.60</td>
<td>Infantile spasms, without mention of intractable epilepsy</td>
</tr>
<tr>
<td>345.61</td>
<td>Infantile spasms, with intractable epilepsy</td>
</tr>
<tr>
<td>345.70</td>
<td>Epilepsia partialis continua, without mention of intractable epilepsy</td>
</tr>
<tr>
<td>345.71</td>
<td>Epilepsia partialis continua, with intractable epilepsy</td>
</tr>
<tr>
<td>345.90</td>
<td>Epilepsy, unspecified, without mention of intractable epilepsy</td>
</tr>
</tbody>
</table>

G40.822 Epileptic spasms, not intractable, without status epilepticus

G40.824 Epileptic spasms, intractable, without status epilepticus

G40.109 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus

G40.119 Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus

G40.909 Epilepsy, unspecified, not intractable, without status epilepticus

AND
CPT E/M Service Code:
99201, 99202, 99203, 99204, 99205 (Office or other outpatient visit-New Patient);
99211, 99212, 99213, 99214, 99215 (Office or other outpatient visit-Established Patient);
99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient)

AND
Female gender

AND
Age ages 12 to 44 years old
**DRAFT MEASURE #7:**  
Two Year Wait to Withdraw Anti-seizure Medication for Children with Epilepsy

**Measure Description**  
Number of children with epilepsy with a history of focal seizures and abnormal EEG who had at least a 2 year wait to withdraw anti-seizure medications

**Measure Components**

<table>
<thead>
<tr>
<th>Numerator Statement</th>
<th>Increase or no measurable change in percentage of all patients &lt; 18 years of age with focal seizures and an abnormal EEG whose anti-seizure medication was withdrawn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator Statement</td>
<td>All patients under the age of 18 with diagnosis of focal seizures and an abnormal EEG during the measurement period who were prescribed anti-seizure medication.</td>
</tr>
</tbody>
</table>
| Denominator Exceptions | • Provider documents medical reason for continuation.  
                         • Patient (or caregiver) declines withdrawing medication.  
                         • Patient lost to follow up. |

**Supporting Guideline & Other References**  
The following clinical recommendation statements are quoted verbatim from the referenced clinical articles and represent the evidence base for the measure:

- The pooled relative risk for seizure relapse in early versus late AED withdrawal was 1.32 (95% CI 1.02 to 1.70). On the basis of this estimate, the number needed to harm, that is expose an individual to a higher risk of seizure relapse because of early withdrawal of AED, is 10. Early discontinuation was associated with greater relapse rates in people with partial seizures (pooled RR is 1.52 (95% CI 0.95 to 2.41)) or an abnormal EEG (pooled RR 1.67 (95% CI 0.93 to 3.00)).

- Authors’ conclusions: There is evidence to support waiting for at least two or more seizure free years before discontinuing AEDs in children, particularly if individuals have an abnormal EEG and partial seizures. There is insufficient evidence to establish when to withdraw AEDs in children with generalized seizures. There is no evidence to guide the timing of withdrawal of AEDs in seizure free adults.

- Remission (which was defined as two years of seizure freedom) occurred in 74% of a prospective cohort of children newly diagnosed with epilepsy. This suggests the issue of medication withdrawal occurs exceedingly frequently in a pediatric...
epilepsy practice. The risks of early medication withdrawal are no insignificant, with a 10% absolute increase in the risk of remaining seizure-free.  

REFERENCES

Rationale for the Measure:
GAP IN CARE
There are a variety of studies that look at seizure-free withdrawal of medications at one year, which were published after 2001.1-6 The evidence strongly suggests that at least some of the time, the 2 year recommendation is not being followed. Multiple studies have been published stating that the local practice does not agree with the recommendations of the review. These studies suggest a gap in practice.

Drum discontinuation after seizure freedom resulted in relapse in one-third of patients (N=148), and that risk of discontinuation needs to be considered.1 Compared to those continuing therapy, seizure-free epilepsy patients on anti-epileptic drug monotherapy who taper their medication may improve neuropsychological performance with a relative risk of seizure relapse of 2.46.2 Suggestion that those with childhood epilepsy who had one year drug withdrawal and an abnormal EEG require more cautious follow-up because of the high risk of seizure recurrence.3 Approximately 1% of children (n=367) who became free of seizure and discontinued antiepileptic drug treatment had recurrent seizures that could not be controlled again with medication; unclear if similar outcome would have occurred if antiepileptic drugs had not been discontinued.4

OPPORTUNITY FOR IMPROVEMENT
This measure addresses the gap in current care for children with focal seizures who do not have a 2 year period of seizure freedom prior to medication discontinuation and will improve the number of patients that are not taken off anti-seizure medication prior to the recommended evidence based time.

REFERENCES
1 Sillanpää, M, Schmidt, D. Prognosis of seizure recurrence after stopping antiepileptic drugs in seizure-free patients: A long-term population-based study of childhood-onset epilepsy. Epilepsy Behav. 2006;8:713-719.
Measure Designation

<table>
<thead>
<tr>
<th>Measure purpose</th>
<th>Quality improvement</th>
<th>Accountability</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Level of Measurement</td>
<td>Individual practitioner</td>
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<tr>
<td>Care setting</td>
<td>Outpatient visits</td>
<td></td>
</tr>
<tr>
<td>Data Source</td>
<td>Electronic Health Record (EHR) data</td>
<td></td>
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</tbody>
</table>

Technical Specifications:

The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the epilepsy measures will be made available at a later date.

DRAFT MEASURE #8
Referral to comprehensive epilepsy center

Measure Description
Percent of all patients with a diagnosis of intractable epilepsy who were referred for consultation to a comprehensive epilepsy center* for additional management of epilepsy.

Measure Components

<table>
<thead>
<tr>
<th>Numerator Statement</th>
<th>Patients who were referred for consultation to a comprehensive epilepsy center* for additional management of epilepsy.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*Comprehensive Epilepsy Care Center: Epilepsy centers that provide comprehensive diagnostic and treatment modalities and access to multidisciplinary teams to address comorbidities that are common in epilepsy. The National Association of Epilepsy Centers has provided details of the essential services, personnel, and facilities at comprehensive epilepsy centers. In general, comprehensive centers will provide diagnostic evaluation including inpatient video electroencephalogram (EEG) monitoring, epilepsy surgery evaluation, access to epilepsy surgery, and staff to address psychiatric and psychosocial issues.</td>
</tr>
<tr>
<td>Denominator Statement</td>
<td>All patients with a diagnosis of intractable epilepsy*.</td>
</tr>
<tr>
<td></td>
<td>*Intractable epilepsy is defined as “failure of adequate trials of two tolerated, appropriately chosen and used antiepileptic drug schedules to achieve sustained seizure freedom.”</td>
</tr>
<tr>
<td>Denominator Exceptions</td>
<td>• Patient is already being seen at a comprehensive epilepsy care center.</td>
</tr>
<tr>
<td></td>
<td>• Patient has been evaluated within the past 2 years.</td>
</tr>
<tr>
<td>Supporting Guideline &amp; Other References</td>
<td>The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines or are summaries from the referenced clinical articles and represent the evidence base for the measure:</td>
</tr>
<tr>
<td></td>
<td>• If seizures are not controlled and/or there is diagnostic uncertainty or treatment failure, children, young people and adults should be referred to tertiary services soon* for further assessment. Referral should be considered when one or more of the following criteria are present:</td>
</tr>
<tr>
<td></td>
<td>• The epilepsy is not controlled with medication within 2 years.</td>
</tr>
<tr>
<td></td>
<td>• Management is unsuccessful after two drugs.</td>
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<tr>
<td></td>
<td>• The child is aged under 2 years.</td>
</tr>
<tr>
<td></td>
<td>• A child, young person or adult experiences, or is at risk of, unacceptable side effects from medication.</td>
</tr>
<tr>
<td></td>
<td>• There is a unilateral structural lesion.</td>
</tr>
</tbody>
</table>
• There is psychological and/or psychiatric co-morbidity.
• There is diagnostic doubt as to the nature of the seizures and/or seizure syndrome. (Level IIb)³

- At the review, children, young people and adults should have access to: written and visual information; counseling services; information about voluntary organizations; epilepsy specialist nurses; timely and appropriate investigations; referral to tertiary services including surgery, where appropriate. (Level Ib & III)³

- Information should be provided to children, young people and adults and families and/or care givers as appropriate about the reasons for considering surgery. The benefits and risks of the surgical procedure under consideration should be fully explained before informed consent is obtained. (Level III)³

- Follow-Up/Chronic Disease Care: IF the diagnosis or seizure type remains unclear after the initial evaluations, or the patient has recurrent seizures THEN the patient should be referred to the next level of epilepsy care.⁴

- If your seizures have not been brought under control after three months of care by a primary care provider (family physician, pediatrician), further neurologic intervention by a neurologist, or an epilepsy center if locally available, is appropriate.¹

- If you are seeing a general neurologist, and your seizures have not been brought under control after 12 months, you should insist upon a referral to a specialized epilepsy center with an epileptologist.¹

- Among patients with newly intractable disabling mesial temporal lobe epilepsy (MTLE), resective surgery plus Antiepileptic Drug (AED) treatment resulted in a lower probability of seizures during year 2 of follow-up than continued AED treatment alone.⁵

- Surgical treatment resulted in greater reduction in seizure frequency compared to medical therapy and was a cost-effective treatment option in children with intractable epilepsy.⁶

- Despite Class I evidence and subsequent practice guidelines, the utilization of lobectomy has not increased from 1990 to 2008. Surgery continues to be heavily underutilized as a treatment for epilepsy, with significant disparities by race and insurance coverage. Patients who are medically refractory after failing 2 antiepileptic medications should be referred to a comprehensive epilepsy center for surgical evaluation.⁷

- Uncontrolled epilepsy was associated with significantly greater healthcare resource utilization, and higher rates of negative outcomes compared to well-controlled epilepsy.⁸
REFERENCES

Rationale for the Measure:
There is high level evidence that treatments delivered at an epilepsy center are more effective than treatments delivered by general neurologists, especially epilepsy surgery and use of high risk anti-seizure medications. However, there is also evidence that epilepsy specialists deliver higher quality care. A retrospective study of 200 patients, found that patients experienced fewer seizures (p < 0.001) and were more frequently seizure-free (p < 0.001) after transferring care from a general neurologist to a specialized epilepsy center.\(^1\) The improvement was not related to treatment with newer vs. older antiepileptic drugs (p= 0.305) suggesting that other aspects of care delivered by an epilepsy specialist were efficacious.\(^1\) However, the most important reason for referral to an epilepsy center is to provide epilepsy surgery evaluation and aggressive use of anti-seizure medications because there is high level evidence they are efficacious and not provided in general practice.

Epilepsy surgery to remove the source of seizures in the brain is the only method available to cure epilepsy. The superiority of epilepsy surgery for control of intractable epilepsy over standard medical care has been demonstrated in two pivotal randomized controlled trials (RCT). In a prospective RCT, 58% of 40 intractable epilepsy patients
randomized to surgery were free of seizures impairing awareness while only 8% of those randomized to best anti-seizure medicine therapy were similarly seizure free 1 year after randomization. Although 10% of patients in the surgery group had adverse events, none were serious; the only death in the study was in the medication group in which a patient died from sudden unexplained death in epilepsy (SUDEP). To determine whether offering surgery early in the course of epilepsy is beneficial, the Early Randomized Surgery for Epilepsy Trial (ERSET) randomized 38 patients with intractable epilepsy for less than 2 years and before it caused disability, to either temporal lobectomy or to best medical therapy. 73% of the surgery group was essentially seizure free while none in the medical group were seizure free 2 years after randomization. Adverse events included a transient neurologic deficit in one patient in the surgery group and 3 episodes of status epilepticus in the medical group, emphasizing the risk of ongoing seizures. Assessors of seizure outcome were blinded to treatment assignment in both of these studies. Therefore, these studies provide high level evidence that surgery is a highly efficacious treatment for intractable epilepsy, which also forms the basis for treatment recommendations in most treatment guidelines noted here.

“High risk” anti-seizure medications are used only by epilepsy specialists because they are prescribed only after failure of commonly available anti-seizure medications. Felbamate has been associated with aplastic anemia and hepatitis. Vigabatrin has been associated with restriction of visual fields. These medications have been restricted to patients with intractable epilepsy for whom the benefit outweighs the risk, and to prescription by physicians familiar with these drugs, thus these drugs are prescribed almost exclusively at epilepsy centers.

Since presurgical evaluation of intractable epilepsy can only be performed at an epilepsy center and since epilepsy centers provide better efficacy for seizures control, patients with intractable epilepsy should be referred to an epilepsy center for management. Intractable epilepsy patients may follow-up with a general neurologist who follows the plan established by an epilepsy center but patients will need periodic re-evaluation at an epilepsy center to determine whether a new intervention is needed, such as new epilepsy surgery techniques or devices, or a high risk anti-seizure medication, but also to provide education, counseling, and/or referral for management of common comorbidities that arise throughout the course of the disease.

**GAP IN CARE**
There is overwhelming long-standing evidence that intractable epilepsy patients are not being referred for epilepsy surgery evaluation...
because the average duration of epilepsy before surgery in almost all trials is nearly 20 years which has not changed despite AAN Practice Parameter recommending early referral.\textsuperscript{3-5} However, the most compelling studies are those designed to determine the rate of compliance with this epilepsy quality measure after it was published in 2009.\textsuperscript{6} In a web based survey of 221 unselected epilepsy patients to determine their perception of how often their doctor followed the 2009 quality measures, only 48\% reported they “strongly agree” or “agree” that “I have been referred to an epilepsy specialist to discuss treatments that are not drugs” at least once in the past 3 years.\textsuperscript{7} A survey of 113 Michigan neurologists found that only 26\% reported they consider referral for surgical therapy at least every 3 years and 84\% reported they would wait until “failure of several antiepileptic medications” despite the demonstrated success of early referral in the ERSET trial.\textsuperscript{8} Chart reviews of 120 children at a pediatric epilepsy center found only 76.9\% of appropriate patients were referred for epilepsy surgery evaluation.\textsuperscript{9}

Despite Class I evidence and subsequent practice guidelines, the utilization of lobectomy has not increased from 1990 to 2008 and continues to be heavily underutilized as a treatment for epilepsy, with significant disparities by race and insurance coverage.\textsuperscript{10} This is very convincing evidence that patients are not being referred to an epilepsy center for consideration of surgery and other interventions.

**OPPORTUNITY FOR IMPROVEMENT**

The gap in care for epilepsy center referral is likely to be reduced with a quality measure. A survey of 113 Italian neurologists found two-thirds of general neurologists had attitudes about epilepsy surgery referral that were inconsistent with established data and inconsistent with epilepsy specialists, which correlated with the number of epilepsy patients referred for epilepsy surgery.\textsuperscript{11} Institution of an epilepsy quality measure checklist increased surgical referral from 3\% to 14\% in one clinic.\textsuperscript{12} The institution of a quality measure is likely to improve general awareness and encourage specific education to reinforce to providers and patients the efficacy of referral to an epilepsy center.

**REFERENCES**


<table>
<thead>
<tr>
<th>Measure Designation</th>
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</tr>
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<tbody>
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### Denominator (Eligible Population)

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**AND**

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99211, 99212, 99213, 99214, 99215 (Office or other outpatient visit-Established Patient);
99241, 99242, 99243, 99244, 99245 (Office or Other Outpatient Consultation-New or Established Patient)
Evidence Classification and Rating Schemes for Guidelines Utilized

American Academy of Neurology (AAN)

AAN Classification of Evidence for Therapeutic Interventions

Class I: A randomized, controlled clinical trial of the intervention of interest with masked or objective outcome assessment, in a representative population. Relevant baseline characteristics are presented and substantially equivalent among treatment groups, or there is appropriate statistical adjustment for differences.

The following are also required:
- concealed allocation
- primary outcome(s) clearly defined
- exclusion/inclusion criteria clearly defined
- adequate accounting for dropouts (with at least 80% of enrolled subjects completing the study) and crossovers with numbers sufficiently low to have minimal potential for bias.
- For noninferiority or equivalence trials claiming to prove efficacy for one or both drugs, the following are also required*:
  1. The authors explicitly state the clinically meaningful difference to be excluded by defining the threshold for equivalence or noninferiority.
  2. The standard treatment used in the study is substantially similar to that used in previous studies establishing efficacy of the standard treatment (e.g., for a drug, the mode of administration, dose and dosage adjustments are similar to those previously shown to be effective).
  3. The inclusion and exclusion criteria for patient selection and the outcomes of patients on the standard treatment are comparable to those of previous studies establishing efficacy of the standard treatment.
  4. The interpretation of the results of the study is based upon a per protocol analysis that takes into account dropouts or crossovers.

Class II: A randomized, controlled clinical trial of the intervention of interest in a representative population with masked or objective outcome assessment that lacks one criteria a–e above or a prospective matched cohort study with masked or objective outcome assessment in a representative population that meets b–e above. Relevant baseline characteristics are presented and substantially equivalent among treatment groups, or there is appropriate statistical adjustment for differences.

Class III: All other controlled trials (including well-defined natural history controls or patients serving as own controls) in a representative population, where outcome is independently assessed, or independently derived by objective outcome measurement.**

Class IV: Studies not meeting Class I, II, or III criteria, including consensus or expert opinion.

* Note that numbers 1–3 in Class Ie are required for Class II in equivalence trials. If any one of the three is missing, the class is automatically downgraded to Class III.

**Objective outcome measurement: an outcome measure that is unlikely to be affected by an observer’s (patient, treating physician, investigator) expectation or bias (e.g., blood tests, administrative outcome data).
AAN Classification of Recommendations
A = Established as effective, ineffective or harmful (or established as useful/predictive or not useful/predictive) for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.)*
B = Probably effective, ineffective or harmful (or probably useful/predictive or not useful/predictive) for the given condition in the specified population. (Level B rating requires at least one Class I study or two consistent Class II studies.)
C = Possibly effective, ineffective or harmful (or possibly useful/predictive or not useful/predictive) for the given condition in the specified population. (Level C rating requires at least one Class II study or two consistent Class III studies.)
U = Data inadequate or conflicting; given current knowledge, treatment (test, predictor) is unproven.
*In exceptional cases, one convincing Class I study may suffice for an “A” recommendation if 1) all criteria are met, and 2) the magnitude of effect is large (relative rate improved outcome > 5 and the lower limit of the confidence interval is > 2).
About the American Academy of Neurology

The American Academy of Neurology, founded in 1948, is an international professional association of more than 26,000 neurologists and neuroscientists.

It is dedicated to promoting the highest quality patient-centered neurologic care and enhancing member career satisfaction.

The AAN's vision is to be indispensable to its members by providing guidance and inspiration through education, information, policy development, and advocacy for our members and their patients, while maintaining the highest ethical and professional standards.

Contact Information

For More Information about the Epilepsy Quality Measure Set please contact:

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