



Inpatient and Emergency Neurology Quality Measurement Set

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Invited Organizations

The following organizations were invited to participate, but declined: American Neurological Association, American College of Emergency Physicians

Improving Outcomes for Patients

Purpose of Measures

In 2015, the American Academy of Neurology (AAN), Neurocritical Care Society (NCS), and Neurohospitalist Society (NHS) formed an Inpatient and Emergency Neurology Work Group (Work Group) to review existing guidelines, current evidence, and gaps in care in order to develop a measurement set for inpatient and emergency neurology that promotes quality improvement and drives better outcomes for neurologically-ill patients for inpatient and emergency settings.

The AAN, NCS, and NHS are developing quality measures based on the belief that specialists should play a major role in selecting and creating measures that will drive performance improvement and possibly be used in accountability programs in the future. The AAN, NCS, and NHS formed the Work Group with representatives from professional associations and patient advocacy organizations to ensure any measures developed included input from all members of the healthcare team. All members of the Work Group were required to disclose relationships with industry and other entities to avoid actual, potential, or perceived conflicts of interest.

No one measurement set is able to capture all the aspects of treatment needed for diverse patients in these settings. This measurement set is focused on measuring the quality of care provided for a variety of conditions or diseases, and does not address the whole scope of each condition or disease, nor all of inpatient or emergency neurology.

Topic Importance

Inpatient and emergency neurology does not focus on one disease alone, but encompasses signs, symptoms and conditions spanning the neurological spectrum in the inpatient and emergency settings. After consideration of a variety of conditions and measures, this measurement set will focus on brain death, urinary catheters, delirium, Guillain-Barre Syndrome, myasthenic crisis, status epilepticus, bacterial meningitis, advance directives, and goals of care.

Brain Death

Brain death determination remains an important task that neurologists are often asked to complete given their expertise in this area. Variability in practice has been shown following the Uniform Determination of Death Act that allowed for brain death guidelines to be made at the institutional level (1). A review of 38 major institution's guidelines on brain death showed there was variability in every aspect of declaring brain death (1). A study of costs in an ICU calculated the average price at \$1,500/day with mechanical ventilation being associated with higher daily costs (2).

Urinary Catheters

Urinary tract infection (UTI) is regarded as one of the most common healthcare-associated infections occurring after placing an indwelling catheter, often placed without a clear medical indication, estimated between 21% and 55.7% (3). It is estimated that there are 449,334 catheter associated UTIs (CAUTI) per year with a cost of \$749-1007 per admission (3). As a result of the apparent excess iatrogenic CAUTIs, in 2008, Medicare stopped paying for care in the hospital resulting from some hospital-acquired infections, including CAUTI. This change in reimbursement policy had a small impact on actual CAUTI rates, only resulting in a one percent reduction (4). Neurology patients in ICUs and neuro-ICUs typically have higher CAUTI rates (5). Reducing CAUTIs in neurology patients has been a recent quality improvement effort due to their higher incidence of CAUTI (6,7,8).

Delirium

Delirium is a common syndrome that is associated with poor outcomes, including increased hospital stay, greater incidence of hospital acquired complications, and earlier death (9). It is prevalent in neurology inpatient populations, particularly in ischemic stroke, intracerebral hemorrhage, seizure, and TBI (REF?). Further, many of the important risk factors for the development of delirium are common in neurology inpatients (10,11,12,13,14). It is estimated that the prevalence of delirium in hospitals is 20% to 30% including a 10% to 50% prevalence for patients recovering from surgery (9). Delirium increases average daily costs by 2.5x at \$16-64K per patient (15), and increases the risk of a function decline (3x), nosocomial infections, prolonged length of stay, discharge to acute rehabilitation or a skilled nursing facility (3-5x), death (10x), poor functional recovery and persistence of poor long term cognitive outcome. Further, the potential impact of better delirium prevention, detection and treatment is large as up to 50% of cases are preventable (9,13).

Guillain-Barre Syndrome

Guillain-Barre syndrome (GBS) prevalence is estimated at 1.65 to 1.79 per 100,000 persons (16). The median hospital stay for these patients is seven days and some of these patients will require mechanical ventilation (16). The estimated annual cost of GBS was \$1.7 billion in the United States in 2004, which is projected at \$318,966 per person. Hospital admissions account for most of the direct cost, and indirect cost was due to premature deaths and disability (17).

Myasthenic Crisis

Myasthenia Gravis prevalence is estimated at about 14 to 20 per 100,000 in the United States (18). 15%-20% of patients with myasthenia gravis experience crisis in their lifetime (19) and three to eight percent of all patients who develop myasthenic crisis will die from the condition (20). The average short term cost for treating a patient with plasma exchange was \$101,140 versus an average of \$78,814 for treating with IVIG. (20). Those with myasthenia gravis are treated with immunosuppressing therapies that include prednisone (21). For severe MG exacerbations PLEX and IVIg should be used to achieve prompt improvement (21).

Status Epilepticus

Status Epilepticus incidence is estimated at 20/100,000 using a conservative approach to the definition of status epilepticus (22). Thus, estimates are much higher if the status epilepticus definition is extended to include cases where the duration of seizures is less than 10 minutes. The status epilepticus mortality rate is between 3 and 40%, depending on a variety of factors (22). A study conducted in 1993-1994 in the United States analyzed the direct costs of inpatient admission to be at \$18,834 per admission (22).

Bacterial Meningitis

According to the CDC there are over 1.2 million cases of bacterial meningitis worldwide every year (23). One in five survivors can have permanent damage that can include hearing loss, neurologic disability, or loss of a limb (23). Every country varies in their incident rates of meningitis. Data from 2006 indicate that there were more than 72,000 hospitalizations due to meningitis with the hospital costs totaling \$1.2 billion (24). In 2006 it was also noted that the in-hospital death rate for those with meningitis is 40 percent higher than the death rate for all other conditions (24). It was reported that meningitis caused by bacteria had the longest hospital stays compared to the other types of meningitis and also had the highest hospital costs (\$520 million) (24).

Clinical Evidence Base

The co-chairs and facilitators, guided by a medical librarian, conducted a comprehensive search to identify published guidelines, measures, and consensus recommendations in the National Guidelines Clearinghouse, the National Quality Measures Clearinghouse, PubMed, MEDLINE, EMBASE, and the Cochrane Library. Supporting guidelines and references were used to guide the development of each measure. In many situations, actual practice may deviate from the cited evidence, but the committee relied only on published data. Modifications to this measure set, and the supporting guidelines and references, can be considered when new evidence becomes available to support any particular practice pattern. The Work Group reviewed existing literature and consulted the following clinical practice guidelines published, which included:

- Evidence-based guideline update: Determining brain death in adults (American Academy of Neurology)
- Clinical Report – Guidelines for the determination of brain death in infants and children: An update of the 1987 Task Force recommendations (American Academy of Pediatrics)
- Clinical Practice Guidelines for the Diagnosis and Management of Intravascular Catheter-Related Infection (Infectious Diseases Society of America)
- National Collaborating Centre for Acute and Chronic Conditions. Delirium: diagnosis, prevention and management
- The prevention, diagnosis and management of delirium in older people (Royal College of Physicians)
- Caregiving Strategies for Older Adults with Delirium, Dementia and Depression (Registered Nurses Association of Ontario)
- Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit
- Evidence-based guideline update: Plasmapheresis in neurologic disorders (American Academy of Neurology)
- Practice parameter: Immunotherapy for Guillain-Barre syndrome (American Academy of Neurology)
- Evidence-based guideline: Intravenous immunoglobulin in the treatment of neuromuscular disorders (American Academy of Neurology)
- Treatment Guidelines for Guillain-Barre Syndrome (Indian Academy of Neurology)
- EFNS guideline on the management of status epilepticus in adults (European Federation of Neurological Sciences)
- Guidelines for the evaluation and management of status epilepticus (Neurocritical Care Society)
- Clinical Practice Guidelines for Quality Palliative Care (National Consensus Project for Quality Palliative Care)
- Palliative Care for Adults (Institute for Clinical Systems Improvement)
- Advance Care Planning. (Michigan Quality Improvement Consortium)

Work Group Recommendations

| 2015 Inpatient and Emergency Measurement Set |
|--------------------------------------------------------------------------|
| Documentation of Brain Death |
| Reduction of Urinary Catheters for Patients with Neurological Conditions |
| Delirium Risk Factor Screening and Preventative Protocol |
| Non-pharmacological Treatment of Delirium |
| Immunosuppressive Treatment of GBS |
| Immunosuppressive Treatment of Myasthenic Crisis |

| |
|-------------------------------------------------------------------------|
| Status Epilepticus Identification and Seizure Cessation |
| Status Epilepticus Treatment with Antiepileptic/Anti-Seizure Medication |
| EEG for Status Epilepticus and Coma |
| Discussion and Documentation of Advanced Directives |
| Discussion and Documentation of Goals of Care |
| Treatment of Bacterial Meningitis |

Definitions and Abbreviations

The Work Group utilized the following definitions and abbreviations in the measurement set:

- EEG: Electroencephalography
- TCD: Transcranial Doppler
- CBF: Radionuclide cerebral blood flow
- CAUTI: Cather Associated Urinary Tract Infection
- UTI: Urinary tract infection
- GBS: Guillain-Barre Syndrome
- PE: Plasmapheresis
- IVIG: Intravenous immunoglobulin
- SE: Status epilepticus
- ED: Emergency Department
- ICU: Intensive Care Unit
- ADL: Activities of Daily Living

Below is a list of acronyms utilized in this document. The AAN has a Quality Improvement Glossary, which provides more in depth explanations and is available at aan.com/practice/quality-measures/quality-resources.

- CMS: Centers for Medicare & Medicaid Services
- NQF: National Quality Forum
- PQRS: Physician Quality Reporting System

Desired Outcomes

This list represents the optimal outcomes for neurology inpatients and neurocritical care patients facing delirium, brain death, CAUTI, myasthenic crisis, GBS, and status epilepticus.

General outcomes

- Engagement
 - Increase patient knowledge of their own diagnosis
 - Increase patient understanding of the management plan and follow-up
 - Increase patient engagement in the treatment decision process
 - Address all patient needs and engage patients on a personal level
- Utilizations
 - Avoid unnecessary hospitalization
 - Avoid emergency service utilization
 - Reduce Length Of Stay (once hospitalized)
 - Reduce readmissions

- Transitions: Appropriate sign out to outpatient physicians (i.e. follow-up providers)
- Increase use of neurology services throughout course of inpatient care for patients with neurological illnesses
- Increase patient satisfaction with the care provided
- Act to reduce care giver (i.e. family) burden
- Improve quality of life
- Improve quality of care from a coordinated treatment team
- Maximize ADL dependence
- Maximize cognitive function
- Maximize motor function and gait ability
- Maximize general function

Delirium (* relevant to other conditions)

- Decrease length of stay*
- Decrease use of restraints
- Return to prior independent state*
- Return to home (Skilled Nursing Facility)*
- Maximize ADL function/independence*
- Maximize long-term cognitive, general and other neurologic function*
- Decrease falls*
- Reduce morbidity and mortality associated with delirium

Brain death

- Avoid misdiagnosis
- Maintain dignity and ensure patient's end-of-life wishes are realized (and not ignored)
- Avoid unnecessary or inappropriate prolonged artificial/medical support
- Decrease length of time to definitive end
- Promote family acceptance of diagnosis
- Minimize inappropriate use of or unnecessary resources

CAUTI

- Decrease rates of catheter associated UTI and UTI-related complications (e.g. sepsis)
- Decrease catheter days
- Increase mobility
- Decrease catheter associated UTIs

Myasthenia

- Minimize duration of mechanical ventilation
- Decrease ICU length of stay
- Avoidance of respiratory failure that requires ventilation
- Decrease time to neurologic stabilization
- Decrease time to ambulation

GBS

- Duration of mechanical ventilation
- Decrease ICU length of stay
- Avoidance of respiratory failure that requires ventilation

Status epilepticus

- Increase rapid recognition of status epilepticus
- Decrease rates of refractory status
- Increase rapid institution of appropriate treatment
- Return to maximum cognitive and neurologic function

- Avoid complications of status epilepticus:
 - Duration of mechanical ventilation
 - Avoidance of respiratory failure that requires ventilation
 - Hospital-acquired infections (pneumonia, UTI)

Intended Care Audience, Settings, and Patient Populations

The AAN encourages the use of these measures by physicians and other health care professionals, practices, and health care systems, where appropriate, to achieve improved performance. These measures are intended as steps that providers, practices, and systems can take towards optimized clinical outcomes for patients with inpatient neurologic disease.

| 2016 Inpatient and Emergency Measurement Set | Applicable Care Settings | | | |
|----------------------------------------------------------|--------------------------|-----------|-----------------|----------------------|
| | Outpatient | Inpatient | Skilled Nursing | Emergency Department |
| Documentation of Brain Death | | X | | X |
| Reduction of Urinary Catheters | | X | | |
| Delirium Risk Factor Screening and Preventative Protocol | | X | | X |
| Non-pharmacological Treatment of Delirium | | X | | X |
| Immunosuppressive Treatment of GBS | | X | | |
| Immunosuppressive Treatment of Myasthenic Crisis | | X | | |
| Status Epilepticus Identification and Seizure Cessation | | X | | X |
| Status Epilepticus Treatment with Antiepileptic | | X | | X |
| EEG for Status Epilepticus and Coma | | X | | X |
| Discussion and Documentation of Advanced Directives | | X | | |
| Discussion and Documentation of Goals of Care | | X | | |
| Treatment of Bacterial Meningitis | | X | | X |

Other Potential Measures

The measures developed are a result of a consensus process. Work Group members are given an opportunity to submit new measures in advance of an in-person meeting where all measures are reviewed and edited individually. After each measure has been discussed, each individual on the work group votes to approve, not approve, or abstain from voting on each measure. The Work Group discussed potential measures for development, and during the meeting the Work Group voted to not approve coma and functional assessment of neurologic disorders. The Work Group felt both these concepts were not ready for development at this time due to lack of strong evidence, difficulty locating data elements needed for measurement, or lack of known gaps in treatment. The work group recommends these concepts be revisited when this measurement set is updated in 3 years.

Measure Harmonization

The Work Group reviewed existing measures on the topics included in this measurement set. Efforts were made to reduce duplicative measures when possible. The Work group considered cutting advance care planning and goals of care as there are already multiple types of these measures. However, the Work Group felt that these were important to this specific population and thus were included.

One measure exists for urinary catheters in long-term care patients written by the Society for Post-Acute and Long-Term Care Medicine (AMDA). The Work Group felt that harmonization was not needed as the population is different and the numerator is measuring something separate. The National Institute for Clinical Excellence (NICE) has a measure for delirium. The Work Group felt it was necessary to break out the various components of delirium to fully measure and capture the spirit of delirium prevention and treatment.

Technical Specifications Overview

The Work Group developed technical specifications for measures that may include:

- Electronic Health Record (EHR) Data
- Electronic Administrative Data (Claims)
- Chart Review (for select measures where EHR data cannot be gathered)
- Registry

Administrative claims specifications are provided for measures when applicable. The AAN is in the process of creating code value sets and the logic required for electronic capture of the quality measures with EHRs, when possible. A listing of the quality data model elements, code value sets, and measure logic (through the CMS Measure Authoring Tool) for each of the measures will be made available at a later date. These technical specifications will be updated as warranted.

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 (e.g., contraindication), patient (e.g., declination or religious belief), or system (e.g., resource limitation) reasons. 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.

Testing and Implementation of the Measurement Set

The measures in this set 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. Select measures will be beta tested once the set has been released, prior to submission to the National Quality Forum for possible endorsement.

Documentation of Brain Death

| Measure Description | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Percent of patients (>37 weeks gestational age) who died in the hospital with a diagnosis of brain death who had documentation of apnea testing* OR, if apnea testing not possible, ancillary test** for assessment of death by neurological criteria was performed. | |
| Measure Components | |
| Numerator Statement | <p>Patients >37 weeks gestational age who died in the hospital with a diagnosis of brain death who had documentation of apnea testing* OR, if apnea testing not possible, documentation of an acceptable ancillary** test performed.</p> <p>*Apnea test defined as absence of a breathing drive that is tested with a CO₂ challenge that includes documentation of the increased levels of PaCO₂ (1)</p> <p>**Ancillary tests must be appropriate for age and currently recommended for use include:</p> <ul style="list-style-type: none"> • EEG (pediatric and adult⁺) • Radionuclide cerebral blood flow (pediatric and adult⁺) • Cerebral angiography (adult⁺) • Transcranial Doppler (adult⁺) |
| Denominator Statement | Patients >37 weeks gestational age who died in the hospital with diagnosis of brain death. |
| Denominator Exceptions | None |
| Exception Justification | N/A |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “The criteria for the determination of brain death given in the 1995 AAN practice parameter have not been invalidated by published reports of neurologic recovery in patients who fulfill these criteria (Level U).” (1) • “There is insufficient evidence to determine the minimally acceptable observation period to ensure that neurologic functions have ceased irreversibly (Level U).” (1) • “Complex-spontaneous motor movements and false-positive triggering of the ventilator may occur in patients who are brain dead (Level C).” (1) • “There is insufficient evidence to determine the comparative safety of techniques used for apnea testing (Level U).” (1) |

| | |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • “There is insufficient evidence to determine if newer ancillary tests accurately confirm the cessation of function of the entire brain (Level U).” (1) • “If the apnea test cannot be performed due to a medical contraindication or cannot be completed because of hemodynamic instability, desaturation to <85%, or an inability to reach a PaCO₂ of 60mm Hg or greater, an ancillary study should be performed” (2) • “Ancillary studies (EEG and radionuclide CBF) are not required to establish brain death unless the clinical examination or apnea test cannot be completed” (2) • “When ancillary studies are used, documentation of components from the second clinical examination that can be completed must remain consistent with brain death. All aspects of the clinical examination, including the apnea test, or ancillary studies must be appropriate documented.” (2) |
| Measure Importance | |
| Relationship to Desired Outcome | This metric is intended to affect the following outcomes: ensure consistent application of American Academy of Neurology evidence-based guidelines for determination of brain death, avoid misdiagnosis of brain death and to promote family acceptance of brain death diagnosis. |
| Opportunity for Improvement | Practice variation has been demonstrated following the Uniform Determination of Death Act (Greer 2008). A review of more than 30 major institution’s guidelines on brain death showed there was inconsistency in every aspect of brain death declaration (Greer 2008). The first American Academy of Neurology guideline on this topic was published in 1995. In the 2010 update to this guideline the authors state “Despite publication of the practice parameter, considerable practice variation remains.” (AAN 2010) |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input checked="" type="checkbox"/> Administrative Data/Claims <input type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Wijdieks EFM, Varelas PN, Gronseth GS, et al. Evidence-based guideline update: Determining brain death in adults: Report of the Quality Standards Subcommittee of the American Academy of Neurology. <i>Neurology</i> 2010;74:1911-1918 2. Nakagawa TA, Ashwal S, Mathur M. Guidelines for the determination of brain death in infants and children: An update of the 1987 Task Force Recommendations. <i>Pediatrics</i> 2011; 128(3):e720 | |
| Denominator | <u>ICD-10 Code</u> G93.82 Brain death |
| Numerator | AND CPT E/M Service Code: 0042T Cerebral perfusion analysis using computed tomography with contrast administration, including post-processing of parametric maps with determination of cerebral blood flow, cerebral blood volume, and mean transit time 78610 Brain imaging, vascular flow only 93880 Duplex scan of extracranial arteries; complete bilateral study 93882 Duplex scan of extracranial arteries; unilateral or limited study 93886 Transcranial Doppler study of the intracranial arteries; complete study 93888 Transcranial Doppler study of the intracranial arteries; limited study 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes) |

Reduction of Urinary Catheters Used for Patients with Neurological Conditions

| Measure Description | |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hospitals that have a protocol for rational urinary catheter use | |
| Measure Components | |
| Numerator Statement | <p>The hospital has a protocol for rational urinary catheter use specifically in neurologically ill patients, including stroke and altered mental status*, that contains a list of appropriate indications for catheter placement. Efforts should be made to avoid usage of catheters in neurologically ill patients given their relationship with CAUTI.</p> <p>*Altered mental status</p> <ul style="list-style-type: none"> • Nonpsychotic mental disorders due to brain damage • Transient alteration of awareness • Encephalopathy • Dizziness and giddiness • Delirium |
| Denominator Statement | All hospitals that care for patients with neurological illnesses including stroke and altered mental status |
| Denominator Exceptions | None |
| Exception Justification | N/A |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “Indwelling catheters should be placed only when they are indicated.” (1) • “Indwelling urinary catheters should not be used for the management of urinary incontinence (A-III). In exceptional cases, when all other approaches to management of incontinence have not been effective, it may be considered at patient request.” (1) • “Institutions should develop a list of appropriate indications for inserting indwelling urinary catheters, educate staff about such indications, and periodically assess adherence to the institution-specific guidelines (A-III).” (1) • “Institutions should require a physician’s order in the chart before an indwelling catheter is placed (A-III).” (1) • “Institutions should consider use of portable bladder scanners to determine whether catheterization is necessary for post-operative patients (B-II).” (1) • “Indwelling catheters should be removed as soon as they are no longer required to reduce the risk of CA-bacteriuria (A-I) and CA-UTI (A-II).” (1) • “Institutions should consider nurse-based or electronic physician reminder systems to reduce inappropriate urinary catheterization (A-II) and CA-UTI (A-II).” (1) |

| | |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • “Institutions should consider automatic stop-orders to reduce inappropriate urinary catheterization (B-I).” (1) • “A full continence assessment should be carried out. Regular toileting and prompt treatment of urinary tract infections may prevent urinary incontinence. Catheters should be avoided where possible because of the increased risks of trauma in confused patients, and the risk of catheter associated infections (C)” (2) |
| Measure Importance | |
| Relationship to Desired Outcome | <p>Urinary tract infection (UTI) is one of the most common health care-associated infections, and catheters are frequently responsible (3). Catheter-associated UTI (CAUTI) is tremendously costly to the health care system (4). Hospital-acquired UTI is currently a condition that the Centers for Medicare and Medicaid Services deems “preventable” for which they will not reimburse for further hospital costs further focusing physicians and health care systems on this problem.</p> <p>In the general medical population, the risk of UTI increases per day of catheter use and therefore a reduction of catheter days is a major focus of reducing health-care associated UTI. Patients with stroke are at a particularly high risk for developing UTI in the hospital, whether catheterized or not, for a variety of reasons related to patient- and disease-specific factors (5). Although patients with acute neurologic injury, including altered mental state and stroke, are frequently catheterized when they arrive in the inpatient setting, careful selection of only those patients who absolutely require urinary catheterization would substantially reduce the burden of CAUTI and its associated costs and poor outcomes.</p> |
| Opportunity for Improvement | <p>Neurologic patients, including those with stroke and altered mental status, should not necessarily be treated with urinary catheterization given the increased risk of catheter-associated UTI and delirium. Hospitals should develop a list of appropriate indications for catheter placement. Catheters should be removed as soon as no longer required using either nurse based or physician based reminder systems and consideration of automatic stop orders.</p> |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input checked="" type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | <p>AMDA measure states: “Percent of chronic/long term care residents who have/had a catheter inserted and left in their bladder.”</p> <p>A separate measure is needed as the AMDA measure is for use in nursing homes.</p> |

| Measure Designation | |
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| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input type="checkbox"/> Individual Provider <input type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Mermel LA, Allon M, Bouza E, et al. Clinical Practice Guidelines for the Diagnosis and Management of Intravascular Catheter-Related Infection: 2009 Update by the Infectious Diseases Society of America. CID; 2009:49. 2. Royal College of Physicians. The prevention, diagnosis and management of delirium in older people. Concise Guidance to Good Practice – A series of evidence-based guidelines for clinical management. 2006. 3. Foxman B. Epidemiology of urinary tract infections: Incidence, morbidity, and economic costs. Am J Med 2002; 113(suppl 1A):5S-13S. 4. Tambyah PA, Knasinski V, Maki DG. The direct costs of nosocomial catheter-associated urinary tract infection in the era of managed care. Infect Control Hosp Epidemiol 2002; 23(1):27-31. 5. Poisson SN, Johnston SC, Josephson SA. Urinary tract infections complicating stroke. Stroke 2010;41: e180-184. | |
| Denominator | <u>ICD-10 Code</u> G00-G99 Diseases of the nervous system |
| Numerator | R41.82 Altered mental status, unspecified F05 Delirium due to known physiological condition F09 Unspecified mental disorder due to known physiological condition R40.4 Transient alteration of awareness G93.4 Other and unspecified encephalopathy G93.40 Encephalopathy, unspecified G93.41 Metabolic encephalopathy G93.49 Other encephalopathy R42 Dizziness and giddiness |

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| | <p>T83.51XA Infection and inflammatory reaction due to indwelling urinary catheter, initial encounter T83.51XDsubsequent encounter T83.51XSsequela</p> <p>AND</p> <p>CPT E/M Service Code: 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> |
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Delirium Risk Factor Screening and Preventative Protocol

| Measure Description | |
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| Percentage of patients at high risk [^] of developing delirium who had a preventative protocol* instituted | |
| Measure Components | |
| Numerator Statement | <p>High risk[^] patients who had a preventative protocol* instituted</p> <p>[^]High risk includes one or more of the following: Age 65 years or older, major/mild neurocognitive impairment, current hip fracture, severe illness (a clinical condition that is deteriorating or is at risk of deterioration) (1), history of hypertension and/or alcoholism (2)</p> <p>*Providers must document or otherwise record the application of an institutional delirium prevention protocol or individual elements of delirium prevention, which includes one or more of the following: Cognitive orientation to date and circumstance, promotion of sleep hygiene, ambulation and mobilization, assessing and controlling pain, avoidance of psychotropic-polypharmacy, and medical treatment of malnutrition, infection, metabolic disorders, urinary retention and hypoxia.</p> |
| Denominator Statement | All patients >18 years of age who are at high risk [^] of developing delirium |
| Denominator Exceptions | <ul style="list-style-type: none"> • Diagnosis of delirium at time of or prior to admission • Patient or family/caregiver refuse preventative protocol • Unable to institute protocol for medical reasons |
| Exception Justification | An existing diagnosis of delirium when being admitted would exclude a person from this population as they would not need to be screened for their risk. Additionally, if a patient cannot be given the screening because they are too young, refuse, or cannot verbalize, this patient should be excluded from the measure. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “When people first present to hospital or long-term care, assess them for the following risk factors. If any of these risk factors is present, the person is at risk of delirium.... Severe illness (a clinical condition that is deteriorating or is at risk of deterioration)” (1) • “Observe people at every opportunity for any changes in the risk factors for delirium.” (1) • “Ensure that people at risk of delirium are cared for by a team of healthcare professionals who are familiar to the person at risk. Avoid moving people within and between wards or rooms unless absolutely necessary.” (1) • “Give a tailored multicomponent intervention package: <ul style="list-style-type: none"> ○ Within 24 hours of admission, assess people at risk for clinical factors contributing to delirium. |

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| | <ul style="list-style-type: none"> ○ Based on the results of this assessment, provide a multicomponent intervention tailored to the person's individual needs and care setting as described in recommendations 1.3.3.1–1.3.3.10.” (1) ● “Four baseline risk factors are positively and significantly associated with the development of delirium in the ICU: preexisting dementia, history of hypertension and/or alcoholism, and a high severity of illness at admission (B)” (2) ● “The Confusion Assessment Method for the ICU (CAM-ICU) and the Intensive Care Delirium Screening Checklist (ICDSC) are the most valid and reliable delirium monitoring tools in adult ICU patients (A)” (2) ● “Routine monitoring of delirium in adult ICU patients is feasible in clinical practice (B)” (2) ● “A history from a relative or carer of the onset and course of the confusion is essential to help distinguish between delirium and dementia (C)” (3) ● “The diagnosis of delirium can be made by non-psychiatrically trained clinicians quickly and accurately using the Confusion Assessment Method (CAM) screening instrument (B)” (3) ● “Nurses should initiate standardized methods to identify risk factors for delirium on initial and ongoing assessments (IIa)” (4) ● “Address cognitive impairment and/or disorientation...” (1) ● “Address dehydration and/or constipation...” (1) ● “Assess for hypoxia and optimise oxygen saturation if necessary, as clinically appropriate.” (1) ● “Address infection...” (1) ● “Address immobility or limited mobility...” (1) ● “Address pain...” (1) ● “Carry out a medication review for people taking multiple drugs, taking into account both the type and number of medications.” (1) ● “Address poor nutrition...” (1) ● “Address sensory impairment...” (1) ● “Promote good sleep patterns and sleep hygiene...” (1) ● “The patient should be nursed in a good sensory environment and with a reality orientation approach, and with involvement of the multidisciplinary team (B)” (3) |
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| Measure Importance | |
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| Relationship to Desired Outcome | By screening for risk of delirium at time of admission, it is assumed that patients at high risk for developing delirium will be identified quickly and intervention offered in a timely manner. Timely interventions reduce the likelihood of longer inpatient treatment stays and increased treatment costs. |
| Opportunity for Improvement | Inpatient delirium is prevalent (particularly in ischemic stroke, brain hemorrhage, seizure, and TBI). Many of the important risk factors for the development of delirium are common in neurology inpatients (cognitive impairment, visual/hearing impairment, immobilization, restraints, urinary |

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| | <p>catheter, polypharmacy, high-risk meds (antipsychotics), sleep deprivation, sedative-hypnotics, acute illness).</p> <p>It increases average daily costs by 2.5x at \$16-64K per patient (5). It increases the risk of a function decline (3x), nosocomial infections, prolonged Length Of Stay and discharge to Acute Rehabilitation Facility-Skilled Nursing Facility (3-5x), death (10x), poor functional recovery and persistence of poor long term cognitive outcome.</p> <p>The Hospital Elder Life Program (HELP) program has been documented to be effective for prevention of delirium, cognitive and functional decline, and hospital falls; decreased length of hospital stay, institutionalization and sitter usage. Additionally, the program has been shown to be cost- effective, saving hospital costs of between \$1165-\$1453 per person per hospitalization; decreasing long-term care nursing home costs of \$13,239 per person-year; and saving \$149,848 per year in sitter costs (All costs adjusted for inflation, 2013 USD). HELP represents one of the first multicomponent delirium intervention programs; since its creation, many intervention programs have been developed based on the principles and procedures of the HELP model. (6)The seriousness of delirium can be underrated, however delirium is a problem for more than 2.3 million elderly. (7) This problem accounts for about \$4 billion in expenditures for Medicare alone. (7) 50% of cases preventable. (1,7) Better care can be delivered by screening those at high risk to catch delirium early.</p> <p>Of note, screening for the risk of developing delirium is separate from screening for delirium itself, the latter of which may utilize the following (non-exhaustive) list of delirium screening tools:</p> <ul style="list-style-type: none"> • Confusion Assessment Method for the ICU (CAM-ICU) • Intensive Care Delirium Screening Checklist (ICDSC) • Nursing Delirium Screening Scale (Nu-DESC) • Delirium Detection Score (DDS) • Cognitive Test for Delirium (CTD) • Short CAM • Long CAM • 3D-CAM |
| <p>National Quality Strategy Domains</p> | <p><input type="checkbox"/> Patient and Family Engagement</p> <p><input checked="" type="checkbox"/> Patient Safety</p> <p><input type="checkbox"/> Care Coordination</p> <p><input type="checkbox"/> Population/Public Health</p> <p><input type="checkbox"/> Efficient Use of Healthcare Resources</p> <p><input type="checkbox"/> Clinical Process/Effectiveness</p> |
| <p>Harmonization with Existing Measures</p> | <p>NICE delirium metric from 2014 assesses, “Adults newly admitted to hospital or long-term care who are at risk of delirium receive a range of tailored interventions to prevent delirium.”</p> |

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| | A separate measure is required as all patients, particularly newly admitted, should be assessed (especially patients at high risk) for delirium and a preventative protocol instituted if the screen is positive. Every hospital should have a protocol developed and ready to be instituted in this population. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input checked="" type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. National Collaborating Centre for Acute and Chronic Conditions. Delirium: diagnosis, prevention and management. London (UK): National Institute for Health and Clinical Excellence (NICE); 2010 Jul. 29 p. (Clinical guideline; no. 103). 2. Barr J, Fraser G, Puntillo K, et al. Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit. <i>Critical Care Medicine</i> 2013; 41:263-306. 3. Royal College of Physicians. The prevention, diagnosis and management of delirium in older people. Concise Guidance to Good Practice – A series of evidence-based guidelines for clinical management. 2006 4. Registered Nurses Association of Ontario (2010). Caregiving Strategies for Older Adults with Delirium, Dementia and Depression. Toronto, Canada: Registered Nurses Association of Ontario. 5. Leslie D, Marcantonio ER, Zhang Y, et al. One-year health care costs associated with delirium in the elderly population. <i>Archives of Internal Medicine</i> 2008; 168(1):27-32. 6. Yue J, Tabloski P, Dowal SL, et al. NICE to HELP: operationalizing National Institute for Health and Clinical Excellence guidelines to improve clinical practice. <i>J Am Geriatr Soc</i> 2014; 62(4):754-61. 7. Inouye SK, Bogardus ST Jr, Charpentier PA, et al. A multicomponent intervention to prevent delirium in hospitalized older patients. <i>NEJM</i> 1999; 340(9):669-76. | |
| Numerator | <u>ICD-10 Code:</u> Major/mild neurocognitive impairment |

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| | <p>G31.84 Mild cognitive impairment, so stated</p> <p>Hip fracture (current)</p> <p>M84.459 Pathological fracture, hip, unspecified</p> <p style="padding-left: 20px;">M84.459A initial encounter for fracture</p> <p>M84.459D subsequent encounter for fracture with routine healing</p> <p style="padding-left: 20px;">M84.459G subsequent encounter for fracture with delayed healing</p> <p style="padding-left: 20px;">M84.459K subsequent encounter for fracture with nonunion</p> <p style="padding-left: 20px;">M84.459P subsequent encounter for fracture with malunion</p> <p>M84.459S sequela</p> <p>Hypertension</p> <p>I10 Essential (primary) hypertension</p> <p>Alcoholism</p> <p>F10.1 Alcohol abuse</p> <p>F10.2 Alcohol dependence</p> <p>AND</p> <p><u>CPT E/M Service Code:</u></p> <p>99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient);</p> <p>99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient);</p> <p>99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> |
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Non-Pharmacological Treatment of Delirium

| Measure Description | |
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| Percent of patients with delirium (that was not present on admission) who were treated initially with a non-pharmacological treatment | |
| Measure Components | |
| Numerator Statement | <p>Patients who were treated initially with a non-pharmacological treatment*.</p> <p>*Non-pharmacological treatment: Prior to starting antipsychotic medication, a practitioner should evaluate each of the following: underlying sensory factors (i.e. cognitive impairment, visual/hearing impairment, immobilization, removal of restraints, urinary catheter, dehydration, malnutrition, polypharmacy (>3 new meds during hospitalization), high-risk medications such as pre-existing antipsychotics, sleep deprivation, iatrogenic event, sedative-hypnotics, and acute illness. (1)</p> <p>Of note, this measure can be attributed to the provider who first manages a patient after the diagnosis of delirium is made</p> |
| Denominator Statement | All patients admitted to an inpatient facility and who are diagnosed with delirium, not present on admission |
| Denominator Exceptions | <ul style="list-style-type: none"> • Preexisting antipsychotic medication prescribed • Drug intoxication or alcohol withdrawal • Patient who is posing direct harm to self or others |
| Exception Justification | Those admitted to the hospital or present to the ER with an existing prescription for an antipsychotic will need to be excluded as well as those already receiving non-pharmacologic treatment, given non-pharmacological treatment cannot be used as the first line treatment. Additionally, those who present with drug intoxication or alcohol withdrawal and those posing a direct harm to themselves or staff should be excluded, as pharmacological treatment may be warranted as a first line treatment. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “Ensure that people at risk of delirium are cared for by a team of healthcare professionals who are familiar to the person at risk. Avoid moving people within and between wards or rooms unless absolutely necessary.” (1) • “Give a tailored multicomponent intervention package: <ul style="list-style-type: none"> ○ Within 24 hours of admission, assess people at risk for clinical factors contributing to delirium. ○ Based on the results of this assessment, provide a multicomponent intervention tailored to the person's individual needs and care setting as described in recommendations 1.3.3.1–1.3.3.10.” (1) • “Address cognitive impairment and/or disorientation...” (1) • “Address dehydration and/or constipation...” (1) |

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| | <ul style="list-style-type: none"> • “Assess for hypoxia and optimise oxygen saturation if necessary, as clinically appropriate.” (1) • “Address infection...” (1) • “Address immobility or limited mobility...” (1) • “Address pain...” (1) • “Carry out a medication review for people taking multiple drugs, taking into account both the type and number of medications.” (1) • “Address poor nutrition...” (1) • “Address sensory impairment...” (1) • “Promote good sleep patterns and sleep hygiene...” (1) • “The most important action for the management of delirium is the identification and treatment of the underlying cause (C)” (2) • “Keep the use of sedatives and major tranquilizers to a minimum (C)”(2) • “Review all medication at least every 24 hours (D)” (2) • “One-to-one care of the patient is often required and should be provided while the dose of psychotropic medication is titrated upward in a controlled and safe manner (C)” (2) • “Restraints have not been shown to prevent falls and may increase the risk of injury. It may be preferable to nurse the patient on a low bed or place the mattress directly on the floor. Adoption of the good practices described should make the use of physical restraints unnecessary for the management of confusion. (C)” (2) • “In conclusion, this meta-analysis suggests that multicomponent nonpharmacological interventions are effective in decreasing delirium incidence and preventing falls, potentially saving more than \$16 billion annually in the United States alone.” (3) |
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| Measure Importance | |
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| Relationship to Desired Outcome | <p>Inpatient delirium is prevalent (particularly in ischemic stroke, brain hemorrhage, seizure, and TBI). Many of the important risk factors for the development of delirium are common in neurology inpatients (cognitive impairment, visual/hearing impairment, immobilization, restraints, urinary catheter, polypharmacy, high-risk meds (antipsych), sleep deprivation, sedative-hypnotics, acute illness. (4,5,6,7,8)</p> <p>It increases average daily costs by 2.5x at \$16-64K per patient (9). It increases the risk of a function decline (3x), nosocomial infections, prolonged LOS and DC to ARF-SNF (3-5x), death (10x), poor functional recovery and persistence of poor long term cognitive outcome.</p> <p>Delirium is an acute and fluctuating disturbance of attention and awareness (10) that is most common in elderly patients (11) and patients with neurologic diseases such as dementia (12) and stroke (13). Delirium is associated with complications such as falls (14) as well as dependence (15) and death (16). Delirium can be the most common diagnosis during</p> |

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| | <p>inpatient neurology consultations (17,18) and one of the top five neurologic diagnoses overall in academic hospitals (19).</p> <p>Although not a specific measure in this measure set, those at high risk are best screened for delirium using standard delirium screening tools, which are included in this non-exhaustive list:</p> <ul style="list-style-type: none"> • Confusion Assessment Method for the ICU (CAM-ICU) • Intensive Care Delirium Screening Checklist (ICDSC) • Nursing Delirium Screening Scale (Nu-DESC) • Delirium Detection Score (DDS) • Cognitive Test for Delirium (CTD) • Short CAM • Long CAM • 3D-CAM |
| Opportunity for Improvement | The seriousness of delirium can be underrated, however delirium is a problem for more than 2.3 million elderly. (6) This problem accounts for about \$4 billion in expenditures for Medicare alone. (6) 50% of cases preventable. (1,6) Better care can be delivered by screening those at high risk to catch delirium early. |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input checked="" type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |

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| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input checked="" type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. National Collaborating Centre for Acute and Chronic Conditions. Delirium: diagnosis, prevention and management. London (UK): National Institute for Health and Clinical Excellence (NICE); 2010 Jul. 29 p. (Clinical guideline; no. 103). 2. Royal College of Physicians. The prevention, diagnosis and management of delirium in older people. Concise Guidance to Good Practice – A series of evidence-based guidelines for clinical management. 2006. 3. Hshieh T, Yue J, Oh E. Effectiveness of Multicomponent Nonpharmacological Delirium Interventions. JAMA 2015; 175(4):512-520. 4. Lee E, Gibbs NE, Fahey L, et al. Making Hospitals Safer for older adults: updating quality metrics by understanding hospital-acquired delirium and its link to falls. Perm J 2013; 17(4):32-6. 5. Reston JT, Schoelles KM. In-facility delirium prevention programs as a patient safety strategy: a systematic review. Ann Intern Med 2013; 158:375-80. 6. Marcantonio ER. In the Clinic. Delirium. Ann Intern Med 2011; 154(11):ITCG-1. 7. Inouye SK, Bogardus ST, Charpentier PA, et al. A multicomponent intervention to prevent delirium in hospitalized older patients. NEJM 1999; 340:669-676. 8. Inouye SK, Baker D, Fugal P, et al. Dissemination of the Hospital Elder Life Program: Implementation, Adaptation, and Successes. JAGS 2006; 54(10):1492-1499. 9. Leslie D, Marcantonio ER, Zhang Y, et al. One-year health care costs associated with delirium in the elderly population. Archives of Internal Medicine 2008; 168(1):27-32. 10. American Psychiatric Association. DSM-5 Task Force. Diagnostic and statistical manual of mental disorders: DSM-5, 5th ed. Washington D.C.: American Psychiatric Publishing, 2013. 11. Maracantonio ER. Postoperative delirium: a 76-year-old woman with delirium following surgery. JAMA 2012; 308:73-81. 12. Robertsson B, Blennow K, Gottfries CG, Wallin A. Delirium in dementia. Int J Geriatr Psychiatry 1998; 13:49-56. 13. Melkas S, Laurila JV, Vataja R, et al. Post-stroke delirium in relation to dementia and long-term mortality. Int J Geriatr Psychiatry 2012; 27:401-408. 14. Marcantonio ER, Kiely DK, Simon SE, et al. Outcomes of older people admitted to postacute facilities with delirium. J Am Geriatr Soc 2005; 53:963-969. 15. McAvay GJ, Van Ness PH, Bogardus ST, Jr., et al. Older adults discharged from the hospital with delirium: 1-year outcomes. J Am Geriatr Soc 2006;54:1245-1250. 16. Rockwood K, Cosway S, Carver D, et al. The risk of dementia and death after delirium. Age Ageing 1999;28:551-556. 17. D’Esposito M. Profile of a neurology residency. Arch Neurol 1995;52:1123-1126. 18. Cruz-Velarde JA, Gil de Castro R, Vazquez Allen P, Ochoa Mulas M. [Study of inpatient consultation for the neurological services]. Neurologia 2000;15:199-202. 19. Ances B. The more things change the more they stay the same: a case report of neurology residency experiences. J Neurol 2012;259:1321-1325. | |
| Denominator | <u>ICD-10 Code:</u> F05 Delirium due to known physiological condition AND <u>CPT E/M Service Code:</u> |

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| | <p>99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient);</p> <p>99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient);</p> <p>99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> |
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Immunosuppressive treatment for GBS

| Measure Description | |
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| Percent of patients admitted to an inpatient facility with Guillain-Barre syndrome (GBS) who are nonambulatory with documentation that immunosuppressive therapy using plasmapheresis (PE) or intravenous immunoglobulin (IVIG) given and not prescribed corticosteroids. | |
| Measure Components | |
| Numerator Statement | Patients admitted to an inpatient facility with GBS who are nonambulatory with documentation that immunosuppressive therapy using plasmapheresis (PE) or IVIG given and not prescribed corticosteroids. |
| Denominator Statement | Patients admitted to inpatient facility with confirmed diagnosis of GBS who are nonambulatory. |
| Denominator Exceptions | <ul style="list-style-type: none"> • Alternative diagnosis suspected and treated • GBS refractory to first line treatments • Patient has a previous history of severe systemic or anaphylactic response to IVIG. • Patient is known to have anti-IgA antibodies with selective IgA deficiencies. • Patient cannot tolerate central line placement. • Patient is actively septic or hemodynamically unstable. • Patient has an allergy to fresh frozen plasma or albumin. • Patient has a heparin allergy that prevents receiving heparin as an anticoagulant during plasmapheresis. • Patient with hypocalcemia. • Patients that are beyond 4 weeks of onset • Patients who refuse |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “Plasmapheresis should be offered in the treatment of ...GBS severe enough to impair independent walking or to require mechanical ventilation (Level A). Plasmapheresis should be considered in the treatment of milder clinical presentations of ...GBS (Level B).” (1) • “[Plasma Exchange] PE is recommended for nonambulant patients within 4 weeks of onset (level A, class II evidence) and for ambulant patients within 2 weeks of onset (level B, limited class II evidence). The effects of PE and IV immunoglobulin (IVIg) are equivalent (see below). There is insufficient evidence to recommend the use of CSF filtration (level U, limited class II evidence).” (2) • “IVIg is recommended for patients with GBS who require aid to walk within 2 (level A recommendation) or 4 weeks from the onset of neuropathic symptoms (level B recommendation derived from class II evidence concerning PE started within the first 4 weeks and class I evidence concerning the comparisons between PE and IVIg |

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| | <p>started within the first 2 weeks). The effects of IVIg and PE are equivalent.” (2)</p> <ul style="list-style-type: none"> • “Sequential treatment with PE followed by IVIg (level A recommendation, class I evidence) or immunoabsorption followed by IVIg (level U recommendation, class IV evidence) is not recommended.” (2) • “Corticosteroids are not recommended for the treatment of patients with GBS (level A, class I evidence).” (2) • “PE and IVIg are treatment options for children with severe GBS (level B recommendation derived from class II evidence in adults).” (2) • “There is insufficient evidence to support or refute the effectiveness of IVIg in children with GBS (Level U). IVIg should be offered to treat GBS in adults (Level A). IVIg combined with plasmapheresis should not be considered for treating GBS (Level B). Evidence is insufficient to recommend MP in combination with IVIg (Level U).” (3) • “IVIg combined with plasmapheresis should not be considered for treating GBS (Level B).” (3) |
| Measure Importance | |
| Relationship to Desired Outcome | Guillain-Barre syndrome encompasses a number of acute inflammatory polyneuropathies that leads to weakness which can be severe enough to make patients non-ambulatory and require mechanical ventilation. The duration of weakness and functional impairment can be weeks to months long. Treatment of patients who are nonambulatory with either plasmapheresis or intravenous immunoglobulin (but not corticosteroids) decreases the duration of functional impairment, shortens the time until a plateau of the illness and may decrease the likelihood of mechanical ventilation (3,4). |
| Opportunity for Improvement | Corticosteroids alone are not enough to treat GBS and should not be given. Proper treatment consist of IVIg or PE. |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |

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| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input type="checkbox"/> Practice <input type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Cortese I, Chaudhry V, So YT, et al. Evidence-based guideline update: Plasmapheresis in neurologic disorders. Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. <i>Neurology</i> 2011; 76(3):294-300. 2. Hughes RAC, Wijdicks EFM, Barohn R., et al. Practice parameter: Immunotherapy for Guillain-Barre syndrome. Report of the Quality Standards Subcommittee of the American Academy of Neurology. <i>Neurology</i> 2003;61-736-740. 3. Patwa HS, Chaudhry V, Katzberg H, et al. Evidence-based guideline: Intravenous immunoglobulin in the treatment of neuromuscular disorders. Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. <i>Neurology</i> 2012; 78(13):1009-1015. 4. van der Meché FG, Schmitz PI. A randomized trial comparing intravenous immunoglobulin and plasma exchange in Guillain-Barre Syndrome. Dutch Guillain-Barre study group. <i>N Engl J Med</i> 1992; 326(17):1123-9. | |
| Denominator | <u>ICD-10 Code:</u> G65.0 Sequelae of Guillain-Barre syndrome AND <u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes) |

Immunosuppressive Therapy for Myasthenic Crisis

| Measure Description | |
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| Percent of patients with myasthenic crisis that are given immunosuppressive therapies (PE or IVIG). | |
| Measure Components | |
| Numerator Statement | Patients with myasthenic crisis that are given immunosuppressive therapies (PE or IVIG). |
| Denominator Statement | Patients admitted to inpatient facility with a diagnosis of myasthenic crisis. |
| Denominator Exceptions | <ul style="list-style-type: none"> • Patient has a previous history of severe systemic or anaphylactic response to IVIG. • Patient is known to have anti-IgA antibodies with selective IgA deficiencies. • Patient cannot tolerate central line placement. • Patient is actively septic or hemodynamically unstable. • Patient has an allergy to fresh frozen plasma or albumin. • Patient has a heparin allergy that prevents receiving heparin as an anticoagulant during plasmapheresis. • Patient with hypocalcemia. • Patient refusal |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “IVIg should be considered in the treatment of MG (Level B).” (1) • “Because of the lack of randomized controlled studies with masked outcomes, there is insufficient evidence to support or refute the efficacy of plasmapheresis in the treatment of myasthenic crisis (Level U) or MG prethymectomy (1).” • “Immunomodulatory treatment is considered standard of care for patients with [myasthenic crisis] MC. Specific immunotherapy consists in plasma exchange (PE), immunoadsorption (IA), and human IVIg. All of them have demonstrated similar efficacy, so they can be chosen by availability, adverse effects, costs, experience, and patients’ profile.” (2) • “...there is not enough evidence of high quality to support one therapy over another during MC. If there is insufficient or no response to treatment, PE can be given after IVIg, and IVIg can be administered after PE.” (2) |
| Measure Importance | |
| Relationship to Desired Outcome | Myasthenic crisis, where worsening of respiratory function due to neuromuscular weakness of the muscles of respiration often necessitates intubation, is a life-threatening condition that is a neurologic emergency. Myasthenic crisis can be difficult for physicians to recognize, especially in patients who do not carry a preexisting diagnosis of myasthenia gravis. Common triggers include recent surgery, systemic infection, and some |

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| | specific medications. When myasthenic patients in crisis are given immunotherapy with either plasmapheresis or intravenous immunoglobulin, more rapid recovery is facilitated including weaning from mechanical ventilation, decreasing the likelihood of requiring tracheostomy, and regaining functional independence (3,4,5). |
| Opportunity for Improvement | Myasthenic crisis should be treated with plasmapheresis or IVIg and not corticosteroids alone. |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Patwa HS, Chaudhry V, Katzberg H, et al. Evidence-based guideline: Intravenous immunoglobulin in the treatment of neuromuscular disorders. Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. <i>Neurology</i> 2012; 78(13):1009-1015. 2. Godoy DA, Mello LJ, Masotti L, et al. The myasthenic patient in crisis: an update of the management in Neurointensive Care Unit. <i>Arq Neuropsiquiatr</i> 2013;71(9-A):627-639. 3. Gajdos P, Chevret S, Clair B. Clinical trial of plasma exchange and high-dose intravenous immunoglobulin in myasthenia gravis. <i>Myasthenia Gravis clinical study group. Ann Neurol</i> 1997; 41(6):789-96. | |

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| <p>4. Qureshi AI, Choudhry MA, Akbar MS. Plasma exchange versus intravenous immunoglobulin treatment in myasthenic crisis. <i>Neurology</i> 1999; 52(3):629</p> <p>5. Mandawat A, Kaminski HJ, Cutter G. Comparative analysis of therapeutic options used for myasthenia gravis. <i>Ann Neurol</i> 2010; 68(6):797-805.</p> | |
| Denominator | <p><u>ICD-10 Code:</u></p> <p>G70 Myasthenia gravis and other myoneural disorders G70.0 Myasthenia gravis G70.00 without (acute) exacerbation G70.01 with (acute) exacerbation</p> <p>AND</p> <p><u>CPT E/M Service Code:</u></p> <p>99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> |

Status Epilepticus Identification and Seizure Cessation

| Measure Description | |
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| Percent of patients in generalized convulsive status epilepticus (SE) rapidly identified and treated with benzodiazepines | |
| Measure Components | |
| Numerator Statement | <p>Patients in generalized convulsive status epilepticus rapidly* identified and treated with benzodiazepines.</p> <p>*Rapidly does not have a specific time frame defined in the literature for this context</p> |
| Denominator Statement | Patients diagnosed with generalized convulsive status epilepticus. |
| Denominator Exceptions | <ul style="list-style-type: none"> • Neonates • Patient received benzodiazepines by emergency services prior to arrival at ED that resulted in SE resolving • Patients with allergies or reaction to these types of drugs |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. The protocol defined here is not applicable to neonates. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “The treatment of convulsive SE should occur rapidly and continue sequentially until clinical seizures are halted (<i>strong recommendation, high quality</i>).” (1) • “Critical care treatment and monitoring should be started simultaneously with emergent initial therapy and continued until further therapy is consider successful or futile (<i>strong recommendation, moderate quality</i>).” (1) • “Treatment options <ol style="list-style-type: none"> a. Benzodiazepines should be given as emergent initial therapy (<i>strong recommendation, high quality</i>). <ol style="list-style-type: none"> i. Lorazepam is the drug of choice for intravenous (IV) administration (<i>strong recommendation, moderate quality</i>). ii. Midazolam is the drug of choice for intramuscular (IM) administration (<i>strong recommendation, moderate quality</i>). iii. Rectal diazepam can be given when there is no IV access and IM administration of midazolam is contraindicated (<i>strong recommendation, moderate quality</i>). • “In [Generalised Convulsive Status Epilepticus] GCSE, the preferred treatment pathway is i.v. administration of 0.1 mg/kg lorazepam (Level A). Depending on the patient's general medical condition, the clinician may decide to start treatment at a lower dose of 4 mg and repeat this dose if SE is not terminated within 10 min (Level B). A single shot of 4 mg lorazepam has proven to be sufficient in more than 80% of patients |

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| | <p>with successfully treated SE. If i.v. lorazepam is not available (e.g., in France), 10 mg diazepam directly followed by 18 mg/kg phenytoin or equivalent fosphenytoin may be given instead (Level A). Phenytoin should be loaded rapidly with an infusion rate at 50 mg/min; this regimen is as safe as anticonvulsant treatment using other drugs (Level A). However, it should be kept in mind that length of infusion time for diazepam followed by phenytoin is about 40 min compared to the 5 min for administration of lorazepam. If possible, pre-hospital treatment is recommended, and in GCSE, i.v. administration of 2 mg lorazepam is as effective as 5 mg diazepam (Level A). Out-of-hospital, i.v. administration of benzodiazepines in GCSE is as safe as placebo treatment (Level A)” (2)</p> <ul style="list-style-type: none"> • “Patients who received adequate first-line treatment were 6.8 times more likely to have seizure termination...”(3) • “Inadequate initial management was 4.7 times more likely to need several benzodiazepine doses and 9.1 times more likely to require a long-acting AED as next treatment.” (3) • “Definitive control of SE should be established within 60 min of onset” (1) • The following conclusions were drawn. In adults, IM midazolam, IV lorazepam, IV diazepam (with or without phenytoin), and IV phenobarbital are established as efficacious at stopping seizures lasting at least 5 minutes (level A). Intramuscular midazolam has superior effectiveness compared with IV lorazepam in adults with convulsive status epilepticus without established IV access (level A). Intravenous lorazepam is more effective than IV phenytoin in stopping seizures lasting at least 10 minutes (level A). There is no difference in efficacy between IV lorazepam followed by IV phenytoin, IV diazepam plus phenytoin followed by IV lorazepam, and IV phenobarbital followed by IV phenytoin (level A). Intravenous valproic acid has similar efficacy to IV phenytoin or continuous IV diazepam as second therapy after failure of a benzodiazepine (level C). (16) • The following conclusions were drawn. In adults with status epilepticus without established IV access, IM midazolam is established as more effective compared with IV lorazepam (level A). No significant difference in effectiveness has been demonstrated between lorazepam and diazepam in adults with status epilepticus (level A). (16) • The following conclusions were drawn. In children with status epilepticus, no significant difference in effectiveness has been established between IV lorazepam and IV diazepam (level A). In children with status epilepticus, non-IV midazolam (IM/intranasal/buccal) is probably more effective than diazepam (IV/rectal) (level B). (16) • A benzodiazepine (specifically IM midazolam, IV lorazepam, or IV diazepam) is recommended as the initial therapy of choice, given their |
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| | <p>demonstrated efficacy, safety, and tolerability (level A, four class I RCTs) (16)</p> <ul style="list-style-type: none"> Intravenous lorazepam is better than intravenous diazepam or intravenous phenytoin alone for cessation of seizures. Intravenous lorazepam also carries a lower risk of continuation of status epilepticus requiring a different drug or general anaesthesia compared with intravenous diazepam. Both intravenous lorazepam and diazepam are better than placebo for the same outcomes. (17) Although multiple AEDs have been studied as first linetherapy for SE, evidence supports and experts agree that benzodiazepines should be the agent of choice for emergent initial treatment. (1) |
| Measure Importance | |
| Relationship to Desired Outcome | <p>Status epilepticus is a major neurological condition with significant morbidity and mortality. Morbidity, defined as severe neurological or cognitive sequelae, has been estimated to be in the range of 11 – 16 % (4-7) and deterioration of functional status to be in the range of 23 – 26% (4,8,9). Mortality at hospital discharge has been estimated to be in the range of 9 – 21% (4,8- 10). The only study done in the US to project annual direct costs for the USA was done in 2005 and projected the cost for admissions for Status Epilepticus in a single year to be \$ 4 billion (11).</p> <p>Although multiple AEDs have been studied as first line therapy for Status Epilepticus, evidence supports that benzodiazepines should be the agent of choice for emergency initial treatment (4, 12 – 14).</p> |
| Opportunity for Improvement | <p>“Status epilepticus is an under-recognized health problem associated with substantial morbidity and mortality. An estimated 152,000 cases occur per year in the United States, resulting in 42,000 deaths and an inpatient cost of \$3.8 to \$7 billion per year.” (15)</p> <p>According to the Neuro Critical Care Society’s 2012 guidelines “the principle goal of treatment is to emergently stop both clinical and electrographic seizure activity”.(1) The traditional treatment method was done in stages (1st, 2nd, 3rd, and 4th line), however this treatment technique is not enough to stop seizures quickly. The Neurocritical Care guideline updated the treatment method to 1) emergent initial therapy, 2) urgent control therapy, and 3) refractory therapy. (1)</p> |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |

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| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Brophy GM, Bell R, Claassen J, et al., Neurocritical Care Society Status Epilepticus Guideline Writing Committee. Guidelines for the evaluation and management of status epilepticus. <i>Neurocrit Care</i>. 2012 Aug;17(1):3-23. 2. Meierkord H, Boon P, Engelsens B, et al., European Federation of Neurological Societies. EFNS guideline on the management of status epilepticus in adults. <i>Eur J Neurol</i>. 2010;17(3):348-55. 3. Aranda A, Foucart G, Ducasse' JL. Generalized convulsive status epilepticus management in adults: a cohort study with evaluation of professional practice. <i>Epilepsia</i>. 2010;51(10):2159–67. 4. Alldredge BK. A comparison of lorazepam, diazepam, and placebo for the treatment of out of hospital status epilepticus. <i>N Eng J Med</i> 2001; 345(9): 631 – 7. 5. Oxbuy JM. Causes and consequences of Status Epilepticus in Adults. A study of 89 cases. <i>Brain</i>. 1971; 94 (4): 733 – 44. 6. Aminoff MJ, Simon RP. Status Epilepticus: causes, clinical features and consequences in 98 patients. <i>Am J Med</i> 1980, 69 (5): 657 – 66. 7. Lowenstein DH, Alldredge BK. Status Epilepticus at an urban public hospital in the 1980's. <i>Neurology</i>. 1993; 43 (3 Pt 1): 483 – 88. 8. Claassen J, et al. Predictors of functional disability and mortality after Status Epilepticus. <i>Neurology</i> 2002; 58 (1): 139 – 42. 9. Novy J, Rosetti AO. Oral pregabalin as add on treatment for Status Epilepticus. <i>Epilepsia</i>. 2010 (10): 2207 – 10. 10. Rosetti AO, et al. Prognosis of Status Epilepticus: role of aetiology, age, and conscious impairment at presentation. <i>J Neurol Neurosurg Psychiatry</i> 2006; 77 (5): 611-5. 11. Penberthy LT, et al. Estimating the economic burden of Status Epilepticus to the health care system. <i>Seizure</i>. 2005. 14 (1): 46 – 51. 12. Treiman DM, et al. A comparison of four treatments for generalized convulsive status epilepticus. Veteran Affairs status epilepticus cooperative study group. <i>N Eng J Med</i>. 1998; 339 (12): 792 – 8. 13. Leppik IE, et al. Double blind study of lorazepam and diazepam in Status Epilepticus. <i>JAMA</i>. 1983; 249 (11): 1452 – 4. | |

14. Silbergleit R, et al. Intramuscular versus intravenous therapy for prehospital status epilepticus. N Eng J Med 2012; 366 (7): 591 – 600.
15. Sirven J, Waterhouse E. Management of Status Epilepticus. Am Fam Physician 2003;68(3):469-476.
16. Glauser T, Shinnar S, Gloss D, et al. Evidence-Based Guideline: Treatment of Convulsive Status Epilepticus in Children and Adults: Report of the Guideline Committee of the American Epilepsy Society. Epilepsy Currents 2016; 16:48-61.
17. Prasad M, Kirshnan PR, Sequeira R, Al-Roomi K. Anticonvulsant therapy for status epilepticus. Cochrane Database Syst Rev 2014; 10:CD003723.

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| Denominator | <p><u>ICD-10 Code:</u> G40.311 Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus G40.411 Other generalized epilepsy and epileptic syndromes, intractable, with status epilepticus</p> <p>AND</p> <p><u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> |
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Status Epilepticus Treatment with AED/Anti-Seizure Medication

| Measure Description | |
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| Percentage of patients with generalized convulsive status epilepticus (SE) rapidly treated with a non-benzodiazepine antiepileptic/anti-seizure medication following (or simultaneously ordered with) the administration of benzodiazepine | |
| Measure Components | |
| Numerator Statement | <p>Patients with generalized convulsive status epilepticus (SE) rapidly* treated with a non-benzodiazepine antiepileptic/anti-seizure medication following (or simultaneously ordered with) the administration of a benzodiazepine</p> <p>* Rapidly does not have a specific time frame defined in the literature for this context</p> |
| Denominator Statement | Patients aged 16 and older diagnosed with generalized convulsive status epilepticus |
| Denominator Exceptions | <ul style="list-style-type: none"> • Status Epilepticus due to alcohol or benzodiazepine/barbiturate withdrawal • Pediatric febrile SE patients • Pediatric patient already prescribed an anti-epileptic medication |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “The treatment of convulsive SE should occur rapidly and continue sequentially until clinical seizures are halted (strong recommendation, high quality)” (1) • “Critical care treatment and monitoring should be started simultaneously with emergent initial therapy and continued until further therapy is consider successful or futile (strong recommendation, moderate quality)” (1) • “Urgent control [Anti-epileptic drug] AED therapy recommendations include use of IV fosphenytoin/phenytoin, valproate sodium, or levetiracetam (strong recommendation, moderate quality)” (1) • “Urgent SE control therapy with an AED immediately after benzodiazepine administration (within 5-10 minutes post seizure onset) is recommended.” (1) • “Patients who received adequate first-line treatment were 6.8 times more likely to have seizure termination...”(2) • “Inadequate initial management was 4.7 times more likely to need several benzodiazepine doses and 9.1 times more likely to require a long-acting AED as next treatment.” (2) |

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| | <ul style="list-style-type: none"> • “Definitive control of SE should be established within 60 min of onset” (1) |
| Measure Importance | |
| Relationship to Desired Outcome | Urgent control AED treatment following administration of short acting benzodiazepines is required in all patients with Status Epilepticus unless the immediate cause of SE is known and definitely corrected (e.g. Severe hypoglycemia). There are two potential goals of urgent control therapy in Status Epilepticus. For patients who have responded to emergent initial therapy and have complete resolution of SE, the goal is rapid attainment of therapeutic levels of an AED and continued dosing for maintenance therapy. For patients who failed emergent initial therapy, the goal of urgent control therapy is to stop SE. (1). |
| Opportunity for Improvement | <p>“Status epilepticus is an under-recognized health problem associated with substantial morbidity and mortality. An estimated 152,000 cases occur per year in the United States, resulting in 42,000 deaths and an inpatient cost of \$3.8 to \$7 billion per year.” (3)</p> <p>According to the Neuro Critical Care Society’s 2012 guidelines “the principle goal of treatment is to emergently stop both clinical and electrographic seizure activity”.(1) The traditional treatment method was done in stages (1st, 2nd, 3rd, and 4th line), however this treatment technique is not enough to stop seizures quickly. The Neurocritical Care guideline updated the treatment method to 1) emergent initial therapy, 2) urgent control therapy, and 3) refractory therapy.</p> |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |

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| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input checked="" type="checkbox"/> Administrative Data/Claims <input type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Brophy GM, Bell R, Claassen J, et al., Neurocritical Care Society Status Epilepticus Guideline Writing Committee. Guidelines for the evaluation and management of status epilepticus. Neurocrit Care. 2012 Aug;17(1):3-23. 2. Aranda A, Foucart G, Ducasse' JL. Generalized convulsive status epilepticus management in adults: a cohort study with evaluation of professional practice. Epilepsia. 2010;51(10):2159–67. 3. Sirven J, Waterhouse E. Management of Status Epilepticus. Am Fam Physician 2003;68(3):469-476. | |
| Denominator | <u>ICD-10 Code:</u> (Generalized convulsive status epilepticus) G40.311 Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus G40.411 Other generalized epilepsy and epileptic syndromes, intractable, with status epilepticus AND <u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes) |

EEG for Status Epilepticus and Coma

| Measure Description | |
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| Percentage of patients with generalized convulsive status epilepticus who remain in coma should have urgent EEG applied and interpreted | |
| Measure Components | |
| Numerator Statement | <p>Patients with generalized convulsive status epilepticus who remain in coma should have urgent* EEG applied and interpreted.</p> <p>*Urgent does not have a specific time frame defined in the literature for this context</p> |
| Denominator Statement | Patients aged 16 and older with generalized convulsive status epilepticus that are in coma |
| Denominator Exceptions | None |
| Exception Justification | N/A |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “The use of cEEG is usually required for the treatment of SE (strong recommendation, very low quality)” (1) • “Continuous EEG monitoring should be initiated within 1 hour of SE onset if ongoing seizures are suspected (strong recommendation, low quality)” (1) • “The person reading EEG in the ICU setting should have specialized training in cEEG interpretation, including the ability to analyze raw EEG as well as quantitative EEG tracings (strong recommendation, low quality)” (1) • “Definitive control of SE should be established within 60 min of onset” (1) |
| Measure Importance | |
| Relationship to Desired Outcome | <p>The cornerstone of diagnosis of nonconvulsive status epilepticus is the correlation of EEG seizure activity to an observed alteration in cognitive function. Coma, being one of the most profound manifestations of an altered consciousness, can be associated with nonconvulsive status epilepticus. Electrical status epilepticus in coma has often been an incidental observation in comatose patients in whom an EEG was obtained. (2) Such a diagnosis would change medical management of the patient and has the potential to improve the outcome.</p> |

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| Opportunity for Improvement | “Status epilepticus is an under-recognized health problem associated with substantial morbidity and mortality. An estimated 152,000 cases occur per year in the United States, resulting in 42,000 deaths and an inpatient cost of \$3.8 to \$7 billion per year.” (3) |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Brophy GM, Bell R, Claassen J, et al., Neurocritical Care Society Status Epilepticus Guideline Writing Committee. Guidelines for the evaluation and management of status epilepticus. Neurocrit Care. 2012 Aug;17(1):3-23. 2. Towne AR, et al. Prevalence of nonconvulsive status epilepticus in comatose patients. Neurology 2000; 54: 340 – 345 | |

3. Sirven J, Waterhouse E. Management of Status Epilepticus. Am Fam Physician 2003;68(3):469-476.

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| Denominator | <p><u>ICD-10 Code:</u> G40.311 Generalized idiopathic epilepsy and epileptic syndromes, intractable, with status epilepticus G40.411 Other generalized epilepsy and epileptic syndromes, intractable, with status epilepticus</p> <p>AND</p> <p><u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> <p>95812 Electroencephalogram (EEG) extended monitoring; 41-60 minutes 95813 Electroencephalogram (EEG) extended monitoring; greater than 1 hour 95816 Electroencephalogram (EEG); including recording awake and drowsy 95819 Electroencephalogram (EEG); including recording awake and asleep 95822 Electroencephalogram (EEG); recording in coma or sleep only 95824 Electroencephalogram (EEG); cerebral death evaluation only 95827 Electroencephalogram (EEG); all night recording</p> |
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Discussion and Documentation of Advanced Directives

| Measure Description | |
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| Percent of patients with a neurological condition admitted to the hospital who have documentation of advanced directive and a healthcare proxy | |
| Measure Components | |
| Numerator Statement | Patients with a neurological condition admitted to the hospital who have documentation of advanced directives presence and a healthcare proxy OR documentation of a conversation to determine advanced directives and a durable power of attorney during the course of admission. |
| Denominator Statement | Any adult patient with a primary neurological diagnosis at the time of admission |
| Denominator Exceptions | <ul style="list-style-type: none"> • Patients with new diagnosis at the time of admission • Patients who are aphasic or otherwise unable to speak for self |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “Among our subjects, 42.5% needed decision making about medical treatments before death; in this group, 70.3% of subjects lacked the capacity to make those decisions themselves.” (1) • “These findings suggest that more than a quarter of elderly adults may need surrogate decision making before death.” (1) • “Among subjects who needed surrogate decision making, 67.6% had an advance directive. This result confirms previous findings and shows a great increase in the use of advance directives since the Study to Understand Prognoses and Preferences for Outcomes and Risk of Treatments first reported that only 21% of seriously ill, hospitalized patients had an advance directive.” (1) • “Although a causal relationship cannot be inferred, our findings suggest that advance directives do influence decisions made at the end of life.” (1) • “Discuss a patient’s wishes before clinical deterioration, possibly over several visits. Start by determining how much the patients desires to know about their disease and how much they desire to participate in decision making. When translation is required, a professional interpreter (rather than a family member) is advisable. <ul style="list-style-type: none"> ○ Determine the patient’s understanding of the disease and condition ○ Discuss the anticipated course of illness, treatment choices, and options in relation to a patient’s preferences, needs, and expectations |

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| | <ul style="list-style-type: none"> ○ Document advance care planning discussion and the existence of any Advance Directive/Representation Agreement ○ Identify and appoint a legal substitute decision maker, ideally a person familiar with the patient’s preferences and able to make informed decisions. ○ Establish plans for key decisions for acute episodes, crisis events, and declining function in relation to life-sustaining therapies and hospitalizations, considering all co-morbidities ○ Clarify the patient’s preferred place of care ○ Establish caregiver’s ability to provide care at home if that is the patient’s preference ○ Review both regularly and when there is a change in clinical status” (2) ● “The care plan is based upon ongoing assessment and reflects goals set by the patient, family or surrogate in collaboration with treatment team. Such goals reflect the changing benefits and burdens of various care options, at critical decision points during the course of illness.” (3) ● “Clinicians should initiate or facilitate advance care planning for all adult patients and their families with regular review as the patient’s condition changes. (low quality of evidence, strong recommendation)” (4) ● “Assist patient in advance care planning: <ul style="list-style-type: none"> ○ Help the patient identify a surrogate who would make decisions on their behalf if they did not have decision-making capacity ○ Incorporate the patient’s goals preferences and choices into the advance care plan ○ Encourage the patient to discuss their preferences and care plan with the surrogate, family member, spiritual counselor and others ○ Encourage the patient to complete an Advance Directive” (5) ● “Documentation and Implementation: <ul style="list-style-type: none"> ○ Place a copy of the Advance Directive and other documentation of the patient’s goals and preferences for end-of-life care in the patient’s record ○ Share the POLST throughout the health system as appropriate, and make accessible to emergency departments, EMS companies, nursing homes, etc.” (5) |
| Measure Importance | |
| Relationship to Desired Outcome | Neurological conditions in the inpatient and emergency care settings can be life threatening illnesses. Evidence for the Medicare population presented that patients with life limiting advanced directives generated lower Medicare end-of-life costs. (6) |

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| Opportunity for Improvement | In the inpatient and emergency settings where a patient is critical, this might not get addressed as there are other more emergent concerns. It is estimated that only about 21% of seriously ill patients have advanced directives documented.(1) |
| National Quality Strategy Domains | <input checked="" type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | While there are other measures currently available on this topic, the work group felt it was necessary to create one specific to hospital care as It is estimated that only about 21% of seriously ill patients have advanced directives documented.(1) |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input type="checkbox"/> Quality improvement <input checked="" type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input checked="" type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Silveira MJ et al. "Advance directives and outcomes of surrogate decision making before death." NEJM. 2010; 362:1211-1218 2. British Columbia Medical Services Commission. Palliative Care for the Patient with Incurable Cancer or Advanced Disease – Part 1: Approach to Care. 2010. | |

<http://www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/palliative1.pdf>. Accessed on October 15, 2015.

3. Clinical Practice Guidelines for Quality Palliative Care, Third Edition. National Consensus Project for Quality Palliative Care.
4. McCusker M, Ceronky L, Crone C. Institute for Clinical Systems Improvement. Palliative Care for Adults. Updated November 2013.
5. Michigan Quality Improvement Consortium Guideline. Advance Care Planning. January 2014. http://www.mqic.org/pdf/mqic_advance_care_planning_cpg.pdf
6. Nicholas LH, Langa KM, Iwashyna TJ, Weir DR. Regional variation in the association between advance directives and end-of-life medicare expenditures. JAMA 2011; 306:1447-53.

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| Denominator | <p><u>ICD-10 Code:</u> G00-G99 Diseases of the nervous system I63.9 Stroke/Cerebral Infarct D32, D33, D35 Neoplasm C72 Malignancies C71 Glioma</p> <p>AND</p> <p><u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes)</p> |
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Discussion and Documentation of Goals of Care

| Measure Description | |
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| Percentage of patients with a primary neurological condition that are admitted to the intensive care unit (ICU) who have documentation of a goals of care discussion with patient or patient surrogate. | |
| Measure Components | |
| Numerator Statement | Patients with a primary neurological condition that are admitted to the intensive care unit (ICU) who have documentation of a goals of care discussion with patient or patient surrogate. |
| Denominator Statement | Any patient with a primary neurological condition admitted to the ICU |
| Denominator Exceptions | <ul style="list-style-type: none"> • Patients unable to verbalize or discuss the issue who have no surrogate decision maker • Elective admissions into the hospital |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “Among our subjects, 42.5% needed decision making about medical treatments before death; in this group, 70.3% of subjects lacked the capacity to make those decisions themselves.” (1) • “These findings suggest that more than a quarter of elderly adults may need surrogate decision making before death.” (1) • “Among subjects who needed surrogate decision making, 67.6% had an advance directive. This result confirms previous findings and shows a great increase in the use of advance directives since the Study to Understand Prognoses and Preferences for Outcomes and Risk of Treatments first reported that only 21% of seriously ill, hospitalized patients had an advance directive.” (1) • “Although a causal relationship cannot be inferred, our findings suggest that advance directives do influence decisions made at the end of life.” (1) • “Discuss a patient’s wishes before clinical deterioration, possibly over several visits. Start by determining how much the patients desires to know about their disease and how much they desire to participate in decision making. When translation is required, a professional interpreter (rather than a family member) is advisable. <ul style="list-style-type: none"> ○ Determine the patient’s understanding of the disease and condition ○ Discuss the anticipated course of illness, treatment choices, and options in relation to a patient’s preferences, needs, and expectations |

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| | <ul style="list-style-type: none"> ○ Document advance care planning discussion and the existence of any Advance Directive/Representation Agreement ○ Identify and appoint a legal substitute decision maker, ideally a person familiar with the patient’s preferences and able to make informed decisions. ○ Establish plans for key decisions for acute episodes, crisis events, and declining function in relation to life-sustaining therapies and hospitalizations, considering all co-morbidities ○ Clarify the patient’s preferred place of care ○ Establish caregiver’s ability to provide care at home if that is the patient’s preference ○ Review both regularly and when there is a change in clinical status” (2) ● “The care plan is based upon ongoing assessment and reflects goals set by the patient, family or surrogate in collaboration with treatment team. Such goals reflect the changing benefits and burdens of various care options, at critical decision points during the course of illness.” (3) ● “Clinicians should initiate or facilitate advance care planning for all adult patients and their families with regular review as the patient’s condition changes. (low quality of evidence, strong recommendation)” (4) |
| Measure Importance | |
| Relationship to Desired Outcome | By engaging patients or patient surrogates in treatment plan, it is anticipated that patients will be more engaged in treatment and treatment outcomes will be reflective of patient wishes. |
| Opportunity for Improvement | Goals of care are rarely documented when a patient is in the hospital. This is a gap in care that can improve patient outcomes and patient satisfaction. |
| National Quality Strategy Domains | <input checked="" type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input type="checkbox"/> Accountability |

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| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input checked="" type="checkbox"/> System |
| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (I) data <input type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Silveira MJ et al. "Advance directives and outcomes of surrogate decision making before death." NEJM. 2010; 362:1211-1218. 2. British Columbia Medical Services Commission. Palliative Care for the Patient with Incurable Cancer or Advanced Disease – Part 1: Approach to Care. 2010. http://www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/palliative1.pdf. Accessed on October 15, 2015. 3. Clinical Practice Guidelines for Quality Palliative Care, Third Edition. National Consensus Project for Quality Palliative Care. 4. McCusker M, Ceronisky L, Crone C. Institute for Clinical Systems Improvement. Palliative Care for Adults. Updated November 2013. | |
| Denominator | <u>ICD-10 Code:</u> G00-G99 Diseases of the nervous system AND <u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes) |

Treatment of Bacterial Meningitis

| Measure Description | |
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| Percentage of patients >21 years of age where dexamethasone 10mg is given intravenously before or with the first dose of antibiotics in suspected acute bacterial meningitis. | |
| Measure Components | |
| Numerator Statement | Patients >21 years of age where dexamethasone 10mg is given intravenously before or with the first dose of antibiotics in suspected acute bacterial meningitis. |
| Denominator Statement | Patients with suspected acute bacterial meningitis |
| Denominator Exceptions | <ul style="list-style-type: none"> • History of hypersensitivity to corticosteroids • Treated with oral or parenteral antibiotics in the previous 48 hours • Recent history of head trauma, neurosurgery • CSF shunt <p>NOTE: primary referenced study also excluded pregnant patients, patients with peptic ulcer disease and patients with active tuberculosis or fungal infections⁴</p> |
| Exception Justification | Exceptions for contraindications necessary to avoid harm to patients. |
| Supporting Guideline & Other References | <p>The following statements are quoted verbatim from the referenced articles:</p> <ul style="list-style-type: none"> • “Delay in the initiation of therapy introduces the potential for increased morbidity and mortality if the patient does indeed have acute bacterial meningitis.” (1) • “On the basis of available evidence on the use of adjunctive dexamethasone in adults, we recommend use of dexamethasone (0.15 mg/kg q6h for 2-4 days) with the first dose administered 10-20 min before, or at least concomitant with, the first dose of antimicrobial therapy in adults with suspected or proven pneumococcal meningitis (A-I)” (1) • “...on the basis of the available evidence, we think that there are inadequate data to delineate specific guidelines on the interval between the initial physician encounter and the administration of the first dose of antimicrobial therapy (C-III)” (1). • “...bacterial meningitis is a neurologic emergency and appropriate therapy should be initiated as soon as possible after the diagnosis is considered to be likely” (1) • “Adjuvant dexamethasone is recommended with or shortly before the first parenteral dose of antibiotic in all previously well and non-immunosuppressed adults with pneumococcal meningitis...”(2) |

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| | <ul style="list-style-type: none"> • “In all patients with clinical suspected pneumococcal meningitis, we recommend that dexamethasone is given with the first dose of empirical antibiotic therapy as above” (2) • “Give dexamethasone for suspected or confirmed bacterial meningitis as soon as possible...” (3) • “If dexamethasone was not given before or with the first dose of antibiotics, but was indicated, try to administer the first dose within 4 hours of starting antibiotics, but do not start dexamethasone more than 12 hours after starting antibiotics.” (3) • “First, in all patients whose condition fulfills the inclusion criteria of the study, dexamethasone (at a dose of 10mg) should be initiated before or with the first dose of antibiotics and continued for four days (at a dose of 10mg every six hours).” (4) |
| Measure Importance | |
| Relationship to Desired Outcome | Meningitis is a serious medical condition that can deteriorate a patient’s health rapidly. This metric is intended to ensure rapid diagnosis and treatment of bacterial meningitis. |
| Opportunity for Improvement | According to many of the guidelines cited, there is an opportunity to rapidly identify and treat bacterial meningitis.(1-4) |
| National Quality Strategy Domains | <input type="checkbox"/> Patient and Family Engagement <input type="checkbox"/> Patient Safety <input type="checkbox"/> Care Coordination <input type="checkbox"/> Population/Public Health <input type="checkbox"/> Efficient Use of Healthcare Resources <input checked="" type="checkbox"/> Clinical Process/Effectiveness |
| Harmonization with Existing Measures | Harmonization with existing measures was not applicable to this measure. |
| Measure Designation | |
| Measure Purpose (Check all that apply) | <input checked="" type="checkbox"/> Quality improvement <input type="checkbox"/> Accountability |
| Type of Measure (Check all that apply) | <input checked="" type="checkbox"/> Process <input type="checkbox"/> Outcome <input type="checkbox"/> Structure |
| Level of Measurement (Check all that apply) | <input checked="" type="checkbox"/> Individual Provider <input checked="" type="checkbox"/> Practice <input checked="" type="checkbox"/> System |

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| Care Setting (Check all that apply) | <input type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Inpatient <input checked="" type="checkbox"/> Emergency Departments and Urgent Care <input type="checkbox"/> Residential (i.e., nursing facility, domiciliary, home care) |
| Data Source (Check all that apply) | <input checked="" type="checkbox"/> Electronic health record (EHR) data <input type="checkbox"/> Administrative Data/Claims <input checked="" type="checkbox"/> Chart Review <input type="checkbox"/> Registry |
| References | |
| <ol style="list-style-type: none"> 1. Tunkel A, Hartman B, Kaplan S. Practice Guidelines for the Management of Bacterial Meningitis. <i>Clinical Infectious Diseases</i> 2004; 39:1267-84. 2. Chaudhuri A, Martin PM, Kennedy PGE. EFNS guideline on the management of community-acquired bacterial meningitis: report of an EFNS task force on acute bacterial meningitis in older children and adults. <i>European Journal of Neurology</i> 2008; 15:649-659. 3. National Institute for Healthcare Excellence (NICE). Bacterial meningitis and meningococcal septicaemia. February 2015. 4. van de Beek D, de Gans J, Tunkel AR. Community-acquired bacterial meningitis in adults. <i>N. Engl J Med</i> 2006; 354:44-53. | |
| Denominatora | <u>ICD-10 Code:</u> G00 Bacterial meningitis, not elsewhere classified G00.0 Hemophilus meningitis G00.1 Pneumococcal meningitis G00.2 Streptococcal meningitis G00.3 Staphylococcal meningitis G00.8 Other bacterial meningitis G00.9 Bacterial meningitis, unspecified AND <u>CPT E/M Service Code:</u> 99221, 99222, 99223 (Initial hospital care 30, 50, or 70 minutes, per day, for the evaluation and management of a patient); 99231, 99232, 99233 (Subsequent hospital care 15, 25, or 35 minutes, per day, for the evaluation and management of a patient); 99291, 99292 (Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes, each additional 30 minutes) |

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15. Leslie D, Marcantonio ER, Zhang Y, et al. One-year health care costs associated with delirium in the elderly population. *Archives of Internal Medicine* 2008; 168(1):27-32.
16. Walling AD, Dickson G. Guillain-Barré Syndrome. *American Academy of Family Physicians* 2013. [Accessed online 7/6/2015]. www.aafp.org/afp.
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