

# Quality improvement in neurology

## Stroke and Stroke Rehabilitation Quality Measurement Set update



Julius Gene S. Latorre, MD, MPH  
Steven Flanagan, MD  
Michael S. Phipps, MD, MHS  
Anant M. Shenoy, MD  
Amy Bennett, JD  
David Seidenwurm, MD

Correspondence to  
American Academy of Neurology:  
quality@aan.com

Stroke is the fifth leading cause of death in the United States and the second leading cause of disability worldwide.<sup>1,2</sup> “On average, every 40 seconds, someone in the United States has a stroke, and someone dies of one approximately every 4 minutes.”<sup>3</sup> Each year, nearly 800,000 people experience stroke, with up to 185,000 experiencing recurrent stroke events.<sup>3</sup> Strokes occur at any age, and risk increases with age.<sup>4</sup> Nearly half of older stroke survivors experience moderate to severe disability.<sup>5</sup>

The economic consequence of stroke is staggering. The annual cost for stroke and cardiovascular disease was estimated to be \$320.1 billion.<sup>3</sup> Strokes alone cost the United States \$34 billion each year, including cost of health care services, medications to treat stroke, and missed days of work.<sup>3</sup> Although there have been improvements in the quality of care provided for stroke over the years, there are still opportunities to improve.

The American Medical Association Physician Consortium for Performance Improvement (PCPI) created stroke and stroke rehabilitation measures in 2008, and the American Academy of Neurology (AAN) in partnership with PCPI updated the measurement set in 2011. In 2015, the AAN assumed stewardship of the measurement set from the PCPI Foundation and embarked on an update to the measurement set. The AAN noted that opportunities exist to improve the stroke measurement landscape, in which the number and scope of available metrics have expanded substantially in the last few years, with measures being created and used by The Joint Commission, American Heart Association (AHA), American Stroke Association (ASA), American College of Cardiology, and others. The AAN formed a multidisciplinary work group to

evaluate new evidence and identify areas where quality improvement efforts could be focused and harmonized to meet patient and provider needs developing updated quality measures (table 1).

**OPPORTUNITIES FOR IMPROVEMENT** Several gaps in quality of care for people with stroke were identified following the literature review. The gaps present opportunities for improvement in the use of IV thrombolysis (tissue plasminogen activator [tPA]), endovascular treatment (ET), timely treatment following TIA, secondary prevention following stroke, dysphagia concerns, statin therapy, cognitive impairment following stroke, and uniform assessment of stroke outcomes across care settings. The work group chose to focus on these areas given the strong evidence and guideline statements supporting standard care for these continued gaps.

Until 2015, IV tPA was the only acute treatment for ischemic stroke associated with improved outcome. Due to limited treatment window, IV tPA use was very low. The development of stroke systems of care helped expand the use of IV tPA.<sup>6</sup> Since then, numerous studies have validated the efficacy of IV tPA and have identified factors associated with more robust treatment effect, including earlier time to treatment and patient-specific factors. A collaborative national quality improvement initiative report showed that the median door-to-needle time (DNT) for IV tPA administration was 77 minutes (interquartile range 60–98) and DNT of 60 minutes or less was only 26.5%, improving to 67 minutes and 41.3%, respectively, during the postintervention period. This improvement was associated with reduced in-hospital mortality and symptomatic intracranial hemorrhage and increased discharge to home.<sup>7</sup>

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Supplemental data  
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### GLOSSARY

**AAN** = American Academy of Neurology; **AHA** = American Heart Association; **ASA** = American Stroke Association; **CMS** = Center for Medicare and Medicaid Services; **DNT** = door-to-needle time; **ED** = emergency department; **ET** = endovascular treatment; **mRS** = modified Rankin Scale; **NIHSS** = NIH Stroke Scale; **PCPI** = Physician Consortium for Performance Improvement; **TICI** = Thrombolysis in Cerebral Infarction; **tPA** = tissue plasminogen activator.

From the Departments of Neurology and Neurosurgery (J.G.S.L.), Upstate Medical University, Syracuse; Department of Rehabilitation Medicine (S.F.), New York University School of Medicine, Rusk Rehabilitation, NYU-Langone Medical Center, New York, NY; Departments of Neurology and Epidemiology and Public Health (M.S.P.), University of Maryland School of Medicine, Baltimore; Baltimore VA Medical Center (M.S.P.), MD; Department of Neurology (A.M.S.), Baystate Health, Springfield, MA; American Academy of Neurology (A.B.), Minneapolis, MN; and Neuroradiology (D.S.), Diagnostic Imaging, Sutter Health, Sacramento, CA.

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**Table 1** 2016 Stroke and Stroke Rehabilitation Quality Measurement Set update

Measure no.	Measure title
	Intravenous Fibrinolytic Treatment Measure Bundle
	Acute Stroke Endovascular Treatment Measure Bundle
	Endovascular Treatment and Imaging Measure Bundle
	Carotid Imaging Measure
	Defect-Free Acute Inpatient Ischemic Stroke Measure Bundle
9	Patient/Caregiver Nutritional Preferences (updated in 2016)
	Potentially Avoidable Complications Following Stroke
	High and Moderate Intensity Statin Therapy Following Stroke
	Cognitive Impairment Screening Following Stroke
6	Rehabilitation Services Assessed (updated in 2016)
	Post-Acute Ischemic Stroke Screening and Care Measure Bundle
	Functional Outcome Assessment Following Recanalization Therapy for Acute Ischemic Stroke

In patients with proximal vessel occlusion, 60%–80% either die within 90 days after stroke onset or do not regain functional independence despite IV tPA, due to modest rate of recanalization and reperfusion.<sup>8</sup> ET enables fast recanalization and high reperfusion rates. In 2015, 5 multicenter randomized studies reported the efficacy of ET for acute stroke within 6 hours of onset, considerably increasing the proportion of patients with excellent outcome compared to patients treated with IV tPA alone. However, systems of care to implement this technology are heterogeneous and often poorly organized.<sup>9–11</sup> Data from the Get With The Guidelines–Stroke registry indicate that only 23.4% of hospitals provide ET.<sup>12</sup> When performed, multiple in-hospital care processes affect the overall treatment effect of ET, including a reduction in absolute risk difference for good outcome by 6% for every hour of delay.<sup>13</sup>

Extracranial atherosclerotic disease accounts for 10% of all ischemic strokes.<sup>14</sup> Recurrent stroke risk in these patients is elevated shortly after incident stroke or TIA, mostly occurring in the first 24 hours.<sup>15–17</sup> Delays in assessment and treatment often occur due to lack of perceived urgency, as well as system factors that impede early imaging and referral.<sup>18</sup> Revascularization therapy of symptomatic carotid stenosis is effective in reducing risk of recurrent stroke or TIA.<sup>19</sup> Attributable risk reduction is greatest if carotid revascularization is done early: 30% when surgery is done within 2 weeks, 18% if done at 2–4 weeks, and 11% if done between 4 and 12 weeks.<sup>20</sup>

Optimal combination of secondary prevention medication after recent noncardioembolic stroke is noted in only 51% of eligible patients, but is associated with significantly lower risk of stroke (61%

reduction), major vascular events (61% reduction), and all-cause death (65% reduction) compared with no or single secondary preventive medication.<sup>21</sup> Individual performance measures on acute ischemic stroke care processes have been consistently high, some of which have reached a ceiling effect over the years.<sup>22,23</sup> However, achievement of defect-free care for individual patients remains low, ranging between 21.9% among nonprimary stroke center certified hospitals to between 45% and 52% among stroke center certified hospitals.<sup>24</sup>

Dysphagia is common after stroke, occurring in 27%–64% of patients, and is associated with reduced quality of life and increased mortality.<sup>25</sup> Early screening for and managing dysphagia reduces pneumonia rates.<sup>26,27</sup> Up to 15% of patients will have persistent dysphagia requiring artificial nutrition,<sup>28</sup> and a gastrostomy tube may be the only option for nutritional support in these patients. It is unclear whether this intervention will contribute to similar improvement in patient-centered outcomes with established stroke prevention therapies.<sup>29</sup> Other complications following stroke, such as falls, pressure ulcers, and venous thromboembolism, can be mitigated by preventive measures. However, despite high adherence to effective therapies, significant variations continue to exist, as venous thromboembolism prophylaxis rates after stroke range from 17% to 100%.<sup>30</sup>

Patients with ischemic stroke due to atherosclerosis of cerebral or noncerebral vascular bed benefit from high-intensity statin therapy. However, rate of use of high-intensity statin therapy is low, ranging from 15.9% to 20.8% among eligible patients,<sup>23</sup> indicating further opportunity to improve,<sup>31</sup> and a missed opportunity in reducing recurrent stroke.<sup>32</sup>

Cognitive impairment following stroke is prevalent, affecting more than one-third of stroke survivors at 3–12 months following the stroke event.<sup>33</sup> These impairments persist in many individuals and are associated with poor long-term survival, higher disability, and greater institutionalization needs.<sup>34,35</sup> In a follow-up to evaluate adherence to Canadian guidelines recommending cognitive screening following stroke events, it was found in a single institution evaluation that cognitive screening rates could be improved.<sup>36</sup>

After acute hospitalization for stroke, a comprehensive assessment of rehabilitation is recommended as soon as the patient's medical stability allows.<sup>32</sup> A total of 90% to 95% of patients in hospitals participate in national (e.g., Get With The Guidelines) or regional stroke registries (e.g., Paul Coverdell), but little information is available about the nature or reliability of these assessments.<sup>24,37</sup>

Outcomes following stroke are needed to assess the effects of stroke care and disability.<sup>3</sup> The modified Rankin Scale (mRS) at 3 months after stroke has

become the accepted standard for assessing recovery from ischemic stroke.<sup>38</sup> The Joint Commission and AHA/ASA have released similar measures for stroke outcomes to be applied by comprehensive stroke centers.<sup>38,39</sup> This process measure is mirrored on existing mRS measures with expanded care settings. Developing a process measure for multiple care settings will hopefully lead to better patient outcome benchmarks and comparisons.

**METHODS** The AAN formed the work group in order to update and modify the stroke and stroke rehabilitation 2011 quality measurement set using the AAN measure development process. Details of the full measure development process are available online.<sup>40</sup> AAN Quality and Safety Subcommittee members served as measure methodologists and nonvoting work group members. The AAN identified Chairs from the AAN, American College of Radiology, and American Academy of Physical Medicine and Rehabilitation and then conducted a search for work group participants. Members were selected by the leadership team through a competitive process reviewing potential conflicts and relevant clinical or quality experience. The selected work group comprised 28 members (a list of members and contributing organizations follows this article), including physician, patient, caregiver, advanced practice provider, payer, and nursing representatives. Insights provided by patient representatives proved invaluable.

A comprehensive search guided by a medical librarian 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 occurred in June 2015 identifying articles published since 2010 when the original measurement set was developed. A total of 2,004 potential articles were identified

via the search. The work group identified 224 articles of interest based on the search and review of guidelines utilized for the prior measurement set release. Of these, the work group consulted 15 clinical practice guidelines to serve as the evidence base for measure drafts. Additional existing measures affecting patients following a stroke were identified and performance data for existing measures being used in the field were reviewed if available.

The expertise and varied perspectives of work group members were invaluable during the consensus-based process used to refine the measures before, during, and after the in-person meeting. Prior to the face-to-face meeting, members were given an opportunity to propose new measures. Candidate measures were reviewed and edited prior to a vote to approve, reject, or abstain from moving the proposed measure forward. All members disclosed potential conflicts of interest and were instructed to abstain if a potential conflict could be perceived during voting. During this process, the work group also reviewed the 2011 measures, evaluating whether current evidence still supported them, a gap in care continued, and links to desired outcomes have been described. The work group was encouraged to retire redundant measures and harmonize measures when possible to prevent duplicative or confusing data elements generating unnecessary burden to providers and practice. The measurement set has been approved by the work group, AAN Quality and Safety Subcommittee, AAN Practice Committee, and AAN Institute Board of Directors.

The AAN will update these measures on an ongoing basis every 3 years, allowing the measurement set to provide a working framework for measurement, rather than a long-term mandate.

**RESULTS** The work group voted to retire 13 measures from the 2011 set (table 2). Several of these were updated and combined into bundled measures, which are calculated using an all-or-none calculation. All-or-none calculation requires each component be completed to meet measure performance, with equal weighting of components. These bundles are valuable as they are patient-focused and indicate a commitment to the highest quality of care. Providers and practices may find it beneficial to identify component measures with lower performance to focus on areas of practice where opportunities for quality improvement exist. The work group notes that many of these component measures are currently available as independent measures in accountability programs (e.g., NQF #18/PQRS #2326 Controlling High Blood Pressure, NQF #0028/PQRS #226 Preventive Care and Screening: Tobacco Use: Screening and Cessation). It is not the work group's intent to replace those measures with these bundled measures, but to complement them, providing practices and providers with a summary of overall performance of care on identified topics. Two measures were approved for updates: rehabilitation services assessed and patient/caregiver nutritional preferences. The work group approved 10 new measures, many of them bundled (table 3).

An IV fibrinolytic treatment measure bundle was created to capture performance on 5 components: (1) NIH Stroke Scale (NIHSS) documented, (2) IV

**Table 2** 2011 Stroke and Stroke Rehabilitation Measurement Set

Measure	Description
1	Deep vein thrombosis prophylaxis for ischemic stroke or intracranial hemorrhage (NQF#0340) (retired in 2016)
2	Discharged on antithrombotic therapy (NQF#0325) (retired in 2016)
3	Anticoagulant therapy prescribed for atrial fibrillation at discharge (NQF# 0241) (retired in 2016)
4a	Tissue plasminogen activator considered (paired measure) (retired in 2016)
4b	Tissue plasminogen activator initiated (paired measure) (retired in 2016)
5	Screening for dysphagia (NQF#0243) (retired in 2016)
6	Rehabilitation services ordered (NQF#0244) (updated in 2016)
7	Avoidance of IV heparin (retired in 2016)
8	CT or MRI reports (retired in 2016)
9	Artificial feeding patient/caregiver preferences (updated in 2016)
10a	Potentially avoidable harmful events: urinary tract infection (retired in 2016)
10b	Potentially avoidable harmful events: stage III or greater decubiti (retired in 2016)
10c	Potentially avoidable harmful events: fall with fracture or acute subdural hematoma (retired in 2016)
11	Lipid management (retired in 2016)
12	Blood pressure control (retired in 2016)
13	Imaging for TIA or ischemic stroke (retired in 2016)

fibrinolytic treatment eligibility assessment documented, (3) IV fibrinolytic treatment documented, (4) IV fibrinolytic treatment initiated within 60 minutes from presentation (i.e., arrival to emergency department [ED] or discovery of symptoms if inpatient stroke), and (5) noncontrast brain CT or MRI interpreted within 45 minutes of presentation.

An acute stroke ET measure bundle was created to capture performance on 2 additional components: (1) NIHSS documented and (2) ET eligibility assessment documented.

An ET and imaging measure bundle was created to capture performance on 6 components: (1) non-contrast brain CT or MRI performed and interpreted within 45 minutes of arrival/in-hospital stroke onset (or for patients transferred, receipt of imaging [e.g., disc or via remote server/DICOM viewer]), (2) non-contrast brain imaging report or stroke team review directly addresses hemorrhage/mass/acute infarction, (3) documented causative intracranial large vessel (artery) occlusion on vascular imaging, (4) groin puncture within 90 minutes of ED or transfer arrival,

(5) final Thrombolysis in Cerebral Infarction (TICI) score documented, and (6) time to final TICI score documented.

A carotid imaging measure was created to capture performance ensuring patients with symptomatic TIA or nondisabling ischemic stroke received timely vascular imaging and carotid revascularization referral if appropriate.

A defect-free acute inpatient ischemic stroke measure bundle was created to capture performance on 3 components: (1) early antithrombotic treatment, (2) discharged on appropriate antithrombotic therapy, and (3) tobacco use management.

The existing measure on artificial feeding in patients with stroke was updated to reflect patient and caregiver nutritional preferences.

One outcome measure was approved evaluating potentially avoidable complications following stroke. The measure is approved for use in quality improvement efforts only at this time. Possible calculation and weighting of components as well as risk adjustment strategies will be evaluated and tested. Pending

**Table 3** 2016 Stroke and Stroke Rehabilitation Quality Measurement Set update descriptions

Measure title	Description (see appendix e-1 at Neurology.org measure specifications for numerator, denominator, and exclusion criteria)
Intravenous Fibrinolytic Treatment Measure Bundle	Percentage of patients aged 18 years and older with a diagnosis of acute ischemic stroke presenting within 4.5 hours from last known well who received optimal IV fibrinolytic treatment evaluation and management based upon their eligibility for all 5 performance components
Acute Stroke Endovascular Treatment Measure Bundle	Percentage of patients aged 18 years and older with a diagnosis of ischemic stroke presenting within 6 hours from last known well who received optimal endovascular treatment evaluation and management based upon their eligibility for 2 performance components
Intra-Arterial Therapy and Imaging Measure Bundle	Percentage of patients aged 18 years and older who received intra-arterial treatment who met all 6 therapy and imaging components
Carotid Imaging Measure	Percentage of patients aged 18 years and older with symptoms or a diagnosis of TIA or nondisabling ischemic stroke receiving timely vascular imaging and carotid revascularization referral if appropriate
Defect-Free Acute Inpatient Ischemic Stroke Measure Bundle	Percentage of patients aged 18 years and older with a diagnosis of ischemic stroke or TIA who were admitted to the hospital for inpatient care and received all appropriate intervention for optimal care (i.e., early antithrombotic administered, discharged on antithrombotic, and smoking cessation addressed) prior to discharge
Patient/Caregiver Nutritional Preferences (updated in 2016)	Percentage of patients aged 18 years and older with a primary diagnosis of acute ischemic stroke or intracranial hemorrhage who have had a gastrostomy tube placed during the acute inpatient stay, and for whom there is documentation of shared decision-making with the patient or the patient's surrogate decision-maker, before the procedure was completed, which included discussion of at least 2 forms of providing nutrition, one of which is oral/natural nutrition
Potentially Avoidable Complications Following Stroke	Percentage of patients aged 18 years and older with a diagnosis of ischemic or hemorrhagic stroke who developed any of the 5 component complications during inpatient stay <sup>a</sup>
High and Moderate Intensity Statin Therapy Following Stroke	Percentage of patients aged 18-74 years with a diagnosis of acute ischemic stroke or TIA who were prescribed high-intensity statin therapy and patients aged 75 and older who were prescribed moderate or high-intensity statin therapy at discharge
Cognitive Impairment Screening Following Stroke	Percentage of stroke patients with documentation indicating validated cognitive screening was completed or attempted
Rehabilitation Services Assessed (updated in 2016)	Percentage of patients aged 18 years and older with a diagnosis of ischemic stroke or spontaneous intracerebral hemorrhage or subarachnoid hemorrhage who were assessed for the need for occupational, physical, or speech rehabilitation services at or prior to acute inpatient discharge and screening results were used to determine referral recommendation to appropriate next level of care, or documentation that no rehabilitation is necessary
Post-Acute Ischemic Stroke Screening and Care Measure Bundle	Percentage of patients aged 18 years and older with a diagnosis of ischemic stroke or TIA within the last 3 months who received defect-free care based upon eligibility for all 6 performance measure components
Functional Outcome Assessment Following Recanalization Therapy for Acute Ischemic Stroke	Percentage of patients with acute ischemic stroke who received any acute reperfusion therapy who have a functional outcome assessment documented at 90 days

<sup>a</sup>Zero percent is not the goal, but a lower score is better.

the results of this evaluation, additional specifications may be released, including specifying the measure for use in accountability programs. The measure assesses performance on 5 components: (1) deep venous thrombosis or pulmonary embolism, (2) aspiration pneumonia, (3) fall, (4) urinary tract infection, and (5) stage II or greater pressure sore.

The work group discussed how best to capture the lipid management needs of patients in bundled measures, but ultimately determined that based on current evidence a standalone measure addressing high and moderate intensity statin therapy following stroke was warranted.

A cognitive impairment screening following stroke measure was created to capture performance ensuring all adult patients following a stroke had documentation indicating a validated cognitive screening was at least attempted. A finite list of current screening tools was developed to meet data collection requirements for electronic or registry collection. The list will be periodically revisited and updated as indicated by additional data supporting changes or additions.

The existing rehabilitation services ordered measure was updated to reflect the assessment of rehabilitation services including occupational, physical, or speech rehabilitation services at or prior to acute inpatient discharge. It also requires those results to be used to determine referral recommendation to appropriate next level of care (outpatient/ambulatory rehabilitation, long-term care hospital, inpatient rehabilitation facility, skilled nursing facility, home health agency, or ambulatory rehabilitation), or documentation that no rehabilitation is necessary.

A post-acute ischemic stroke screening and care measure bundle was created to capture performance on 6 components: (1) blood pressure management, (2) diabetes screening, (3) appropriate antithrombotic prescription, (4) tobacco use management, (5) exercise, and (6) depression.

A functional outcome assessment following recanalization therapy for acute ischemic stroke measure was created to address a gap in current measurement settings. The measure assesses the percentage of patients with acute ischemic stroke who received any acute reperfusion therapy who have a functional outcome assessment via the mRS documented at 90 days.

**DISCUSSION** The goal of quality measures is to guide their users to evidence-based improvements in care and, eventually, health care outcomes. It is the hope of the work group that implementation of the measures will lead to measurable improvements in the care of patients following a stroke.

The results of this work group consensus development process emphasize (1) the gains made in inpatient process of care for patients with stroke by

existing stroke measures and (2) the lack of stroke quality measures in other care settings and those addressing outcomes. To reduce burden on providers and to focus on measures where gaps in care exist, every effort was made to bundle, retire, or harmonize AAN stroke measures that were similar to those of other organizations. However, opportunities for quality improvement in ET, potentially avoidable complications, cognitive screening, rehabilitation assessment, and functional outcomes in stroke exist, and the work group used current guidelines of care to fashion measures with the intention to be meaningful to patients and families. In addition, it was believed that bundles of existing measures may be more useful to providers and systems evaluating care than the individual measures, and would reflect the quality for the entire episode of care for stroke. Many other measures were considered, but due to lack of guidelines or evidence, feasibility concerns, or duplicative efforts by other organizations, these were not created. Measures developed apply to individual providers, practices, or systems. The AAN will evaluate development of stroke unit level measures during future measurement updates if advances have been made in the field to establish a corresponding standard and unified documentation.

Quality improvement and measurement is an ongoing process, requiring updating as new evidence emerges. Just as the 2011 AAN stroke quality measures are updated here, the measures will be reviewed periodically, which currently occurs once every 3 years. Therefore, these measures use the best evidence that is available at this time, but some may become less relevant as new evidence accumulates. In addition, there is increasing emphasis on outcome measures in quality improvement, and as the ability to risk adjust and assign attribution improves, outcome measures are likely to play a greater role in this measurement set.

These quality measures are intended to be used by providers and health systems to improve quality measurement and provide feedback on performance for the purposes of improvement of care to patients with stroke. The Center for Medicare and Medicaid Services (CMS) and other organizations are increasingly using these types of measures for accountability programs. In developing the stroke quality measures, multiple CMS quality strategy goals were addressed, including improving patient safety and reducing preventable complications, strengthening patient engagement by promoting patient-centered care, promoting effective communication and coordination of care, as well as promoting effective prevention and treatment of diseases.

Previously measures were submitted for consideration in CMS' pay-for-reporting programs and

utilized in the Physician Quality Reporting System. In addition, select private payers utilized prior measures to track provider performance. It is anticipated that these measures will be submitted for consideration in CMS' Merit-based Incentive Payment System.

Although presented as a measurement set, there is no mandate that providers or practices perform every measure. For those new to quality measurement, it is recommended that 1 to 2 individual measures be identified and adopted to drive performance improvement in practice meaningful to patient populations served. It is hoped that these measures developed by a collaboration of stroke neurologists, rehabilitation specialists, radiologists, patients, and other stakeholders will not only improve patients' lives, but will also be good options for providers to use for these programs in the changing health care system.

### AUTHOR CONTRIBUTIONS

Dr. Latorre contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and study supervision including responsibility for conduct of research and final approval. Dr. Flanagan contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and study supervision including responsibility for conduct of research and final approval. Dr. Phipps contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and study supervision including responsibility for conduct of research and final approval. Dr. Seidenwurm contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and study supervision including responsibility for conduct of research and final approval. Dr. Shenoy contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and study supervision including responsibility for conduct of research and final approval. A. Bennett contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, and study supervision including responsibility for conduct of research and final approval. Dr. Sico contributed to study concept and design, acquisition of data, analysis and/or interpretation of data, drafting/ revising the manuscript, critical revisions of the manuscript for important intellectual content, and study supervision including responsibility for conduct of research and final approval.

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### Quality improvement in neurology: Stroke and Stroke Rehabilitation Quality Measurement Set update (see p. 1619)

This podcast begins and closes with Dr. Robert Gross, Editor-in-Chief, briefly discussing highlighted articles from the October 10, 2017, issue of *Neurology*. In the first segment, Dr. Dan Ackerman talks with Dr. Gene Latorre about his paper on the updated Quality Measurement Set for Stroke and Stroke Rehabilitation. In the second part of the podcast, Dr. Alberto Espay focuses his interview with Dr. David Sulzer on Parkinson disease and autoimmunity.

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**Quality improvement in neurology: Stroke and Stroke Rehabilitation Quality  
Measurement Set update**

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