Development of Stroke Performance Measures
Definitions, Methods, and Current Measures

Mathew J. Reeves, PhD; Carol Parker, MPH; Gregg C. Fonarow, MD; Eric E. Smith, MD, MPH; Lee H. Schwamm, MD

Background and Purpose—In the United States and elsewhere, stroke performance measures have been developed to monitor and improve the quality of care. The process by which these measures are developed, implemented, and evaluated is complex, evolving, and not widely understood. We review the methodological development of stroke performance measures in the United States.

Methods—A literature search identified articles that addressed the development and endorsement of performance measures for stroke care. Emphasis was given to articles specific to acute stroke, but when these were lacking, other cardiovascular diseases were included.

Results—Ten process-based performance measures relevant to acute hospital-based stroke care have now been developed and endorsed. These measures include intravenous thrombolysis, deep vein thrombosis prophylaxis, dysphagia screening, stroke education, and discharge-related medications and assessments. There are currently at least 5 major US-based stroke quality improvement programs implementing stroke measures. Data indicate that rapid improvements in the quality of stroke care can be induced by the systematic collection and evaluation of stroke performance measures. However, current stroke measures are relatively limited, addressing only inpatient care and mostly patients with ischemic stroke.

Conclusions—Stroke quality improvement is still in its early stages, but data suggest that large-scale improvements in stroke care can result from the implementation of stroke performance measures. Performance measures that address multidisciplinary stroke unit care, outpatient-based care, and patient-oriented outcomes such as functional recovery should be considered. Ongoing challenges relevant to stroke quality improvement include the role of public reporting and the need to link better stroke care to improved patient outcomes. (Stroke. 2010;41:1573-1578.)

Key Words: acute stroke ■ performance measurement ■ quality of care

Healthcare systems throughout the world face the vexing problem of improving healthcare quality while at the same time confronted with ever-increasing costs and greater demands for accountability.1 Over recent years, at least 9 different healthcare organizations and entities in the United States have undertaken initiatives related to measuring and improving the quality of care provided to patients with acute stroke patients (Table 1).2–10 In Canada, stroke quality improvement (QI) efforts, including best practice recommendations for stroke care, have been developed under the auspices of the Canadian Stroke Network and the Heart and Stroke Foundation of Canada.11

A large part of these initial efforts have been dedicated to determining how to measure the quality of stroke care.12–14 This has involved the development and promulgation of performance measures designed to measure specific aspects of the structure, processes, and outcomes of acute stroke care. Ideally, these performance measures should represent measurable and actionable interventions that are supported by evidence-based clinical guidelines.11,15,16 The processes by which performance measures are developed, endorsed, implemented, and evaluated is complex, multifaceted, evolving and not well understood by many healthcare professionals.

The degree to which the promulgation of performance measures in local, regional, and national QI initiatives has resulted in measureable improvements in quality of care, as defined by those measures, is reasonably well established. However, whether the public reporting of performance mea-
Definitions of Healthcare Quality, Quality Metrics, and Performance Measures

Defining healthcare quality is an inherently complex task that over the years has involved numerous organizations and agencies that have often had different perspectives and competing interests. Given the complexity of this task, it is not surprising that the language used to describe healthcare quality and quality-related measures is often confusing involving numerous terms and definitions. Over recent years, considerable efforts have been devoted to standardizing definitions. The most comprehensive framework currently proposed for developing quality metrics and performance measures for cardiovascular disease is described in a 2008 report from the American College of Cardiology/American Heart Association (ACC/AHA) Task Force on Performance Measures. This Task Force was charged with developing performance measures for cardiovascular disease to promote the implementation of clinical guidelines. The task force defined quality metrics as “any objective measure that has been developed to support self-assessment and quality improvement at the provider, hospital, and/or health care system level.” They also restricted the use of the term performance measure to those quality metrics selected by the Task Force that have “attributes that render them suitable for public reporting, and other forms of accountability, including direct comparisons between different institutions and health care providers, and possibly pay for performance.” These ACC/AHA-endorsed performance measures are developed using a methodological framework which includes a process for public comment and peer review, and may involve the collaboration of other organizations such as the Joint Commission (TJC), Physicians Consortium for Performance Improvement (PCPI), Center for Medicare and Medicaid Services (CMS), and the National Quality Forum (NQF).

Quality metrics, including performance measures, can be classified into 4 groups: process, structure, outcome, and efficiency measures. Process measures illuminate the complicated processes of delivering health care and describe specific actions associated with healthcare delivery. The majority of currently endorsed performance measures for cardiovascular disease and stroke are process-based. Structural measures focus on the characteristics of the resources in the healthcare system, including institutional capacity (eg,
hospital size), system resources (eg, stroke units, stroke-specific care protocols, availability of specialists), and system characteristics (eg, teaching status, QI participation). The number of structural measures tends to be limited and their main disadvantage is that many are not readily amenable to modification or improvement. Outcome measures focus on the end results of care or the effect of the care process on the health and well-being of patients and populations. Outcome measures should reflect outcomes that are judged to be important to the patient—so-called patient-oriented or patient-centered outcomes—which include death, disability, functional status, and quality of life. Because stroke can result in lifelong severe disabilities, outcomes measures that address long-term functional status and quality of life are particularly relevant. Efficiency measures are designed to incorporate both the resources expended as well as outcomes. Despite their potential value in producing a more efficient and equitable healthcare system, efficiency-based performance measures are few in number.

Quality metrics and performance measures typically focus on processes of care derived from specific recommendations in clinical guidelines. Quality metrics should have sufficient evidence that failure to provide the recommended care or action is likely to result in suboptimal patient outcomes; for example, failure to provide an eligible patient with ischemic stroke with an antithrombotic agent at discharge results in an increased risk of stroke recurrence. Compliance with quality metrics therefore implies that the patient’s life can be extended or enhanced. Although some quality metrics do not meet the ACC/AHA criteria for performance measures, a given quality metric can become a performance measure if further research and/or field testing provides evidence that it meets the ACC/AHA standard and is selected by the ACC/AHA Task Force or other organizations. The promotion of a quality metric to a performance measure should involve the consideration of several factors, including the degree to which healthcare providers understand what the measure means, the degree to which healthcare providers can directly influence the measure, the measure’s reliability and accuracy, and the feasibility of data collection.

Although the ACC/AHA Task Force uses the term quality metrics to describe the broad range of quality-related measures, it should be noted that in practice, these measures are often referred to by several other terms, including quality measures, reporting measures, quality improvement measures, and test measures. For example, the AHA-sponsored Get With The Guidelines–Stroke (GWTG-Stroke) program uses the terms achievement measures, quality measures, and reporting measures to describe its metrics. Compliance with these various metrics are used by GWTG to recognize different levels of performance among participating hospitals, which may include performance measures selected using the ACC/AHA Task Force’s methodology.

**Recommendations for the Development of Performance Measures for Cardiovascular Disease and Stroke**

Although formal efforts to measure the quality of health care date back to the Victorian era and beyond, efforts to systematically conceptualize, define, and measure quality of health care for cardiovascular disease and stroke is a relatively recent undertaking. In 2000, the ACC/AHA first published a report on measuring and improving the quality of care for cardiovascular disease and stroke. This report addressed the methodological challenges of measuring healthcare quality and provided candidate quality measures for acute myocardial infarction, heart failure, and stroke. The reader is referred to the original publication for further details, but examples of proposed process measures for stroke included specific clinical evaluations (brain imaging, electrocardiography), acute therapy (tissue plasminogen activator, aspirin), preventive therapy (antithrombotic therapy and education), and having a functional assessment/rehabilitation plan. Given the documented benefits of coordinated stroke care, the proposed structural measures included the presence of a designated stroke unit and a multidisciplinary stroke team. Examples of stroke-specific outcome measures included the prevention of complications (pneumonia, deep vein thrombosis), secondary prevention (recurrent stroke, myocardial infarction), and restoration of function (disability and quality of life). Importantly, this report also addressed the issue of when outcomes should be measured relative to the delivery of stroke care, concluding that stroke-related outcomes should be measured 1 month after discharge from the acute care setting. This time period was chosen because the bulk of stroke recovery occurs within 1 to 3 months and outcomes beyond 1 month are more difficult to ascribe to the care provided during the acute hospitalization.

At about the same time as the 2000 ACC/AHA report, Holloway and colleagues convened a panel of 16 multidisciplinary stroke experts to identify and rate hospital-based acute stroke performance measures. A total of 44 measures were rated on the following 6 dimensions: validity, feasibility, impact on outcomes, room for improvement, plausibility, and overall rating. The process identified several highly rated measures, including antithrombotics, anticoagulants, carotid imaging, and the use of stroke units. The study found that the performance measures with the most room for improvement were also those that were the most difficult to measure, highlighting the limitations of current information sources and the need to develop better data collection methods.

A subsequent 2005 ACC/AHA report expanded on the conceptual framework and process described in the initial 2000 ACC/AHA report. The new report detailed a 3-phase process for developing and implementing performance measures. The phases include (1) identification of candidate measures; (2) formal evaluation of the accuracy and feasibility of the measures; and (3) reporting and implementation mechanisms.

**Current Stroke Performance Measures**

Over the past 5 years, there have been considerable efforts undertaken in the United States to develop common stroke performance measures that can be used by different accreditation and evaluation organizations. This effort was driven in part by healthcare providers who, participating in multiple QI projects, wanted to avoid duplicate data collection efforts. In 2003, TJC in collaboration with AHA/ASA began developing
performance measures for the Certification for Primary Stroke Centers based on recommendations of the Brain Attack Coalition and other evidence-based guidelines. Because many Primary Stroke Center sites were also participating in the GWTG-Stroke program or the Centers for Disease Control and Prevention (CDC) Paul Coverdell Registry, the effort was expanded to include all 3 programs. The Stroke Performance Measure Consensus Group, comprising representatives from TJC, AHA/ASA, and the CDC, was established to align data element definitions and develop common guidelines for data abstraction across the 3 measurement sets.

The resulting 10 harmonized consensus stroke performance measures (current as of December 2009) are shown in Table 2. These 10 measures are limited to process measures that apply to acute hospital care and are mostly relevant to patients with ischemic stroke. Obviously, the current set of measures does not include all worthwhile clinical interventions; several interventions with substantial evidence supporting their role in stroke care (eg, carotid endarterectomy, hypertension control, use of stroke units) are challenging to measure or define in the acute stroke setting and are therefore not included. Although every effort was made to operationalize each measure in the exact same manner, there are some

Table 2. Current Stroke Performance Measures as Endorsed by the Major Stroke QI Organizations, Including Applicable Stroke Subtypes

<table>
<thead>
<tr>
<th>ID</th>
<th>Performance Measure</th>
<th>CDC3</th>
<th>AHA/GWTG4</th>
<th>TJC2</th>
<th>NQF8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deep vein thrombosis (DVT) prophylaxis</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Nonambulatory patients should start receiving DVT prophylaxis by end of hospital Day 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Discharged on antithrombotic therapy</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Patients prescribed antithrombotic therapy at discharge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Discharge on Anticoagulation for patients with atrial fibrillation</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Patients with atrial fibrillation discharged on anticoagulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Thrombolytic therapy administered</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Patients with acute ischemic stroke who arrive at the hospital within 120 minutes (2 hours) of time last known well and for whom intravenous tissue plasminogen activator was initiated at this hospital within 180 minutes (3 hours) of last known well</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Antithrombotic therapy by the end of hospital Day 2</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Patients who receive antithrombotic therapy by the end of hospital Day 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Discharged on cholesterol-reducing medication</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic†</td>
<td>Ischemic†</td>
</tr>
<tr>
<td></td>
<td>Patients with LDL &gt;100, or LDL not measured, or on cholesterol-reducer before admission, who are discharged on cholesterol-reducing drugs</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dysphagia screening</td>
<td>Ischemic</td>
<td>Ischemic</td>
<td>Ischemic</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Patients who undergo screening for dysphagia with a simple valid bedside testing protocol before being given any food, fluids, or medication by mouth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Stroke education</td>
<td>Ischemic</td>
<td>Ischemic</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Patients or their caregivers who were given education or educational materials during the hospital stay addressing all of the following: personal risk factors for stroke, stroke warning signs, activation of EMS, need for follow-up after discharge, and medications prescribed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Smoking cessation</td>
<td>Ischemic</td>
<td>Ischemic*</td>
<td>Ischemic</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Patients with a history of smoking cigarettes who are, or whose caregivers are, given smoking cessation advice or counseling during hospital stay; a smoker is defined as someone who has smoked cigarettes anytime during the year before hospitalization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Assessed for rehabilitation</td>
<td>Ischemic</td>
<td>Ischemic</td>
<td>Ischemic</td>
<td>Ischemic</td>
</tr>
<tr>
<td></td>
<td>Patients who are assessed for rehabilitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*One of 7 GWTG achievement measures used for hospital recognition programs.
†Measure is defined as discharged on statin medication.
X indicates not included in the NQF measure set.
LDL indicates low-density lipoprotein; EMS, emergency medical services.
differences among the 3 organizations. For example, TJC excludes patients with transient ischemic attack and uses International Classification of Disease, 9th Revision codes to identify stroke cases rather than relying on the clinical diagnosis abstracted from the medical record. Each organization also uses slightly different data abstraction methods and skip patterns to collect the data. Finally, it should be noted that the refinement of these measures is an ongoing process and so further changes can be expected.

Because of the central role played by the NQF as an independent arbiter of quality measurement, and the policies of the TJC relating to external validation of performance measures, the 10 measures were submitted to the NQF in response to a call for stroke measures issued by the CMS in 2007. In July 2008, 8 of the measures were endorsed by the NQF. Smoking cessation was not endorsed as a separate stroke measure because the NQF already endorsed a global smoking measure that applies to all hospitalized patients, and dysphagia screening was not endorsed due to limited evidence that the measure improves outcomes and concerns over the validity of the screening tools.

Importantly, the CMS has announced their intention to include the 8 NQF-endorsed stroke measures as part of the Reporting Hospital Quality Data for Annual Payment Update (RHQDAPU) initiative beginning with inpatient discharges in Fiscal Year 2011. Hospitals must participate in the RHQDAPU and report these measures in 2011 to receive full Medicare payment in Fiscal Year 2012. Current CMS publicly reported performance measures are available to consumers on the Hospital Compare web site. Their inclusion in RHQDAPU is an important milestone; data on the quality of acute stroke care will now be available from almost all US acute hospitals and not just those participating in voluntary QI programs. Additionally, several analogous stroke measures that are reported at the provider level rather than institutional level have been constructed and endorsed by the NQF for use in the CMS Physician Quality Reporting Initiative (PQRI) program, an incentive pay-for-reporting program for health professionals.

The inclusion of stroke performance measures in QI programs such as the Paul Coverdell National Acute Stroke Registry and the GWTG-Stroke Program plays an essential role by allowing for the measurement and monitoring of quality of care. There is now increasingly good evidence from initiatives such as the Coverdell Registry, GWTG-Stroke, and other QI programs that a process based on the systematic collection and evaluation of stroke performance measures can result in rapid improvement in the quality of stroke care delivered by hospitals. For example, recent data from GWTG-Stroke measured adherence to 7 of the 10 currently endorsed stroke performance measures in >322,000 patients discharged with ischemic stroke or transient ischemic attack from 790 hospitals nationally. The authors found statistically significant and clinically meaningful improvements in all measures over a 5-year period since the program started in 2003 with absolute increases ranging from 3.2% to 30.7%. Other examples include a 1-year QI intervention conducted by a prototype Coverdell Registry in 13 Michigan hospitals, which found significant improvements in 5 of 16 measures targeted.

Finally, although this review is focused on the development and use of stroke performance measures in North America, it should be noted that similar efforts to develop stroke measures to promote QI exist in several other countries, including the United Kingdom, Germany, Sweden, Denmark, Australia, and New Zealand. A full discussion of these programs is beyond the scope of this article.

Limitations

The current stroke performance measures have several limitations. First, the current metrics are mostly limited to process measures that address the care of patients with ischemic stroke in acute hospital-based settings. Further efforts are required to expand the scope of performance measures to include ambulatory-based settings as well as other subtypes (ie, hemorrhagic stroke). Second, there is a pressing need for research to demonstrate a direct link between better adherence to stroke performance measures and improved patient-oriented outcomes. Finally, like with all quality measures, there are inherent limitations to using a limited number of specific metrics to defining the complex trait of healthcare quality.

Conclusions

Despite the considerable progress made to date to develop methodological standards for quality metrics and performance measures, continuing concerns about the process have led to the recommendation to set up a government-sponsored agency to develop and oversee national standards for the development and public reporting of quality-of-care measures. A recent Institute of Medicine report on performance measurement came to a similar conclusion, recommending the establishment of a new independent board, the National Quality Coordination Board, housed within the US Department of Health and Human Services, to provide coordination and financial support to strengthen ongoing standards and activities in both the public and private sectors.

Although stroke QI programs are still in their early stages, data indicate that large-scale changes in quality of care can be induced by the systematic collection and evaluation of stroke quality data. However, the current stroke performance measures are limited to process measures and are applicable to acute hospital-based care only; measures that address organized multidisciplinary care, outpatient-based care, and patient-oriented outcomes are clearly needed. Other ongoing challenges to the continued development and enhancement of stroke performance measures include the role of public reporting and the need to develop more evidence linking better quality of care to improved patient-oriented outcomes.

Disclosures

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Institutes for Health Research, Canadian Stroke Network, and Hotchkiss Brain Institute. L.H.S. serves as chair of the AHA GWTG Steering Committee; serves as a consultant to the Massachusetts Department of Public Health; and has provided expert medical opinions in malpractice lawsuits regarding stroke treatment and prevention.

References


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背景与目的：在美国以及其他一些国家，人们探索卒中绩效评估体系用于监测和提高医疗保健质量。绩效评估体系的发展、落实和评估的过程非常复杂，而且还在持续发展，但尚未被广泛了解。本文综述了美国卒中医疗保健绩效评估体系的发展。

方法：查阅卒中医疗保健绩效评估体系的发展和认可等方面的相关文献，重点放在急性卒中方面。当这方面文献缺乏时，引用一些其他心血管疾病方面的文章。

结果：对于急性卒中的院内治疗，美国产生并认可了十个评估项目，包括静脉溶栓、深静脉血栓预防、吞咽困难筛查、卒中知识教育、出院后药物治疗和监测等。在美国，目前至少尚有五项国家卒中医疗保健质量提高项目。数据显示，系统地收集和评估卒中医疗绩效评估相关资料能快速提高卒中医疗保健的质量。然而，目前卒中绩效评估相对局限，仅针对入院治疗的病人，并且绝大多数为缺血性卒中患者。

结论：卒中医疗保健质量的提高尚处于早期阶段，但数据显示，落实卒中医疗保健绩效评估体系能大规模提高卒中治疗保健水平。应考虑开展多学科卒中单元治疗评估、门诊患者治疗评估、以及病人疗效监测包括功能康复情况等评估。提高卒中医疗保健质量的挑战包括发挥媒介的作用，以及需要将改进卒中医疗保健与改善患者预后联系起来。

关键词：急性卒中，绩效评估，医疗保健质量

提高医疗保健质量是全世界卫生系统面临的一个难题，同时又面临不断增长的费用和质量评定需求[1]。近年来，美国至少有9个卫生组织和机构致力于研究和提高急性卒中患者的医疗保健质量（表1）[2-10]。在加拿大，加拿大卒中网络及心脏和卒中基金会赞助开展了提高卒中医疗保健质量研究，包括最佳的实用卒中医疗保健建议[11]。

最初的评估体系主要致力于研究如何评估卒中的医疗保健质量[12-14]，包括急性卒中医疗保健的组织结构、过程以及效果等特定方面的质量评定体系的发展和普及。理想的绩效评估应针对临床指南支持的可评价且易实施的干预措施[11,15,16]。评估体系建立、认可、实施和评价的过程非常复杂，具有多面性，而且在不断发展，很多医疗保健专家不太了解。在地区、区域内以及全国范围内普及绩效评估体系，能在一定程度上提高医疗保健质量。然而，为比较各卫生机构的医疗保健质量，将质量评定资料公布于众的做法是否是最佳途径仍有争议，其引起的一些不良的后果已引起关注[17,18]。

本文目的是：(1) 定义医疗质量、质量评定和绩效评估体系；(2) 综述关于开发心血管疾病和卒中医疗保健绩效评估体系的建议；(3) 综述目前应用的卒中医疗保健绩效评估体系。

医疗保健质量、质量评定和绩效评估体系的定义

要对医疗质量下一个准确定义很困难，因为长期以来不同相关研究机构有不同的角度和利益。鉴于问题的复杂性，用于描述医疗质量和相关的质量评定的语言常令人困惑不解，包含有很多的术语和
定义。近年来，人们一直试图给出一个标准的定义。2008年美国心血管病学院/美国心脏协会（ACC/AHA）绩效评估体系团队的报告中对开发心血管疾病的质

量评估和绩效评估体系给出了一个综合构架[19]。为促进临床医疗指南的实施，这个团队负责开发心血管疾病医疗保健绩效评估体系。该团队将质量评估定义为“在医疗保健人员、医院和/或卫生保健系统层面，为进行自我评估和提高医疗保健质量而进行的任何客观真实的评价”[19]，并将其与绩效评估体系限定在那些具有如下特性的质量评估“即适于公布，和其他形式的评估，包括不同机构和卫生保健人员以及服务费用之间的直接比较”[19]。运用一个方法学框架，包括公众评估和同行评估的途径，开发出ACC/AHA认可的绩效评估体系，这套绩效评估体系需要一些其他机构，如联合委员会（TJC），促进医疗保健质量评估协会（PCPI），医疗保健和医疗补助中心（CMS），国家质量论坛（NQF）的参与合作[19]。

质量评估，包括绩效评估，可以分为四种：医疗保健的过程、组织结构、效果和效能评估[4,20]。过程评估反映医疗保健服务的复杂过程，及与服务相关的一些特定工作[14,20]。目前认可的血管疾病和卒中医疗保健绩效评估，大多数是过程评估。组织机构评估着重于卫生保健系统资源特征，包括机构规模（如医院规模）、系统资源（如卒中单元、卒中医疗保健协议、卒中专业人员的可及程度）和系统的特征（如教学单位，参与医疗保健质量提高的单位）[14]。组织机构评估项目数相对有限，并且很多项目不易被调整或提高。医疗保健效果评估着重于医疗保健的最终效果，或医疗保健过程对患者和群体的健康产生的效果[14,20]。效果评估应当反映对患者至关重要的结局，即以病人为中心，包括死亡、残疾、健康状况和生活质量[14]。由于卒中可导致严重残疾，反映长期健康状况和生活质量的效果评估尤为有效。效能评估既要评价医疗保健服务花费的资源，又要评价其效果[21]。尽管效能评估可能促进我们建立一个更高效、公平的卫生保健系统，但目前效能评估项目却很少。

质量评估和绩效评估体系主要集中在临床指南所建议的医疗保健过程[11,15,16]。绩效评估拥有足够的证据显示，如果不执行推荐的医疗保健或措施很可能导致某些关键的患者结局。如对确诊的缺血性卒中患者不予以抗凝血药物将导致卒中复发的危险增加，而执行绩效评估项目可降低患者卒中复发的风险。尽管有些绩效评估项目目前不能达到ACC/AHA规定的绩效评估体系的最低标准，但一旦进一步的研究和/或实验证实它能达到ACC/AHA标准而被ACC/AHA团队和或选择的机构选中，则该评估项目可以纳入绩效评估体系[19]。绩效评估项目进入评估体系需要考虑很多因素，包括医疗保健项目对其项目的可行性、医疗保健项目对其项目的直接影响程度，评估的可靠性和准确性，以及数据收集的可行性[22]。

尽管ACC/AHA团队和质量评估团队对医疗保健服务的评估体系发展出一套综合的评估体系，但这些评估体系也面临着很多挑战，如数据收集的可行性和质量评估的可靠性。尽管如此，这些评估体系对于促进医疗保健服务的改进和提高医疗保健服务质量具有重要意义。
质量评估和评估报告等术语来描述质量评价。对GWGT使用的这些不同术语的顺应性用来评估参与医院绩效的不同水平，可能包括了采用ACC/AHA团队的方法学选择的绩效评估法。

关于完善心血管疾病和卒中医疗保健绩效评估体系的建议
尽管维多利亚女王时代就致力于卫生保健质量的评定[23]，而对心血管疾病和卒中卫生保健质量进行系统化概念、定义和评估的尝试直到最近才开始[12]。2000年，ACC/AHA首次公布一项关于心血管疾病和卒中医疗保健质量的评定和提高的报告[14]。这项报告指出了评定医疗保健质量方法学上的挑战，并提出了对急性心肌梗塞、心力衰竭和卒中的备选质量评定项目。具体的细节，读者可查阅原文，但推荐的脑卒中医疗保健过程评估项目包括卒中相关临床评估（脑部影像、心电图）、急性期治疗（组织型纤溶酶原激活剂、阿司匹林）、预防性治疗（抗凝治疗和教育）和身体功能评估/康复计划[14]。由于文献[24,25]证实了组织化卒中保健的获益，推荐的组织结构评估项目包括指定的卒中单元和多学科的卒中团队的存在情况[7]。脑卒中相关的效果评估项目包括并发症的预防（肺炎，深静脉血栓）、二级预防（复发性卒中、心肌梗死）和功能康复（残疾，生存质量）[14]。更重要的是，该报告还强调了卒中医疗保健效果评估的时间，认为评估应在接受了急性医疗保健的患者出院后1个月时进行。之所以选择这段时间是因为绝大多数卒中恢复发生在卒中后1到3个月，1个月以后评估的效果很难归因于急性期的医疗保健效果[14]。

于2000年，ACC/AHA报告发布同时，Holloway及其同事召集了16个学科的卒中专家识别并评定出了以医院为基础的急性卒中医疗保健绩效评估体系[12]。对44项评估项目依据可靠性、可行性、对结局的影响、改善的空间、合理性和总体等级评定等6个维度进行评定。该过程识别了几项重要的评估项目，包括抗血栓药物、抗凝血药物、颈动脉成像和卒中单元的运用。研究发现，最有改善空间的项目也是最难评估的项目。要关注目前信息资源的缺陷以及急需研发更好的数据收集方法。

2005年，ACC/AHA扩展了2000年报告的概念框架[22]。新的报告详细指出了发展和完善医疗保健绩效评估体系需要的三个阶段：(1)提出候选的评估项目；(2)评估项目的准确性和可行性；(3)评估报道和落实机制[23]。

目前的卒中医疗保健绩效评估体系
过去五年，美国一直致力于开发能被不同评定组织应用的统一的脑卒中医疗保健绩效评估体系的尝试。参与改善医疗保健质量的医疗保健人员为了避免重复收集评估资料，在一定程度上推进了这项工作的尝试。2003年，基于脑卒中中心联盟和指南的建议，为实现初级脑卒中中心认证，联合委员会与AHA/ASA合作致力于开发医疗保健评估体系[15,16]。由于很多初级卒中中心也参与了“跟着指南走-卒中”项目或疾病预防控制中心(CDC)Paul Coverdell登记，所以尝试扩展到包括所有的三个项目。由联合委员会、AHA/ASA和CDC的代表组成了脑卒中医疗保健绩效评估小组，主要任务是统一术语定义和为三个质量评定单位制定资料收集共同纲领。

建立的10项统一的卒中医疗保健评估项目见表2。这10项主要局限在用于急性期入院医疗保健并且大多数为缺血性卒中患者的医疗保健过程评估。显然，目前的评估项目并没有包含所有有价值的干预措施：几项在卒中医疗保健中很重要的干预措施（如颈动脉内膜切除术、高血压控制和卒中单元）由于在急性卒中时难以评估或定义而没有包括在内。尽管统一小组努力使用一致的方式开展每个评估项目工作，但三个评定机构仍有差异。例如，TJC用国际疾病分类第9版，而不是根据医疗记录做出的临床诊断进行卒中分类，从而排除了短暂性脑缺血发作的患者。每个机构纳入和排除数据时收集资料的方法也有轻微差异。最后应当注意，绩效评估体系的改进是一个渐进的过程，将来会有进一步的改变。

由于NQF在质量评定方面发挥的独立作用以及TJC相关的质量评估需得到外部认可的政策，为响应2007年CMS呼吁，这10项评估提交给NQF。2008年7月，NQF通过了其中的8项评估[26]。戒烟一项没有作为独立的评估项目获得支持是因为NQF已经通过了一项适用于所有入院病人的戒烟评估项目。吞咽困难监测没有获得支持是因为没有足够的证据证实该项目能改善患者预后以及对监测器械的可靠性存有顾虑。

重要的是，CMS已经宣布，从2011财政年度开始，NQF认可的8项评估将被纳入每年的医院住院患者医疗质量支出报告(RHQDAPU)[27]。为获得2012年全额医疗保险资助，医院必须参与RHQDAPU，并汇报2011年度这些评估项目的评估情况[28]。在医院
表 2 目前主要卒中 QI 机构认可的绩效评估项目，包括选用的卒中亚型

<table>
<thead>
<tr>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>深静脉血栓 (DVT) 预防</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>卧床患者在入院后第 2 天接受 DVT 预防</td>
<td>出血性</td>
<td>出血性 *</td>
<td>出血性</td>
<td>出血性</td>
</tr>
<tr>
<td>2</td>
<td>出院后抗凝治疗</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>出院时给患者处方抗凝药物</td>
<td>TIA</td>
<td>TIA *</td>
<td>TIA</td>
<td>TIA</td>
</tr>
<tr>
<td>3</td>
<td>卧床患者的出院后抗凝治疗</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>卧床患者的出院后抗凝治疗</td>
<td>TIA</td>
<td>TIA *</td>
<td>TIA</td>
<td>TIA</td>
</tr>
<tr>
<td>4</td>
<td>溶栓治疗</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>急性缺血性卒中患者在发病 2 小时到达医院，在发病 3 小时内静脉使用组织型纤溶酶原激活剂</td>
<td>TIA</td>
<td>TIA *</td>
<td>TIA</td>
<td>TIA</td>
</tr>
<tr>
<td>5</td>
<td>入院第 2 天抗凝治疗</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>患者入院第 2 天接受抗凝治疗</td>
<td>TIA</td>
<td>TIA *</td>
<td>TIA</td>
<td>TIA</td>
</tr>
<tr>
<td>6</td>
<td>入院后降胆固醇治疗</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性 *</td>
<td>缺血性 *</td>
</tr>
<tr>
<td></td>
<td>入院后 LDL 高于 100 或未检测，或在服用降胆固醇药物的患者，出院后处方降胆固醇药物</td>
<td>TIA</td>
<td>TIA *</td>
<td>TIA</td>
<td>TIA</td>
</tr>
<tr>
<td>7</td>
<td>吞咽困难监测</td>
<td>缺血性</td>
<td>缺血性</td>
<td>缺血性</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>在给予任何食物、液体或口服药物之前，用简易有效的床边检测方法监测患者的吞咽功能</td>
<td>出血性</td>
<td>出血性</td>
<td>出血性</td>
<td>出血性</td>
</tr>
<tr>
<td>8</td>
<td>降胆固醇</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>在住院期间对患者及监护者进行卒中的相关知识教育：个体卒中危险因素，卒中发生的危险信号，急性发作时如何求助 EMS、出院后随访的必要性和药物治疗</td>
<td>出血性</td>
<td>出血性</td>
<td>出血性</td>
<td>出血性</td>
</tr>
<tr>
<td>9</td>
<td>戒烟</td>
<td>缺血性</td>
<td>缺血性 *</td>
<td>缺血性</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>在住院期间对有吸烟史的患者及监护者进行戒烟教育；在住院的前一年内任何时间有吸烟行为的均定义为吸烟者</td>
<td>出血性</td>
<td>出血性 *</td>
<td>出血性</td>
<td>出血性</td>
</tr>
<tr>
<td>10</td>
<td>康复评估</td>
<td>缺血性</td>
<td>缺血性</td>
<td>缺血性</td>
<td>缺血性</td>
</tr>
<tr>
<td></td>
<td>对患者进行康复评估</td>
<td>出血性</td>
<td>出血性</td>
<td>出血性</td>
<td>出血性</td>
</tr>
</tbody>
</table>

* GWTG 医院认可项目之一。
† 出院后他汀药物带药评测项目。
X 指不包括在 NQF 项目中。
LDL 指低密度脂蛋白；EMS，急诊医疗服务。


最后，尽管这篇文章着重综述美国南部卒中医疗保健绩效评估体系的开发和应用，其他国家，如英国 [34]、德国 [35]、瑞典 [36]、丹麦 [37]、澳大利亚 [38] 和新西兰 [39]，也一直致力于建立卒中绩效评估体系，对此本文不再赘述。

局限性

目前的卒中医疗保健绩效评估体系有以下几点不足：首先，目前的评估绝大多数限于对缺血性卒中患者急性期医院内医疗保健的过程评估，需要
进一步扩大绩效评估的范围，将急救医疗保健评估及其他类型的卒中（出血性脑卒中）也包含在内。第二，急需研究证实坚持卒中医疗保健绩效评估与改善患者结局前后之间的直接联系。最后，正如所有质量评估体系，有诸项特定评估来解释卫生保健质量的复杂性本身就有局限性。

结论
尽管到目前为止质量评价和绩效评估在方法学标准上取得了一定进步，人们对这一进程仍有顾虑，以致有人提议为改善和公布医疗质量评估项目，建立一个政府资助机构，制定和监督统一的国家标准[40]。最近医学协会的一项关于绩效评估的报告得出相同的结论，提议建立一个新的独立机构，国家质量协作委员会，隶属于国家健康和公共事务部，为公立和私立机构提供协调服务和财政资助以促进正在进行的评价标准和评价工作[48]。

尽管卒中 QI 项目尚处于初级阶段，资料显示卒中医疗保健质量数据的系统性收集和评估能大规模改善医疗保健质量。然而，目前卒中医疗保健绩效评估仅限于过程评估，仅限于急性期医院内的医疗保健，显然需要建立组织化的多学科的医疗保健、门急诊医疗保健以及患者预后结局等方面绩效评估的持续开发和完善卒中医疗保健绩效评估的其他挑战还包括媒介的作用以及需要获得更多关于改善医疗保健质量能改善患者预后的证据。