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ORIGINAL RESEARCH

Quality of Care and Outcomes for Patients With Stroke in the United States Admitted During the International Stroke Conference

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***Background*—**Patients presenting to hospitals during non–weekday hours experience worse outcomes, often attributed to reduced staffing. The American Heart Association International Stroke Conference (ISC) is well attended by stroke clinicians. We sought to determine whether patients with acute ischemic stroke (AIS) admitted during the ISC receive less guideline-adherent care and experience worse outcomes.

***Methods and Results*—**We performed a retrospective cohort study of US hospitals participating in Get With The Guidelines–Stroke and assessed use of intravenous tissue plasminogen activator, other quality measures, and outcomes for patients with AIS admitted during the ISC compared with those admitted the weeks before and after the conference. A total of 69 738 patients with AIS were included: mean age, 72 years; 52% women; 29% nonwhite. There was no difference between the average weekly number of AIS cases admitted during ISC weeks versus non-ISC weeks (1984 versus 1997; P=0.95). Patient and hospital characteristics were similar between ISC and non-ISC time periods. There were no significant differences in 14 quality metrics and 5 clinical outcomes between patients with AIS treated during the ISC versus non-ISC weeks. Patients with AIS who presented within 2 hours of onset had no difference in the likelihood of receiving intravenous tissue plasminogen activator within 3 hours (adjusted odds ratio, 0.89; 95% confidence interval, 0.77–1.03; P=0.13) or the likelihood of receiving intravenous tissue plasminogen activator within 60 minutes of arrival (adjusted odds ratio, 0.92; 95% confidence interval, 0.83–1.02; P=0.13).

***Conclusions*—**Patients with acute stroke admitted to Get With The Guidelines–Stroke hospitals during ISC received the same quality care and had similar outcomes as patients admitted at other times. **(*J Am Heart Assoc*. 2018;7:e009842. DOI: 10.1161/JAHA.118.009842)**

Key Words: quality indicators • stroke care • tissue-type plasminogen activator

Multiple studies have reported that patients who present to a hospital during a weeknight or weekend receive suboptimal care and experience worse outcomes, possibly attributable to reduced staffing during these periods.[1–3] Similar challenges may exist when physicians attend large disease-specific scientific meetings during which staffing may be reduced and clinicians who stay behind may have less expertise in caring for patients with the relevant disease. A prior study of high-risk patients with heart failure and cardiac arrest who presented to teaching hospitals during the time of national cardiology meetings had lower 30-day mortality, although patients with acute myocardial infarct were less likely to receive a percutaneous coronary intervention.[4]

It remains unclear how major scientific meetings affect the care of patients with acute ischemic stroke (AIS). The American

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An accompanying Table S1 is available at https://www.ahajournals.org/doi/suppl/10.1161/JAHA.118.009842.

The abstract of this work was presented as a moderated poster at the International Stroke Conference, February 21 to 24, 2017, in Houston, TX.

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Clinical Perspective

What Is New?

- Clinical quality care metrics and outcomes for patients admitted with acute ischemic stroke do not change during the time of the International Stroke Conference.

What Are the Clinical Implications?

- These findings are reassuring for sites that participate in the Get With The Guidelines–Stroke quality improvement program.
- It is unknown whether patients with stroke admitted to hospitals that do not participate in Get With The Guidelines are similarly unaffected by the International Stroke Conference.

Heart Association/American Stroke Association International Stroke Conference (ISC) is the largest conference of its kind in the world and attracts physicians, nurses, and coordinators focused on stroke care and research. Get With The Guidelines (GWTG)–Stroke is a voluntary national registry and quality improvement initiative that captures a substantial percentage of stroke admissions in the United States and provides a unique opportunity to assess the impact of this annual meeting on the care of patients with AIS. We hypothesized that patients with AIS admitted during the ISC would receive intravenous tissue plasminogen activator (tPA) at the same rate and that they would have similar overall quality-of-care and clinical outcomes as patients admitted at other times.

Methods

Several previous publications provide detailed descriptions of the GWTG-Stroke program.[5] Briefly, GWTG-Stroke is a national stroke quality improvement program available to any US hospital since April 2003. The web-based patient management tool (Outcome; A Quintiles Company, Cambridge, MA) uploads abstracted deidentified patient data into the GWTG-Stroke database. All institutions participating in GWTG-Stroke comply with local regulatory and privacy guidelines, and institutional review board approval is obtained, if required. Because data are used primarily for quality improvement at each site, they are granted a waiver of informed consent under the Common Rule. The Duke Clinical Research Institute (Durham, NC) serves as the data analysis center and maintains institutional review board approval to analyze aggregate deidentified data for research purposes. Because data were collected for clinical care and quality improvement rather than primarily for research, the American Heart Association (the steward of the data according to contracts between the American Heart Association and participating hospitals) cannot provide the data, statistical analysis code, or other study materials to other researchers.

Study Population

We identified all patients admitted with a diagnosis of AIS over a 5-week period, including the 2 weeks before the ISC, the ISC week, and the 2 weeks after the ISC each year from 2009 to 2015 (see Table S1 for specific dates used). We excluded patients given experimental therapy, those transferred to a GWTG-Stroke hospital, those with stroke while already admitted to the hospital, those with missing time of arrival to the emergency department, those missing time of last known well, those missing intravenous tPA information, and those missing discharge status.

Statistical Analyses

To ensure that there were no meaningful differences for the time periods before and after the ISC, we first assessed the use of tPA, as well as patient and hospital characteristics, for admissions during the 2 weeks before the ISC compared with the 2 weeks after the ISC. Then, the average number of weekly admissions, individual patient and hospital characteristics, GWTG-Stroke quality measures, and patient clinical outcomes were compared between the ISC and non-ISC weeks using the Pearson χ^2 test and Wilcoxon rank sum tests. We then performed multivariable logistic regression adjusting for potential confounders (age, sex, arrival mode [emergency medical services versus other], calendar year, medical history of atrial fibrillation/flutter, previous stroke/transient ischemic attack, coronary artery disease/prior myocardial infarction, carotid stenosis, diabetes mellitus, peripheral vascular disease, hypertension, dyslipidemia, smoking, onset to treatment time, presentation during off hours, National Institutes of Health Stroke Scale score, region, academic/teaching hospital, number of beds, annual volume of ischemic stroke admissions, annual intravenous tPA volume, and The Joint Commission Primary Stroke Center [TJCPSC] status), using generalized estimating equations to account for within-site correlations, to determine whether patients admitted during the ISC within 2 hours of onset of symptoms were less likely to receive intravenous tPA within 3 hours and less likely to receive intravenous tPA within 60 minutes from presentation to the hospital. Multivariable analyses included interaction terms for admission during the ISC, teaching hospital, and hospital size. All analyses were conducted by the GWTG-Stroke statistical analysis center at the Duke Clinical Research Institute (Durham, NC) using SAS software, version 9.3 (SAS Institute, Cary, NC).

Results

There were 69 738 patients with AIS included in the analysis. The mean age was 72 years, 52% were women, and 29% were nonwhite. Intravenous tPA was given to 11 437 patients

Table 1. Patient and Hospital Characteristics Dichotomized by Admission During the 2 Weeks Before or After the ISC

Characteristics	Overall (N=55 850)	Admission Before the ISC (N=27 897)	Admission After the ISC (N=27 953)	Standard Mean Difference	*P* Value
Patient demographics					
Age, mean±SD, y	71.7±14.5	71.7±14.4	71.7±14.5	−0.6	0.84
Female sex, %	51.6	51.7	51.6	−0.1	0.87
Race/ethnicity, %					
White	70.8	70.7	70.9	0.5	0.51
Black	15.7	15.9	15.5	−1.2	
Hispanic	7.0	7.0	6.9	−0.3	
Asian	2.9	2.8	2.9	−0.3	
Other	3.7	3.6	3.8	1.0	
Health insurance, %					
Private insurance	44.5	44.7	44.3	−0.9	0.49
Medicare	40.3	40.0	40.6	−0.8	
Medicaid	9.6	9.7	9.5	1.3	
Self-pay/no insurance	5.6	5.6	5.6	0.1	
Missing	15.2	15.0	15.4		
Patient arrival and admission					
Arrival mode: EMS, %	66.3	66.5	66.1	−0.9	0.28
Missing, %	6.7	6.4	7.0		
Arrival during nonweekday hours, %	47.7	48.1	47.3	−1.5	0.08
Onset to arrival time, median (IQR), min	200 (69–617)	203 (69–621)	197 (68–613)	−0.7	0.14
Missing, %	1.2	1.2	1.2		
NIHSS score recorded, %	80	79.6	80.3	2.0	0.02
NIHSS score, median (IQR)	5 (2–11)	5 (2–11)	5 (2–11)	1.5	0.06
NIHSS levels, %					
0–4	49.2	49.6	48.8	−1.7	0.06
5–9	21.5	21.3	21.6	0.7	
10–14	10.8	11.0	10.7	−1.0	
15–20	9.5	9.1	9.9	2.7	
≥21	9.1	9.0	9.1	0.2	
Medical history, %					
Atrial fibrillation/flutter	21.1	21.2	21.0	−0.6	0.51
Prosthetic heart valve	1.5	1.4	1.6	1.6	0.07
Previous stroke/TIA	31.3	31.7	30.9	−1.6	0.18
CAD/prior MI	25.8	26.1	25.5	−1.5	0.17
Carotid stenosis	3.6	3.6	3.6	0.1	0.88
Diabetes mellitus	31.5	31.9	31.1	−1.7	0.05
PVD	4.4	4.5	4.4	−0.6	0.50
Hypertension	76.3	76.5	76.0	−1.1	0.19
Smoker	16.7	16.7	16.6	−0.3	0.76
Dyslipidemia	44.4	44.4	44.4	0	0.99

Continued

Table 1. Continued

Characteristics	Overall (N=55 850)	Admission Before the ISC (N=27 897)	Admission After the ISC (N=27 953)	Standard Mean Difference	*P* Value
Heart failure	9.2	9.4	9.0	−1.3	0.11
Medical history panel missing	0.7	0.7	0.7	0.6	0.46
Hospital characteristics					
Teaching hospital, %	57.7	57.6	57.8	0.4	0.69
Region, %					
Northeast	25.6	25.9	25.4	−1.2	0.14
Midwest	18.7	18.3	19.0	1.8	
South	35.3	35.5	35.2	−0.5	
West	20.3	20.3	20.4	0.2	
Rural location, %	4.2	4.3	4.1	−0.8	0.36
TJCPSC, %	47.8	47.7	47.8	0.3	0.71
No. of beds, median (IQR)	353 (242–531)	355 (243–531)	352 (240–531)	−0.4	0.61
Annual volume of ischemic stroke admissions, median (IQR)	219 (146–334)	219 (146–333)	219 (146–334)	0	0.77
Annual volume of intravenous tPA administrations	18 (10–30)	18 (10–30)	18 (10–30)	−0.3	0.82

CAD indicates coronary artery disease; EMS, emergency medical services; IQR, interquartile range; ISC, International Stroke Conference; MI, myocardial infarction; NIHSS, National Institutes of Health Stroke Scale; PVD, peripheral vascular disease; TIA, transient ischemic attack; TJCPSC, The Joint Commission Primary Stroke Center; tPA, tissue plasminogen activator.

(16.4%), and symptomatic intracerebral hemorrhage was reported in 480 (4.2%) of these patients. Comparing the 2 weeks before the ISC with the 2 weeks after the ISC, there were no differences in tPA use within the 3- or 4.5-hour window (*P*=not significant for each year). Similarly, patient and hospital characteristics between pre- and post-ISC periods demonstrated no clinically meaningful differences (Table 1). The only factors that were statistically significantly different were whether a National Institutes of Health Stroke Scale score was recorded (79.6% versus 80.3%; *P*=0.02) and history of diabetes mellitus (31.9% versus 31.1%; *P*=0.05).

Comparing ISC with non-ISC weeks, there was no difference between the average weekly number of acute stroke admissions during ISC weeks compared with non-ISC weeks (1984 versus 1997; *P*=0.95). Similarly, there were no differences for patient and hospital characteristics between ISC and non-ISC time periods (Table 2). As shown in Table 3, there were no differences in 14 quality-of-care metrics and 5 clinical outcomes between ISC and non-ISC weeks, including percentage of patients who received intravenous tPA (16.4% versus 16.4%; *P*=0.94), symptomatic intracerebral hemorrhage after tPA (4.0% versus 4.3%; *P*=0.66), or discharge to home (48.2% versus 48.4%; *P*=0.68). The percentage of patients who arrived within 2 hours and were treated with intravenous tPA by 3 hours and those who arrived within 3.5 hours and were treated with intravenous tPA by 4.5 hours were similar before, during, and after the ISC in each year (Figure). After adjusting for potential confounders, patients with acute stroke who presented within 2 hours of onset had no difference in the likelihood of receiving intravenous tPA within 3 hours (adjusted odds ratio, 0.89; 95% confidence interval, 0.77–1.03; *P*=0.13). Similarly, there was no difference in the likelihood of receiving intravenous tPA within 60 minutes of arrival (adjusted odds ratio, 0.92; 95% confidence interval, 0.83–1.02; *P*=0.13). There was no evidence of interaction by teaching hospital (*P*=0.99 for arrive by 2 and treat by 3 hours, and *P*=0.29 for door-to-needle time of <60 minutes) or hospital size (*P*=0.91 for arrive by 2 and treat by 3 hours, and *P*=0.68 for door-to-needle time of <60 minutes).

Discussion

This study identified no degradation in the quality of care given to patients with AIS admitted during the week of a major conference on cerebrovascular disease. Patients were just as likely to receive intravenous tPA, with a similar door-to-needle time and with similar adherence to guideline-based quality measures during the ISC as at other times. Clinically important outcomes, including symptomatic intracerebral hemorrhage rate after intravenous tPA, ambulatory status at discharge, and discharge to home, were unchanged during the conference. Finally, there was no evidence of an interaction

Table 2. Patient and Hospital Characteristics Dichotomized by Admission During the Week of the ISC or the 2 Weeks Before or After the ISC

Characteristics	Overall (N=69 738)	Admission During the ISC (N=13 888)	Admission Not During the ISC (N=55 850)	Standard Mean Difference	*P* Value
Patient demographics					
Age, mean±SD, y	71.7±14.5	71.5±14.5	71.7±14.5	−1.6	0.09
Female sex, %	51.6	51.6	51.6	0	0.97
Race/ethnicity, %					
White	70.9	71.4	70.8	1.4	0.32
Black	15.7	15.6	15.7	−0.3	
Hispanic	6.9	6.5	7.0	−1.9	
Asian	2.9	2.9	2.9	0	
Other	3.7	3.6	3.7	−0.2	
Health insurance, %					
Private insurance	44.7	45.4	44.5	1.9	0.09
Medicare	40.2	39.5	40.3	−1.7	
Medicaid	9.5	9.2	9.6	−1.4	
Self-pay/no insurance	5.7	5.9	5.6	1.2	
Missing	15.3	15.8	15.2		
Patient arrival and admission					
Arrival mode: EMS, %	66.4	66.7	66.3	0.9	0.35
Missing, %	6.7	6.9	6.7		
Arrival during nonweekday hours, %	47.8	48.2	47.7	1.1	0.27
Onset to arrival time, median (IQR), min	199 (69–616)	196 (69–611)	200 (69–617)	0.5	0.69
Missing, %	1.2	1.3	1.2		
NIHSS score recorded, %	80	80.3	79.9	0.8	0.40
NIHSS score, median (IQR)	5 (2–11)	5 (2–11)	5 (2–11)	0	0.71
0–4, %	49.1	48.9	49.2	−0.5	0.72
5–9, %	21.5	21.6	21.5	0.3	
10–14, %	10.9	11.0	10.8	0.6	
15–20, %	9.5	9.5	9.5	0	
≥21, %	9.1	9.0	9.1	−0.2	
Medical history, %					
Atrial fibrillation/flutter	21.1	21.3	21.1	0.5	0.62
Prosthetic heart valve	1.5	1.6	1.5	0.7	0.46
Previous stroke/TIA	31.2	30.7	31.3	−1.3	0.18
CAD/prior MI	25.7	25.2	25.8	−1.3	0.17
Carotid stenosis	3.6	3.3	3.6	−1.6	0.11
Diabetes mellitus	31.4	31.2	31.5	−0.6	0.50
PVD	4.4	4.5	4.4	0.5	0.60
Hypertension	76.2	75.9	76.3	−0.9	0.36
Smoker	16.7	16.5	16.7	−0.4	0.66
Dyslipidemia	44.4	44.3	44.4	−0.1	0.91
Heart failure	9.2	9.2	9.2	−0.1	0.90

Continued

Table 2. Continued

Characteristics	Overall (N=69 738)	Admission During the ISC (N=13 888)	Admission Not During the ISC (N=55 850)	Standard Mean Difference	*P* Value
Medical history panel missing	0.8	0.9	0.7	1.8	0.05
Hospital characteristics					
Teaching hospital, %	57.9	58.7	57.7	1.9	0.05
Region, %					
Northeast	25.7	25.7	25.6	0.2	0.61
Midwest	18.8	19.2	18.7	1.2	
South	35.3	35.0	35.3	−0.7	
West	20.3	20.2	20.3	−0.4	
Rural location, %	4.2	3.9	4.2	−1.6	0.09
TJCPSC, %	47.8	48.1	47.8	0.7	0.49
No. of beds, median (IQR)	355 (242–531)	355 (243–540)	353 (242–531)	1.1	0.20
Annual volume of ischemic stroke admissions, median (IQR)	219 (146–334)	219 (147–334)	219 (146–334)	0.6	0.58
Annual volume of intravenous tPA administrations	18 (10–30)	18 (10–30)	18 (10–30)	0.5	0.57

Patient variables other than NIHSS score had <7% missing values and were imputed to the most common category. CAD indicates coronary artery disease; EMS, emergency medical services; IQR, interquartile range; ISC, International Stroke Conference; MI, myocardial infarction; NIHSS, National Institutes of Health Stroke Scale; PVD, peripheral vascular disease; TIA, transient ischemic attack; TJCPSC, The Joint Commission Primary Stroke Center; tPA, tissue plasminogen activator.

by teaching hospital status or hospital size, despite the concern that clinicians working at academic hospitals may be more likely to attend the ISC and that smaller hospitals would be more likely to be understaffed if clinicians were away.

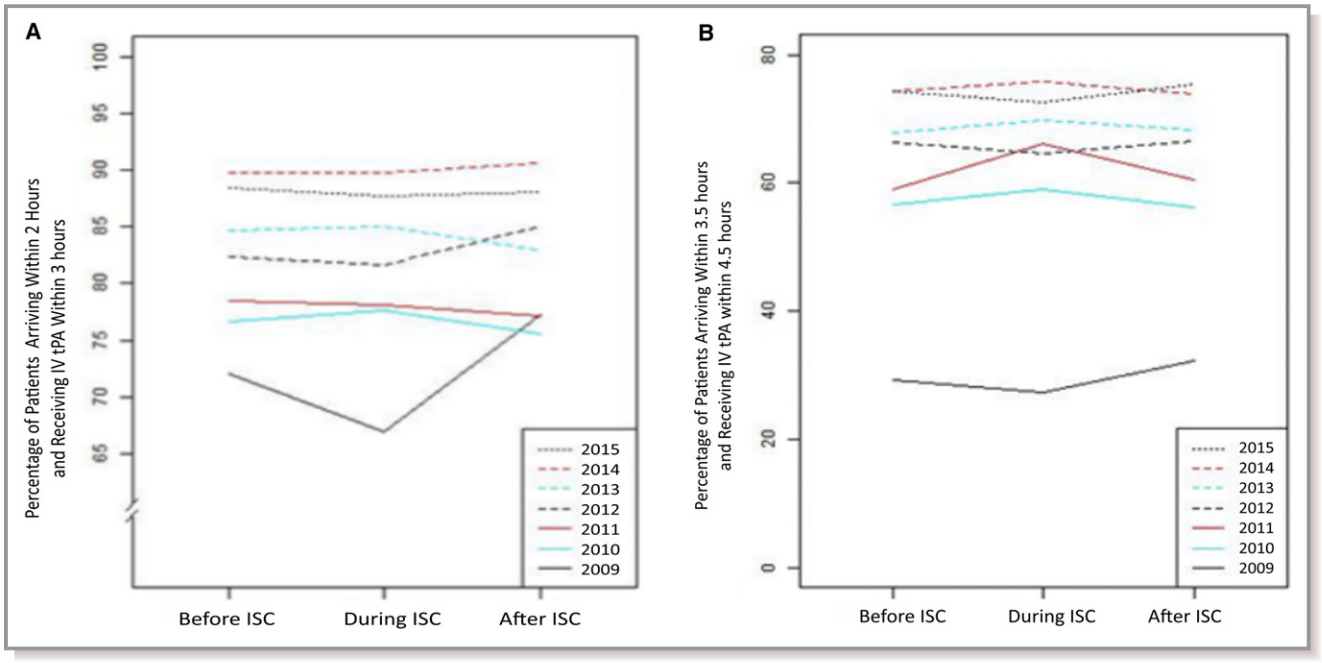

Figure. Treatment with intravenous tissue plasminogen activator (tPA) within the 3- and 4.5-hour window before, during, and after the International Stroke Conference (ISC). A, The percentage of patients arriving within 2 hours of stroke symptom onset, who were treated with intravenous tPA by 3 hours. B, The percentage of patients arriving within 3.5 hours of stroke symptom onset, who were treated with intravenous tPA by 4.5 hours.

Table 3. GWTG-Stroke Quality and Performance Measures and Outcome, Dichotomized by Admission During the ISC or the 2 Weeks Before or After the ISC

Variable	Overall (N=69 738)	Admission During the ISC (N=13 888)	Admission Not During the ISC (N=55 850)	Standard Mean Difference	*P* Value
Primary outcomes					
Arrive by 2 h, treat by 3 h, %	83.0	82.3	83.1	−2.3	0.35
Door-to-needle time, median (IQR), min	67 (50–90)	67 (51–92)	67 (50–90)	3.1	0.25
Secondary outcomes					
Arrive by 3.5 h, treat by 4.5 h, %	61.3	61.9	61.1	1.7	0.38
Intravenous tPA use among all patients with acute ischemic stroke, %	16.4	16.4	16.4	0.1	0.94
IA thrombectomy use among all patients with acute ischemic stroke, %	2.2	2.2	2.2	0.2	0.87
Missing, %	15.2	15.6	15.1		
Door-to-CT time, median (IQR), min	31 (17–61)	31 (17–62)	31 (17–61)	0.1	0.70
Door-to-CT time ≤25 min, %	42.1	42.1	42.1	0.1	0.96
Door-to-needle time ≤60 min, %	48.4	47.5	48.6	−2.1	0.35
Antithrombotics <48 h from admission, %	97.8	97.9	97.7	1.0	0.44
VTE prophylaxis, %	98.0	97.9	98.0	−0.8	0.49
Antithrombotics prescribed at D/C, %	98.9	98.8	98.9	−1.0	0.31
Anticoagulation at D/C for atrial fibrillation, %	95.7	96.1	95.7	2.4	0.32
Smoking cessation counseling, %	97.4	97.2	97.4	−1.1	0.65
LDL <100 mg/dL or statin given, %	96.2	96.2	96.2	−0.4	0.78
Symptomatic ICH after intravenous tPA, %	4.2	4.0	4.3	−1.3	0.66
Missing, %	2.9	3.1	2.9		
In-hospital mortality, %	5.2	5.0	5.2	−1.0	0.29
Discharged home, %	48.3	48.2	48.4	−0.4	0.68
LOS, median (IQR), d	4 (2–6)	4 (2–6)	4 (2–6)	0.6	0.02
LOS >4 d, %	40.2	40.8	40.0	1.5	0.10
Ambulatory status at discharge, %					
Independent	48.6	48.5	48.6	−0.1	0.76
With assistance	29.0	29.3	29.0	0.8	
Nonambulatory	16.0	16.0	16.1	−0.3	
Expired	6.3	6.2	6.4	−0.9	
Missing	18.2	18.7	18.1		

For each variable, there were no missing data if not stated otherwise. CT indicates Computed Tomography scan; D/C, discharge; GWTG, Get With The Guidelines; IA, intra-arterial; ICH, intracerebral hemorrhage; IQR, interquartile range; ISC, International Stroke Conference; LDL, low-density lipoprotein; LOS, length of stay; tPA, tissue plasminogen activator; VTE, venous thromboembolism.

The GWTG-Stroke registry is one of the largest available data sets of hospitalized patients with stroke in the world and represents a mix of academic and nonacademic hospitals of varying sizes from all the regions of the United States. There are almost 2000 hospitals currently active in the program, representing ≈40% of all hospitals in the United States and ≈75% of incident stroke cases. It is representative of the Medicare fee-for-service population with ischemic stroke, and the specificity of included patients and data accuracy have been demonstrated to be high.[6,7] However, there are notable limitations to this study. Hospitals that participate in GWTG have inherently demonstrated an interest in improving stroke care. GWTG-Stroke provides protocols, templates, and clinical tools that are designed to standardize care with guideline-adherent practices. Furthermore, participating hospitals submit data and can track their performance on quality care measures, with public recognition awards given to hospitals that meet established thresholds. Thus, it is likely that these

hospital practices become established as routine and are not dependent on individual clinicians' practices.

As evidence of the impact of GWTG-Stroke participation, a quality improvement initiative undertaken to disseminate practices associated with faster intravenous tPA treatment resulted in improved timeliness of tPA administration, lower in-hospital mortality and intracranial hemorrhage rates, and an increased percentage of patients discharged home.[8] Similarly, a recent multicenter, cluster-randomized clinical trial among 40 public hospitals in China demonstrated that instituting a quality improvement intervention, including a clinical pathway, care protocols, quality coordinator oversight, and performance measure monitoring and feedback, resulted in improvement in performance measures of patient care and a reduction in recurrent vascular events up to 1 year after discharge.[9] However, given that this analysis was limited to hospitals participating in GWTG-Stroke, it is not clear whether these results would generalize to hospitals that do not participate in the program. A final limitation that deserves mention is the fact that the data from GWTG-Stroke are dependent on the accuracy and completeness of clinical documentation. More important, there was no decrease in the number of strokes reported during the week of the ISC and no difference in missingness in key variables, suggesting that selective documentation was not occurring during the time of the conference.

In conclusion, the care and outcomes of patients with acute stroke at hospitals participating in GWTG-Stroke do not differ during the time of a major conference on cerebrovascular disease compared with other times.

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Disclosures

Messé is a member of the Get With The Guidelines (GWTG) Steering Committee and Stroke Clinical Work Group. Smith is an Assistant Editor of *Stroke*; is a member of the Editorial Board of the *Journal of the American Heart Association*; and has received research funding from the Canadian Institutes of Health Research, Alberta Innovates—Health Solutions, Canadian Partnership Against Cancer, and the Heart and Stroke Foundation of Alberta. Saver is an employee of the University of California (UC); has served as an unpaid site investigator in multicenter trials run by Medtronic, Stryker, and Lundbeck, for which the UC Regents received payments on the basis of clinical trial contracts for the number of subjects enrolled; serves as an unpaid consultant to Genentech advising on the design and conduct of the PRISMS (Potential of rtPA for Ischemic Strokes With Mild Symptoms) trial (neither the UC nor Saver received any payments for this voluntary service); and receives funding for services as a scientific consultant on trial design and conduct to Medtronic/Covidien, Stryker, Neuravi, BrainsGate, Pfizer, Squibb, Boehringer Ingelheim (prevention only), ZZ Biotech, and St Jude Medical. The UC has patent rights in retrieval devices for stroke. Bhatt discloses the following relationships—Advisory Board: Cardax, Elsevier Practice Update Cardiology, Medscape Cardiology, and Regado Biosciences; Board of Directors: Boston Veterans Affairs (VA) Research Institute and Society of Cardiovascular Patient Care; Chair: American Heart Association (AHA) Quality Oversight Committee; Data Monitoring Committees: Cleveland Clinic, Duke Clinical Research Institute, Harvard Clinical Research Institute, Mayo Clinic, Mount Sinai School of Medicine, and Population Health Research Institute; Honoraria: American College of Cardiology (Senior Associate Editor, *Clinical Trials and News, ACC.org*), Belvoir Publications (Editor in Chief, *Harvard Heart Letter*), Duke Clinical Research Institute (clinical trial steering committees), Harvard Clinical Research Institute (clinical trial steering committee), HMP Communications (Editor in Chief, *Journal of Invasive Cardiology*), *Journal of the American College of Cardiology* (Guest Editor and Associate Editor), Population Health Research Institute (clinical trial steering committee), Slack Publications (Chief Medical Editor, *Cardiology Today's Intervention*), Society of Cardiovascular Patient Care (secretary/treasurer), and WebMD (continuing medical education steering committees); Other: *Clinical Cardiology* (Deputy Editor), National Cardiovascular Data Registry (NCDR)–ACTION Steering Committee (Chair), and Veterans Affairs Clinical Assessment Reporting and Tracking (VA CART) Research and Publications Committee (chair); Research Funding: Amarin, Amgen, AstraZeneca, Bristol-Myers Squibb, Chiesi, Eisai, Ethicon, Forest Laboratories, Ironwood, Ischemix, Lilly, Medtronic, Pfizer, Roche, Sanofi Aventis, and The Medicines Company; Royalties: Elsevier (Editor, *Cardiovascular Intervention: A Companion to Braunwald's Heart Disease*); Site Coinvestigator: Biotronik, Boston Scientific, and St Jude Medical (now Abbott); Trustee: American College of Cardiology; Unfunded Research: FlowCo, Merck, PLx Pharma, and Takeda. Grau-Sepulveda is an employee of the Duke Clinical Research Institute, which serves as the AHA GWTG data coordinating center. Cox is an employee of the Duke Clinical Research Institute, which serves as the AHA GWTG data coordinating center. Matsouaka is an employee of the Duke Clinical Research Institute, which serves as the AHA GWTG data coordinating center.

Fonarow reports serving as a member of the GWTG steering committee; receiving significant research support from the National Institutes of Health and the Patient-Centered Outcomes Research Institute (PCORI); and being an employee of the UC, which holds a patent on retriever devices for stroke. Schwamm serves as a volunteer for the AHA as chair of the stroke clinical workgroup for GWTG-Stroke and chair of the Healthcare Accreditation Science Committee; serves as the principal investigator of a National Institute of Neurological Disorders and Stroke (NINDS)–funded SPOTRIAS (Specialized Programs of Translational Research in Acute Stroke network) trial, MR WITNESS, which is a phase 2 safety study of alteplase delivered in an extended time window with MR-guided patient selection (NC 01282242). The study is funded primarily by NINDS, and alteplase is provided by Genentech to Massachusetts General Hospital for distribution to sites, as well as modest per-patient supplemental site payments. Genentech has no control over study design, analysis, or publication. He reports receiving significant research support from the PCORI; serving as a stroke systems consultant to the Massachusetts Department of Public Health; and serving as a scientific consultant on trial design and conduct to Lundbeck (international steering committee, DIAS3, 4 trial), Medtronic (steering committees for REACT AF [Real Evidence of Anti Coagulation Treatment in AF] and STROKE-AF [Stroke of Known Cause and Underlying Atrial Fibrillation]), and Penumbra (data and safety monitoring committee, Separator 3D trial). The remaining authors have no disclosures to report.

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SUPPLEMENTAL MATERIAL

Table S1. Dates of the American Heart Association/American Stroke Association International Stroke Conference from 2009 through 2015.

Year	Two Weeks Before ISC	One Week Before ISC	ISC Week	One Week After ISC	Two Weeks After ISC
2009	February 2 – February 8	February 9 – February 15	February 16 – February 22	February 23 – March 1	March 2 – March 8
2010	February 8 – February 14	February 15 – February 21	February 22 – February 28	March 1 – March 7	March 8 – March 14
2011	January 24 – January 30	January 31 – February 6	February 7 – February 13	February 14 – February 20	February 21 – February 27
2012	January 16 – January 22	January 23 – January 29	January 30 – February 5	February 6 – February 12	February 13 – February 19
2013	January 21 – January 27	January 28 – February 3	February 4 – February 10	February 11 – February 17	February 18 – February 24
2014	January 27 – February 2	February 3 – February 9	February 10 – February 16	February 17 – February 23	February 24 – March 2
2015	January 26 – February 1	February 2 – February 8	February 9 – February 15	February 16 – February 22	February 23 – March 1