Brief Report

Establishing Recommendations for Stroke Systems in the Thrombectomy Era

The Upstate New York Stakeholder Proceedings

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Background and Purpose—The American Heart Association/American Stroke Association and Department of Health Stroke Coverdell Program convened a stakeholder meeting in upstate NY to develop recommendations to enhance stroke systems for acute large vessel occlusion.

Methods—Prehospital, hospital, and Department of Health leadership were invited (n=157). Participants provided goals/concerns and developed recommendations for prehospital triage and interfacility transport, rating each using a 3-level impact (A [high], B, and C [low]) and implementation feasibility (1 [high], 2, and 3 [low]) scale. Six weeks later, participants finalized recommendations.

Results—Seventy-one stakeholders (45% of invitees) attended. Six themes around goals/concerns emerged: (1) emergency medical services capacity, (2) validated prehospital screening tools, (3) facility capability, (4) triage/transport guidelines, (5) data capture/feedback tools, and (6) facility competition. In response, high-impact (level A) prehospital recommendations, stratified by implementation feasibility, were (1) use of online medical control for triage (6%); (2) regional transportation strategy (31%), standardized emergency medical services checklists (18%), quality metrics (14%), standardized prehospital screening tools (13%), and feedback for performance improvement (7%); and (3) smartphone application algorithm for screening/decision-making (6%) and ambulance-based telemedicine (6%). Level A interfacility transfer recommendations were (1) standardized transfer process (32%)/timing goals (16%)/regionalized systems (11%), performance metrics (11%), image sharing capabilities (7%); (2) provider education (9%) and stroke toolbox (5%); and (3) interfacility telemedicine (7%) and feedback (2%).

Conclusions—The methods used and recommendations generated provide models for stroke system enhancement. Implementation may vary based on geographic need/capacity and be contingent on establishing standard care practices. Further research is needed to establish optimal implementation strategies. **(*Stroke*. 2017;48:00-00. DOI: 10.1161/STROKEAHA.117.017412.)**

Key Words: emergency medical services ■ feedback ■ goals ■ patient transfer ■ stroke ■ thrombectomy ■ triage

In light of the 2015 acute stroke treatment guidelines[1] recommending acute endovascular therapy for select patients with large vessel occlusions, United States hospitals, emergency medical services (EMS), and state Departments of Health are working to operationalize acute stroke systems. The American Heart Association/American Stroke Association and the Stroke Coverdell Program of the New York State Departments of Health convened a stakeholder meeting in upstate New York to review evidence, practice, goals/concerns, and to develop consensus-based recommendations for acute stroke patient evaluation, triage, and management. Fifty-six percent (120/213) of hospitals in New York State are state-designated primary stroke centers; of these, 48% (57/120) are in upstate New York,[2] covering 45% (23 201/51 541) of all stroke discharges in New York (Figure).[2–6] The meeting was convened in 2016, in the

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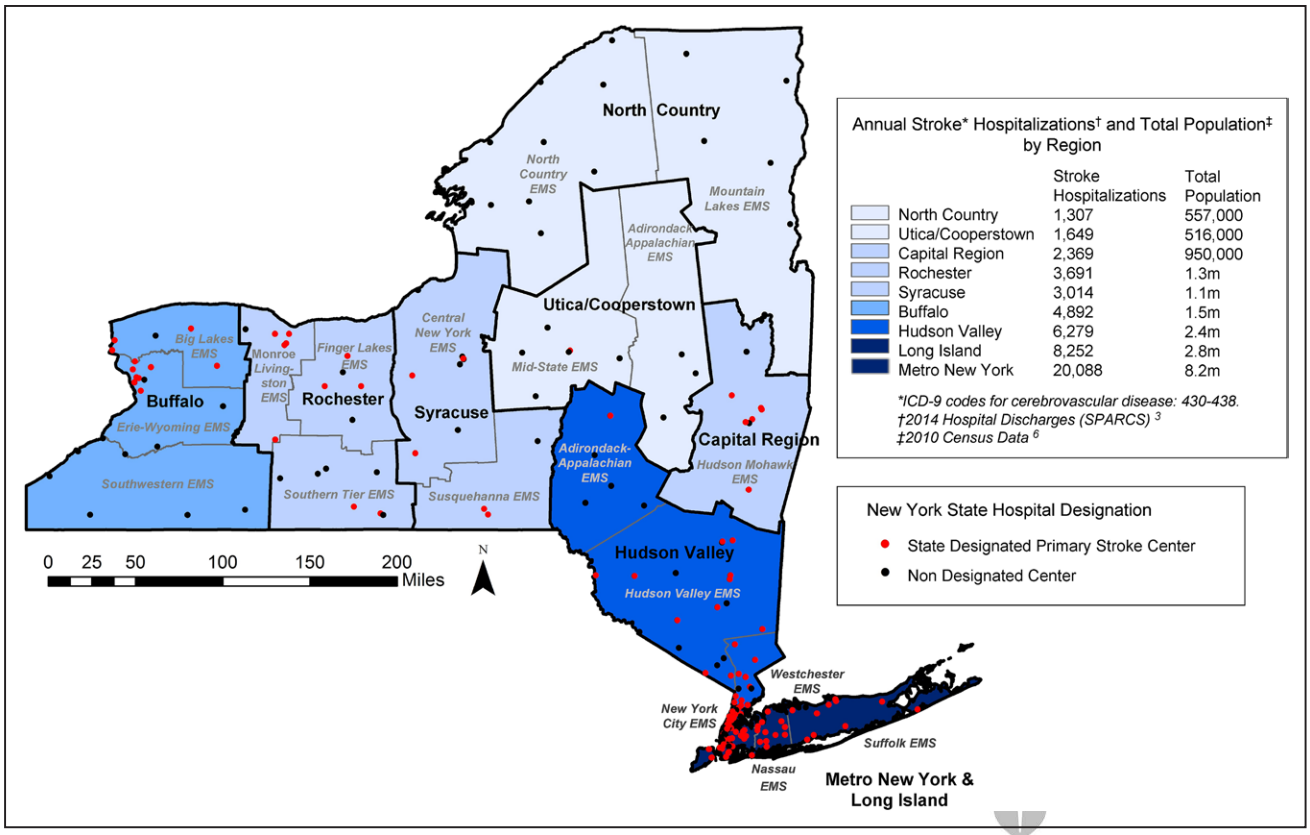

Figure. New York State (New York State) geographic regions, designated stroke centers, and regional emergency medical services (EMS) councils by stroke hospitalizations and total population. Sources: ESRI, 2014,[4] NYS Statewide Planning and Research Cooperative System (SPARCS) Database[3] and NYS State Bureau of EMS Data as of September 1, 2016.[5] United States Census Data 2010.[6]

geographically large and resource diverse upstate New York area, covered by 15 regional EMS councils.

Methods

Invitations (n=157) were sent to prehospital, hospital, and Departments of Health leaders across upstate New York. Attendees participated in a moderated daylong meeting which began with didactic sessions followed by group recommendation generating sessions (Appendix I in the online-only Data Supplement). Pre- and postmeeting assessments were conducted to assess stroke systems knowledge and gauge participant goals/concerns (Appendix II in the online-only Data Supplement). Participants provided recommendations in 2 domains (1) prehospital (EMS tools and operationalizing transport) and 2) interfacility transfer. Recommendations were then ranked using an impact/feasibility matrix,[7] impact (A: high impact to C: low impact) and feasibility of implementation (1: high feasibility to 3: low feasibility). After the meeting, recommendations were thematically analyzed, concentrating specifically on A-level recommendations. Six-week post-meeting, participants, organized into workgroups (Table I in the online-only Data Supplement), were provided the results for review, comment, and subsequent agreement.

Results

Seventy-one stakeholders (47% of invitees) attended the meeting, and 57 (80% of participants) completed the pre-/post-assessments. Respondent characteristics, goals, and concerns are detailed in Tables II through IV in the online-only Data Supplement. Goals/concerns varied by stakeholder specialty, practice environment, and region (Tables V through X in the online-only Data Supplement); however, they coalesced around 6 themes: (1) EMS capacity (an overburdened EMS system, funding inadequacies, long distance transport burden, and training feasibility); (2) use of validated screening tools to diagnose large vessel occlusion; (3) clear definitions of facility capability (primary stroke center versus comprehensive stroke center, the role of endovascular-capable centers); (4) clear guidelines for prehospital triage and interfacility transport; (5) data capture and feedback tools; and (6) competition because of costs, resources, and threats to interfacility collaboration.

In response to the goals/concerns, 67% (90/134) of the A-level recommendations focused on prehospital triage and tools (Table 1); 33% (44/134) focused on interfacility transfer (Table 2).

Discussion

The recommendations generated from the meeting dovetail with the stroke guidelines[1] which emphasize care coordination between EMS, sending and receiving hospitals, and monitoring of relevant process metrics and clinical outcomes for all patients. Recent publications have called for solutions similar to those emanating from the meeting (eg, smartphone applications, performance metrics, etc).[8] Examination of the recommendations reveals that several are contingent on community collaboration and consensus, clear delineation of institutional capabilities, and most will need to be driven by regional needs and available resources. Although the meeting focused on

Table 1. Prehospital Triage and Tools A-Level Recommendations

A1: High impact, high feasibility	n* (%)
Online medical control: to assist with the decision-making process concerning transport to a PSC, CSC, or endovascular-capable center.	5 (5.6)
A2: High impact, moderate feasibility	
Regional transportation strategy: based on prehospital diagnosis to the most appropriate center.	28 (31.1)
Standardized EMS checklist: for assessment of a stroke patient, inclusive of information, such as last known well, family/witness contact information, contraindications to tPA, etc.	16 (17.8)
Quality metrics: to assess prehospital performance.	13 (14.4)
Standardized prehospital stroke screening tool: to assess for LVO; determine the most appropriate screening tool and standardize its use by region (perhaps statewide).	12 (13.3)
Feedback to EMS for performance improvement.	6 (6.7)
A3: High impact, low feasibility	
Smartphone application algorithm: to assist with the screening and decision-making process for transportation that accounts for stroke scale score, geography, time of day, etc.	5 (5.6)
Ambulance-based telemedicine: to assist with the decision-making process concerning transport.	5 (5.6)

CSC indicates comprehensive stroke center; EMS, emergency medical services; LVO, large vessel occlusion; PSC indicates primary stroke center; and tPA, tissue-type plasminogen activator.

*Number of times recommendation was generated out of total A-level prehospital recommendations.

Table 2. Interfacility Transfer A-Level Recommendations

A1: High impact, high feasibility	n* (%)
Standardized transfer process: includes automatic activation of an interfacility transfer unit and pre-established packaging list for patient transfer.	14 (31.8)
Established transfer timing goals: set expectations for transfer timing goals between agencies and hospitals; clearly delineate an EMS unit's capacity for transfer, including upgrading a unit capable of transfer if necessary.	7 (15.9)
Regionalized stroke systems: establish stroke systems that complement preestablished patterns of patient transfer within facilities in the region building on trauma and STEMI models.	5 (11.4)
Performance metrics: to assess performance at stroke centers, including door-in–door-out and timing goals for EMS transfer.	5 (11.4)
Image sharing capabilities: establish capabilities between facilities.	3 (6.8)
A2: High impact, moderate feasibility	
Provider (EMS and hospital) education: on the transfer process, including standardization of content and as a means of peer-to-peer support.	4 (9.1)
Stroke Tool Box: that lists necessary information and equipment for the safe and expeditious transfer of patients between facilities.	2 (4.5)
A3: High impact, low feasibility	
Interfacility telemedicine: to assist with the transfer decision-making process.	3 (6.8)
Feedback system: to institutions and EMS for performance improvement.	1 (2.3)

EMS indicates emergency medical services; and STEMI, ST-segment–elevation myocardial infarction.

*Number of times recommendation was generated out of total A-level interfacility recommendations.

triage and transport for large vessel occlusion, several recommendations apply to improving stroke systems in general.

Because the goals/concerns and recommendations represent opinions of a sample of stakeholders, and at the time of the meeting and this publication the New York State stroke designation program recognized only state-designated primary stroke centers, findings may not be generalizable to other regions, including the New York City metropolitan area.

Conclusions

The recommendations based on impact and feasibility generated from this meeting do not serve as a recipe for success; rather, they provide an opportunity for communities to set priorities and plan for implementation funding and distribution of work. Ultimately, regional partners will determine which recommendations will be prioritized based on needs/capacity. Key determinants for success include defining standards and facilitating discussion. Stakeholder meetings and subsequent working groups may serve as useful models to guide regions on implementing effective stroke systems of care in the thrombectomy era.

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ONLINE SUPPLEMENT

APPENDIX A: Stakeholder Meeting Agenda

American Heart Association | American Stroke Association
life is why

Synergizing Acute Stroke Systems of Care: From Pre-Hospital to Triage to Transfer Stakeholder Meeting

Organized by the American Stroke Association a division of the American Heart Association
Jointly Sponsored by the New York State Department of Health Coverdell Program

June 9, 2016 ~ Rochester Regency Hyatt, Rochester, NY

AGENDA

7:30 –8:00 AM	**REGISTRATION**	
8:00 – 8:30 AM	**Welcome & Introductions** • Goals for this Initiative • Structure for the Day: thoughts and ideas • Brief review of current regional work • Goals for Coverdell	*Meeting Facilitator: Kenneth LaBresh, MD, FAHA* Curtis Benesch, MD, MPH Jeremy T. Cushman, MD, MS, EMT-P, FACEP Ian Brissette, PhD
8:30 – 9:00 AM	**Regionalization Of Stroke** • Review of Stroke Trial Data • Current Guideline Review	Steven R. Levine, MD, FAHA, FAAN, FANA Curtis Benesch, MD
9:00 – 9:20 AM 9:20 – 9:40 AM	**EMS Triage Tools** ***Optimizing Pre-Hospital Recognition of Stroke*** • How to diagnose large vessel strokes in the field • Review available scales/tools • Discussion to identify scales/tools with greatest promise/applicability *Discussion*	Ethan Brandler, MD
9:40 AM – 9:50 AM	**BREAK**	
9:50 – 10:10 AM 10:10 – 10:35 AM	**Regional Experience: Systems of Care** ***Mobile Telestroke During Ambulance Transport in a Rural EMS Setting – iTREAT Study*** *Discussion*	Andrew M. Southerland, MD, MSc
10:35 – 10:55AM 10:55–11:20 AM	**Stroke Triage & Transfer: Best Practices & Tools** • Best practices on how to appropriately triage patients to higher level centers • Discussion to identify barriers and enablers to appropriate triage and transfer *Discussion*	Cemal Sozener, MD
11:20 – 11:40 AM	**Wrap Up & Summary of Morning Discussion**	*Meeting Facilitator: Kenneth LaBresh, MD* Jeremy T. Cushman, MD
11:40 – Noon	**BREAK & GRAB LUNCH**	

Noon - 1:30 PM	**WORKING LUNCH** **Participants will be divided into two groups for the working lunch, and will spend 30 minutes discussing each of the following:** • I: *EMS Tools* • II: *Operationalizing Transport* • III: *Triage from the ED*	*Meeting Facilitator: Kenneth LaBresh, MD* *Group 1 Moderators:* Ethan Brandler, MD Andrew M. Southerland, MD Curtis Benesch, MD *Group 2 Moderators:* Steven R. Levine, MD Cemal Sozener, MD Jeremy T. Cushman, MD
1:30 – 2:00 PM	**Summary of Lunch Discussions**	*Meeting Facilitator: Kenneth LaBresh, MD*
2:00 – 3:00 PM	**Pen to Paper!** • Development of a 6, 12 and 18 month plan for the Upstate Region • Identify metrics to assess performance	*Meeting Facilitator: Kenneth LaBresh, MD* Curtis Benesch, MD Jeremy T. Cushman, MD Steven R. Levine, MD Ian Brissette, PhD Zainab Magdon-Ismail, Ed.M, MPH
3:00PM	**ADJOURN!**	

Opportunities for Q&A will be provided at the end of each lecture session.

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APPENDIX B: Pre-Post Survey

Synergizing Acute Stroke Systems of Care: From Pre-Hospital to Triage to Transfer
Stakeholder Meeting

QUICK ASSESSMENTS PRE- & POST

Demographics:

A. I am an:
   a. Emergency Medicine Physician
   b. Stroke Neurologist
   c. Endovascular Neurologist
   d. EMS Representative
   e. Other, please specify: _____

B. I am from the:
   a. Capital District Region
   b. Hudson Valley Region
   c. Greater Buffalo/Niagara Region
   d. Greater Rochester Region
   e. Greater Syracuse Region
   f. Utica/Cooperstown Region
   g. Other, please specify_____

C. I practice at: (select all that apply)
   a. An academic medical center
   b. A community medical center
   c. A voluntary EMS service
   d. A paid EMS service
   e. Other (please list):_____

PRE-MEETING ASSSEMENT

1. **List two goals for this initiative that you hope we can accomplish today.**
    a. Goal 1:
    b. Goal 2:

2. **What are your top 2-3 concerns regarding regionalization of stroke care in the region?**
    a. Concern 1:
    b. Concern 2:
    c. Concern 3:

3. **How familiar are you with the stroke trial data and latest stroke guidelines from 2014-2015?**
    a. Not very familiar
    b. Familiar
    c. Very familiar

4. **How familiar are you with EMS triage tools, especially those used to diagnose large vessel strokes?**
    a. Not very familiar
    b. Familiar
    c. Very familiar

5. **Do you know what EMS scales, if any, are being used in your region?**
    a. Yes—we are using (please list):_____
    b. No, we aren't using any
    c. I am not sure

6. **In your region, have there been discussions about regionalizing stroke care and triaging patients since the publication of the 2015 stroke guidelines?**
    a. Yes
    b. No
    c. Not Sure

7. **In your region, have there been discussions on how to efficiently triage patients from one hospital to another hospitals for higher level care (i.e. transfer of stroke patients)?**
    a. Yes, we have implemented the following (briefly describe):

    b. No
    c. Not sure

POST-MEETING ASSSEMENT

1. **Did we address your two goals set forth at the start of the meeting** (circle answer)**?**
    a. Goal 1: Yes/No/Somewhat
    b. Goal 2: Yes/No/Somewhat

2. **Did we address your 2-3 concerns regarding regionalization of stroke care in the region?**
    a. Concern 1: Yes/No/Somewhat
    b. Concern 2: Yes/No/Somewhat
    c. Concern 3: Yes/No/Somewhat

3. **Following the meeting, how familiar are you with the stroke trial data and latest stroke guidelines from 2014-2015?**
    a. Not very familiar
    b. Familiar
    c. Very familiar

4. **Following the meeting, how familiar are you with EMS triage tools, especially those used to diagnose large vessel strokes?**
    a. Not very familiar
    b. Familiar
    c. Very familiar

5. **Following the meeting, do you know what EMS scales, if any, are being used in your region?**
    a. Yes—we are using (please list):_____
    b. No, we aren't using any
    c. I am not sure

6. **Following the meeting, list one thing you might do to engage in discussions about regionalizing stroke care and triaging patients in your region.**

7. **Following the meeting, list one thing you might do to address efficiently triaging patients from one hospital to another hospitals for higher level care (i.e. transfer of stroke patients)**

8. **How useful was the information discussed at this meeting?**

1	2	3	4	5
Not Useful				**Extremely Useful**

Other Comments:

SUPPLEMENTAL TABLE I:

Upstate New York Stroke Stakeholder Meeting Participant & Workgroup Members

Martha	Auster		American Heart Association/American Stroke Association	Albany	NY
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Cemal	Sozener	MD	University of Michigan Medical Center	Ann Arbor	NY
Deborah	Steck	RN, MS	Kaleida Health, Buffalo General Medical Center / Gates Vascular Institute	Buffalo	NY
Susie	Surprenant	BBA, BS, NRP	Central New York EMS	Syracuse	NY
Matthew	Talbott	MD	Finger Lakes Health	Geneva	NY
Michael	Tayler	RN, MPA, EMT	New York State Department of Health, Bureau of EMS and Trauma Systems	Albany	NY
Mary Ann	Teeter	FNP-C, CEN, CNRN, SCRN, FAEN	Arnot Ogden Medical Center	Elmira	NY
Kevin	Thomas	MD	St Joseph's Hospital	Syracuse	NY
Akira	Todo	MD	Northern Westchester Hospital	Mt Kisco	NY
Rafael	Torres	MD	White Plains Hospital Center	White Plains	NY
Anuj	Vohra	MD	Orange Regional Medical Center	Middletown	NY
Brian	Walters	DO	Chautauqua County Office of Emergency Services	Chautauqua	NY
Kathleen	Wales		New York State Department of Health	Albany	NY
Cheryl	Wood	ACNP-BC	Rochester General Hospital	Rochester	NY
Gregory	Young	MD, FACEP	New York State Department of Health	Buffalo	NY
Gregory	Zimmer	MD	University of Rochester Medical Center	Rochester	NY

Supplemental Table II. Meeting Questionnaire Respondent Characteristics (n=57)

Characteristics	Questionnaire Respondent, n (%)
Specialty	
Emergency medicine physician	22 (38.5)
Stroke neurologist	10 (17.5)
EMS	10 (17.5)
Stroke coordinator/other[*]	15 (16.3)
Practice environment[†]	
Community medical center	32 (56.1)
Academic medical center	18 (31.6)
Paid EMS	9 (15.8)
Voluntary EMS	8 (14)
Other[‡]	7 (12.3)
Region (includes outlying geography)	
Rochester	16 (28)
Syracuse	11 (19.3)
Buffalo	9 (15.8)
Capital Region	8 (14)
Hudson Valley	5 (8.8)
Utica/Cooperstown	5 (8.8)
Other[§]	3 (5.7)

[*]Other: Neurosurgeon (3); Neurologist (2); Department of Health (2); Administrator (1); Endovascular (1); Neurocritical Care (1); Neurointerventional Radiologist (1)

[†]More than one response possible

[‡]Other: Department of Health, Regional Emergency Medical Advisor Committee Member

[§]Other: New York City (1); Buffalo & Rochester (1); Statewide (1)

EMS indicates emergency medical services

Supplemental Table III. Summary of Goals Expressed by Meeting Participants

Goals	Examples	n*	%
Triage protocols	Standardize guidance to a PSC versus CSC	29	31.2
	Develop standardized triage protocol/assessment tools		
	Develop endovascular diversion strategy		
Stroke system	Understand stroke systems and set specific action plans	19	20.4
	Develop a stroke network for improved patient care		
Stroke center levels	Clarify role/capability/partnership for PSCs and CSCs	17	18.3
	Develop standards for stroke hospitals		
Transfer protocols	Standardize protocols for stroke center designation	14	15.1
	Identification of patients eligible for endovascular care		
Education	Improve tools for training EMS	9	9.7
	Understand stroke systems initiative		
Treatment protocols	Create guidelines for acute stroke intervention	5	5.4
	Standardize patient treatment protocols similar to STEMI		

*number of times goal was recommended out of total number of recommended goals

PSC indicates primary stroke center; CSC, comprehensive stroke center; EMS, emergency medical services STEMI, ST-elevation myocardial infarction.

Supplemental Table IV. Summary of Concerns Expressed by Meeting Participants

Concerns	Examples	n*	%
Stroke system	Standardize treatment & consistency of care	31	27.2
	Inter-hospital collaboration		
	Increased use of academic centers may result in overload		
Stroke center levels	Bypassing community hospitals for larger stroke centers	21	18.4
	Dilution of stroke center by using the 'stroke ready' term		
	Competition/lack of partnership between stroke systems		
Triage protocols	Standardized pre-hospital care with updated protocols	16	14.0
	Appropriate EMS triage and pre-notification		
Transfer protocols	Identification of transfers from ED to endovascular center	12	10.5
	Lack of/delay in inter-facility transfer protocols		
	Unnecessary transfer of patients		
EMS protocols	Understanding EMS operation	2	12.3
	Early transfer to hospitals		
Technology/ economic barriers	Efficiency of LVO diagnostic technology	9	7.9
	Lack of image sharing and standardization		
Education	Education on signs, symptoms & stroke hospitals	12	3.5
	Appropriate education for pre-hospital providers		
Geographic	Feasibility of implementation in varied geographies	6	6.2
	Challenges with transport for rural regions		

*number of times concern was raised out of total number of expressed concerns

EMS indicates emergency medical services; ED, emergency department; LVO, large vessel occlusion.

SUPPLEMENTAL TABLE V: Concerns Regarding Regionalization of Stroke Care Systems by Attendee Speciality

		Concerns (%)							
Specialty	n	Stroke System	Stroke Center levels	Triage Protocols	Transfer Protocols	EMS protocols	Adequate Technology/Economic Boundries	Education	Geographic
Total	57	27.2	18.4	14.0	10.5	12.3	7.9	3.5	6.2
Emergency Medical Physician	22	34.9	25.6	14.0	11.6	2.3	2.3	2.3	7.0
EMS	10	10.0	5.0	10.0	10.0	35.0	25.0	5.0	0.0
Stroke Neurologist	10	23.5	17.6	29.4	5.9	17.7	0.0	0.0	5.9
Stroke Coordinator/Other*	15	29.4	17.7	8.8	11.8	8.8	8.8	5.9	8.8

*Neurosurgeon (2), Neurologist (2), DOH (2), Administration-CMO (1), Endovascular, Neurocritical care, Neurointerventional Radiologist

SUPPLEMENTAL TABLE VI: Concerns Regarding Regionalization of Stroke Care Systems by Attendee Practice Environment

		Concerns (%)							
Practice Environment (multi-select)	n	Stroke System	Stroke Center levels	Triage Protocols	Transfer Protocols	EMS protocols	Adequate Technology/Economic Boundries	Education	Geographic
Total	57	27.2	18.4	14	10.5	12.3	7.9	3.5	6.2
Community Medical Center	32	30.5	20.3	16.9	10.2	8.5	1.7	3.4	8.5
Academic Medical Center	18	38.4	20.5	15.4	10.2	7.7	2.6	2.6	2.6
Paid EMS	9	15.0	25.0	10.0	10.0	20.0	15.0	5.0	0
Volunteer EMS	7	21.5	35.7	14.3	0.0	14.3	0.0	7.1	7.1
Other*	8	15.8	15.8	5.3	10.5	21.1	21.1	5.3	5.3

*VAMC, Regional Committees, DOH, Neuroscience Inst., Tertiary Care Facility (n=8)

SUPPLEMENTAL TABLE VII: Concerns Regarding Regionalization of Stroke Care Systems by Attendee Geographic Region

		Concerns (%)							
Region	n	Stroke System	Stroke Center levels		Transfer Protocols	EMS protocols	Adequate Technology/Economic Boundries	Education	Geographic
Total	57	27.2	18.4	14.0	10.5	12.3	7.9	3.5	6.2
Rochester	16	39.3	17.9	14.3	7.1	7.1	3.6	3.6	7.1
Syracuse	11	17.4	21.7	30.4	4.4	13.0	0.0	4.4	8.7
Buffalo/Niagara	9	26.3	36.8	5.3	10.5	5.3	15.8	0.0	0.0
Capital District	8	6.3	12.4	6.3	18.8	37.5	12.4	0.0	6.3
Hudson Valley	5	55.6	22.2	11.1	11.1	0.0	0.0	0.0	0.0
Utica/Cooperstown	5	16.7	0.0	8.3	16.7	16.7	8.3	16.7	16.7
Other*	3	42.9	0.0	14.3	14.3	0.0	28.5	0.0	0.0

*NYC, NYS, greater Buffalo/Niagara and Rochester regions (n=3)

SUPPLEMENTAL TABLE VIII: Concerns Regarding Regionalization of Stroke Care Systems by Attendee Speciality

		Concerns (%)							
Specialty	n	Stroke System	Stroke Center levels	Triage Protocols	Transfer Protocols	EMS protocols	Adequate Technology/Economic Boundries	Education	Geographic
Total	57	27.2	18.4	14.0	10.5	12.3	7.9	3.5	6.2
Emergency Medical Physician	22	34.9	25.6	14.0	11.6	2.3	2.3	2.3	7.0
EMS	10	10.0	5.0	10.0	10.0	35.0	25.0	5.0	0.0
Stroke Neurologist	10	23.5	17.6	29.4	5.9	17.7	0.0	0.0	5.9
Stroke Coordinator/Other*	15	29.4	17.7	8.8	11.8	8.8	8.8	5.9	8.8

*Neurosurgeon (2), Neurologist (2), DOH (2), Administration-CMO (1), Endovascular, Neurocritical care, Neurointerventional Radiologist

SUPPLEMENTAL TABLE IX: Concerns Regarding Regionalization of Stroke Care Systems by Attendee Practice Environment

		Concerns (%)							
Practice Environment (multi-select)	n	Stroke System	Stroke Center levels	Triage Protocols	Transfer Protocols	EMS protocols	Adequate Technology/Economic Boundries	Education	Geographic
Total	57	27.2	18.4	14	10.5	12.3	7.9	3.5	6.2
Community Medical Center	32	30.5	20.3	16.9	10.2	8.5	1.7	3.4	8.5
Academic Medical Center	18	38.4	20.5	15.4	10.2	7.7	2.6	2.6	2.6
Paid EMS	9	15.0	25.0	10.0	10.0	20.0	15.0	5.0	0
Volunteer EMS	7	21.5	35.7	14.3	0.0	14.3	0.0	7.1	7.1
Other*	8	15.8	15.8	5.3	10.5	21.1	21.1	5.3	5.3

*VAMC, Regional Committees, DOH, Neuroscience Inst., Tertiary Care Facility (n=8)

SUPPLEMENTAL TABLE X: Concerns Regarding Regionalization of Stroke Care Systems by Attendee Geographic Region

		Concerns (%)							
Region	n	Stroke System	Stroke Center levels		Transfer Protocols	EMS protocols	Adequate Technology/Economic Boundries	Education	Geographic
Total	57	27.2	18.4	14.0	10.5	12.3	7.9	3.5	6.2
Rochester	16	39.3	17.9	14.3	7.1	7.1	3.6	3.6	7.1
Syracuse	11	17.4	21.7	30.4	4.4	13.0	0.0	4.4	8.7
Buffalo/Niagara	9	26.3	36.8	5.3	10.5	5.3	15.8	0.0	0.0
Capital District	8	6.3	12.4	6.3	18.8	37.5	12.4	0.0	6.3
Hudson Valley	5	55.6	22.2	11.1	11.1	0.0	0.0	0.0	0.0
Utica/Cooperstown	5	16.7	0.0	8.3	16.7	16.7	8.3	16.7	16.7
Other*	3	42.9	0.0	14.3	14.3	0.0	28.5	0.0	0.0

*NYC, NYS, greater Buffalo/Niagara and Rochester regions (n=3)