

Appendix 1. Acute ischemic stroke patient survey instrument

(Preferred survey mode – self-administered privately on a computer tablet, with bystander nurse-interviewer available to clarify items when asked.) Stars indicate required items for all surveys.

I. To be completed by Surveyor:

*Surveyor name: _____ *Verbally verified surveyed patient name with medical record: Y/N

*Medical Record number: _____ *Patient consent obtained: Y/N *Survey date: _____ Time: _____

Date/Time of admission: ____/____/____ AM/PM *Survey Respondent: ____ Patient ____ Next of Kin (select 1)

*Interviewee if Next of Kin: ____ relationship to patient *Age of respondent: ____ years

*Reason for next of kin interview: ____ NIHSS $\geq$ 15 (verify from chart) ____ Aphasia present (verify from chart);
Patient too tired, not feeling fit to interview: ____ Yes ____ No ____ Other reason

II: To be completed by patient /respondent

1. What was the FIRST symptom or unusual feeling? (Read all in the list and select only ONE as you best recall)

____ Sudden numbness WHERE? ____ Face ____ Arm ____ Leg

____ Sudden weakness WHERE? ____ Face ____ Arm ____ Leg

____ Unable to move

____ Drooping of face/mouth

____ Sudden trouble seeing in one or both eyes

____ Trouble speaking or slurred speech

____ Trouble walking OR lost balance OR lost coordination

____ Dizziness

____ Severe headache without reason

____ Confusion

____ Suddenly felt very sleepy

____ Slowly lost consciousness or control of body

____ Sudden feeling of something very wrong; a strange feeling

____ Diagnosed at a medical visit OR relative/other person notices something wrong

____ Other

Please state symptom: _____

____ Don't know/ Don't remember (Skip to Q7 if selected Unknown)

2. Time you felt the first symptom? ____ Date Time: ____ AM/PM ____ Unknown

3. Were you awake when symptom started?

____ Yes ____ No, I woke up with symptom ____ Do not know-Not sure

3a. Follow up if No: How did you feel BEFORE going to bed?

____ Normal and conscious ____ Not fully normal OR felt drowsy OR buzzed

____ Feeling of something wrong ____ Don't know

4. What was your SECOND symptom or unusual feeling?

____ Sudden numbness WHERE? ____ Face ____ Arm ____ Leg

____ Sudden weakness WHERE? ____ Face ____ Arm ____ Leg

____ Unable to move

____ Sudden trouble seeing in one or both eyes

____ Drooping of face/mouth

____ Trouble speaking OR slurred speech

____ Slowly lost consciousness or control of body

- ☐ Trouble walking OR lost balance OR lost coordination
☐ Dizziness
☐ Sudden felt very sleepy
☐ Severe headache without reason
☐ Confusion
☐ Sudden feeling of something very wrong OR strange bad feeling
☐ Other _____ Please state symptom: _____
☐ Don't know OR Did not have second symptom

4a. Did 2nd symptom start **WITH** the 1st symptom? ____ Yes ____ No

5. When did the second symptom start? ____ Date ____ Time ____ AM/PM

6. DID you think of STROKE when you felt the symptoms?

- ☐ Yes, at the first symptom ☐ Yes, after the second symptom ☐ Yes, after symptoms worsened
☐ Yes, after a friend/family member told me ☐ No, I did not think of stroke

6a) Follow-up: if any “Yes” response to 6: What were your thoughts then? (Choose all that apply)

___It may be stroke because of my health problems below:

6.a.i) Follow up to health conditions:

- ☐ Overweight
☐ Diabetes/sugar problem
☐ High blood pressure
☐ High cholesterol
☐ Heart problems
☐ Other problem (please state problems) _____

- ☐ It may be stroke because my doctor told me about stroke symptoms and to call 911.
- ☐ I thought I can't have stroke because I have no health problems that cause stroke
- ☐ I can't have stroke because I thought my problems were under control (sugar, blood pressure, etc)
- ☐ I can't have stroke because my doctor had not warned me about stroke, only heart attack
- ☐ I felt the symptoms were due to tiredness or stress, or drinks or meds that I had taken
- ☐ The symptoms were too mild to be a stroke
- ☐ The symptom may be temporary due to:
- ☐ neglecting my diabetes (sugar)
☐ neglecting my blood pressure
- ☐ Such symptoms happened before, and went away, this may be the same thing
- ☐ I (or a family member) had a stroke before; this time the symptom was different
- ☐ Stroke cannot happen to ME, I dismissed the idea
- ☐ I felt scared, and I prayed/tried other thoughts to make it go away

6b) Follow up if “No” to 6: Why did you not think of stroke: (Choose all that apply)

- ☐ I did not know about stroke symptoms (**for those who selected this, DON'T ASK Q8**)
☐ I thought stroke only happens to those who are careless about their health, not me
☐ Because I do not have sugar or blood pressure problems
☐ Because my sugar or blood pressure is under control
☐ Because my doctor had not warned me about stroke, only heart attack
☐ The nurse at my doctor's office had told me about stroke, but not my doctor
☐ The symptoms were very mild
☐ I thought the symptom was due to:
 ☐ tiredness or stress; ☐ neglecting my diabetes (sugar) or blood pressure;
 ☐ having some drinks that day; ☐ my pain meds or other pills
☐ I (or a family member) had stroke before; this time the symptom was different
☐ Such symptoms happened to me before and went away, this may be the same thing
☐ Other (please state): _____

7. (All patients) What did you do about getting help? (Choose one OR more than one)

- I decided to drive myself to the hospital immediately

- ☐ My family member/other person drove me to the hospital immediately
- ☐ My family member/other person called the doctor's office
- ☐ I/we called our friend or relative who is a nurse/doctor/healthcare professional
- ☐ I was alone and I waited till my spouse/family member came home
- ☐ I/We decided to call 9-1-1 for an ambulance
- ☐ I did not want to call 9-1-1, but my family member/other person felt we should
- ☐ I did not want to make a big deal by calling for ambulance
- ☐ I don't like to go to a doctor or hospital generally, I did not like to get help from others
- ☐ I am afraid of disease and hospitals, and decided to wait and see
- ☐ In my family or among my people, we wait and see before going to a doctor or hospital

8. Which stroke warning signs DID you know BEFORE the stroke? (Not asked if they selected first item to 6b)

- ☐ Sudden numbness **WHERE?** ☐ Face ☐ Arm ☐ Leg
- ☐ Sudden weakness **WHERE?** ☐ Face ☐ Arm ☐ Leg
- ☐ Sudden trouble seeing with one or both eyes
- ☐ Drooping of face or mouth
- ☐ Trouble speaking or slurred speech
- ☐ Trouble walking, OR losing balance OR coordination
- ☐ Dizziness
- ☐ Severe headache without reason
- ☐ Confusion
- ☐ Other (please state symptom:) _____
- ☐ Did not know any stroke signs

***8a) Follow up** if they selected any symptoms). **How did you know about stroke symptoms?**

- ☐ Family member or friend had a stroke; ☐ My doctor/nurse told me about symptoms;
- ☐ Brochure at the doctor's office; ☐ Read about it on the internet;
- ☐ Billboard on the side of the road; ☐ Church or other gathering; ☐ TV commercial;
- ☐ Facebook, twitter, or other social media; ☐ Other public place (like the supermarket);
- ☐ Other (please specify): _____

9. I had a stroke, mini-stroke, or stroke-like event before this stroke ☐ Yes ☐ No

10. I know a friend/ family member/ other person who had a stroke ☐ Yes ☐ No

11. Did you/family member/ other person call 911 for an ambulance?

- ☐ Yes ; ☐ No - did not call 911 - went to hospital by car
- ☐ I did not call 911 - the ambulance was already there

If Yes, ask 11a), 11b), 11c), 11d), 11g) and 11h) (11h is done only if ambulance actually came, see 11d)

***11a) Follow up why you call 911: (Reasons why they called 911 for ambulance)**

*Out of the following, please **Select at least 2 MOST IMPORTANT REASONS WHY YOU CALLED 911.** Then RANK (1st to 5th - 1st – Most important reason, 2nd – Next most important and so on. You can change your rank or take off your selection if something else comes up later that were more important.*

Yes Rank

- ☐ ☐ I felt my symptoms could be stroke
- ☐ ☐ Symptoms were severe and scary
- ☐ ☐ I live alone, and nobody was there to drive me to the hospital
- ☐ ☐ A neighbor or family member agreed/insisted to call 911
- ☐ ☐ I know someone with bad effects due to not calling ambulance
- ☐ ☐ I knew that arriving at the hospital quickly was important
- ☐ ☐ I knew others who became disabled or died from stroke
- ☐ ☐ I felt ambulance was the best way to get care
- ☐ ☐ My doctor told me to call 911 if I had symptoms

- ☐ ☐ Nurse told me to call 911 if I had symptoms
- ☐ ☐ I normally take care of my health and felt I needed care urgently
- ☐ ☐ I/We had good prior experience with using ambulance
- ☐ ☐ I have good insurance and knew they could cover the cost
- ☐ ☐ I have good insurance and had met my deductible
- ☐ ☐ I was unconscious; others called 911
- ☐ ☐ No other reason

11b) WHEN did you/other person call 911 for ambulance?

- ☐ As soon as I felt the first symptom
- ☐ After discussing with another person
- ☐ After returning home from the place where symptom occurred
- ☐ When symptoms became worse
- ☐ When a new symptom started
- ☐ Next morning because symptom started late at night
- ☐ After one or two days because symptom started on weekend

11c) Experience of the 911 call for ambulance: (Choose all that apply):

- ☐ a) Staff took my phone call promptly; ☐ b) Staff asked questions about symptoms,
- ☐ c) Staff immediately said, they were sending ambulance; ☐ d) Staff advised about using ambulance
- ☐ e) Staff asked about insurance; ☐ f) Advised me to go to hospital; no ambulance available;
- ☐ g) They would call me back when ambulance is available; ☐ h) Advised me to call my doctor

11d) Ambulance arrival time:

- ☐ a) Ambulance did not come; ☐ b) Ambulance came much sooner than expected;
- ☐ c) Came in the expected time given distance; ☐ d) Somewhat delayed than expected;
- ☐ e) Very much delayed; ☐ f) 911 sent Fire/Police instead of ambulance

11e), 11f) and 13) are follow-ups to those who did not call 911:

11e) Why you did NOT call 911 (Choose all that apply):

- ☐ I live alone and was too weak/ unable to call
- ☐ Symptoms took a long time to become serious
- ☐ I felt normal; symptoms came and went
- ☐ I had no pain, so I did not feel it was urgent or serious
- ☐ I live alone and was too weak or unable to call
- ☐ My family members were out, and I could not move
- ☐ My spouse/other household member insisted we should not call ambulance
- ☐ My family members were out, and I could not speak
- ☐ I was at work/outside home and waited til I could leave
- ☐ I/family member was treated badly by ambulance staff before
- ☐ I called my doctor and they asked me to come in
- ☐ I called my doctors office and they said to go directly to the ER or hospital
- ☐ There is a long waiting time at the ER anyway, may as well go by car
- ☐ I live out in the country, driving may be quicker than ambulance
- ☐ Insurance may not cover ambulance if my symptom was not serious
- ☐ I was worried about my share of the ambulance cost
- ☐ I have no insurance and will get a big bill
- ☐ My insurance has a high deductible; I had not met my deductible
- ☐ I already owe a lot of money to doctors and hospitals
- ☐ I/my family member already had a large expense or bills before this
- ☐ I did not know that I could have serious problems if treatment is delayed
- ☐ I did not know that reaching by ambulance would get me quick treatment
- ☐ I did not trust the hospital or doctor to do their best to help me
- ☐ Hospitals care about money, and I have no insurance, so I may not get good care
- ☐ The hospital/doctor/nurses may not be nice to me
- ☐ The hospital/doctor/nurses may harm me
- ☐ The hospital/doctor/nurses may embarrass me

- ☐ Because I had neglected my blood pressure, sugar or weight problem, ER staff may judge me badly
- ☐ Because I smoke, I did not want to face the hospital staff
- ☐ Because I drink, I did not want to face the hospital staff
- ☐ Because I use drugs, I did not want to face the hospital staff
- ☐ My family/friends may blame me for the stroke, I did not want to face that
- ☐ The ambulance siren and lights will disturb neighbors, I did not want them to know my problems
- ☐ I was not properly dressed to meet ambulance staff

11f) Follow up to selections of 11e). Here are the reasons why you did not call 911. (if they select >5 ask them to select and rank, if not ask them to rank selections only)

Please select at least 2 most important and RANK 1st to 5th the most important 5 items: 1st – Most important reason why you did not to call, 2nd – Next most important and so on.

(Survey brings up their selected items only).

- ☐ Symptoms took a long time to become serious
- ☐ I had no pain, so I did not feel it was urgent or serious
- ☐ I felt normal; symptoms came and went
- ☐ I live alone and was too weak to call
- ☐ My family members were out
- ☐ My spouse/other household member insisted we should not call ambulance
- ☐ I was at work/somewhere else and waited til I could leave
- ☐ I called my doctor and they asked me to come in
- ☐ I called my doctor and they said to go directly to the hospital or ER
- ☐ There is a long waiting time at the ER anyway, so might as well go by car
- ☐ I live out in the country, so driving may be quicker than ambulance
- ☐ I/family member was treated badly by ambulance staff in the past
- ☐ Insurance may not cover ambulance if my symptom was not serious
- ☐ I was worried about my share of the ambulance cost
- ☐ I have no insurance and will get a big bill
- ☐ My insurance has a high deductible; I had not met my deductible
- ☐ I already owe a lot of money to doctors and hospitals
- ☐ I/my family member already had a large expense or bills before this
- ☐ I did not know that I could have serious problems if not treated quickly
- ☐ I did not know that reaching by ambulance would get me quick treatment
- ☐ I did not trust the hospital or doctor to do their best to help me
- ☐ Hospitals care about money, and I have no insurance, so I may not get good care
- ☐ The hospital/doctor/nurse may not be nice, or may harm or embarrass me
- ☐ Because I have neglected my sugar or blood pressure, the staff may judge me harshly
- ☐ Because I smoke/drink/use drugs, I did not want to face the hospital staff
- ☐ My family/friends may blame me for the stroke and I did not want to face that
- ☐ The ambulance siren and lights will disturb neighbors, and I don't want them to know my business
- ☐ I was not properly dressed to meet ambulance staff
- ☐ No other reason

11g) Your ER experience on arrival:

11.g.i. How long did you wait in the ER before they took you for treatment?

☐ hours ☐ minutes ☐ Don't know

***11.g.i.a.** Did a doctor or nurse check or treat you?

☐ Yes ☐ No, I left from the first hospital and then came to Richland Hospital

11.g.ii. Did ER staff give you priority for treatment ☐ Yes ☐ No

***11g.ii. a) Follow-up if No: Why? (Choose all that apply) – Because:**

- ☐ I did not come by ambulance
- ☐ I did not tell the important symptoms on arrival.
- ☐ Many waiting patients were in the ER, crowded ER
- ☐ Other patients had more serious-looking symptoms or in pain

- ☐ I often used this ER for minor problems.
- ☐ I had no insurance
- ☐ I have Medicaid
- ☐ Because of my race
- ☐ I am poor and they may have judged that I cannot pay

11h) Follow-up if the ambulance came (see 11d): Experience with ambulance

- ☐ Ambulance staff checked me and took me to the Palmetto Richland hospital
- ☐ Ambulance first took me to another hospital. Which hospital: _____.
- ☐ Ambulance staff checked me, gave treatment, and told me to contact my regular doctor
- ☐ I refused to get checked by ambulance staff and came here by car
- ☐ I refused to get checked even the second time the ambulance came and I sent it back
- ☐ Ambulance staff was rude, and I decided not to ride the ambulance

12. Previous experience with 911 for ambulance:

Had you or (family) called 911 for ambulance before? ☐ Yes ☐ No;

If yes,

12a) How many times did you/family member/ other person call for ambulance in the last 3 years?

☐ Yes ☐ No

12b) Follow-up Did you/ family/ other person actually use the ambulance? ☐ Yes ☐ No

12c) Follow-up Did you any time call for ambulance, but they did not send one? ☐ Yes ☐ No

12d) Follow-up Did insurance FULLY cover the ambulance cost?

☐ Yes, every time ☐ Covered fully at times ☐ I always paid some out of pocket

12d.i) Follow-up If you paid out-of-pocket, how much did you pay or owe the last time you used ambulance? _____

13. I would recommend my relatives and friends to call the ambulance if they have serious symptoms.

☐ Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree

14. I would recommend that anyone with stroke warning signs should call for an ambulance.

☐ Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree

15. Based on your own experience, please give 3 SUGGESTIONS to INCREASE ambulance use for stroke?

- ☐ No idea/cannot say
- ☐ More TV commercials about symptoms, diseases that cause stroke, and to call 911 immediately
- ☐ Brochures in doctor's offices about stroke, and to call 911 for symptoms even if living near a hospital
- ☐ Doctors should educate patients about the stroke warning signs and to call 911 immediately.
- ☐ Ambulance staff should be trained to treat all patients with respect and a good attitude.
- ☐ Insurance should fully cover ambulance for stroke symptoms.
- ☐ Other _____

Who actually completed this survey?

- ☐ Patient only
- ☐ Relative only
- ☐ Both
- ☐ Survey not complete due to reason out of control

Appendix 2. Comparison of survey respondents and non-respondents

		Respondents (n = 108) No (%)	AIS patients not surveyed (n = 1071) No (%)
Demographics and stroke severity			
Sex*	Male	47 (48.5)	560 (52.3)
	Female	50 (51.5)	511 (47.7)
	Missing [†]	11	0
Age, mean (SD)*		63.5±15.4	67.6±13.9
Race*	White/Asian/Other	54 (55.7)	536 (49.2)
	Black/African American	43 (44.3)	533 (48.9)
	Missing [†]	11	2
Severity based on initial NIHSS*	Mild (NIHSS 0-5)	57 (59.4)	625 (60.4)
	Moderate (NIHSS 6-15)	27 (28.1)	250 (24.2)
	Severe (NIHSS ≥16)	12 (12.5)	160 (15.5)
	Missing NIHSS [†]	12	36
Medical record-documented arrival mode and alteplase receipt			
Arrival mode*	EMS vehicle from home/scene	48 (49.5)	557 (52.3)
	Private transport/taxi/other	21 (21.6)	212 (19.9)
	Transfer from other hospital	28 (28.9)**	297 (27.9)
	Missing [†]	11	5
Alteplase initiated at this hospital*	Yes	14 (14.4)	104 (9.7)
	No	83 (85.6)	967 (90.3)
	Missing [†]	11	0

AIS, acute ischemic stroke; EMS, Emergency Medical Services; GWTG; Get-With-the-Guidelines; NIHSS, National Institutes of Health Stroke Scale.

* $P < 0.05$ between surveyed and not surveyed AIS patients.

** 27 of them reported using EMS to reach the first hospital. This information is not captured in GWTG-stroke data.

† Of these, 11 were first admitted to another hospital and transferred to the study hospital, for whom data on sex, race, initial stroke severity, alteplase administration and documented arrival mode was missing in the GWTG registry-sourced data. For all 97 surveyed patients linkable to the GWTG data, their self-reported arrival mode in the survey matched the documented arrival mode in the registry database.

Appendix 3. Responses to survey questions

		Classified by EMS Use		All surveyed Patients n = 108 No (%)
		Yes (n = 75) No (%)	No (n = 33) No (%)	
Symptoms				
Stroke symptoms experienced	≥ 1 typical symptom	33 (44.0)	16 (48.5)	49 (45.4)
	Multiple typical symptoms	29 (38.7)	12 (36.4)	41 (38.0)
	No typical stroke symptom	13 (17.3)	5 (15.2)	18 (16.7)
Sudden symptom onset		48 (64.0)	24 (72.7)	72 (66.7)
Thought of stroke and perceived symptom as relevant and indicating possible stroke (not dismissing the symptom)*		67 (89.3)	7 (21.2)	74 (68.5)
Awake at stroke onset		60 (80.0)	21 (63.6)	81 (75.0)
Multiplicity of symptoms: multiple symptoms at onset		74 (98.7)	31(93.9)	105 (97.2)
Did Patient First Think About Stroke?				
Thought symptom could be stroke: On their own		36 (48.0)	13 (39.4)	49 (45.4)
On being prompted by family member/friend		4 (5.3)	2 (6.1)	6 (5.6)
Did not think of stroke at first		33 (44.0)	17 (51.5)	50 (46.3)
Knowledge of Stroke Symptoms Before the Stroke				
Knew 1-3 typical symptoms before the stroke		23 (30.7)	12 (36.4)	35 (32.4)
Knew 4-6 typical symptoms before the stroke		25 (33.3)	12 (36.4)	37 (34.3)
Knew no symptoms before the stroke		27 (36.0)	9 (27.3)	36 (33.3)
Knew atypical symptoms before the stroke		44 (58.7)	17 (51.5)	61 (56.5)
No atypical symptoms before the stroke		31 (41.3)	16 (48.5)	47 (43.5)
Familiarity with the stroke experience				
History of stroke/mini-stroke or experience of family member /friend with stroke)*		60 (80.0)	19 (57.6)	79 (73.2)
Knowledge of Importance of Quick Treatment/Ambulance in Stroke Outcomes				
Knew the importance of quick treatment/ambulance arrival for good outcome*		27 (36.0)	0	27 (25.0)
Influence of Social Networks				
Family member/other person was present at time of stroke		74 (98.7)	33(100.0)	107 (99.1)
Family member/bystander discouraged patient from calling 911*		2 (2.7)	8 (24.2)	10 (9.3)
Family member/bystander supported patient thoughts to call 911*		33 (44.0)	0 (0)	33 (30.6)
Experienced Symptom Matched Known Symptom				
Experienced stroke symptom matched knowledge of that symptom		37 (49.3)	16 (48.5)	53 (49.1)
Financial Barriers/Concerns About Ambulance Use				
Reported financial concerns about ambulance use /Concern about cost of ambulance use		11 (14.7)	10 (30.3)	21 (19.4)
Expecting ED care Delay/Prior Experience of ED Waiting Time				
Prior experience of or expectation of long ER waiting time*		0	2 (6.1)	2 (1.9)
Live out in the country				
Live out in the country, better to drive personally to reach quickly*		1 (1.3)	9 (27.3)	10 (9.3)
Habits of Personal Health Action-Taking				
Tend to be proactive about personal health/takes care of health		3 (4.0)	0	3 (2.8)
Concerns about ED Medical Staff’s Negative Affective Response				
Concerned about potential ER medical staff's negative affective response due to personal health habits or other reasons		0	0	0
Role of Personal Physician or Their Staff				
Patient reported being educated about stroke symptoms by their		27 (36.0)	10 (30.3)	37 (34.3)

doctor or nurse			
Physician's office directed the patient to actions other than calling 911 when symptoms occurred*	0	6 (18.2)	6 (5.6)
Source of stroke knowledge			
Physician/Nurse/ Personal stroke experience	36 (48.0)	19 (57.6)	55 (50.9)
Public sources (internet, billboards, etc.)	23 (30.7)	7 (21.2)	30 (27.8)
No stroke knowledge	16 (21.3)	7 (21.2)	23 (21.3)
Previous Experience with Ambulance			
Prior experience of self/family with calling 911 for ambulance*	51 (68.0)	12 (36.4)	63 (58.3)
Had a good experience	1 (1.3)	0	1 (0.9)
Had a bad experience	2 (2.7)	1 (3.0)	3 (2.8)

EMS, emergency medical services; ER, emergency room.

* $P < 0.05$ between the two groups.

Appendix 4. Multiple regression analysis results showing adjusted associations of each factor with EMS use (n = 97)*

	Adjusted Odds Ratio (95%CI)
Stroke Severity Initial NIHSS score (continuous variable)	1.2 (1.0, 1.3) [†]
Symptoms Thought of stroke and perceived it as relevant for self having stroke: Yes (vs. No)	41.4 (9.1, 187.8) [†]
Experience/Personal History of Stroke Prior personal or family/friend experience with stroke: Yes (vs. No)	5.8 (1.1, 30.5) [†]
Influence of Social Networks Family member present discouraged the patient from call 911: Yes (vs. No)	0.02 (0.002, 0.3) [†]

AIS, acute ischemic stroke; ER, emergency room; NIHSS, National Institutes of Health Stroke Scale; OR, odds ratio.

* Adjusted for age, sex and race. N=97 because 11 patients had missing race data. Final model retaining only significant variables is presented. Certain survey items showing differences in bivariate analyses did not attain significance or resulted in indeterminate values (OR.999) due to zero or very low frequencies in the comparison category. These included: Knew the importance of quick treatment/ambulance arrival, Family member/others available at time of stroke, Positive reinforcement to call 911 by person around at the time, Experience or expectation of having to wait in ER, Live out in the country, Tend to be proactive about personal health, Directed by physician's office to actions other than calling 911. Insurance status (Yes/No) was not included as it was not significant in the adjusted model.

[†] All $P < 0.05$ between the decision to call 911 for an ambulance (Yes/No).

Appendix 5. Patients' EMS Experiences: Current episode and previous experiences before the stroke

	No. (% of total 108 respondents)
Experience of calling 911 in the current episode	
EMS staff checked patient and took him/her to the study hospital directly	48 (64.0)
EMS staff transported patient to another hospital first	16 (21.0)
Prior experience of calling 911	
No prior experience of calling 911	40 (37.0)
Had prior experience with 911	61 (56.5)
Previous EMS use experiences	
Ambulance did not come	2 (3.2)
Cost was covered fully every time	39 (63.9)
Cost was not covered fully at times	7 (11.5)
I always paid some cost out of pocket	14 (23.0)

EMS, emergency medical services.

Appendix 6. Patient recommendations to increase EMS vehicle use by stroke patients*

	No. (% of total 108 respondents)
Insurance should fully cover ambulance for stroke symptoms	50 (46.3)
Doctors should educate patients about the stroke warning signs and to call 911 immediately	46 (42.6)
Brochures in doctor's offices about stroke, and to call 911 when faced with symptoms even if living near a hospital	42 (38.9)
TV commercials about stroke symptoms and diseases that cause stroke, and to call 911 immediately	39 (36.1)
Ambulance staff should be trained to treat all patients with respect and a good attitude	38 (35.2)
Other	14 (13.0)
No response	25 (23.2)

EMS, emergency medical services. *Includes multiple responses, numbers add up to >108.

Appendix 7. Reasons for not completing the survey among survey-eligible AIS admissions

		No.	Percent of total	
Completed survey		108	9.8%	
Patient not contacted (weekends and university breaks)		347	31.5%	
Attempted, but patient found discharged at:	1 st attempt*	374	34%	46.9%
	Subsequent attempts	141	12.9%	
Patient not available and family not available for proxy interview		62	5.6%	
Patient refused (including too long consent form)		20	1.8%	
Other reason (incl. ICU-admitted, expired or assigned hospice, aphasic, not English speaking, other)		48	4.4%	
TOTAL		1100**	100%	

*45.2% of patients had a length of stay of 4 days or less. With intensive clinical care procedures or patients recovering from the acute aftermath of a brain attack typically taking up to 3 days (patient is not cleared by nursing staff for survey under these conditions), our finding of 34% of patients found to be already discharged by the time of first attempt to contact is consistent with the percent of patients discharged within 4 days or less.

** Total eligible is less than 1179 because the survey period, July 5, 2016 to March 12, 2018 was different from the patient outcomes study period, April 1, 2016 to October 31, 2017.