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≥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:

6a.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/tryed 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 called 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/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
    *11g.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

| Demographics and stroke severity | Respondents (n = 108) | AIS patients not surveyed (n = 1071) |
|----------------------------------|-----------------------|-------------------------------------|
| **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**|                       | 57 (59.4)                           | 625 (60.4)                         |
|                                  | Mild (NIHSS 0-5)      | 27 (28.1)                           | 250 (24.2)                         |
|                                  | Moderate (NIHSS 6-15) | 12 (12.5)                           | 160 (15.5)                         |
|                                  | Severe (NIHSS ≥16)    | 12                                  | 36                                 |
|                                  | Missing NIHSS†        |                                     |                                    |

| Medical record-documented arrival mode and alteplase receipt | Respondents (n = 108) | AIS patients not surveyed (n = 1071) |
|-------------------------------------------------------------|-----------------------|-------------------------------------|
| **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 ot 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                  |
|------------------------------|-----------------------|---------------------|-----------------------------------------------|
|                              | Yes (n = 75) No (%)    | No (n = 33) No (%)   |                                               |
| **Symptoms**                 |                       |                     |                                               |
| Stroke symptoms experienced  | ≥ 1 typical symptom   |                     |                                               |
|                              | Multiple typical symptoms |                 |                                               |
|                              | No typical stroke symptom |               |                                               |
|                              | 33 (44.0)              | 16 (48.5)           | 49 (45.4)                                    |
|                              | 29 (38.7)              | 12 (36.4)           | 41 (38.0)                                    |
|                              | 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)*

| Stroke Severity | Adjusted Odds Ratio (95%CI) |
|-----------------|-----------------------------|
| 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

| Experience of calling 911 in the current episode | No. (% of total 108 respondents) |
|-----------------------------------------------|----------------------------------|
| 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. (% of total 108 respondents) |
|---------------------------------|----------------------------------|
| No prior experience of calling 911 | 40 (37.0) |
| Had prior experience with 911 | 61 (56.5) |

| Previous EMS use experiences | No. (% of total 108 respondents) |
|------------------------------|----------------------------------|
| 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*

| Insurance should fully cover ambulance for stroke symptoms | No. (% of total 108 respondents) |
|----------------------------------------------------------|----------------------------------|
| 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

| Reason                                                                 | 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:                           |      |                  |
| 1st attempt*                                                         | 374  | 34%              |
| 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.