GEORGIA DEPARTMENT OF PUBLIC HEALTH

J. Patrick O'Neal, M.D., Commissioner / Brian Kemp, Governor

2 Peachtree Street, NW, 15th Floor
Atlanta, Georgia 30303-3142

dph.ga.gov

Report on Stroke in Georgia2018, as Required by the Coverdell-Murphy Act, Georgia SB549, Amended by Georgia HB853
Compiled by the Georgia Coverdell Acute Stroke Registry
Georgia Department of Public Health
December 2018

Background

Why should we care about stroke in Georgia?

- **Georgia's age-standardized stroke death rate in 2017 was *15.7%* higher** than the national average[1]
- **In 2017, Georgia had the *8th–highest stroke death rate*** in the U.S.[1]
- **Stroke is the fifth-leading cause of death** in Georgia **(*4,399* stroke deaths in 2017**)[1]
- **In 2017**, about ***19%* of Georgia stroke deaths were premature**, i.e. among persons under the age of 65 years.[1]
- **In 2017**, the age-adjusted stroke death rate for Blacks in Georgia was **51.7 per 100, 000 population,** which was ***26%*** *and* ***100% higher than*** the rates for Whites and Asian or Pacific Islanders, respectively.[1]
- Stroke is a ***leading cause of disability*.**[2] Treatment of eligible stroke patients with the drug Alteplase (a tissue plasminogen activator) can reduce disability by 30%, but the drug needs to be administered in the first three hours after symptom onset.[3]
- **In 2017,** Georgians had more than ***21,000* stroke hospitalizations**
    - The median charge per hospitalization was around ***$35,185***
    - The total stroke-related hospitalization charges **were over *$1.6* billion in Georgia**
- **Georgia is in the "Stroke Belt,"** an area in the southeastern U.S. with stroke death rates that are approximately ***30% higher than*** the rest of the U.S. The coastal plains of Georgia are in the "buckle" of the Stroke Belt, an area with stroke death rates about ***40% higher*** than the rest of the nation.[4]
    - The higher death rates seen in the Stroke Belt can be collectively explained, in large part, by demographic and socioeconomic factors and the prevalence of stroke risk factors and chronic diseases like diabetes and hypertension.[5]

- **In 2017, only *54%*** of adult Georgians knew all three signs of stroke – facial droop, arm weakness, and slurred speech – and the importance of calling 911 immediately.
- **Adult Georgians have high prevalence rates for stroke-related risk factors.** The 2017 Behavioral Risk Factor Surveillance System (BRFSS) data showed that:[6]
    - ***33.1%** of adult Georgians had hypertension*
    - ***31.1%** had high cholesterol*
    - ***11.4%** were diabetic*
    - ***31.6%** were obese*
    - ***31.0%** were physically inactive*[§]
    - ***17.5%** of Georgia adults smoked*

Coverdell-Murphy Act Required Reporting

To assure that patients are receiving the appropriate level of care and treatment at each level of stroke center, Georgia's Coverdell-Murphy Act (CMA), Senate Bill 549, enacted in 2008 and amended in 2016 (House Bill 853), requires the reporting of stroke care related data to the Georgia Department of Public Health (DPH) as part of the Georgia Coverdell Acute Stroke Registry (GCASR).[7,8] The required data elements are used to generate performance measures that help to monitor the quality of stroke care among the designated stroke centers. GCASR currently has 75 participating acute care hospitals, of which 4 are designated as comprehensive, 43 as primary, and 12 as remote treatment stroke centers. In 2017, the designated hospitals received 87% of Georgians admitted with acute stroke across the state.

Summary of Data Findings

Based on 2008-2017 hospital discharge data from 12 designated Remote Treatment Stroke Centers, acute ischemic stroke patients **treated after the hospitals were designated** had **47% lower odds of in-hospital death** compared to patients **admitted when the hospitals were not participating** in the Georgia Coverdell Acute Stroke Registry, which aims to improve the quality of stroke care in.

From2015 to 2017, Georgians received high quality stroke care consistently.

- The percentage of eligible ischemic stroke patients who received intravenous tPA **improved from 91% to 95%**.
- **Nine out of ten** eligible ischemic stroke patients received the clot-busting drug Alteplase intravenously

§: didn't do any physical activity or exercise during the past 30 days other than their regular job

- The median time from hospital arrival to administration of Alteplase was **shortened from 54 minutes in** 2015 **to 51 minutes in** 2017.
- About **87%** of the patients received alteplase in the first 60 minutes of hospital arrival in 2017 **compared to 80%** in 2015.

Numbers for other quality indicators, such as venous thromboembolism prophylaxis, antithrombotic medication, stroke education and discharge on appropriate medication, remained **consistently high (above 90%)** from 2015 to 2017.

However, **less than 60%** of stroke patients were transported to hospitals by EMS and the proportion of patients who arrived at hospital in the first two hours of symptom onset remained persistently **below 40%**, indicating the need to raise public awareness to identify stroke in the community, call 911, and transport patients to designated centers rapidly.

Discussion

The Centers for Disease Control and Prevention (CDC) funds the Georgia Coverdell Acute Stroke Registry (GCASR) to improve stroke systems of care in Georgia. Participating EMS agencies, hospitals, and rehabilitation centers are working to strengthen the existing relationships and developing new approaches to deliver the best stroke care possible at all levels of the patient care continuum. Currently, 31 EMS agencies and 75 acute care facilities in Georgia participate in GCASR, and they have already had a major impact on the lives of thousands across the state by reducing mortality and limiting disability from stroke.[9,10] By the end of 2018, 12 hospitals were designated as Remote Treatment Stroke Centers, and the impact of designation is seen in the reduction of in-hospital death.

Shortening the time between symptom onset and hospital arrival is crucial for better patient outcomes. Because 62% of patients arrived at hospitals two hours or later after symptom onset and 43% transport themselves to a hospital, it is critical that all stakeholders exert a concerted effort to increase public awareness about the signs of acute stroke and the importance of calling 911 for a swift transfer of patients to one of the designated stroke centers for the appropriate level of treatment.

Moreover, we must continue to improve stroke prevention and treatment across the state by reducing the prevalence of stroke risk factors in Georgia. Adults 55 years and older have a higher risk for stroke.[11] Based on the National Center for Health Statistics projection, 16% of Georgia residents are expected to be 65 years and older by the 2030.[12] Thus, the number of Georgians affected by stroke is expected to rise over the next decade. This will increase costs, both financially and in terms of productive years of life lost.

Stroke is a major cause of disability, and adequate post-hospital care contributes significantly to reducing late complications of the acute incident. It is imperative, therefore, to monitor the quality of post-hospital stroke care. With the current five-year grant from the Centers for Disease Control and Prevention, the GCASR has expanded its reach and it is expected that the registry will be able to adopt and implement performance indicators to improve the quality of post-hospital care as well.

Table 1. Performance Measures for Designated Stroke Centers, GCASR, 2015-2017

Performance Measure	2015	2016	2017
Reach			
% of state acute stroke admissions in designated GCASR hospitals	--	87%	87%
Public Awareness			
% of patients presenting to ED with acute stroke or TIA that arrive by EMS	57	57	57
% of patients with acute stroke or TIA who arrive at ED in less than 2 hours from time last known to be well (LKW)	39	38	38
Quality of In-hospital Stroke Care			
Early phase			
% of stroke patients who have brain imaging performed within 25 minutes of hospital arrival	67	71	69
% of ischemic stroke patients whose disease severity was assessed and documented using NIH stroke scale score	87	87	87
% of acute stroke patients who had dysphagia screening	86	87	87
% of acute stroke patients who received venous thromboembolism prophylaxis the day of or the day after admission	95	96	95
% of acute ischemic stroke patients who arrived at the hospital within 2 hours from time LKW and received IV alteplase within 3 hours of time LKW	91	90	95
% of acute ischemic stroke patients who received IV alteplase within 60 minutes of hospital arrival	80	85	87
% of ischemic stroke patients who received antithrombotic medication by the end of hospital day two	98	98	98
Later and at discharge			
% of ischemic stroke patients with medical history of smoking who received smoking cessation advice or counseling	98	99	99
% of ischemic stroke patients who were prescribed antithrombotic at discharge	99	99	99
% of ischemic stroke patients with atrial fibrillation who received anticoagulation therapy	96	97	97
% of eligible ischemic stroke patients who were discharged on statin medication	98	98	99
% of stroke patients who were assessed for rehabilitation services	99	99	99
Patient Education			
% of patients and/or caregiver that received educational materials during the hospital stay addressing all stroke education areas[1]	97	97	97
Aggregate			
% of patients with defect-free[2] in-hospital care	78	79	79
Total number of patients	18,888	19,268	19,799

Abbreviation: **ED** – Emergency Department; **EMS** – Emergency Medical Service; **GCASR** – Georgia Coverdell Acute Stroke Registry; **LKW** – Last Known Well; **NIH** – National Institute of Health; **TIA** – Transient Ischemic Attack

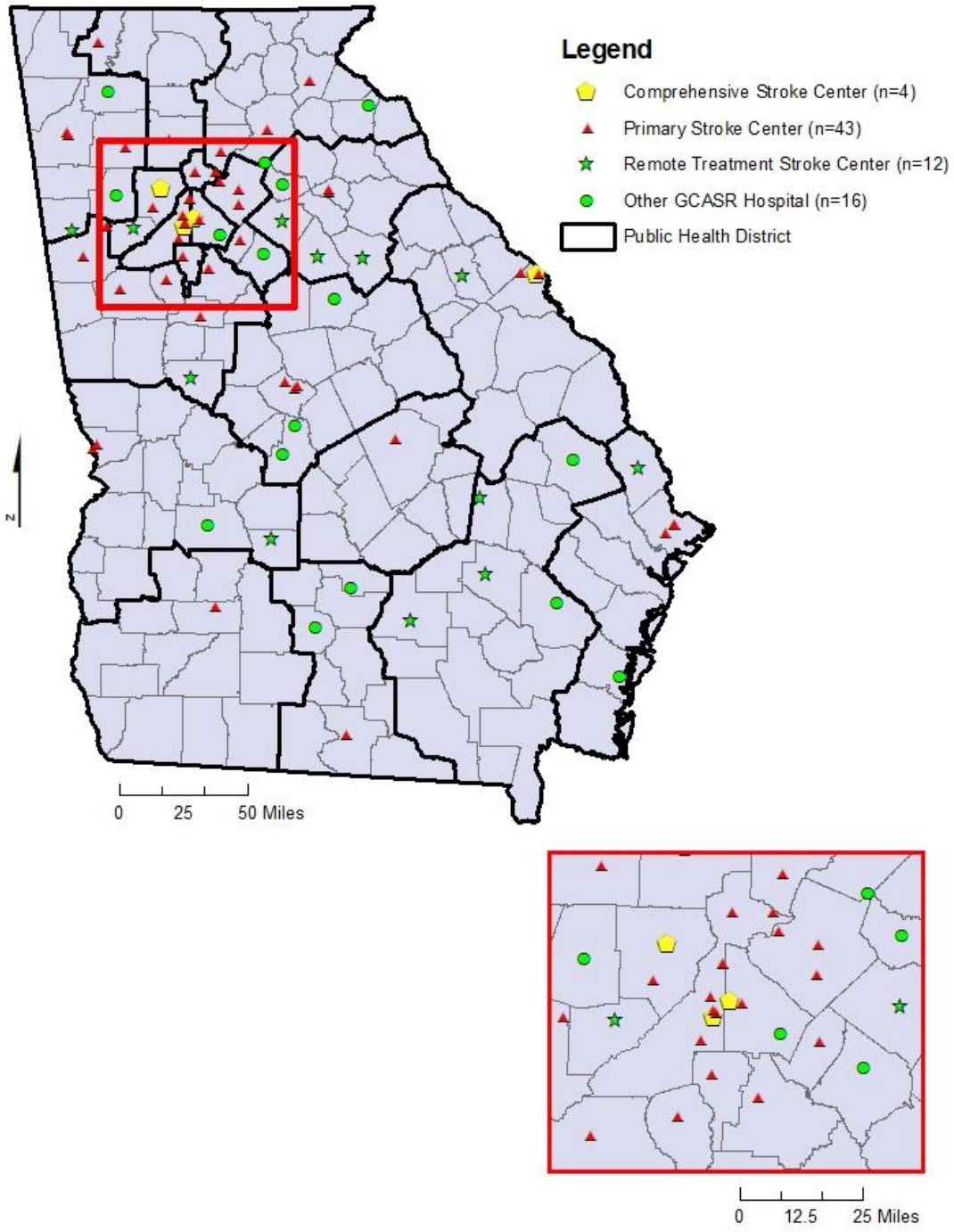
[1]Stroke education areas include activation of EMS, follow-up after discharge, medication adherence, risk factors, and sign and symptoms of stroke.

[2]Defect-free care is defined as the delivery of care meeting all quality indicators for which a patient is eligible.

References

1. Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017 on CDC WONDER Online Database, released December, 2018. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http://wonder.cdc.gov/ucd-icd10.html on Jan 8, 2019.
2. Centers for Disease Control and Prevention (CDC). Prevalence and most common causes of disability among adults: United States, 2005. *MMWR Morb Mortal Wkly Rep*. 2009;58:421–426. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5816a2.htm
3. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. *N Engl J Med*. 1995; 333:1581-1588. Available at: http://www.nejm.org/doi/full/10.1056/NEJM199512143332401#t=article doi: 10.1056/NEJM199512143332401
4. Benjamin EJ, Virani SS, Callaway CW, Chamberlain AM, Chang AR, Cheng S, et al; on behalf of the American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *Circulation*. 2018; 137(12):e67-e492. doi: 10.1161/CIR. 0000000000000558.
5. Liao Y, Greenlund KJ, Croft JB, et al. Factors Explaining Excess Stroke Prevalence in the US Stroke Belt. *Stroke*. 2009,40:3336-3341. Available at: http://stroke.ahajournals.org/content/40/10/3336.full (https://doi.org/10.1161/STROKEAHA.109.561688)
6. Georgia Behavioral Risk Factor Surveillance System Data 2017. Chronic Disease, Healthy Behaviors, and Injury Epidemiology, Georgia Department of Public Health. For more information: http://dph.georgia.gov/georgia-behavioral-risk-factor-surveillance-system-brfss
7. Georgia Coverdell-Murphy Act. SB 549, Section 31-11-116. 14 May 2008, Official Code of Georgia Annotated, 2008. Available at: http://www.legis.ga.gov/Legislation/20072008/85749.pdf
8. Amendment to Georgia Coverdell-Murphy Act. House Bill 853, 26 April 2016. Accessed on Dec 15, 2017 at: http://www.legis.ga.gov/Legislation/en-US/display/20152016/HB/853
9. Ido MS, Bayakly R, Frankel M, Lyn R, Okosun IS. Administrative data linkage to evaluate a quality improvement program in acute stroke care, Georgia, 2006-2009. *Prev Chronic Dis*. 2015;12:E05. doi: 10.5888/pcd12.140238.
10. Ido MS, Okosun IS, Bayakly R, Clarkson L, Lugtu J, Floyd S, et al. Door to intravenous tissue plasminogen activator time and hospital length of stay in acute ischemic stroke patients, Georgia, 2007-2013. *J Stroke Cerebrovasc Dis*. 2016;25(4):866-71. doi: 10.1016/j.jstrokecerebrovasdis.2015.12.025.
11. Ralph L. Sacco R, Emelia J. Benjamin EJ, Joseph P. Broderick JP, Mark Dyken M, J. Donald Easton JD, William M. Feinberg WM, et. Al. Risk Factors. *Stroke*. 1997;28:1507-1517. Available at http://stroke.ahajournals.org/content/28/7/1507.full (https://doi.org/10.1161/01.STR.28.7.1507)
12. Population Projections, United States, 2004–2030, by state, age and sex, on CDC WONDER Online Database, September 2005. Accessed at http://wonder.cdc.gov/population-projections.html on Dec 15, 2018.

Acute Care Hospitals participating in the Georgia Coverdell Acute Stroke Registry, October 2018



Definitions:

Alteplase*:* FDA-approved clot-busting drug for stroke. This drug can reduce disability by 30% in stroke sufferers if given to eligible patients within 3 hours of symptom onset.

Anticoagulation and Antithrombotic Medications*:* Medications that reduce blood clotting.

Atrial fibrillation: A disorder resulting in an irregular and often rapid heart rate. It predisposes to blood clotting and increases the risk of stroke, coronary heart disease and other heart-related complications.

Door-to-Needle Time*:* Time elapsed from when an eligible stroke patient arrives at the hospital to when Alteplase is administered. Eligible patients must receive Alteplase within 3 hours of symptom onset.

Dysphagia Screening*:* Screening for difficulty in swallowing. This identifies patients who need targeted treatment to improve their ability to swallow, so they do not aspirate or take fluid into the lungs. Aspiration of fluid can lead to pneumonia.

Hemorrhagic Stroke*:* A stroke caused by a blood vessel rupturing and bleeding in the brain. Hemorrhagic strokes are often fatal.

Ischemic Stroke*:* A stroke caused by a clot or blockage in a blood vessel supplying blood to the brain. The majority of strokes in Georgia are ischemic.

Statin medications: High cholesterol is a risk factor for stroke and statins lower blood cholesterol level.

Venous Thrombosis*:* When a blood clot forms in a vein, usually in the leg. If the clot breaks off, it can cause serious complications and even death.

Know the Signs and Symptoms of Heart Attack and Stroke

Heart attack and stroke are life-threatening emergencies. Call 911 if you experience these symptoms.

Signs of Heart Attack

- Chest discomfort. Most heart attacks involve discomfort in the center of the chest that lasts more than a few minutes, or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, fullness, or pain.
- Discomfort in other areas of the upper body. Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw, or stomach.
- Shortness of breath. This feeling often accompanies chest discomfort, but it can occur before the chest discomfort.
- Other symptoms may include nausea, lightheadedness, or breaking out in a cold sweat.

Signs of Stroke

- Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body.
- Sudden confusion, trouble speaking or understanding.
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination.
- Sudden, severe headache with no known cause.