

DISEASE BURDEN

- In 2017, 19,813 Georgians were hospitalized for acute stroke or transient ischemic attack in 125 Georgia hospitals.
- Total stroke hospitalization charges were more than \$1.6 billion, with a median charge per patient of about \$35,185.
- Based on the Georgia Coverdell Acute Stroke Registry and Georgia death data, mortality from acute ischemic stroke and its complications in Georgia during 2017 was estimated to be:
 - 7.8% at 30 days post-incident
 - 17.4% at 1 year post-incident

- Based on the 2017 hospital discharge data, GCASR-participating hospitals serve about 94% percent of stroke admissions in Georgia.

PROGRAM OVERVIEW

- The Georgia Coverdell Acute Stroke Registry (GCASR) is named in honor of the late Senator Paul Coverdell of Georgia who died of a massive stroke in 2000.
- GCASR is funded by the Centers for Disease Control and Prevention (CDC) as part of the Paul Coverdell National Acute Stroke Program.
- GCASR is a partnership between the Georgia Department of Public Health (DPH) Epidemiology, DPH Office of EMS, Emory University, American Heart Association, American Stroke Association, Alliant Health Solutions (Georgia Medical Care Foundation), Georgia Hospital Association, CDC, and the participating hospitals, rehabilitation centers, and Emergency Medical Services (EMS) agencies in Georgia.

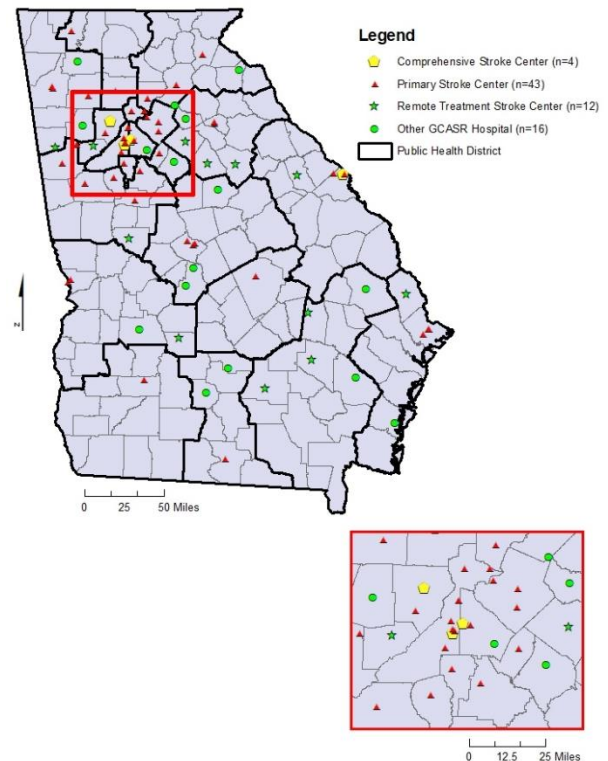
GOALS OF THE GCASR

- Reduce fatalities and disability due to stroke and the incidence of recurrent stroke in Georgia by:
 1. Monitoring and improving the quality of pre-hospital, in-hospital, and post-hospital discharge care of stroke patients.
 2. Encouraging collaboration among EMS providers, hospitals, rehabilitation facilities, home health services, and other institutions in Georgia concerned with stroke care quality improvement.

PARTICIPATION

- Hospitals, rehabilitation facilities, home health services, and EMS agencies join GCASR voluntarily.
- During 2018 in Georgia, 31 EMS agencies and 81 hospitals participated in GCASR, of which 47 are Joint Commission- or Det Norske Veritas-certified comprehensive or primary stroke centers and 12 are Georgia DPH-designated remote treatment stroke centers.

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



DATA COLLECTION

- Data about stroke patient characteristics and care received are collected by GCASR-participating hospitals for patients admitted with acute stroke or transient ischemic attack
- Data about EMS performance indicators/measures are obtained through the Georgia EMS Information System (GEMIS).
- The purpose of data collection is to measure and monitor the quality of pre-hospital and in-hospital stroke care delivery in Georgia.

QUALITY IMPROVEMENT ACTIVITIES

Hospitals and EMS agencies participating in GCASR receive:

- Individualized stroke care quality improvement consultation

- Regular educational conference calls and newsletters to share best practices among participating hospitals and EMS providers
- Regular trainings to enhance skills and exchange best practices
- Organized mentorship among the participating facilities
- Acute Stroke Life Support (ASLS) training
- Quality improvement efforts focused currently on thrombolytic treatment for eligible stroke patients and door-to-needle time
- Development of tools to strengthen EMS-hospital communication

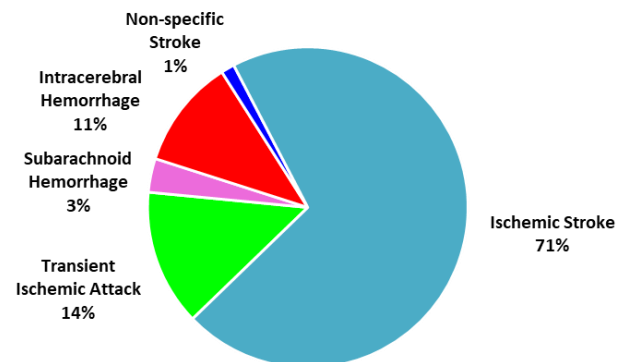
QUALITY INDICATORS

- The quality of care received by stroke patients is measured by indicators representing care processes included in clinical recommendations.
- Quality indicator calculations include identification of patients for whom a care process would have been recommended, and a determination of how many of those patients received the recommended care.
- The 13 GCASR in-hospital care quality indicators are:
 1. Administration of tissue plasminogen activator
 2. Dysphagia screening
 3. Administration of antithrombotic medication within 48 hours
 4. Deep vein thrombosis (DVT) prophylaxis
 5. Prescription for lipid lowering medication
 6. Delivery of stroke education
 7. Smoking cessation counseling or treatment
 8. Rehabilitation assessment
 9. Prescription for antithrombotic medication at discharge
 10. Prescription for anticoagulant medication for patients with atrial fibrillation
 11. NIH stroke scale score recorded
 12. Door-to-image time
 13. Intravenous Alteplase within 60 minutes of hospital arrival
- Defect-free care is defined as the delivery of care meeting all quality indicators for which a patient is eligible.
- Based on GEMSIS data, three performance measures are used to monitor the quality of pre-hospital care:
 1. On-scene time < 15 minutes
 2. Transports with a stroke screen completed and recorded
 3. Transports with a blood glucose checked and recorded

STROKE REGISTRY & GEMSIS DATA

- Analysis included data from 87,750 stroke patients' admissions to GCASR-participating hospitals during 2013 to 2017 and 6,385 presumable stroke patients transported by 31 EMS agencies from the field in 2017.
- In Georgia during 2017, among patients transported by EMS with provider impression of stroke/cerebrovascular accident or transient ischemic attack:
 - 37.8% had pre-hospital stroke assessment done
 - 56.6% had their blood sugar measured
 - the median time from 911 call to hospital arrival was 42 minutes
 - the median travel time from scene to hospital was 14 minutes
 - the median on-scene time was 15 minutes, and 49.1% had an on-scene time less than 15 minutes

Figure 1. Types of Stroke, GCASR Admissions, 2017 (n=20,226)



- In 2017, among 20,226 acute stroke admissions in GCASR facilities:
 - Ischemic stroke and transient ischemic attack accounted for 85 percent of admissions (Figure 1).
 - Forty-seven percent of stroke admissions were for patients brought to the hospital by EMS, 37 percent by private transportation, and 16 percent were transferred from one healthcare facility to another.
 - Hospitals received pre-notification from EMS for 55 percent of the stroke admissions brought by EMS.
 - Of the total 19,028 GCASR patients in 2017, 28% were previously admitted with stroke and 10% had a previous TIA admission.

- Eighty-four percent of stroke admissions had a history of hypertension, of which 77 percent were on antihypertensive medication during the week prior to their admission for acute stroke.
- Of the 20,226 GCASR admissions, 241 were newly diagnosed with diabetes during admission for acute stroke.
- About 55 percent of all stroke admissions resulted in discharge to home.

Table 1. Most frequent co-morbidities among stroke patients (n=19,317) and prevalence among adult Georgians, GCASR, 2017

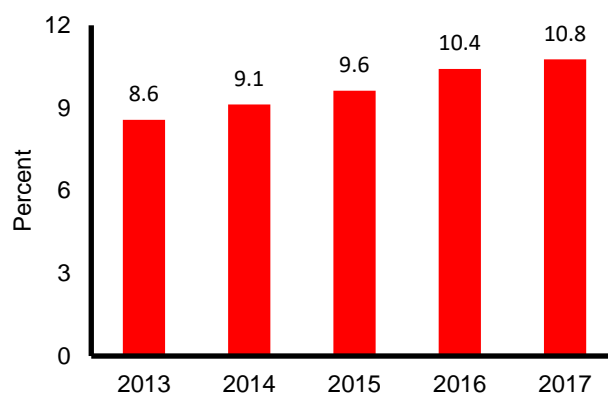
| Co-Morbidity | Acute Stroke Patients (%) ^a | Adult Georgians (%) ^b |
|-----------------------------|--|----------------------------------|
| Hypertension | 83.8 | 33.1 |
| Dyslipidemia | 45.7 | 31.1 |
| Diabetes Mellitus | 37.8 | 11.4 |
| CAD ^c /Prior MI | 22.7 | 6.0 |
| Atrial Fibrillation/Flutter | 15.0 | -- |
| Smoking | 22.7 | 17.5 |

Note: a - GCASR 2017; b - Georgia Behavioral Risk Factors Surveillance System 2017; c - Coronary Artery Disease

For ischemic stroke patients, prompt thrombolytic treatment, if eligible, is critical for better survival and functional outcomes.

- In 2017, among ischemic stroke patients admitted to GCASR-hospitals with symptom onset time noted, 32 percent (2,379/7,379) arrived at the emergency department within 2 hours from the last time they were known to be well.
- Among these, 68 percent (1,613/2,379) had their brain image taken within 25 minutes of hospital arrival and 38 percent (914/2,379) were eligible, without contraindications, for Alteplase.
- Among the Alteplase-eligible patients, 94 percent (859/914) received intravenous thrombolytic treatment within 3 hours after symptom onset.
- Among eligible patients treated with a thrombolytic agent, 42 percent (384/914) and 67 percent (611/914) received intravenous Alteplase within 45 minutes and within an hour of arrival at the emergency department, respectively.
- In 2017, the median time to receive Alteplase for eligible ischemic stroke patients arriving within two hours of symptom onset was 50 minutes.

Figure 2. Percentage of ischemic stroke patients receiving intravenous Alteplase treatment, GCASR, 2013-2017 (n=62,662)



Note: In 2008, only 4.8% received IV Alteplase.

IMPROVEMENTS OVER TIME (GCASR HOSPITALS), 2013-2017

- Overall, intravenous Alteplase administration among ischemic stroke patients increased from 8.6 percent in 2013 to 10.8 percent in 2017 (Figure 2).
- The percentage of patients who received defect-free care increased slightly from 76 percent in 2013 to 79 percent in 2017 (Figure 3), indicating improvement in all ten performance measures on aggregate.
- The percentage of eligible ischemic stroke patients who received intravenous Alteplase within 3 hours of symptom onset consistently remained at around 90%. Those who received the treatment within 60 minutes of hospital arrival increased from 50 percent in 2013 to 69 percent in 2017 (Figure 4).
- The median times from hospital arrival to take a brain image and administer Alteplase intravenously (door-to-treatment time) were shortened from 21 and 60 minutes in 2013 to 15 and 50 minutes in 2017, a reduction of 29 and 17 percent, respectively (Figures 5 & 6).

Figure 3. Percentage of acute stroke patients who received defect-free care, GCASR, 2013-2017 (n=71,581)

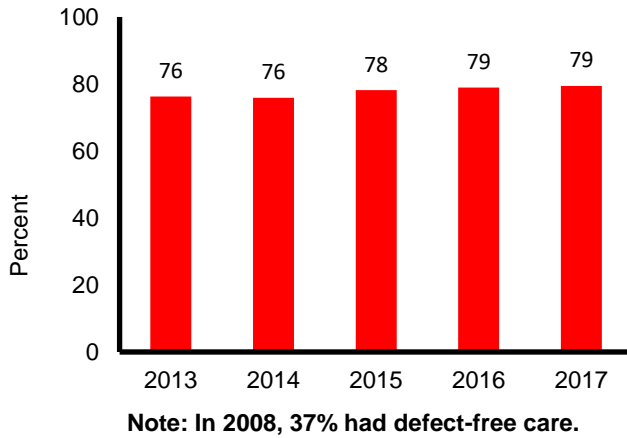


Figure 5. Trend in median door-to-imaging time among ischemic stroke patients who arrived at a hospital within 120 minutes of symptom onset, GCASR, 2013-2017 (n=10,025)

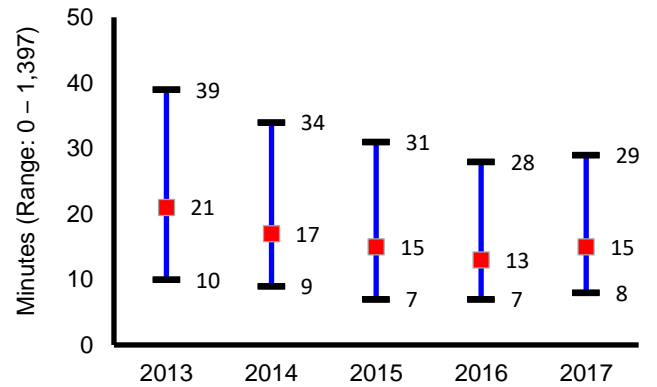


Figure 4. Percentage of eligible ischemic stroke patients treated with intravenous Alteplase within 60 minutes of hospital arrival, GCASR, 2013-2017 (n=3,927)

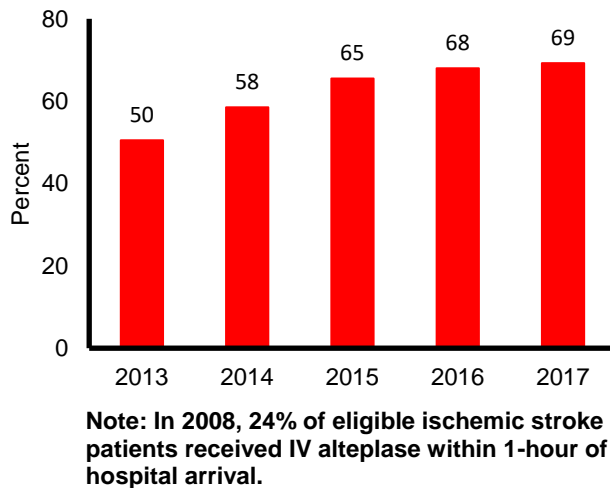
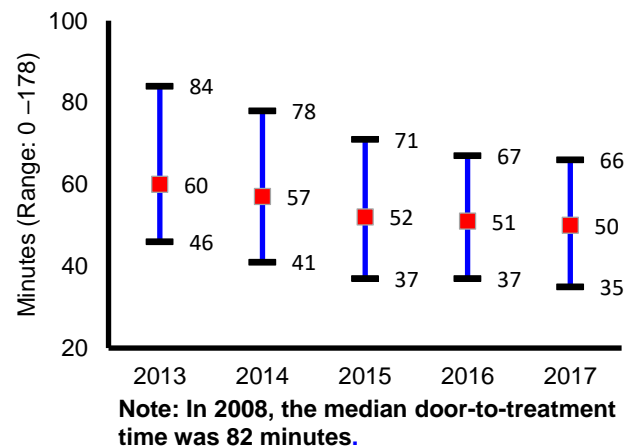
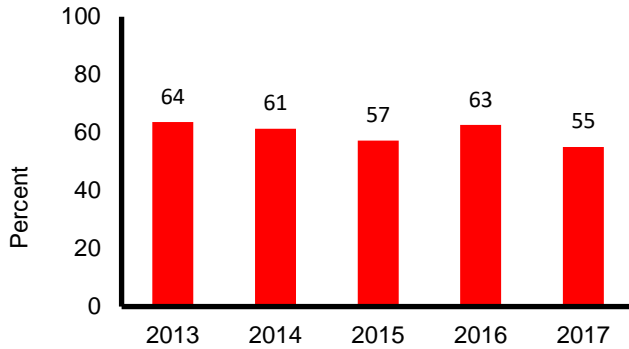


Figure 6. Trend in median door-to-treatment time among eligible ischemic stroke patients treated with intravenous Alteplase, GCASR, 2013-2017 (n=3,927)



- A stroke alert system expedites in-hospital patient care. However, the percentage of patients transported by EMS with hospital pre-notification decreased from 64 percent in 2013 to 55 percent in 2017, albeit inconsistently. (Figure 7)

Figure 7. Percentage of stroke patients transported by EMS with hospital pre-notification, GCASR, 2013-2017 (n=39,916)



Note: In 2008, 51% of patients transported by EMS had hospital prenotification and received IV Alteplase.

DEFINITIONS

- Stroke: brain tissue death; can be the result of a thrombus (blocked artery) or a hemorrhage (ruptured artery) which prevents blood flow to the brain
- Transient ischemic attack: temporary blockage of cerebral blood flow that causes a short-lived neurological deficit
- Deep Vein Thrombosis (DVT): blood clot located in a large vein; a potential complication of stroke
- Dysphagia: problems swallowing; a potential complication of stroke that can lead to pneumonia
- Antithrombotic: medication administered to prevent platelets or clotting factors in the blood from forming a blood clot
- Anticoagulation: administration of medications to prevent clotting of the blood
- Tissue plasminogen activator (Alteplase): a thrombolytic medication administered to eligible acute ischemic stroke patients to reestablish blood supply to the brain

FOR MORE INFORMATION ON GCASR, PLEASE VISIT

<http://dph.georgia.gov/georgia-coverdell-acute-stroke-registry>