2021 Data Summary

Georgia Coverdell Acute Stroke Registry (GCASR)

DISEASE BURDEN

- In 2020, 19,405 Georgians were hospitalized for acute stroke or transient ischemic attack in 121 Georgia hospitals.
- Total stroke hospitalization charges were more than $1.7 billion, with a median charge per patient of about $46,013.
- Based on the Georgia Coverdell Acute Stroke Registry and Georgia death data, mortality from acute ischemic stroke and its complications in Georgia during 2020 was estimated to be:
  - 7.6 percent at 30 days post-incident
  - 17.0 percent at 1-year post-incident

PROGRAM OVERVIEW

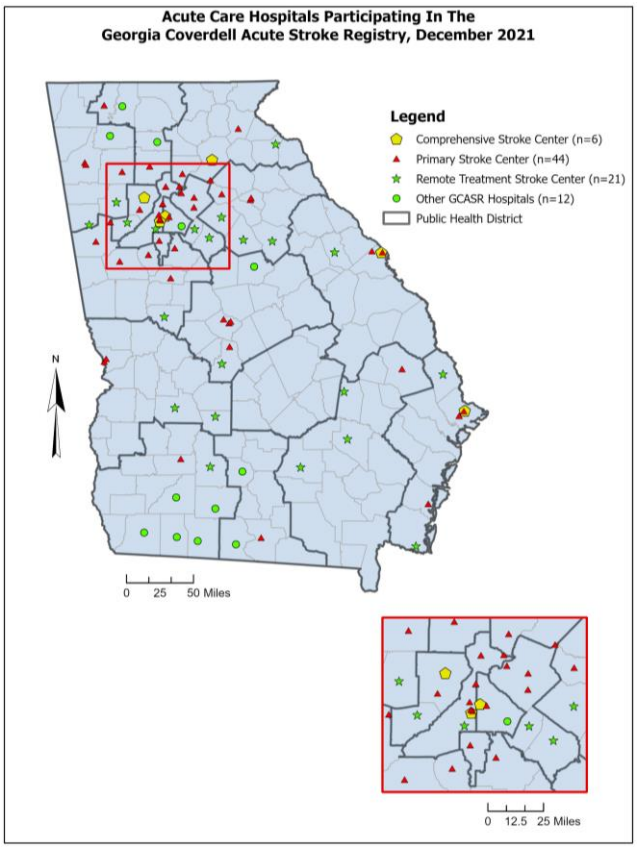
- The Georgia Coverdell Acute Stroke Registry (GCASR) is named in honor of the late Senator Paul Coverdell of Georgia who died of a massive stroke in 2000.
- GCASR is funded by the Centers for Disease Control and Prevention (CDC) as part of the Paul Coverdell National Acute Stroke Program (PCNASP).
-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

GOALS OF THE GCASR

- Reduce morbidity, mortality, and disability due to stroke, the incidence of recurrent stroke, and stroke-related disparity 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, post-acute care facilities, and EMS agencies join GCASR voluntarily.
- During 2021 in Georgia, 46 EMS agencies and 83 hospitals participated in GCASR, of which 50 were Joint Commission- or Det Norske Veritas-certified comprehensive or primary stroke centers and 21 were Georgia DPH-designated remote treatment stroke centers.
- Based on the 2020 hospital discharge data, GCASR-participating hospitals serve about 96 percent of stroke admissions in Georgia.



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 measures are obtained through the Georgia EMS Information System (GEMSIS).
- The data collection aims at measuring and monitoring 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.

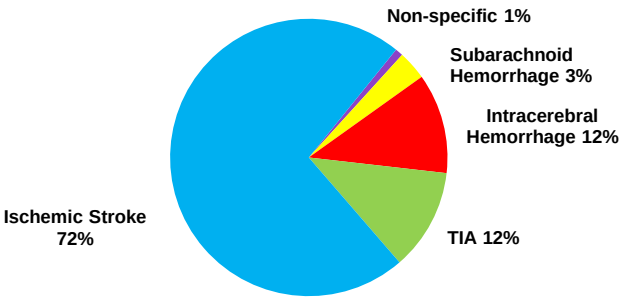
QUALITY INDICATORS

- 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-the-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 109,452 stroke patients' admissions to GCASR-participating hospitals during 2016 to 2020 and 10,291 presumable stroke patients transported by 42 EMS agencies from the field in 2020.
- In Georgia during 2020, among patients transported by EMS with provider impression of stroke/cerebrovascular accident or transient ischemic attack:
  - 78 percent had a stroke screen completed and recorded
  - 95 percent had their blood glucose checked and recorded
  - Median on-the-scene time was 16 minutes, and 43 percent had an on-scene time less than 15 minutes
  - Median travel time from scene to hospital was 14 minutes
  - Median time from 911 call to hospital arrival was 44 minutes

Figure 1. Types of Stroke, GCASR Admissions, 2020 (n=23,042)



- In 2020, among 23,042 acute stroke admissions in GCASR facilities:
  - Ischemic stroke and transient ischemic attack accounted for 84 percent of admissions (Figure 1).
  - Forty-eight percent of stroke admissions were for patients brought to the hospital by EMS, 34 percent by private transportation, and 17 percent were transferred from one healthcare facility to another.
  - Hospitals received pre-notification from EMS for 63 percent of the stroke admissions brought by EMS.
  - Of the total 23,042 GCASR patients in 2020, 27 percent were previously admitted with stroke and eight percent had a previous TIA admission.
  - Seventy-eight percent of stroke admissions had a history of hypertension, of which 75 percent were on antihypertensive medication during the week prior to their admission for acute stroke.
  - Of the 23,042 GCASR admissions, 370 were newly diagnosed with diabetes during admission for acute stroke.
  - About 56 percent of all stroke admissions in Georgia resulted in discharge to home.

Table 1. Most frequent co-morbidities among stroke patients (n=23,042) and prevalence among adult Georgians, GCASR, 2020

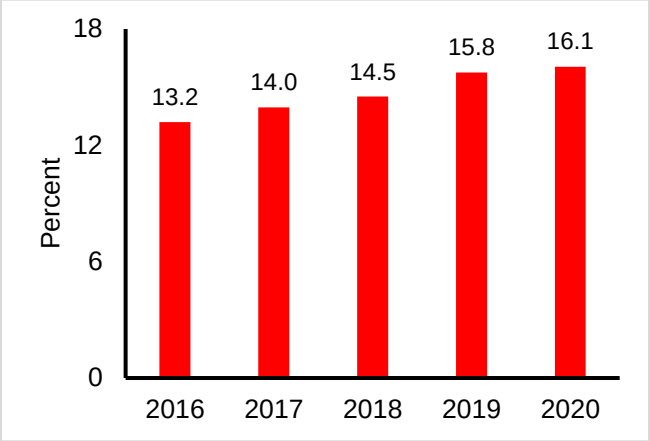
Co-Morbidity	Acute Stroke Patients (%)[a]	Adult Georgians (%)[b]
Hypertension	78.4	34.8*
Dyslipidemia	45.3	32.4*
Diabetes Mellitus	35.5	11.6
CAD[c]/Prior MI	19.6	7.0
Atrial Fibrillation/Flutter	13.7	--
Smoking	21.3	15.8

Note: a - GCASR 2020; b - Georgia Behavioral Risk Factors Surveillance System 2020 (*2019); c - Coronary Artery Disease

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

- In 2020, among ischemic stroke patients admitted to GCASR-hospitals with symptom onset time noted, 28 percent (2,703/9,559) arrived at the emergency department within 2 hours from the last time they were known to be well.
- Among these, 75 percent (2,025/2,703) had their brain image taken within 25 minutes of hospital arrival and 49% percent (9,90/2,025) were eligible, without contraindications, for Alteplase.
- Among the Alteplase-eligible patients, 94 percent (932/990) received intravenous thrombolytic treatment within 3 hours after symptom onset.
- Among eligible patients treated with a thrombolytic agent, 52 percent (494/949) and 75 percent (715/949) received intravenous Alteplase within 45 minutes and within an hour of arrival at the emergency department, respectively.
- In 2020, the median time to receive Alteplase for eligible ischemic stroke patients arriving within two hours of symptom onset was 44 minutes.

Figure 2. Percentage of ischemic stroke patients receiving intravenous or intraarterial Alteplase treatment, GCASR, 2016-2020 (n=77,545)

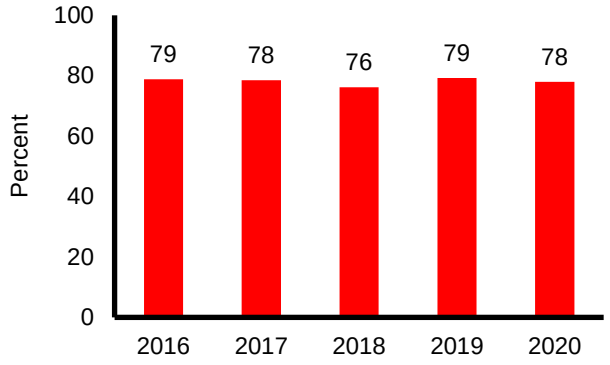


Note: In 2008, only 4.9 percent received IV Alteplase.

CHANGES OVER TIME (GCASR HOSPITALS), 2016-2020

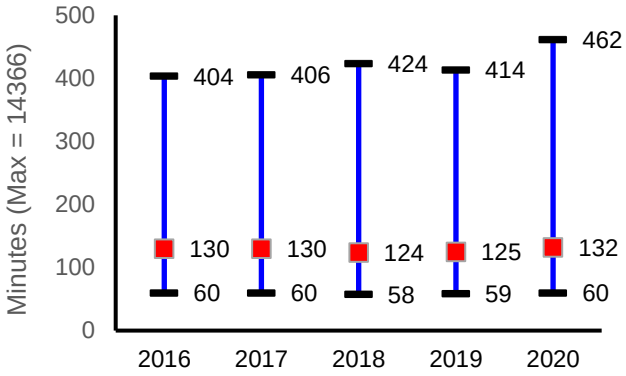
- Overall, Alteplase administration among ischemic stroke patients increased from 13.2 percent in 2016 to 16.1 percent in 2020 (Figure 2).
- The percentage of patients who received defect-free care showed no consistent increase from 2016 to 2020 (78 percent) (Figure 3).
- The median time from symptom onset to hospital arrival among patients with ischemic stroke has fluctuated between 2016 and 2020 (Figure 4).
- A stroke alert system expedites in-hospital patient care. A consistent increase is observed from 2016 (59%) to 2020 (63%) after a sharp decrease to 52% in 2017 (Figure 5).
- The percentage of eligible ischemic stroke patients who received intravenous Alteplase within 3 hours of symptom onset increased from 87 percent in 2016 to 94 percent in 2020.
- Those who received the treatment within 45 minutes of hospital arrival increased from 41 percent in 2016 to 52 percent in 2020 (Figure 6).
- The median time from hospital arrival to administering Alteplase intravenously (door-to-treatment time) was shortened from 51 minutes in 2016 to 44 minutes in 2020, a reduction of 14 percent (Figure 8) whereas the median time from hospital arrival to taking a brain image did not show consistent reduction (Figure 7).

Figure 3. Percentage of acute stroke patients who received defect-free care, GCASR, 2016-2020 (n=85,015)



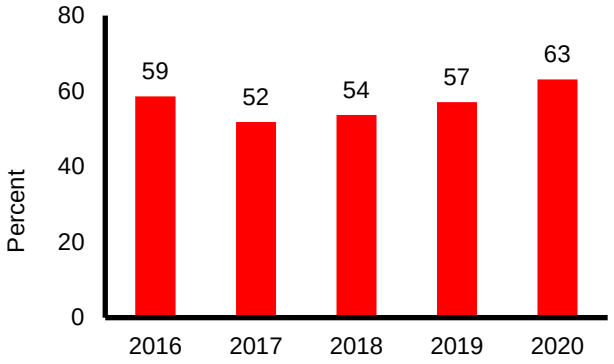
Note: In 2008, 37 percent had defect-free care.

Figure 4. Trend in median symptom onset to hospital arrival time among Acute Ischemic Stroke patients, GCASR, 2016-2020 (n=36,367)



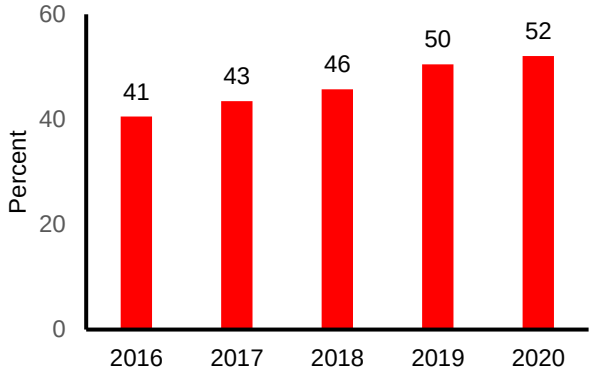
Note: In 2008, the median symptom onset to hospital arrival time was 122 minutes.

Figure 5. Percentage of stroke patients transported by EMS with hospital pre-notification, GCASR, 2016-2020 (n=50,537)



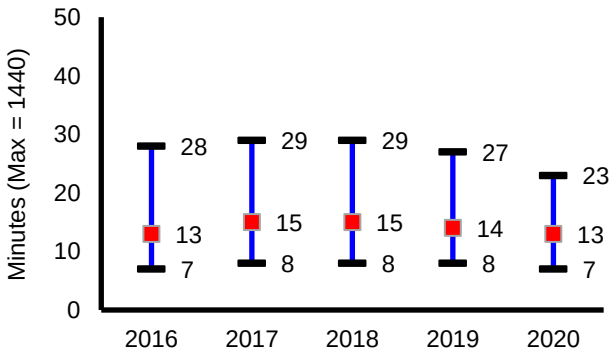
Note: In 2008, 48.4 percent of stroke patients transported by EMS had hospital prenotification.

Figure 6. Percentage of eligible ischemic stroke patients treated with intravenous Alteplase within 45 minutes of hospital arrival, GCASR, 2016-2020 (n=5,106)



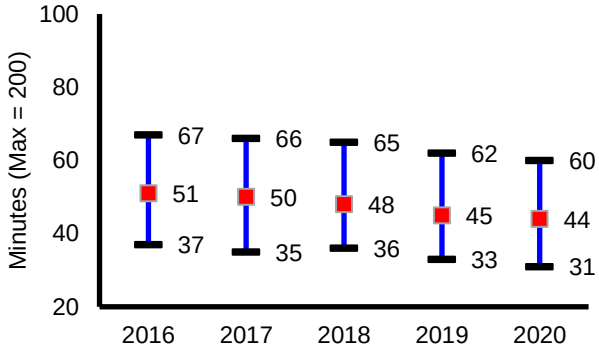
Note: In 2008, 8.7 percent of eligible ischemic stroke patients received IV alteplase within 45 minutes of hospital arrival.

Figure 7. Trend in median door-to-imaging time among ischemic stroke patients who arrived at a hospital within 120 minutes of symptom onset, GCASR, 2016-2020 (n=12,444)



Note: In 2008, the median door-to-imaging time was 31 minutes.

Figure 8. Trend in median door-to-treatment time among eligible ischemic stroke patients treated with intravenous Alteplase, GCASR, 2016-2020 (n=4,739)



Note: In 2008, the median door-to-treatment time was 82 minutes.

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: difficulty of 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