

KENTUCKY STROKE ENCOUNTER QUALITY IMPROVEMENT PROJECT (SEQIP)



Kentucky Heart Disease and Stroke Prevention Program

SEQIP Stroke Registry 2016 Data Summary

2018 Annual Report



Kentucky Public Health

Prevent. Promote. Protect.

June 1, 2018

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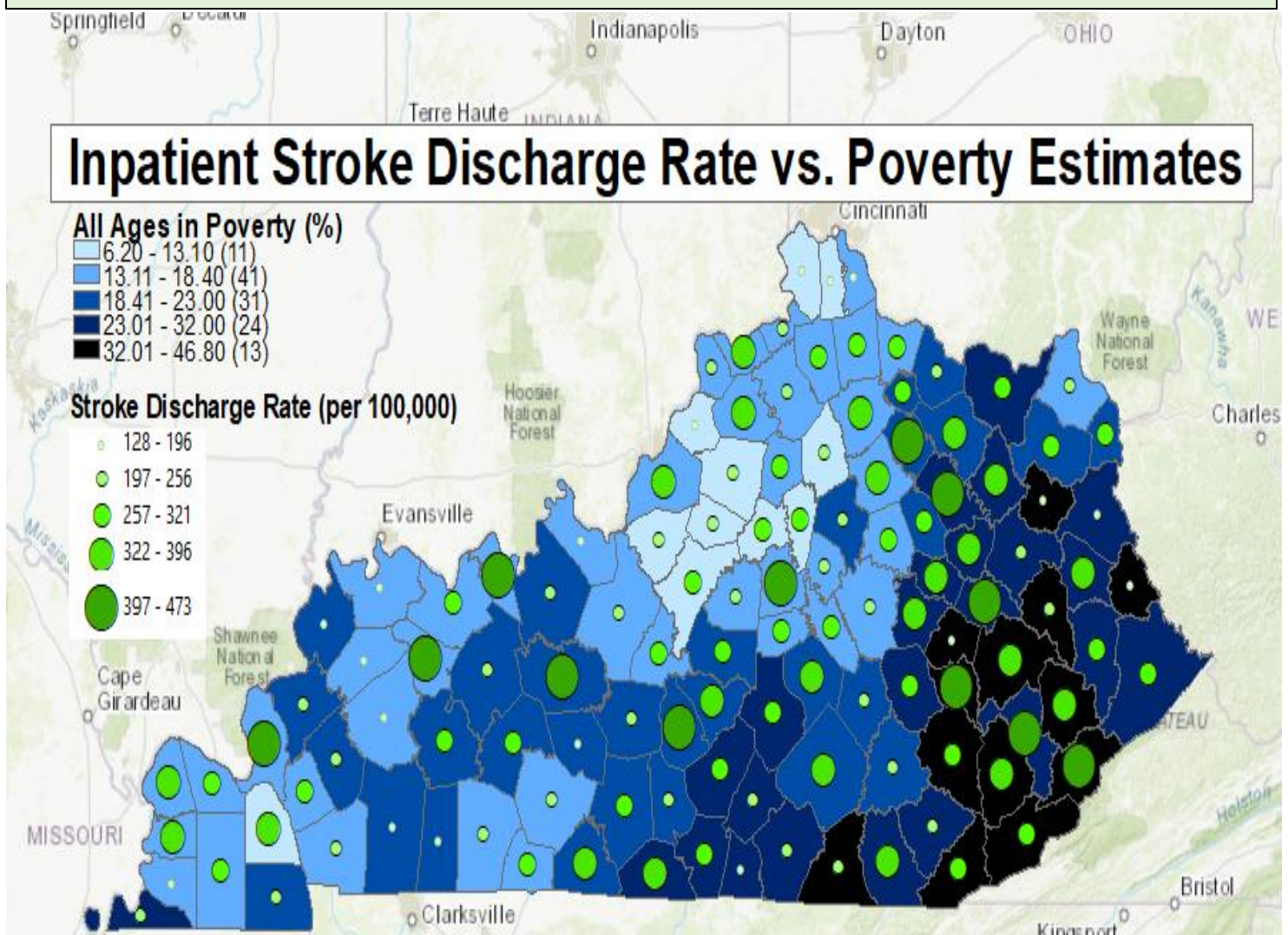
BURDEN OF CARDIOVASCULAR DISEASE IN KENTUCKY

Heart Disease and Stroke

Data from the Kentucky Behavioral Risk Factor Survey for 2016

- 6.8% of **adults** have been told by a health care professional they have angina or heart disease
- 4.5% of **adults** have been told by a health care professional they had a stroke
- 7.2% of **adults** have been told by a health care professional they had a heart attack

Map 1. Kentucky Statewide Discharge Rate vs. Poverty Estimates



Total Stroke Discharges by County Residents (ICD10: 160 to 169): 11,783

Data Source:
 2015 Poverty Estimates, U.S. Census Bureau
 2016 Inpatient Hospitalizations, Kentucky Office of Health Policy

Sources: Esri, HERE, DeLorme, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

For All Kentuckians

- The risk for cardiovascular disease can be greatly reduced by 1) managing blood pressure, 2) engaging in regular physical activity, 3) following a heart-healthy diet, and 4) reducing stress.

STROKE ENCOUNTER QUALITY IMPROVEMENT PROJECT

Stroke Encounter Quality Improvement Project (SEQIP) Mission/Background

The mission of SEQIP is to advance acute stroke care management and reduce stroke disparities in Kentucky by:

- Establishing a network of professionals that will encourage and support collaboration among stroke care providers in Kentucky.
- Providing opportunities to share information and resources related to stroke program development and proficiency across the continuum of care in Kentucky.
- Promoting quality, improving outcomes and standardization of acute stroke care through collegiality and use of evidence-based practice guidelines.
- Collaborating on stroke related research throughout Kentucky.

SEQIP was created in 2009 as a statewide voluntary stroke quality improvement initiative of the Kentucky Heart Disease and Stroke Prevention Task Force - Cardiovascular Health (CVH) Delivery Systems Subcommittee and the American Heart Association/American Stroke Association (AHA/ASA). SEQIP initiated a voluntary participation in a stroke registry for hospitals, the first in Kentucky.



Since its inception, SEQIP has grown to include hospitals that are stroke certified as Comprehensive, Primary, and Acute Stroke Ready, as well as hospitals seeking to advance stroke care in the community in which they serve. Participation in SEQIP is voluntary and open to all hospitals and stakeholders in Kentucky and surrounding areas. Membership does not require registry participation.

Engaging Stakeholders

SEQIP was designed to encourage collaboration between hospitals and stakeholders in Kentucky in order to improve the quality of care given to stroke patients. At inception, 16 hospitals were geographically chosen and invited to participate to represent the state as a whole. Quality and process improvement reports were generated and reviewed by SEQIP member hospitals, and action plans were created and implemented by members. As the initiative has grown, additional hospitals have joined the effort. The data presented in this report are based on 23 certified stroke centers that provided mandatory data for calendar year 2016. There are currently 35 participating hospitals engaged in SEQIP. Data from these additional centers will be reflected in future reports.

Reporting Purpose

This data summary report is compiled pursuant to KRS 211.575, which requires the Kentucky Department for Public Health (KDPH) to establish and implement a plan to address continuous quality improvement for stroke care. KDPH is required to provide an annual report to the Governor and the Legislative Research Commission that includes data, related findings, and recommendations to improve the delivery of stroke care efforts in Kentucky.

EXECUTIVE SUMMARY

Cardiovascular Disease in the Commonwealth

Citizens of the commonwealth have high rates of heart disease, heart attack, stroke, and common medical problems, such as high blood pressure and high cholesterol that increase the risk of developing these cardiovascular diseases. As a result, Kentucky ranks 8th in the nation for deaths caused by cardiovascular diseases with the highest death rates in Eastern and Western Kentucky.

Stroke Encounter Quality Improvement Project (SEQIP)

SEQIP is a statewide quality improvement initiative and registry to advance stroke care management and reduce disparities in Kentucky. Membership is voluntary and includes hospital representatives from all certified stroke centers in the state, as well as hospitals seeking certification and other individuals and organizations with an interest in improving stroke care.

The project was designed to share best practice strategies and encourage collaboration. SEQIP has grown from 16 hospitals in 2009 to 35 hospitals in 2017.

Demographics of SEQIP Patients

In 2016, 60% of stroke patients in Kentucky's stroke registry were over the age of 65, comprising the largest age group by frequency; 34% were between 46 and 65 years. Gender consisted of 51% female and 49% male. The race of the patients was predominantly White at 89%, followed by Black 10%, and then Latino with 1%.

Stroke Types of SEQIP Patients

Strokes are caused by a loss of blood flow to the brain due to blockage or breaking of the blood vessel. An ischemic stroke (the most common in the US, 87%) occurs when there is a loss of blood flow to the brain from a blood clot or plaque build-up in the brain arteries or arteries leading to the brain. A temporary loss of blood flow to the brain that does not cause permanent damage is known as a Transient Ischemic Attack (TIA). Hemorrhagic strokes (13% of all strokes) are due to rupture of a blood vessel causing bleeding into the brain tissue or space around the brain. In 2016, there were 7,118 strokes in the SEQIP registry. The major types of stroke in Kentucky's registry were as follows:

Ischemic Stroke:	77%
Hemorrhagic Stroke:	11%
Transient Ischemic Attack:	9%

Descriptives of SEQIP Patients

Some of the most common modifiable risk factors leading to a stroke are: high blood pressure, high cholesterol, diabetes, cigarette smoking, atrial fibrillation or flutter (an irregular heart rhythm increasing the risk for blood clot formation), drug and alcohol abuse, and obesity. In the Kentucky registry, those patients suffering a stroke or TIA had the following top risk factors: high blood pressure – 77%, high cholesterol – 44%, diabetes – 35%, cigarette smoking – 22%, obesity 19%, atrial fibrillation/flutter – 17%. These risk factors are controllable and therefore all public health stakeholders should be invested in population health approaches that will reduce the risk factors and prevent future strokes.

Arrival Modes of SEQIP Patients

Activation of the 911 response system is recommended by the Centers for Disease Control and Prevention and the American Heart/Stroke Association when stroke is suspected. SEQIP hospitals throughout the state engage in community education to increase awareness on the symptoms of stroke and activation of 911. Data for 2016 show that 39% of stroke patients utilized Emergency Medical Services (EMS) for transportation to the hospital, 29% were transferred from another hospital, 28% utilized private vehicle, and 2% the transportation mode was unknown. The number of people utilizing a private vehicle reflects the ongoing need for continued education.

In 2015, SEQIP identified through a survey that stroke response protocols, orientation, and education for EMS dispatchers throughout the commonwealth is inconsistent and lacks standardization. Therefore, SEQIP hospitals continue to partner with EMS agencies to provide education and assist with continued development of stroke systems of care.

Initial Exam Findings

The most common stroke symptoms present on arrival to SEQIP hospitals were: muscle weakness, trouble with speech, and altered level of consciousness. The National Institute of Health Stroke Scale (NIHSS) Score is used to document the severity of symptoms on arrival to the hospital. Scores range from 0-42. Zero reflects no deficits and a score of 42 would indicate the most severe disability. On arrival to SEQIP hospitals, 94% of patients had an initial NIHSS performed. The majority of stroke patient's (6,088) presented with an NIHSS score of 1-15 indicating a mild to moderate stroke while 1,030 patients presented with an NIHSS of 16-42 indicating a more severe stroke on arrival.

Performance Measure Results

SEQIP hospitals monitor 10 evidence-based performance measures endorsed by the American Heart/Stroke Association and Stroke Center certification bodies for the treatment and management of stroke patients from hospital to discharge. The 10 measures monitored are:

1. Alteplase (IV rt-PA) administration - administering the only FDA approved clot busting drug to eligible patients.
2. Early Antithrombotics – administering medications by the end of hospital day two that help prevent strokes from reoccurring by keeping products in the blood from sticking together.
3. Venous Thromboembolism (VTE) Prophylaxis – administering medications or applying pulsating sleeves to the legs that assist with pumping blood flow back to the heart and decrease the risk of blood clot formation in the legs.
4. Antithrombotics at Discharge – prescribing medications at discharge that help prevent strokes from reoccurring by keeping products in the blood from sticking together.
5. Anticoagulation for Atrial Fibrillation/Flutter – administering medications at discharge that thin the blood and prevent blood clots from forming for those patients with the abnormal heart rhythm of atrial fibrillation or flutter.
6. Smoking Cessation – All stroke patients who smoke should receive counseling and be notified of resources available to assist them in their efforts to stop smoking.
7. Low Density Lipoprotein (LDL) - All patients with an LDL (bad cholesterol that contributes to plaque build-up in the arteries) should be prescribed a statin (medication that prevents cholesterol and plaque build-up) at discharge unless contraindicated.
8. Dysphagia Screen – All stroke patients safe swallowing ability should be assessed before giving pills, food, or liquids by mouth to ensure they are not going into the lungs.

9. Stroke Education – All stroke patients or their caregivers should be educated on the signs and symptoms of stroke, their personal risk factors for stroke, medications prescribed for stroke prevention, activation of 911 for stroke symptoms, and follow up appointments.
10. Rehabilitation Considered – physical therapists, occupational therapists, and speech language pathologists should evaluate patients and assist in the decision making for most appropriate discharge location and plan.

The nationally recognized goal for the above performance measures by the American Heart Association/Stroke Association and Stroke Center certifying bodies is > 85% achievement for each measure. SEQIP hospitals met this goal for all 10 measures during calendar year 2016.

Recommendations

The Kentucky Heart Disease and Stroke Prevention Task Force along with the KDPH Heart Disease and Stroke Prevention Program developed the Kentucky Heart Disease and Stroke Prevention Strategic Map and Plan for 2017-2019. SEQIP members were active participants in the development and creation of the map and are committed to furthering the initiatives outlined in the plan for continued improvement in stroke systems of care in the commonwealth.

Recommendations are to:

- Continue to recruit hospitals and stakeholders to become involved in SEQIP;
- Increase the number of certified stroke centers in the state;
- Administer the only FDA approved clot busting drug to appropriate stroke patients;
- Continue partnering with the Kentucky Hospital Association's (KHA) Rural Hospital Flexibility Program to disseminate updated stroke education for health care providers and EMS personnel;
- Partner with the Kentucky Board of EMS (KBEMS) to further define opportunities for shared data collection, EMS personnel education, and dissemination of approved stroke protocols;
- Continue to educate the public on how stroke can be prevented, the signs and symptoms of stroke, and the importance of calling 911 when a stroke is suspected.

SEQIP is positioned to achieve these goals by maximizing our current resources; sustaining and creating new partnerships; and maintaining collaboration amongst stakeholders.

SEQIP Steering Committee

June 1, 2018

DEMOGRAPHICS OF SEQIP PATIENTS FOR 2016

Figure 1. Percent of patients by age

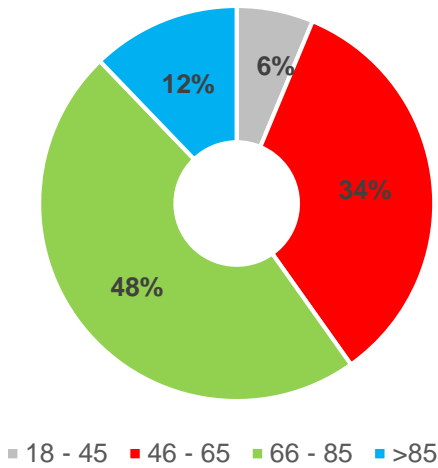
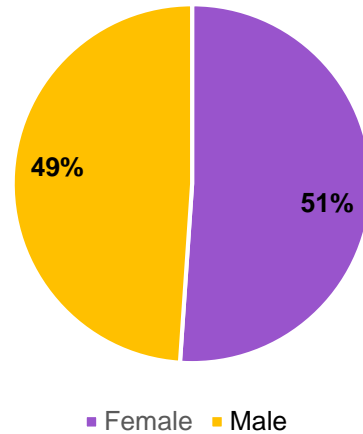


Figure 2. Percent of patients by gender



Who is Affected?

Deaths due to stroke are a major threat to public health. According to 2016 National Vital Statistics Reports, stroke deaths are the fifth leading killer for all Americans. While there are a number of modifiable risk factors that can be targeted to reduce the likelihood for experiencing a stroke, certain predictors of stroke are non-modifiable. For example, age, race, gender, and family medical history are independent predictors of stroke that cannot be modified. However, public health stakeholders can focus efforts on reducing the prevalence and burden of stroke by addressing the modifiable risk factors that are listed further in this report.

Figure 3. Percent of patients by race

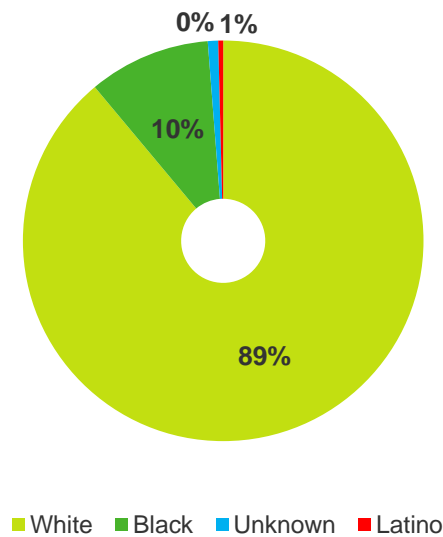
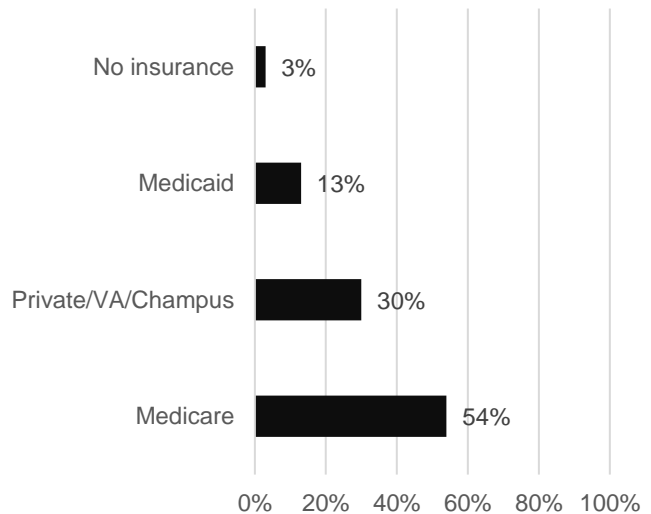
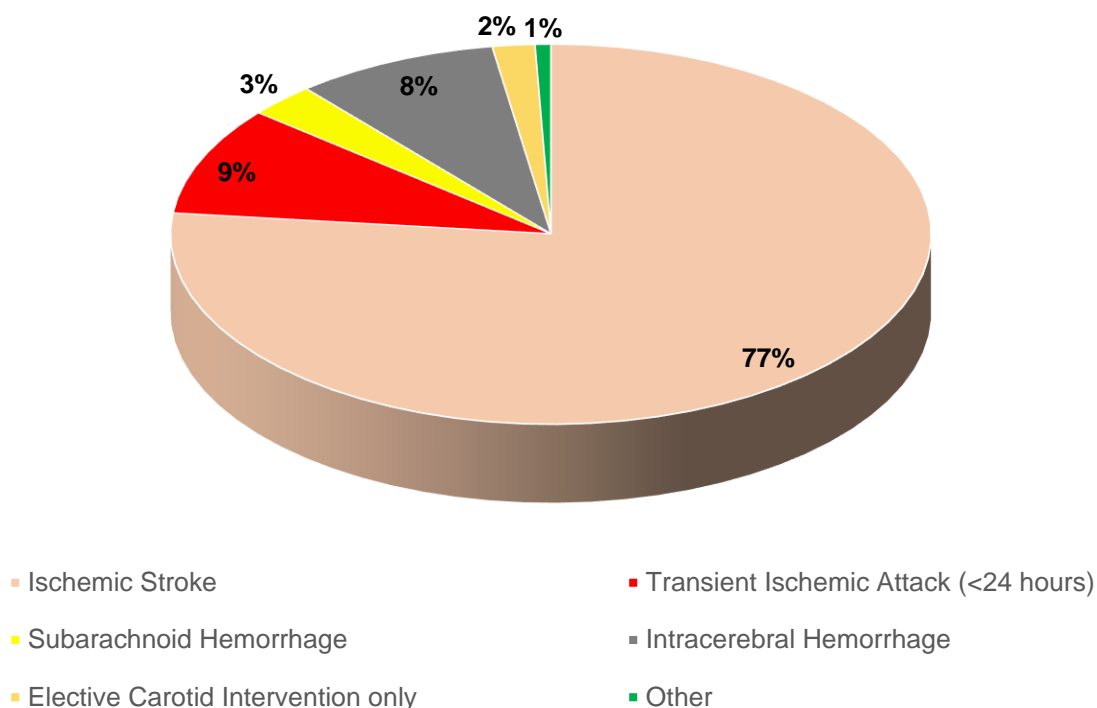


Figure 4. Patient groupings by insurance type



STROKE TYPES OF SEQIP PATIENTS FOR 2016

Figure 5. Percent of patients by stroke type



Stroke Types: A clinical syndrome caused by disruption of blood supply to the brain resulting in brain cell death, characterized by rapidly developing signs of cerebral dysfunction.

Ischemic Stroke (IS): occurs when an artery to the brain is blocked resulting in inadequate blood supply and oxygen causing brain tissue to die.

Transient Ischemic Attack (TIA): occurs when part of the brain does not get the blood flow it needs. The symptoms occur rapidly and usually last for a short time before resolving completely and leaving no permanent damage.

Intracerebral Hemorrhage (ICH): occurs when a blood vessel within the brain ruptures, allowing blood to leak inside the brain tissue.

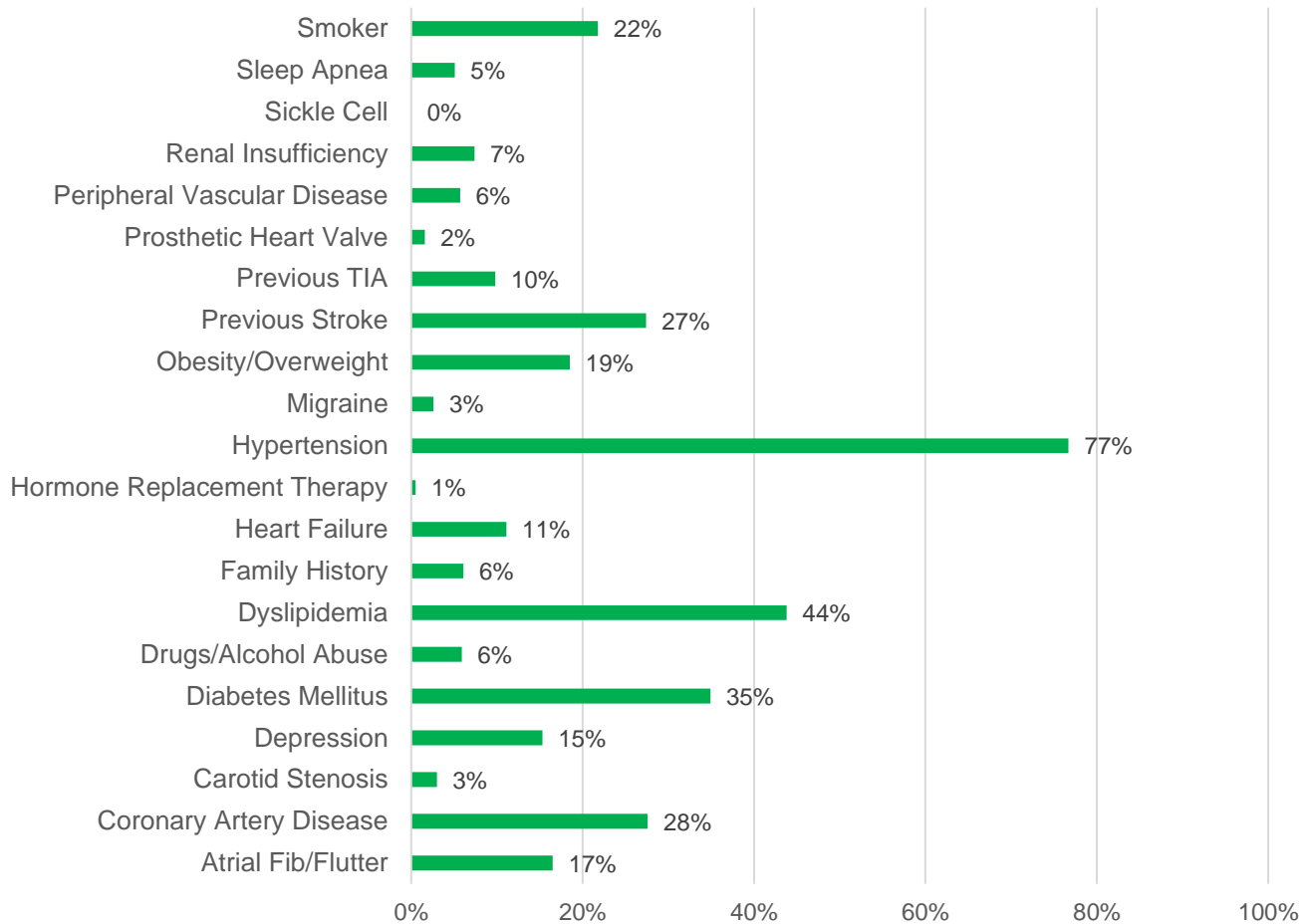
Subarachnoid Hemorrhage (SAH): occurs when a blood vessel just outside the brain ruptures. The area between the skull and the brain (the subarachnoid space) rapidly fills with blood.

Other: includes stroke not otherwise specified, no stroke-related diagnosis, and missing diagnosis.

Elective Carotid Intervention Only: elective definitive interventions include elective carotid endarterectomy, angioplasty, and carotid stenting.

DESCRIPTIVES OF SEQIP PATIENTS FOR 2016

Figure 6. A histogram of patients' previously known medical history



Modifiable Risk Factors

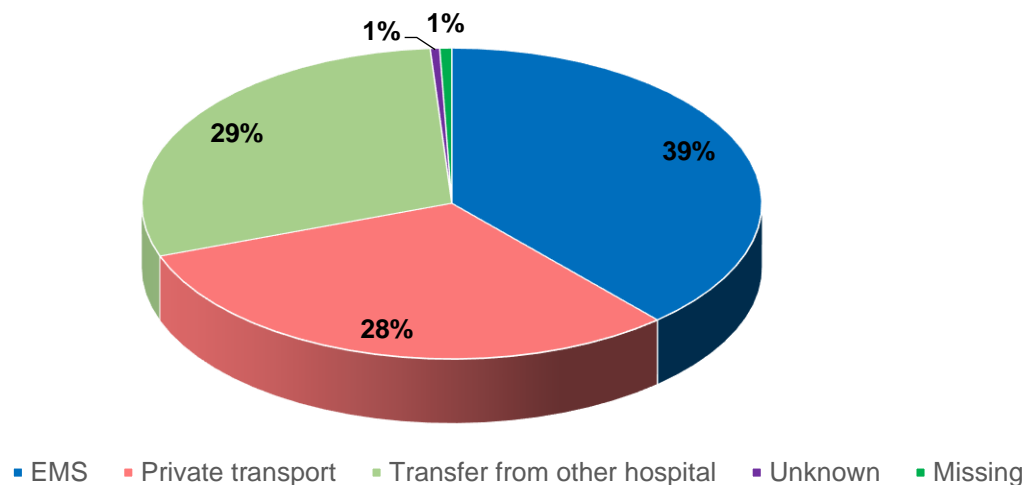
While one cannot alter age, race, gender, or family medical history, there are a number of behavioral risk factors that can be targeted to reduce the chances for having a future stroke.

High Blood Pressure	Cigarette Smoking	Diabetes
Dyslipidemia	Atrial Fibrillation	Alcohol/Drug Abuse
Diet/Nutrition	Physical Activity	Body Mass
Sleep Apnea	High Stress Levels	Sodium Reduction

The risk factors above have been linked to premature mortality and serious morbidity. To reduce the likelihood for experiencing a stroke, individuals should discuss their health status with their health care providers and learn about how they can manage controllable risk factors.

ARRIVAL MODES OF SEQIP PATIENTS FOR 2016

Figure 7. Patient groupings of how they arrived at the hospital



Pre-Hospital Mode of Transport

The notification and response of Emergency Medical Services (EMS) for a stroke involves a complex interaction between the public, the applicable EMS agencies, and the relevant hospital emergency departments. The CDC recommends hospitals develop partnerships with local EMS providers, as well as educate communities about how to recognize the symptoms of stroke and the importance of dialing 911 when someone is experiencing these symptoms. These recommendations promote timely life-saving treatment. It is also important for EMS and emergency dispatch operators to be trained in stroke symptom recognition and be able to assist patients in quickly getting to the nearest appropriate hospital that is able to provide the “clot-busting” drug IV rt-PA.

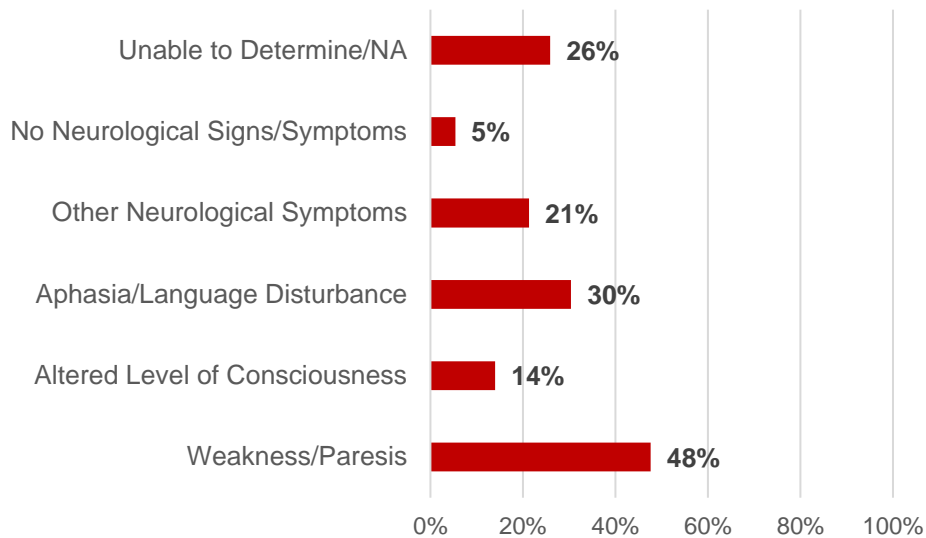
Kentucky Board of Emergency Medical Services (KBEMS)

KRS 311A.180 requires emergency medical services directors to establish pre-hospital care protocols for the assessment, treatment, and transport of stroke patients. Specific objectives include:

- Identify and convene experts and partners to guide the statewide approach to definitive treatment of cardiac and stroke cases and recommend project interventions.
- Implement and evaluate a comprehensive acute myocardial infarction (AMI) and stroke access assessment targeting 120 counties in the commonwealth.
- Collaborate with system engineers to analyze EMS system capabilities and the capabilities of regional healthcare facilities and specialty care centers.
- Begin implementation of quality improvement initiatives prioritized by expert groups.
- Identify policy initiatives based on the findings of the assessment and the expert group recommendations.
- Promote and advocate for educational programs, protocol updates and regionalized EMS system of care.
- Establish a minimum set for cardiac and stroke care that can be reported by EMS systems and healthcare facilities for ongoing research.
- Implement a reassessment to evaluate progress, remaining challenges, clarify questions on the initial assessment, and develop a gap analysis for ongoing evaluation.

PATIENT SYMPTOMS ON ARRIVAL FOR 2016

Figure 8. Initial exam findings (more than one symptom permitted per patient)



Common Stroke Symptoms

- **Altered level of consciousness:** sudden confusion, disorientation, agitation, and altered level of responsiveness
- **Aphasia/language disturbance:** loss of the ability to understand or express speech
- **Hemiparesis/weakness:** sudden onset of one-sided weakness and/or loss of movement, usually beginning in the face and the same side of the body
- **Other symptoms:** include facial drooping, difficulty swallowing (dysphagia), headaches

Figure 9. Dysphagia screening results

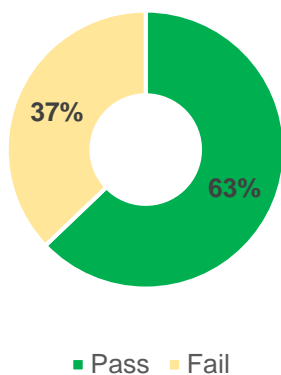


Figure 10. NIHSS reported

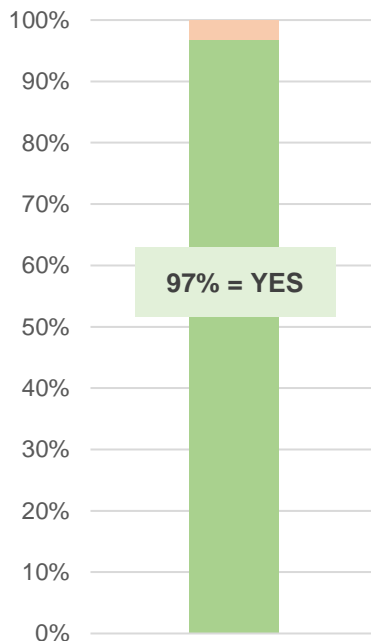
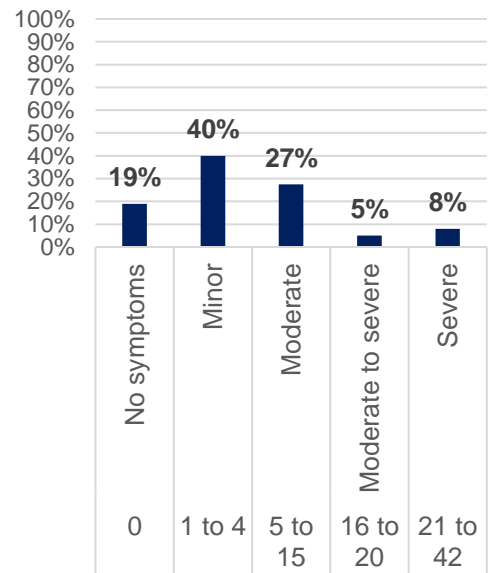


Figure 11. NIHSS admit scores



PERFORMANCE MEASURES DEFINITIONS

IV RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR (IV rt-PA):

Percent of acute ischemic stroke patients who arrive at the hospital within 120 minutes (2 hours) of time last known well and for whom IV t-PA was initiated at this hospital within 180 minutes (3 hours) of time last known well.

EARLY ANTITHROMBOTICS:

Percent of patients with ischemic stroke or TIA who receive antithrombotic therapy by the end of hospital day two.

VTE PROPHYLAXIS:

Percent of patients with an ischemic stroke, or a hemorrhagic stroke, or stroke not otherwise specified who receive VTE prophylaxis by the end of hospital day two.

ANTITHROMBOTICS AT DISCHARGE:

Percent of patients with an ischemic stroke or TIA prescribed antithrombotic therapy at discharge.

ANTICOAGULATION FOR ATRIAL FIBRILLATION/ATRIAL FLUTTER:

Percent of patients with an ischemic stroke or TIA with atrial fibrillation/flutter discharged on anticoagulation therapy.

SMOKING CESSATION:

Percent of patients with ischemic or hemorrhagic stroke, or TIA with a history of smoking cigarettes, who are, or whose caregivers are, given smoking cessation advice or counseling during hospital stay.

LOW DENSITY LIPOPROTEIN (LDL):

Percent of ischemic stroke or TIA patients with LDL \geq 100, or LDL not measured, or on cholesterol-reducer prior to admission who are discharged on statin medication.

DYSPHAGIA SCREENING:

Percent of stroke patients who undergo screening for dysphagia with an evidence-based bedside testing protocol approved by the hospital before being given any food, fluids, or medication by mouth.

STROKE EDUCATION:

Percent of patients with stroke or TIA or their caregivers who were given education and/or educational materials during the hospital stay addressing ALL of the following: personal risk factors for stroke, warning signs for stroke, activation of emergency medical system, need for follow-up after discharge, and medications prescribed.

REHABILITATION CONSIDERED:

Percent of patients with stroke who were assessed for rehabilitation services.

PERFORMANCE MEASURES RESULTS FOR 2016

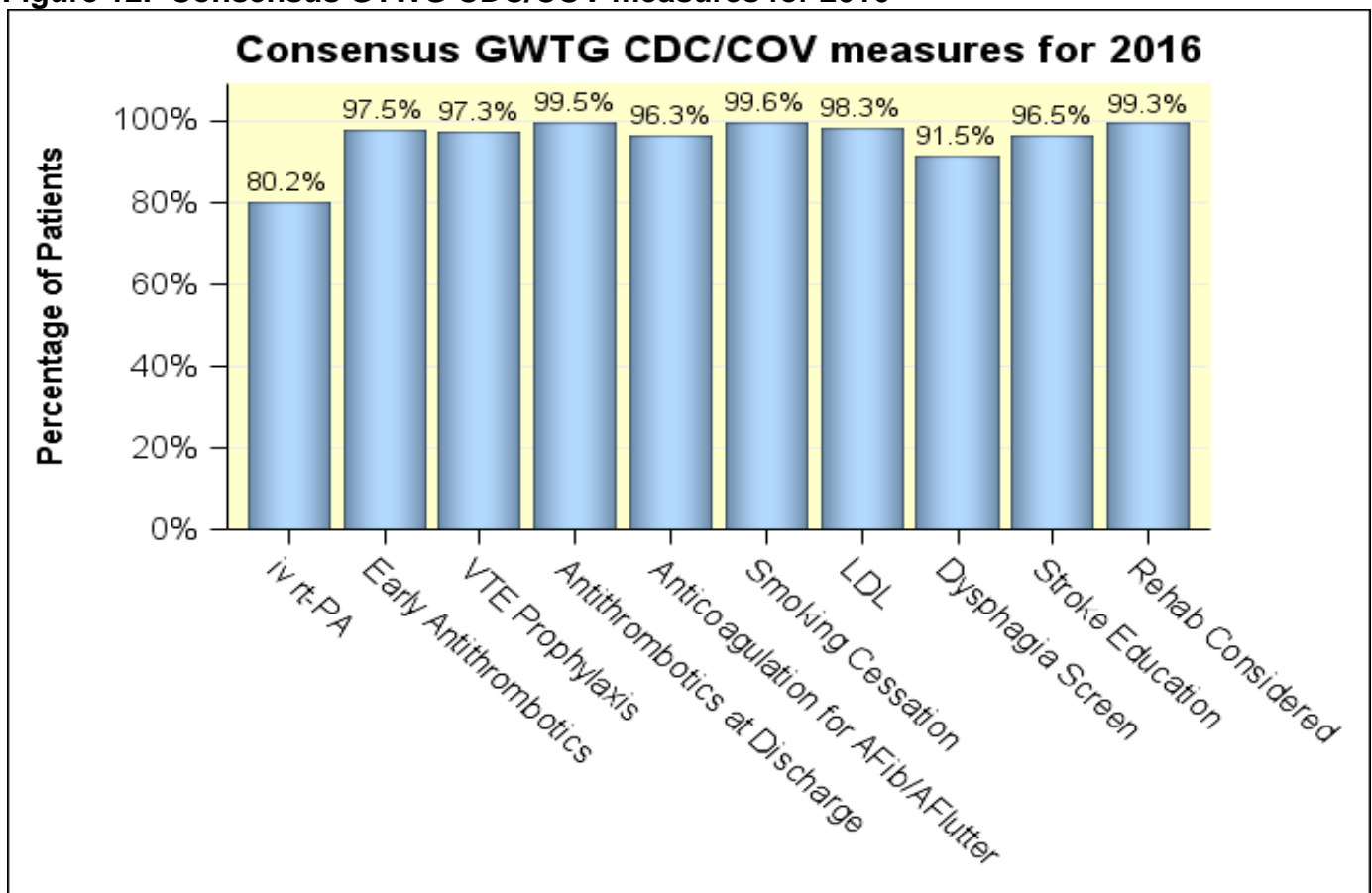
Overview of Performance Measures

Kentucky SEQIP hospitals utilize the performance measures found in the American Heart Association/American Stroke Association's (AHA/ASA) nationally recognized Get With The Guidelines® (GWTG) – stroke hospital based quality improvement module that uses a data set platform with patient confidentiality standards. SEQIP collects data on 10 measures related to stroke that are evidence-based guidelines for the treatment and management of stroke and TIA from hospital admission to discharge.

Optimal Treatment of Ischemic Strokes and Rationale

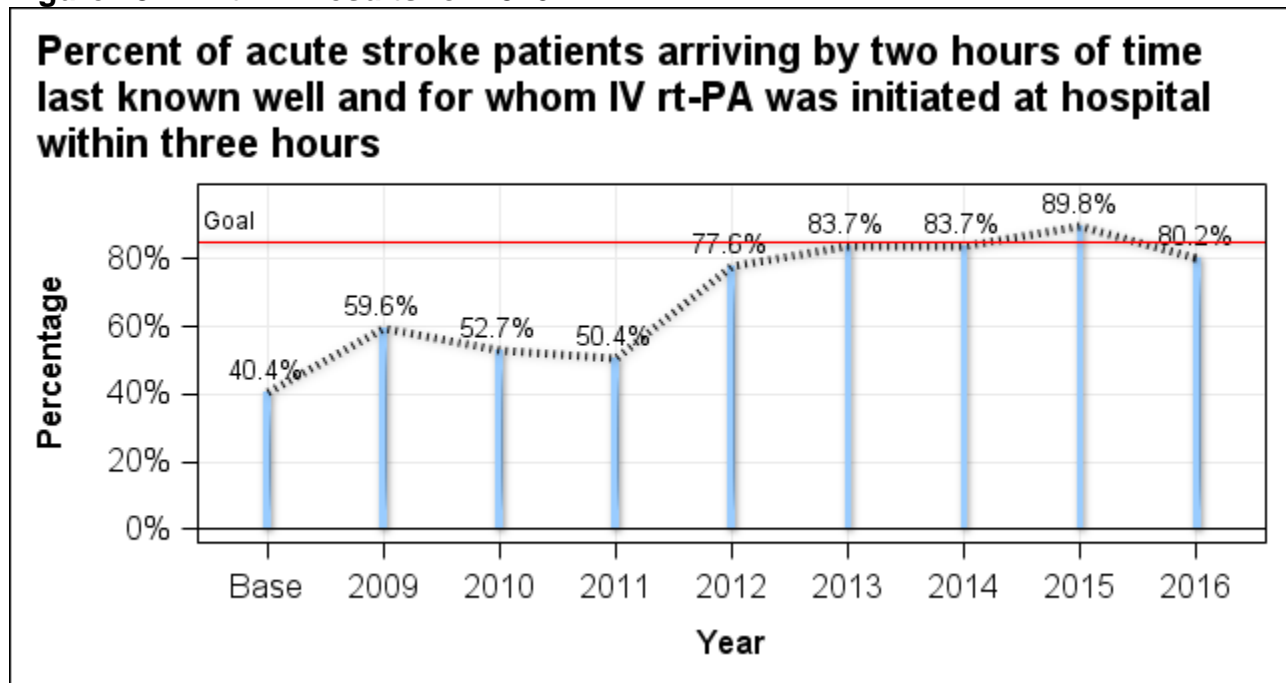
The chart below is based on data reported by the participating SEQIP hospitals between January and December 2016. The performance measures were developed by the Joint Commission, AHA/ASA, and the Centers for Disease Control and Prevention (CDC) and Committee on Volunteers (COV) for optimal treatment of ischemic strokes. The ten criteria are based on clinical effectiveness in several trials and are well established within the AHA/ASA guidelines for management of stroke.

Figure 12. Consensus GTWG CDC/COV measures for 2016



IV RT-PA RESULTS FOR 2016

Figure 13. IV rt-PA Results for 2016



From Baseline to 2016:

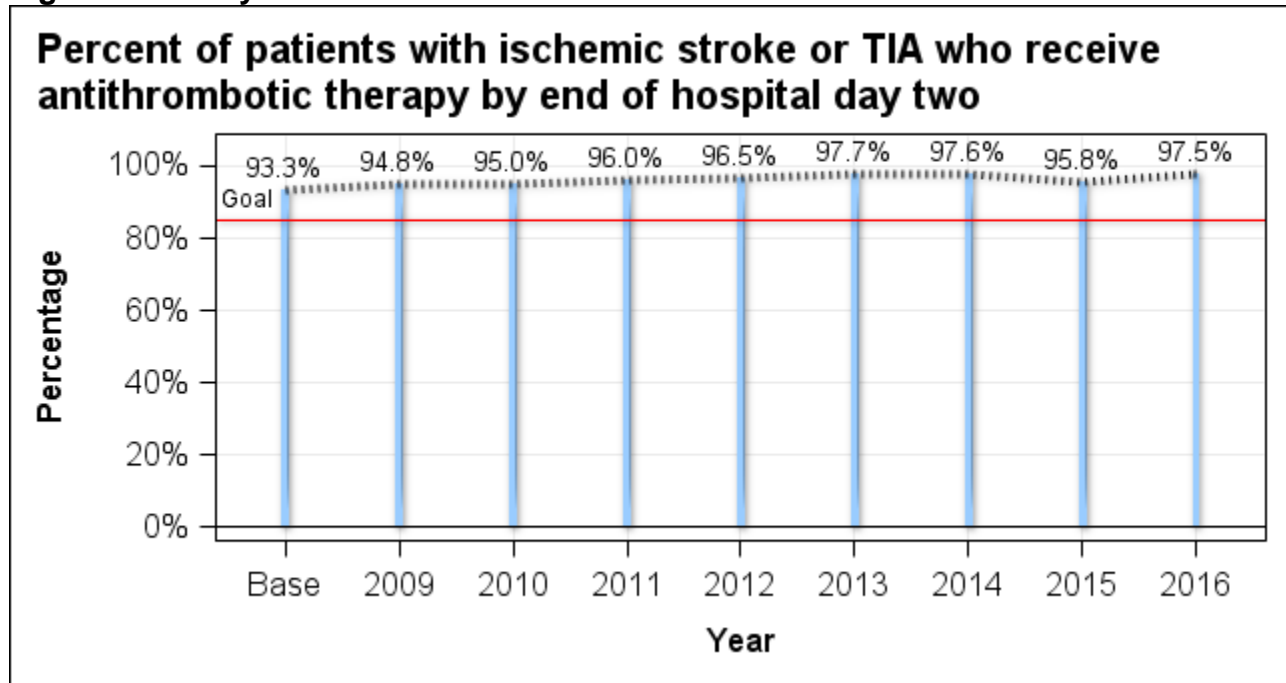
- ✓ There was a 99% increase in the **percentage of eligible patients** who received IV rt-PA within three hours of time last known well
- ✓ The **number of sites** reporting on this measure increased by seven

Table 1. Data table used to calculate and measure results for IV rt-PA. It includes the years, proportion of patients, 95% confidence intervals (CI), numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.404	0.264	0.558	19	47	16
2009	0.596	0.528	0.663	127	213	16
2010	0.527	0.462	0.592	126	239	16
2011	0.504	0.441	0.567	129	256	16
2012	0.776	0.720	0.827	191	246	17
2013	0.837	0.789	0.879	236	282	18
2014	0.837	0.791	0.876	261	312	18
2015	0.898	0.865	0.926	361	402	23
2016	0.802	0.767	0.835	450	561	23

EARLY ANTITHROMBOTICS RESULTS FOR 2016

Figure 14. Early Antithrombotics Results for 2016



From Baseline to 2016:

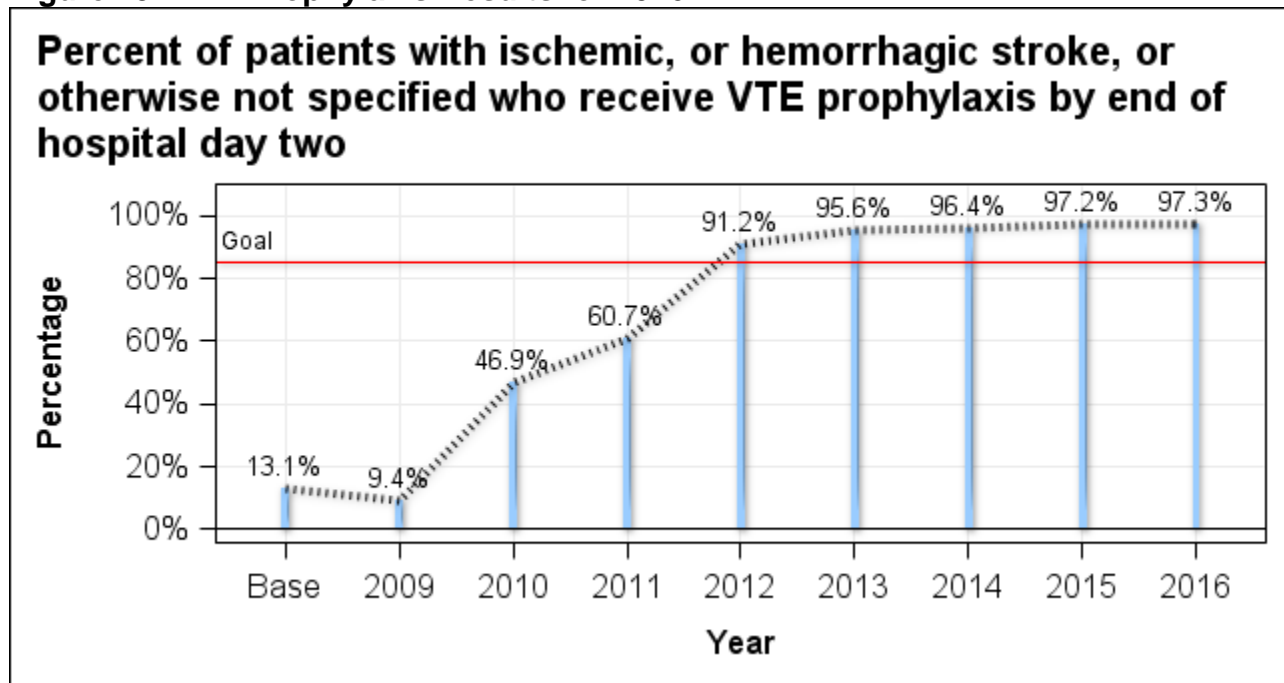
- ✓ There was a 5% increase in the **percentage of eligible patients** who received antithrombotic therapy by end of hospital day two
- ✓ The **number of sites** reporting on this measure increased by seven

Table 2. Data table used to calculate measure results for early antithrombotics. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.933	0.901	0.958	308	330	16
2009	0.948	0.941	0.956	3092	3261	16
2010	0.950	0.943	0.957	3656	3848	16
2011	0.960	0.954	0.966	3751	3907	17
2012	0.965	0.959	0.970	4329	4487	17
2013	0.977	0.973	0.982	4362	4465	18
2014	0.976	0.972	0.981	4682	4795	19
2015	0.958	0.952	0.964	4643	4847	23
2016	0.975	0.971	0.979	5373	5511	23

VTE PROPHYLAXIS RESULTS FOR 2016

Figure 15. VTE Prophylaxis Results for 2016



From Baseline to 2016:

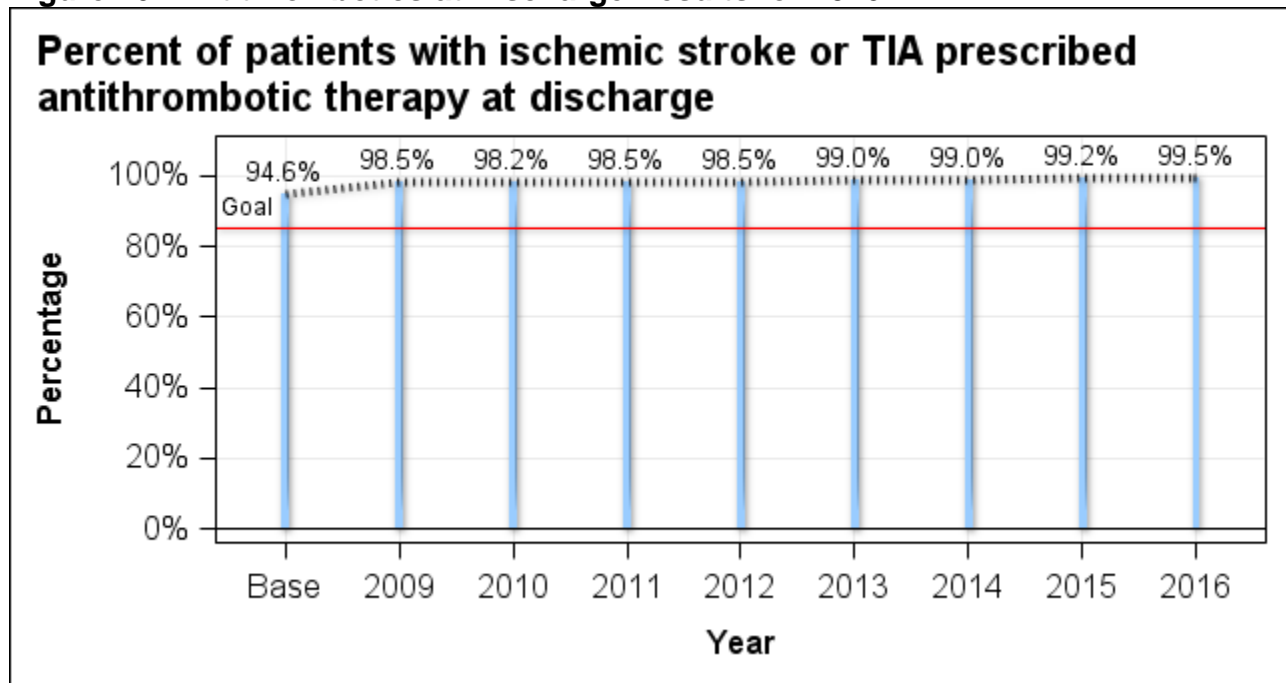
- ✓ There was a 643% increase in the **percentage of eligible patients** who received VTE prophylaxis by end of hospital day two
- ✓ The **number of sites** reporting on this measure increased by seven

Table 3. Data table used to calculate measure results for VTE prophylaxis. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.131	0.101	0.168	55	419	16
2009	0.094	0.085	0.105	317	3383	16
2010	0.469	0.453	0.485	1803	3848	16
2011	0.607	0.592	0.623	2347	3868	17
2012	0.912	0.904	0.920	4407	4832	17
2013	0.956	0.950	0.962	4845	5070	18
2014	0.964	0.959	0.969	5400	5601	19
2015	0.972	0.968	0.977	5556	5715	23
2016	0.973	0.969	0.977	6448	6627	23

ANTITHROMBOTICS AT DISCHARGE RESULTS FOR 2016

Figure 16. Antithrombotics at Discharge Results for 2016



From Baseline to 2016:

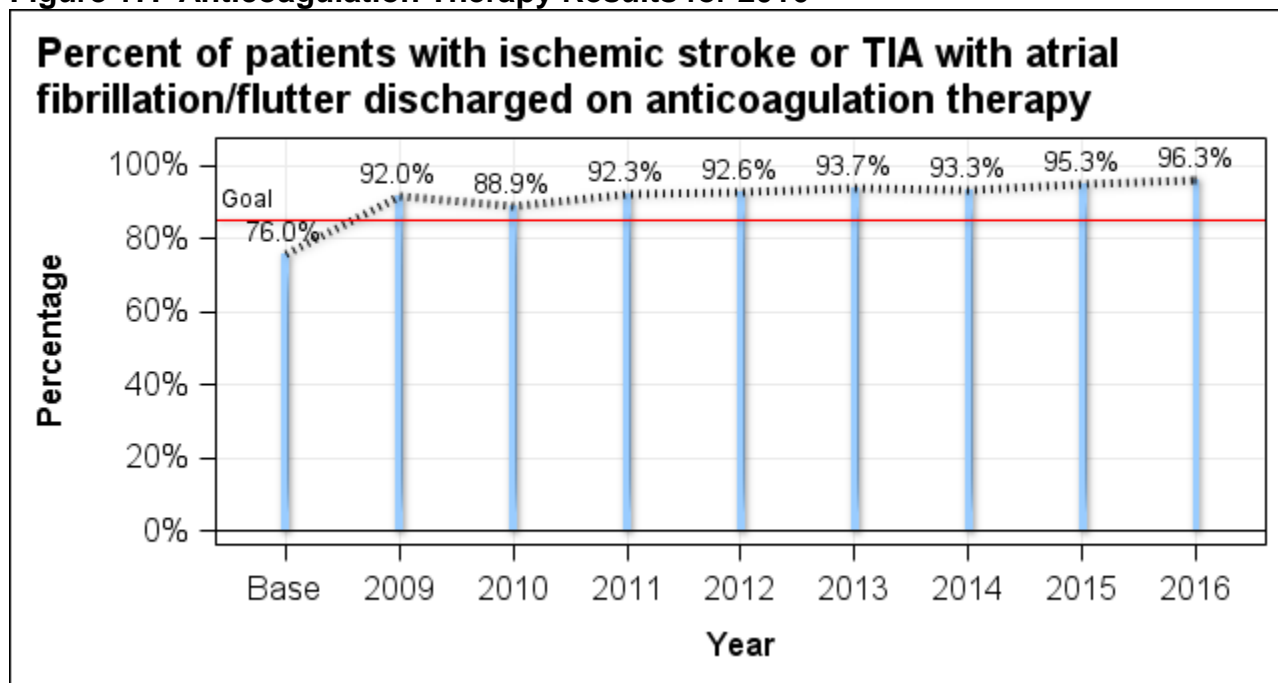
- ✓ There was a 5% increase in the **percentage of eligible patients** who were prescribed antithrombotic therapy at discharge
- ✓ The **number of sites** reporting on this measure increased by seven

Table 4. Data table used to calculate measure results for antithrombotics at discharge. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.946	0.92	0.966	385	407	16
2009	0.985	0.981	0.989	3561	3616	16
2010	0.982	0.978	0.986	4204	4282	16
2011	0.985	0.981	0.989	4239	4304	17
2012	0.985	0.981	0.988	5034	5113	17
2013	0.990	0.987	0.993	5083	5134	18
2014	0.990	0.988	0.993	5478	5532	19
2015	0.992	0.990	0.995	5679	5723	22
2016	0.995	0.994	0.997	6638	6671	23

ANTICOAGULATION THERAPY RESULTS FOR 2016

Figure 17. Anticoagulation Therapy Results for 2016



From Baseline to 2016:

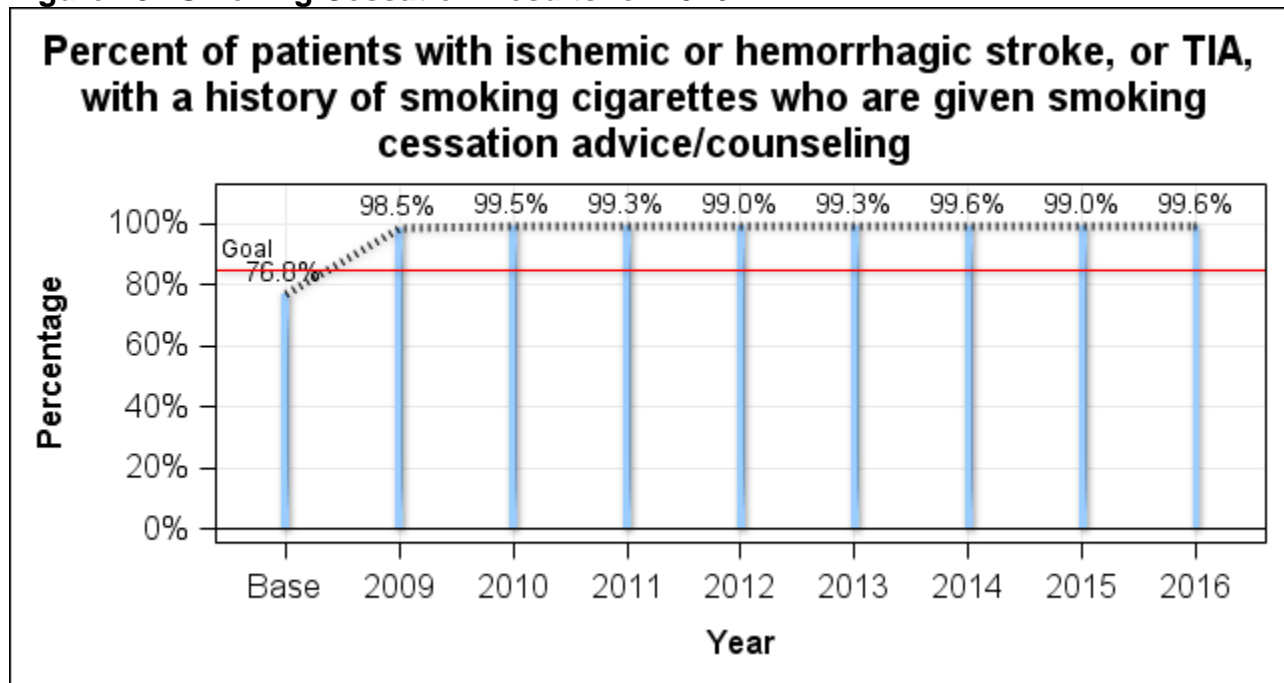
- ✓ There was a 27% increase in the **percentage of eligible patients** who were discharged on anticoagulation therapy
- ✓ The **number of sites** reporting on this measure increased by seven

Table 5. Data table used to calculate measure results for anticoagulation therapy. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.760	0.619	0.870	38	50	16
2009	0.920	0.895	0.942	519	564	16
2010	0.889	0.862	0.913	544	612	16
2011	0.923	0.900	0.943	587	636	17
2012	0.926	0.905	0.944	709	766	17
2013	0.937	0.918	0.953	757	808	18
2014	0.933	0.915	0.949	831	891	19
2015	0.953	0.938	0.965	966	1014	22
2016	0.963	0.950	0.974	1057	1098	23

SMOKING CESSATION RESULTS FOR 2016

Figure 18. Smoking Cessation Results for 2016



From Baseline to 2016:

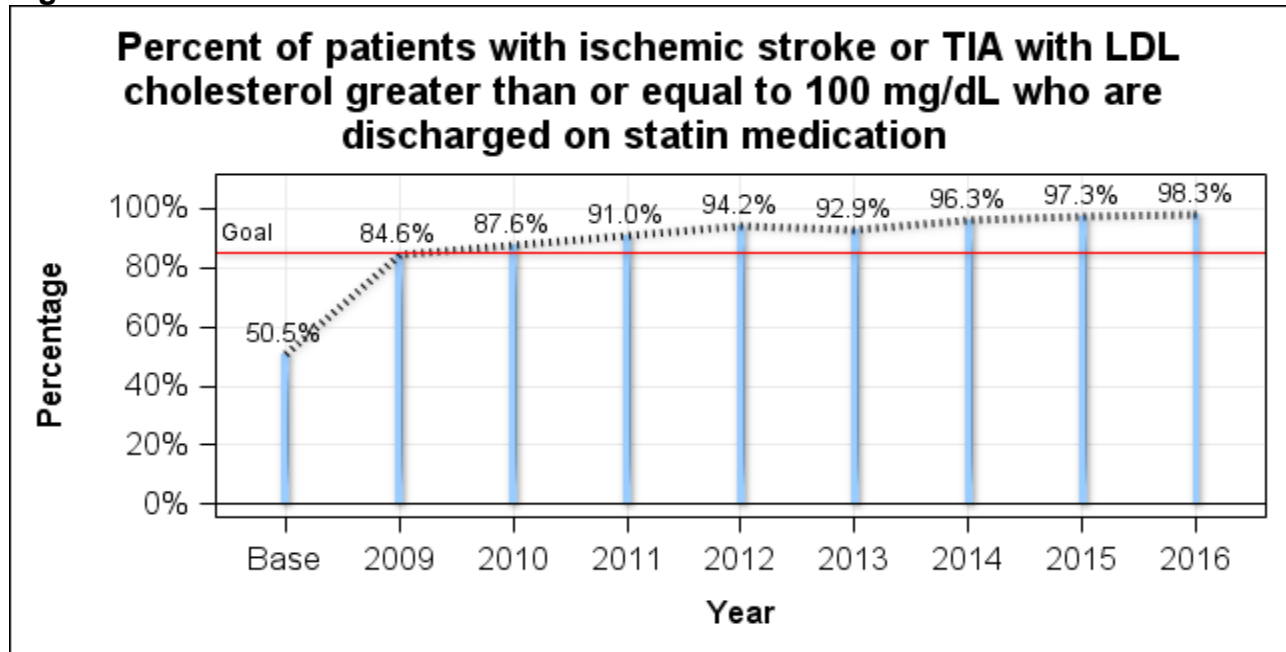
- ✓ There was a 31% increase in the **percentage of eligible patients** who were given smoking cessation advice/counseling
- ✓ The **number of sites** reporting on this measure increased by seven

Table 6. Data table used to calculate measure results for smoking cessation. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.768	0.671	0.849	73	95	16
2009	0.985	0.975	0.992	960	975	16
2010	0.995	0.989	0.999	1111	1117	13
2011	0.993	0.987	0.998	1177	1185	17
2012	0.990	0.985	0.995	1549	1564	17
2013	0.993	0.987	0.997	1384	1394	18
2014	0.996	0.993	0.999	1651	1657	19
2015	0.990	0.984	0.994	1633	1650	23
2016	0.996	0.992	0.999	1683	1690	23

LDL RESULTS FOR 2016

Figure 19. LDL Results for 2016



From Baseline to 2016:

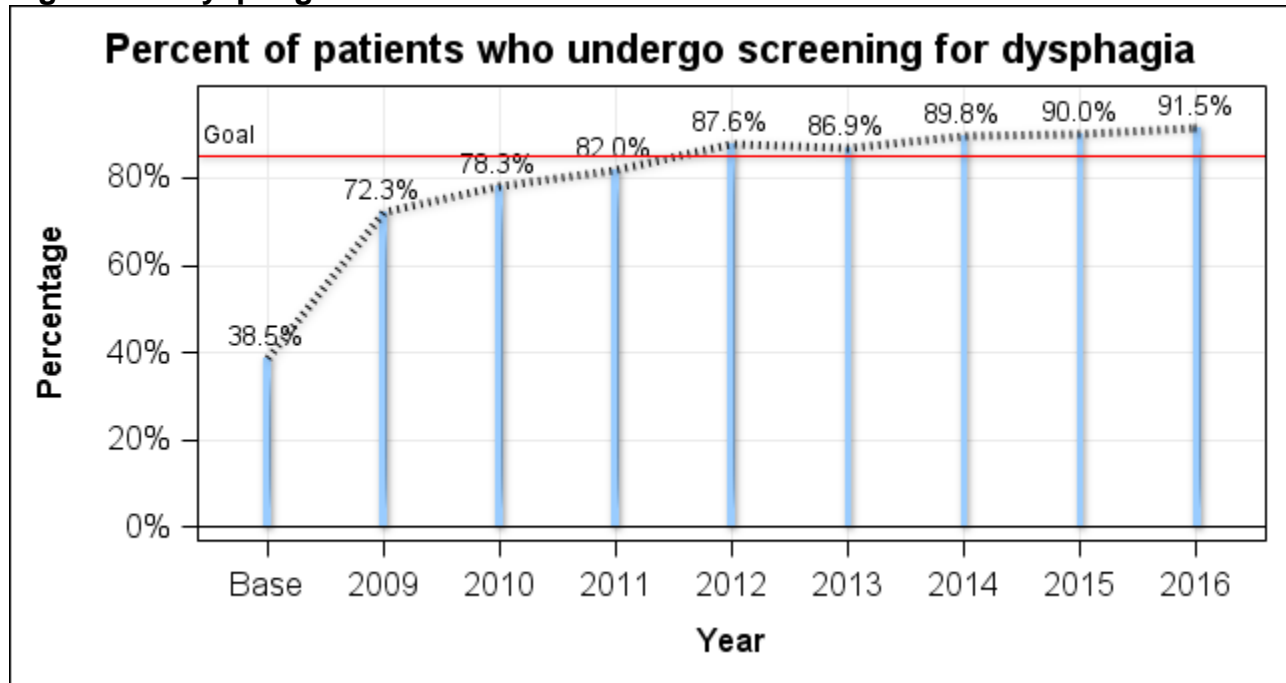
- ✓ There was a 95% increase in the **percentage of eligible patients** who were discharged on statin medication
- ✓ The **number of sites** reporting on this measure increased by seven

Table 7. Data table used to calculate measure results for elevated LDL with statin treatment. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.505	0.450	0.561	165	327	16
2009	0.846	0.826	0.865	1188	1405	16
2010	0.876	0.863	0.888	2381	2719	16
2011	0.910	0.900	0.920	3053	3356	17
2012	0.942	0.935	0.949	3709	3938	17
2013	0.929	0.921	0.937	3695	3978	18
2014	0.963	0.958	0.969	4083	4238	19
2015	0.973	0.968	0.978	4273	4391	22
2016	0.983	0.979	0.987	4953	5040	23

DYSPHAGIA RESULTS FOR 2016

Figure 20. Dysphagia Results for 2016



From Baseline to 2016:

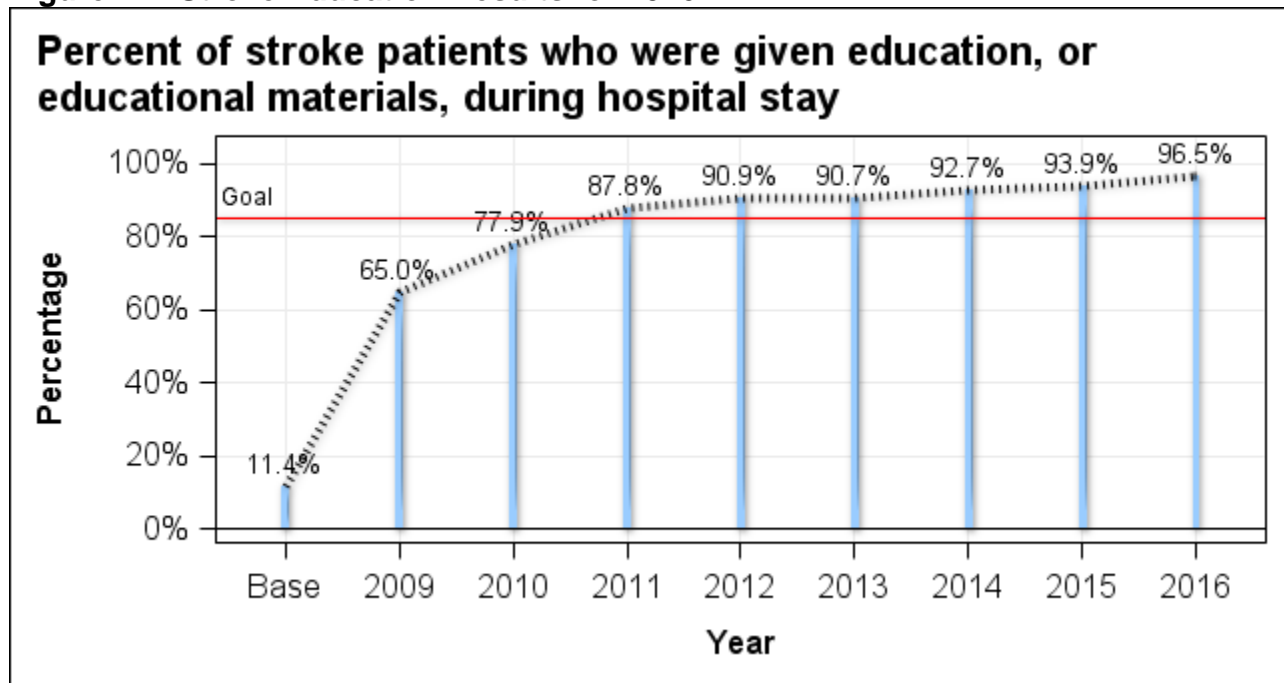
- ✓ There was a 138% increase in the **percentage of eligible patients** who were screened for dysphagia
- ✓ The **number of sites** reporting on this measure increased by seven

Table 8. Data table used to calculate measure results for dysphagia. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.385	0.339	0.434	163	423	16
2009	0.723	0.708	0.738	2456	3398	16
2010	0.783	0.770	0.796	3063	3914	16
2011	0.820	0.808	0.833	3146	3836	17
2012	0.876	0.867	0.886	4242	4841	17
2013	0.869	0.860	0.879	4520	5199	18
2014	0.898	0.891	0.907	5172	5757	19
2015	0.900	0.893	0.908	5477	6085	23
2016	0.915	0.909	0.922	6391	6982	23

STROKE EDUCATION RESULTS FOR 2016

Figure 21. Stroke Education Results for 2016



From Baseline to 2016:

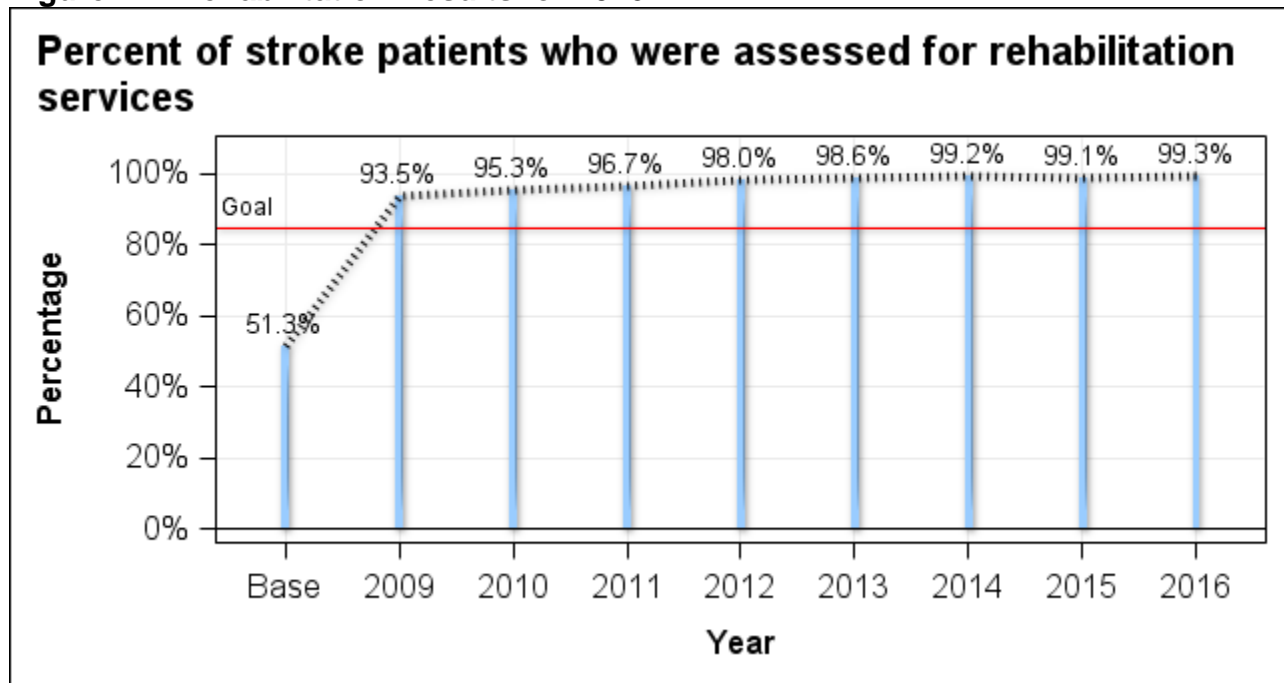
- ✓ There was a 746% increase in the **percentage of eligible patients** or their caregivers who were given education, or educational materials, during hospital stay
- ✓ The **number of sites** reporting on this measure increased by seven

Table 9. Data table used to calculate measure results for stroke education. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.114	0.078	0.16	29	254	16
2009	0.650	0.632	0.669	1649	2536	16
2010	0.779	0.764	0.794	2355	3025	16
2011	0.878	0.867	0.890	2721	3098	17
2012	0.909	0.899	0.919	3200	3521	17
2013	0.907	0.898	0.917	3245	3576	18
2014	0.927	0.919	0.936	3437	3706	19
2015	0.939	0.932	0.947	3615	3848	23
2016	0.965	0.960	0.971	4197	4347	23

REHABILITATION RESULTS FOR 2016

Figure 22. Rehabilitation Results for 2016



From Baseline to 2016:

- ✓ There was a 94% increase in the **percentage of eligible patients** who were assessed for rehabilitation services
- ✓ The **number of sites** reporting on this measure increased by seven

Table 10. Data table used to calculate measure results for rehabilitation. It includes the years, proportion of patients, 95% confidence intervals, numerators and denominators, as well as the number of sites reporting on this measure.

Year	Proportion of Patients	95% CI. Lower	95% CI. Upper	Numerator	Denominator	Sites
Baseline	0.513	0.463	0.563	204	398	16
2009	0.935	0.927	0.944	3086	3300	16
2010	0.953	0.946	0.960	3606	3783	16
2011	0.967	0.961	0.973	3629	3754	17
2012	0.980	0.976	0.984	4787	4886	17
2013	0.986	0.983	0.989	5020	5093	18
2014	0.992	0.989	0.994	5589	5636	19
2015	0.991	0.989	0.994	5739	5792	23
2016	0.993	0.992	0.996	6717	6762	23

RECOMMENDATIONS

The Kentucky Heart Disease and Stroke Prevention Task Force along with the Kentucky Department for Public Health developed the Kentucky Heart Disease and Stroke Prevention Strategic Map and Plan for 2017-2019. SEQIP members were active participants in the development and creation of the map and are committed to furthering the initiatives outlined in the plan for continued improvement in stroke systems of care in the commonwealth. The following objectives and action items are outlined in the plan and recommended for ongoing development and growth of stroke systems of care in the commonwealth:

Identify and Improve Current Cerebrovascular Systems of Care

- To continue the collaboration with SEQIP and the American Heart Association/Stroke Association to identify and map certified stroke centers by certification levels as defined in KRS 216B.0425 (Comprehensive, Primary, and Acute Stroke Ready) and disseminate to KBEMS;
- To continue the collaboration with SEQIP and the KHA's Rural Hospital Flexibility Program;
- To educate and partner with Kentucky hospitals to increase appropriate utilization of intravenous therapy (IV) recombinant tissue plasminogen activator (rt-PA);
- To disseminate KBEMS statewide inter-facility stroke transfer protocol during or after IV rt-PA protocol;
- To identify EMS agencies which have a field transport protocol for stroke;
- To partner with KBEMS to determine specific data points available for capture;
- To explore pilot project for EMS feedback utilizing proposed data elements;
- To continue collaboration with KBEMS Cardiac and Stroke Care subcommittee;
- To enhance EMS interaction and support of dispatch centers;
- To partner with KBEMS for continued development of inter-facility transport protocols for all stroke subtypes.

Continue Stroke Encounter Quality Improvement Project through FY 2020

- Recruit at least one additional hospital pursuing acute stroke ready certification by March 2019;
- Utilize registry to develop and implement an action plan around quality metrics and education;
- Develop and disseminate Stroke Registry Data Summary in accordance with KRS 211.575.

Continue to Engage Hospitals to Become Stroke Certified

- Disseminate the Kentucky State Plan for Stroke Systems of Care and statewide map to target hospitals;
- Monitor and provide support for development of effective stroke program development in target hospitals;
- Update and disseminate KHA stroke resources.

Develop Collaboration Among Healthcare Systems and Public Health in the State to Standardize Messaging

Provide patient and family education regarding:

- Signs and symptoms of stroke;
- The importance of calling 911;
- Primary and secondary prevention of stroke.

In conclusion, SEQIP is positioned to achieve these goals by maximizing its current resources; sustaining and creating new partnerships; and maintaining collaboration amongst stakeholders.

SEQIP Steering Committee

June 1, 2018

APPENDIX A

KRS 211.575 Statewide system for stroke response and treatment.

(1) As used in this section, "department" means the Department for Public Health.

(2) The Department for Public Health shall establish and implement a plan for achieving continuous quality improvement in the quality of care provided under a statewide system for stroke response and treatment. In implementing the plan, the department shall:

(a) Maintain a statewide stroke database to compile information and statistics on stroke care as follows:

1. The database shall align with the stroke consensus metrics developed and approved by the American Heart Association, the American Stroke Association, the Centers for Disease Control and Prevention, and the Joint Commission;

2. The department shall utilize the "Get With The Guidelines-Stroke" quality improvement program maintained by the American Heart Association and the American Stroke Association or another nationally recognized program that utilizes a data set platform with patient confidentiality standards no less secure than the statewide stroke database established in this paragraph; and

3. Require primary stroke centers as established in KRS 216B.0425 to report to the database each case of stroke seen at the facility. The data shall be reported in a format consistent with nationally recognized guidelines on the treatment of individuals within the state with confirmed cases of stroke;

(b) To the extent possible, coordinate with national voluntary health organizations involved in stroke quality improvement to avoid duplication and redundancy;

(c) Encourage the sharing of information and data among health care providers on methods to improve the quality of care of stroke patients in the state;

(d) Facilitate communication about data trends and treatment developments among health care professionals involved in the care of individuals with stroke;

(e) Require the application of evidence-based treatment guidelines for the transition of stroke patients upon discharge from a hospital following acute treatment to community-based care provided in a hospital outpatient, physician office, or ambulatory clinic setting; and

(f) Establish a data oversight process and a plan for achieving continuous quality improvement in the quality of care provided under the statewide system for stroke response and treatment, which shall include:

1. Analysis of the data included in the stroke database;

2. Identification of potential interventions to improve stroke care in specific geographic regions of the state; and

3. Recommendations to the department and the Kentucky General Assembly for improvement in the delivery of stroke care in the state.

(3) All data reported under subsection (2)(a) of this section shall be made available to the department and all government agencies or contractors of government agencies which are responsible for the management and administration of emergency medical services throughout the state.

(4) On June 1, 2013, and annually on June 1 thereafter, the department shall provide a report of its data and any related findings and recommendations to the Governor and to the Legislative Research Commission. The report also shall be made available on the department's Web site.

(5) Nothing in this section shall be construed to require the disclosure of confidential information or data in violation of the federal Health Insurance Portability and Accountability Act of 1996.

Effective: July 12, 2012

History: Created 2012 Ky. Acts ch. 106, sec. 1, effective July 12, 2012.

APPENDIX B

KRS 216B.0425 Certification designations for stroke care for acute care hospitals.

- (1) Except as otherwise provided, for purposes of this section:
- (a) "Acute care hospital" means a licensed facility providing inpatient and outpatient medical or surgical services to an individual that seeks care and treatment, regardless of the individual's ability to pay for services, on an immediate and emergent basis through an established emergency department and a continuous treatment basis on its premises for more than twenty-four (24) hours; and
 - (b) "Primary stroke center certification," "acute stroke ready hospital certification," and "comprehensive stroke center certification" mean certification for acute care hospitals issued by the Joint Commission, the American Heart Association, or another cabinet-approved nationally recognized organization that provides disease-specific certification for stroke care, that:
 - 1. Complies with census-based national standards and safety goals;
 - 2. Effectively uses evidence-based clinical practice guidelines to manage and optimize care; and
 - 3. Uses an organized approach to measure performance.
- (2) The secretary of the Cabinet for Health and Family Services shall designate as a primary stroke center any acute care hospital which has received an acute stroke ready hospital certification, a comprehensive stroke center certification, or a primary stroke center certification.
- (3) The secretary shall suspend or revoke an acute care hospital's designation as an acute stroke ready hospital, a comprehensive stroke center, or a primary stroke center if certification is withdrawn by the Joint Commission, the American Heart Association, or another cabinet-approved certifying organization.
- (4) (a) The cabinet shall maintain a list of certified acute stroke ready hospitals, comprehensive stroke centers, and primary stroke centers and post the list on its Web site. The cabinet shall provide the list and periodic updates to the Kentucky Board of Emergency Medical Services.
- (b) The Kentucky Board of Emergency Medical Services shall share the list with each local emergency medical services provider at least annually, and as new centers and hospitals are designated and certified.

Effective: June 24, 2015

History: Amended 2015 Ky. Acts ch. 9, sec. 1, effective June 24, 2015. -- Created 2010 Ky. Acts ch. 67, sec. 1, effective July 15, 2010.

APPENDIX C

KRS 311A.180 Medical control documents -- Review -- Approval -- Appeal -- Schedule for submission and review.

- (1) Each emergency medical services medical director for an ambulance service, or other emergency medical services provider, shall submit:
 - (a) His or her protocols, including the pre-hospital care protocols related to the assessment, treatment, and transport of stroke patients;
 - (b) His or her standing orders; and
 - (c) Similar medical control documents to the board for approval prior to placing the document in use.
- (2) The medical advisor for the board shall review each document submitted to ascertain if it is in accordance with accepted standards of medical care and in accordance with the provisions of this chapter and administrative regulations promulgated thereunder. If the protocol, standing order, or other medical control document clearly violates the accepted standards of medical care, this chapter, or an administrative regulation, the medical advisor shall notify the emergency medical services medical director of the exact violation and recommend a correction thereof.
- (3) Following review of protocol, standing order, and medical control documents and giving the emergency medical services medical director who submitted the documents an opportunity to review the medical advisor's comments, the medical advisor shall submit the documents together with his or her comments to the board for approval or disapproval.
- (4) The board shall approve, disapprove, or approve with modifications protocol, standing order, and medical control documents submitted by the emergency medical services medical director at its next regular or special meeting following the submission of the documents.
- (5) If a protocol, standing order, or other medical control document is disapproved by the board, the emergency medical services medical director who submitted it may appeal the decision to the Franklin Circuit Court. If the decision of the board is appealed to the Franklin Circuit Court, the board shall bear the burden of proving that the protocol, standing order, or other medical control document violates the accepted standards of medical care, or an administrative regulation.
- (6) The board shall, by administrative regulation, specify a schedule for submission and prompt review and decision making with regard to protocols, standing orders, and medical control documents submitted to the board.

Effective: June 24, 2015

History: Amended 2015 Ky. Acts ch. 9, sec. 2, effective June 24, 2015. -- Created 2002 Ky. Acts ch. 211, sec. 33, effective July 15, 2002.

APPENDIX D

Listings of SEQIP Hospitals

Hospitals whose data are included in this report

Baptist Health Louisville
Baptist Health LaGrange
Baptist Health Lexington
Baptist Health Paducah
Hardin Memorial Health
Jackson Purchase Medical Center
Jewish Hospital
King's Daughter's Medical Center
Lake Cumberland Regional Hospital
Norton Audubon Hospital
Norton Brownsboro Hospital
Norton Hospital
Norton Women's and Children's Hospital
Owensboro Health Regional Hospital
Pikeville Medical Center
Saint Joseph Hospital
St Elizabeth Edgewood
St Elizabeth Florence
St Elizabeth Ft Thomas
Sts. Mary and Elizabeth Hospital
The Medical Center at Bowling Green
University of Kentucky Hospital
University of Louisville Hospital

All SEQIP hospitals

Baptist Health Floyd
Baptist Health Louisville
Baptist Health LaGrange
Baptist Health Lexington
Baptist Health Paducah
Cardinal Hill Rehab Hospital
Ephraim McDowell Regional Medical Center
Fleming County Hospital
Frankfort Regional Medical Center
Georgetown Community Hospital
Greenview Regional Hospital
Hardin Memorial Health
Harlan ARH
Highlands Regional Medical Center
Jackson Purchase Medical Center
Jewish Hospital
King's Daughter's Medical Center
Lake Cumberland Regional Hospital
Morgan County ARH
Norton Audubon Hospital
Norton Brownsboro Hospital
Norton Hospital
Norton Women's and Children's Hospital
Our Lady Of Bellefonte Hospital
Owensboro Health Regional Hospital
Pikeville Medical Center
Saint Joseph Hospital
St Elizabeth Edgewood
St Elizabeth Florence
St Elizabeth Ft Thomas
Sts. Mary and Elizabeth Hospital
The Medical Center at Bowling Green
Three Rivers Medical Center
University of Kentucky Hospital
University of Louisville Hospital